SCIENCE FOR THE SOUTH/SCIENCE FOR THE NORTH
THE GREAT DIVIDE?
ORSTOM VERSUS CNRS

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Some observers of South/North relations argue that the scientific community which generates knowledge and skills for developing countries is very different from the scientific community which addresses northern audiences. A few commentators have occasionally even intimated that the former is inferior to the latter.[1] In this chapter we examine the ways and extent to which the profession, institutions and cognitive products connected with Northern research agencies that deal mainly with other metropolitan interlocutors converge with and contrast from metropolitan-based research agencies mandated to address the South. Recent historical and sociological studies of science demonstrate that science does not constitute a homogeneous body, either cognitively or socially. For every discipline there exists a vast choice of analytic objects open to exploration, a variety of methods that can be adopted and an array of fully legitimate research results. In this text we take the case of France and compare science whose principal frame of reference is the North and science for which the South constitutes the relevant system of coordinates. Key elements of the Office de Recherche Scientifique et Technique d'Outre-Mer (ORSTOM), – founded in 1943 to deal with technical questions in the French colonies and eventually to generate a distinct, appropriate form of knowledge and know-how – will be matched with key components of the Centre National de Recherche Scientifique (CNRS) – set up in 1939 to promote innovative, world quality research in fundamental science. While ORSTOM focuses mainly on applied science, cooperating with Southern countries in attempting to spawn development, the CNRS addresses Northern audiences and serves the ambitions and demands of metropolitan France.

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Our underlying question is the following – what is the shape and focus of the "scientific field"[2] encapsulated in ORSTOM and in the CNRS, and do they produce a specific category of science in conjunction with a specific community, organization and vocation? While the CNRS has over 25,000 employees – 11,400 full-time scientists – ORSTOM is only one tenth the size of the CNRS both in terms of budget and employees. This naturally restricts both the practical and cognitive scope of ORSTOM. The CNRS encapsulates a full range of disciplines, extending from astronomy, mathematics and physics to biology and zoology, and from history, sociology, and linguistics to philosophy; in all, about fifty separate sub-disciplines. By contrast, ORSTOM's repertoire excludes mathematics and most of the physical sciences, concentrating on the natural sciences, agriculture, medicine and some of the social sciences.

To compensate in part for variance in institutional size, and also in order to give greater precision and detail to this study, we focus on a single discipline, sociology. Even here, however, a strict comparison proves thorny. The CNRS employs about 270 sociologists, approximately half of the nation's total professionals in the domain. CNRS sociologists dominate two of the agency's national scientific committees. By contrast, ORSTOM employs around 250 researchers in all of the social and human sciences. Only about 50 are sociologists. To overcome the discrepancy in community size and collect ample documentation, when dealing with matters associated with professional orientation and career paths we have, in the case of ORSTOM, grouped together various sub-disciplines in the social sciences (sociology, ethnology, economics and geography). But when considering narrowly intellectual matters the population is restricted to sociologists. By contrast, the size of the CNRS sociology section is patently too vast to study in detail. For certain categories of information we have consequently focused on one single laboratory – the Centre d'études des mouvements sociaux. For both the CNRS and ORSTOM our research for this paper is based on historical and current administrative documents, a statistical and qualitative analysis of personnel records, interviews and mail questionnaires and "epistemological records". The latter documentation refers to the self-representations of the research objects, methods, results and intellectual evolution produced by scientists when soliciting promotion.

In part one of this essay we examine the origins, institutional traits and constraints and the specific professional physiognomy of ORSTOM and the CNRS. This is intended to cast light on the general orientation of the respective research of the two agencies. In part two we study the kinds of intellectual products thereby generated by ORSTOM and CNRS sociologists. Part three contains a description and analysis of the epistemological modes that characterize the research of the two agencies. The sociology departments of ORSTOM

and the CNRS are compared with regard to five aspects of their organization and operation: institutional objectives, institutional strategies and constraints, recruitment, quantity and purview of publication and epistemological preferences.

1. The specificities of ORSTOM and CNRS knowledge-production landscapes and the impact of agency constraints

In this initial section we examine the relations between certain social characteristics of ORSTOM and the CNRS and the general features of each agency's intellectual output. More precisely, we explore the web of influences between organizational constraints and research vocation. In the case of ORSTOM ideological, political and administrative constraints prevail while for the CNRS professional and financial factors prove decisive. Here we describe and analyze training, recruitment, organizational and financial prescriptions and the focus of sociological inquiry for each of the two agencies. Sociologists involved in research are subject to academic constraints. But these are not the only, nor necessarily even the principal, factors that affect their intellectual production.

Academic constraints operate through the norms of the profession – training, certification, group control. Standards are set to determine who is a legitimate member of the community. The requirement and sanctions of publication comprise an essential feature of this clutch of controls. Publication thus operates as a mediating device in the academic sphere. Academic constraints are held to be separate from the local, organizational context. They are general in scope, applying equally to everyone in the scientific community, regardless of particular institutional idiosyncrasies. However, parallel to this, intra-institutional elements can also impact the process of intellectual production through prioritizing the direction of work, by selecting markets for research results and by structuring highly local intra-organizational career criteria that establish local systems of rewards and penalties. In the case of ORSTOM and the CNRS the salients and shape of academic constraints and the form and importance of intra-organizational inducements and sanctions have frequently diverged, with profound consequences for the orientation of intellectual production.

1.1. *The Institut de recherche scientifique pour le développement en coopération (ORSTOM)*

ORSTOM was established in 1943 under the tutelage of the Ministry of the Colonies. Its mandate included the formulation of a body of scientific and

technical knowledge and know-how specific to the colonial context. Initially, ORSTOM focused on pedology, tropical medicine and the human and social sciences – linguistics and ethnology. It frequently borrowed scientific staff attached to other ministries, but very rapidly ORSTOM acquired endogenous research personnel. Between 1960 and 1982 the ORSTOM mandate shifted, reflecting in part the acquisition of independence by the former colonies.[3] It was mandated to stimulate development of the former dependencies in the tropical regions and, in particular, to aid in the process of rural development. Simultaneously, the agency's internal organization grew more elaborate and formal, and it assumed a different profile from many of France's other research agencies. A two-track administrative framework evolved. There existed a policy administration which determined the general political and cognitive orientation of the agency and which was closely linked to the ministry that oversaw ORSTOM and frequently imposed an ideological/ political line. Parallel to this was a scientific administration. It supervised recruitment and careers. It also influenced the intellectual orientation of research. Nevertheless in those instances when the volition of the scientific administration clashed with policy administration, the latter managed to quell the former.

This centralized, authoritarian configuration prevailed between 1960 and 1980, at the very moment when the social sciences developed rapidly at ORSTOM. Many of the researchers in ethnology, history and linguistics who had previously worked in ORSTOM while on temporary leave from posts in other ministries, rejoined their home agency during this period. New, young personnel were recruited in order to constitute an autonomous ORSTOM research community in the human and social sciences. The new cohort was specialized in geography, anthropology, economics and sociology. In the span of a single decade the number of ORSTOM researchers in these areas rose from fifty to 150. With the rise to power of the French Socialist Party in 1981, the organization and mandate of ORSTOM changed considerably. The agency was detached from The Ministry of Overseas Development and transferred to the Ministry of Research and Technology. Furthermore its mandate henceforth entailed development activities of all sorts and not principally rural development as previously. It became responsible for development in all areas of the globe and not principally the former French colonies, as had been the case in the past. The new policy which favored general development was coupled to a plan to strengthen the agency's scientific capacity.[4] New multi-disciplinary departments were established, and due to a recrudescence in the perceived relevance of the social sciences, most of them competed to augment the number of sociologists which rose from thirty to fifty. The newly organized scientific administration decided which research programs would be pursued, but with

the accord of the policy administration. In addition, the departments possessed a measure of economic autonomy. The former discipline-based technical committees were retained and they continued to regulate the careers of scientists. In the case of the social sciences, these committees participated in the activities associated with recruitment and promotion.

