

INTERVIEWING... CARLOS FIOLHAIS



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Author of more than 130 scientific articles, Carlos Fiolhais has dedicated his life to science. Born in Lisbon, in 1956, he graduated from the University of Coimbra, in Physics, where he teaches. Carlos Fiolhais published 40 books, including “Ciência em Portugal” and “Breve História da Ciência em Portugal”. Cerciência - Science Network spoke with Carlos Fiolhais to find out his opinion about science in Portugal and the importance of our history so that it continues moving and evolving.

CERCiência (CER) - How would you describe the path of science in Portugal?

Carlos Fiolhais (CF) - Ever since there has been science, it has always existed in Portugal. But it did not always exist with the same intensity. There have been periods of light and shadow, and it could be said that unfortunately the last ones have been longer. Light happened when we were not isolated: at the time of the Discoveries (15th-16th centuries), which preceded the so-called Scientific Revolution of Galileo and Newton; in Marquês de Pombal's time, when Newton's ideas arrived here and Chemistry emerged with “Laboratorio Chimico” and, in the last 20-30 years, with Portugal joining the European Union and with the massive growth of science in Portugal. There have never been so many scientists in Portugal as there are today. In fact, there are more today than ever before. Fortunately, we have science, and we hope that it is here to stay.

CER - What was the main milestone for the beginning of the history of science in our country? When did it start? How?

CF - Only conventionally can a milestone be established for the beginning of science. Modern science, according to some, began in 1543, with the publication of the books "On the Revolution of the Celestial Orbs" by Nicolaus Copernicus and "*Fabrica*" by Andreas Vesalius. This is the era of Pedro Nunes and Amato Lusitano, two of our best scientists of all time. Pedro Nunes read Copernicus, although he did not embrace the new world system. And Lusitano read Vesalius, despite not having followed him in some points. Both of these national scientists prized the value of observation and experience as a core value of experience.

CER - Which events were the most important in the science revolutions in our country?

CF - Once again, it is difficult to pinpoint milestones. However, after a darker period, the year 1772 was certainly remarkable: Marquês de Pombal decreed the Reform of the University of Coimbra, establishing the experimental teaching of science. And, in more recent times, joining the European Union in 1986 had an impact, with the subsequent creation, in 1995, of the Ministry for Science and Technology, which was able to take advantage of European funds for the benefit of science.

CER - We have scientists working here and others developing their work abroad. Do you think that Portuguese names are recognized internationally?

CF - Yes, it is a characteristic of science to be international: science is done, with relatively uniform methods, on a global scale. There is science done by the Portuguese, even though there is no Portuguese science. The Portuguese scientists can be abroad, as João Magueijo and António Damásio are, as well as here in Portugal, as most of them are. Many of the Portuguese scientists have a fair international reputation in their fields, despite the fact that the country is small and there is strong international competition. A series of awards - research grants - have recently been given by international institutions to Portuguese scientists, in general quite young, who work in Portugal. Portugal can be proud of its scientists.

CER - Do you think that scientific research is an area in motion or in which little investment is made?

CF - It is certainly an area in motion. In the last 20-30 years, Portugal has been an area in clear expansion: more people, more money. Not enough is invested yet compared to more developed countries, which are more developed precisely because of their strong commitment to science and technology. In particular, in Portugal, the private sector must grow more in order to reach the share it has in other more advanced countries. At a time of financial and economic crisis, such as the one we are experiencing, it is necessary to prevent a crisis in science. Growth should continue so we could get closer to more developed countries. Many young people have been trained to do scientific research and, for everyone's benefit, they should continue to do so. Our brains are national wealth, perhaps the greatest national wealth.

CER - In your opinion, how do you think Portugal's financial situation can influence investment in scientific areas? Will there be more difficulties?

CF - A slight retraction in investment in science is already noticeable, as a result of the crisis. Although I don't agree with it - scientific research should be an exception in financial cuts, given its power to ensure, even if in the long term, wealth - I understand that this is the case. I'm afraid there will be more difficulties, but I hope I'm wrong.

