

# ***Ciència* magazine, first period (1926–1933): A project for the recovery and dissemination of the Catalan scientific heritage**

**Àngela García-Lladó,<sup>1</sup> Òscar Montero-Pich,<sup>1</sup> Alfons Zarzoso,<sup>1,2</sup> Àlvar Martínez-Vidal<sup>3</sup>**

<sup>1</sup>Center for the History of Science (CEHIC), Autonomous University of Barcelona, Barcelona. <sup>2</sup>Catalan Museum of the History of Medicine (MHMC). <sup>3</sup>López Piñero Institute for the History of Medicine and Science, CSIC-University of Valencia, Valencia.

## **Correspondence:**

A. Zarzoso  
Museu d'Història de la Medicina de Catalunya  
Passeig del Comte d'Egara, 22, 1-2  
08221 Terrassa, Catalonia  
Tel. 937845380  
Fax: 937845380  
E-mail: azarzoso@museudelamedicina.cat

**Summary.** In 1926, a new publishing project was realized: the magazine *Ciència*. Its nameplate included, in a programmatic declaration, the following subtitle: *Revista catalana de ciència i tecnologia* (Catalan Magazine of Science and Technology). The magazine became emblematic of a project of Catalanism that aimed at meeting the need of communicating science and technology to a growing interested public and of establishing a scientific and technical terminology in Catalan. In the current technological context and in the framework of different initiatives for the digitization, preservation, and dissemination of Catalan scientific heritage, the Institute for Catalan Studies has supported a distinctive initiative to archive the scientific, technological, and medical periodicals produced in Catalonia during the first third of the 20th century. This article introduces *Ciència* and the projects implemented to preserve and communicate Catalonia's scientific heritage, placing both in their historical context.

**Keywords.** science-medical-technology journalism · Catalanism · popular science · professional identity · science audiences · Catalan scientific-medical-technological lexicon

**Resum.** L'any 1926 es va dur a terme un nou projecte editorial: la revista *Ciència*. La nova capçalera portava com a subtítol, en una declaració programàtica: *Revista catalana de ciència i tecnologia*. La revista va esdevenir emblemàtica d'un projecte de catalanisme que cercava tant la necessitat de comunicar la ciència i la tecnologia a un públic cada cop més in teressat, com també la necessitat de fixar un lèxic científic i tècnic en català. En el context tecnològic actual i en el marc de diferents iniciatives de digitalització, conservació i difusió del patrimoni científic, l'Institut d'Estudis Catalans dona suport a una acció singular de recuperació del patrimoni hemerogràfic científic, tècnic i mèdic produït a la Catalunya durant el primer terç del segle XX. Aquest article presenta i situa en context històric tant la revista *Ciència* com els projectes de conservació i comunicació d'aquest patrimoni.

**Paraules clau.** periodisme científic-mèdic-tècnic · catalanisme · divulgació científica · identitat professional · públics de la ciència · lèxic científic-mèdic-tècnic català

## **Science publishing**

Contemporary science has developed exponentially, and its progress has been communicated predominantly in periodical publications. In fact, the growth in the volume of periodicals

in the Western world has followed that of science itself [18]. The roots of science publication are to be found in 17th century Europe, in the publications of the first royal academies and learned societies. The *Philosophical Transactions* of the Royal Society of London and the *Journal des Sçavants* are

considered to be the first scientific periodicals; both were first published in 1665 [21]. The French were the first to publish a medical journal, the *Nouvelles découvertes sur toutes les parties de la médecine*. Edited by Nicolàs de Blegny in Paris between 1679 and 1681, it was the first to employ a vernacular language. But it is Thomas Wakley's *The Lancet*, founded in 1823, that is considered to be the starting point of medical journalism. Fifty-five years later, in 1869, the amateur astronomer Norman Lockyer founded the journal *Nature*, which, like *The Lancet*, is still published. Thus, at the birth of science periodicals, institutional, scholarly publications were already distinct from commercial, business, and popular publications [5]. With growing industrialization and the emergence of new urban social classes, during the second half of the 19th century, science publication spread, not only in the academic sphere but also as a means to disseminate science to lay audiences. The context was favorable, since progress in science and technology was considered to reflect economic growth and social promotion. Indeed scientific and technological advances were matters of interest to European society and they were regularly reported by newspapers, many of which had by then established scientific and technological sections.

