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Science communication strategies of amateurs and professional scientists in nineteenth century Belgium

(1) Introduction

Arguably the most important evolution in the practice of science to be studied in the nineteenth century was the growing differentiation between professional and amateur scientists. Before 1800, almost any one engaging in scientific research of some kind could be called an amateur; whereas one hundred years later, scientific research was all but completely professionalized, excluding most of the amateurs still around. Being an amateur in science came to mean a lower status, to be something of an exception at best, more often a mere oddity to be kept at a distance from ‘serious’ science.

This was basically the narrative told by authors such as Dorothy Stimson in her 1948 book on the history of the Royal Society, aptly called *Scientists and Amateurs*. Stimson remarked how in the first years of the Society, “the true scientists among them were less than a third of their number, and the amateurs among them were too often led astray into absurdities and fantastic speculations.” Amateurs were thus responsible for the criticism and ridicule the Society had to suffer. By the beginning of the twentieth century, when “only a handful of the distinguished men are not scientists themselves,” it had finally turned into “an association of the leading British scientists”.¹

Stimson used the difference between scientists and amateurs as a causal explanation for interpreting the history of science. For her, it seemed very easy to distinguish between those categories, and self-evident that amateurs could not be true scientists. Scholarship in the last 50 years has done much to qualify the neat distinction made by Stimson. We have come to appreciate the positive and even fundamental contributions made by amateurs, in particular in the field of natural history, geology, meteorology etc.² Moreover, amateur science was anything but growing in the nineteenth century. Colin Russell has pointed to the shift of emphasis in British science away from chemistry and physics towards the field sciences, which encouraged the foundation of learned societies run by amateur scientists.³ Amateur science was certainly not an aberration from ‘serious’ science, but an indication of the widespread interest in science and an essential step towards the opening up of new fields of inquiry. Amateurs could very well consider themselves the followers of Francis Bacon in his appeal

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¹ Dorothy Stimson, *Scientists and Amateurs. A History of the Royal Society*. New York: Henry Schuman, 1948. Quotations on p. 96 and 236. In an earlier lecture, Stimson put less emphasis on the opposition between amateurs and scientists, but seemed at least bewildered by the fact that the Royal Society could have grown from a gentleman club of amateurs into the highly professionalized society of today. See Dorothy Stimson, “Amateurs of Science in 17th Century England,” *Isis* 31(1939), p. 32–47. On Dorothy Stimson, see I. Bernard Cohen, “Eloge: Dorothy Stimson, 10 October 1890–19 September 1988,” *Isis* 81(1990), p. 277–278.

² Among many others, I may mention Samuel J.M.M. Alberti, “Amateurs and Professionals in One County: Biology and Natural History in Late Victorian Yorkshire,” *Journal of the History of Biology* 34 (2001), p. 115–147; E.B. Keeney, *The Botanizers: Amateur Scientists in Nineteenth-Century America*. Chapel Hill and London: University of North Carolina Press, 1992; S.G. Kohlstedt, “The Nineteenth-Century Amateur Tradition: The Case of the Boston Society of Natural History,” in: G. Holton and W. A. Blanpied (eds.), *Science and Its Public: the Changing Relationship* (Dordrecht: Reidel, 1976), pp. 173–190; John Lankford, “Amateurs versus Professionals: The Controversy over Telescope Size in Late Victorian Science,” *Isis* 72 (1981), p. 11–28; P.D. Lowe (1976), “Amateurs and Professionals: The Institutional Emergence of British Plant Ecology,” *Journal of the Society for the Bibliography of Natural History* 7 (1976), p. 517–535; A. Secord, “Science in the Pub: Artisan Botanists in Early Nineteenth-Century Lancashire,” *History of Science* 32 (1994), p. 269–315; A.B. Shteir, *Cultivating Women, Cultivating Science: Flora’s Daughters and Botany in England 1760 to 1860* (Baltimore: Johns Hopkins, 1996).

³ Colin Russell, *Science and Social Change 1700–1900* (London: The MacMillan Press, 1983).

for a collaborative effort to bring together descriptive observations and ‘natural histories’ of various phenomena.

