AFCAL and the Emergence of Computer Science in France: 1957-1967

Pierre-Éric Mounier-Kuhn, Maël Pégny

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Pierre-Éric Mounier-Kuhn[1] and Maël Pégny[2]

[1] CNRS, Université Paris-Sorbonne, Maison des Sciences de l'Homme
mounier@msh-paris.fr
[2] CNRS, Université de Paris 1 Panthéon-Sorbonne, IHPST
maelpegny@gmail.com

Abstract. Founded in 1957, the *Association Française de Calcul* (AFCAL) was the first French society dedicated mainly to numerical computation. Its rapid growth and amalgamation with sister societies in related fields (Operations Research, Automatic Control) in the 1960s resulted in changes of its name and purpose, including the invention and adoption of the term *informatique* in 1962-1964, then of the adoption of *cybernétique* in 1967. Our paper aims at explicating the motives of its creation, its evolving definition and the functions it fulfilled. We seek to understand how this association, altogether a learned and a professional society, contributed to the emergence and recognition of Computing as an academic discipline in France. The main sources are the scattered surviving records of AFCAL, conserved in the archives of the Observatoire de Paris, of the *Institut de Mathématiques appliquées de Grenoble* (IMAG) and of the CNRS' *Institut Blaise Pascal* in Paris, as well as AFCAL's first congress and journal, *Chiffres*.

Introduction

The *Association Française de Calcul* (AFCAL) was founded in 1957 by French academics and industry engineers who wanted to join forces, to form a specialist community promoting applied mathematics and computing technologies in the context of the post-war modernization. With this technoscientific and political agenda, the new society soon attracted hundreds of members and support from various organizations.

It would be anachronistic to retrospectively tag AFCAL as a champion of "computer science". It focused initially on numerical analysis, a sub-discipline of applied mathematics, and on the use of calculating machines. The idea that electronic computers and their programs could become a new, distinct scientific academic field did not emerge until the 1960s. One of the main questions addressed in this paper is precisely how AFCAL participated in this emergence: what convergence of agenda and which internal tensions came to shape digital computation as a new academic discipline[3].

[3] This question is addressed in a broader scope in Mounier-Kuhn 2010a.

The archives of the association disappeared accidentally in a flood in the 1980s, making our research a bit difficult. The main sources are scattered surviving records of AFCAL, conserved in a variety of institutions: the archives of the *Observatoire de Paris* keep a box of papers from AFCAL's early years[4], those of the *Institut de Mathématiques appliquées de Grenoble* and of the CNRS *Institut Blaise Pascal* in Paris contain correspondences and reports exchanged between founding members. There are certainly more records waiting to be discovered in other organizations or with private persons. Published sources include AFCAL journal *Chiffres* (from 1958) and its conferences (from 1960). Finally, the first meeting on the history of computing in France included several papers addressing the evolution of French societies in this field[5].

In this sketch of our paper[6], we will highlight three episodes of the association's beginnings: the circumstances and motives of its creation; its participation to the international congress ICIPS and the international association IFIP; the functions of the association and their evolutions. In this last part, we will examine the role of the association in the emergence of *informatique* as a new scientific discipline.

1 The Emergence of a Computing Community

While the French academic spheres in the post-war period were dominated by pure mathematics, a growing demand for applied mathematics was expressed by physicists, and by various branches of engineering. From the late 1940s on, several young university professors responded to this demand by creating courses in numerical analysis and computing laboratories (Mounier-Kuhn 2012). In the early 1950s, electronic calculators were acquired from manufacturers and installed in these laboratories or, on a larger scale, in big organizations such as *Électricité de France* (E.D.F.) and aeronautics companies. In 1955, the first stored-program computers entered service in France, considerably reinforcing these facilities and offering new perspectives to mathematical modeling as well as to data processing.