CER - How would you describe the lives of those who decide to dedicate their lives as scientists in Portugal? Many decide to develop their careers abroad. Do you think there is a lack of opportunities?

CF - Today, quality science can be done in Portugal in many areas. In some niches we work as well here as they do in the best places abroad. The lives of researchers are lives dedicated to looking for answers, and once some are found, others soon appear. The profession of scientist is passionate for most of those who practice it. Science is international, so it is natural for people to come and go. There is a global market for researchers. The question is: how to make the country attractive, or more attractive, for researchers? Some difficulties in scientific careers are noticeable and we should be able to keep the best individuals. Particularly, there should be a better connection between science and universities, since the Portuguese science system has been, to a great extent, established alongside them. We must be wise enough to create opportunities for young people in the universities, whose teaching staff has been aging.

CER - Which area has been most developed in Portugal?

CF - It is difficult or even impossible to compare areas in Portugal. What we can see is how Portuguese science is situated in several areas internationally. We are better in medicine, biology and biochemistry, physics and space science, chemistry and chemical engineering. But not only in these areas.

CER - In general, when it comes to parents, teachers, society, do you think that young people are encouraged to pursue scientific areas or are these areas more associated with unemployment?

CF - There has been a great effort to attract young people to science in recent years. Ciência Viva programme has been a good tool for informal science education, although there are still difficulties in formal education. Therefore, we are not bad at an European level if we consider the percentage of young people between the ages of 20 and 30 studying science and technology (we are not well, in general, considering the active population that has sufficient knowledge of science and technology). Among us, unemployment does not happen in more scientific and technological areas, but it is more frequent in areas such as management, psychology, education, etc. In addition, regardless of the area, there is a growing awareness that advanced training is a defense against unemployment.

CER - How do you think there can be greater contributions to the development of science in its various areas?

CF - Science *input* is made by people and by means made available to those people. Those people should be associated with solid institutions. Among us, science has grown rapidly; I believe there is the need for a better organization of the scientific system, which requires an evaluation effort, so that the best institutions become more solid. This evaluation should take into account the results produced: training of new people, articles, patents, startups, etc. Evaluation is already a hallmark of science: it has to be, in the Portuguese case, an even bigger mark. The higher education system must be improved in connection with science and the connection between research and companies must be strengthened. There is also the need to spread and improve science teaching and scientific culture, a basic condition of the scientific system.

CER - The archive created in December by Fundação para a Ciência e Tecnologia (Foundation for Science and Technology) about the history of science in Portugal intends to be an incentive to young people in this area. How do you think this initiative can contribute to an increase in the number of recognized scientists in our country?

CF - I do not know if that is the direct goal of the archive, but rather to preserve the memory about science in Portugal for future research. The history of science is an important area for science and it is still largely unexplored in Portugal. Fortunately, it is attracting some young people and could attract even more. It is good that they have archives available, particularly documents about the recent years. However, some distance is necessary in order to make history... Regarding the most distant past, there is still much to be done, including preserving the sources through scanning and making it available freely on the internet. In the project "History of Science at the University of Coimbra", that is precisely what we are doing.

CER - There 40 thousand folders that make up the history of less than a century are enough to describe history to our scientists?

CF - No, they are not. I think they relate more to the last few decades. Besides documents, there are also books, periodic publications, etc. There is also the need to make oral history, that is, to collect testimonies from living people who were main characters in history.

CER - When you book “Breve História da Ciência em Portugal” (“Brief History of Science in Portugal”) was published, you stated that “researching the history of science is the only way to bring to light aspects of the History of Portugal that better explain who we are and where we should go”. These words reflect the importance of knowing our history to continue its creation. To what extent?

CF - Yes, History is part of our culture, it helps us to understand ourselves and make better decisions for the future. This applies in general and also to the case of science.

CER - Do you think that knowledge of science in Portugal can lead more young people to invest in this area and develop it?

CF - Yes, I hope so. Science is a non-stop enterprise. The desire to know more knows no crisis... And young people are, in general, the most creative researchers. Einstein had a "miracle year", full of new ideas, at the age of 26!

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