The growing divide between amateurs and professional scientists can be understood through a sociological analysis of the professionalization of science.⁴ (For reasons of convenience, I will use the terms ‘amateurs’ and ‘professionals’ which reflect a twentieth century perspective, although it would be better to use more specific distinctions such as between ‘elite’ and ‘provincial’, ‘institutionally affiliated’ and ‘privately funded’, or ‘metropolitan’ and ‘local’.) The inclusion of the natural sciences in university curricula, the founding of university laboratories and the increase of state and industrial support brought forth the conditions for the emergence of a specific scientific profession. Amateurs would not be a part of this professional culture. But why should this have a negative impact on the status of amateur science? And on what grounds were some scientists included in the process of professionalization, and others not?

The answer may be that the distinction between amateurs and professional scientists was only created during this very process. As Robert Fox has argued for France, it was through the aspirations of academic scientists for special status and through their self-serving claims for expertise that a distinction between amateurs and academic scientist began to emerge during the last quarter of the nineteenth century.⁵ Patricia Faasse has documented how in the Dutch Botanical Society amateurs and professional botanists tended to hold separate meetings: field trips in summer for the amateurs, laboratory meetings in winter for the academic professionals. As the years went on, both groups had hardly any contact with each other. Mutual neglect then turned into mutual hostility until in 1909 the Society was split in various commissions and amateurs slowly disappeared from membership lists.⁶ I have reached similar conclusions concerning the Belgian chemical and geological societies.⁷

These studies show that the opposition between amateurs and professional scientists was indeed real and that the tension between these groups has to be taken into account to understand the development of academic science. Yet, it has also become clear that the antagonism between amateurs and professionals was very complex and dynamic. Professional scientists sought to increase their status by strategically playing down amateur science as superficial, un-academic, provincial — in short inferior to the work of professional scientists in every respect. This denouncement of amateur science was thus a vehicle for professional scientists to underscore their status. In his report on amateurs and professionals in Victorian biology, Adrian Desmond observed that

[...] the very construction of the metropolitan ‘professional’ required the antithetical construction of the parochial ‘amateur’.⁸

This implies that the definitions of amateurs and professionals in nineteenth century science necessarily refer to each other and are to be understood in the context of their mutual antagonism, career strategies, competition for knowledge claims, and their respective desire for some form of cultural or even political authority. In so far as the professional aspired to become the expert, he needed to put himself above less knowledgeable competitors.

One way to study this antagonism between these two cultures of science is to compare their respective communication strategies. Communication is central in the formation of a scientific community. It defines the actors involved in the communication process; it discloses the field of phenomena about which meaningful statements can be made; it selects the intended audiences and it builds the public space for science to be discussed. In terms of competition, the command of communication channels

⁴ The perspective from professionalization studies can be appreciated in e.g. Jack Meadows, *The Victorian Scientist. The Growth of a Profession* (London: The British Library, 2004).

⁵ Robert Fox, “The *Savant* confronts his peers: Scientific Societies in France, 1815–1914,” in: R. Fox and G. Weisz (eds.), *The Organisation of Science and Technology in France 1808–1914* (Cambridge: Cambridge University Press, 1980), p. 241–282.

⁶ Patricia Faasse, *Between Seasons and Science*. Amsterdam: SPB Academic Publishing, 1995.

⁷ Geert Vanpaemel, “Gustave Dewalque en de crisis van de Belgische geologie op het einde van de negentiende eeuw,” in: J. Massard (ed.), *L’homme et la Terre. Actes du 13e Congrès Benelux d’Histoire des Sciences Echternach* (Luxembourg: Centre Unviersitaire de Luxembourg, 1996), p. 171–183.

⁸ Adrian Desmond, “Redefining the X Axis: ‘Professionals’, ‘Amateurs’ and the Making of Mid-Victorian Biology – A Progress Report,” *Journal of the History of Biology* 34 (2001), p. 3–50, quotation p. 14.

enables actors to impose their views and to dominate public perception of scientific credibility. Through science communication, conceptions of professional and amateur science would invade the public imagination, and hence become reality.

