Sociology of statistics: possibilities of a new field of investigation

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Abstract

This article presents some possibilities for investigation unveiled by the sociology of statistics. Of particular importance in the area of demand is the power to provide the fundamentals used in government technologies in nation-states (political domain). In terms of the use of statistics, the role in forming the categories of perceptions of reality (cognitive domain) is highlighted. Within the scope of production (institutional domain), it is important to emphasize the organization of the activity into different temporalities. The tensions between the technical/normative advances recommended by scientific associations and the pragmatic requirements of public administration are also examined. This article seeks to provide a brief reflection on the morphology and the scientific culture of statistical institutions.

Keywords: statistical institutions; information policy; political technologies; classification categories; historical research into statistics.

The sociology of statistics, a relatively recent approach in the academic world, adopts the production, dissemination and utilization of public statistics by the broadest sectors of society and the State as its investigative horizon. The expression is not even that commonly used by academics who often prefer to use the expression 'public statistics.' Whatever the case, the research involved is also based on the same principle and the same approach. Taking statistics as the object of study, and not as the means of analysis (which is the more common approach), the primary aim of these studies is to acknowledge the plurality of the roles assumed by public statistics. This plurality spans from the political demands for planning and coordination, on which the statistical programs are founded and geared, through to the indomitable conceptual and procedural autonomy present in the methods and techniques used to compile the statistics. It also encompasses the values that are comprised in a scientific culture shared by statisticians, economists, demographers, cartographers, educators, sociologists and anthropologists – namely the professionals involved in the production and analysis of statistics. This complex relationship between the pragmatic and scientific extremes was fully appreciated by Simon Schwartzman (2004), the renowned sociologist and former president of the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística – IBGE, in Portuguese):

> Statistical information is of particular interest to the scientific sociologist, as it is produced by institutions that are, simultaneously, centers of research – thereby involving scientific values and technologies, as well as the perspectives and approaches typical to their fields of investigation – and public or official institutions, subject to the rules, values and restrictions of public service. Published in the press, their products – figures relating to the population, income, national product, urbanization, employment, birth rates, and poverty, among others – are used both to support government policies and to evaluate the results, and they can create or limit the legal rights and benefits of groups, institutions and specific individuals. This plurality of roles, contexts and perspectives associated with public statistics is inherent to the origin of this field (p.69).[1]

Being figures, albeit without being reduced to mere figures, statistics are used to draw up public policies. But they also supply input for the hypotheses of academic research and mold our categories of perception of reality, as we can see ourselves in others, thanks to the comparative equivalences created by statistical classifications. This is the way in which Nelson de Castro Senra (2005, p.16) affirms "the process of compiling statistics deconstructs the individualistic nature of any previously idealized collective group, in order in the final analysis to rebuild them as individualizations: the one seen in the other." By minutely analyzing day-to-day life, statistics related to employment, inflation, income, and fertility, among others, provide input for descriptions of economic situations, denunciations of social injustices, and the justification of political actions. We tend to determine the conditions of road safety in a country on the number of accidents that occur in it, especially on holidays.

Statistics play an increasingly important part in subjective evaluations and personal choices. How many people have not hesitated before going to multifarious types of events based on the latest news reports propagating statistics regarding criminality, measurements of urban violence and public safety? More than ever, statistics carry weight in the evaluation

of risks implied in a variety of different situations. The example cited by Anthony Giddens (1991, p.49; free translation from this edition) should suffice: "anyone in a Western country that decides to get married nowadays knows that the divorce rate is high ... . Awareness of high divorce rates may well affect a person's decision to get married, as well as decisions about related factors – such as the system of community ownership adopted in the partnership, etc."

For Bruno Latour, the power of statistics is that they are a tool of government technology, effectively taking people, objects and situations to the tables of those who are responsible for political decision-making, in the form of tables, graphs and plot charts. In so doing, they distinctly contribute to making distant and/or absent realities a known factor, capable of being pondered and, for this reason, potentially governable (Senra, 2005, p.15). The progressive imposition of statistical matrixes and tables opened up the possibility for: (a) creating spaces for equivalence, based on which the comparison between phenomena and units of analysis of diverse natures is ensured[2]; (b) summarizing the information based on synthetic indicators (averages, measurements of position and indices); and (c) creating the foundations for a distance technology that seeks to analyze social reality using an ongoing process of allowing the social discourses in play to be treated objectively (Otero, 2006, p.46).

It therefore becomes possible to think about building and operating nation-states in terms of statistical knowledge, this being understood not in epistemological terms, but as a vast network of people (scientists, politicians and intellectuals), institutions, instruments and equipment. We insist that analysis of this network should always consider the specificity of the statistical activity involved, governed by the rule of pragmatism and techno-science.

In fact, the frontier position between the State's political and administrative scope and the field of science is perhaps the most singular characteristic of public statistics. In this sense, these statistics provide an insight into both the state in which social disciplines are found in a country (their themes, concepts, objects and approaches), as well as the available options in terms of State policies to be adopted. This is thanks to a logic that is largely determined by the attribution of material means (censuses are the most expensive operation performed in any country during peacetime), by the definition of priorities and by the resolution of institutional conflicts. On the other hand, the field of science provides the theoretical foundations for the means of measurement and the formalized representations of the social world. It is precisely by virtue of this relative autonomy of the apparatus of the State that statistical information, once produced, is no longer within the control of its creator(s) and can be reused by others users, who can even download it onto networks for vastly different uses than the theoretical universe it was originally designed for (Otero, 2006, p.25).

In this respect, the study of the sources, procedure and uses – both intellectual and political – employed in the operations involved in drawing up statistics is the end goal to which the sociology of statistics aspires. This type of analytical care can be seen in what is now considered one of the pioneering studies on the subject. In *The sociology of official statistics*, which, unless we are mistaken, coined the name for the field, Paul Starr (1983, p.8) already distinguishes two structural organizations within the statistical system: the

"social organization," which, for the author, consists of the social and economic relationship between the agents involved in the analysis, distribution and use of the statistical information (interviewees, state agencies, private companies, professional associations, international entities); and the "cognitive organization," which consists of the process of structuring information, namely the intellectual construction of presuppositions, rules, categories of classification and methods of measurement used to produce the information by the statistical institutions.

As far as the social organization is concerned, the use of historical research reveals the social foundations of the measurement process. There is the question of the setting up of the infrastructure used to count the population (institutional innovation), related to the creation of the material means for domination of the nation-state, including the alliances established between the elites and the territorial pacts that promote the physical extension of central power. With respect to the cognitive organization, historical research can investigate decision-making processes about the emergence or abandonment of statistical series[3], the adoption of one technological platform or another, one *corpus* of concepts or another, which effectively constitutes a historical study about the politics of information.

Borrowing the words of Alain Desrosières (1996, p.6; emphasis in the original; free translation from this edition),

> the joint development of the role of the State and its more material cognitive technologies provides a lightning rod for reading the history of statistics. And it is here that we find, for example, a crucial distinction between the activities of the State that deal with *singular* cases (tribunals, for example) and those that organize *general* policies, which are valid for society as a whole.

