THE INTERPRETATION OF IRISH STATISTICS.

By Professor C. H. Oldham, *President.*

[*Read Friday, 28th November, 1924.*]

The Interpretation of Irish Statistics is chosen as the subject of this Address because I have wished to draw attention to the main object of our Society. I have also the hope that by illustrations I may succeed in recommending the scientific use of statistics to persons who want to gain a truer insight into Irish social problems. Our Society has had a long history, and if it were properly supported it might still prove itself to be a useful institution of our country at the present time.. We began seventy-seven years ago, as the Statistical Society of Dublin for promoting the study of Statistical and Economic Knowledge. In 1850 a branch society—the Social Inquiry Society—was formed to defray the costs of accurate and systematic investigation into many questions that were then absorbing public attention and for which legislation was required. The two Societies were in fact amalgamated from 1855, the "Social Inquiry Fund" being still kept distinct in the finances; but not until February, 1862 (when the Society was being reorganised after it had ceased using the premises of the Royal Dublin Society for its meetings) was the name changed into the Statistical and Social Inquiry Society of Ireland. Also the object of the Society was at that time extended to embrace all questions of Social Science. From our Society we try to exclude religious differences and party politics. We do not intrude into the province of the politician by taking practical action as a Society to push social reforms. But it may well be our business to discover and to demonstrate, by the application of scientific principles, the legislative action appropriate to a certain phase of Society and to a certain group of economic conditions. The aim of our researches and discussions is to enlighten the mind with knowledge, to overthrow error and to establish truth in the plane of opinion. Our Pole Star is Truth,

our faith is that where Truth is comprehended it will prevail: thus, without sitting in the councils of State, or mingling in the strife of parties, we believe that our work here in this Society may do something towards the improvement of the institutions of our country.

I will speak first of the nature and use of statistics. Mr. Henry W. Nevinson, who accompanied Mr. MacDonald on his motor journey through Great Britain during the October Election Campaign, has written for the *New Leader* (October 24 and 31) his impressions after that remarkable experience, and I will quote here one personal statement by this highly-gifted journalist, viz. :—"For myself, I was, unfortunately, born incapable of realising man in the mass. I suppose that is why I have never joined the Fabian Society. Blue-books and statistics mean nothing to me. . . . But when I see and speak with the actual men and women in our great industrial districts, when I know their homes and can follow their way of life from hour to hour, then I begin to understand the meaning of work, poverty, and unemployment." Now I suggest that, like Mr. Nevinson, *we are all born incapable of realising man in the mass.* We have to acquire that capacity with long, patient, persistent, tiresome toil, feeding the mind with an indigestible diet of blue-books and statistics, which has to be chewed and masticated again and again (like grass, in the compound stomachs of ruminants) before it can be utilised as material for the formation of a judgment or opinion. Without the use of measurement this thing cannot be done. The knowledge of social man, of man in the mass, cannot be acquired by a hasty generalisation from a narrow and limited experience: that is the error of the "practical man," and Mr. Nevinson only deceives himself when he tells us in the above passage how he "begins to understand the meaning of work, poverty, and unemployment." His personal observations of "the actual men and women in our great industrial districts" must be translated into the uncouth language called "Statistics," and that difficult language must be interpreted, before he can begin to understand such highly complex phenomena as "work," as "poverty," or as "unemployment." Does this seem too hard a saying? Then are we now ready to learn about the nature and use of statistics.

Recollect clearly that we are contemplating the study of social man, of man in the mass, of man as a member of Society. What we call statistics is etymologically connected with state or condition: just as the word statist means etymologically the same as statesman, one skilled in handling the problems of men grouped in masses. Now statistics is the collection of *measur-*

able facts which relate to man's social condition, i.e., unless the facts directly bear on our social relations we exclude them as being not statistical facts. The statistics method has always to be used whenever we are discussing the massed facts of social reforms: and (forgive this aside!) in most cases it is badly misused. The late Professor Marshall said (in Evidence to the Committee on the Census, 1890) that statistics are "the straw out of which the economist has to make bricks"; and (forgive the aside!) half-baked bricks have weakened many economic structures. Now the use of statistics is certainly wider than its use in Political Economy, which is but one of the social sciences: that one which regards man as a being who makes exchanges. But still let us notice how statistics can help Political Economy, and also how Political Economy helps statistics.