In sum, two stable logics characterize different phases of ORSTOM's past. One is cognitive and scientific, and is sometimes associated with academic concerns. The second is political and ideological. The two logics are organized separately. One has responsibility for recruitment, careers and promotion. The other influences the intellectual facet of research through control over scientific projects and programs. For their part, individual researchers deal with this bifurcated context by addressing each category of the ORSTOM organizational system with a different and appropriate rhetoric. Solutions to career ambitions on the one hand, and to intellectual aspirations and demands on the other are negotiated separately and on an individual basis.

In contrast to administrative stability, ORSTOM's recruitment of scientists proved flexible, and shifted in response to changing educational and social conditions. The early years of the agency's recruitment program were colored by France's rapid and often turbulent de-colonization. Administrative personnel from the former colonies flooded back to France from the mid 50s onward. Some of the displaced, disaffected and unemployed manpower found positions with ORSTOM which absorbed as many former colonialists as possible. So, the human and social sciences were thus populated by former colonial administrators, doctors from the former colonial army health corps interested in matters sociological and amateur ethnologists. In addition, by the late 50s, there was also a component of university-trained people. They accounted for about a third of the one hundred people involved in the social sciences. This university-trained element included scholars in musicology, history, archeology and ethnology or linguistics. Other disciplines were also represented – law, sociology, and geography. Several of this people were members of the École d'Extrême-Orient and graduates of Langues orientales. Others were linked to the South-east Asia Research Institutes or the African Institutes.A dozen employees had the *agrégation* in law and taught in specialized institutes. Twenty individuals possessed at least two *licences* (frequently in law or letters). Five had pre-doctoral certificates. Several held a doctoral degree.

In the 1960s training and recruitment became "normalized". Most recruits graduated from a university with four or five years of training. Some were recruited by means of an open competitive examination. However, as in the past most were personally selected by the heads of the social science units where they were to work. In the 60s the average age of fresh recruits was

twenty four. In the 70s it rose to between twenty six and twenty nine. The system of competitive examinations became prevalent during this time, and most applicants had from five to seven years of university training. Since 1982 a doctorate has become compulsory, and the recruitment age has constantly risen. Over the entire span ORSTOM's predilection for training in multiple disciplines has remained constant. This contrasts with CNRS sociology. Another constant of ORSTOM is that personnel come from small and middle sized towns spread across all of France, and they tend to receive their educations at provincial universities. In comparison with CNRS scientists, they tend to possess less "social and cultural capital". Graduates from the École normale supérieure or the École polytechnique—the summit of the French system of higher education – are relatively few in number in CNRS sociology, but at ORSTOM they comprise a glaring exception. Nevertheless, in the 60s ORSTOM did recruit a few Polytechniciens, Normaliens, etc, but their stay with the agency was brief, largely lasting fewer than ten years. With them went the research themes that they had sought to introduce into ORSTOM – planning, macro-economics, industrialization and sociological modeling. It is not that the nation's elite necessarily saw ORSTOM as a poor career avenue. Rather, the ORSTOM spirit and style proved incompatible with the grandes écoles style of reasoning and working.

1.1.1. *Operational research, scientific desocialization and "devoir de réserve": the cognitive effects of institutional constraints*

The professional agenda of ORSTOM sociologists has until very recently entailed compulsory, exceptionally long-term, posting in an overseas, developing country. These postings allowed researchers to become immersed in the terrain on which they were undertaking research. It brought a range of advantages and opportunities such as the possibility of pursuing detailed ethnographic observation and careful longitudinal studies, acquiring great familiarity with indigenous culture and involvement in local intellectual life. However, this "opportunity" entailed a key inconvenience – one which perhaps constitutes the fundamental constraint of the agency and which strongly affects its intellectual orientations. Proximity to the research terrain was regarded by the agency's administration as paramount. "Permanent" overseas posting allowed the maintenance of close bonds between France and the former colonies. These advantages nevertheless had their negative counterpart – the loss of contact with the metropolitan scientific community, resulting in a certain professional desocialization, difficult access to international and metropolitan journals and books and difficulties in attending scientific meetings. While the policy of protracted overseas posting was often flexible, it constituted a stringent internal

norm within ORSTOM. It was possible for an individual to escape! However, the matter was acutely sensitive and was decided individually in the privacy of the administrative director's office. Scientists felt duty-bound to comply, and avoidance of very long-term overseas posting was taboo. Criticism of it or any mention of the wish to foreshorten a long stay was not to be broached even in conversation between close friends.

Working as a "scientist expatriate" entailed two major constraints. Throughout its history ORSTOM has imposed what it terms *le devoir de réserve* over its personnel, which has continuously had a strong affect over numerous aspects of scientific and extra-science activities. First, during overseas posting all scientists must strictly avoid any involvement in the politics of the host country and must avoid all statements and acts that could embarrass the French government. While the interpretation of this *réserve* remains malleable, it nevertheless constitutes an inhibiting force. The local, overseas ORSTOM administration, as well as ORSTOM scientists posted abroad and desirous of a trouble-free work environment, exercise subtle but strong pressure for compliance. Indeed, in the case of the social sciences, several researchers have been taken to task for violating the *devoir de réserve* by having close relations with certain foreign colleagues who belonged to a "revolutionary party" even though the party held power at the time. Some sociologists were banned from future work in a given country and in a few instances they were formally sanctioned, resulting in the blockage of their career. Other sanctions stemmed from involvement, for example, with the Sahel committee that accused certain development programs of having contributed to desertification – programs supported by France. The *devoir de réserve* directly and indirectly discouraged research that contained elements related to local administration or politics or to relations between developing nations and international considerations.

Only since 1982 has subtle but important change began to occur here. In recent years a discussion has developed over the advantages and disadvantages of the *droit de réserve* and permanent posting abroad as opposed to alternative arrangements such as balanced time allocation in France and in one or several developing countries. For example, a new concept has been proposed by ORSTOM scientists whereby they would move from country to country, but with long posting in France. This proposal is underpinned by the claim that a circulation of personnel and skills would better serve the needs of development. Still, in the view of the ministry having jurisdiction over ORSTOM, this new perspective remains highly suspect and even dangerous "for does not the legitimating specificity of ORSTOM – which justifies its separateness and independence from the CNRS and the university – not lay precisely in its duty to the South as reflected in researcher expatriation."

Until 1982 another organizational constraint directly affected the direction and content of scientific knowledge. The ORSTOM administration imposed an "intellectual visa". In practice this meant that the upper administration exercised control (through each disciplinary committee) over the final content of publications and reports. A visa was required before research results were permitted to leave a research unit. In certain instances the visa functioned as censorship. Alternatively, the very threat of sanctions forced scientists toward self-censorship. Much research was thereby marginalized and concealed. For example, ORSTOM researchers were highly active in economic anthropology. This domain was sometimes linked to a Marxist view. Notions of class and exploitation were unacceptable to the ORSTOM administration, however. The domain, including a dissertation, was consequently banned. Official ORSTOM records covering the period contain almost no references to Marxist inspired research programs or to their results. This demonstrates the extent of administrative control over scientific production. The complex and far-reaching web of official and tacit ORSTOM constraints thus infringed effectively on scientists' professional and intellectual life.

Scientists were required to occupy two "scientific fields", that of the metropolitan country and of the host country. To a certain extent researchers also necessarily belonged to each of the two countries' social-cultural landscape. ORSTOM constraints on researchers influenced the choice of subjects and the way in which they were carried out. The constraints similarly affected the vocabulary and analytic frameworks that could be employed. It is often argued that ORSTOM's primary guideline is politics. This results in the following configuration. First, its organization sponsors operational research; that is, research having practical, concrete and immediate outcomes that are explicitly awaited by the French government. Conversely, the agency deplores conceptualization and analysis. Second, the agency recruits scientists whose educational certification is elevated and whose career success depends more on practical services rendered in posting abroad than on a contribution to academic learning. Third, pushed by the administration toward the periphery (both geographic and intellectual), researchers renounce international competition. They sustain a brand of somewhat dated science, disconnected from broader intellectual developments. The research results of this group, which tend to be sparse, often take the form of confidential reports. These contain raw information and lack analysis and syntheses. This broad, sweeping representation of ORSTOM is somewhat extreme and certain individual's careers and work do not fit. Nevertheless, this picture is based on ample documentation, and many ORSTOM personnel see it as correct in its most important respects.