Within two years, a series of learned societies were founded in related fields, a veritable blooming of professional communities active in Operations Research (SOFRO), Automatic Control (AFRA), Measure and Regulation (AFIC) and Computing (AFCAL). Simultaneously, scientists with political connections established a governmental council, CSRSPT (*Conseil supérieur de la recherche scientifique et du progrès technique*), in order to support the modernization of research and higher education. This body identified automatic control, applied mathematics and computing as a priority sector, under the label *Cybernétique.*

[4] *Archives de l'Observatoire de Paris*, Ms 1061 II-2-D.

[5] See the papers by Anne Brygoo, Jean Carteron, Colette Hoffsaës and Félix Paoletti in the proceedings of *Colloque sur l'histoire de l'informatique en France*, 1988.

[6] The present text is only a provisional account of a work in progress, and should not be quoted without the authors' permission.

1.1 Technoscientific Networking: Applied Mathematics as a Modernization Tool

One of the main actors of this movement was Jean Kuntzmann, an algebraist turned militant of applied mathematics, who had created a small laboratory of numerical analysis at the university of Grenoble to meet the needs of the local *Institut Polytechnique* [7]. His correspondance reveals his role as the initiator of the creation of AFCAL and sheds light on his motivations.

Kuntzmann's action to foster useful mathematics was supported by the local academic authorities and by the Ministry of Education which favored initiatives toward vocational studies. Most of the financial resources of his laboratory came from contracts with civilian or military clients who appreciated his expertise and, in turn, brought stimulating problems. The synergy between funding, research, teaching and practical computing generated a cumulative growth process. In the mid-1950s, Kuntzmann was recognized in France and abroad as a leading specialist in his field. He was consulted by junior professors who wanted to set up their own computing laboratories (in Lille, Nancy, Barcelona and other universities). His laboratory attracted visiting teachers and doctoral students.

Having systematically informed the major French users about the services his laboratory could provide, and received acknowledgements of their interest, Kuntzmann had built an interactive network of colleagues and partners. In April 1956, he began contacting other French specialists to suggest an association.

His correspondents, men of his generation or younger engineers and professors, shared his project and responded positively. This first poll allowed Kuntzmann to solicit and obtain the patronage of academic notabilities at a higher hierarchical level, the dean of the Paris faculty of science and the director of *Institut Henri Poincaré*[8]. He did not explain his purpose in detail, as these men obviously knew the usefulness of a learned society: Kuntzmann's correspondence contains no negative answer, not a single letter from a colleague objecting to his project.

Already a member of several learned societies, Kuntzmann had a precise idea of the one he wanted to create. He belonged to the *Société française de mathématiques*, which was still too general-purpose and exclusively academic to be of real use in his project. He also participated in the International Association for Analogue Calculation, which by contrast covered only part of the domain. The closest model was the American Association for Computing Machinery (ACM) with its specialized journal, to which Kuntzmann subscribed.

In Spring 1956, Kuntzmann also became a member of the German *Gesellschaft für Angewandte Mathematik und Mechanik* (GAMM). Kuntzmann could not attend the inauguration of the PERM computer in May 1956, but, always keen on completing his documentation on the state of the art, the Grenoblois ordered

[7] Our choice of J. Kuntzmann as a key actor is based on his role as a science entrepreneur and the availability of his correspondence conserved at the *Archives départementales de l'Isère* (Grenoble), henceforth ADI.

[8] J. Kuntzmann's letters to J. Pérès and R. Darmois, May 3 1956 (ADI IMAG 4).

the proceedings of the important Darmstadt conference held the previous year[9]. The GAMM existed since the 1920s and, with its institutional weight, could be a model of what Kuntzmann and his partners wanted to create in France, where no learned society existed in applied mathematics until 1955.