In all of the instances cited above, one sees the overriding intimacy of statistics and the statisticians – who ponder and formulate the statistics – with the nation-states and the sciences. And it is this intimacy that we will be dealing with henceforth.[4]

Statistics and political technologies

Statistics have been prized ever since the first great States were formed in ancient times. Censuses long ago proved to be a valuable instrument for administration, helping the State get to know its territory and its population. In this day and age, technical resources involving averages and sampling can appear excessively simple to those of us now familiar with more complex forms of measurement. Military conscription, the marshalling of a country's warriors, proved to be one of the more immediate uses of censuses, although undoubtedly they were not easy to conduct. This is especially true when we think back to societies such as the Greeks and Romans, for whom war was an endemic phenomenon, where the social mobilization required to 'make war' accounted for the bulk of the productive lives of its citizens.

It was necessary for the state monopolies of a military and tax order to advance, at the dawning of the Modern Age, in order for population surveys to grow in importance in the administrative structure. A pedagogic role was served by statistics, largely due to their

detailed descriptions of a given territory and its subjects, primarily aimed at educating and guiding the absolute sovereign. Between the sixteenth and eighteenth centuries, statistics assumed the role of 'mirrors for princes,' showing them the extent of their greatness in the shape of their kingdom – the metaphoric extension of their bodies (Desrosières, 1998, p.26). Quantified and periodic information reserved for the administrators were added to the descriptive scenarios. At the end of the day, statistics were the basis for the fiscal control of mercantile policies. It was believed that the wealth of the world was limited and expressed in favorable trade balances. Economic and financial activities should be totally subservient to the State, seeking to increase its power under the sovereignty of the king. Any improvement in the life of the subjects was only seen in secondary terms, as it was accepted that monarchs had the power of life and death over their subjects. In a world that was extending through imperial colonization, it was essential to ensure that revenues grew by creating and applying taxes. More than anything else, the figures relating to subjects expressed the power and wealth of a nation-state, giving prestige to the sovereigns of countries and elevating their position vis-à-vis rival monarchs.

As a direct result of this, the population censuses continued, even advancing in terms of what details they provided and in the innovatory use of various others, including customs records of imports and exports, used largely for the purposes of taxation. Registration of births, marriages and deaths was then added, separate from religious records. Armed with civil lists, the States began to affirm the civil condition of their subjects, signifying that only they could confirm a person's status, irrespective of the religion they adopted (Senra, 2005, p.59).

It is undeniable that the relationship between the centralization of administration in nation-states grew along with the desire for statistics. However, for a patrimonialist State, in which goods and people are administered privately, as dependents of a sovereign lord, statistics were seen as the monarch's prerogative and, as such, a state secret. No information was passed to civil society separate from the State, and even less attention paid to autonomous public opinion. Within this administrative scenario, it is assumed that statistics not only revealed the powers but also the weaknesses of the States. Externally, the more that was kept hidden from the enemy the better, and this is achieved by keeping statistics confidential. As far as the internal plan was concerned, statistics remained a material instrument of state power and vigilance. They were placed in the dimension of the coercive relationship between the sovereigns and their subjects. This is therefore far removed from the contemporary sense of statistics, characterized by an environment of cooperation between citizens and their representatives, by the principle of credibility in carrying out census polls promoted by policies related to the publicity of information and ensuring the anonymity of the informants providing the information.

Locating the historical origins of this profound change requires scrutiny of the development of a 'statistical reason' in the wake of a 'modernity reason.' We understand this last factor as the advent an acute historical conscience, through which mankind recognized itself as an externality in relation to the dominance of nature, which signifies the loss of hegemony of metaphysical ideologies and the transformation of the spatial-temporal conditions into a kind of blank page. As stated by Michel de Certeau (1996,

p.225), "a cut is made in the traditional cosmos, where the subject is possessed by the voices of the world. An autonomous surface is placed under the gaze of the subjects, which gives them a means to do something of their own making," and on which they circumscribe a space for their own distinct production, by which they can implement their will and action. The author goes on to affirm that the "this very revolution, this 'modern' idea, represents the draft project at the level of society as a whole, and one that has the ambition to *see itself legibly formed* on a blank page in relation to the past, to write for itself with its own system, and to *remake history* using a model made by them (this being 'progress')" (p.226-227; emphasis in the original; free translation from this edition).

In fact, the experience of a political revolution, such as the French revolution, appears to have entirely restructured the attitude of western humanity. The rupture of modernity with the 'traditional cosmos' had no precedent. In defense of this idea, it is worth citing the historian Ciro Flamarion Cardoso (quoted in Moraes, Rego, 2002, p.232):

> a recent (approximately six thousand-year-old), stable universe in which humanity is considered as an inhabitant at the center of this universe, created separately by God and placed above other living beings on the planet, organizing itself immutably, has been giving way, since the seventeenth century, to a different universe, as well as a more diverse perception of human beings. The contemporary social and political revolutions – from the French in 1789, to those in 1830 and 1848, with their extremely varied trajectories depending on the case – show that, when victorious, human societies are mutable in nature.

The embryo of this rationale has perhaps already been seen in what has conventionally been called the 'reason of State' since the seventeenth century. Michel Foucault (2006) was one of the first to relate the evocation of this reason with the reinvention of the notion of government, based on the external perception of the political phenomenon: "the doctrine of the reason for State tried to define how the principles and methods of state governments differed, for example, the way in which God commonly governed the world, the father his family, or a superior his community" (p.373; free translation from this edition). At this time a distinct rationale appeared about the art of governing the States, separate from the sphere of nature, respect for general world order, Christian and judicial traditions, with the intention of ensuring a profoundly fair and just government. The contractualist philosophers, such as Thomas Hobbes and John Locke, who sought the ethical and political origins of the State in the notion of a social contract, can be considered the precursors of this doctrine. Thus the exercising of power was depersonalized. Unlike Machiavelli, who was concerned with defining what maintained or reinforced the ties between the Prince and State, and not with the very existence or nature of the latter. Machiavelli was also concerned with the exercise of the sovereign's power over his territory; and did not see the endless resources for the production of wealth in the movements of the population.

In these terms, the need to increase the power of the State and to know its strength, resisting the encroachments of any others, created an entirely new normative reality:

> government therefore entails more than just implementing general principles of reason, wisdom, and prudence. Knowledge is necessary; concrete, precise, and measured knowledge

> as to the state's strength. The art of governing, characteristic of reason of state, is intimately bound up with the development of what was then called either political *statistics*, or *arithmetic*; that is, the knowledge of different states' respective forces. Such knowledge was indispensable for correct government (Foucault, 2006, p.376; emphasis in the original; free translation from this edition).

In the previous passage, Foucault refers to two distinct traditions: the German *statistik*, conceived literally as the 'science of the State,' and English political arithmetic, which developed between the seventeenth and eighteenth centuries. Both had something in common – the regaining of a specific domain for operation of the State, endowed with its own intelligibility, and dedicated to increasing its power and visibility in the international community. Since the outset, the Germanic tradition made every effort to show a synthetic understanding of social activities and human groupings. This tradition's focal point was the study of the communities in states, regions, cities or professions, taken as a whole, although endowed with specific powers, and only described by a combination of numerous aspects: climate, natural resources, economic organization, population, laws and customs. Gottfried Achenwall (1719-1772) has been credited as the person who coined the term *statistik*, and is its major exponent. With strongly descriptive characteristics, it was not initially involved with the collection and analysis of numbers any more than history or geography. Its task was to describe, while the use of the summarized numeric tabulations was at the convenience of their idealizer, as the case required. It is not difficult to predict that, given the low operational level of these contributions, their authors developed a solid academic formation, albeit without achieving any real practical application.