Political Economy is a mixed science: (i) of facts, found by observation and reduced to measurement if possible; (ii) of principles of abstract reasoning applied to the facts. Now, *perhaps,* the facts are incomplete, *perhaps* the reasoning is fallacious: *what then?* Why then the economist will go wrong. The frailty of human intellect when it attempts to handle these highly complex matters will often make him go wrong. Either there was a too hasty generalisation from particular facts, so that other facts were overlooked of which account ought also to have been taken; or else by fallacious reasoning he was led to wrong conclusions from the known facts. When this happens, when the economist's bad principles have led him to false conclusions, *how is it discovered to be wrong?* By statistics: which soon demonstrates that the record of facts has turned out to be quite different from what the false conclusions had led us to expect. That is the use of statistics to correct bad economics. This is a very common case, and I now submit that it is a case likely to occur in the Irish Free State. People who have very good intentions may here or anywhere put into operation bad economics. I assert the axiom that the economic consequences of man's actions are not kept right by anyone's good intentions, but are determined by economic laws which work out whether we ignore them or not: the consequences are sometimes the exact opposite of what was intended. Statistics are needed to exhibit how far the result has corresponded to our good intentions. Is not that a strong reason why Irish Statistics must be now improved and why we must begin to learn how to use them properly?

Again, I would point out, on the other hand, how Political Economy can be a help to statistics. "The mere huddling together of facts without regard to the deduction of any vital

truth from them burdens the memory without enlightening the understanding. We require to go further and endeavour to attain a knowledge of their causes. It requires a philosophic mind to determine whether there be a link of causation, or whether the coexistence be casual. When a multitude of facts is presented, it is only the mind prepared and purged by much practice in economic reasoning that can *seize on* those that are important and pregnant with consequences, *reject* those that are fortuitous, and, above all, *connect fact with fact* in a chain of causation, so as to arrive at general truths—the great desideratum in all scientific investigations!" (Condensed from James Anthony Lawson, in Vol. I., Transactions of Dublin Statistical Society.) It delights me to quote this noble statement from the first contribution that was ever read at a meeting of our Society (December 22, 1847). In these words Mr. Lawson lifts the use of statistics to a very high point. The pertinent facts of any department of social science must be expressed quantitatively (*i.e.*, reduced to measurement) in the form of statistics; then the philosophic mind, trained to wisdom by much familiarity with the manifold shapes of detected errors, must brood over the interpretation of the statistics till it can read the significant meaning that lies latent in the figures; only on rare occasions, and by a lucky thought, the link of causation that connects fact with fact may emerge into view, and the human mind reaches out to the perception of some general truth. That is the only method by which the human intellect can study a social problem, can acquire a knowledge of man in the mass. The statesman must begin by being a statistician. "Statistical knowledge, when judiciously used, forms a sure and safe basis for legislation; and for a statesman to legislate for a people, with whose social condition he is not accurately acquainted, is as absurd as it would be for a physician to prescribe by hearsay, without examining the symptoms of the patient and the history of his case." (James A. Lawson, *id.*)

I have called statistics an uncouth language. But few persons in Ireland have yet learned how to read in this language, how to interpret statistics when laid before them, how themselves to employ statistics in a way which conveys some intelligible meaning to others whom they wish to instruct. The main object of our Society is to give our members opportunities for acquiring and practising the use of this language. Irish Statistics are hieroglyphics that express chunks of Irish Life to those who can read them. The interpretation of Irish statistics is specially troublesome because the statistical material here is so fragmentary, so blotted all over with inaccuracies, published in such an undigested unintelligible form, and charged for at

quite prohibitive prices. We are said to be a quick-witted people here in Ireland: most of us are far too quick to have much capacity for accuracy. "No one should attempt to use statistics," writes Professor Arthur L. Bowley, of the University of London, "unless he is prepared to devote considerable time and thought to ascertain the exact meaning, nature, and limitations of the particular reports (blue books) which relate to the subject in question." (*Official Statistics: What they contain and How to use them,* 1921, Humphrey Milford, 2s. 6d.) But British Statistics is now a well-mapped territory, with guide-books and direction-posts at most of the difficult corners where one might go astray. Irish Statistics were at one time better done than British: that was in the early days after the formation of our Society. But, since the partition of this country and the beginning of the Free State, our Irish Statistics have largely disappeared; the whole territory is now a chaos; and an immense work is waiting to be done by the present generation of Irishmen in the reconstruction of our statistical records, the interpretation of the figures, and their presentation to our legislators and journalists in a form that is capable of being understood by ordinary people. There is to-day an opportunity for our Society to attempt a great service to our self-governed Ireland if we could now attract into our ranks a number of workers who would patriotically co-operate together for the improvement of Irish Statistics. It might be possible, after some ten years of carefully-planned spade work, for us to bring out a Statistical Abstract for the Irish Free State, covering the whole field of our national life, which would supply accurate information for our own use and which would remove what is at present a real reproach, a stigma of incompetency, upon our people. A people that is unable to properly use statistics is not yet capable of self-government.