## Science journals and magazines in Catalonia

The medical periodical press in Catalonia developed in the late 18th century, during the emergence of new ways of understanding medicine and disease. By the mid-20th century, over 270 journals were being published in Catalonia, mostly in Barcelona, which housed the offices of 250 journals and other publications. Publication of the remaining 20 was scattered among (in decreasing order) Reus, Lleida, Tarragona, Girona, Mataró, Blanes, and Vilanova i la Geltrú. Evidence of the thriving publishing industry in Barcelona and the importance of the city as a center of production, transmission, and dissemination of medical news and research can be gained from the fact that around 150 new medical periodicals were published there between the 1890s and 1938. Despite the setback posed by the Civil War, which resulted in the disappearance of most scientific journals, Barcelona remained a leading publishing center in Spain, with around 100 periodical publications from 1940 to the end of the 20th century. This was a time of profound change in the medical sciences and in the ways of communicating and accessing medical information.

The features of Catalan medical publications were characteristic of the medical periodicals of the respective period. There were journals and other publications that served as the voice of medical or pharmaceutical corporations, of health professionals, and even of religious ideologists. In addition, in the transition to the professionalization of medical journalism, "author journals" predominated, in which edi-

tors were also publishers and the publication was a means to propagandize. The importance of the potential audience of these media is attested to by the significant presence of periodicals that recorded the struggles to delimit the powers of a growing medical market, particularly in attempts to rein in practices offering an alternative to those of regular medicine. The turn of the 19th century was a politically convulsive period marked by urban transformations and social changes. The publications of this period gave voice to the problems arising from the living conditions of the urban working class. At the same time, the complexity of medical knowledge, the increasing technical sophistication, and the social division of medical work promoted the development of medical specialties whose presence was increasingly represented by specific publications [24].

The development of the scientific and technological press in Catalonia took place throughout the 19th century, but it was mainly the last third of that century that gave rise to a clear publishing and communicating process [8]. New publications emerged that reflected the range of scientific audiences: illustrated magazines devoted to showing the transforming power of technology in the fields of electricity or engineering; specialized journals aimed at expert audiences; popular science magazines that included news, experiments, and practices and that were filled with models, illustrations, and photographs; and institutional publications, such as the *Arxius de l'Institut de Ciències* (Archives of the Institute of Sciences), published beginning in 1912 by a society affiliated with the Institute for Catalan Studies (IEC), or the magazine *Iberica. El progreso de las ciencias y de sus aplicaciones* (*Iberica. The Progress of Science and of its Applications*), published in Spanish by the Jesuits in Tortosa from 1913 to 1924 and then in Barcelona [see the article by M. Genescà in pp. 157-166 of this issue]. The latter was clearly popular in its nature, since although published by scientists, the magazine was aimed at a general audience eager to be instructed and informed on advancements in science and technology [12].

Advertising played a relevant role in scientific, technological, and medical periodicals during the first third of the 20th century. It was not solely a means of financing the publications, along with subscription fees [25]; rather, it became an additional means of scientific communication, by showcasing the latest innovations. It also had an innovative use of language, which along with visual and textual codes, employed different strategies to persuade readers of the value and novelty of the products offered [10,23].

## Scientific Catalanism: language and periodical publications

The history of Catalan medical publication includes a clearly defined 40-year period during which medical Catalanism

tried to provide structure to the country's medical profession. The first medical journal in Catalan, *La gynecologia catalana* (Catalan Gynaecology), was published in 1898 but 1938 marked the end for an extensive group of medical periodicals written in Catalan—their existence cut short by the Spanish Civil War. During the early 20th century, medical publishing had been both intellectually and professionally productive. Its success was tied to that of a scientific revitalization program and the building of a Catalan nation and it was led by Catalan physicians through an institutional support of medicine. Indeed, in 1931 there were 14 medical publications in Catalan [26].

The history of medical Catalanism is linked to the Academy of Medical Sciences and Laboratory of Catalonia (currently the Academy of Medical and Health Sciences of Catalonia and the Balearic Islands), an institution that resulted from the merging of two previous entities: The Laboratory, founded in 1872 by a small group of students from the Faculty of Medicine of Barcelona, and the Academy of Medical Sciences, found by a group of physicians in 1877. The proceedings of the institution were published throughout the final decades of the 19th century and then in the journal *Annals de Medicina* (Annals of Medicine) (1907–1936). This monthly publication became both a means of disseminating news of institutional activities and the voice of the scientific rejuvenation and social intervention programs of medical Catalanism [16]. Other actions related to the linguistic activism of the Science Section of the IEC (1912) and the *Congressos de Metges de Llengua Catalana* (Congresses of Physicians of Catalan Language, since 1934 known as the Congresses of Physicians and Biologists of Catalan Language) started in 1913. They were driving forces in the creation of the *Mancomunitat de Catalunya* (the Commonwealth of Catalonia), whose purpose was to promote the emergence of an extensive group of scientific, technological, and medical journals and book collections in Catalan [19]. The creation of the Union of Physicians of Catalonia (1920) consolidated this professional organization, while the pages of the *Bulletí del Sindicat de Metges de Catalunya* (Bulletin of the Union of Physicians of Catalonia) (1920–1937) raised awareness of the great problems associated with the practice of medicine in cities and in rural areas [14]. Medical specialization benefited from the initiative promoted by the physician and politician Jaime Aiguader (the mayor of Barcelona from 1931 to 1933 and a minister in the Spanish Government during the Spanish Civil War), to publish the *Monografies Mèdiques* (Medical Monographs) (1926–1936). This collection, which was a great publishing success, became a forum for Catalan physicians to share their expertise with their Catalan-speaking colleagues [17].