1.2. *The Centre national de la recherche scientifique (CNRS)*

The origins, professional identity and organizational constraints of CNRS sociology differ considerably from those of ORSTOM, and its intellectual orientation diverges accordingly. CNRS and ORSTOM training, however, have certain elements in common. The specificities of CNRS sociology are ground in three circumstances: the development of a deliberately new, alternative array of topics and a methodology distinct to that generally practiced in France's university system up to the 1950s; the carving-out of a socio-professional space which assured security of employment and a measure of social status and which rivaled the status of university teachers; the emergence of government policy intended to dictate the focus of sociology and the purposes to which it was put.

For the CNRS the late 1950s and 1960s was the key period in the initial elaboration of its form of sociology. The essential tension lay between itself and the brand of sociology defended and disseminated by the university system. A bifurcation arose between university sociology and non-university sociological research. There occurred a two-fold cleavage with respect to the focus and form of knowledge and with respect to careers. The detailed studies of V. Karady and J. Heilbron[5] clearly indicate that this separation originated as far back as the 1920s within the Durkheim group itself. Virtually every thought opposed university scholars like C. Bouglé, D. Parodi, and L. Lévy-Bruhl to researchers clustered around Marcel Mauss at the École pratique des hautes études. The latter institute, founded in 1868 outside the purview of the national university system, was mainly devoted to advanced scientific research as opposed to teaching and orthodox learning. It was often the seat of intellectual innovations. University sociologists, frequently allied to orthodox political and intellectual currents of establishment republicanism, saw sociology as the foundation for a badly needed "secular morality." The second group, however, who were often socialists, rejected the university outlook. Instead they separated Durkheim's sociology from all attempts to reduce it to a new, politically expedient morality. Here then, was a cleavage between a philosophically-inclined form of sociology and another variety whose objective was empirical sociological studies of concrete, topical social issues or problems.

While this debate between a highly speculative, philosophically-minded and universalistic sociology taught by the universities and sociological research ground in careful empirical investigations changed somewhat between the 1920s and 50s, the underlying tension nevertheless persisted. From the 50s onward, the latter was institutionalized not only in the École pratique des hautes études, but also at the Centre d'études sociologiques of the CNRS – established in 1947.[6] During this period empirical sociological research also

began to develop at INSEE, INSERM, IFOP and the like where it provided information required by the State bureaucracy.

The training and recruitment specific to CNRS sociology also emerged in the 50s and 60s. Immediately after the war recruitment often hinged on personal and group affinities – for example, shared experience in the resistance, adherence to Marxist ideology or a commitment to the worker movement. During the agency's initial decades some CNRS sociologists possessed the *agrégation* diploma and a small number were graduates of the highly selective, prestigious and influential École normale supérieure. A considerably larger group, however, did not have advanced training or high certification. Moreover, there were relatively few formally trained sociologists. Many recruits had their training or experience in the disciplines of history, geography, ethnology, law and the like. In 1968 the French government published recruitment statistics for sociology which highlight another particularity of the agency's profile.[7] For the university, approximately 70% of its sociologists had seven years of higher education and an *agrégation* or doctorate – or both. By contrast, 30% to 40% of the CNRS sociologists possessed such certification. While ORSTOM tended toward the CNRS profile, the level of certification was somewhat inferior, as only 20% to 30% had doctorates or an *agrégation*. With the passage of time this rapidly changed, as entry to both the CNRS and ORSTOM required a doctorate.

These statistics reveal that in at least one important respect CNRS and ORSTOM followed a similar path. The certification level was similar in the 1960s. During an initial stage of operations both agencies employed individuals lacking a sociological background but experienced in a range of alternative intellectual or practical domains. This heterogeneity diminished both at the CNRS and ORSTOM, but to a lesser extent in the case of the latter.

While recruitment in sociology at the CNRS was scanty in the 50s, the professional and social status of agency sociologists was also problematic. It remained a marginal discipline, regarded by communist intellectuals as a bourgeois domain intended for social policing and seen by the university establishment as a domain inferior to history and Latin studies. In his autobiography, Alain Touraine describes the isolation and marginality of the non-university sociologist during this period.[8] Material living conditions and work conditions were poor. Lacking socio-professional legitimacy and in danger of downward social mobility, it is thus understandable that numerous CNRS sociologists embraced the "engineering" conception of sociology advocated by G. Friedmann, the director of the Centre d'études sociologiques of the CNRS between 1949 and 1951. Friedmann's intention was not merely to obtain for CNRS sociology a measure of institutional and scientific legitimacy, but also to ground his discipline in the broader terrain of social action.[9] Consequently many CNRS

sociologists participated in the re-definition of their "trade", a definition that hinged on empirical studies and a response to "national demand." This perspective provided a linkage between their aspirations as a professional group and the interest of the nation. It was this line that Friedmann constantly put forward in his courses at the École des hautes études and his night courses that brought together sociologists, high level civil servants, engineers and captains of industry. The L'ISST, founded in 1953, functioned as a linkage mechanism between research supply and social demand. It provided research funding to many young Centre d'études sociologiques sociologists as well as the possibility to enhance their professional autonomy.[10] Sociologists like M. Crozier and D. Reynaud were closely associated with this movement.

1.2.1. *Contractual research and its effects on scientific production*

The CNRS sociology vocation, born of a need to carve out a specific professional and cognitive position with respect to the entrenched university brand of sociology, was accompanied in the 1960s by a government initiative which consisted of bureaucracy-driven thematic research programs. Contractual research comprised the second major constrain of CNRS sociology. It framed the categories of research that received institutional support. Beginning with the Fourth Government Plan (1961-65), contract research was established as one of France's foremost mechanisms for pursuing science. In the Sixth Government Plan (1971-1975) the so called *Actions Concertées* became a prime science policy instrument. The idea was to use government-programmed contract research to identify socio-economic demand, help satisfy that demand and stimulate outstanding research and the development of new laboratories. The Sixth Plan introduced a new element. It gave government officials who financed contract research a greater voice in deciding and controlling the direction of research. This was accompanied by a reduction in the creation of new research positions at the CNRS (people in such posts had tenure and guaranteed salaries, although they lacked sufficient project funding) and a general reduction in laboratory operating budgets. It also occurred when new jobs in university or secondary school teaching began to dry up. As a consequence, particularly for sociology, dependance on CNRS contract-based research increased for people hoping to pursue a sociology career.[11]

Contract research fragmented the market of CNRS sociological production and products,[12] and generated a variety of knowledge quite different from that which developed in ORSTOM. A scientist, forced to take into account the desiderata of a financing agency as well as the norms and evaluative criteria of scientific peers, experiences a particular form of pressure. Contract work led to a growth in the number and kind of arenas in which CNRS sociologists

compete for resources and recognition. Legitimacy is often arena specific and cannot readily be transferred from one arena to another. A sociologist who enjoys legitimacy with respect to a government agency for which he undertook particular contract work may not see his credibility enhanced within the academic community. This fragmented market was progressively crystallized both with respect to communication networks and specific forms of research outlets. This in turn spawned an immense multiplication in the number of sociology-related periodicals (beyond specialist and inter-specialist reviews). By so doing it engendered a diminution in their importance for evaluating the relative salients of the work of competing scientists. This would explain why, in CNRS sociology, books rather than an abundance of outstanding articles, weigh heavily in forging a successful career. But this is not all. Between 1970 and 80 contractual thematic research policy succeeded in orienting sociological research among many CNRS scientists. An OECD report clearly shows that it was government-selected, contract-sponsored, thematic sociology that developed most during this period at the CNRS, particularly in socio-economic issues associated with urbanization.[13] This theme was richly financed by the Ministries of Urban Planning and Tourism, and a large number of CNRS sociologists participated in the program. The research carried out at the Centre d'étude des mouvements sociaux, directed by A. Touraine up to 1980, is a case in point.

