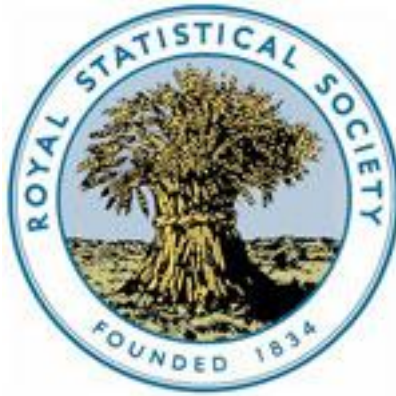


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"Economic Science and Statistics." The Address of the President of Section F of the British Association, at the Fifty-Sixth Meeting, Held at Birmingham, in September, 1886

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“ECONOMIC SCIENCE *and* STATISTICS.” *The ADDRESS of the PRESIDENT of SECTION F of the BRITISH ASSOCIATION, at the FIFTY-SIXTH MEETING, held at BIRMINGHAM, in SEPTEMBER, 1886. By JOHN BIDDULPH MARTIN, M.A., F.S.S., F.Z.S.*

As the years succeed each other, and the roll of past Presidents lengthens, an ever increasing burden of responsibility lies on the occupant of the chair which I am called upon to fill. For twenty-one years (1835-55) this Section existed as the Statistical Section; for thirty-one years more it has been known as the Economic and Statistical Section, and for the fourth time its meeting place is Birmingham. Henry Hallam presided over this Section at the Birmingham meeting in 1839, the late Lord Lyttelton in 1849, the Earl of Derby, then Lord Stanley, in 1865; since the last-mentioned date the chair has been occupied by men distinguished by their knowledge and practice of public affairs—such as the late Mr. W. E. Forster, Lord Iddesleigh, and Mr. Shaw-Lefevre—or by their acquaintance with the theoretic aspect of economic questions, among whom may be mentioned Professor Ingram, Professor Jevons, Professor Thorold Rogers, and Professor Sidgwick; while the names of Mr. Palgrave and of the late Mr. Henry Fawcett recall men who in different careers of life have shown themselves conversant with matters theoretical and matters practical alike. It might have been assumed that under such guidance the position of this Section of the British Association would have been at all times amply secured; yet it is no secret that but a few years ago its efficiency was called in question, and its status as a scientific body was seriously challenged. The attack called forth an address that has been described by a subsequent President as “the most elaborate and brilliant to which this Section has ever listened,” and since the delivery of this address at Dublin by Professor Ingram in 1878 the position of the Economic and Statistical Section has been, if not absolutely defined as a matter of form, yet practically secure as a matter of fact.

But it is not only before the followers of rival sciences in this many-sided British Association that economic research has had to stand on its defence. Almost at the same time that Professor Ingram was vindicating the proposition that economic phenomena were “capable of” and “proper subjects for” scientific treatment,

Professor Bonamy Price, addressing a body* somewhat similar to our Section in its constitution, declared that "political economy is in entire abeyance," and concluded that "political economy is not a science, in any strict sense, but a body of systematic knowledge gathered from the study of common processes, which have been practised all down the history of the human race in the production and distribution of wealth. Who," he exclaims, "sends for a professional economist in a strike?" and in despair at finding that "in the war of classes political economy is absent," and that he was unable to discover "uniform sequences, general facts which can be described as laws because they ever recur in the same form," decides that until the far-distant day shall come when the actions of man in his social relations shall be guided by a supreme governing science of society, "for sociology we must substitute political philosophy in its broadest sense; or better yet, the legislator himself." But we should hardly look for such a legislator among the ranks of practical men, "swarming with theories, with ideas built up with the greatest dogmatic confidence in his knowledge of business. His common sense is the very last authority to which the decision of what is right political economy ought to be referred." From the guidance of such untrained empiricism, as obnoxious to Professor Bonamy Price as to Mr. Herbert Spencer, no right guidance is to be hoped, nothing but disaster can be expected. In point of form the controversy was obscured by the difficulty that exists in deciding the exact limits of art and science respectively, and in defining either the one or the other of these. It is not for one whose training has been strictly practical, whose conclusions have been derived rather from observation of contemporary facts than from academic teaching, and whose present object is not to weary you with dialectic subtilities, but to insist that true social science is nothing if not practical, to refine on the shades of meaning that attach to words and terms. It may be left to a more fitting time and place to reconcile or to decide between the dictum of Mill that "art necessarily presupposes knowledge; art, in any but its infant state, presupposes scientific knowledge,"† with that of Dr. Guy: "An art, so long as it continues to be a mere affair of skilful handiwork, remains an art; but directly it submits itself to the guidance of well-ascertained principles, it may claim to be a science;"‡ or to reconcile the saying of Sir John Herschel, that "science is the knowledge of many, orderly and methodically

* Department of Economy and Trade, *Social Science Congress*, Cheltenham, 1878.

† "Logic," Introduction, sec. 2; *cf.* also sec. 6.

‡ "Meaning of term Statistics," *Journal of the Statistical Society*, December, 1865, p. 488.

