

Science at Work Workshop

University of Vienna

9-11 September 2013

National Styles in the Social Sciences: unemployment theories and the rise of mathematical statistics in the early 20th century (Britain and France)

Christian Topalov (EHESS, Paris)

(*) Let me take two documents as the starting point for this paper. They were both published in 1909 by men who were roughly 30 years old: *Le chômage et la profession* by Max Lazard, and *Unemployment: A Problem of Industry* by William Beveridge. These books, which were to enjoy very different degrees of success, both testified to a recent change in the way scientists and reformers represented the phenomenon of “the unemployed”.

The first was a doctoral thesis presented at the Faculty of Law in Paris. The author was unknown at the time. Heir of a prominent family of bankers and thus a man of independent means, Lazard chose to become an advocate of reform. He set out to acquire recognition as a scientist, specialising in unemployment. After defending his dissertation, he immediately began preparations for an International Conference on Unemployment, together with the Belgian reformer Louis Varlez. (*) In May 1909, Lazard was admitted to the Paris Statistical Society, which published a review of his thesis by Lucien March, head of the French statistics administration, in the August edition of its *Journal*. The thesis was also reviewed by Arthur Bowley, one of the founders of English mathematical statistics, in the *Journal of the Royal Statistical Society*, and by François Simiand, a philosopher-turned-sociologist and disciple of Durkheim, in *l'Année sociologique*. All three of these well-known scholars acknowledged Lazard's efforts but they also expressed reservations about the methods of the author, whom they considered an amateur. Although the Conference on Unemployment in September 1910 was a success, Lazard's career stagnated when his ideas failed to gain acceptance at the municipal employment offices set up in Paris shortly before and just after the start of the war. He was a firm believer in reform through philanthropy and did not realise that voluntary solutions had become outmoded. His book, *Le chômage et la profession*, was

forgotten and, after the war, its author embarked on new ventures with the International Labour Office.

In contrast, Beveridge's book was widely read throughout the industrial world. Like Lazard's book, it aimed to combat unemployment, but the political situation in England offered far more opportunities. By the time of its publication, Beveridge had already achieved a certain notoriety as a member of the Central (Unemployed) Body of London, the organisation that distributed municipal relief during the depression of 1905. He had introduced his proposals for a national network of employment offices by writing various magazine articles, participating in the initial activities of the Sociological Society and by testifying at a hearing held by the Royal Commission on the Poor Laws. With the publication of *Unemployment: A Problem of Industry*, Beveridge became a recognised expert on the issue. The author's success and the continuing interest in his book were made possible by the reformist turn adopted by the liberal Asquith cabinet starting in 1908. Beveridge's investment in the science of unemployment aroused the interest of the Board of Trade where he was hired to work directly with Llewellyn Smith and Churchill, leading to his appointment as director of the national system of labour exchanges established in 1909. He enjoyed a meteoric rise in his administrative career until he was ejected in 1919. He bounced back in 1930, when the government called him to save the unemployment insurance system from ruin. Of course, not long afterwards, he was to be hailed as the father of the British Welfare State.

Max Lazard – *Le chômage et la profession* (1909)

Now let us take a closer look at these books. (*) Lazard intended to produce a scientific work:

“To fight unemployment efficaciously, first it is necessary to define the phenomenon and its laws”. (Lazard 1909: 1)

Statistics were to be the key to establishing these “laws” by showing there was a connection between unemployment and occupation. Lazard used the results of four recent population censuses, two in France and two in Germany. He calculated “occupational coefficients of unemployment”, defined as the unemployment rate of each occupation or industry divided by the overall average rate at the same date. He found the coefficients to be remarkably constant.

“It is surprising to observe that, at five years' remove, with different economic circumstances and people, the phenomenon of unemployment,

apparently so unstable and accidental, turns out to be at almost exactly the same level in each industry taken separately". (1909: 152)

Therefore, "occupation has an influence on unemployment" (1909: 341). Lazard was careful about causality. He pointed out that unemployment varied in inverse proportion to the size of the factory workforce and ultimately depended on the technical organisation and the nature of the market for the output of the various industries. This was "fortunate", because:

"[...] one fails to see why it would be impossible to apply to a given branch of production the processes or organisation that reduce the unemployment rate in another one". (1909 : 351)

Another essential point: the very existence of the consistent behaviour of unemployment in each industry meant that "the so-called personal factors of unemployment either have almost no effect or do not have the individual character attributed to them"(1909: 344).