The scientific level reached in the field of medicine in Catalonia during the first third of the 20th century was exemplified by *La medicina catalana. Portantveu de l'Occitània Mèdica*

(Catalan Medicine. Guide to Medical Occitania) (1933–1938), a journal run by Leandre Cervera. It became a forum for the dissemination of Catalan research in the basic sciences and in medical and surgical specialties, both in Occitania (understood as a cultural, linguistic unit comprising the territories that, in the Middle Ages, spoke the several dialects of the *langue d'Oc*, including Northern Catalonia—now belonging to France—Catalonia, Valencia, and the Balearic Islands) and throughout the world [15] [Perona Carrión, J. La consolidació de les especialitats mèdiques a Catalunya a través de la revista *La Medicina Catalana. Portantveu de l'Occitània Mèdica* (1933-1938). UAB, Master Dissertation, Barcelona, 2011]. Several of the medical societies that stemmed from the consolidation of certain specialties, i.e., pediatrics (1924–1938), radiology (1934–1936), surgery (1933–1935), and psychiatry (1936–1937)—and from the acceptance of Catalanism by their members, chose to publish their journals in Catalan. The Association of Industrial Engineers of Barcelona also adopted Catalan as its official language in 1931, from which time on it published its institutional journal *Tècnica. Revista Tecnològico-Industrial* (Technique. A Technology and Industry Journal) (1918–1936) in Catalan. This initiative was continued by industrial engineers in their journal *Indústria Catalana* (Catalan Industry) (1933–1935) [6,22]. It was against this background that the journal *Ciència. Revista Catalana de Ciència i Tecnologia* (Science. Catalan Magazine of Science and Technology) (1926–1933) was launched. It was written entirely in Catalan and among its aims was the establishment of a Catalan technical terminology.

### **Ciència, the magazine**

In February 1926, during Primo de Rivera's military dictatorship, the first issue of *Ciència. Revista Catalana de Ciència i Tecnologia* was released. Shortly after, the monthly magazine became a key cultural tool of the Catalanist movement in general, and of scientific Catalanism in particular [García-Lladó, A. La revista *Ciència* (1926–1933): Una eina al servei del catalanisme. UAB, Master Dissertation, Barcelona, 2011].

The chemist Ramon Peypoch Pich was the founder of *Ciència* and its editor-in-chief from the first issue until the magazine abruptly stopped being published, during the winter of 1933. Peypoch was born in Barcelona in 1898 and was a prolific figure in the fields of politics, science, and periodical publications. His Catalanist political ideals forced his exile first to France (1939) and later to Mexico (1942). This, however, did not prevent him from keeping up his intensive cultural activities. During the years of *Ciència's* publication, Peypoch led and coordinated a network of institutions that, along with the magazine, strove to raise the level of Catalan science to that of the first-rank scientific production centers of the time [11,1].