“ digested and arranged, so as to become attainable by one,”* with that of Professor Sidgwick, who understood science as “ the consideration of all subjects, whether of a pure or mixed nature, capable of being reduced to measurement and calculation.”† Within the bounds of one or other of these definitions we may arrive at the exclusion from the domain of science of all but the registration of immutable laws, and lay down as the *ne plus ultra* of science the statement of the simplest mathematical formula. In this showing there can be no experimental science, for there can be no science until the experimental process has evolved the knowledge of a law. Or, on the other hand, we may easily claim a place among sciences for the objects of this Section, namely, to investigate the laws which govern the individual and social life of man, to examine causes which seem to be accountable for exceptions, real or apparent, to such laws, and, in the words of Dr. George Mayr, “ from milliards of facts obtain the grand average of the world.”

It is perhaps in the sciences that have their origin in our knowledge of physiological law that we can find the closest parallel to the position of economics as a science. The sciences of medicine or of surgery are clearly based on our acquaintance with the growth, the nutrition, and the decay of the body, the structure and properties of its component tissues. We know that “ if the brain be out, the man will die;” that if we open an artery he will certainly bleed to death; that a given quantity of a certain drug will inevitably kill. But if medical science were no more than this, the physician would be no more than the veterinary, the surgeon nothing better than a joiner. In the application of medical knowledge, whether to a particular case or to an epidemic, previous history, immediate environment, even psychological considerations must certainly be taken into account. Mistakes have arisen, and still arise; we are amazed at the faulty inferences and analogies that have been drawn by medical experts in the past, and we may doubt whether finality has been in all cases attained even at the present; but the physical laws remain, and are not discredited by the faulty interpretation of them by their students.

We need not, then, despair of the future of political economy, and acquiesce in its relegation to a distant planet, because its teaching, based too often on *à priori* reasoning, and too little on the experience of history, does not always square with the actions of men, warped in their judgment of any particular problem of the day by prejudice or self-interest. May we not claim that economic science has rather taken up wider ground than, as has been said

* “ Discourse on Natural Philosophy,” p. 18.

† Address to British Association, 1833.

by a recent writer, that it has abandoned many of its outworks: that it does not only concern itself with the production and distribution of wealth, regarding human beings as mere automata, or as parts of a machine, each fulfilling its assigned function with undeviating and passionless precision: but that rather

Quidquid agunt homines, votum, timor, ira, voluptas,
Gaudia, discursus,—*

must be taken into account in that true statecraft to which political economy should be our guide? If the parties to an impending civil war between labour and capital, to an international war of tariffs, or of arms, do not refer their differences to the arbitrament of a professional economist, it is not less because scientific opinion or expert common sense could not be trusted to a sound or right decision, than because

Faciunt homines plerumque cupidine cæci
Et tribuunt ea quæ non sunt his commoda vere? †

It is no reproach to economic science to have taken up wider ground, to have recognised as matters within its proper scope considerations that the older economists, concerning themselves with wealth in its narrow sense as the *summum bonum*, and with the desire for its acquisition as the one mainspring of human action, would have rejected as sentimental or philanthropic. Humanity is many-sided, its units do not lend themselves to grouping or combination with the precision of mathematical symbols, and the experiments of the social philosopher are subject to disturbances unknown in the laboratory of the chemist. The experiments of physical science are difficult enough. "In the spontaneous operation of nature there is generally such complication and such obscurity, they are mostly either on so overwhelmingly large or on so inaccessible minute a scale, we are so ignorant of a great part of the facts which really take place, and even those of which we are not ignorant are so multitudinous, and therefore so seldom exactly alike in any two cases, that a spontaneous experiment is commonly not to be found." ‡

But experiment on the body social is a matter of yet greater complexity; the very conditions of man's being, and the prerogative of independent action based on intelligent reasoning power, that form the basis of, and give rise to the study of social science, render all experiments tentative, and their result rather a calculation of grand average than an evolution of absolute law. Professor

* "Juv. Sat.," i, 85.

† "Lucretius," iv, 1153 and 1154.

‡ Mill, "Logic," vol. i, book iii, chap. viii.

Marshall, in considering the functions and limits of the historic method, uses language similar to that applied by Mill to experiment in the physical sciences:—

“History never repeats itself. In economic or other social problems no event has ever been an exact precedent for another. The conditions of life are so various: every event is the complex result of so many causes, so closely interwoven that the past can never throw a simple and direct light on the future.”*

The attention of more than one ingenious inquirer has been occupied by the harmonies and antagonisms between economic and natural science, and the former may be shown to have its physical, its biological, and its psychological side.† It is in no way derogatory to the latter studies if they too depend on the accurate observation and correct interpretation of facts for the determination of their truths and the establishment of their general laws. The discovery of a footprint in some primeval sandstone, of a flint weapon in the drift gravels of the Somme, of a human skull in the caverns of the Meuse Valley, or in the auriferous drifts of California, may set back the dial of geological time and revolutionise our conceptions of the duration of animal or human life on our planet. If then our inquiries into the physical phenomena that surround us compel us to admit that no finality has yet been reached, need the economist hesitate to allow that the bases of his sphere of observation are not immutably laid down, that his conclusions are not yet absolute?