We should not underestimate the argumentative strength of statistics as a discourse about the truth, capable of capping controversy with reason, which had already been perceived by these men. If statistics currently remove some of the legitimacy of their official statute, in the moments that followed their invention they become indispensable for the founding of the State's domination. In the second half of the seventeenth century, the English political arithmeticians were already certain about the situation, and this is the reason for the term 'political' used in the expression 'arithmetic.'[5] By applying arithmetic operations to the use of administrative records (particularly the civil registers – birth, marriage and death), Doctor William Petty (1623-1687) was maybe unaware that he was founding the calculation of statistics, a term that, as already seen, would only be coined several decades later, by Achenwall. But he was already aware of the value of numbers in official discourses, which he considered indispensable to the art of governing. In his book *Political Arithmetick*, only published in 1690, he speaks of the creation of a method that was specific to the compilation of statistics. Unfortunately, primarily concerned with the task of counseling the King, he symptomatically valued the political ends rather than explaining the means, or the actual method itself.[6]

Even more surprising was the warning he gave the King that the funds spent on combating diseases would reap a greater reward than the most profitable investments, as it would save part of the large amount expended in the form of human lives that would perish, if abandoned to diseases (Porter, 1986, p.19). With the aim of calculating the number of subjects, which determined the extent of the power of the State, men like Petty,

the businessman John Graunt (1620-1674) and official Davenant (1656-1714) created maxims of ethical virtue founded with the purpose of maximizing the population. As 'apostles of procreation,' they condemned the consumption of alcohol, gaming, prostitution, urban life, sacerdotal celibacy and even war, which could be avoided by removing the obstacles to natural demographic growth (p.19-20). It is easy to see the difference between them and the German statisticians. They were not academic theorists setting up charts and logical descriptions of the State in general, but men from diverse backgrounds and educations, who had accumulated a given practical knowledge during the course of their normal activities, and were keen to offer it to the government. They were the first to adopt mathematics as an indirect method of estimating population growth based on the regularities observed in vital statistics. They delivered a decisive blow on religious concepts about death, until then seen as the fruit of fortune or divine castigation, by conceiving the phenomenon as one that can potentially be known and measured by universal laws.

According to Alain Desrosières (1998, p.23), the administrative use of the written records, their classification in published material at the time, and their interpretation in terms of "numbers, weights and measures" led to political arithmetic representing the source of material procedures of objectification. The accumulation of written biographic traits of individuals makes statistical aggregation feasible, which is a way of thinking about the collective based on the individual and on the basis of same. And it is here we find the limits of statistical activity, in the scenario of an absolute monarchy. The social differentiation in the hierarchical structure of the Old Regime encountered even more severe restrictions on the general principle that subjects can be freely manipulated according to the will of the sovereign. In no case whatsoever were individuals treated as individuals or autonomous persons, and always as members of orders and states. The foundation of statistics – comparative equivalence – could not be considered as a premise for measurement, whereas the notions of personality and universality failed to displace the naturalized differences founded on privileges and corporations. Although political arithmetic and the German tradition were already, each in their own way, "an answer for the Modern States in operational terms, of the ambition for knowledge inseparable from the desire for manipulation of men" (Furet, Ozouf, 1977, p.360; free translation), the constitution of 'social mechanics,' in which the individuals are treated as comparable and interchangeable units, defined by what identical traits they have in behavioral and role-playing terms, would only be possible after the French Revolution, in the context of the more liberal revolutions of 1830 and 1848.

In any event, the 'consequences of modernity' have a much wider reach and have been felt since the seventeenth century. This is the case, for example, of the changes in political technology that took place in the eighteenth century, which led to overriding the model of family management as ideal for good government. It is when the notion of population was conceived and understood as a fundamental resource of State Power, the movements and composition of which should be known and controlled by specific areas of knowledge, by sciences of the State. The rationalization of the exercise of power as a general practice of the government is defined by Michel Foucault (2000) as 'governmentality' and, according to the author, deals with

> the ensemble formed by the institutions, procedures, analyses and reflections, the calculations and tactics that allow the exercise of this very specific albeit complex form of power, which has as its target population, as its principal form of knowledge political economy, and as its essential technical means apparatuses of security ... resulting, on the one hand, in formation of a whole series of specific governmental apparatuses, and, on the other, in the development of a whole complex of *savoirs* (p.291-292; free translation from this edition).

If the biggest challenge of the statesperson becomes governing the economy (and from there the great success known as political economics), statistics are vital, given that they 'construct' the public spaces that statespersons should know and upon which they can act:

> statistics will gradually reveal that the population has its own regularities, its own rates of deaths and diseases, its cycles of scarcity and so on; statistics shows also that the domain of population involves a range of intrinsic, aggregate effects, phenomena that are irreducible to those of the family, such as epidemic, endemic levels of mortality, ascending spirals of labor and wealth. Finally, it shows that, through its shifts, customs, activities, and so on, population has specific economic effects (Foucault, 2000, p.288; free translation from this edition).

Despite the previous innovations, it was only from the nineteenth century onwards that population censuses began to register and count at an individual level, no longer solely referenced to households as a minimum unit in terms of numbers, which took place *pari passu* with the publicity and wider release of information. Even more significant is the separation of the statistical agencies from the institutions responsible for charging taxes and executing the law, freeing up these areas from their former role of vigilance. The Bureau Statistique de la Republique was created in Napoleonic France in 1800. Endowed with institutional and administrative autonomy, this was the first official space designed exclusively for statistics, an indispensible condition for the development of research methodologies and techniques, until then much heralded – as by Petty – but very ineffective.

Statistics and scientific concepts: brief considerations

Reared in this new environment, Adolphe Quetelet (1796-1874), a mathematician and keen astronomer, was to become one of the founding fathers of statistics, particularly if we consider the legacy he left for the formalization of the social sciences. His intellectual activity was first noticed in the effervescent 1830s, in which people lived, more than ever, with the revolutionary uncertainties of a mutating society. The climate of insecurity led the young Quetelet to dedicate himself to statistics, seeking in them a science of stability and predictability. He was the first to see veritable scientific laws in numeric regularities, well beyond the simple revelation of objective facts. Anticipating Comte, he coined and consecrated the expression "*la physique sociale*" – the title of his greatest work – to designate statistics. It only remained for the precursor of positivism to baptize the study of the mechanics of the social relations of sociology. Quetelet defended the adoption of a single method for all sciences. Combining the administrative vocation of statistics with the techniques of astronomers and mathematicians, he effectively questioned the competence

of social reformers (physicians and health workers) in the area. The astronomer's love of natural order would prove to be the foundation of statistical science.

Prior to the nineteenth century, statistical regularities such as the ratio between the births of men and women and the uniformity of murders, robberies and suicides were explained in natural and theological terms, indicating divine will and expressing the general order of the world. Quetelet proposed an alternative interpretation, based on a cosmology that turned regularity into a natural process in all domains. In the words of Theodore Porter (1986, p.51-52), "Quetelet interpreted the regularity of crime as proof that statistical laws may be true when applied to groups even though they are false in relation to any particular individual. Beyond that, he implied that the obliteration of the particular by the general was responsible for the very preservation of society." Based on this rationale, society became independent from the idiosyncrasies of its constituent individuals. He announced the "law of large numbers," in which he advocated that the great social phenomena are produced by general causes, given that happenstance and/or accidents cannot have an influence on facts considered collectively. He created the notion of the average man, an abstract human being, defined by the average of all human attributes in a given country, considered a 'national type,' and thus representative of a given society. Any deviations were annulled by the resulting average. The responsibility for crimes and deviations could then be distributed within the community in question as a whole. His major objective was to measure the changes experienced by his 'average man' over the course of time, to reveal the general law of development, discovering the forces that act on a social body to predict its future course (p.54).

