arithmetical mean is the sum of all the members forming the series of figures under consideration divided by their number, without reference to their *weight* or relative importance among themselves. A weighted mean is the sum of such figures divided by their number, with due allowance made for their weight. An example will make this clear, and the simplest example is taken from a class of statistical quantities of a peculiar kind, viz. *prices.* The price of a given article is the approximate mathematical expression of the rates, in terms of money, at which exchanges of the article for money were actually made at or about a given hour on a given day. A *quotation of price* such, as appears in a daily price list is, if there has been much fluctuation, only a very rough guide to the actual rates of exchange that have been the basis of the successive bargains making up the day's business. But let us suppose that the closing price each day may be accepted as a fair representative of the day’s transactions, and let us further suppose that we desire to obtain the *average* price for thirty days. Now, the sum of the prices in question divided by thirty would be the arithmetical mean, and its weak point would be that it made no allowance for the fact that the business done on some days is much larger than that done on others; in other words, it treats them as being all of equal weight. Now if, as is actually the case in some markets, we have a daily account of the *total quantities sold* we can weight the members accurately, and can then obtain their weighted mean. There are cases in which the careless use of arithmetical means misleads the student of the social organism seriously. It is often comparatively easy to obtain arithmetical means, but difficult to obtain weighted means. Inferences based on the former class of average should be subjected to the most rigid investigation.

There are many methods of weighting averages; for descriptions of these statistical processes the reader must be referred to the works on the technique of statistics. In chapter v. of Mr Bowley’s volume, the subject is dealt with in a manner suitable for students.

Before closing this short survey of the very important subject of averages or means, it is needful to discuss briefly the nature of the phenomena which they may safely be regarded as, indicating, when they have been properly obtained. Given a weighted mean of a scries of numbers referring to no matter what phenomenon, it is obvious that the value of the mean as a *type* of the whole series will depend entirely on the extent of divergence from it of the members of the series as a body. If we are told that there are in a certain district 1000 men, and that their average height is 5 ft. 8 in., and are told nothing further about them, We can make various hypotheses as to the structure of this body from the point of view of height. It is possible that they may consist of a rather large number of men about 6 ft. high, and a great many about 5 ft. 5 in. Or the proportions of relatively tall and short men may be reversed, that is, there may be a rather large number of men about 5 ft. 4 in., and a moderate number of men about 5 ft. 11 in. It is also possible that there may be very few men whose height is exactly 5 ft. 8 in., and that the bulk of the whole body consists of two, large groups— one of giants and the other of, dwarfs. Lastly, it is possible that 5 ft. 8 in. may really give a fair idea of the height of the majority of the men, which it would do if (say) 660 of them were within an inch of that height, either by excess or deficiency, while of the re­mainder one half were all above 5 ft. 9 in. and the other half all below 5 ft. 7 in. This latter supposition would most likely be found to be approximately correct if the men belonged to a race whose average height was 5 ft. 8 in., and if they had been collected by chance. The extent of the divergence of the items composing an average from the average itself may be accurately, measured and expressed in percentages of the average, the algebraic signs + and — being employed to indicate the direction of the variation from the mean. An average may, therefore, advantageously be supplemented: (1) by a figure snowing what proportion of the members from which it is derived differs from the average by a relatively small quantity, and (2) by figures showing the maximum and minimum deviations from the average. The meaning, of the term “ relatively small ” must be considered independently in each investigation. Fuller remarks on averages will be found in the works mentioned at the conclusion of this article.

*Prices.—*Reference has already been made to the peculiar class of statistical quantities known as *prices.* Prices in their widest sense include all figures expressing *ratios of exchange.* In modern society the terms of exchange are always expressed in money, and the things for which money is exchanged are: (1) concrete entities with physical attributes, such as iron or wheat;, (2) immediate rights, such as those given by interest-bearing securities of all kinds, by bills of exchange, by railway or steamship contracts to carry either passengers or goods, and by bargains relative to the foreign exchanges; (3) contingent rights, such as those implied in policies of insurance. All these rates of exchange belong to the same category, whether they are fixed within certain limits by law, as in the case of railway charges, or are left to be determined by the "higgling of the market.” All these cases of price may con­ceivably come within the operation of the statistical method, but the only matter connected with price which it is necessary to refer to here is the theory of the *index number.*