(2) Centralization

The study of communication strategies has been quite helpful in understanding the development of science in Belgium. During the French revolutionary era, Belgium had lost much of its intellectual traditions.⁹ Its only university was closed in 1797 and the Academy held no meetings for over twenty years. After Napoleon's defeat at Waterloo, three new State universities were opened and also the Academy took up again its work. From the start, science was quite prominent in these institutions. A new generation of scientists was rapidly to fill the increasing number of positions for teachers or government officials. The status of science was very much linked to the authority of the state, thus masking the fact that science itself had only a low standing. As Quetelet complained in 1830,

science in this country is like a Chinese painting: every one is placed on the same level — the charlatan besides the good scientist.¹⁰

Quetelet would become a powerful promoter of science in Belgium, enhancing its public status and successfully securing state support. But Quetelet also introduced a sharp distinction between elite scientists and 'others'.¹¹ The elite were mainly based in the capital, often through direct links to state of government institutions, in particular as members of the Brussels Academy. Most of the scientists in this elite group were 'professionals', as professors at one of the four Belgian universities (although not every university was a state university). But until the last quarter of the century, amateurs could also play a role in this group. Pierre-Henri Nyst had only had a secondary school education and was employed as a simple tax official, but he became director of the Science Class in 1869. Yet, this was an exception. After 1846, election rules became rather strict, and 'amateurs' of this kind were not elected any more.

The Brussels Academy was not the only learned society in the country. In the 1840s, at least some 25 other scientific societies were active in Belgium, some of them local, provincial societies; others specialized in a particular field of expertise. Although these societies were supported by the government, they were not official state organizations, such as was the Brussels Academy. A proposal made in 1853 by the provincial societies to the Ministry of the Interior to found a nationwide network of societies, was considered unacceptable by the Brussels Academy. This Academy was to remain the hallmark of elite science and was not interested in sharing this privilege with other, provincial societies.

This policy of centralization also included the access to the official publications of the Academy. The memoirs and the bulletin of the Academy disseminated work by members or correspondents of the Academy and prize memoirs, crowned by an Academy jury. There was no possibility to freely submit a paper. In rare cases did members of the Academy co-operate with non-members in writing papers, but even then the difference between the collaborators was maintained. When in 1856 the National Prize for Natural Sciences for the preceding five year period was awarded (the prize jury was again formed by Academy members), it selected a memoir on paleontology written by two scientists, one of them a member of the Academy, the other a well-known amateur. Yet, only one of them, the Academy scientist, received the award, as the jury was utterly convinced that "the scientific part of the work belonged exclusively" to him only. The amateur author tried in vain to obtain his part of the prize and the public esteem.¹²

⁹ An updated historical account of Belgian science during the nineteenth century is to be found in R. Halleux., J. Vandersmissen, A. Despy-Meyer, G. Vanpaemel (eds.), *Geschiedenis van de wetenschappen in België 1815–2000 / Histoire des sciences en Belgique 1815–2000* (Tournai: La Renaissance du Livre, 2001).

¹⁰ A. Quetelet, "Aperçu de l'État actuel des Sciences mathématiques chez les Belges," *Correspondance mathématique et physique* 9 (1837) 1–46 (quotation on p. 46).

¹¹ This is discussed Geert Vanpaemel and Brigitte Van Tiggelen, "Science for the people. The Belgian Encyclopédie populaire and the constitution of a national science movement," *Scientiarum Historia* 32 (2006) in press.

¹² The amateur concerned was Henri Lehon (see note 14).

The provincial societies had their own journals, but they were less important, and had lower status. Indeed, provincial societies were keener to publish work on local topics by local scientists for a local audience. Although I have not been able yet to study these societies and their policies in great detail, it appears that this local context was much more prominent in their work. This was enhanced by other important features of their communication strategies, the excursion or visit of particular localities, the public sessions or the admission of non-members to their meetings, and finally the public exhibition of collections. In particular exhibitions were major scientific events. The Malacological Society, founded in 1863, obtained funding of the Ministry of the Interior to organize a large exhibition, which did take place in 1866.¹³ Some forty participants exhibited about 75 collections. The collection on molluscs alone contained 10,000 individual specimens, representing about 5,000 different species. The exhibition was a great success. Yet, the society at that date listed only 32 members, and had as yet no proper publication of its own. It shows how much their work was directed towards the public at large, and less towards in depth discussion within a closed community.