This was pure Durkheimism, as François Simiand noted in his review in *Année sociologique*. Indeed, Lazard's book can be described as a Durkheimian sociological study applied to a social issue. The fact that the author was subsequently neglected in the history of French sociology was no doubt due to the fact that he did not pursue an academic career. It may also have stemmed from reluctance among the historians of sociology to admit there might well be a connection between the pure science of Durkheim's disciples and the burning questions of their time.

William Beveridge – *Unemployment: A Problem of Industry* (1909)

Let us turn to Beveridge now. Of course nothing could be further from Durkheim than the intellectual environment of the young British reformer. This will allow us to observe that one and the same intellectual operation – the objectification of unemployment as a social fact – was expressed at the same time in two entirely different scientific languages.

(*) Beveridge wanted to produce general theory of unemployment. His study was governed by two methodological principles:

"First, the inquiry must be essentially an economic one. The evil to be analysed is [...] that of maladjustment between the supply of and the demand for labour. Second, the inquiry must be one as to unemployment rather than as to the unemployed." (1909 : 3).

The change of perspective lies in these two sentences. Unlike the many treatises on "the unemployed" published in Great Britain over the previous fifteen years or

so, the title of Beveridge's work refers to "unemployment". The term designated a new object of scientific discourse that no longer referred to individuals but to the social phenomenon at the root of their situation. Like Lazard, Beveridge intended to show that the problem was first of all the result of industrial organisation:

"The first question must be, not what is to be done with the unemployed individual, but why he is thus unemployed. His involuntary idleness indicates excess of the supply of labour over the demand for labour". (1909: 3).

Here Beveridge employed the language of political economy and its laws to express what the language of Durkheimian sociology called a "social fact". Nevertheless, the scientific revolution was the same in both cases: the statement of a causal order that did not depend on individual characteristics. (*) Unemployment was an industrial phenomenon, i.e. it was social and objective. It fluctuated along with other economic phenomena like discount rates and foreign trade, as well as what were usually considered moral phenomena, such as the marriage rate, beer consumption and pauperism. Unemployment, in short, reflected "the pulse of the Nation".

(*) Beveridge was not alone in observing the relationship between unemployment and business cycles: the notion of "cyclical unemployment" was already widely used in Britain by the time he published his book. Here is a chart based on the "unemployed percentages" of trade unions.

(*) In these circumstances, Beveridge insisted on the fact that the "personal factor" undoubtedly played a role in determining the "incidence of unemployment" on this or that individual but it had no influence on the "volume of unemployment". Consequently, "no conceivable improvement in the character of the workmen will eliminate the main economic factors in unemployment". (1909: 138).

A new paradigm of causality and classification

We are accustomed to presenting the new ideas of Beveridge, Lazard and others like them as "progress" from a scientific as well as a political standpoint. These reformers had finally recognised that the poor were not to blame for their poverty and that social organisation had to be reformed to solve a problem previously discussed in individual and moral terms. This view is not wrong, but it has two drawbacks. First it exempts us from giving serious consideration to any scientific claims related to earlier charitable and repressive practices. Second, it keeps us from examining the paradigm shift introduced by these new conceptions. The conflict was not between science and obscurantism; it was

between different approaches to science and action. That is why these works of practitioners often neglected by the history of science can shed light on the relationship between scientific content and the social conditions that enabled it to emerge.

The objectification of unemployment as a social fact was indeed closely tied to a new method for reform and new types of knowledge about society, particularly ways of defining how “causes” operated. The causal systems used by unemployment reformers in the early 1900s were opposed to the system that dominated 19th century moral science, which I call the “system of individual diagnosis” or “of enumerating causes”.

