

Review

Opposing the “lessons of things”, for children and adults

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Nowadays, when science and technology become more and more the object of polemic, controversy and politics, at the same time as they penetrate even the most recondite domain of human life, Brazilian science popularizers still remain distant from the articles and weekly journals on the subject. There is no doubt the number of science popularizers and journalists capable of reading, interviewing and even writing in another language, especially English, has increased. However, in the academic environment, being ignorant of these texts, partly due to the lack of knowledge of the languages in which they are written, has curbed the insertion of national researchers in the international study of science communication in its various modalities. In addition, and despite the media and Brazilian science museums having created an ample interface with children regarding concepts, utopias, dystopias and actualities in relation to science and technology, the country still lacks systematic, in-depth and broad reflections on divulgation directed to the public.

The two books recently published by Vieira & Lent, by the Casa da Ciência¹ (House of Science) and by the Oswaldo Cruz Museu da Vida (Life Museum, Cruz/Fiocruz), *O Pequeno Cientista Amador – a divulgação científica e o público infantil*, e *Terra Incógnita – a interface entre ciência e público* (*The Young Amateur Scientist - scientific divulgation and the youthful public*, and *Unknown Land – the interface between science and the public*) have, therefore, filled lacunas, and can be considered an editorial milestone. The books lead us to reflect, in an extremely opportune manner, on the potentialities and limitations of different popularisation initiatives.

The chapters alternate between theory and practice, aside from a few with a “double character”, describing and interpreting experiences, facts and research that interpenetrate one another, delimiting a unique space for reflection. Widely utilized expressions are explained and given back to their own historicity: scientific literacy, public understanding of science, risk communication, consensus conferences. The texts also examine some of the methods employed in the research on science and public perception: content and discourse analyses, focus groups, interviewing. Scientific uncertainties and risk are addressed in some articles, increasing the relevance of the work for those who are looking for ways to improve their own popularisation practice.

It is important to emphasize the perspective used by the series organizers to guide the proposed reflection: a well-presented scientific divulgation can constitute a tool for promotion of a scientific culture. This perspective is manifested through the consideration of the public, the audiences, and the (active) reception of the contents. In *Terra Incógnita*, public perception of science deserves special attention, which, somehow, is to be expected in a book that elects as its initial mark an article by John Durant, originally published in 1993, which criticizes the expression “scientific literacy”, as well as the distorted vision, typical of manuals, transmitting a false image of parts as being the whole, based on notions such as “scientific attitude” or “scientific method”.

In this same sense, the next article, by Brian Wynne, shows how the encounter of people with science in the “real world” stimulates them to elaborate a knowledge that can actually interfere in the procedures of expert scientists, denying support to the idea that the “lay people” cannot understand science. The secret lie is finding the general public’s motivation and personal or practical use for the comprehension of a scientific theme. From these experiences, a “lay expertise” can be formed – if this expression does not represent an insurmountable oxymoron. This is the theme of another article, revealing the mystifying character of all discourse having the “capacity” or the “ignorance” of the general public as support.

As others, this myth of incapacity was constructed and is maintained with the aid of various actors, above all scientists themselves and scientific institutions and it has political consequences: the lack of

public comprehension of science would represent an impediment to the participation of citizens in the controversies of which science constitutes the base and driving force. But, as Wynne warns, the contrary may also be true: that the impoverished democracy and the intensifying hegemony around science are the main obstacle to the improvement of public understanding of science. This theme is revisited in the article by Steve Miller, who briefly relates the development of the homonymous movement, criticizing, as Durant, the equivocality of the scientific-literacy concept and reinforcing the necessity of overcoming the deficit model in the study of public perception of science and in the elaboration of proposals to approximate the public to science.

Although more and more widely recognized, the “mirage of the abyss” has not yet been undone and replaced with a more ample and multidimensional model for this type of communication. And the deficit model insidiously continues to be evident in the discourse of a large part of those involved in divulgation. In relation to the experience of the United Kingdom’s Committee for Public Understanding of Science, Miller judges that the techniques based on the deficit model adopted by the majority of the practitioners of public communication of science did not meet the expectations of the public during the mad cow crisis, the fundamental test for public comprehension of science in the United Kingdom in recent years. Just as in the case of the mad cow disease, other controversies surrounding science have shown that the public and the scientists have distinct perceptions and language to deal with risk, the object of the article by Douglas Powell and William Leiss. But other important actors exist, when the subject is risk: governments and companies (oil-producing, chemical, biotechnological, etc.). And, in general, these social actors have failed in the communication on the subject, both in the supply of information on experiments, methods and results obtained in laboratories, field experiments or simulations (models) as well as in the adoption of open attitudes, favourable to the influx of public evaluations.

Jon Turney, adventuring into the land of public imaginary, revisits the myth of Frankenstein, which provides the predominant “script” for debates related to biotechnologies and biomedicine. The list of debates in which the figure of Victor Frankenstein (or of his creature) is invoked includes *in vitro* fertilization, recombinant-Dna technology, transgenic organisms and cloning, since they all deal with the creation of life and inspire more often terrifying than marvellous scenarios. Jeanne Fahnestock analyzes the operation of language adaptation that characterizes the discourse of science popularisation; Carol Rogers learns from focal groups the evaluation that the public gives on media coverage regarding global warming and Aids; S. Holly Stockling writes about the tendency of the media when dealing with uncertainties.

As for the children, in the presentation of the *Young Amateur Scientist*, Luísa Massarani correctly affirms that “the scientific content transmitted to children is of poor quality and presented inadequately”. In her opinion, the problem begins with school books that, often, do a disservice, distancing children from science instead of approximating them. Worse yet, the books spread mistaken or even outdated concepts. Also, on television or in comic books, scientists tend to be depicted in a stereotyped or distorted form, either as mad men who invent marvellous gadgets with little practical utility, or as perverse men whose discoveries and inventions are capable of destroying humanity and the planet, as Nisbet *et al.* also observe in relation to the content exhibited by the North-American media.²

Many of the reported experiences also give evidence of the importance of adults in infantile development and in the learning process, providing a stimulating domestic environment, giving incentive to reading books and magazines appropriate for each age group, as well as visits to expositions and museums. However, the cognitive aspects do not exhaust the relationship established between children and the world. In general, the ludicrous and the emotional emerge as highly attractive components in the popularization activities focused on children. It is fundamental that they truly feel involved in the activities: reading a magazine such as the extinct Mexican *Chispa* or the Brazilian *Ciência Hoje para Crianças (Science Today for Children)*; camping trips in which science and companionship are equally important; expositions in museums, stories, games and amusing activities, such as Virginia Schall’s group provides at Fiocruz.

After all, as Durant said at the beginning of the excursion through the unknown land of popularization and public perception of science and technology, the necessary comprehension transcends “the mere knowledge of the facts”. Therefore, we can say, popularizing science, to children and adults, is more than the transmission of “lessons of things”.

Notes and references

¹ Centro Cultural de Ciência e Tecnologia da Universidade Federal do Rio de Janeiro. Available at:
<<http://www.vieiralent.com.br/catalogo.htm>>

² M.C. Nisbet *et al.*, “Knowledge, reservations, or promise? A media effects model for public perceptions of science and technology”, *Communication Research*, 29 (5), 2002, p. 584-608.

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