*Index Numbers.—*The need for these became conspicuous during the investigations of Tooke, Newmarch and others into the general cyclical movements of the prices of commodities; and to construct a good system of these may be said to be one of the highest technical aims of the statistical method. In comparing the prices of different years it was soon observed that, though whole groups of articles moved upwards or downwards simultaneously, they did not all move in the same proportion, and that there were nearly always cases in which isolated articles or groups of articles moved in the opposite direction, to the majority of articles. The problem pre­sented to statisticians therefore was, and is, to devise a statistical expression of the general movement of prices, in which all prices should be adequately represented. The first rough approximation to the desired result was attained by setting down the percentages representing the movements, with their proper algebraic signs before them, and adding them together algebraically. The total with its proper sign was then divided by the number of articles, and the quotient represented the movement in the prices of the whole body of articles during the period under consideration. It was soon seen, however, that this procedure was fatally defective, inasmuch as it treated all prices as of equal weight. Cotton weighed no more than pimento, and iron no more than umbrellas. Accord­ingly an improvement was made in the procedure, first by giving the prices of several different articles into which cotton, iron and other important commodities entered, and only one price each in the case of the minor articles, and secondly by fixing on the price of some one article representing iron or cotton, and multiplying it by some number selected with the view of assigning to these articles their proper weights relatively to each other and to the rest. The objection to both these plans is the same—that the numbers attached to the various articles or groups of articles are purely arbitrary; and attempts have been made to obtain what may be called *natural* index numbers, the most successful so far being that of Sir Robert Giffen, whose index numbers were obtained from the declared values of the imports or exports into or from the United Kingdom of the articles whose prices are dealt with. In the case of both imports and exports Sir Robert worked out the proportion borne by the value of each article to the total value for a series of years. Deducting the “ unenumerated ” articles, a series of numbers was thus obtained which could be used as the means of weighting the prices of the articles in an investiga­tion, of a movement of prices. This procedure is no doubt sus­ceptible of further improvement, like its predecessors. The index numbers prepared and published every month by the *Economist,* and by Mr Augustus Sauerbeck, which are weighted, are of great value; owing to the frequency of their appearance they make it possible to watch the tendency of prices closely.

*The Desirability of Increased Uniformity in Statistics.*—One of the most serious difficulties in connexion with statistical investigations is the variety of the modes in which primaries of the same order are obtained, as regards dates and periods. This is a matter of which all persons who have occasion to use statistics are made painfully aware, from time to time. Some attempts have lately been made to introduce more harmony into the official statistics of the United Kingdom,, and many years ago a committee of the treasury sat to inquire into the matter. The committee received a good deal of evidence, and presented a report, from which, how­ever, certain members of the committee dissented, preferring to express their views separately. The evidence will be found very interesting, by all who wish to obtain an insight into the genesis of the official statistics of the country.

*The International Institute of Statistics.—*The absence of uni­formity in statistics which is felt in England is not so marked in foreign countries, where the principle of centralization in arrange­ments of a political character is more powerful. In several con­tinental countries and in the United States there are statistical bureaus with definite duties to perform. In the United Kingdom, as already remarked, the nearest approach to a central statistical office is the commercial and statistical department of the board of trade, on which the work of furnishing such statistics as are not definitely recognized as within the province of some other state department usually falls. Various attempts have been made to introduce more uniformity into the statistics of all countries. It was with this object that statistical congresses have met from time to time since 1853. An endeavour was made at the congress held in 1876 at Budapest to arrange for the publication of a system of international statistics, each statistical bureau undertaking a special branch of the subject. The, experiment was, however, foredoomed to be only a very partial success, first because all countries were not then and are not yet furnished with central statistical offices, and secondly because the work which fell on the offices in existence could only be performed slowly, as the ordinary business of the offices necessarily left them little leisure for extra work. In 1885, at the jubilee of the London Statistical Society, a number of eminent statistical officials from all parts of the world except Germany were present, and the opportunity was taken to organize an International Institute of Statistics with a view to remedying the defects already ascertained to exist in the arrangements made by the congresses. The only obstacle to secur­ing a proper representation of all countries was the absence of any, German delegates, none of the official heads of the German statistical office being allowed to attend—apparently on political