I direct your attention just here to the publications now annually issued from H.M. Stationery Office, London, called *Guide to Current Official Statistics of the United Kingdom.* They are prepared by the "Permanent Consultative Committee on Official Statistics"—a new body, located in the Government Actuary's Department, Treasury Chambers, Whitehall, London, S.W. 1. For the price of 1s. you get a clearly-arranged volume of above 300 pages, which is a systematic survey of all published statistics designed for the ordinary man who is not an expert. The Second Volume, covering 1923, is dated July, 1924, and was issued in September. I would point out that *Ireland is not dealt with at all in this "Guide,"* except when H.M. Stationery Office has published something about Ireland. What we want is an Irish Supplement to this Guide, prepared

in our Free State Treasury and issued by our Stationery Office, designed for the ordinary Irishman who is not an expert: who should be able to find there (price 6d.) a similar Annual Survey of all publications (with Subject—Index and Key to statistical contents) issued about Irish Statistics by our Government Departments. Such a Guide to Irish Official Statistics is the piece of "Pears' Soap" that our turbulent Irish Baby really wants, and he won't be happy till he gets it. It is work that Ireland wants done; that Irishmen must do; and that the members of this Society ought to undertake.

Statistics, although expressed in figures, are not mere arithmetical symbols: they are measurements of massed facts; and to be able to read their meaning one must use a great deal of knowledge in order to penetrate to the massed facts and to see what the figures really say about them. The figures are not scientific evidence to any thinking mind unless we know by what method the measurement of the massed facts was done. I will illustrate this by directing your attention to what seems to me to be a statistical joke. It is in the Final Report of our Commission on Agriculture, dated 11th April, 1924. The "far-reaching importance of agriculture in An Saorstat" is surely sufficiently obvious. But the Commissioners think that proof should be given, and they write: "The most convincing proof of this fact is afforded by the following estimate of the exports from An Saorstat during 1922:—Farm produce, 68 per cent.; Raw material, 4 do.; Manufactured goods, 15 do.; Drink and Tobacco, 13 do." Is this statement a "convincing proof" of anything? The exports from An Saorstat have not been collected for 1922, and are not known to anybody. Statistics for All Ireland were last published for 1921, and for An Saorstat the publication of exports statistics commenced only with the month of January, 1924, first issued at the end of March. The quotation talks of the "following estimate"; but we are not told (1) who made the estimate, (2) on what data it was founded, (3) how the Agricultural Commission learned about this estimate. I happen to have read a speech in the Dail on 23rd January, 1924, in which Mr. P. Hogan, Minister for Agriculture, used these same percentage figures. He was at once challenged for his authority in stating these percentages, and Mr. Hogan is reported as replying: "The figures are published. I did not get them from my Department. I confirmed them in my Department. Before coming to a debate like this, I thought Deputies would have taken the trouble of getting the facts in regard to our industries. . . . The Deputy admits that those are the figures." Now, really this is not serious, not real speech—I take it to be a joke, a bit of daring debating bluff.

Yet the whole prestige of the Government was flung in: "I confirmed them in my Department!" It would seem therefore that the Commission of Agriculture was gullible enough to swallow Mr. Hogan's percentages, and even to serve them up in their Report as "the most convincing proof" of the quite obvious fact in question. But that is carrying the joke too far. My point is not that the figures quoted are wrong—nobody knows, and nothing turns on their correctness: my point is that *these figures are not statistics at all, and are not scientific evidence of the facts.* The term "estimate" in these matters does not mean a mere guess *in vacuo;* it means a judgment formed upon evidence even if the evidence be incomplete. But no authority attaches to any estimate beyond the personal repute of the estimate-maker (who in this case is unnamed—a suspicious fact in itself!); and his reputation depends entirely on his readiness to disclose the evidence upon which he bases his estimate. I only here refer to this absurd incident in order to illustrate this proposition, viz., that no statistics ought to be allowed to influence the judgment until interpreted, and it is impossible to interpret the actual meaning conveyed by the figures until we know how the massed facts were measured, how the statistics was made up. Whenever statistics are published, we should be told by what methods the statistics were collected, and put into shape for publication.