Quetelet's contribution to history and sociology was immense. It is worth stopping to examine his contribution more closely, as one of the objectives here is to reveal the richness of the relationship between statisticians and the sciences, in the very constitution of their knowledge and practice. The historian Henry Thomas Buckle, for example, in his work entitled *The history of civilization in England*, denounced the importance of corporate institutions on historiography, such as the State and nobility, and even religious entities such as the Church, consecrating the relationship between science and society instead. Avoiding the presentation of history as chronicles of Kings and battles, Buckle was one of the first – and among the most vociferous – opponents of traditional political history. The substance of history does not lie in politics but in society, in the gradual and continuous diffusion of knowledge. An incorrigible enthusiast for material progress, Buckle empathized with the liberalism in England in the 1850s. The fact is that the regularities of statistical science prove to the historian that there are no exceptions to the natural order of the universe, and that it applies to a series of social phenomena (Porter, 1986, p.63). The deviation is reduced to the minimum; the freedom and will of the individuals are denied when they are considered collectively.

A similar influence can be seen in Karl Marx and in Émile Durkheim. The former used the theory of Quetelet's average man to define a uniform and universal category of work and to interpret the theory of the value of work. Durkheim's study on suicide also pays tribute to the master of statistics, as well as his notion of social fact, an objective phenomenon and with its own regularities, isolated from the world of nature. This is the

sense of his assertions: "social force does not determine one individual rather than another, but only exacts a definite number of certain kinds of actions." And also "any phenomenon composed of numerous independent events could be expected to exhibit impressive regularity in the mass" (Durkheim, cited in Porter, 1986, p.70). As once written by the historian Peter Gay (1995, p.461; free translation from this edition),

> decades before Durkheim, Quetelet merged bibliography into sociology. After the social physicist had gathered sufficiently solid information, it would be possible to show the probability of an 'individual choice' between embracing a life of crime and committing suicide, between becoming an alcoholic and remaining abstemious. But this determinism, protested Quetelet, slightly on the defensive, did not make him a fatalist. The type of collective knowledge that he wished to propagate expanded rather than reduced the sphere of freedom of the human soul.

In the incessant fight for the recognition of the scientific status of history and sociology, at a time in which the paradigm of the natural sciences was predominant, authors such as Marx and Durkheim did not hesitate to have recourse to Quetelet's postulates of social physics. They built the methodologies of their arguments on the basis of borrowing statistics, which was then a social science par excellence.

Besides the obvious appropriation, there was a fundamental structural transformation, albeit more diffuse and subtle and more obscure to our perception. After Quetelet's formulations and those of the institutional organization of the activity, which we will visit in the next section, statistics became the forerunner in terms of the conceptual classification of social experience. The consecration of probabilism by statistics raised the demand for its use significantly; largely due to its capacity to predict and intervene in the movements and composition of society. Since the second half of the nineteenth century, the pleasures, vices, violence and, more recently, more intimate questions, such as sex, sleep, friendship and even public fears, have been unremittingly tabulated.

As an instrument of government, statistics gave technical foundations to the politics of normalization and individualization of the deviant elements. In terms of regulating the population, or the "power over life" (an expression used by Michel Foucault), they favor interventions that targeted the social body, a political anatomy focused on the body, biological processes: propagation, births and deaths, state of health, life expectation and longevity. In contemporary capitalist society, statistics adjust the spatial distribution of individuals to capital accumulation, they articulate the growth of groups to the expansion of productive forces and to the differential division of profits. Statistics also compartmentalize and create a hierarchy of space in which individuals can be isolated, easily accessed and located.

In the areas of normalization/individualization, statistics underpin the positions of the subject. Within the categories, the individuals see themselves vis-à-vis others, no longer in their individualities, but in their individualizations. In this way, statistics singularly express the subtlety with which power is exercised, as they do so in the order of the symbolic, to the extent they construct a homogeneous conception (a truth) on matters that they enumerate and announce, which makes it possible to reach an agreement between the intelligences. The regularities become perceived in terms of their connections with

deviant modes of conduct: suicide, crime, prostitution, madness and disease were some of the phenomena that then began to be codified and measured, fed by the notion of increasing control over the deviant population, based on their enumeration and classification (Hacking, 1990, p.3).

The strength of these codifications lies in the realism of the aggregations, through which the conventional becomes real. This is the basis of the individualizing power of statistics. It is present in the appreciation of individuals in general about questions such as race, religion, health, inflation, income, unemployment, poverty, among many others referenced by statistics, which thus provide the terms for public debate about all the related problems. They foment the descriptions of economic situations, denunciations of social injustice, justifications for political actions, and the organization of interest groups. In this way, they foster real debate, which serves as input for decision-making by different agents (academia, governments, social groups, international organisms, etc.), interfering in the spatial distribution of both public and private resources, a fact that has resulted in an impasse about exactly what should be studied and the appropriate methodology to be used. As benchmarks, the definitions and criteria that govern the classifications can be discussed and contested, but they themselves and their objectives remain indisputable. This is the realism of the aggregations.

This first-order reality, which organizes the conceptual classification of social experience, also pervades all the scientific production, thereby serving as a true table of reference. Since the middle of the nineteenth century, and on an ever-increasing basis, the construction of scientific concepts has been based on interpretations arising from analysis of the categories of classification of the activities and social groups, as we can see in the astute comments made by Ian Hacking (1990, p.3): "Marx read the minutiae of official statistics, the reports from the factory inspectorate and the like. One can ask: who had more effect on class consciousness, Marx or the authors of the official reports which created the classifications into which people came to recognize themselves?" If, as Buckle advocated, the substance of history lies in the gradual growth of production and the diffusion of knowledge, historiography should not overlook the analysis of procedures for objectifying statistics. We will record this warning to the historians of the science, and even to those who study reading practices.

For all the above reasons, figures, tables, charts and classifications are accepted as the reality of the situation they describe, which is indispensible for discussions about the truth they sustain, including the construction of scientific concepts. Thanks to the stable language and broad recognition of statistics, reality and convention become confused. Reality is consecrated by the strength of social representation, which imposes itself as the fundamental problem to be investigated by researchers. It is present in the academic discussions of statistics, as well as in the discourses of official statistical bodies towards different social actors. These seek to reduce the conventional fundamentals of their production as much as possible, given that the 'realism of the aggregates' is the source that legitimates the activities of official statistical bodies, besides establishing agreement between the individual intelligences, thereby stabilizing social interactions.[7]

We reach an impasse here, as stated by Alain Desrosières (1998, p.12; emphasis in the original):

> on the one hand, they [statisticians] will specify that the measurement *depends on conventions* concerning the definition of the objects and encoding procedures. But on the other hand, they will add that their measurement *reflects a reality*. The paradox is that although these two statements are incompatible, it is nonetheless impossible to give a different answer.

It is up to the analyst to think of the objects of statistics simultaneously as they really exist, as well as in their conventional character, a position in which the reality of the object is a methodological attitude: "the concurrence of these interpretations [realist and nominalist] allows us to outline a connecting space between the technical languages and their uses in the social debate. In doing so, statistical reasoning can be reintegrated into a reflexive scientific culture" (Desrosières, 1998, p.2).