Scientific collections formed an essential part of amateur culture. The commerce of science did not consist in the exchange of ideas, but rather in the acquisition of rare objects and the organization of one's own proper museum. Collections were at the basis of personal networks or even national and international co-operation between societies. Henri Lehon, who assembled probably the largest geological and paleontological collection in the country, considered himself not to be a real scientist ("fortunately" he added), but rather a curious and idle man who was not able to produce scientific lectures but only plain talks (causeries).¹⁴ Yet, Lehon's collection was impressive and made him a well known geologist and palaeontologist. The collection attracted visitors from abroad, among them Charles Lyell, with whom Lehon had a long standing contact. The role of scientific collections in the formation of the amateur scientific community was crucial and determined a certain type of communication. Scientific content was mixed with practical advice, aesthetic considerations, and personal involvement. Looking at his collection, Lehon found himself

in the middle of all these extinct races, of this stony history of animals and plants of the ancient world, written by God himself ... I can see before my eyes the development of the work of creation!

Whereas science may be considered universal, collection were always particular. The owner of the collection literally owned the natural objects of his studies. Access to these collections was regulated by personal contact, and became a powerful instrument to attract and entertain audiences. At the same time, this put the amateur scientific event very close to other forms of public spectacle. In some cases, the building of a zoological or botanical garden was indeed as much a social as it was a scientific establishment.

(3) Popularization

Another area where differential communication strategies can be studied was popularization. Not surprisingly, Academy scientists were less involved in popularization than were local amateurs, but also in the style of their popular accounts differences may be noted. The Academy was only once engaged in large scale popularization project. In 1849 it collaborated under the impulse of Quetelet in the publication of an *Encyclopédie populaire*, a series of small booklets on various topics ranging from history, art, culture, politics, economics, agriculture and science. Compared to other popularization initiatives, the *Encyclopédie populaire* stood out by its abstract treatment of basic science. There was no popular approach, no explanation of applications, no rhetorical style apt to capture the attention. This reflected the high status of elite science, embodied by the Academy and a few other Brussels institutions. The image promoted was that scientists held the power to instruct the people, although the distance between science and audience was strongly reinforced.

¹³ See Paul Cogels, *Notice historique sur la Société Malacologique de Belgique 1863–1880* (Brussels: P. Weissenbruch, 1884).

¹⁴ For further details, see G. Vanpaemel, "Henri Lehon en de zondvloedtheorie van J. Adhémar" [Henri Lehon and the diluvial theory of J. Adhémar], *Tijdschrift voor de geschiedenis der geneeskunde, natuurwetenschappen, wiskunde en techniek* 13 (1990), p. 212–230.

More popular books used a different approach. They would be written in a colloquial style, sometimes even in dialogues, telling stories and referring to local places or events. The authors were often teachers from secondary or vocational schools, giving advice in practical matters such as horticulture, apiculture, or explaining meteorological observations, industrial processes, and new inventions. The knowledge embodied in this literature was less connected to individual research or special competences. On the contrary, authors tried to present a broad overview of everything they had heard or read in the press. They gave information on public lectures, on newspaper articles, on popular books, on interesting observations made by correspondents etc. Popular texts may also have commercial intentions, in particular aiming to sell books, journals, goods or services to prospected clients.

Although the science in the popular press was less connected to individual achievements, the role of broker of information did depend much on the personalities involved. The broad scope of popularisation topics and the necessary command of the science implied, made writing for a general public quite difficult. In selecting the information to be transmitted, personal opinion or preference played a role and this could be countered by other, competing writers. It was not uncommon therefore, that popularizers engaged in controversies, accusing one another of incompetence. These debates were necessarily settled in the public sphere, as the approval of the public was the final goal of every popularizer.¹⁵ In the Academy, controversies were very rarely brought in the open. The selective choice of membership and the strict control of publications made it almost impossible for controversies to find their way in print. Although political life in Belgium was strongly marked by the antagonism between liberals and Catholics, hardly anything of these political tensions can be seen in the Academy.