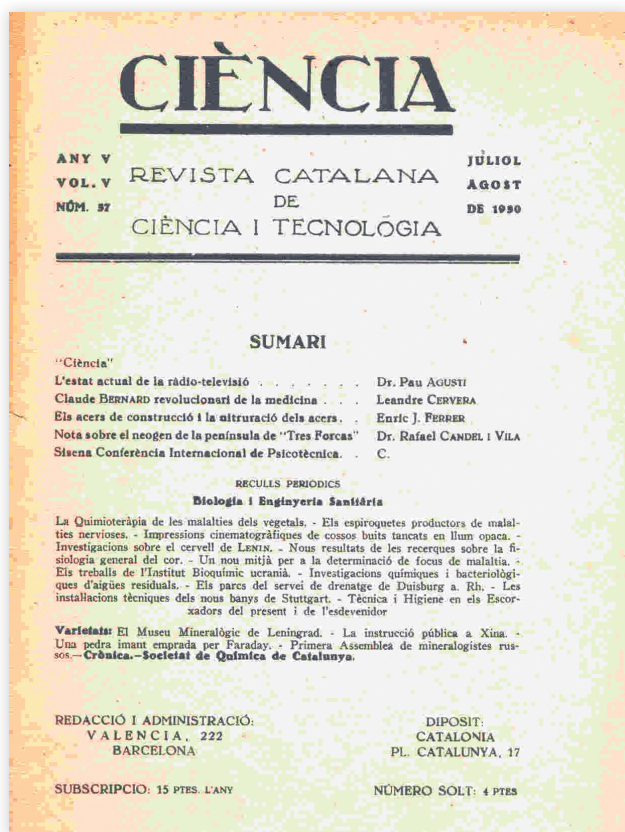


Fig. 1. *Ciència*, July-August, 1930; cover and index

The team behind Peypoch was composed of the scientific and technological community belonging to the intellectual Catalanist and conservative sectors and linked to political parties such as the *Lliga Regionalista* (Regionalist League) and *Acció Catalana* (Catalan Action). It was not until issue 37, published in July 1930, that the creation of the magazine's first Editorial Board was announced (Fig. 1). Its members were Catalan scientists and industrialists in charge of *Ciència's* management and editorial line: Leandre Cervera, Josep Grau, Ramon Peypoch, Enric Rebés, Santiago Rubió, and Josep de Calassanç Serra. Two years later, in July 1932, this Editorial Board was modified, as *Ciència* became the official bulletin of both the Catalan Society for Mathematical, Physical and Chemical Sciences and the Association of Directors of Electrical and Mechanical Industries of the Institute of Applied Electricity and Mechanics (IEMA) [20]. Five more Board members were added: Rafael Candel, Antoni Cumella, Francesc Ribera, Enric Soler, and Joan Visa. Of these new members, Rafael Candel was the only one to contribute four articles to the magazine. It can thus be surmised that the other new Board members served mostly as representatives of the two above-mentioned entities, in order to exert control over the magazine and its contents. Nonetheless, some of the bi-

ographies (1) of the Board Members were in many respect similar to that of Ramon Peypoch. These men were renowned scholars in their respective scientific disciplines and they held positions of responsibility in the different specialized institutions set up in Catalonia throughout the 20th century. In most cases, they combined their academic and institutional activities with an active political commitment in the Catalanist environment.

With this strongly Catalanist Editorial Board, *Ciència* emerged in 1926 with clear purposes. It sought to become a modern publication with a professional scientific level, a point of reference for the science and technology research carried out in Catalonia. The main goal of *Ciència* was made explicit in its first editorial: to increase the number of science and technology publications written in Catalan. This editorial also noted the contributions of the IEC and clearly stated the publication's most ambitious goal: to replace the Catalan Society for Mathematical, Physical and Chemical Science while this group remained inactive due to its repression under the dictatorship of Primo de Rivera. Thus, the goals of the magazine went beyond the transmission of knowledge to encompass providing support for the creation and emergence of new scientific and medical disciplines in Catalonia, with the larger goal being to build an independent Catalan scientific culture—one closely linked to the European scientific and technological movements of the time. As a matter of fact, it was during those years that, in Catalonia, the boundaries between different disciplines and specialties were defined, including in *Ciència*.

These programmatic goals were not only embodied in the magazine's ideology, but were also accomplished in practice. Issue 43 announced a series of lectures organized by the Chemical Society of Catalonia. Indeed, The Chemical Society of Catalonia expanded its presence by including the texts of its meeting lectures in the pages of *Ciència, Revista Catalana de Ciència i Tecnologia*, which became the platform for publicizing its activities [7]. It was this printed material that certified the society's tasks. These concrete and durable efforts have greatly satisfied the Society.

The publishing aims of *Ciència* were in accord with the construction of a Catalan national identity as carried out by professionals in the fields of science, technology, and medicine during the late 19th and early 20th centuries. *Ciència* played a key role in providing Catalan science and industry with an institutional structure, as well as its scientists and industrialists with the necessary tools to increase their knowledge to the level of that of members of prestigious centers elsewhere in the world. *Ciència* was the first popular science magazine written entirely in Catalan; before its release, all scientific publications were either bilingual or in Spanish. The examples include *Crònica Científica* (Scientific Chronicle), founded in 1878 and published entirely in Spanish, and journals such as *Tècnica*

(Technique) (1878–1936), *Bulletí de l'Acadèmia de Ciències i Arts de Barcelona* (Bulletin of the Academy of Arts and Sciences of Barcelona) (1892–1936), and *El Eco de la Indústria* (The Echo of Industry) (1898–1917) [8]. The editorial line of *Ciència* explicitly sought to update the knowledge of the Catalan scientific community and technological elite, to professionally unite these two communities, and to increase their prestige. In spite of the continuous evolution of its sections and structure, the magazine continued to apply rigorous standards to its articles and insisted on the use of a highly technical language, which largely restricted its distribution to an expert audience.