I venture once more to illustrate the same point by quoting next an example of very fine statistical evidence where this disclosure of the methods used was also omitted. In the *Manchester Guardian Commercial,* May 10, 1923 (Second Irish Number) Mr. D. Twomey, A.R.C.SC.I., of the Irish Department of Agriculture, gave the following statistical table in order to compare Ireland with other countries as regards Live Stock, viz.:—

Persons and Live Stock per 1,000 Acres of Total Area.

	Persons.	Cattle.	Sheep.	Swine
Ireland	215	242	178	52
England	1,045	156	445	70
Scotland	245	61	300	8
Wales	424	158	743	47
Denmark	296	236	77	155
Holland	770	250	104	167
France	303	112	126	53
Switzerland ...	382	146	16	58

Notice the absence of dates from this table.

For my Class at the University Mr. Twomey's figures were put on the blackboard, and we proceeded to interpret them. To read them with any insight *we had first to find out how Mr. Twomey had got the figures*: but on this essential point he gave no guidance. We consulted the British publication called "Statistical Abstract for Foreign Countries," Cd. 7525, which was last issued in 1914, price 2s. 2d., giving figures for years 1901 to 1912. (I regret that its publication has been discontinued.) We got there these data :—

(*a*) Total Area (omitting lakes, rivers) in Acres=Denmark, 9,468,000; Holland, 8,038,000; France, 130,801,000.

(*b*) Latest Population of Persons (1911)=D., 2,757,076; H., 5,858,175; F., 39,602,258.

(*c*) Cattle (all sorts)=D., 2,253,982; H., 2,026,943; F., 14,705,900.

(*d*) Sheep and Lambs=D., 726,870; H., 889,036; F., 16,467,700

(*e*) Pigs=D., 1,467,822; H., 1,259,844; F., 6,903,750.

No particulars for Switzerland were in that Statistical Abstract; but we got from the "Statesman's Year Book, 1921," that her Total Area=10,200,000 acres, but included Lakes=300,000 acres; so we put it down as 9,900,000 acres. Also her Population (1910) was 3,753,293. We could not find the Live Stock for Switzerland there. But we found in Webb's *Dictionary of Statistics* that, as long ago as 1906, Switzerland had Cattle=1,497,900; Sheep=209,200; and Pigs=548,400. We could now, by numerous *rule-of-three* sums, calculate the foreign part of Mr. Twomey's Table; and we worked out the following *replica*:—

Persons and Live Stock per 1,000 Acres of Total Area.

	Persons.	Cattle.	Sheep.	Swine.
Denmark	291	238	77	155
Netherlands ...	729	252	110	158
France	303	112	126	53
Switzerland ...	379	146	20	54

You will notice how close our results were to Mr. Twomey's figures; for France they were quite identical. Any discrepancies are probably due to the fact that, in the records of his Department, Mr. Twomey had access to more recent

Consular Reports which gave him figures more up to date. Some of our data were ludicrously old, all prior to 1912, some prior to 1906. Nevertheless every lesson taught by Mr. Twomey's Table was also corroborated by our antiquated version. This will show you how slowly changes happen, how stable is the economy of all countries, how the facts revealed by statistics of a single year may be regarded as almost stereotyped by the permanent natural conditions of each country. After one has discovered this striking unexpected *permanency in the facts,* one realises how important is Statistics as a method whereby the human mind can grasp the significance of facts in the mass. After that class-exercise my students had acquired for themselves a new mental power, the faculty of using statistics as scientific evidence in the study of social questions. We had now placed ourselves in a position to interpret Mr. Twomey's statistics. We not only knew that we could rely on him as an honest and competent statistician, but we could rely on ourselves that we really knew what his figures meant. They now shone like figures of fire into our intelligence because we had interpreted them. Yes, but was it right for Mr. Twomey to put us to all that trouble? Had he dropped a few remarks where his statistics came from he would have caused his figures to shine with significance to his readers' mind exactly as they shone in his own mind. Was he too lazy? Was he too timid lest he would overload his page with too many figures? Foolish timidity! Could he expect to be understood unless he revealed the foundations on which his Table was built? It is a table skilfully formed and pregnant with meaning. To make Irish facts significant to Irish people the only way was to make such a comparison between Ireland and other countries. To compare bulk figures would have been futile: the comparison had to be based on relative figures, per 1,000 acres of Total Area, before it could shine with significant meaning. It would have been better if it were per 1,000 acres of "Cultivatable Land." But the absence of statistical material often compels the use of the second best. It was wrong not to name the sources of his figures: that omission made the Table sterile of meaning to most of his readers, who will have merely skipped past it as unreadable. Why did he nowhere state the dates of his figures?