Following the guidelines proposed by Desrosières, we defend the position that statistics are thus lodged within a fundamental duality, which is constitutive in nature. It seems to me that this is because it is found throughout its production circuit, in the conceptual, associative and procedural aspects. Returning to the beginning of this article, we see this perspective as a result of the dual insertion of the statistical activity in the socio-political sphere – which underpins and adjusts the statistical program – and in the techno-scientific domain, which formalizes the stability of its language and references. The next section may help to clarify my take on this.

The institutional organization of the statistical activity

The cognitive duality that we have dealt with was already evident at the precise moment that the Bureau Statistique de la Republique was created in Paris in 1800. To know the departments and their municipalities was the imperative that befell the Bureau. In light of the formation of the republican State, statistics had to represent the nation in electoral terms, and no longer reduce the country and demographics to 'mirrors for princes.' This was the horizon that justified the creation of the Bureau, as well as its stability and relative institutional independence. We can imagine that its directors, *avant la lettre* statisticians, sought to dedicate themselves to their activity, with almost everything still needing to be done, identifying and affirming themselves with it.

Two radically opposed strategies emerged in this process, assumed by Peuchet, the director given the task of running the Bureau between 1800 and 1805, and Duvillard, who replaced him in 1806. While the former encouraged written descriptions that made narratives and memorizations easier, criticizing the reductionist nature of tabulations, the latter appreciated numeric precision and its laws, as represented in equations. Duvillard thought that the information sent by the departments and municipalities would only be rigorous if their administrations preserved the registers, as a prototype of the codification procedures. They mutually disapproved of each other, one disqualifying the premise of the other: "dry tables" and "hermetic calculations" rivaled with "seductive polish of an elegant style" (Desrosières, 1998, p.35-40).

The controversy itself already served as a way of provoking cultivated minds, drawing attention to the importance and the need for statistics. By inviting a mere fraction of the intellectual elite to take part in the debate, choosing between argumentative strength and numeric precision, these men sought to highlight their function. However, maybe unwittingly, they fomented an area of discussion and analysis from which would emerge, years later, Adolphe Quetelet, among other notable academics. The accusations that Peuchet and Duvillard exchanged in the Bureau's memorandums and reports are the first official record of the underlying tension in statistical activity.

In defense of the descriptive and didactic tables, the adoption of a more accessible and literary language, as practiced by Peuchet, can be associated with the administrative role of statistical activity as an instrument for government. Translating languages and communicating realities to members of government is an indispensable task in the formulation of public policies. One should not lose sight of the fact that the legitimacy of statistics lies in their official nature. In the microcosm of Peuchet's actions, we see the fight for visibility, always based on *ex ante* demand from the State in terms of the socio-political dimension of statistics.

Duvillard took the diametrically opposite stance. He stressed the technical component and the professionalism involved in the production and interpretation of results. In other words, he was concerned with the formalization of the activity, having recourse to the scientific parameters of his time to endow statistics with a stable language. And this was the core of the relationship that was established between the registers and the procedures necessary for codification.

Peuchet and Duvillard had sundry followers, both in France and around the world. There were their compulsory disciples, who did not even know their names, but who acted within the constraints of this fundamental duality in statistical activity. Their emphasis lay either on the conventional character of statistical knowledge, seen in the need to communicate/translate realities for the political-pragmatic field, or was based on the 'realism of the aggregates,' when the priority is the formalization of their techno-scientific space. It is true that the opposition between the parties was considerably assuaged, which even accelerated the process of institutionalization of this area of knowledge. Once again, we can quote the lucid words penned by Alain Desrosières (1998, p.39-40):

> In the course of time, the expression of these two modes of discourse became more refined, and the opposition between then become less brutal than that between Peuchet and Duvillard. However, this basic tension is inherent in the very nature of the bureau of administrative statistics, the credibility of which depends both on their visibility and on their technical aspects. The way in which this dual requirement is approached and retransformed according to the era or the country involved is a major topic in the history of these bureaus.

We will find a similar duality in the context of international statistical congresses during the second half of the nineteenth century. A significant moment in the process of institutionalization of the activity, the structure of these events was idealized by Quetelet, and he was the principal organizing agent in this arena. The first congress was held in Brussels in 1853, and the president of the central committee of statistics in Belgium was

Quetelet himself, the great pioneer. In the minutes of his final report, we read:

> The intended objective of organizing this Congress was specifically to promote the unification of official statistics that the governments published, providing comparable results. Specific works will be much easier when the general premises, uniform nomenclatures and tables are established, associated and adopted in different countries,: a type of universal language, simplifying the works, attributing them with more importance and solidity.
>
> To provide unity to the official works, it is necessary to relate them to a common base; it is necessary that the key employees, given the responsibility of presenting the different segments of general statistics, can see and understand this together, accepting the same divisions, adopting, after detailed examination, the same names and numbers to represent the same objects, thus not leaving any gap in the general tables and, on the other hand, avoiding duplicities. The safest means of attaining the desired unit appears to be the creation, in each State, of a central committee of statistics, or a similar institution, made up of representatives from the main public administrations, together with people who, as a result of their studies and specific knowledge, can enlighten the practice and resolve the essentially scientific difficulties.
>
> ... it is also desirable, on the other hand, that the central institutions in different countries actually relate to each other, thus stimulating the exchange of the publications and models of tables used to draw up documents, classify and summarize them (Rapport..., 1983, p.4; free translation).

Of particular note in this lengthy quotation is the attempt to organize, consolidate and broaden the international scientific community centered on statistical activities. The main effort was concentrated on establishing the normative (conceptual and operational) fundamentals that should govern them, unifying numbers, nomenclatures and tables in the representation of the objects in question. Quetelet and his consorts were, then, aware of the need to stabilize the language of statistics to support another central objective of the congresses: create equivalences that allowed for the comparison between the activities and the wealth of nations. It is worth noting that a central organization was mooted to provide unity to the committees in each country, each of which held administrative registers and records. This was a way of thinking about some form of unity in the development of instruments of coordination (Senra, 2005, p.83). Among the inflection points of these congresses was the formation of the science per se. Special attention was paid to professional qualification, which included the basic knowledge that should be included in the curriculum of any such 'specialist.'

The desire was to stimulate the development of national committees, offering them technical support and a prestigious affiliation. However, to achieve this, it was necessary to comply with another fundamental objective of the congresses: that of winning over the governments of nation-states, convincing them that it would be advantageous to grant autonomy to their statistics committees (create, where necessary) and lavish hefty sums from the public treasury upon them. This intimacy with the politics of State weighed heavily in the deliberations during these congresses. It was expressly recommended that the national committees were made up of "representatives of the main public administrations," which meant gathering prominent politicians to work alongside the intellectuals versed in statistical matters. Furthermore, various representatives of national

governments turned up at the congresses, which gave an official stamp to the discussions. As a result, the problem of political feasibility appeared as both a horizon and obstacle to the success of the congresses. The duration of these events was short, ending after nine meetings, in Budapest in 1876, two years after the death of its founder, Adolphe Quetelet. The diagnosis of Nelson Senra (2005, p.86; emphasis in the original) is revealing:

> The fact is that the *Congresses of Statistics* never managed to provide a solution to the controversy surrounding representation. The intention was that representation at the congresses should be public and official, and this was precisely the source of the controversy. Thus, to what extent did the participants effectively represent their countries? To what degree could they deliberate and make unequivocal commitments? To what extent, on returning to their home countries, with briefcases full of resolutions, could they implement them successfully? Not to mince words – none whatsoever! The representations, albeit official, were fragile, occasional, bureaucratic, commonly ignoring the daily basis of the statistical compilations, which thus reduced the application of the resolutions. Furthermore, as they were traditionally generic resolutions, even reaching a consensus made any practical applications difficult.