*Ciència* was funded mainly by private patrons, as was the case for many other cultural projects of the Catalan bourgeoisie of the time. Like these other projects, it suffered problems related to irregular and often meager financing. This situation is corroborated by an editorial that appeared a year after the publication of the first issue, in March 1927. It stated that publication of the journal “takes place almost entirely motivated by the stimulus of ideological imperatives” [2]. A similar editorial was published in July and August, 1930. Without explicitly asking for funds, that editorial made clear that the magazine needed financial help, and it appealed to the conscience and sense of responsibility of subscribers while continuing to be enthusiastic and optimistic about the magazine’s goals and scope [3]. Other funding sources for the publication included subscriptions

and the advertisements printed on the back cover (Fig. 2). Advertisers were companies related to the world of industry and science, while subscribers were mainly industrialists and scientists. The exact income of *Ciència* is unknown, but from an editorial published in 1931 it is clear that the money raised from publicity and subscriptions was insufficient to cover expenses. The most visible consequence of this economic struggle was the lack of regularity in the periodicity of the publication. The founders wanted a monthly magazine, but this was only possible during the first year. In its editorials, the Editorial Board was overly optimistic in predicting subscriber rates, which, instead, did not “reach the levels that were to be expected.” The same applied to the number of advertisers. Another reason for the struggles of the magazine was “the lack of connection—maybe due to an exaggerated optimism in the design of our journal—between the subscription cost and its real cost” [4]. Ninety-nine authors published their articles in the 53 issues of *Ciència*, and 64 of those authors contributed only one article. A significant proportion of authors were foreigners. All but one of these foreign authors came from the universities and research centers of Paris and Munich. Since many readers and subscribers were also potential authors of *Ciència*’s articles, we can infer that the magazine’s audience was an active agent in its existence and had the capacity to modify its content and publishing context.

**A**

**Societat de Química de Catalunya**  
Llíria, 7, pral. Barcelona

**Químics:**  
Si voleu estrenguer amb els vostres col·legues els lligams de solidaritat professional i científica.  
Si aneu a perfeccionar els vostres coneixements i a col·laborar al desenvolupament de les ciències químiques a Catalunya.  
Si aneu amb a vostre els propòsits que us exposen en la circular que osteniu en aquest número.

**Ingresseu a la Societat de Química de Catalunya**

**Industrials:**  
Si voleu col·laborar a una obra d'alta cultura científica, en la qual no podeu per menys d'estar interessats.

**Protegiu la Societat de Química de Catalunya**

**Societat de Química de Catalunya**  
Llíria, 7, pral. Barcelona

En de professió (1) domiciliat a adreça s'adhereix a la "Societat de Química de Catalunya" i desitja ingressar-hi com a soci <sup>ordinari</sup> <sup>profesional</sup> <sup>profesional</sup> Barcelona.

Quota: pes, anuals

(1) Preparen els autògrafs ingressar com a soci numerari que entenda l'utilitat en la qual col·labora.

**B**

OFICINES: TELÈFON 15502  
PLAÇA CATALUNYA, 9 **MEIRON** BARCELONA

Taller amb aparells d'il·luminació correctiva

Utilitzant aparells científics i racionalment els H.C. LOPHANE s'obté una il·luminació uniforme, amb un rendiment màxim, una reducció de més d'un 50% de consum de fluid elèctric, supressió de l'enlluernament, ombres de les lamparals un rendiment constant i unes despeses de conservació nul·les. Els aparells H.C. LOPHANE són indispensables si es vol obtenir una il·luminació perfecta en tallers i fàbriques, eviten molts accidents i augmenten la producció.

Il·luminació científica y racional **H.C. LOPHANE**

En molts tallers amb els **H.C. LOPHANE**

**C**

**Fabricants de Productes Químics!**  
Feu les vostres instal·lacions amb **EBONITA**  
Cap altre material no us donarà millor resultat

Instal·lacions completes de tuberies de totes mides amb accessoris (colzes, tes, vàlvules, reduccions, etc.)  
Recobriments de dipòsits i centrífugues de gran tamany  
Bombes rotatives de pistó per a la circulació d'àcids

Demaneu detalls a **Neboda de B. Garriga Escarpanter**  
Fàbrica: Passalço Galló, 8-12 - Despatx: R. Sta. Mònica, 12 - Telèf. 11375 i 51273  
BARCELONA

Fig. 2. Advertisements published in the Catalan magazine *Ciència*, vol 5, No. 37, 1930–1931. (A and C) In 1930. (B) In 1931.