I mean by this illustration to assert that statistics cannot be understood except by people who themselves can make some effort to handle statistical material. Statistics is a language, like Russian or Persian—*i.e.,* I understand that both these languages are very difficult to learn, and that few persons in Ireland have learned to read in them. If anybody imagines that

it is an easy thing to use Irish Statistics to obtain a knowledge of Irish Life and Irish Economy, I hope he will allow me to say that I, too, once was young and found things easy. *Et in Arcadiâ ego!* But others will bear with me while I complete that quotation from Professor A. L. Bowley which I began some time ago, viz. :—

> " Statistics on any subject have generally a long history. In the beginning an organisation had to be initiated to collect records of those things connected with the subject which it was anticipated could be counted or measured. Experiment showed what facts could be ascertained and where the organisation was weak; criticism and analysis defined and interpreted the meaning of the totals and averages obtained, and showed their relation to the facts of which knowledge was desired. The organisation was gradually improved, new methods were devised for making good deficiencies, the meaning of the totals was modified and new definitions were necessary. When one has followed the process by studying successive reports or by reading a well-informed book or article on the subject the limitation and meaning of the totals can be appreciated; failing this, the best plan is first to think out for one's self what one would expect or wish to be included in a total (*e.g.*, of the number of persons unemployed), then to read very critically word by word the heading, explanation and notes in the summary (always inserting some such phrase as ' recorded by ' or ' reported to ' or ' computed by ' the department concerned), and then to get the larger report (blue book) on which the abstract is based and study whatever information is there given about the method and purpose of the investigation. *The critical faculty should be very alert when statistics are in question;* the published heading may be pedantically and officially correct, but it will not contain such a statement as this : ' every word is used in a technical sense and has a special meaning only known to the officials who made the compilation, the part that is not recorded is more important than that which is, where the facts are not known an estimate has been made by a method which cannot for departmental reasons be divulged, and the method of computation has been modified since the last issue of the numbers '—yet part or all of this is sometimes implied." (Bowley, *id.*)

Most blunders in the use of statistics are caused by taking things as granted, according to common sense or common knowledge, because one will not be at the tedious trouble of

testing whether this assumption or common-sense inference is the same thing as real information. Thus people who know that the Irish Census is an organisation to ascertain just that particular, will assume offhand that *if they quote the figures of the Population of Ireland from the actual Census Report* they will be all right. But will they be all right? Look at the following Table:—

POPULATION OF IRELAND.

Year.		Irish Census.		Statistical Abstract.
1821	...	6,801,827	...	6,801,827
1831	...	7,767,401	...	7,767,401
1841	...	8,175,124	...	8,196,597
1851	...	6,552,385	...	6,574,278
1861	...	5,798,967	...	5,798,967
1871	...	5,412,377	...	5,412,377
1881	...	5,174,836	...	5,174,836
1891	...	4,704,750	...	4,704,750
1901	...	4,458,775	...	4,458,775
1911	...	4,390,219	...	4,390,219

The Statistical Abstract is here different from the Census (which it is summarising) for the two dates, 1841 and 1851. To understand why it gives two different figures the reader must himself supply two bits of information, viz.: (*a*) Before 1861 the Irish Census did not count among the Irish Population the members of the Army and Navy present in Ireland on the Census Night. After 1861 the members of these forces were counted among the Population. The Statistical Abstract has corrected (by the use of military records) the Census figures for 1841 and 1851 in order that the statistics given may be comparable from end to end of the Table. And for other reasons. (*b*) The Irish Census figures for the years 1821 and 1831 are known to be quite unreliable because the Census organisation of those years was very imperfect, and those totals cannot be said to be known at all. The Statistical Abstract did not correct 1821 and 1831? Either the military records were there unobtainable or the absurdity of correcting a figure that was itself absurd made the thing too ludicrous. But our Irish histories and best writers still go on quoting the fall of Ireland's Population as from the Census Reports; if figures must be quoted of course they ought to be quoted correctly. I merely draw your attention to this small point to illustrate the general principle that common sense is not sufficient, is not a substitute for real information, when we are using statistical records.