It is revealing that Kuntzmann aimed to create a new society rather than join the cybernetician community, which had been popular since Norbert Wiener's manifesto in 1948, and which possessed its own organization. While Kuntzmann sent one of his doctoral students at the International Congress of Cybernetics (Namur, Belgium, 1956) and ordered its proceedings, he explained in a harsh letter why he refused to join the *Association Internationale de Cybernétique*: "I have always thought that the grandiose term of Cybernetics covers very diverse matters. Some are mathematical, others are technical. Unfortunately, on top of that comes some philosophy, and even certainly babble (*fumisterie*). Either Cybernetics shall fall into oblivion or, some day, one will have to separate what is robust from what is not. I reserve my adhesion (and my participation in meetings) for the moment when this decantation is achieved[10]."

We know that this rejection of Cybernetics, or of what it had become in the mid-1950s, was shared by other French computing pioneers. They believed Cybernetics could not provide the identity of their emerging profession.

Kuntzmann knew that an informal group existed already in Paris, gathering periodically a handful of specialists and distinguished amateurs in a seminar on numerical calculation. Somehow its lack of institutional strategy and of scientific ambition reflected the low status of reckoning in the past decades. Kuntzmann courteously suggested to integrate the group in his future association to broaden its scale and scope. The merger was completed swiftly at a meeting in Paris, during a conference on scientific management. It avoided a possible conflict and brought a mailing list of 200 corresponding members to the nascent AFCAL[11]. The *Groupe de Calcul Numérique* held its seminars at the Paris *Institut d'Astrophysique*, and the AFCAL naturally followed suit, obtaining an office and a mailbox in this convenient venue. More importantly, the director of the Institut d'Astrophysique, André Danjon, an energetic and open-minded astronomer, agreed to become AFCAL's first president, bringing his own legitimacy and political connections.

Danjon had sent his young astronomers to learn programming on the IBM650 computer at IBM France, and was aware of the potential of the new machines. Beyond the technical importance of calculation in science, we can suggest the hypothesis of a solidarity between emerging disciplines. Just like computing in the years to come, astrophysics had had to assert its legitimacy against the conservatism of traditional astronomy, which was entirely mathematical and

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[9] J. Kuntzmann's letters to J. Heinhold, TH München, June 5 1956 (ADI IMAG 4). On the Darmstadt conference, see Petzold 2004.

[10] J. Kuntzmann's letter to AIC, October 2 1956 (ADI IMAG 4).

[11] J. Kuntzmann's letter to É. de Lacroix de Lavalette, May 4 1956 (ADI IMAG 4); and É. de Lacroix de Lavalette's historical report on his *Groupe de calcul numérique*, 1995. Private archives of the first author.

had reasons to view astrophysics as an uncertain science, lacking rigor, perhaps not a science at all: "Basically [for them], astrophysics could not be considered a science" (*À l'extrême, l'astrophysique ne pouvait être considérée comme une science*[12]).

Under Danjon's tutelage, AFCAL had two vice-presidents: Prof. Jean-André Ville, a mathematician who had just been put in charge of a computing center at the Paris faculty of science; and Jean Carteron, a Polytechnique engineer who headed the computing center at the R&D Department within E.D.F., and was equally active in founding the association (EDF sponsored AFCAL generously) (Mounier-Kuhn 2010b). Kuntzmann reserved for himself the responsibility of the future journal, a position of scientific gate-keeper in the new field.

Kuntzmann's work to promote modern theories and practices in applied mathematics was in synergy with the efforts of the computer industry to market their machines and their applications, and with the need of mathematical modeling among users. The lists of AFCAL members (200 in 1957, some 500 six years later) and of the institutions where they worked offer a fairly complete picture of French applied mathematics[13]: higher education and research, laboratories of major public or private companies, computer makers, consultants in mathematical and programming expertise. These various specialists felt the need to share their experiences and to promote their methods, which was the primary function of the association. It took nearly a year to create the association, as each founding member had many other urgent tasks. The constitutive assembly (May 31 1957), beyond adopting the charter, heard lectures on the present computing needs and resources among users, on recent machines' capabilities, and on the search for better programming methods that AFCAL should foster, a program covering most of the purposes of the association.