According to the laboratory reports of this period, out of a total of between twenty five and thirty sociologists, either five or eight scientists undertook research on this domain, under the direction of Castells. Additional work was carried out on development, although more in the framework of political sociology than in the spirit of socio-economics that characterized the investigations of urbanization. When first established the system of contract research selected projects by means of mixed committees that contained both scientists and delegates of the various ministries requiring sociological expertise. Competition between projects, individuals and research units was often sharp. Subsequently, the committees were disbanded. Administrative delegates established direct contact with sociologists having a reputation for the kind of expertise required or who were personally known to the delegates. The erstwhile scientific component of the contract system was eroded. The generalization of a contract system where only administrators formulated research themes and distributed funding, generated a group of sociologists who possessed the relevant networks, were capable of effecting the appropriate kind of negotiations and understood how to establish credibility with government administrative types. In many instances these skills were concentrated in the hands of sociologists already having considerable standing and a stable CNRS position. While today the influence of

thematic contractual financing of sociological research has diminished, the evaluation criteria employed within the CNRS now frequently reflects the thematic orientation. The emphasis on thematic continuity has long profoundly colored the intellectual trajectory of CNRS sociologists, to the extent that it comprises a significant feature. As stated by one of the sociologists whom we interviewed:

> There are two kinds of (CNRS) sociologists. One category of researcher continues to work on the same question, using about the same terrain and employing the same model for year after year—up to twenty years. He acquires ever more data, clarifies issues and builds-up an ever clearer picture. This research might lead to a dissertation. If the sociologist already has a dissertation he will instead publish a small number of articles and later an immense compendium containing all of his data and reflections for a twenty or thirty year period. I operate very differently from that, however. I function according to a different logic. I have often been told this and the CNRS committee has reproved me for it. For my part, rather than accumulating a sociological compendium, I prefer to operate in a way closer to the journalist. I do not want to produce sociology but rather information —information about important social activities. What interests me is a "butterfly-like space" which goes beyond what one discerns in publications.[14]

What we have seen both for ORSTOM and the CNRS is that organizational constraints weigh on the orientation of intellectual production. We have seen the complex web of influences that affects the periphery of intellectual products. However, these constraints cannot reasonably be seen as intervening directly or forcefully in the cognitive process proper of either of the two research agencies. In order to explore their respective cognitive processes it is necessary to locate more deeply structuring forces and relations. Yet it is far from evident that narrowly contextual relations provide the relevant base for this.

2. Intellectual products and markets

The kinds of products generated in the CNRS and ORSTOM are very different. This stems in part from the differences in professional identity and vocation, institutional constraints and training and recruitment as examined above. However, it is also associated with features of the intellectual markets available to the researchers of each of the agencies.

2.1. *ORSTOM literature: confidentiality and instrumentality*

Four kinds of cognitive products have emerged at ORSTOM. Each is linked to a particular period in the agency's internal evolution and its position in French political and bureaucratic life.

A) Pre-1960 – During this period several scientists in the social and human sciences researched and presented studies of particularly high quality. The names of G. Balandier (the founder of post-colonial African sociology), and G. Sautter and P. Pélissier (renovators of tropical geography), and P. Mercier (modern anthropology) come to mind, but other young ORSTOM scientists worked along similar lines. The research results were innovative and they quickly won a large public. The work of Balandier and his co-workers was academic. It satisfied the highest standards of international scholarship. To a certain extent it suited the demands of the ORSTOM administration as it cast what was often generally viewed as relevant and useful light on the processes involved in practical development. However, for Balandier, as for certain of his closest colleagues, ORSTOM did not offer the desired kind of career. The research, also marginally accepted, nevertheless raised difficulties within the agency. More important, ORSTOM was institutionally far from the university system, with its aura of entrenched prestige. It would be unwarranted to suggest that Balandier-type, quasi-academic research prevailed even at this time at ORSTOM. Most intellectual products were of an acutely descriptive, informational kind, suited to in-house consumption.

B) 1960-70 – The young, newly recruited personnel was assigned to work in the former colonies. This was perceived as a means of acquiring experience and a proof of ability. The policy administration called for the production of monographs for each region; in the case of sociologists and ethnologists a detailed description of villages and village life, for geographers an exhaustive description of local resources. The goal was to identify areas of specific need for, and possible dynamics of, social change and modernization. The tenor of the research results was often flat, encyclopedic description. While ORSTOM social scientists were given a research topic, they were not encouraged, or necessarily even permitted, to elaborate, extend or conceptualize it. Nevertheless ORSTOM scientists used this material as a basis for dissertations. Here, written communication prevailed in the form of in-house reports. These reports constituted a kind of "scientific document" tailored to the demands of ORSTOM administrative requirements. Except for the occasional dissertation, the written reports seldom entered the academic arena.

C) 1970-80 – In this decade the recruits of the former period reached maturity. They were joined by a new cohort of young staff who already possessed dissertations. Scientists strove for greater independence, notably in the selection of research topics. Simultaneously, the ORSTOM administration, wishing increasingly to respond to local post-colonial demand, and wishing to maintain its established intellectual traditions, sought to tame the various internal departments and committees which were striving for a measure of autonomy. The latter, unable to impose a clear, decisive policy, soon gave in to the administration's insistence on continued empirical research.

However, the researchers nevertheless did succeed in imposing on the policy administration several new topics of investigation. For example, they considered the dynamics of education and social development particularly important. They also gained a measure of flexibility in the way they could approach problems. If examined closely, the orientation remained practical and directly linked to the local terrain. While stressing the practical side of their work, it is also clear that most research did not lead to changes in local practice. During this decade an increasing amount of research found its way into print. Most, however, continued to take the form of in-house reports with carefully controlled circulation. (The administration maintained the famous intellectual visa.) The professional areas in which scientists engaged also multiplied. Some became teachers in the universities or engineering institutes of developing countries. Others moved into consulting. The latter sometimes worked formally in this capacity, often signing contracts to do so with the countries to which ORSTOM had assigned them. Others were unofficial consultants who informed official experts themselves attached to strategic French bureaucracies or international development agencies.

D) Post 1982 – Over the last decade ORSTOM has sought to re-define its intellectual policy, and with it the kind of cognitive products generated by the agency and the market for the products. The work of the science departments has shifted, and social sciences have gained in importance. Many new research teams have been formed and the identity of the research laboratory reenforced. Greater emphasis now lies on publishing as opposed to reports or the circulation of information in in-house journals. This new, partially academic orientation reflects a certain long silent aspiration of at least some ORSTOM personnel. Freedom to participate in national and international congresses, to publish and become members of editorial boards has been welcomed. Our investigation of forty one researchers attached to the Department of Development Strategy shows that between 1982 and 1986 sociologists published more papers and books than they had in the preceding twenty years. The same is true for involvement in the organization of national and international colloquia. The recent explosion of activity also affects teaching. It has increased four-fold while consulting has grown by a factor of three. Above all, the current production of intellectual products that circulate beyond the walls of ORSTOM has become the institutional norm. Before 1980 over 80% of extra-muros products were authored by a handful of sociologists who worked mainly in France.[15] Now, however, a comparison of the research production of CNRS sociologists and ORSTOM personnel indicates that the latter produce a roughly equal

amount; a book every two years at CNRS and every four years at ORSTOM, and two articles annually for the sociologists of both agencies.[16]

Nevertheless, the market places for the sociological products of the ORSTOM and CNRS communities differ considerably. Although at ORSTOM there is now an increasing tendency to publish outside of the in-house journals, 1/6th of all articles continue to appear there. The rest are scattered among seventy other reviews, fifty of them French language journals. Most sociologists do not publish repeatedly in any journal outside of the in-house one. Most do not seek to publish in high visibility international journals. Indeed, for the majority of ORSTOM sociologists, their publications primarily appear in relatively unknown reviews, and they are rarely cited. Many of the reviews in which they publish belong to the Third World countries where they conduct their research and have little readership and standing in international academic sociology. While ORSTOM sociologists publish, they do so in a cognitive market that diverges markedly from that of the CNRS. Moreover, even a cursory examination of the content of ORSTOM sociology articles reveals continuity with the past. While rich in data and detail, content is often lacking in synthesis and complex analysis.