Every statistics about Ireland is a statement of massed facts which is unintelligible *per se.* Its significance leaps to light by comparing it with a comparable statistics: you may compare different periods in the same country (as with the Population of Ireland, above); or you may compare the same statistics, at same dates if possible, for different countries (as with Mr. Twomey's Table for Live Stock). Now, both are desirable; and each puts in a fresh meaning, makes the figures shine with a different colour of light. But here we can easily delude ourselves: unless we know that the basis of the figures and the definitions of the massed things are nearly the same, the two figures ought not to be compared, because they are philosophically incomparable. Thus, an "emigrant" in our Irish Statistics means one who leaves our Ireland (not the Free State administrative area only) in a passenger ship, with intention to reside permanently outside of Ireland: in British statistics, he is not an "emigrant" unless he intends to reside permanently outside of Europe, and he can leave by a cargo ship. Clearly the Irish and British statistics about emigration are incomparable: yet respectable publicists make this silly comparison continually. All the best known and most reiterated statistical arguments (*e.g.,* Imports and Exports of rival countries) are usually reduced to rubbish by this error. The public are officially supposed to be experts who have got all the information needed in order to interpret the meaning of the figures. But when great public expense is incurred issuing statistics, there should accompany the Irish figures as much other information as is wanted in order to make the figures intelligible. The Railway Statistics now being published by the Irish Free State are very expensive to buy: I have myself found them entirely unintelligible. The Trade Statistics as now published are being very much better done; and when we do get the annual report I feel hopeful that great help will be given to enable the public to interpret the figures.

The principles of interpretation so far referred to (by the comparison of different times or countries) are applicable to the statistics of any country that has got long statistical records. But Irish Statistics also require a peculiar handling of their own before they can be properly interpreted. This unique feature of Ireland is that here alone we have a country with a dwindling population—witness the statistics above quoted. This fact itself is supposed to be well known: but the neglect of statistics among us Irish is such that perhaps this fact is not sufficiently known. Let us consider this feature of Irish Life from various standpoints: I will select just two aspects as

samples. (I.) Take the Adult Population (aged 20 years and up). We find the following facts in the Irish Census :—

Census.	Male Adults.	Female Adults.	Total Adults.
1881 ...	1,337,516 ...	1,464,374 ...	2,801,890
1891 ...	1,264,973 ...	1,360,802 ...	2,625,775
1901 ...	1,277,548 ...	1,355,238 ...	2,632,786
1911 ...	1,316,898 ...	1,349,673 ...	2,666,571

We perceive here that, during the last thirty years—(*a*) The Adult Population has been growing, (*b*) The movement of the Sexes has been in opposite directions, (*c*) It is the Adult Women, not the Adult Men, who are dwindling. (II.) Take the Civic and Rural Population separately (*i.e.*, Civic=living in towns with population of 2,000 or more; Rural=living elsewhere in Ireland). The Census facts, seen from this angle, are :—

Census.	Civic.	Rural.	Total Population.
1841 ...	1,135,465 ...	7,039,659 ...	8,175,120
1911 ...	1,470,595 ...	2,919,624 ...	4,390,219

We have seen above that the Census Population for the year 1841 must be corrected, by adding 21,475 persons for the Army and Navy then present. But that correction would have meant an increase of the Civic Total only. This point alters nothing to the significance of those statistics: which show that the fall in numbers has been entirely that of the Rural Population. Take the area of Ireland as 32,000 square miles roughly: then in 1841 the figure (7,039,659) represented a population density of 220 to the square mile; while in 1911, the figure (2,919,624) meant 90 to the square mile. It ought to be clear from these two samples that the Irish people have still much to learn about even this well known fact that the population here is dwindling.

Now, this unique feature of Irish Life must not be forgotten when we try to interpret Irish Statistics. It introduces an element of paradox into economic interpretation. Because of this unique circumstance, it follows that *all those rules that we usually apply to interpret the significance of economic facts in other countries require a readjustment when we come to apply those rules to Irish facts.* Take, for examples, the growth in figures that measure Bank Deposits, Export and Import Values, Government Expenditure, and so on. Those figures grow in all countries; but the growth elsewhere is partly the

natural result of a swelling population, whereas here in Ireland these figures grow in spite of the fact that our population is dwindling. Ask yourself how are you to interpret statistics which show that the area under cultivation has been shrinking in Ireland? Is this shrinkage due to diminishing numbers merely: or is there a change in our farming capacity? The statistical answer to this question would be to compare the acreage of ploughed land with the population that remains in Ireland. The following figures represent the number of acres of ploughed land per 1,000 of Total Population, viz.:—1851, 704; 1861, 749; 1871, 701; 1881, 617; 1891, 586; 1901, 550; 1911, 535. The verdict must be that the land goes out of cultivation because the people who remain in the country will not work the land. But that single fact does not by itself warrant a pessimistic conclusion, and I could quote many other facts (such as the increased yield per acre of Irish crops) that would have a contrary significance in interpretation. I have only given an illustration of the general truth that the interpretation of Irish Statistics requires peculiar handling from the unique circumstance that this country has a dwindling population.