Once again we are faced with the duality of a necessity. With the congresses, the technical formalization of the activity of statistics became more sophisticated, attaining new heights. This was the case with standardized codifications, disciplinary methodology, professional qualifications, developments in terms of the formal associations and the diffusion of knowledge. At the same time, the congresses served as the embryo for a world organism, capable of dealing directly with national governments. However, the political visibility inherent to the representation of the national committees and official delegations was simply not sufficient to implement most of the advances and conquests made by the scientific community. This ended up proving to be yet another example of the tense and dynamic relationship between the socio-political translation/reception of public statistics and the technical formalization of this disciplinary field.

We now move on to a closer analysis of the theoretical and procedural intimacy of statistical institutes, in line with their techno-scientific profile. According to Bruno Latour, these entities are 'calculation centers.' They bring distant and/or absent realities closer to the State, thereby allowing them to be considered and making them potentially governable. They thus constitute government technologies, implemented by means of actions taken at a distance. They construct social collectives, which are useful as far as regulations are concerned, as they make the requisite figures available in tables, graphs and charts on the tables of the decision-makers.

This production takes place in the sphere of supply to nation-states, or "*ex post* demand", in the expression of Nelson Senra. This is a dimension that does not reveal per se the technical and operational complexity of the network in which the statistical knowledge is produced. To analyze this, it is necessary to get to the core of the calculation center. Before anything else, there is a cycle of accumulation of inscriptions, thanks to which a convivial relationship is established between two places: the first being a center (the coordinating agencies) acting from a distance over the many other peripheral points (the survey and research zones). This operation hinges on the portability and stability of transmission of

inscriptions (the forms distributed to the field agents), in such a way that it is possible to 'bring them back' such that the new envoys can accumulate new inscriptions. In this way technology at a distance is achieved about events, people and places, based on three conditions: the calculation center can do this "by inventing the means that (a) render them *mobile* so that they can be brought back; (b) keep them *stable* so that they can be moved back and forth without additional corruption, distortion or decay; and (c) are *combinable,* so that whatever stuff they are made of, that they can be cumulated, aggregated or shuffled like a pack of cards" (Latour, 2000a, p.362; emphasis in the original; free translation from this edition).

The dynamic relationship between the centers and their peripheries constitutes what Latour (2000a) called "immutable and combinable mobiles." These are scientific procedures of objectification, such as templates, totalizations, lists, graphs and tables, which allow for the complementary treatment of inscriptions by calculation centers. In this context, statistics are particularly effective for broadening the reach of inscriptions, when they refer to averages, and control over their dispersion after the invention of variance and sampling (p.385-386). This cycle of the capitalization of inscriptions transforms them into information that can be manipulated for governments, while serving as stable references for society and analytical means for researchers.

Once the statistical program has been carried out, the complexity of the cycles of accumulation/capitalization submerge into the networks that use them, and which are formed by institutions, instruments, equipment and people, including scientists (economists, demographers, anthropologists and sociologists), as well as a bureaucracy ramified in the states and municipalities, supervisors and field agents, collectors of various types, as well as the informants themselves. In the eyes of the main users of statistics – governments, social organizations, academia – the complexity of the scientific network disappears. This fact is undoubtedly corroborated by the widely recognized argument regarding the techno-scientific autonomy of the statistical institutions.

This once again falls into a constitutive duality, because the scientific space of statistics is indispensable to meeting demand, which, in turn, guides the statistical program. It guarantees the credibility of its products and stabilizes the references of a series of social interactions. However, this argument favors the recurring illusion that these institutions are sufficiently distant, when not isolated, from the political and scientific networks, which, in fact, pervade their own systems of production. This is a dangerous representation, shared by most of those involved in compiling and using public statistics.

Let us look at a quite special example: the so-called postulate of the delegate viewpoint. This principle proposes that the actions of the collection network are standardized by the calculation center at the time of the survey's conception. The uniform procedures acquired in personnel training by field agents, together with the normative body of information in the agents' instruction manuals are considered the sole benchmark. Any possibility of interaction with the interviewees is formally denied, bearing in mind the possible corruption of the conceptual framework that gave rise to the forms. In short, the determination of the interview situation is a foreseen and implemented aspect.

Given that the inscriptions should be mobile, stable and combinable, the delegate viewpoint serves statistical research well, as it allows for the expropriation of the relativism of its observers. The central agencies need to transcend the perspectivism of observation and emerge as the sole privileged observer. This is the opinion of Latour (2000b, p.39; free translation from this edition): "it is precisely because delegated observers from afar lose their privilege – the relativism – which allows the central observer to elaborate his panopticon – the relativity – and be present everywhere at the same time where it does not actually reside." All the positions of the subject and all those of the object, which benefit the stable transport of information by the vector institution, are equivalent. From the relativism of the observers we move to the relativity of the calculation centers, which is a condition for the mobility and immutability of the inscriptions.

The equivalence between the positions emerges as basic support for relativity. However, the basic principle of the delegate viewpoint should not obscure the perception of the information networks in which the production of statistics is inserted. Neither should it obscure the recognition of distances between the levels in the production chain, from the specialized bureaucracy of the calculation centers though to the collection networks. After all, recognizing the distances is already a step towards minimizing them. And here we agree with Jean Peneff (1988, p.534):

> On one hand, there is the bureaucratic control and oversight of routinized office work; on the other, almost total autonomy or the workers in the field. This separation is aggravated by the absence of relationships and exchanges or information about the nature of the work between the two levels. The head ignores the field and continue to believe in the effectiveness and importance of standardization because it cannot appreciate the practical realities of the work the interviewers do in the field. If it did begin to understand this latter work, the whole organization and its hierarchy would be brought into question.

Offsetting the distances between the spheres of production assumes taking social interactions into account and, therefore, the different levels of approximation to the object of the interview, which vary according to the situations encountered. There are empathies, but there are also dissimulated – and not always that well disguised – antipathies as it is always a game of approximation that is in question (Álvaro, 2006, p.4). This results in the paradox of the social relationship of the interview, by demanding, on the one hand, that the interviewers remain sufficiently distant from the interviewees so as not to lose their objectivity; on the other hand, they have to get sufficiently close to the interviewees to gain their confidence. It is, therefore, important to integrate the procedural dimension of the collection network in the frame of reference of the surveys. This means acknowledging the symbolic interactions, the negotiations, the strategies of presentation used by the researchers, the adaptations of practices, procedures and even the questionnaires to the interview situations, which are always exchangeable.

In this respect, we find a fundamental contribution that the sociology of science can provide for public statistics. By investigating the different actors that take part in its production, the complex translations, changes in meaning, interpretations and relevant responsibilities that have their place, the sociological focus shows to the generating organisms and its costumers the limitations and implicit choices present in all statistical

procedures, insisting that it is impossible to offer technical solutions to conflicts of interest that cannot be accommodated (Schwartzman, 2004, p.98).