The naturalist or biologist watches the infinite complexity of the opposing forces of construction and destruction that make up the balance of animal and vegetable life. All nature is incessantly at war with itself, and the battle is to the strong, the race to the swift; a sure instinct guides each individual, or each aggregation of individuals, in the path of unswerving selfishness that leads, in the great majority of cases, to the maintenance of the species. In the crowded communities of the lower animals all is order, regularity, and method; the sustenance of the community, the ventilation and sanitation of the common dwelling, and the disposal of its redundant population, all is provided for; and though pestilences occur, it is chiefly in the case of animals subject to man that they appear to have any sensible or permanent effect on the aggregate numbers of the species. With mankind it is different; his better and more amiable feelings no less than his self-interests, his virtues as well as his vices, tend ever towards results that are not in harmony with those that would ensue from the operation of

* “Present Position of Economics,” 1885, p. 41.

† P. Geddes, “Analysis of the Principles of Economics,” London and Edinburgh, 1883.

natural law. The higher the civilisation of any community, the more does it tend to aggregation and concentration of its members; in large cities the forces that lead to the deterioration as well as those that promote the conservation of the race tend no less to destroy than to maintain the balance of nature. Sanitary science, even though its teaching be enforced by compulsory legislation, has a hard struggle to keep at bay the diseases that man, less well taught in this than are the lower animals, seems inevitably to invite to his crowded cities and insanitary dwellings. The resources of medicine and surgery ally themselves with the promptings of humanity or natural affection in promoting the survival of the least fit, and the perpetuation of a race too often inheriting the vices, no less than the diseases of their predecessors. Nor is it in cities only that man's interference with natural forces reacts on the conditions of his life; the settlement and clearing of a new country, and in a minor degree even a change of agricultural methods in one already settled, affects the fauna, the flora, and even the climate and meteorology of the land, its power of production of food, and its salubrity for habitation.

It is something if we have learnt by the experience of time that social problems are not the mere calculation of man's actions as determined by motives of self-interest, and as measurable in money or its equivalents. Need we abandon all observation because we cannot conduct experiments with the precision of the chemist, weighing our ingredients in the balances of the laboratory? The land, as delimited by Adam Smith, by Ricardo, and even by Mill and Cairnes, has been found too narrow for us; the boundaries have been broken down and overpassed: is there no alternative between the despairing admission that all is barrenness before us, and the elaboration of such Utopian schemes of society as have been imagined by Rousseau, by Robert Owen, or by Comte and his disciples of the present day? One lesson at least we may learn and take to heart: whether, on the one hand, the problems of social science are capable of being stated and solved by a method towards which we are as yet but groping our way in semi-darkness, by some new organon yet to be formulated; or whether, on the other, we must depend on the promptings of well balanced and trained common-sense for the explanation of every new combination of conditions: whether political economy consist in the discovery of truths, or merely in the recognition of facts, it must not be academic only. No community can be fed on dogma; an industrious and hardworking population, such as is that of our country, and of which the great city in which we are assembled furnishes the most conspicuous example; quick to appreciate the hardness of the struggle by which it maintains itself in existence, and eager to grasp at any

prospect of alleviation, will not be convinced as to the universal applicability of formulæ of supply and demand, of entire freedom of contract and unlimited competition in the circumstances of their particular case. Nor, on the other hand, will any credit accrue to the study of political economy if we abandon ourselves for all guidance to the untrained promptings of empiricism; the guidance of so called common sense, sometimes called into action by generous instincts, sometimes by mere impulse, is only too frequently misleading.

It is at this point that the statistical method comes in as an inseparable ally of economic speculation. If the latter has had from time to time, and still has, to assert its position among the sciences, what place shall be assigned to the method which is only too often assumed to be the mere massing and grouping of figures? It has been said—and the saying is not altogether devoid either of truth or humour—that “statisticians when they meet together devote half their time to discussing the status and dignity of their pursuit, and its precedence of, or subservience to, economics.”* The vulgar misuse of the word statistics has no doubt contributed in many cases, to ambiguity in its use. The extreme instance need perhaps hardly be mentioned when “statistics” are used simply as equivalent to “figures;” one may read or hear even this expression, “You can prove anything by statistics.” To say that you can prove anything by figures is intelligible; just so can you prove anything by a syllogism with a faulty premiss, or that might be right by the law of the stronger. But apart from cases in which false figures do not tell the truth—I do not say false statistics, for to speak of false statistics appears to me to be very nearly a contradiction in terms—there is the much more frequent class of cases in which they do not tell the whole truth. Examples of this class will readily occur to everyone; I may refer to one very happily chosen by the President of this Section in 1865 (Lord Derby), namely, the error that may be imported into the death-rate by a year of pestilence, not only by its effect on the mortality of the year of its occurrence, but by its clearing away feeble lives, and so lightening the death-rate in years immediately consequent. There is less to be feared from errors arising out of this source if we lay to heart the warning uttered by Mr. Goschen on a recent occasion, “Beware of totals”—if we recognise more fully than we are usually apt to do that a table of figures, even if it be absolutely correct as a statement of fact, is merely raw material, not a finished product. The misfortune is that it is only too frequently treated as the latter. Such a table usually sets forth

