

THURSDAY, FEBRUARY 18, 1915.

## VITAL STATISTICS.

*Vital Statistics Explained: Some Practical Suggestions.* (The Chadwick Library.) By J. Burn. Pp. x+140. (London: Constable and Co., Ltd., 1914.) Price 4s. net.

IN a preface to this work Sir William Collins, as chairman of the Chadwick Trust, explains that the volume is based upon a course of lectures delivered at Liverpool, under the auspices of that trust. Mr. Burn pays a high compliment to the present Registrar General on the improvements introduced by him into the annual reports of his department, and says that it is now for the first time "possible to discuss and analyse the enormous mass of statistics in a coherent and intelligent manner."

The author deals first with the Census as an index to the development of national life. A comparison of the twelfth census, taken in 1911, with the first, taken in 1801, shows a wonderful advance. Mr. Burn thinks that nearly all the information that can be relied upon is now collected. He deprecates further elaboration. "Merely to ask an extra question on the census paper does not ensure a correct answer being given."

The leading facts that are shown by the Census returns and the reports of the Registrar General are: (1) a steady decline in the marriage rate during the last thirty years; (2) a steady increase in the mean age at marriage for both sexes; (3) a reduction in the birth-rate, both as regards legitimate and illegitimate births; (4) a reduction in the infantile death rate. While these observations are closely related, they point to a number of contributing causes.

The success which has attended the measures that have been taken of late years for sanitary improvement is shown by the statistics of death from various diseases. Small-pox is practically non-existent. Phthisis and tuberculosis have decreased by more than 50 per cent. during the sixty years since 1851. On the other hand, the deaths from cancer have greatly increased. All these statements have to be qualified by the possibility of differences of definition in successive records.

After a brief chapter on the preparation of mortality tables, in which he suggests that in addition to the national tables, municipal and occupational tables should be prepared, Mr. Burn proceeds to show how such tables may be put to practical use by medical men and other persons, and the light they might throw upon causes of death and upon

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the prevention of disease. For this purpose he has examined the rates of mortality of the industrial branch of the Prudential Assurance Society, of which he is actuary, and as these are derived from twenty million policies, he claims that they fairly represent the population of the United Kingdom, a claim which may at any rate be supported if limited to the industrial classes. He arrives at the satisfactory result that there is a steady and continuous improvement going on in the vitality of the country.

The proper method of graduating a mortality table so that the crude results of the enumeration may be smoothed into a symmetrical curve without destroying the trend of the facts, has exercised the minds of actuaries for some time. The late Mr. Woolhouse, Dr. Sprague, Mr. George King, and others have learnedly discussed it, and the method now generally adopted is that which the German actuaries call by the fanciful name of "osculatory interpolation." In an appendix to his volume, Mr. Burn gives a description of this method, so lucid and so simple that any person might employ it without having a knowledge of the mathematical principles upon which it is based. He has certainly the gift of clear exposition, and his little book is calculated to be useful to many persons to whom actuarial science has not hitherto offered any attraction.

## TECHNICAL METHODS OF CHEMICAL ANALYSIS.

- (1) *Technical Methods of Chemical Analysis.* Edited by Dr. G. Lunge and Collaborators; English translation edited by Dr. C. A. Keane and Collaborators. Vol. iii, part i, pp. xxxi+538. Vol. iii, part ii, pp. xv+539—1125. (London: Gurney and Jackson, 1914.) Two volumes. Price 3l. 3s. net.
- (2) *Technical Gas-Analysis.* By Dr. Lunge. Pp. xv+407. (London: Gurney and Jackson, 1914.) Price 15s. net.

(1) **T**HE two sections now issued of volume iii. of this important work complete the English edition of Dr. Lunge's great monograph published in German in 1910-11. The English edition, however, differs in certain material respects from that on which it is based, inasmuch as certain German processes are inapplicable, from the very nature of the case, to British procedure, and it is unlikely, owing to special conditions, that they will ever become applicable. Hence particular sections of the work have had to be entirely re-written by British experts from the British point of view, and to this extent these may lay claim to be original productions. At the

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