the *Quarterly Journal of Economics* and similar publications in different countries.

*Sources whence Statistics are Derived.—*The term "statistics ” in the concrete sense means systematic arrangements of figures representing “ primary statistical quantities.” A primary statis­tical quantity is a number obtained from numbers representing phenomena, with a view to enable an observer to perceive a certain other phenomenon related to the former as whole to parts. They represent either a phenomenon of existence at a given point of time or a phenomenon of accretion during a given period. As examples may be mentioned the number of deaths in a given district during *a given time,* the number of pounds sterling received by the London & North Western railway during a given time, and the number of “ inches of rain ” that fell at Greenwich during a given time. Other examples are the number of tons of pig-iron lying in a par­ticular store at *a given date,* the number of persons residing (the term “ residing ” to be specially defined) in a given territory at a given date, and the number of pounds sterling representing the “private deposits” of the Bank of England at a given date.

*Primary statistical quantities* are the result of labours carried on either (A) by governments or (B) by individuals or public or private corporations.

A *Government Statistics.—*1. A vast mass of statistical material of more or less value comes into existence automatically in modem states in consequence of the ordinary administrative routine of departments. To this class belong the highly important statistical information published in England by the registrar-general, the returns of pauperism issued by the local government board, the reports of inspectors of prisons, factories, schools, and those of sanitary inspectors, as well as the reports of the commissioners of the customs, and the annual statements of trade and navigation prepared by the same officials. There are also the various returns compiled and issued by the board of trade, which is the body most nearly resembling the statistical bureaus with which most foreign governments are furnished. Most of the government departments publish some statistics for which they are solely responsible as regards both matter and form, and they are very jealous of their right to do so, a fact which is to some extent detrimental to that uniformity as to dates and periods which should be the ideal of a well-organized system of statistics. Finally may be mentioned the very important set of statistical quantities known as the budget, and the statistics prepared and published by the commissioners of inland revenue, by the post office, and by the national debt com­missioners. All these sets of primary statistical quantities arise out of the ordinary work of departments of the public service. Many of them have been in existence, in some form or other, ever since a settled government existed in the country. There are records of customs receipts at London and other ports of the time of Edward III., covering a period of many years, which leave nothing to be desired in point of precision and uniformity. It may be added that many of these sets of figures arc obtained in much the same form by all civilized governments, and that it is often possible to compare the figures relating to different countries and thus obtain evidence as to the sociological phenomena of each, but in regard to others there are differences which make comparison difficult.

2. Besides being responsible for the issue of what may be called administration statistics, all governments are in the habit of ordering from time to time special inquiries into special subjects of interest,. either to obtain additional information needful for administrative purposes, or, in countries possessed of representative institutions, to supply statistics asked for by parliaments or con­gresses. It ìs not necessary to refer particularly to this class of statistical information, except in the case of the census. This is an inquiry of such great importance that it may be regarded as one of the regular administrative duties of governments, though as the census is only taken once in a series of years it must be mentioned under the head of occasional or special inquiries undertaken by governments. In the United Kingdom the work is done by the registrars-general who are in office when the period for taking the census comes round. On the Continent the work is carried out by the statistical bureaus of each country—except France, where it is under the supervision of the minister of the interior. The new regulations as to income-tax assessment and the new land taxes will furnish the government with much fresh information as to incomes; and the census of production ordered in the session of 1907 and already carried out as regards a number of trades will also be useful.

B. The primary statistical quantities for which individuals or corporations are responsible may be divided into three categories:

1. Among those which are compiled in obedience to the law of the land are the accounts furnished by municipal corporations, by the Bank of England, by railway, gas, water, banking, insurance and other public companies making returns to the board' of trade, by trades unions, and by other bodies which are obliged to make returns to the. registrar of friendly societies. The information thus obtained is. published in full by the departments receiving it, and is also furnished by the companies themselves to their pro­prietors or members.