In June 1957, Kuntzmann set to create its journal, *Chiffres*, that is to find a suitable publisher and to hunt for good papers. The journal would also include sections devoted to scientific news, the announcement of courses and seminars, reviews of books and of conferences... In October, Carteron urged Kuntzmann to "give life as soon as possible to the Association" by organizing meetings, and both men gave it all the publicity they could in France and abroad. By November, Kuntzmann had formed an editorial board and gathered sufficient material for a first issue of *Chiffres*.

From its very beginning on, the association had an international dimension. Firstly, its membership soon included mathematicians working in Switzerland (Charles Blanc, Pierre Banderet, etc.), in Italy (particularly at the Olivetti-Bull joint venture) and in Belgium (Vitold Belevitch, Jacques Burniat). About 10% of AFCAL members in the early 1960s worked outside of France[14]. Its audience still remained limited to French-speaking countries or readers, as its publications provided initially no English abstracts.

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[12] Evry Schatzmann's interview with J.-F. Picard, February 24 1987.
[13] *Annuaire 1963 de l'AFCALTI. Archives privées de J. Carteron.*
[14] *Annuaire 1963 de l'AFCALTI. Archives privées de J. Carteron.*

2 Creating an Internationale of Computing: IFIP and its Scientific Agenda

Soon after its creation, the association contributed to establish an internationale of computing specialists. In December 1957, AFCAL was contacted by an American engineer and entrepreneur, Isaac L. Auerbach. As a member of the US Association for Computing Machinery (ACM), he planned to come to Paris in order to organize an international meeting of Information Processing societies from different countries. Isaac Auerbach had just left the Burroughs Corporation to form his own consultant company. Establishing international contacts to help Auerbach Associates conduct market surveys was certainly an incentive. Yet the main rationale for this internationalization was, as in other learned societies, to exchange information and gain political weight collectively.

The French reacted positively and agreed to meet with Auerbach and to cooperate for the preparation of the conference[15]. Just as in the creation process of AFCAL, the movement to join forces and cooperate appears to have been quite smooth: it was somewhat obvious to all actors, and it hardly needed more explanation than a few words in a letter. In June 1958, in Paris again, an ad-hoc committee gathered computer experts from most developed countries to organize the conference.

The International Conference of Information Processing Societies (ICIPS) met in June 1959 at the UNESCO building in Paris, gathering some 1800 participants from 38 countries during a week. For many French scientists, it was the first opportunity to hear foreign scholars (particularly Americans) present their work, and to discover the state of the art in programming techniques and in non-numerical applications of computers, an important milestone in their evolution towards research in computer science. Beside processor architecture or computing and coding methods, sessions were devoted to machine translation, pattern recognition, machine learning or future perspectives in computing. This diffusion of information was precisely the purpose pursued by Isaac Auerbach and Pierre Auger, the physicist who headed the French delegation at Unesco[16].

The ICIPS conference gave birth to the International Federation for Information Processing (IFIP) (see I.L. Auerbach 1986 and J. Carteron 1996). From then on, IFIP set up a similar worldwide conference every three years in a major city (Munich in 1962, New York in 1965, etc.). The mere existence of this global learned society and of its conferences, comparable with those in astronomy or geophysics, contributed to establish a scientific status for information processing. Such a status was explicitly targeted since its creation, as highlighted by

[15] Correspondence between I. Auerbach, A. Danjon, J. Carteron, J. Kuntzmann and J. Ville, December 7-12 1957 (ADI IMAG 5) and *Archives de l'Observatoire de Paris*, Ms 1061 II-2-D.

[16] The 600 pages proceedings were published by the UNESCO both in Paris (1960) and London (1960). Pierre Auger happened to coin the term *Traitement de l'information*, translated from "Information processing". The journal of the congress can be found at http://unesdoc.unesco.org/images/0015/001537/153718fb.pdf.

the general secretary of the 1959 conference, Pierre Auger: "It is absolutely indispensable to have an international organization to respond to the needs of the science of Information Processing[17]".