On the other hand, there is the serious risk that this approach is interpreted as a lack of competence in these official spaces, as a need to reinforce the technical and normative fundamentals. These are the same ones that silence the uncertainties and tensions in the scientific process of the activity. One must be aware that before being constituted as research centers, these agencies were planning entities, operating in accordance with the country's political and administrative structure. This is the reason why they are so zealous to maintain the integrity of their stability at all costs, avoiding all debates and controversies, including those of an academic nature. This is why it is imperative that one implements and strengthens a permanent environment of sociological and historical contemplation in these institutes, geared to the analysis of knowledge and the practice of statistical activity. By revealing the intimacy, the semantic (process of construction) and syntactical (result of the construction) aspects make it possible to suppress the incongruities and translate the academic language of change into an effective gain in terms of legitimacy, without detriment to the indispensable credibility.

Conclusion: the space of historical research

We thus view our hypothesis about the three levels at which the duality of statistical activity operates, each in a separate case study. The cognitive aspect reveals the emphasis, by the producers, that their surveys reflect the reality, particularly at the moment of capitalization of information when they release the results to the press, at a time of *ex-post* demand.

The associative plan can be interesting by showing the value of argumentation, representation and the political imbrications in the molding of the great international statistical organisms (International Statistical Institute – ISI; Inter-American Statistical Institute – Iasi; Food and Agriculture Organization of the United Nations – FAO; International Labour Organization – ILO; United Nations Educational, Scientific and Cultural Organization – Unesco), in their close relationships with the different States. This is a particularly important level for analyzing the process of institutionalization of the activity, given the fact that the tensions and negotiations about the implementation of resolutions and advances in the disciplinary field are more evident here.

The procedural duality is the most sensitive of all, as it deals with the hidden face, or that which prefers to remain hidden, of the official bodies working with public statistics. It relates to the cognitive dimension, in that they both express the defense of techno-scientific autonomy, which is necessary for the stabilization of social interaction. In this respect, the main points are the inner workings of the production process, choices and decisions, such as the preference for given questions in the survey, to the detriment of others. By taking this route, we arrive at Bruno Latour's "laboratory of life", where the "hard facts" are constructed, involving men, machinery, experiences, papers and strategies. It is the *locus* of the irrefutable freedom of statistical activity. For this very reason, it is the environment in which the sociological and historical analyses can first bear fruit, helping

the statistical institutions to fulfill their mission. By recognizing the interdependence of the social instances, the institutes can better meet the demands and diversify supply, thus enhancing their technical autonomy.[8]

For this purpose, it is important to reveal the methodologies, the tensions surrounding the technical conceptions, the external relationships of the statistics institutions, the symbolic disputes within the community of researchers, which characterize the plane of discovery, and not just the plane of justification, molded in the period of 'normal science,' in the understanding of Thomas Kuhn. In the words of Gilberto Hochman (2008, p.25),

> From the 1990s onwards, there emerged a plethora of literature about the spaces of the science in Brazil in which the IBGE and statistics were not included. The history of the institutionally-organized science in Brazil, more concerned with medicine, physics, biology, mathematics and the human sciences, paid scant attention to other sciences and institutions that were at the center of the symbolic and material construction of Brazil.

Placing public statistics on a wider agenda of reflection in the scenario of the history of sciences: that is the decisive contribution that the space of historical research can bring to statistical institutions. This makes the documents produced and kept by these institutions more readily available and useable, organizing them according to the demands of historiography.

This perspective favors the understanding of the technical scenario concerning the productive methods applied in large surveys, such as the delegate viewpoint postulate. Among many other things it also favors the social interactions that take place in interviews, the generation of records and the configuration of classifications of activities and occupations. The same applies to the trajectories and development of the themes and categories of population censuses, as an investigation of their conceptions and uses.

As far as the academic universe is concerned, historical research reveals the processes involved in the intellectual construction of the categories of classification, as well as the underlying meanings of their applications, based on the semantics attributed to them by different social groups. It is worth stressing that the historian should start from the understanding of the methodologies applied to the production of statistics, in order to think about their significance in political terms.

Through historical research it is possible to revisit the trajectories of statisticians and, most importantly, their contributions to the composition of the main works of interpretation of nationality. Seemingly opaque figures, and with a distinctly technical profile, their greatest works were deprived of the aura of luminosity and controversy that characterized the prolific tradition of analytical thought, and of the representatives of subjects strongly linked to social control (such as medicine and psychiatry). Embedded in the apparatus of State, they were largely marginalized by academic studies, which preferred to prioritize the scientific work being produced by the universities. They wrote in an arid language with copious statistical content, so their works suffered from the ambivalence of being excessively technical for social historians of ideas, and too sociological for statistical studies. Research should rehabilitate these central agents, focusing on the existing circularity between, on the one hand, the intellectual discourses that forged the great national projects

and, on the other, the material and conceptual procedures that made possible the objectification of the country's realities.[9]

More than anything else, the new approach represents an entirely original field of investigation. As expressed by Jean-Claude Perrot, it constitutes a "concrete history of abstraction." It could be considered a history of government by numbers, in which the construction of the nation-state is analyzed through a prism of the materiality of policies and the instrumental rationality of decision-making processes. A history of the uses and translations of statistics, in which their real argumentative force as discourse, present in the indicative planning, was gradually transformed into the quantitative sustenance of public policies, which permeated techno-scientific planning.[10] It is the history of the emergence of the statistical mentality marking the transition of the country into modernity, from a starting point at the moment the desire for statistics was unequivocally accepted, and which effectively opened up other dimensions for political and social history.

Following another line of reasoning, the formation of a community of researchers and the spaces for symbolic mediations are examples of questions that favor the history of the sciences. The creation of societies and scientific magazines, of intellectual influences (technical books, publicity manuals, author circles and the national formation of technicians (schools, courses, curriculums) are all found within this perspective of investigation. It brings to light the process of specialization in statistical activity, its transformation from a typically administrative profile, when the statistics are compiled on the basis of obtaining administrative records (from hospitals, schools, customs, courts), to a truly scientific profile, when the sampling techniques and household surveys will be widely adopted by the national statistical agencies on a permanent and systematic basis. These, therefore, begin to produce their own scientific records, becoming calculation centers – as defined by Bruno Latour. To conclude, it was not our task here to write up an inventory of themes, approaches and objects suitable for the historical perspective of statistical activity, which is still virtually unexplored territory and only touched upon on previous occasions.[11] Instead of this, we wanted to present some challenges and possibilities that the universe of public statistics can bring to the sociology of science. History recuperates and reveals the potential of the documentary archives kept by the statistical institutions for the entire community of academic users, enriching the possibilities of understanding the methodologies and utilization of statistics. Sociology, in turn, is guided by the prescriptive dimension, it indicates the precarious equilibrium of the dividing lines in the statistical program: the model of what is desirable in the social-political sphere, not always technically feasible, and the realism of what is possible in the sphere of scientific production, not always socially appreciated. The common denominator of the two approaches is that they are committed to the scope of activity of statistical institutions, such that the latter are able to carry out their missions with ever-increasing success.

NOTES

[1] All quotations from works and documents in Portuguese have been freely translated into English.