* “Times,” 25th June, 1885.

what in the dialect of the produce market is known as the "statistical position" of some article of trade, or, in the language of Mr. Wynnard Hooper,* as the "primary statistical quantity." Mr. Hooper, while agreeing with Professor Ingram in denying to statistics any right to be described as a science, defines the statistical method as "a scientific procedure involving the employment " of statistics," the intelligent compilation of these primary quantities, and the intelligent use of them when so compiled. This definition makes the statistical method applicable to the solution of the well known problem, interesting, no doubt, to some in Birmingham, "What becomes of all the pins?" no less than to the most complex economic questions. If the word "statistics" were equivalent to "figures," there would be nothing to be said against this; but the history of the word shows that its connotation has always been in a condition of unstable equilibrium. The late Dr. Guy, one of the most ardent champions of the dignity as a science of the method for which he did so much, has traced for us the evolution of the word,† from the now almost extinct form "statist," as used by Shakespeare, Milton, and the dramatists of the Restoration, in the sense of economist, to the invention in 1749 by Achenwall of the singular form "Die Statistik," and the adoption of "statistics" in this country at the beginning of the present century. Even since that recent period the wheel has come round full circle. In 1833 statistical inquiry was introduced to the notice of the British Association as one which should limit itself strictly to "matters of fact" and "numerical results," eschewing altogether matters of opinion, even as deduced therefrom. A similar spirit seems to have been in the founders of the Statistical Society of London in 1834, who adopted as their motto "aliis exterendum," a phrase implying that their province was merely the harvesting of the above defined primary statistical quantities, to be threshed and winnowed by the political economist. That this restricted scope was all that could be claimed by statistics was strongly held by some of its leading members; but the original motto of the Society has been abandoned, and the narrower view has been by no one more emphatically repudiated than by Sir Rawson Rawson, late President of the Society, in his opening address to its jubilee meeting in 1885: "I am not prepared to make statistics the handmaid of social science, to degrade the parent into the position of a hewer of wood and a drawer of water in the service of its own offspring."‡ Nor have indications been wanting of a desire, still

* "Method of Statistical Analysis," *Journal of the Statistical Society*, March, 1881, pp. 44 and 45.

† "Meaning of the term Statistics," &c., *Journal of the Statistical Society*, December, 1865, pp. 478—493.

‡ Statistical Society, "Jubilee Volume," 1885, p. 9.

more recently expressed, to break down the wall of division between statistics as generally understood and political economy, and to treat the two, if not as identical, at least as so closely allied as to be capable of similar or simultaneous consideration.*

Enough has been said to show how very indeterminate have been the positions of economics and statistics from the time when they first obtained recognition as subjects of special study; how attempts have been made and resisted to restrict economics to the narrow circle of political arithmetic, or how statistical study has attempted, and that successfully, to vindicate for itself a more enlarged scope than the mere tabulation of figures. Dr. V. John of Berne, Dr. Geo. Mayr of Strasburg, and among ourselves the late Dr. W. A. Guy, have amply summarised the history and terminology of this branch of inquiry. It would be superfluous to add to or to repeat what these and others have written; it is sufficient to insist—if indeed it be necessary to do so—that as in the debatable etymology of the word statistics we may find by implication the whole range of political economy, so in the word economy are included all things that pertain to the due regulation of the body corporate, whether State or household, and not those only that pass in the former as laws of the distribution of wealth, and in the latter as the keeping of accounts. But from whatever standpoint we may regard either economic or statistical study, whatever may be their mutual connection one with the other, and whatever affinities we may trace between either of them and the branches of knowledge which divide with them the attention of this Association, we must always bear in mind that we in this Section, though by no means utilitarian only, are yet pre-eminently liable to be called on to show how far our works have been of practical advantage to mankind. In other departments of inquiry, as in our own, science and art go hand in hand; astronomy depends not only on the interpretation of nature's laws reduced to mathematical formulæ, but on the art of the instrument maker as taught by the science of optics; the microscope, the spectrum, the retort, and the blowpipe lend their assistance equally to the chemist, the geologist, and the physicist. So with us are figures, if not the slave or the handmaid, yet in any case an indispensable adjunct to and an inseparable companion of economic research. But while the word utilitarianism has an unpleasing sound to the majority of scientific ears, it is one by which ours need not be offended. The astronomer will be slow to admit that the knowledge of the causes that affect the tides and the better guidance of the adventurous navigator are the highest outcome of his science; the chemist or geologist alike will demur to the proposition that his proudest achievement has been

* Statistical Society's Report, 1886.

the facilitation of gold mining, or the improved application of artificial manure to the soil. The services of physical science to humanity have, indeed, been many and splendid; they have affected the conditions of man's existence all over the world, and have given rise to new problems for the economist; we cannot level at the man of science the reproach

nec quidquam tibi prodest
Aerias tentasse vias, animoque rotundum
Percurrisse polum, morituro.*