Moreover, in subsequent years the IFIP created specific committees on specific problems: Software theory and practice, Algorithmic languages and calculi, Formal description of programming concepts, Programming languages, Programming methodology. IFIP thus not only constituted an international computing community, it also provided it with a scientific roadmap of research directions.

Being essentially French-speaking was not a serious handicap for the association, at a time when many mathematicians could at least read French as well as German. The association was thus part, from its beginnings, of an international family of sister societies with which it actively interacted. J. Carteron became IFIP's treasurer and general secretary. AFCAL members participated in the various IFIP committees and working groups, discussing research and education problems and drawing inspiration from foreign experiences (Mounier-Kuhn 2014).

3 Tensions Over a New Discipline

3.1 Applied Mathematics vs. Data Processing?

Operations research was excluded from AFCAL's scope, as it already had its own society. So was all work exclusively related to hardware, which belonged to the *Société Française des Electriciens*, the French member of IEEE, and could be published in a new journal, *Automatisme*. As for data processing, it was a set of office techniques remote from any scientific formalization. The association constituted the study of computation as a specific, hierarchized object, where calculating machines were scientific instruments applying branches of mathematics.

Since the very beginning of AFCAL, however, a tension had appeared between two conceptions of its scope: one centered on applied mathematics, the other pushing to include data processing. And of course this would grow along with the progressive diversification of the society in the following decade. In 1957 already, Carteron had written a letter to president Danjon on the definition of AFCAL's domains. Carteron recommended not to separate numerical computing and information processing: "For example, problems of sorting on magnetic tapes, or of machine translation of language, are part of our preoccupations, as well as the technical aspects of automatic data processing problems[18]". The fact that he mentioned these particular problems reveals that he was remarkably aware of recent research directions. There was also a sociological rationale in his proposal: with the advent of electronic computers, data processing would soon

[17] *Journal du Congrès*, No.6, p.2 (italics ours).

[18] J. Carteron's letter to A. Danjon, December 6 1957 (*Archives de l'Observatoire de Paris*, Ms 1061 II-2-D).

become too complex for traditional punch-card technicians; it would require engineers trained at a higher level, who could be eligible among the advanced elite of AFCAL members.

At the other end of the spectrum, Kuntzmann, like other academic numerical analysts, wanted to involve the association in militantism for a reform of mathematical education, in order to give more room to applied mathematics. In several letters and reports, he advocated for a restructuring of mathematical categories, which would acknowledge the importance of "algorithmic mathematics". Even if he was soon to include a machine translation team in his institute, and courses on data-processing techniques in its curriculum, his priority always remained applied mathematics. Even decades later he kept considering *informatique* a technical application of mathematics.

In 1960, this debate became a central topic at AFCAL's annual assembly. The members who wanted to broaden the association's scope to data processing were led by Jean Carteron, Henri Boucher, a computer pioneer in the French Ministry of Defence, and Philippe Dreyfus, then a sort of sales evangelist for Bull computers who had already an international reputation. They succeeded in adding to the association's name the initials "TI" (*traitement de l'information*). Thus renamed, AFCALTI asserted the unity of a field broadened beyond applied mathematics, precisely at the time when it organized a joint conference with SOFRO (Operations Research) and the French chapter of The Institute of Management Sciences (TIMS). This change was still consolidated as Carteron was elected president as successor to Danjon. The journal's title became *Chiffres-Revue française de traitement de l'information.*

3.2 Toward a New Scientific Discipline

At the 1962 annual assembly, a neologism, *informatique*, was defined by Philippe Dreyfus and Robert Lattès as the"technique of the logical and automatic processing of information, the support of human knowledge and communication" (see Ph. Dreyfus 1962). Note that various attempts had already been made to name the computer field, including *Informatik* in Germany as early as in 1957. Ph. Dreyfus later explained the invention of *informatique* by the simple need he felt to name his professional occupation, encompassing all types of applications of electronic computers[19]. But there was another reason: Dreyfus had just left Bull to create a software and service bureau firm, in partnership with Robert Lattès, a brilliant mathematician who worked simultaneously for the French atomic energy authority (*Commissariat à l'Énergie Atomique*) and for a mathematical consultancy firm, SEMA. *Informatique* was the brand name of their company, just as, at the same time across the Atlantic, Walter Bauer founded Informatics Inc.