Scientific charity, which developed rapidly during the last quarter of the 19th century, operated on the model of clinical medicine described by Michel Foucault. It had gradually drawn up a complete nosographical chart of the types and causes of poverty, which it used as a tool to diagnose each “case” and prescribe remedies suited to the individual. (*) One of the later expressions of this epistemology can be found in the statistics on the “causes of pauperism” established by Charles Booth in 1889, based on the analysis of 4,000 files of families on relief. Here is a notebook used by his assistants to classify the cases.

Another expression of the same construction was a study of the causes of unemployment conducted by Lucien March at the French Labour Office in 1895. The questionnaire listed some forty different causes and requested that all cases of unemployment be classified according to this nomenclature.

Thus, the epistemological novelty of the “objectification of unemployment” did not lie in the reference to “science”, or even in the idea that “laws” silently govern sensible appearances. These were old notions that had laid the groundwork for political economy. The novelty lay in the definition of what they sought to explain – and thereby to change. It was no longer the particular behaviour of each individual but rather the objective laws of a collective or social phenomenon. This phenomenon existed independently of its individual manifestations and had to be combatted by acting upon the institutions that organised the labour market. In the language of political economy, it was a question of applying to the labour market the same laws that governed other production factors, while acknowledging that, in this case, the economic law was not natural because it had to be instituted. Alfred Marshall himself clearly saw that the discipline of hunger by no means guaranteed the optimising behaviour he had just conceptualised: How could casual workers be kept from abandoning their jobs and encouraged to remain permanently in the labour market? How could unstable workers be transformed into regular wage earners? That was the

chief concern of unemployment reformers in the early 20th century. The operation of the labour market as a market presupposed the existence of a rational individual yet to be created and the organisation of the industry, the city and the market itself could slow down or facilitate his creation. As Beveridge admirably summed it up: the problem was to “make reality correspond to the hypotheses of economic theory” (Beveridge 1909: 237)

Objectivating social reality and dissolving numerical realism

In the new causal system, the traditional question concerning “the number of the unemployed” was abandoned in favour of new questions: what was the differential probability of unemployment in each industry and what was the variation of unemployment in time. The first question was linked to developing unemployment insurance systems, the second to the idea of public works projects that had to be set in motion as soon as an unemployment crisis loomed. This new approach was manifested by two statistical forms that gradually emerged in the 1890s and then triumphed after the turn of the century: the rate and the index. Rates were organised into comparative tables and indices into chronological series. These new forms radically modified the nature and purpose of the measurement process.

English mathematical statistics played a pioneering role in this evolution and was the first to successfully apply it in the area of unemployment statistics. In June 1912, Arthur Bowley gave a talk to the Royal Statistical Society entitled: “The Measurement of Unemployment: An Experiment” (Bowley 1912). The “experiment” in question was a provocative exercise in applying the fledgling theory of “index-numbers”. At the time, Bowley taught statistics at London School of Economics and mathematics at University College, Reading. An academic working in a discipline dominated by practitioners of administrative production of figures, he had asserted himself as a leader of the English statistical school some ten years earlier. The object Bowley chose to measure – unemployment – was at once brand new (the word itself had only recently entered the scientific lexicon) and a burning social issue.

Official British statistics had deliberately given up measuring the phenomenon because it was impossible to arrive at an objective definition of “the unemployed”. In 1895, Llewellyn Smith, the head of the Labour Department, stated quite clearly:

“It is doubtful if the State could undertake with propriety to assess the value of the impressions left on the minds of a number of persons by certain facts, and make a statistical record of these impressions.

Gouvernement statistics as a rule must be records of facts or statements derived first-hand, and resting on a perfectly definite and tangible basis [...] it is partly because in the case of the unemployed such a basis is quite untruthworthy, that a census in the true sense is not possible.”

Through Bowley’s “experiment”, mathematical statistics demonstrated its superiority over official statistics by coming to the aid of the civil servants on the Board of Trade.