But we ourselves must be content to be judged directly by our works, to stand or fall as we can vindicate to ourselves that we have done, are doing, and shall continue to do work for the advantage of our fellows. "Orthodox" political economy may be said to be the study of the laws which regulate the acquisition or distribution of wealth; the object of orthodox statistical inquiry to check, as in a balance sheet, its concentration or diffusion: unless we enlarge the definition of wealth so as to make it include all things desirable by the well balanced mind, a deliberate election of the good, under the guidance of rightly exercised reason, such as Aristotle defined virtue to be,† we shall be constrained to admit that the founders of the United States of America were better advised when they laid down as the scope and object of their political system the assurance to every man of "liberty and the pursuit of happiness." If this be so, the "unorthodox" economist of the present day will have to admit to himself that he has to address himself to the problem declared in a well known passage of Carlyle‡ to be insoluble by "the whole finance ministers and upholsterers and confectioners of modern Europe in joint stock company, to make one shoeblack HAPPY." Nor will the disciples of the school of Humanity go far beyond us in declaring that "we uphold as the true key-note of social re-organisation in the future the insisting on the moral law as supreme and paramount to interest."§

Our responsibilities are great, if our studies and labours are anything more than philosophic speculations, anything better than an Epicurean survey of causes and effects, which we are altogether powerless to direct or to influence. As we contemplate the changes that have taken place in the material conditions of man's life all over the civilised world during the past century, or in our own country during the period of fifty years, whose approaching completion under the sway of our Sovereign is giving a text to so many themes of self gratulation, this responsibility is constantly

* Horace, *Carm.*, i, 28, 4.

† *Cf.* definition of ἀρετή, Aristotle, "Ethics," book ii, sec. 6.

‡ "Sartor Resartus," book ii, chap ix.

§ Mr. Frederic Harrison, "Times," 31st May, 1886.

forced on our attention. Has this vast increase of population, concomitant with a still more astonishing and ample store of the means of sustenance and of the collective wealth, been accompanied by an improvement in the well-being of the individual? And if we are able to answer this question in the affirmative, and to justify our answer by figures, so far as figures will enable us to do so, can we claim that this general improvement is due in any degree to our right appreciation of economic laws, and to the right application of human control to them, so far as human agency is competent to interfere in their operation? Or has this progress been brought about by causes which we are impotent to control, and which it is therefore useless to examine? Or, on the other hand, is this apparent progress entirely illusory? is it true that the type must deteriorate in proportion as the individual multiplies? and must we admit that our researches have been either labour misapplied, or that they have been powerless to arrest the movement on the downward slope? These are questions to which it is not easy to give any answer that shall be beyond cavil or criticism, but they are always before us, and we may not decline to face their consideration. Most notably do they press themselves on our attention in such a place as Birmingham. Our overgrown inorganic metropolis is a thing apart, without cohesion or entity, not comparable with any other social unit; our large cities still have a life and individuality of their own. When we contemplate our busy ports, our fleets of ships, and the vast mass of foreign materials which a network of railways distributes to inland centres of manufacture; when we view the swarming streets, the splendid buildings, and teeming industrial population of such a city as Birmingham, we may point to evidence of material prosperity that cannot be gainsaid, and may challenge comparison in this respect with the world. But we pay a penalty for all this in a shape which is no less constantly forced on our notice; crowded lanes, noisome alleys, insanitary dwellings, stunted and unhealthy men and women, sickly children, bread hardly won by labour in factories or at occupations that no legislative interference can render wholly innocuous. "The evils and the diminished vitality that are caused by poverty, crime, personal uncleanliness, drink, and excess of all kinds, as also by the close agglomeration of human beings in places that offer the best chance of lucrative employment, and especially by the unhealthiness of certain occupations, are such as can at best be mitigated by the sanitary authorities, and often lie entirely outside their power of interference."* Hence arise misery and poverty, and

* "Supplement to Report of Registrar-General," 1885, Introduction, p. xvii; see also "Report of Chief Inspector of Factories," &c., 1885, pp. 18—23.

thence discontent, contrasts between luxury or ease, and poverty or want. Hence, again, conflicts between capital and labour—a worse than civil, a fratricidal strife—between forces whose co-operation is essential to success, and an inclination to apply legislative remedies at every turn to each evil that strikes the imagination or the eye.

It is not surprising that pessimist views should sometimes prevail, and that expressions should pass current such as the one which I quote from the public press: “Some attempt should be made to strike at the over-pressure of population in London, which is, of course, the root of the evil. . . . It obviously is the evil which we have got to face. The tendency to drift into cities is one of the curses of all civilised communities, of whatever social stock they may be.”* For myself I am not prepared to admit that a tendency which is indisputable, and which is displayed in every nation in proportion to its enjoyment of peace at home and abroad, has laid the world under so widespread a curse. It is a tendency that is as well marked in nations that are among the least progressive in point of population as in those of most rapid growth. In France, whose population is practically stationary, the rural population, which forty years ago constituted three-fourths of the total inhabitants, is now but two-thirds of the whole, showing a transfer on balance of four million souls (including, however, one million of immigrant foreigners) from the country to the towns.† On the other hand, in the United States, whose population is expanding with a rapidity that is proverbial, and whose numbers are doubling themselves every twenty years, as against an estimated period of two hundred and seventy-one years in the case of France, the increase of urban population is still more strongly marked. The official figures of 1840 show that in the United States one-twelfth of the population lived in cities of 8,000 and over; in 1850, one-eighth; in 1860, one-sixth; in 1870, a little over one-fifth; in 1880, not much less than one-fourth.‡

* “Observer,” 7th February, 1886.