According to the president of AFCALTI, Carteron, *informatique* covered "all disciplines covered by calculation and information processing, from the logical design of computers to numerical analysis through machine translation." (see

[19] P. Mounier-Kuhn's interview with Ph. Dreyfus, September 21 2007.

Carteron 1963) Defined as a "technique" in 1962, *informatique* thus evolved into a set of "disciplines".

A further step was taken in the proceedings of the third congress of the association (CNRS, 1963). In the brief introduction, the editors asserted that programming was no longer a mere means to communicate with the machine, but that it turned into "a science of languages extending from algebra to decision theory", allowing to define "the modes of expression as well as the construction of compilers [...]. Finally, considerations about logic allowed to monitor the evolution of ideas concerning theoretical *informatique* ". *Science*, *informatique théorique*: these bold assertions were thus launched, with no explanatory development, likely to stimulate the discussion and to accelerate an evolution.

It is also a good case for a geography of science. The fact that this happened in Toulouse is not irrelevant. None in Grenoble would have written such provoking phrases under Kuntzmann's direction. The Toulouse computer scientists, by contrast, were mainly physicists, engineers or applied mathematicians coming from marginal positions. Contrary to Kuntzmann, they did not worry about their mathematical legitimacy, and felt more free to embrace a new academic identity. The next year, Dreyfus and Lattès hammered their message again. Aiming at a broader readership than AFCALTI members, they chose Le Monde to publish an article-manifesto: "A new discipline: *Informatique*"(Lattès and Dreyfus, 1964). The context was favourable: several French universities had already created specialized degrees, IBM had just launched its "third generation" computers, operating systems were now a central issue for computer scientists, and the takeover of the french company Bull by General Electric had triggered reactions in industry and government spheres.

The headlines described *informatique* as a broad set of sciences and techniques, reflecting the variety of AFCALTI's interests. Then Dreyfus and Lattès recalled their definition of 1962, but assertively added a much more scientific dimension: "More than a simple technique, computing is a discipline, a science-interface (*une science-carrefour*) covering a large and disparate sector as much technical as scientific; it is also a mental attitude in approaching problems. " They insisted that computing had become a fully-fledged research sector, with specific matters of its own "such as software and certain technologies". In conclusion the article stressed the growing importance of computing for society and economy, which required its integration in all parts of higher education and executive training, "to raise generations of men adapted to the mode of thought now required by the machine."

By that time, *informatique* was being gradually adopted in French common vocabulary, coexisting with other terms, and triggering discussions (within and outside the association) about its content, its meaning, its position between science and technology. The controversy opposed mainly those who thought in terms of applied mathematics and those who asserted the central place now occupied by computers in different activities. Branch or application of mathematics? Or technique, or even science of computers ? or of information? The initial definition given in 1962 was tentative, and anyone was entitled to propose variants of it. This debate would eventually continue over several decades, drawing a dividing line within academic spheres, and shaping its institutional organisation.

3.3 The Evolving Functions of the Association and the Institutionalization of Computing

Finally, we examine how the definition of the functions of the association evolved over time, and draw lessons on the emergence of Computing as a new professional field in France.

The association had multiple functions from the start. Its founders knew that their field and its economic impact were growing fast. One of their initial goals was to increase awareness of the potential applications of computation among institutional actors; some members such as J. Kuntzmann also wanted to involve the association in their campaign for a reform of mathematical education, which would give more room to applied mathematics and numerical computation.

But the association was initially dominated by academics and engineers, and its primary goal was research. A key issue in the definition of its function was thus the definition of its scientific object. This definition underwent important, and somewhat tortuous evolutions during its first ten years. In the beginning, it was dedicated to computation, its methods and the relevant mathematical developments. Analog computation was not excluded, but numerical computation was central.