(*) The experiment involved constructing “a series of index-numbers”, that is: “a series which reflects in its trend and fluctuations the movements of some quantity to which it is related” (Bowley 1912: 791). This was a powerful definition, signalling the advent of a radically new way of objectivating social realities and a new status of numbers. A number was no longer a sum of units homogeneously defined and exhaustively counted, like those used in administrative statistics. (*) The unemployment index constructed by Bowley for the years 1894-1911 was not a series of numbers of unemployed people: it was a series of weighted averages combining heterogenous data that varied from one industry and period to another. It included the “unemployed percentages” provided to the Labour Department by the trade unions, workforce figures in certain industries, and even survey-based qualitative assessments of the situation in local labour market. This statistical mixture horrified the realists: they no longer understood what this measurement actually measured, when what they wanted to know, after all, was how many unemployed people there were in the Kingdom. Chiozza Money, a radical liberal member of Parliament in the forefront of the political debate on this issue, accused the new-style statistician of arbitrariness (Bowley 1912 discussion: 825-826).

That was precisely the magic of the new “mathematical statistics”: it provided a measure of unmeasured – and often unmeasurable – phenomena. In 1906, Bowley had already presented the programme to the economic and statistical section of the British Association for the Advancement of Science over which he presided that year. He emphasised how the new approach represented a break from the old “arithmetical statistics” practised by administrators:

“Purely arithmetical work is [...] limited to the tabulation of exact records, where the whole field to be surveyed can be covered, [...] and where statistics becomes only another name for accountancy; whereas the application of mathematical principles makes it possible to measure the inaccessible, to describe the animal from the single bone, to make firm observations from a shifting base [...].”(Bowley 1906 : 541).

Mathematical statistics did more than merely authorise the use of an approximation by verifying its order of magnitude. It testified to a deliberate shift to abstraction – what one might call “dissolving numerical realism”. The unit, which is necessary for counting, gives way to a constructed magnitude with the sole property of varying like a set of other magnitudes. When these magnitudes cannot be measured themselves but merely postulated, the statistician’s “index” resembles the clue of a scientifically inclined detective (i.e. Carlo Guinzburg’s “indexical paradigm”) or, indeed, the paleontologist’s discovery: it offers a “measure of the inaccessible”.

Bowley’s index was a composite measure that did not imply knowing the exact quantities or weightings to be used: it merely postulated that “its trend and fluctuations [reflect] the movements of some quantity to which it is related” (Bowley 1912: 791). The realism of the numbers had to be called into question in every instance, and not just when the data was insufficient. Even the most apparently obvious magnitudes of enumerations – such as the first and foremost governmental number: the “population of the United Kingdom” – were in fact the result of conventions (Bowley 1908: 461-462).

It is significant that Bowley chose to carry out his demonstration in the area of unemployment. By producing his index, he solved a problem that had bedeviled British administrative statisticians for twenty or thirty years: counting the unemployed. Bowley showed that there was no need to do it, and therefore no need for a formal definition of the conditions an individual had to fulfil to belong to that category. His construction, he said, “is primarily an index rather than a measurement”. That is precisely why his approach eliminated the problem of the “false unemployed”, which inevitably arose in counting individuals.

On the other hand, he revealed the “fluctuations” of unemployment and employment. Thus, before economists began to reason in these terms, mathematical statisticians offered a language to designate a social phenomenon the laws of which could be empirically induced. There was a striking similarity between this construction and the “social fact” of the Durkheimians, which was distinct from individual facts and manifested by statistical regularities. In the area that interests us here, these two, parallel paradigm shifts can be linked to the tasks resulting from the new relationship developing between the social

sciences (statistics was still one of them) and new methodologies for administering society.¹

The case of unemployment statistics shows very clearly how processes too often studied independently are in fact interconnected and mutually reinforce each other: the formal innovations of mathematical statistics, the search for solutions to the problems encountered by administrative statistics, the scientific redefinition of a “social problem” and finally, the development of practical proposals to solve it.

Social policy issues and statistical formalism

Let us quickly summarise this point in order to conclude.

In France, between about 1895 and 1908, French official statisticians were exclusively concerned with bringing out the differences in unemployment rates according to “occupations”. The statistical agenda was clearly set in this case by a political priority: “the organisation of unemployment insurance”.