There is in all these cases a great field now open to Irish Civil Servants who are handling this statistical material, not only to make great personal reputations by the quality of their statistical output, but also to render great national service towards the upbuilding of our much-ruined country. Properly interpreted statistics are wanted by our legislators, administrators, merchants, manufacturers, thinkers and journalists; they are the refined materials out of which constructive plans must be formed in the brain; they are the high explosives with which practical reforms must be fought for in the boardroom, in the council chamber, in public debate and in the columns of the press. The better interpretation of Irish Statistics ought to be the main object of this Society, and at its meetings our members ought to gain a mutual improvement by resolving to pool their knowledge on this difficult subject. From this Presidential Chair I invite the co-operation of you all in the greatly neglected task of so mapping out and disentangling this wilderness of Irish Statistics that it may be transformed into a fair garden wherein every patriotically-minded man and woman will rejoice to find and to acquire renewed power for the practical handling of the problems of a self-governing Ireland. Believe me, the power of handling the massed facts of Irish Life is the power of reading the significant meaning of Irish Statistics. Let us arise and help one another to get on with this work!

ADDENDUM TO PROFESSOR OLDHAM'S ADDRESS.

In the discussion which followed after the above address, the following statement was made by Mr. John Hooper, Director of Statistics, Ministry of Industry and Commerce; and, on the suggestion of the President, it was resolved that Mr. Hooper's statement be printed.

At many points in his paper the President has referred to the unsatisfactory condition of Irish Statistics. It is to this side of the matter I wish to confine my remarks. The President used these words: "The interpretation of Irish Statistics is specially troublesome, because the statistical material here is so fragmentary, so blotted all over with inaccuracies, published in such an undigested and unintelligible form."

This is a very serious statement coming from the President of the only Statistical Society in Ireland. It is calculated to discourage persons in search of Irish Statistical material, and to shake the confidence of our present and future legislators, administrators and public in the statistics which are now available. Each part of the statement quoted is utterly wrong, although there may be some grains of truth in each.

The statement to which I attach most importance is that our Statistics are "blotted all over with inaccuracies." Professor Oldham has on many occasions drawn attention to the inaccuracies in Irish Statistics. This is the first occasion on which he makes the statement as President of this Society, and it is the first occasion that I have the honour to attend as a member, and I feel I must take notice of this particular statement.

I will take one example of the President's attitude of mind on the question of inaccuracy from the population figures he quoted towards the end of his paper. It is not a good example from my point of view, but it will suffice. He attached great importance to the apparent discrepancies between the population figures for the years 1841 and 1851, as published in the Census Reports and in the Statistical Abstracts. The apparent discrepancy for 1841 amounted to one quarter of one per cent.; the discrepancy for 1851 amounted to one-third of one per cent.

I have on several occasions come across this attitude mind towards Statistics. A few years ago a learned Doctor of Science came into my office one day, and with a very grave face informed me that he had found that our published figures did not tot. I am afraid I greatly shocked him by telling him to make them tot, as our clerks had not always time to make

figures tot nicely and tidily for the public. I found that the learned Doctor of Science had gone to the trouble of carefully totting all the figures in one of our Import and Export Reports, and in a total of something like £200,000,000 found that we had made an error of something like £29,000—an error of £1 in £7,000. I am speaking only from memory. The figures were in or about what I have said, and I hope that the President will not ask me for exact particulars. It is the attitude of mind that I want to draw attention to.

Might I suggest that the comparatively little energy devoted in this country to Statistics should not be wasted on verifying with meticulous accuracy the work of junior clerks, but should be applied to the interpretation of official figures.

In statistical offices two checks in general are adopted—one a test by arithmetic, the other a test by scrutiny. The second is by far the more important, and is assigned to a better class of clerk than the first. It ensures that, though there may be arithmetical inaccuracies, no wrong deductions can be drawn from the figures which are to be published.