**Fig. 3.** A photograph of the Rockefeller Institute, New York, USA, in 1928, included in an article on cancer by Francesc Duran Reynals published in the Catalan journal *Ciència* (No. 22, August 1928).

The structure of *Ciència* greatly varied throughout the years of its publication. These modifications were not accidental; rather, they responded to the new functions assigned to the magazine over the course of its history. In the July 1930 issue, the changes that had been made and were still to be made were announced. These had to do with the structure of the magazine and the management of its publication. The changes affected all its sections and were aimed at systematizing the content and at facilitating access to the development of the different scientific and technological disciplines in Catalonia. The second great change took place when the IEC was able to resume its activity, under the Republican government. There was no longer a need for *Ciència* to carry out its activities, but it was still important that it served as a communication platform for those societies affiliated with the IEC and for other professional associations that resumed offering lectures, meetings, or gatherings of specialists in particular topics. In fact, this new function was announced in July 1932 by means of a new subtitle on the magazine's nameplate, which announced that the magazine had become the *Butlletí de la Societat Catalana de Ciències Físiques, Químiques i Matemàtiques* (Bulletin of the Catalan Society for Physics, Chemistry, and Mathematics). This society was a member of the International Scientific Press Federation, and it was the official organ of the Electrical and Mechanical Industries Association of the IEMA. From then on, *Ciència* was fully and explicitly adapted to this new function, with subsequent changes in its structure.

In February 1933, the last issue of *Ciència* was published. There were no hints that this issue would be the last one and the causes of the magazine's disappearance remain unknown. Joan March Noguera has pointed out that a likely

reason for the discontinuation of *Ciència* was that the new political responsibilities of its leader and driving force, Ramon Peypoch, prevented him from continuing his publishing activities [13]. In 1980, however, *Ciència* started a new chapter in the (re)construction of a Catalan-speaking scientific community [9; see article by M. Vallmitjana, pp. 175-180 this issue].

### The IEC's heritage recovery and digitization project

The recovery and digitization of *Ciència* is part of a project funded by the IEC: "Scientific Periodicals: Finding, Digitizing, and Disseminating Science, Technology, and Medicine Periodicals Published in Catalan (1898–1938)" (2). Its aim is to find the original issues of scientific periodicals from the first decades of the 20th century, reproduce them electronically, and disseminate them through Internet in order to link, at least virtually, the pre-Civil War bibliographic heritage with that of the last decades of the 20th century.

The project is part of a larger effort carried out by the IEC that aims at recovering and disseminating, by means of computer technology, the bibliographic Catalan scientific heritage. One of the most recent outcomes in this regard is the exhaustive digitization of books (lectures and proceedings of papers) that came out of the above-mentioned Congresses of Physicians and Biologists of Catalan Language (until 1934, Congresses of Physicians of Catalan Language) from 1913 to the present (3). These digital versions are now available on the Internet. At the same time, the Catalan Society for the History of Science and Technology (SCHCT), which is affiliated with the IEC, has frequently expressed concern regard-

ing very old scientific journals, which tend to be underestimated or even forgotten due to the obsolescence of their content. A good example of this is that the ARCA digital repository (Archive of Antique Catalan Periodicals) at the Library of Catalonia did not include scientific journals until 2009. The introduction of the first scientific journal in this repository (*La Medicina Catalana. Portantveu de l'Occitània Mèdica*, 1933–1938) resulted from negotiations between the Biblioteca de Catalunya and three representatives of the SCHCT (Àlvar Martínez Vidal, José Pardo Tomás, and Alfons Zarzoso). The latter formed a research team that worked on the project “Medicine and its audience in Barcelona during the inter-war period: the Union of Physicians of Catalonia (1920–1939)” (HUM2006-07206-C03-03), funded by the Spanish Ministry of Science and Innovation (MICIIN). The digitization of the above-mentioned *Butlletí del Sindicat de Metges de Catalunya* (1920–1937), which was immediately placed within ARCA, was made entirely possible by this research project. The program for the selective recovery of the major medical journals from this period was continued thanks to the MICIIN's funding of the research project “Between Central and Peripheral Science: Medical Publications in Catalonia (1898–1938)” (HAR2009-11342), which was carried out by Àlvar Martínez Vidal—who was then a lecturer at the Autonomous University of Barcelona. Initially funded until December 2012, the program for the selective recovery of the major medical journals from this period has been continued. An outcome of that project is the digital archive *Prensa Mèdica Catalana*, which can be freely accessed online [www.prensamedica.cat].