† “La question de la Population en France et à l’Étranger,” M. Cheysson, Paris, 1883.

‡ Population of the United States: from “Compendium of Tenth Census Report,” Introduction, p. xxx, and Report, p. 8:—

	Town Population 8,000 and over.		Rural Population.		Total.	
1840	1,453,000	8·5	15,616,000	91·5	17,069,000	100
'50	2,897,000	12·5	20,294,000	87·5	23,191,000	100
'60	5,072,000	16·1	26,371,000	83·9	31,443,000	100
'70	8,071,000	20·7	30,487,000	79·3	38,558,000	100
'80	11,318,000	22·5	38,837,000	77·5	50,155,000	100

In England the same process has been going on simultaneously with the great stream of emigration which has transferred millions of our population to other countries. The phenomenon is too familiar to be insisted on, though the exact extent to which it has been displayed is less clear. The distinction between an "urban" and a "rural" district is, and perhaps must be, arbitrary, and in many cases unsatisfactory; it is not always easy to decide, officially or otherwise, who is a townsman and who is a peasant. But it is roughly estimated* that whereas thirty years ago the population of England supported by agriculture was about equal in number to that supported by manufacturing industry, the proportions are now approximately as to two-thirds manufacturing, and as to the remaining one-third agricultural. Passing over the fact that in many cases a manufacturing population does not cease to be rural, and bearing in mind that the question is as to the comparative welfare of townsman and peasant respectively, a comparison of the birth-rate and death-rate in town and country does not show so preponderating a balance as is usually imagined to exist. A net normal increase in the English agricultural population of 14.135 per thousand as compared with an increase in the towns of 14.030, or a balance in favour of the former of 1 per thousand, is but a narrow margin of advantage. Nor is it the largest cities that are the most attractive to new immigrants, since we find that the rate of increase varies inversely with their size, and that during the last ten years the population of towns of under 20,000 inhabitants has increased almost exactly as fast again as that of towns of 50,000 and over. On the other hand, it is precisely during the evil times of 1841-51, the evil days of "Sybil," of "Mary Barton," of "Sartor Resartus," recently quoted by Mr. Giffen,† when the increase of the population was the slowest, that the proportion of the population supported by agriculture reached its highest point. And if we compare the vital statistics as a whole of our present town dwelling population with the more rural one of 1838-54, as presented to us by Mr. Noel Humphreys in a recent paper read before the Statistical Society, we do not find that the conditions of town life have told adversely on the population of the country as a whole. Mr. Humphreys answers the question, "Do we have a greater enjoyment of life as the result of a decline in the death-rate, or are we only a little slower in dying?" by demonstrating that "although a large propor-

* *Journal of the Statistical Society*, June, 1886, "Occupations of the People."—Charles Booth.

† "Progress of the Working Classes," *Journal of the Statistical Society*, March, 1886; see also Tooke's "History of Prices," 1848, vol. iv, pp. 56 and 57, as to the effect of the stoppage of flow of population from country to town in 1842-44.

“tion of people cease to be dependent before 20, and a large
 “proportion of people do not become dependent at 60, we shall
 “not be far wrong in classing the forty years from 20 to 60 as the
 “most useful period of man’s life. Of the 2,009 years added to
 “the lives of 1,000 males by the reduction of the death-rate in
 “1876-80 (as compared with 1838-54), no less than 1,407, or
 “70 per cent., are lived at the useful ages of between 20
 “and 60.”*

Nor did the Anthropometric Committee, appointed on the recommendation of this Section in 1875, which carried on its work until 1883, verify by its observations the generally prevailing notion that the population of the kingdom is degenerating. The observations of the Committee were on a comparatively small scale, but as far as the opportunities and resources of the Committee enabled them to be carried out, they showed that although in average height and weight the peasant in this country is superior to the artisan, as might be expected from the conditions of an outdoor as against a mainly indoor life, the stature and weight of factory children has decidedly increased. “The increase in weight
 “amounts to a whole year’s gain, and a child of 9 years of age
 “in 1873 weighed as much as one of 10 years in 1833, one of 10
 “as much as one of 11, and one of 11 as much as one of 12 years
 “in the two periods respectively.”†

I have dwelt briefly on the subject of vital statistics, as being perhaps the most important subject of inquiry that can come under the consideration of the statistician or the economist. “That which
 “does no harm to the State does no harm to the individual;” we may state conversely this maxim of Marcus Antoninus, and claim that which is beneficial to the individual is beneficial to the State; and if the prolongation of life be, and be rightly, an object of universal aim, it is especially desirable that we should inform ourselves accurately as to whether we are living under conditions favourable to its prolongation. And if we can prove to demonstration that this is the case, and that the average duration of life at the period when life is most useful and most enjoyable has increased, we shall have made one step necessarily preliminary to the inquiry, how far this has been due to the common sense of the community rightly left alone, and how far to regulation by the State of man’s apparent inclination to choose the evil rather than the good.