There is no hard and fast measure of the degree of accuracy required in any of the affairs of every-day life, and statistics has to do essentially with practical problems. A ton of coal or even a stone of flour is not usually weighed on a chemical balance, nor is a yard of tape measured with a vernier scale. Statistics involve very large numbers. These numbers are quoted as a rule down to the unit, and it is only on this account that insignificant arithmetical errors become at all obvious and may give the impression that the statistics are inaccurate. An official statistician who makes himself responsible for spending money necessary in order to attain punctilious mathematical exactness would, in my opinion, be a waster of public money. It should, of course, always be his aim to reach exactness, but I think his duty is discharged when he has got to such a degree of accuracy that no wrong deductions can be drawn from his figures. In picturing the economic life of a whole nation we must be permitted to use the big brush. A province will require a somewhat smaller one, a county a still smaller one; but if we are to get along at all we must not be urged to ask our Ministry of Finance to supply camel-hair brushes for painting the life of the country as a whole. In my opinion our statistics are far more accurate than the statistics of most countries, simply because the machinery which our administrative offices place at the disposal of the statistician for purposes of collection is very efficient for that purpose, and also because our normal economic and social life is less complex than in most countries.

I have already referred to the fact that our social and

economic life is less complex than that in most other countries, and on this account I would suggest that it would be possible for us to get on with less elaborate statistics than they require, but I do not for a moment suggest that we should attempt to do so. I think the keeping of a nation's accounts in a very efficient form is a good business proposition from the Government's point of view. Here I am dealing with Professor Oldham's suggestion that our statistical material is so fragmentary. I contend that he has very greatly over-rated this defect.

Our largest problem from the social as well as from the economic aspect is agriculture, and we have, perhaps, the finest body of agricultural statistics of any country in the world, most of it stretching back to the year 1847. Here is the statistical evidence placed at a moment of great pressure before the recent Agricultural Commission. The hungriest statistician could not call it fragmentary, although it only pretended to be a mere skimming of the surface of available statistics, and while covering a large surface was intended merely to suggest to the Commission the sort of material that was available. I would call particular attention to the diagrams. Can the President point to anything comparable with this publication which has at any time been published by the British Government, whom he holds up in his paper as a model? (As this is the first time I have spoken in public on statistics, may I take this opportunity of expressing the gratitude that I personally—and I am sure I can speak in this matter for my statistical colleagues in other departments—feel towards British official statisticians for all the generous help they have given to us.) There are no finer body of statisticians in the world than the British, but their Government have never given them the opportunity, at least as far as I know, of producing anything of this kind. I feel freer to refer to the whole of this evidence as it was the work of a member of my staff and as I was unable to devote any attention whatever to it. In connection with these agricultural statistics I have to point out that the present methods for arriving at areas and numbers of live stock had to be devised when the old police system broke down as a result of political trouble. The present system is perfectly sound; it is better than the permanent systems in use in many leading countries, and perhaps it may be of interest to state that a leading American statistician informed me that in the United States they had arrived independently at an exactly similar system. Still I prefer the old system, and we are getting back to it and hope to have it in full running order next year. Through it we can get more comprehensive information than under the present system.

Perhaps the next most important economic statistics are those relating to Trade; they have taken up a lot of our energies for the last twelve months. I do not think that anyone can suggest that the information in our monthly trade publication is either inaccurate or fragmentary or can object to the method of presentation. As far as I know the publication has been received with general commendation. In addition to these new Trade Statistics we are still collecting and compiling all the figures relating to the Irish Free State which were collected under the old system so as to splice together as far as possible the two systems. There has been no break in the old system up to the present, but it would be misleading to publish the results of that system in so far as it relates to the Irish Free State, as that system does not take into account the land frontier trade.

We have inherited Railway, Labour and a number of other statistics formerly controlled from London, and accordingly we have inherited little or no interpretation of results from the Irish point of viw. We are therefore naturally cautious with regard to the publication of many of these statistics. We are developing all the statistics along lines suitable to the Irish Free State requirements, and will publish results as soon as possible, but our energies have been so much occupied with setting up and organising such new systems as the Trade, Shipping, Cost of Living, Emigration, etc., Statistics that we have had to be cautious with regard to the interpretation and publication of new systems. The only one set of statistics that I am really anxious about is that referring to Labour.

I am responsible for the statistics of only two Ministries, but they cover practically the whole ground of our economic statistics. The most important gap is a census of industrial production, but the Minister for Industry and Commerce has promised that this census will be taken in hands shortly.

I was shocked to learn that the President would have the patience to wait ten years for our first Statistical Year Book. I think that the officer made responsible for its publication would prove himself utterly incompetent if he failed to produce such a volume—not necessarily a perfect volume—within, say, eighteen months of being entrusted with the task.