The project funded by the IEC, “Scientific periodicals: location, digitization and dissemination of Catalan scientific, technological, medical periodicals published in Catalan (1898–1938)” aims at recovering and disseminating, by means of their identification and digital preservation, scientific journals published in Catalan between 1898 and 1938. Out of 54 science, technology, and medical journals and other periodicals (including those in the disciplines of pharmacy and veterinary medicine), nine have been prioritized according to the following criteria: (a) their relevance, which is defined by their age, lifetime, number of pages, and level of interest; and (b) the absence of copyright ownership by present-day institutions or people.

The project comprises three stages: (i) finding all the issues of each journal from library catalogs and in situ confirmation; (ii) the digitization of all the issues using optical character recognition (OCR); and (iii), the creation of a digital repository of scientific periodicals in Catalan, with its own search engine and links to similar repositories such as ARCA and *Prensa Mèdica Catalana*.

## Classifying and grouping: publishing online the content of *Ciència*

The unabridged digitization of *Ciència* began once an agreement between the two institutions interested in the project—Ateneu Barcelonès, owner of the magazine collection to be digitized, and the IEC, promoter of the project—was reached.

After a long discussion on how to obtain the best technical results, the process was carried out according to the following criteria (4): (i) digitization in TIFF format, 24-bit color, uncompressed and at 600 dpi; (ii) creation of TIFF files at 400 dpi per page; (iii) creation of JPEG files at 150 dpi per page; (iv) creation of PDF files with recognized text at 150 dpi per page; (v) creation of TXT files from the text extracted from each page by the OCR process; (vi) storage of the resulting files on external USB 2.0 hard disks; and (vii) control and follow-up of the project and the digitized pages in Excel format.

Digitization took place on the premises of the Ateneu Barcelonès, owner of the collections, where a room was allocated for the task. The hardware used included a BookEye 3 Color Repro (a special scanner for books), a computer, a bar code reader, and external USB hard disks. Once this first digitization stage was completed, the material was reviewed and grouped into PDF files, according to the same sections used to organize the magazine throughout its history: Contents, Scientific and Technological articles, Abstracts and Translations (which was changed to Miscellany from issue 37 onwards), and News (which was changed to Chronicles from issue 37 onwards). In addition to this general classification, *Ciència* included other sections that also changed, appeared, and disappeared according to the editorial needs of the times. Those sections were: Catalan Scientific Institutions, Scientific Societies, Congresses and Lectures (from issue 17 onwards); Chemical Society of Catalonia (from issue 33 onwards); and Press Clippings (from issue 34 onwards). Two additional sections were included during the last period of the magazine: Catalan Society for Physics, Chemistry and Mathematics (from issue 44 onwards) and a section dedicated to the Association of Directors of Electrical and Mechanical Industries of the IEMA (from issue 46 onwards). Digitization of the issues also included a bibliographical section and reproduction of the magazine covers.

The last stage of the magazine's digitization process, which is still in progress, involves putting the data on the web. This involves the transfer of the digitized content, already grouped and indexed, in the structure proposed by the IEC, which is based on the typical layout and organization of a scientific journal. Once all the data have been entered, a key publication in the history of science in Catalonia will be freely available on line. ■

## Notes

1. The biographies of Leandre Cervera i Astor, Pius Font i Quer, Pere Bosch i Gimpera, and Josep de Calassanç Serra i Rafols were obtained from “Membres numeraris i emèrits de l’IEC” at the website of the Institute for Catalan Studies (IEC) [www.iec.cat]. Last visit, October 9, 2013.
2. The research project (PT2012-S02-MARTINEZ) is supervised by Francesc Asensi Botet, member of the Biological Sciences Section of the IEC. Its principal investigators are Alvar Martínez-Vidal and Alfons Zarzoso, members of the Catalan Society for the History of Science and Technology.
3. The content of all books produced by the above mentioned congresses can be freely accessed at the Fundació Alsina i Bofill website [fab.espais.iec.cat/congressos-de-metges-i-biòlegs-de-llengua-catalana-cmbic]
4. The technical settings are those included in the budget presented by SPI (the company in charge of the digitization) and approved by the IEC.