I do not propose to discuss here the precise extent to which the Factory Acts, Sanitary Acts, the greater recognition of the necessity for providing open spaces in large towns, or play-

* *Journal of the Statistical Society*, June, 1883, p. 204.

† “Report of British Association,” 1883, p. 298.

grounds and recreation for their children and inhabitants, have contributed to the results which have been obtained. I would rather limit myself to pointing out how, in such an all-important subject of inquiry, the utmost diligence is necessary if we would escape dangerous error. The population of a great city is not a mere inert mass of units, to be counted and compared with other similar aggregations, as we count and compare tons of iron or bales of cotton in stock. Before we can arrive at any pronouncement as to its welfare or otherwise, we must take into consideration many factors besides its actual population at successive periods, or its birth-rate as compared with its death-rate. I may cite for one or two instances of these disturbing causes the admirable essay by Mons. E. Cheysson, to which reference has already been made. He shows clearly how in the case of Paris the birth-rate is raised by the many cases in which provincial shame and crime seek concealment in the metropolis, and how the infant mortality of the city, frightful though it be,* is diminished by the custom of sending the children to be nursed in the country, with the apparently paradoxical result that of 1,000 births there are remaining but 421 of between 1 or 2 years of age, while there are 465 of 2 years and over. Again, the various motives which have their expression in attracting a vast immigrant population to Paris, place the city in some respects in the position of a new colony; the immigrants are of the age of the greatest vigour and energy, and consequently the population of Paris between the age of 15 and 25 years is greatly in excess of that at even the earliest years of life. The disturbing influence which this state of things must exercise on the birth- and death- tables is obvious, and should serve to warn us how careful we must be in arriving at what on a previous page has been referred to as a "primary statistical quantity" in matters of vital statistics, before applying to it the "scientific procedure involving the employment of "statistics" of Professor Ingram.

It is therefore satisfactory to know that at the first meeting of the International Statistical Institute it will be proposed that the first work of the Institute shall be to consider what are the points in regard to vital statistics that it is most essential to be informed upon, and how far it may be possible to assimilate the returns in such matters of the civilised countries of the world. No better or more useful contribution to economic knowledge could be made by

* "La mortalité des petits Parisiens est affligeante; ils vont, suivant un mot populaire, 'paver' les cimetières des campagnes, où on les envoie en nourrice. Il n'en subsiste plus que la moitié environ vers la deuxième année, lorsque tout ce qui n'est pas mort est rentré à Paris."—"Question de la Population en France," &c., p. 22.

the distinguished statisticians whom the formation of the Institute has brought into relation with each other.

I cannot conclude the remarks which I am on this occasion permitted to make without reference to another subject which must be one of engrossing interest in a commercial centre such as Birmingham. The subject of currency and prices seems to me to be one as to which the economist, whether orthodox or latitudinarian, is distinctly waiting on the statistician. Has the currency of the world fallen, through interference here, and non-interference there, into a condition that has told adversely on the commerce of the world? In what year, or during what period of years, were prices at the normal level which may serve as a starting point? Have prices since then fallen all round, and if so, by how much? or if they have not generally fallen, to what extent have they fallen in the cases in which the fall is admitted? These are clearly questions that should be definitely answered before we can discuss, except as a matter of speculative opinion, whether that fall has been to the advantage of the community as a whole or otherwise. But statisticians are not only divided in opinion as to the answer to the preliminary questions, it may be almost said that the opinion of no two are in accord. It is true that the investigation of the variation of prices by means of an "index number" seems to offer a means of forming some definite conclusion; but it must be admitted that the attempts to arrive at anything like a satisfactory index number have as yet been very far from satisfactory in their result. It cannot be maintained that any comparison of the fluctuations in price of a selected number of principal articles of export or trade, or even of the ratio of all the articles dealt with in the "Statistical Abstract" to the whole volume of foreign trade can ever furnish a measure of the many sources of expenditure that make up the total cost of living. The inquiry is one that seems at the first blush attractive almost to fascination; and it is one that has for many years past exercised the ingenuity of careful thinkers. Mr. Joseph Lowe* more than sixty years ago devised a plan to which Mr. Poulett Scrope, writing ten years afterwards, appears to refer in the following passage: "It has been proposed to correct the legal standard of value (or, at least, to afford to individuals the means of ascertaining its errors), by the periodical publication of an authentic price current, containing a list of a large number of articles in general use, arranged in quantities corresponding to their relative consumption, so as to give the rise or fall from time to time of the mean of prices, which will indicate with all the exactness desirable for

* "The Present State of England." London, 1823, pp. 333—346, and Appendix, pp. 95—100.