But as we have seen (section 3.1), as computing applications kept growing, a more applied point of view gained traction within the association, and it became more and more inclusive. This expansion was justified by the common interests shared by the different specialists, and by the extremely rapid growth of computer applications. This rate of growth helps to explain the frantic pace of institutional evolution, as the association underwent three amalgamations in less than a decade.

If the term "amalgamation" is adequate at an institutional level, it is nevertheless misleading at the level of research practices. The series of institutional amalgamations did not erase the differences between the various intellectual traditions involved. Considering its scientific object, the evolution of the association might be better described as a movement of "expansion-subdivision". In its March-April 1967 issue, the *Chiffres* journal was divided in two collections, one for theory and methodology, the other for practice. In 1968 it was further divided into three different collections: mathematics, computer science, operations research. In the 70s, the subdivision process continued, as the association itself was subdivided into subsections and work groups (Brygoo, 1988). The association was thus a place where different subdisciplines would interact, not a melting pot where those subdisciplines would lose their original identities.

The association general assembly, and *Chiffres* were also places where *informatique* was proposed and discussed as a disciplinary term. Less successful neologisms, such as the 'economic cybernetics' (*cybernétique économique*), reveal the fluidity of the new professional domain, and the efforts made to cope with it. As Y. Gingras 1991 put it, scientific associations are a privileged place for specialists of a given domain to articulate a discourse on their activity and intellectual identity, both for themselves and for outsiders. Terminological innovation is thus a way to define and defend the identity of a new group of specialists. The association was thus one of the institutions where the professional identity of *informaticien* emerged.

To conclude, let us use this story to test the idea that the creation of scientific associations can be a criterium for the emergence of new disciplines. When it was renamed AFIRO, the association was a scientific institution at least including computer science as part of its object. According to this criterium, it played a part in the institutionalization of computer science. But a couple of remarks should be made in order to understand more precisely this institutionalization process. We must distinguish between disciplines *qua* intellectual tradition and disciplines *qua* institution. As J. Gayon 2015 remarked, an intellectual tradition like evolutionary theory could exist for decades without being institutionalized, and natural history is still an academic institution without being an autonomous intellectual tradition anymore. Furthermore, for an association to be the institutionalization of intellectual tradition X, the intellectual tradition X has to be identified as such by actors. In a typical scenario, an intellectual tradition would be formed before it would be equipped with institutions such as scientific societies.

But at the beginning of the AFCAL, it was not obvious that computation, even if its fast development demanded an institutional response, would represent a distinct intellectual tradition, other than just a branch of applied mathematics. Second, even when the intellectual tradition of computer science started to emerge, it did not lead the association to focus exclusively on computer science - quite the contrary. The word *informatique* was included in its title precisely when the scope of the association was broadened to include *recherche opérationnelle* (operations research), then automatics and control. The association thus defined and covered a much broader field of expertise and applications than the academic discipline of computer science in France would in the near future, since Operations Research and Automatics have autonomous academic institutionalizations outside of computer science departments.

Far from being just an institutionalization of an already existing academic tradition, the association was a forum where, through collaborative work, tensions over agenda and terminological debate, the conscience of the existence of a new discipline, computer science, was going to emerge. Using the existence of the association as a static criterium for the institutionalization of an academic tradition masks its dynamic role in the very constitution of this intellectual tradition.

4 Conclusion

The creation of the AFCAL, and much of its evolution, was application driven. The huge expansion of computer applications in the first years of its existence is the driving force behind the growth of its membership, and the fluidity of its scope. It can be also seen as a decisive factor in the definition of the various association functions. Spreading the knowledge about potential applications of the new technologies among institutional actors, reforming the mathematical education, gathering specialists coming from different domains around a new research object: all these actions can be understood as a fast institutional response to a rapidly evolving field of high socio-economical impact.

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