2.2. *CNRS literature: between academism and popularization*

The cognitive products generated by CNRS sociologists fall into four principal categories: specialist texts, inter-specialists texts, reports and popularization. The balance between these streams changed appreciably between 1960 and 1990. The number of specialist publications has rocketed, and in many instances publication occurs in refereed, high quality and frequently internationally respected professional journals. This reflects two circumstances. In CNRS sociology, discipline-ground academic publication is paramount. The agency norm entails the penning of abundant, state of the art texts which receive notice in sociology circles both in France and beyond. Broad readership by the professional community comprises a central concern. The quantity of specialist articles by CNRS sociologists rose regularly until the late 80s. Massive publication of research results gathered in contract studies partly fueled this evolution. It was also fueled by explicit linkage between professional status and publication frequency. Today, the average *per capita* CNRS output is about two articles per annum.[17]

Scientific reports likewise constitute a fundamental vehicle for CNRS sociology, although to a lesser extent than at ORSTOM. The 70s and early 80s were the golden age of this genre which constituted the privileged outlet for contract research. As with ORSTOM, CNRS reports frequently contained confidential

information, and the circulation of the report was occasionally restricted, particularly when private firms were the sponsor. By contrast, in some instances a portion of the data presented in reports was subsequently also included in an academic publication. Nevertheless for many CNRS sociologists the report remained the primary, if not the exclusive, research vehicle. Here the research referent was government bureaucracy or private companies. Some CNRS sociology careers have been built almost exclusively around this form of research. It must be stressed that the legitimacy derived through this form of activity cannot, in the CNRS, be readily converted into academic legitimacy. A deep gulf frequently separates the two worlds of reports/contracts sociology and high-level, professional publication.

Scientific popularization has also figured importantly in CNRS sociology. During the last decade the agency has included popularization in the official list of researcher evaluation criteria. Sociologists' participation probably surpasses that of most other disciplines. This is partly due to a belief among some scientists that the disciplinary vocation entails commentary on and, sometimes, involvement in current social issues. Here, the trained, studious eye of the professional is seen as providing germane and penetrating insights. In addition, as we have already mentioned, there exists a strong tradition in France of linkage between high sociology and practitioner visibility on the broader public stage. Contract sociology can likewise be seen as further enhancing the popularization predisposition. In some instances, contract topics have easily lent themselves to the broader circulation of information. Indeed, the research topics were chosen by government bureaucracy precisely for their social relevance. While certain contract findings were not readily convertible into specialist articles, they could be rewritten as texts for broad public consumption. For these several reasons, during the 70s and 80s around half of the CNRS sociologists analyzed for this study published popular texts on at least one occasion, and many published a substantial number of such articles.

3. Epistemological forces – the cognitive impact of research trajectories

3.1. *Methodological caveats*

Before examining the relations between epistemology and the specificities of the science generated for the South and North it is necessary to stipulate two essential caveats. First, the concept of linkage between forms of research and professional setting is here restricted to the hypothesis that the particular reasoning mode used by a researcher is connected to the professional circumstances that surround his recruitment and his early professional experience,

which thereby affect the selection of topics and the most suitable strategies for dealing with them. This in turn affects the particular way in which the researcher represents his intellectual production and scientific practices. Second, the writings of the ORSTOM and CNRS sociologists contained in our sample were not systematically consulted. Nevertheless, a careful examination was made of the *Titres et travaux* of each researcher. *Titres et travaux* is the often lengthy, highly detailed document that personnel from each agency have to prepare when applying for career promotion. The document constitutes an intellectual auto-biography of the applicant. It systematically includes information on the various topics studied over a career, the kind of data collected, the methodology employed to collect and process data and to derive conclusions and, finally, the focus of major research results. It provides indirect information on the applicant's self-perception of his epistemological choices, practices and occasionally his motives. The analysis proposed here is thus not of the epistemology of sociologists' research products, but rather an exploration of the epistemologies accredited by them. Stated differently, it treats the epistemologies seen by them as characteristic of their respective agencies and as strategically beneficial in their quest for promotion. To explore and analyze the relevant epistemologies we employ a "socio-epistemological" typology developed by T. Shinn for previous, analogous investigations.[18] Three types of reasoning modes have been selected.

1. Retroductive reasoning. Here an integrated balance is struck between conceptualization and empirical information. Thought embraces the two, moving constantly back and forth between them. The approach is multidimensional. It incorporates processes of rigorous formalization and careful observation of phenomena. An initial hypothesis is based on a preliminary axiom integrated with precise data. This leads to procurement of additional data, which in turn allows the refinement and extension of the initial hypothesis. The cycle between abstraction and data is repeated until the sociologist is satisfied with the congruence between observation and modeling. Concepts and empirical materials enjoy equal status and they provide a system of balanced controls.

2. Induction. This reasoning mode incorporates both conceptualization and data, but the priority is given to empirical information. Observation and local phenomena lay at the heart of this epistemology. Unlike retroduction, universalistic claims are not the objective. Nevertheless, there exists a strong concern for generalization. However, this does not take the form of theory, structure or universalistic claims. Induction focuses on regularities established through the collection and collation of data from the observation of local phenomena.

It achieves generalization by multiplying studies of local sites and comparing them.

3. Rhizome reasoning.[19] It is ground on highly detailed observation of local phenomena. Practitioners of such reasoning exhibit mistrust for grandiose models and elaborate observational frameworks, preferring instead to adhere closely to the terrain of observation. The approach is entirely empirical. Its detractors claim that rhizome reasoning is simply enumerative. Those who practice it respond that this reasoning alone sustains the authenticity of the material being studied. There occurs a minimum of reconstruction and interpretation. Rhizome reasoning entails a measure of multi-disciplinarity and inter-disciplinarity. The local field of observation is examined from a multitude of angles and perspectives. This may require the use of several sub-disciplines. Here, the aim is a full, very accurate "photograph" – one that delves deeply into the subject. In itself the language of description constitutes sufficient intelligibility. Nothing is to be gained by trying to insert data into a model. To the contrary, this can only lead to data loss and intellectual distortion.

Despite several similarities, rhizome reasoning and induction diverge in important ways. The practitioner of inductive reasoning rejects an integrating model, but generates intelligibility on the basis of a group of objects and questions. He develops a specific ensemble of technics and skills which are transferred from study to study. This raises acute problems in the process of the generalization of findings. Moreover, in inductive reasoning observation has a strategic character, as the goal consists of movement toward the identification of social regularities. This trait is entirely absent from rhizome reasoning and is fully alien to it. In this last epistemology, reasoning is *ad hoc* and dismissive of attempts to objectify as occurs to different degrees in the two other categories of reasoning.

Both in ORSTOM and the CNRS there exist strong ties between their respective epistemological postures and processes of professionalization. The elements involved and the manner in which the involvement has occurred are quite different for the two agencies, which has had profound consequences. Because of this, the science generated within ORSTOM for the South contrasts, sometimes quite sharply, from that formulated within the CNRS for the North.

3.2. *Rhizome prevalence: the case of ORSTOM*

We examined forty one individual files of ORSTOM sociologists, grouping them into three categories. One file from each epistemological category will be presented in order to indicate the epistemological profile of the agency.

a. The file of "Albert" indicates that he does not regard himself as closely linked to any discipline, nor does he see himself as a specialist in the area in which he routinely works – development studies. Albert writes that his research approach transcends the basic intellectual tools acquired during his multi-disciplinary formal education. To these must be added the tricks of the trade acquired through long practical experience in the field where a person learns to approach problems from a great number of angles. Albert regards himself as proficient in social anthropology, economics, history, etc. – skills were developed during a broad oceanography-related project. Of utmost importance, the researcher sees each of these different fields as complementary perspectives which all converge on a single object of investigation. The intent is to comprehend the micro-processes that constitute a single, unique kind of social experience.

This approach belongs to a phenomenological perception of scientific research. It is an example of rhizome reasoning operating within ORSTOM. Here, commitment to the experiences of field research and reliance on detailed field notes are paramount. In the rhizome system this is the substance of research. Field experience is conveyed exhaustively, and this information communicates the facts and the atmosphere of field phenomena. Here, in the language of Duhem, is an instance of *l'esprit de finesse* as opposed to the more analytic-synthetic *esprit de géometrie*. Understanding occurs through meticulous, complete *exposé*. According to Albert, this form of reasoning is advantageous in that it escapes the formalistic and finalizing pitfalls associated with dependance on a model. Each Third World development experience is infinitely rich and complex in a multitude of ways – economics, politics, family life. No model, whatever its worth, can cope. Even the best conceivable model would reduce and straightjacket the complexity and vividness of the complete social experience. In this way, items as diverse and essential as the technic of agricultural production, local history, political evolution, family events, the role of institutions, religion and the mediation of bureaucracy can all be extensively touched on. Albert refuses to abandon locally established groups, such as girls or wives, for artificially constructed ones like "women in the development process". In the same spirit, he disallows notions like "class", "structure" or "system". Here then, is utter emphasis on the local and opposition to everything smacking of the "general". Without deploying the term, Albert exhibits suspicion of retroductive reasoning which he views as a device that deletes and distorts information and understanding.

