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Spanish scientific journals; the forgotten investment

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In Spain, politicians responsible for science and education policies, science publishers and even researchers are not often aware of two relevant aspects of scientific publishing. First, the fact that the final product of most scientific, technical or medical research studies is neither a commercial report nor a patent, but rather an article in a professional scientific journal. Second, that the cost of publishing an article in a first-rank journal can range, on average, from 1,000 to 3,000 Euros. This money is paid to the publishers, usually large, private, multinational companies, which may charge authors per page, or for color figures, reprints, electronic editing, etc. Most high-quality Spanish scientific research is published abroad, mainly in journals from the United States, the Netherlands, Germany, and the United Kingdom. These journals tend to have very expensive subscription rates, which researchers must deduct from their projects, and libraries from their budgets. Scientific publication has become a thriving concern, which may represent more than 20% of the Spanish national budget for research. In view of the potential profit publishers can obtain from our increasing research activity, several foreign companies have decided to set up branches in Spain.

Unfortunately, with the exception of a few cases, major Spanish publishers seem to have an interest only in the humanities or social sciences; their dedication to the experimental sciences, medicine, or technology does not go further than publishing textbooks and a few monographs – usually translations of foreign works – with the limitations of a market restricted to Spain and Latin America. Moreover, the conspicuous, prolific publishing services of Spanish universities and public research centers, including the Spanish Council for Scientific Research (CSIC), publish almost exclusively for

domestic use. Their products tend to be of poor quality and frequently end up being sold by weight or collecting dust on the shelves of warehouses for decades. In the light of this scenario, we must bear in mind that having brilliant researchers and modern facilities will not be enough for Spain to join the most developed countries in science. This will only happen when the country has, in addition, public or private companies able to export printed and electronic primary science to other European countries, the United States, Japan, Australia, etc.

Some international bibliometric indices published recently make these facts obvious. In fact, of the almost 1,000 scientific journals published in Spain, only a few of them reach the minimum acceptable standards regarding rigor in the selection of papers, originality, scientific quality, periodicity and diffusion. Accordingly, only 28 Spanish journals were included in the last edition of the Science Citation Index/Journal Citation Report (2001), which includes the well-known Impact Factor (IF); only two Spanish journals have an IF value greater than one! In addition, only half of these journals were taken into account by the Canadian-based company that developed the Prestige Factor (PF), a new bibliometric index which could have ended up replacing the IF because of its higher accuracy in measuring scientific quality. However, legal problems with the Institute for Scientific Information (ISI) have very recently impeded its use.

For over 13 years, *The International Journal of Developmental Biology* has slowly progressed in achieving international prestige, albeit in utter solitariness. Fuelled by the hopeful dedication of a few people, the journal barely generated any enthusiasm among colleagues, who sometimes even showed a scornful lack of confidence in the project. Forced closure of the journal was also threatened, and for a long time it received scarce institutional financial support. Currently, however, the journal is a fruitful venture; not only does it produce scientific benefits, but also financial profit despite the great limitations that a modest university press faces in the competitive, aggressive international market of scientific publishing. Were other Spanish

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journals to follow the path of *The International Journal of Developmental Biology*, so that there was at least one high-quality journal for each field of knowledge, the country's scientific prestige would surely grow extraordinarily, not to mention the significant income that the exports would provide. To reach this goal, we must turn from being passive consumers of foreign science to active exporters of scientific achievements through professional, competitive Spanish journals. In addition, Spanish publishers and companies producing scientific equipment and consumables can be of great help. Spanish scientific policy for the next few years should give higher priority to the production of exportable scientific journals than to setting up "star" centers of research or trying to recover Spanish researchers that have gained prestige abroad. Some of our politicians are especially prone to recovering famous Spanish scientists whose productivity can be out of all proportion to the expenses their return generates.

In science, as in sports, continuous long-term training and work are necessary, as is a continued search for promising young researchers. One must also be cautious of researchers who in addition to obtaining rapid, dramatic results – usually by depleting enormous budgets which soon, however, turn out to be short-lived – are not

able to create a group of thinking disciples. Moreover, it is of note that in many cases the main reason for Spanish researchers returning home after having developed a brilliant career abroad is because their professional future has declined, because of an illness or simply because they look for a comfortable retirement. Sadly, the status quo (at the level of political institutions and poorly informed public opinion) ignores or even despises good researchers who, with slender means, work hard and obtain very good results in the country itself, while it may flatter those who become famous abroad. Hard-working researchers can and do develop great projects at home, often in modest laboratories. Promoting scientific culture at the level of research and also of its associated industries (publishers and laboratory suppliers) is the necessary next step to raise the prestige of the contribution of Spanish science to the global scientific community. It is our hope that politicians with perspicacity and ample vision will seize the present opportunity and implement the policies necessary to achieve these worthy aims.

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