[2] It is worth emphasizing that the possible correlations between the phenomena and analytical units foreseen in statistical scenarios at different times warrant an investigation into the social representations, the political and scientific concepts, implicitly or explicitly used in the production and utilization of statistical information. In this respect, Hernán Otero (2006, p.47) warns: "it is necessary to read the statistical matrixes and tables as texts, translated into propositions and systems of hypotheses that can be expressed in verbal language. As such, for example, two scenarios about the levels of infant mortality drawn up according to the time of year or socio-occupational groups of the deaths are based on two radically different scientific hypotheses and theoretical universes: mortality as a climatic or social factor." The analytical approach thus becomes increasingly important, as it reveals the implicit components of statistical ideology, understood as "a series of pseudoscientific, political and cultural criteria that provide the basis for the selection and definition of the variables, the values and the analytical units; determine the type of statistical instrument to be prioritized (ways of building the scenarios, tables, indicators and measurements); guide the interpretation of result and legitimize their uses through discursive procedures" (p.50; free translations).

[3] On this front, an investigation into the construction and development of the categories of classification is of special interest. By analyzing the minutes, reports and opinions of commentators and census teams, it is possible to delimit the extension and the significance of these categories. The demographics, in general, are controversial and discontinuous in terms of the scope of investigation adopted in statistical surveys: occupation, income, migration, fertility, instruction, and work. The case of the social categories, such as religion and color (color or race, according to the 2000 census) is even more serious. The options left for the population surveyed again to include and reclassify themselves were rarely the same in terms of these questions, which shows that the survey of categories is conditional on the predominant social discourse and image the country wants to portray. The oscillation in the investigation of the diverse statistical categories and plurality of implied meanings in terms of the historical context of their production represent an enormous challenge to social analysis, and one that has demanded the attention of historians. In terms of racial classification, a preliminary approach will be embarked upon elsewhere, comparing the appearance of the question in the 1872, 1890, 1920, 1940 and 1950 censuses

in Brazil (Camargo, in press).

[4] It is worth emphasizing that various renowned authors have dedicated themselves to writing about the relationships between statistical knowledge and the construction of social order. Among the many names of distinction, it is important to cite Michel Foucault, Bruno Latour, Theodore Porter, Ian Hacking, Alain Desrosières, Laurent Thévenot, Nikolas Rose, Peter Miller, Hernán Otero, and Jean-Pierre Beaud. Simon Schwartzman and Nelson Senra have made valuable contributions in Brazil, and have become obligatory references on this theme. Taken together, their studies prefigure the horizons and tools necessary for any useful analysis of public statistics, which, by all accounts, still needs to be better formulated in terms of its overall field of investigation, notably in Brazil.

[5] In this respect, it is worth referring to the interesting work of Senra (2006) about English political arithmetic and its appropriation in the administrative scenario of imperial Brazil.

[6] The pragmatism resulting from political concessions of William Petty (1690) can be seen in the book mentioned: "The Method I take to do this, is not yet very usual; for instead of using only comparative and superlative Words, and intellectual Arguments, I have taken the course (as a Specimen of the Political Arithmetick I have long aimed at) to express myself in Terms of Number, Weight, or Measure; to use only Arguments of Sense, and to consider only such Causes, as have visible Foundations in Nature; leaving those that depend upon the mutable Minds, Opinions, Appetites, and Passions of particular Men ... . Now the Observations or Positions expressed by Number, Weight, and Measure, upon which I bottom the ensuing Discourses, are either true, or not apparently false, and which if they are not already true, certain, and evident, yet may be made so by the Sovereign Power, *nam id certum est quod certum reddi potest*…"

[7] An almost invisible function, albeit of vital importance, statistics act to stabilize social interactions. According to Simon Schwartzman (2004, p.74), "the reasons the conflicts do not remain unresolved for ever are the same as those that explain why other social conflicts end up being overcome: in the long term, the collective gains associated with stable systems tend to be greater than any private benefits obtained from conflicts fostered for a long period of time. Statistical concepts and technical devices play important roles in the process of stabilizing social interaction, a 'moral role' which is not immediately visible from their ingenuously simple technical aspects."

[8] In a pioneering effort, Nelson Senra coordinated the História das Estatísticas Brasileiras (1822-2002) (History of Brazilian statistics) collection. In his four volumes, the work maps out the paths taken in the institutionalization of statistics among us. It is also worth referring to the article "Pesquisa histórica das estatísticas: temas e fontes" (The historical research of statistics: themes and sources), by the same author, published in this magazine (Senra, 2008), which recovers documents and suggests themes and chronologies essential for any analysis of statistical activity in a historical perspective.

[9] It should be mentioned various names that, in Brazil, made their personal mark on the organization of statistical activities, at different times, from as far back as the Empire to the New Republic. To cite just a few, due to the undeniable central roles they played in the periods highlighted: Roberto Jorge Haddock Lobo (1817-1864) and Joaquim Norberto de Souza e Silva (1820-1891), authors of reports with important methodological incursions; Sebastião Ferreira Soares (1820-1887), considered the first Brazilian statistician; Manoel Timóteo da Costa (1855-1934), who carried out the general census of 1890, and was responsible for the introduction of the statistics in the positivist project at the outset of the Republic; Aureliano Portugal (1851-1924) and Hilário de Gouveia (1843-1923), demographers and basic sanitation specialists, and the main analysts of statistics in the First Republic; Oziel Bordeaux Rego (1874-1926), who evaluated, created and implemented systems for cultural and social statistics; José Luiz Sayão de Bulhões Carvalho (1866-1940), considered the founder of Brazilian statistics; Mario Augusto Teixeira de Freitas (1890-1956), who founded the IBGE and the National Statistics System, and was one of the most prolific producers and analysts of educational statistics ever; Rafael Xavier (1894-1982), the main organizer behind municipalism as an alternative route to national development; Lourival Câmara (1911-1973), responsible for structuring the higher education courses involving statistics; Giorgio Mortara (1885-1967), one of the greatest demographers of the twentieth century, who found refuge in Brazil during the World War II (as he was a Jew), and where he formalized this disciplinary field, in a task continued by João Lyra Madeira (1909-1979); Isaac Kerstenetzky (1926-1991), who transformed the statistical institutions into techno-scientific centers capable of coping with the challenges associated with modern economic planning, producing his own records, social indicators, sample research and permanent residential dwellings; Simon Schwartzman (1939-) who rethought the National Statistical System when presiding over the IBGE, and to whom we owe our first thoughts about the burgeoning area of the sociology of statistics.

[10] In this case, it is worth evaluating the reception of the resolutions and recommendations of the international organisms in Brazil, since the first congresses during Imperial times, up to the gradual consolidation of the International Statistical Institute (ISI), founded in 1885. Examinations of the composition of the official delegations from Brazil sent to the most important world meetings, the translations made by the members of different national governments, the efforts to institutionalize the activity with the creation of official bodies and formal associations, the exchange with private organizations in defense of correlated activities (such as in the fields of education and the municipal movement, in the Brazilian case), the use of statistics in the press, in didactic school books and the great works about national identity are some of the indispensable methodological horizons to investigate the construction and social recognition of knowing statistics and the position of statistics.

[11] It is worth citing some initiatives in this area: the document "Fundamentos preliminares para uma linha de pesquisa histórica no IBGE" (Preliminary Principles for a line of historical research at the IBGE), which we prepared together with Nelson Senra; the two meetings entitled Historical Research at the IBGE, that took place in 2006, when various historians and renowned specialists were heard, which helped to formalize a line of investigation; the article cited "Pesquisa histórica das estatísticas: temas e fontes" (Senra, 2008).

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