The microscopic and local focus of ORSTOM rhizome reasoning is echoed in the agency's organizational prescriptions. Albert's choice of reasoning apparatus reflects ORSTOM's institutional policies on intense field work, detailed observation, long term expatriation, loyalty to the host country's and France's

perceived needs, and sensitivity to a form of "neutrality". One of ORSTOM's principal aims has been to chart social reality, which corresponds precisely to rhizome thought. This category of reasoning has long pervaded ORSTOM. It constitutes the dominant reasoning mode in twenty four of the forty one files examined for this study, although its contours vary from individual to individual. While constituting the principal epistemological mode among ORSTOM sociologists, rhizome reasoning occurs even more strongly and frequently among ORSTOM ethnographers, where the fragmented, idiosyncratic perception of social conduct comprises the legitimate disciplinary framework.

b. Twelve individuals of our ORSTOM epistemology sample ground their sociological research on inductive reasoning. While similar in some important ways to rhizome reasoning, in the ORSTOM context salient differences nevertheless emerge. Inductive reasoning shares rhizome reasoning's misgivings toward modeling, structures, projections and prophesy. Again like rhizome thought, induction adheres tightly to field work. However validation of induction entails the multiplication of field studies. Rhizome is self-referencing to the extent that "meaning" arises directly out of the internal relations of a field study. A broader referent is irrelevant. Induction, though, generates meaning through developing patterns across numerous case studies. It involves transcendent research themes. Though the purpose is not necessarily to elucidate structures, regularities are established by means of comparison. Comparison constitutes the strength of this approach. Induction makes it possible for ORSTOM sociologists to transcend their local field observations and thereby move beyond the specificities of a self-defining social circuit in order to identify a common underlying feature of broader social existence.

In the cases of the files that we examined, our induction-minded sociologists either compared multiple groups within a single country or undertook cross-country comparative analysis for a single category or group in the same vicinity. In each instance, the researcher strove to uncover a trans-local regularity. This constituted the goal and substance of the projects. To quote one of the files in the category of inductive reasoning:

> I never consider that I am engaged in a research project until my field work is highly advanced. Beforehand I conceive of the research as simply a theme of investigation... It is necessary to transcend the stage of unending data collection, and it is at this juncture that the research becomes a genuine project. This often requires considerable time. Through induction I move beyond the narrowly particular – for example to the identification of what constitutes *créole* culture. My investigations acquire a certain measure of generalization, but within a specific and particular cadre.

Instead of producing a synthesis, the goal here is to establish a general understanding of a narrow phenomenon. Through induction, this new understanding is integrated into established learning in the same and neighboring fields. It emerges as a possible constituent for further specific and also more general knowledge.

c. Despite the prevalence of rhizome thought at ORSTOM, and an appreciably lesser use of induction, another epistemological mode also occurs at the agency. A few sociologists deploy retroductive reasoning to frame their research. This is the case for five of the forty one files that we explored. As in the case of the aforementioned Albert, the ORSTOM sociologist Yves was also trained in two disciplines. But unlike Albert, Yves does not perceive himself as "an all-rounder" – as multi-disciplinary. Yves' use of retroduction is ground in two considerations; on the one hand a preoccupation with "reality", and on the other hand the resistance of reality to intelligibility which thereby necessitates a theoretical frame. Yves indicates in his file that a lesser commitment to "reality" on his part would pressure him in the direction of pure theory. However, retroductive reasoning is characterized by continuous fluctuation between field work and theory – between detail and synthesis. Here, analytic categories are constructed for the purpose of collecting and grouping data and for its analysis. Concept and data enjoy equal importance. The latter enables refinement of the former. The former constitutes a necessary pointer for the constitution of the latter. In his career file Yves begins by emphasizing his considerable experience in the field – often under stark, uncomfortable conditions. He quickly adds, however, that field work does not suffice for good research. It must be coupled to a conceptual schema.

After a few years in the field Yves turned to theoretical endeavors, reading articles and the classics in economics and anthropology. He had entered ORSTOM during the phase of high ideals when new recruits dreamed of achieving development innovations through tying concepts to a firm grasp of local social reality. Indeed, the disciplinary context constituted an extremely strong normative referent for Yves who saw it as providing a necessary frame for gleaning intelligibility. Yves' research rapidly led to an article which quickly became a minor classic. However, the author regarded this product merely as a strong hypothesis for future studies – as a set of credible axioms. During the five years that followed Yves resumed field work, using his axioms as the basis of research. He successively modified his hypothesis in the light of additional data. Finally, he published two short articles that summarized his emergent concepts. He also published two major works which presented an impressive

amount of empirical information, and which carefully linked the data to the new analytic set-up.

Here, then, is a positive correspondence between a reasoning mode and professional-institutional considerations. The professional norms and panoply of activities of Yves differs from those of Albert. Yves had a much narrower pallet of professional activities (Albert was involved in teaching and administration in addition to research) and for Yves the disciplinary referent lay at the center of events (not at all the case with Albert). He published relatively abundantly and, to a considerable extent, outside of France. Invited to participate in Europe and the USA in academic congresses, Yves was regarded as an international expert. His articles were translated. Unlike Albert with his rhizome reasoning, Yves sought to furnish his academic audience with a structured image of a nuanced world. By contrast, Albert developed an exhaustive piecemeal representation of society which was often intended for practical use. Indeed, Yves belongs to the cohort of recruits who were interested in organizing development processes from the top down and who saw social understanding as a fundamental component of this program. Conceptual apparatus comprised an element of considerable importance. At the same time, development entails a grasp of local factors. Hence we see the balanced unification of empirical information and a conceptual focus. Of course, the reluctance of the ORSTOM administration toward this posture eroded the viability of such a project within the agency. Concurrently, it also undermined the legitimacy of retroductive reasoning.

The tacit rules that underpin the intellectual products of ORSTOM distinguish it from the cognitive products of other research agencies. For example, unlike texts published in the world of international academic sociology, ORSTOM texts rarely set forth the question under examination and this is never done in the framework of a review of recent issues and current sociological publications. ORSTOM products take the form of tightly circulated in-house reports, restricted circulation publications or publications based in the South and often having a severely restricted readership. The texts contain relatively few sociological citations and they are in turn rarely cited in international journals. Of utmost significance, a comparison of the career patterns of individuals employing different epistemologies reveals the advantage of rhizome and inductive reasoning. Rhizome reasoners pass more quickly through the ranks than any other category. These personnel reach higher positions in the agency hierarchy, and they do so more quickly. Induction reasoners are also relatively successful, although less so than the rhizome group. Retroduction is not positively correlated with high or rapid upward mobility in ORSTOM. Other ORSTOM traits parallel the demands of rhizome: long overseas stays,

protracted studies of a specific topic, multiple kinds of inter-related field-based professional activities, moderate loyalty to a given discipline, remoteness from the academic core. In effect, here epistemology seems to function as a subterranean force which drives the ORSTOM institutional culture and which assures its maintenance and reproduction. Rhizome epistemology works to smooth over potential cleavages inside ORSTOM, such as might stem from the co-existence of innumerable disciplines and the fragmented investigation of innumerable countries in Africa, Asia and Latin America.