“commercial purposes the variations in the value of money, and enable individuals, if they shall think fit, to regulate their pecuniary engagements by reference to this “Tabular Standard”*

Mr. Poulett Scrope, holding alarmist views as to the appreciation of gold, as shown by the tables of average prices drawn up by the Board of Trade for 1819-30, cordially approved such a plan; it was also shadowed forth by G. R. Porter and Thomas Tooke, the first part of whose “History of Prices” appeared almost simultaneously with Poulett Scrope’s book. The name of Thomas Tooke and his work will always be associated with that of the late Mr. Newmarch, by whom the idea of an index number was further developed. The late Professor Jevons applied to the same subject his usual painstaking skill,† and it has only the other day been brought under the notice of so practical a body as the London Institute of Bankers by Professor Marshall,‡ in the discussion of a recent paper by Mr. Giffen. An ideal index number is not inconceivable; if attained it would give us not only the ratio between commodities so called as among themselves, but also the ratio between commodities generally and the precious metals which serve as the medium of barter between them. But the attempt to arrive at it is attended with infinite difficulty; the almost innumerable total of commodities is not, even when ascertained, a number of articles to be measured in height by an arithmetical scale, but rather a series of circles, sometimes concentric, at others mutually intersecting to a greater or less degree until the space left to each is a matter of the most elaborate and intricate calculation. To take an apparently very simple instance, if we would attempt to investigate the fall in the price of pig-iron, we may find ourselves involved in the consideration of an antecedent fall in the freight charges on Spanish hæmatite ore, no less than in that of a simultaneous fall in wages, consequent on a reduction in cost of food products consumed by the wage earners at the iron works; or we may have to take into account a decreased demand coincident with the development of a more economical and safer system of coal mining. The complexity of the conditions has led French statisticians to regard with very great suspicion the system of index numbers, if not to reject them as altogether misleading. I cannot myself share this scepticism. Without expressing an opinion on the economic effects that might arise from the establishment of a “Tabular Standard of Value,” I cannot but think that from a patient investigation of this arduous

* “Principles of Political Economy.” London, 1833, p. 406.

† “Money and Mechanism of Exchange,” p. 333; *Journal of the Statistical Society*, June, 1865; Letter to “Economist,” 8th May, 1869.

‡ “Journal of Institute of Bankers,” June, 1886.

subject good results may follow, and that to the elaboration of some such common measure as an effective index number, we must ultimately look for the determination of the degree of prosperity or otherwise of trade at any given period of time. The valuable paper contributed by Mr. Stephen Bourne to this Section at Aberdeen* has served to show what has been done in this direction; and still more recently Mr. Palgrave† has constructed index numbers for England and France, extending from 1865 onwards, in which the relative importance of each commodity included is estimated and a value put on it; thus meeting the objection of the French economists, that in our index numbers we do not sufficiently distinguish the importance of each article. I cannot imagine any greater service that this Section could render to economic science than an elaboration of this most valuable adjunct to statistical and economic inquiry.

I do not venture to avail myself further of the licence as regards time which is accorded to me by custom in addressing you. The address of a Sectional President, unknown, I believe, in the earlier years of the British Association, and of comparatively modern origin in this Section, has attained in the hands of my predecessors in this chair a high standard of excellence. Of the difficulty of maintaining this standard I am only too sensible. The conception and elaboration of the observations which I have laid before you have been attended with grave doubts on my own part whether I should not have done better in working up some point of economics or statistics that has either come directly under my own observation and attention, or that would have been of immediate interest at this present time, and in this particular place. Of such there would have been no lack, and for taking such a course there would have been ample precedent. But it appeared to me that the address of a President to the Section should, unless there be some special reason to the contrary, be something more than a Sectional paper, emancipated from the ordinary restrictions as to length, and by courtesy almost equally sheltered from the free criticism to which Sectional papers are subjected. I have preferred to attempt, inadequately though it may be, to show how narrow are the limits which divide economic from statistical inquiry, how inseparably associated they must ever be, how wide is the sphere of their joint action, and how cognate in their method they are to other branches of research which are inclined to arrogate to themselves exclusively the prerogatives of

* Printed *in extenso* in "Report of British Association," Aberdeen, 1885.

† "Third Report of Royal Commission on Depression of Trade," &c. (C-4797). Appendix B, pp. 312—90; "Memo. on Currency and Standard of Value in England, France, and India," by Mr. R. H. Inglis Palgrave.

science. In selecting for special, though cursory, mention, two points of particular interest to the economist and the statistician, namely, vital statistics, and that fluctuating basis for the estimate of wealth which we call the standard of value; in pointing out how specially these are subject to those disturbing influences which Professor Cairnes* has specially taught us always to reserve in matters of economic speculation; and in admitting how tentative have been, and still are, our efforts to grasp the complexity of their conditions, I trust that I have not in any way derogated from the dignity of the cause which we are here assembled to advocate and to advance. The formulæ of economics and the lessons of statistics may not in all cases have been universally received or practically laid to heart; the ever-varying conditions of society may enforce a constant change in the appearance of social phenomena, and may lend an appearance of uncertainty to our conclusions, but it is not in this place, nor is it at the present time, that we need fear to meet the question, What has the science which you are investigating done for the good of mankind?

* "Logical Method of Political Economy," Lecture III, p. 85 (edit. 1875), *et al.*