Contrary to government statisticians in Great Britain, the French Labour Office had been using the national census to count the unemployed since 1896. To do so, it was necessary to define carefully the notion of “establishment” and separate workers who had been attached to an “establishment” from the self-employed: by convention, only the former could be considered “unemployed”. This was the solution chosen by French official statisticians for eliminating from the number of the unemployed any worker who was not clearly in a relationship of subordination to an employer. The Labour Office did not only aim to solve the problems encountered in conducting occupational censuses. It also sought to respond to the issues raised by “the organisation of unemployment insurance”,

¹ There may also be grounds for speculating about the new economy of representation and signs that emerged in extremely diverse but homologous forms during the same period. It characterised the notion of the index-number, *Les Demoiselles d'Avignon*, Saussure's Course in General Linguistics and Simmel's *Philosophy of Money*. On this last point, cf. Orléan, André. 1992. “La monnaie comme lien social. Etude de *Philosophie de l'argent* de Georg Simmel”. *Genèses*, no. 8, June, p. 86-107. The homologies suggested here between economics, painting and linguistics were presented from a philosophical standpoint by Jean-Joseph Goux in a talk entitled “La monnaie: étalon, jeton, trésor” at the Franco-Russian Conference “Psychanalyse et sciences sociales”, Moscow, 30 March-3 April 1992.

henceforth on the political agenda. The scheme was indeed conceived as organised by “occupation”, that is by separate industry. The unanimity on this point was accompanied by disputes over the legal form of unemployment funds. Whether they should be run by workers, employers or jointly, operated by insurance companies, managed on a mutualist basis or public and mandatory – in every case they were to be “occupational”. That is what determined the statisticians’ programme.

The cross-Channel debate between Bowley and Lazard indicates quite well the practical stakes of their respective statistical constructions. Bowley fired the first salvo in his review of Lazard’s book: he found the method of calculating “occupational coefficients of unemployment” odd; all the author had to do was calculate an “ordinary coefficient of correlation”. It is true, Bowley added treacherously, as an amateur statistician, Lazard probably did not know what that was. Lazard was in fact familiar with the instrument developed in the 1890s by Galton, Pearson and Fisher: he had discussed “its disadvantages” in his thesis (Lazard 1909: 159-186). And when Bowley gave his talk in 1912, Lazard wrote a scathing review of his method of index construction as “really too artificial”. Above all, he claimed the index served no purpose: “while it is true that [it] informs us about the meaning and amplitude of the fluctuations of the average unemployment rate, [it] tells us nothing about what we most need to know, namely the value of that rate. One might even wonder if this single average rate, all occupations combined, is of any real interest whatsoever” (Lazard 1913: 619).

In short, neither one grasped what the other was trying to do, because their two statistical forms were obviously not constructed to achieve the same practical purpose.

If Lazard did not use the coefficient of correlation in 1909, it was because he was not seeking to establish an abstract law, but rather to draw up a table of unemployment frequencies in the various industries and show their constancy and predictability along with their relative levels. He was working like an actuary to prove first that the risk of unemployment could be insured, and second, that it should be insured independently in each occupation or industry. If, in 1912, he did not see any advantage in an index of unemployment fluctuations, it was for the same reason. Lazard did not think it was useful or even possible to try and thwart the effects of economic cycles on the volume of employment. He remained focused on the objective he shared with most French reformers of his time: unemployment insurance organised within an occupational framework.

On the other hand, if Bowley launched an experiment to determine an index-number of unemployment, it was because he grasped that such a construction could be useful to Board of Trade officials, who were thinking about the possibility of launching public works programmes to create jobs during periods of depression. His index said nothing about the number of unemployed people, but it enabled planners to anticipate increases by a few months and therefore to decide precisely when such works should be launched. This revolutionary statistical form was potentially useful, and thus became scientifically relevant.

Clearly, the new statistical forms opened up new avenues of action; in turn, the modes of public action that began to seem possible required the development of such forms. What we see here is the joint construction of new cognitive forms by scientists and administrators. No doubt that was why, in spite of such intense international scientific discussion, the statistical constructions we have observed were used only locally for a very long time. This may help to make sense of how “national styles” developed in the social sciences.