Since local foci and fragmentation are legitimate (even favored by rhizome reasoning), the potential lines of tension and fracture are instead transformed into positive attributes. In sum, ORSTOM sociology exhibits three epistemological forms. The primacy of rhizome reasoning, and to a lesser extent induction, transcends sociology, as they also appear to be strongly represented in other ORSTOM disciplines as well. The predominance of certain reasoning systems, and the marginality of others, says much about an institution. At ORSTOM the alliance between the agency's self-image, institutional goals and strategies on the one hand, and rhizome epistemology on the other, are explicit. Recruitment criteria privilege broad training and success in field work. An encyclopedic mentality is favored. When publicizing its achievements and in addressing possible sources of funding, ORSTOM systematically stresses its multi-disciplinary orientation and its successes in providing a full, detailed landscape when conducting research. ORSTOM administrators pride themselves in the precision and completeness of the agency's micro-studies, its commitment to local field work and its non-judgmental character. What ORSTOM refers to as *le privilège du local* is for the agency a political element which indicates respect for Southern clients. For researchers *le privilège du local* indicates respect for the exigencies of local field work and for the people whom they have studied. It is a sort of ethical, moral stance that colors ORSTOM as a whole. Rhizome reasoning's salient characteristics suits this focus better than do alternative epistemologies.

3.3. *The Kingdom of retroduction and induction: the case of CNRS*

The epistemological topography of the CNRS differs significantly from that of ORSTOM, thereby reflecting different educational and professional experiences and a contrasting set of demands. In ORSTOM, rhizome and inductive thought prevail, with a preference for the former. This order is inverted at the CNRS. Moreover, while retroduction occurs frequently in the CNRS, it is relatively uncommon at ORSTOM. (See table 1.) Data on CNRS epistemology is based on lengthy interviews with a dozen members of the Centre des

TABLE I

CNRS-ORSTOM: The epistemological Contrasts (real strengths)

Establishments	Rhizome	Induction	Retroduction	Total
ORSTOM	24	12	5	41
CNRS	18	25	20	63
Total	42	37	25	103

mouvements sociaux, detailed examination of personnel files and on a written questionnaire distributed to 210 CNRS sociologists – of which sixty two returned complete responses. This low response rate calls for prudence regarding the qualitative data. Skewing may be present. However, there exists good agreement between the quantitative and qualitative data. The biggest single group of CNRS sociologists surveyed for this article represent their intellectual production in terms of induction – twenty six individuals. Induction constitutes the dominant reasoning mode of 40% of CNRS researchers as against 26% at ORSTOM. Four circumstances have contributed to the salients of induction. First, the traditional mandate of CNRS sociology lies in the domain of social observation, field work and fact-finding. Topics such as the labor movement, urbanization and rural change have been important. CNRS sociology has had strong links with the practical processes of social change and modernization. For much of this endeavor, induction constituted a promising strategy. It provided precision as well as the possibility of deriving trans-local conclusions by dint of comparative investigations. Second, at the CNRS the mandarin structure of sociology, coupled to contract research, has favored induction. Perseverance in imposing and extending a given theory, concept or model (by some directors of agency laboratories) required highly dependent, short-term contract researchers to proceed inductively along a pre-established intellectual path for purposes of supplying data necessary to the validation of an interpretive frame. Inductive processes proved effective as a confirmation device. Third, contract sociologists who subsequently obtained permanent positions in the CNRS, but continued in the contract arena of production even after acquiring a stable position, have often retained a preference for induction reasoning. Induction operates here in such a way that sociologists can readily extend their domains of investigation while sustaining loose links with former work. Such intra-thematic intellectual mobility is specifically facilitated by induction, due to the latter's emphasis

on establishing regularities through comparisons across social fields. Indeed, induction appears to comprise the foremost reasoning mode of "social experts" in the agency.

The fourth factor that reenforces induction also paved the way for rhizome reasoning inside the CNRS for several decades. Eighteen of the sociologists who responded to our questionnaire indicated adherence to the rhizome approach. At the CNRS 25% of researchers employ the rhizome while at ORSTOM 59% are rhizome reasoners. At the CNRS rhizome provides an even greater proximity to local events and to the research terrain than induction. It succeeds not merely in conveying data, but the color and spirit of phenomena are conveyed as well. This category of information and appreciation has had its uses both as a source of academic and administrative/political intelligibility. In CNRS sociology, educational considerations correlate strongly with the predilections for rhizome and inductive thought. Three-fifths of these two categories of reasoners received their sociological training prior to 1965 when the French education system privileged elementary empiricism over all other approaches to sociological knowledge. This enchantment with empiricism constituted in part a reaction to speculative, philosophical-driven Durkheimian university thought which was deductive in bent. Because of these historical circumstances, the accent placed on elementary empiricism in the 40s, 50s and 60s often proved a welcome antidote. Structuralist-minded sociological teaching arose only after 1965 in France, and particularly after 1968. The teaching manual of G. Gurvitch[20] – which was perhaps the most widely used university text in the mid 60s and which may reasonably be regarded as representative of the dominant pedagogical way of thinking and teaching (an exemplar) of the 50s – is illustrative of the kind of preparation available to the group of young sociologists desirous of making a career in CNRS sociology during the agency's early years. The university text book contained two weighty volumes which dealt in competent detail with a full range of sociological domains. Gurvitch emphasized the accomplishments of the sociological art and he stressed the discipline's progress in recent years. It was a highly impressive compendium. By contrast, the manual devoted a scanty fifteen pages to issues of methodology, and there was virtually no mention of the role that models could play in sociological analysis or any discussion of their requirements and pitfalls. The text provided an introduction exclusively to empirical sociology. Before 1965 there was thus little possibility for future sociologists to acquire skills in, or an appreciation of, conceptualized methods. The paradigmatic methodology – in the Kuhnian sense – had not yet emerged in France. It was only after 1968 that attention to concepts, theory and modeling took root in sociology teaching, with the sociology manuals of P. Bourdieu, R. Boudon etc.[21]

Retroductive reasoning occurs as frequently in CNRS sociology as rhizome thought – in both cases eighteen individuals in a sample of sixty two. Retroduction is used by only 12% of sociologists at ORSTOM. There appear to be two principle reasons for retroduction's prevalence. Over half of these reasoners trained after 1965, which afforded greater exposure to structuralist thought – Marxism, structuralism, the Bourdieu model, Foucault and the statistical orientation. Familiarized with a patently conceptual orientation to data collection and analysis, to comprehension and reasoning in terms of systems, it became conceivable for CNRS recruits to employ this focus in their own work. Indeed, retroduction quickly emerged as a legitimate, prized norm inside the CNRS in the 70s and 80s. Employed by many mandarins and other laboratory directors to give scope to their analysis and connect it to far reaching social issues, retroduction has also been assimilated by a sizable percentage of sociologists who experienced contractual research.

In our above discussion we suggested a connection between induction/rhizome and contract investigations. These two categories of reasoning were imposed by directors on young scientists who lacked job security in order to obtain badly needed, detailed findings. While this observation appears entirely justified, the insecure, unstable professional status of contract sociologists has also sometimes induced the adoption of retroductive-based research. Particularly in the 70s and 80s, the paradigmatic representation generated by retroduction came into prominence in academic sociology, conferring a premium of visibility and legitimacy. The advantage of speaking from a lofty intellectual position of the kind provided by retroduction has long been appreciated and embraced by CNRS academic mandarins. The power of retroduction derives both from its potential for achieving synthesis and its affinity for systematization and prophesy. However, ambition and the quest for prestige are certainly no less intense among former contract researchers than other CNRS recruits. Some contract scholars have now risen to positions of prominence and authority inside the agency. Retroduction operates as an excellent strategy here. It has enabled contract people to move into new research fields discontinuous with their initial domains. Linkage between initial work and new fields is likewise facilitated. Perhaps most important, retroduction-ground endeavors furnish a broad vision of social events, and with it is generated an authoritative vocabulary and discourse. Retroduction hence converges with the strategies of CNRS mandarins. It also converges with the aspirations and ploys of contract-based individuals wishful of relatively assured upward professional movement in the agency.