This is most striking in the reception of Darwinism. In his recent work on the history of Darwinism in Belgium, Raf de Bont has documented how university scientists, working in physiological or morphological laboratories, refrained from speaking out on the subject of Darwinism.¹⁶ Also at the Academy, there was little interest to discuss the speculative aspects of the theory of evolution, as this was considered in conflict with the ethos of a positivist view of science. On the other hand, Darwinism was fiercely discussed — with scientific, religious and ideological arguments — in the public space, most of all with respect to paleontology, prehistoric archeology and the new discipline of physical anthropology. These disciplines attracted a large audience and formed something of an alternative scene in Belgian scientific life, populated by a wide variety of amateurs and self educated scholars. One of the more colourful people in this group was Ernest van den Broeck, a financial exchange agent, who worked in different fields, from geology, paleontology, botany and malacology, to studies on religion, Japanese culture and garden design. He was a member of several learned societies, but almost invariably ran into deep controversies. In this, he was assisted by yet another colourful amateur, Aimé Rutot, who became famous for his statues of prehistoric men.

Rutot and Van den Broeck were among the proponents of a very pronounced clash between amateurs and professionals. In 1886 the Belgian Geological Society broke up in a highly dramatized episode, in which different views on the social function of geology played a significant role. On the one hand stood the Liège professor of geology, Gustave Dewalque, who regarded geology as a pure science, based on physics, chemistry, mineralogy, and to a lesser extent on paleontology. Utilitarian considerations were important, but only after geology had been founded on a secure basis. Van den Broeck and Rutot (and their mentor Edouard Dupont) were attracted to geology because of its speculative arguments, in particular with relation to evolution and the antiquity of man. They considered their work as a contribution to public debates, and although they were good geologists in their own right, they would not accept a purely academic of geology. They left the Geological society to form an alternative society on geology, paleontology and hydrology.¹⁷

¹⁵ G. Vanpaemel, "Science, honour and commerce. The public face of chemistry in nineteenth-century Belgium," in: Isabel Malaquias, Ernst Homburg, M. Elvira Callapez (eds.), *Chemistry. Technology and Society. Proceedings of the 5th International Conference on History of Chemistry* (Aveiro: Sociedade Portuguesa de Quimica, 2006), p. 447–452.

¹⁶ Raf De Bont, *Darwins kleinkinderen. De omgang met de evolutieleer in België 1865–1945* (Leuven, unpublished PhD Dissertation, 2005).

¹⁷ Vanpaemel, Dewalque (see note 7). On Rutot, see Raf De Bont, "The creation of Prehistoric man: Aimé Rutot and the Eolith controversy, 1900–1920," *Isis* 94(2003), p. 604–630.

(4) Conclusion

As a conclusion, the analysis of the communication strategies of amateurs and professional scientists has yielded some clear differences. It appears that amateur scientists were more often than professional scientists members of several scientific societies, were active in several scientific fields at the same time, were more prone to travel and to have international contacts, and that they identified more closely with material objects in particular scientific collections. They were more willing to engage in public debate and to participate in exhibitions or public lectures and their publications were more accessible to the public at large.

We can apply a basic scheme of communication strategies, reflecting four different ways in which the process of communication is controlled by the various agents: hierarchical (e.g. top-down, education), sociable (among peer groups, personal networks), mediated (through newspapers, popularization) or participatory (two way interaction). In this scheme science communication among amateurs can be called sociable and participatory (as nineteenth century audiences can be largely considered as belonging to the same class as the amateur scientists). Professional communication on the other hand tended to be more hierarchical and mediated.

The growing cultural distance between amateurs and professionals discredited the amateur approach to science and made it increasingly difficult for professional scientists to reach for wider audiences. The mix between professionals and amateurs which was still quite apparent around the middle of the nineteenth century, had almost completely disappeared by the beginning of the twentieth century, not because of a change in competence or level of technical skill, but through a deliberate distancing of the professional scientists from the world of amateurs and their audiences.