*2.* An enormous mass of statistical information is furnished voluntarily by public companies in the reports and accounts which, in accordance with their articles of association, are pre­sented to their proprietors at stated intervals. With these statistics may be classed the figures furnished by the various trade associa­tions, some of them of great importance, such as Lloyd’s, the London Stock Exchange, the British Iron Trade Association, the London Corn Exchange, the Institute of Bankers, the Institute of Actuaries, and other such bodies too numerous to mention.

.3. There are cases in which individuals have devoted themselves with more or less success to obtaining original statistics on special points. The great work done by Messrs Behm and Wagner in arriving at an approximate estimate of the population of the earth does not belong to this category, though its results are really primary statistical quantities. Many of these results have not been arrived at by a direct process of enumeration at all, but by ingenious processes of inference. It need hardly be said that it is not easy for individuals to obtain the materials for any primary statistical quantity of importance, but it has been done in some cases with success. The investigations of Mr Charles Booth into labour and wages questions, carried, out with care over many years, are a remarkable example of this.

*Operations Performed on Primary Statistical Quantities.*—Only a brief description of matters connected with the *technique* of the statistical method can be given in this article. In order to form statistics properly so called the primary statistical quantities must be formed into tables, and in the formation of these tables lies the art of the statistician. It is not a very difficult art when the principles relating to it have been properly grasped, but those who are unfamiliar with the subject are apt to underrate the difficulty of correctly practising it.

*Simple Tables.*—The first thing to be done in the construction of a table is to form a clear idea of what the table is to show, and to express that idea in accurate language. This is a matter which is often neglected, and it is a source of much waste of time and occasionally of misapprehension to those who have to study the figures thus presented. No table ought to be considered complete without a “ heading ” accurately describing its contents, and it is frequently necessary that such headings should be rather long. It has been said that “ you can prove anything by statistics.” This statement is, of course, absurd, taken absolutely., but, like most assertions which are widely believed, it has a grain of truth in it. If this popular saying ran "you can prove anything by tables with slovenly and ambiguous headings,” it might be assented to without hesitation. The false “ statistical ” facts which obtain a hold of the public mind may often be traced to some widely circulated table, to which, either from stupidity or carelessness, an erroneous or inaccurate “ heading ” has been affixed.

A statistical table in its simplest form consists of "primaries ” representing phenomena of the same class, but existing at different points of time, or coming into existence during different portions of time. This is all that is essential to a table, though other things are usually added to it as an aid to its comprehension. A table stating the number of persons residing in each county of England on a given day of a given year, and also, in another column, the corresponding numbers for the same counties on the corresponding day of the tenth year subsequently, would be a simple tabular statement of the general facts regarding the total population of those counties supplied by two successive censuses. Various figures might, however, be added to it which would greatly add to its clearness. There might be columns showing the increase or decrease for each county and for the whole kingdom during the ten years, and another column showing what *proportion,* expressed in percentages, these increases or decreases bore to the figures for the earlier of the two years. Then there might be two columns- showing what proportions, also expressed as percentages, the figures for each county bore in each year to the figures for the whole kingdom. The nine-column table thus resulting would still be simple, all the figures being merely explicit assertions of facts which are contained implicitly in the original "primaries.”

*Complex Tables.—*Suppose now we have another table precisely similar in form to the first, and also relating to the counties of England, but giving the number of houses existing in each of them at the same two dates. A combination of the two would form a complex table, and an application of the processes of arithmetic would make evident a number of fresh facts, all of which would be implied in the table, but would not be obvious to most people until explicitly stated.

The technical work of the statistician consists largely in operations of which the processes just referred to are types.

*Proportions.—*The most usual and the best mode of expressing the proportion borne by one statistical quantity to another is to state it as a percentage. In some cases another method is adopted, viz. that of stating the proportion in the form “ one in so many.” This method is generally a bad one, and its use should be dis­couraged as much as possible, the chief reason being that the changing portion of this kind of proportional figure becomes greater or less inversely, and not directly, as the phenomenon it represents increases or diminishes.

*Averages.—*Averages or means are for statistical purposes divided into two classes, the *arithmetical* and *weighted.* An