## References

1. Alberola P (2011) Ciència. Revista catalana de Ciència i Tecnologia. Caplletra: Revista Internacional de Filologia 51:35-50
2. Anonymous (1927) Ciència 12:3-5
3. Anonymous (1930) Ciència 37:3-4
4. Anonymous (1931) Ciència 38:129-130
5. Bynum W, Lock S, Porter R (eds.) (1992) Medical journals and medical knowledge: historical essays. Routledge, London, 272 pp.
6. Canosa-Farran F (2005) El somni d’una societat i d’un periodisme: la televisió de paper (1931-1936) (doctoral thesis) Universitat Ramon Llull, Barcelona [http://www.tdx.cat/handle/10803/9219]
7. Chemical Society of Catalonia (1931) Sis conferències sobre adobs. Ciència 41:393-394
8. Deó i Raventós JF (1998) Apunts per a una història de la premsa científica i tècnica en català. Gazeta: Actes de les Primeres Jornades de la Premsa 1:137-147
9. Figueres JM (2011) El cas de les dues revistes *Ciència*. *Mètode* 69:34-40
10. Gaudellière JP, Hess V (eds.) (2013) Ways of regulating drugs in the 19th and 20th centuries. Palgrave MacMillan, Basingstoke
11. Guillamet J (1989) Ciència i el periodisme científic. *Annals del Periodisme Català* 15:41-47
12. Herran N (2010) Science to the glory of God: The popular science magazine Iberica and its coverage of radioactivity, 1914–1936. *Science and Education* 21(3):335-353
13. March-Noguera J (2002) La Revista *Ciència* (1926-1933): Primera revista de ciències i de tècnica en català. In: J Batlló, P De la Fuente, R Puig (eds) Actes de la VI Trobada d’Història de la Ciència i la Tècnica. Institut d’Estudis Catalans, pp. 381-387.
14. Martín-Berbois JL (2012) El Sindicat de Metges de Catalunya: un exemple de perseverança en la defensa de la medicina i el país. Afers, Catarroja 145 pp.
15. Martínez-Vidal A, Perona J (2011) La consolidación de las especialidades médicas a través de un ‘abstract journal’: La Medicina Catalana. Portantveu de l’Occitània mèdica (Barcelona, 1933–938). In: Actas del XV Congreso de la SEHM. SEHM-UCLM, Ciudad Real, pp. 287-292.
16. Pastor-Cubo I, Martínez-Vidal À (2002) L’Acadèmia, expressió del catalanisme mèdic (1898–1923). *L’Informatiu: Acadèmia de Ciències Mèdiques de Catalunya i de Balears* 3:25-28
17. Perdiguero E, Pardo-Tomás J, Martínez-Vidal À (2009) Physicians as a public for the popularisation of medicine in interwar Catalonia: The Monografies Mèdiques series. In: F Papanelopoulos, A Nieto-Galan, E Perdiguero (eds) Popularizing science and technology in the European periphery, 1800–2000. Ashgate, Farnham, pp. 195-216
18. Piqueras M (2008) Aproximació històrica al món de la publicació científica. *Quaderns de la Fundació Dr. Antoni Esteve* 15:1-14
19. Ramis-Coris J (1996) Els Congressos de Metges i Biòlegs de Llengua Catalana: Gairebé un segle. Uriach, Barcelona, 547 pp.
20. Roca-Rosell A (ed) (2008) L’Escola Industrial de Barcelona: Cent anys d’ensenyament tècnic i d’arquitectura. Diputació de Barcelona, Ajuntament de Barcelona, Consorci de l’Escola Industrial de Barcelona, Barcelona, 544 pp
21. Salavert-Fabiani VA, Camarasa JM, Vidal JM (eds) (2007) Cartes que lliguen: les correspondències científiques com a font de la història de la ciència. Jornada d’homenatge a Joan Joaquim Rodríguez Femenias (1939–1905) en el centenari de la seva mort. Afers, Catarroja-Maó, 134 pp.
22. Valentines J (2012) Tecnocràcia i catalanisme tècnic a Catalunya als anys 1930: els enginyers industrials, de l’organització del taller a la racionalització de l’estat (doctoral thesis). Autonomous University of Barcelona, Bellaterra [http://www.tdx.cat/handle/10803/96722]
23. Wong WS (2000) Establishing the modern advertising languages: Patent medicine newspaper advertisements in Hong Kong, 1945–1970. *Journal of Design History* 13(3):213-226
24. Zarzoso A, Fajula S (2009) Premsa mèdica catalana. COMB, Barcelona, 24 pp.
25. Zarzoso A, Fajula S (2010) Publicitat i medicina. COMB, Barcelona, 24 pp.
26. Zarzoso A, Fajula S (2011) Especialidades médicas en el papel: publicaciones y publicidad en la prensa médica catalana. In: Actas del XV Congreso de la SEHM. Transmisión del conocimiento médico e internacionalización de las prácticas sanitarias: una reflexión histórica. SEHM-UCLM, Ciudad Real, pp. 283-286