Finally, while political influences are rife at ORSTOM, where they affect careers and the arena of intellectual production, and thereby obliquely weigh on epistemology, at the CNRS, by contrast, it seems that politics has some-

times had a relatively direct impact on epistemology. This pertains particularly to retroduction. In the late 60s and throughout most of the 70s, many new CNRS recruits were involved in political events – some very actively and others more cerebrally. This pertains perhaps particularly to individuals who were forced to run the contract gauntlet before being taken on as tenured staff. They viewed themselves as analysts of the socially, economically and politically disenfranchised, and to some extent as their spokesmen. However, in an academic research agency like the CNRS, commitment to the disenfranchised does not favor cognitive status or bring authority. Indeed, the opposite is true, at least from the authorized, institutional perspective. It would seem here that a conflation occurred between the political identity (allied to the disenfranchised) of politically-minded CNRS sociologists and their professional identity which was also relatively unstable and impoverished (menial contract workers). Autobiographical writings of some of these sociologists indicate that there thus existed still another motive for adopting retroductive reasoning. By so doing, a sociologist could both enhance the cogency of his partisan message and raise his professional status. Retroduction would serve as a vehicle for upward political and career mobility. Adherence to rhizome reasoning or induction would produce the opposite effect.

4. The great divide?

This study illuminates several salient and fundamental dimensions of science at large. Even more particularly, it sheds light on central features of the organization and performance of science for the South. The comparison of ORSTOM and the CNRS demonstrates that with respect to certain key elements science is assuredly not universal. It is a heterogeneous entity, but this is not to say a necessarily relativistic one or one which does not have some extremely generalizable aspects. The publication formats of ORSTOM and the CNRS contrast sharply. So do their epistemologies, the kinds of problems they treat and their evaluative criteria. Training and recruitment exhibit some similarities. Institutionalized expectations, norms and constraints differ vastly. It should thus be no surprise that the "science" produced in the two agencies is not isomorphic. Three further remarks are in order, however.

As the "scientific field" of the CNRS and ORSTOM are structured, organized and focused differently, this necessarily means that the knowledge which they generate varies. Indeed, intellectual products constitute an integral component of a scientific field – both structuring it and comprising an output. The institutional, professional and normative reaches of science thus contain some bits

which are essentially local. In effect they are defined by local circumstances. However, it appears that the local, professional setting does not necessarily cancel out trans-local standards for establishing propositional validity with regard to the robustness and durability of specific research results. While, for example, CNRS and ORSTOM sociologists come at a problem from contrasting perspectives, asking different questions and deploying contrasting epistemologies, and even though complete overlap may not occur in the articulation of evaluative procedures, when both communities of scientists weigh knowledge claims they nevertheless almost always agree in a relatively short period of time. It is the convergence of evaluation procedures that spawns the robustness of research claims tested in a variety of local science fields. This is because some rough system of shared evaluative operations moves across and through the cleavages entailed in separate scientific fields.

In addition, this study has suggested that epistemological considerations are pivotal to the operation of science and its understanding. Epistemology is not a mechanical, systematic product arising out of a given institutional-professional setting. Epistemology should not be regarded strictly as a socially determined or driven component. Neither does it stand autonomous – "a universal prop of science." It is rather a fluctuating, integrated component of scientific fields. Indeed it is a combination of the epistemological and institutional-professional that structures the career and the cognitive outputs of individual scientists. This is constitutive of scientists' "research trajectories", which remain opaque and stubbornly resistant to intelligibility when scrutinized exclusively in terms of erstwhile institutional or professional criteria. Epistemology is hence constitutive of education, recruitment, career, the arena of research production and thought in science – a "SOCIO/COGNITIVE BLOCK."

The specificity of the "science for the South scientific field" thus derives from its peculiar epistemological, professional and institutional traits. ORSTOM assuredly generates scientific products, and their focus and form arise out of the history of French colonialism, colonial and post-colonial related science policy, and out of the particular links that ORSTOM sustains with the French educational system, national and international academia and, of utmost importance, with the links it maintains with its Southern clients. ORSTOM's intellectual products do not lay on the periphery of academia because of some intrinsic form of low quality. Rather, the products often address a non-academic or semi-academic audience. Their focus and form match this audience, composed mainly of Third World politicians or administrators, or Third World social and economic groups, international bureaucrats, other ORSTOM scientists or their counterparts in non-French agencies and, finally, the ORSTOM administration. The demands of this scattered audience differ greatly from the

expectations of academic communities. Similarly, what counts as intelligibility for that scattered community, whose background and commitment is often not disciplinary, diverges from academia. These elements contribute fundamentally to the particular profile of "Northern science for the South" in the French setting.

Of course, patterns are probably very different in other national contexts. The specificity of ORSTOM arises in part from the highly planned, centralized and institutionalized character of France's scientific research system. Countries having different organizational traditions will evolve a contrasting kind of scientific field for the South. Also, France possesses a long, pervasive colonial past. Nations like Canada or Sweden which have no colonial heritage develop alternative science for the South research agencies with alternative agendas and producing alternative forms of knowledge. Detailed and systematic comparisons between different national science for the South systems will certainly prove enlightening, and hopefully such studies will soon appear in the research programs of South/North science studies.

Notes

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2. The concept of "scientific field" used here converges with that of Pierre Bourdieu to the extent that it intertwines cognitive and social relations as elements in processes of intellectual production. Richard Whitley's notion of "field" also figures here in the sense that processes of integration are central.
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13. OCDE, Politique des sciences sociales. France, Paris: OCDE, 1975.
14. Interview, 28 January, 1994.
15. R. Waast, *Enquete rétrospective sur la production des chercheurs du Département H. Analyse des questionnaires "Valorisation", 1985 et 1986*, (documents au dossier des Conseils de Département tenus en mars 1985 et mars 1986), ORSTOM, Archives du Département "Stratégies du développement", 1986.
16. We have strong reservations about the validity of the number of books attributed to CNRS laboratories. Moreover, the document from which we have drawn the data seems to conflate CNRS personnel and university staff. (See Direction scientifique de l'information scientifique et technique du CNRS, Documents disponsibles au Département des sciences de l'homme et de la société, pruduits par 240 laboratoires de son ressort, 1985.)
17. This figure is based on the production of sociologists in three CNRS laboratories, and most observers believe that it is a good approximation of agency output.
18. T. Shinn, "Enseignement, épistémologie et stratification," in C. Charle, R. Ferré, eds., *Le personnel de l'enseignement en France au XIXème et XXème siècles*, Paris: CNRS, 1985.
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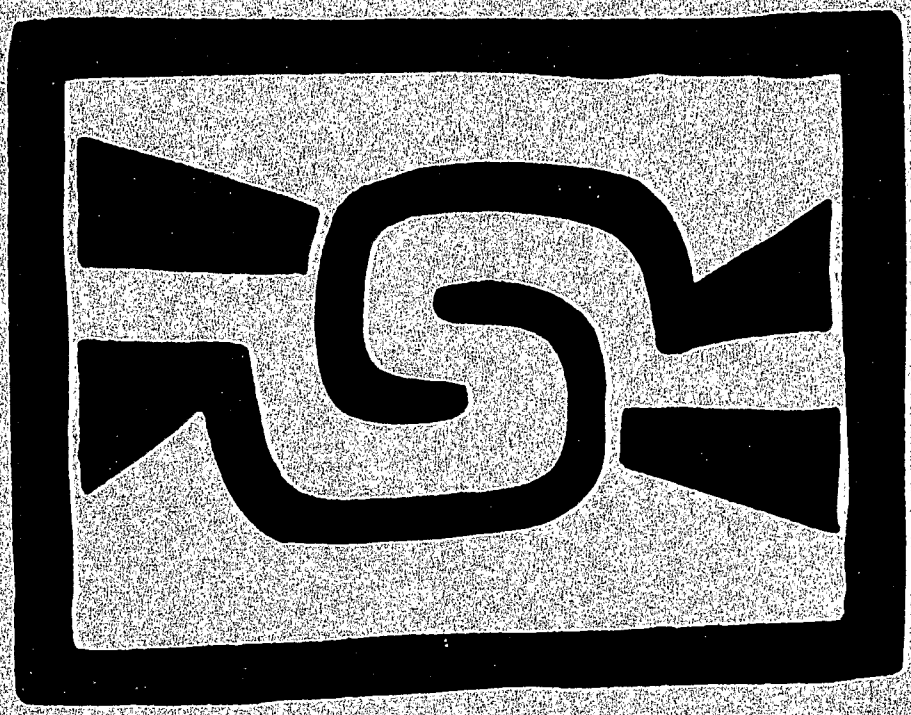

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