

George Handley KNIBBS

b. 13 June 1858 - d. 30 March 1929

Summary. First government statistician after Federation in Australia, Knibbs contributed significantly to vital statistics.

The Colonial Period in Australia extended from the time of European settlement in 1788 until Federation in 1901. Early vital statistics were provided in annual "Blue books" without analysis. Later, major thrusts in the development of official statistics came from the colonies of NSW, Victoria and Tasmania through the work of T.A. Coghlan, H.H. Hayter and R.M. Johnson, respectively. However, rivalry between the colonies and debate over protectionism in trade and population issues constrained progress.

With Federation of the colonies in 1901 the Australian Commonwealth Constitution gave the Federal Parliament authority over census and statistics. However, it was not until 1906 that the Commonwealth Bureau of Census and Statistics was created with George Handley Knibbs as its Head.

Knibbs, who was born in Sydney, was an unlikely appointment as the first Commonwealth Statistician; he had no background in statistics or economics and had been trained as a surveyor. He was Lecturer in Surveying at the University of Sydney from 1890 to 1903. In 1904 he was Acting Professor of Physics at the University of Sydney and in 1905 he became Director-General of Technical Education for NSW.

Prior to his appointment as Commonwealth Statistician Knibbs had, however, published on a wide range of topics - fluid mechanics, observational accuracy and surveying, effects of rainfall distribution on agriculture, water conservation and irrigation and city planning, albeit avoiding all considerations of randomness. These give the impression of competence as a mathematician, and a comprehensive knowledge of the international literature, but an obsessive amount of detail is sometimes provided.

The remainder of Knibbs' publications, some seventy in number, postdate his appointment as Commonwealth Statistician and all deal with statistical topics with the exception of two books of poetry published in 1913.

Knibbs interpreted his brief broadly as Commonwealth Statistician, to be "a professional expert in statecraft, assisting the administrative statesmen with his counsel and advice", as well as to undertake the task of unification and coordination of statistical effort, and he set to work with zeal.

Following a trip through Europe in 1909 to examine various statistical

bureaux, and attend international congresses (including the ISI Session in Paris), Knibbs prepared a report on social insurance in which he outlined schemes operating elsewhere and made recommendations for Australia. In this work he took pains to elaborate an organic theory of the state and he justified public health measures on the grounds of national development. It should be noted that Social Darwinism, the supposed implications of evolutionary theory for social policy, was widely promoted at the time, with argument over whether the society or the individual was the developing organism. William Morris Hughes, Prime Minister during World War 1, employed evolutionary theory to justify state activity.

In Knibbs' work on social insurance he was led naturally to examine causes of unemployment but he suffered from lack of public co-operation both for this and for his work on the cost of living. His interest in the cost of living did lead to theoretical work on index numbers which, although well regarded in its time, was of ephemeral interest. However, it did lead to the production of the first Australian price indices based on clearly defined principles and his advocacy was important in the wide international acceptance of the fixed weights aggregative formula.

Knibbs' expectations were also high in terms of the possibilities for a detailed nosological classification and he maintained a continuing interest in this topic. His suggestions, which would have placed considerable demands on the medical profession, not unexpectedly achieved limited success.

A prime task for Knibbs upon assuming office was to commence the production of the Commonwealth *Year Book* and the first of these, which drew heavily on principles already adopted by Hayter in Victoria and Coghlan in NSW, appeared in 1908.

The *Year Books* were well received. Melbourne's *Argus* newspaper referred to it as "a monument to Knibbs' energy, clear-sightedness and enthusiasm" while *The Times* (of London) in a leading article described it as "The most wonderful book of its kind in the world...the creation of a genius...the Commonwealth Statistician, and there is no other publication in the Empire to compare with it." However, such praise for this kind of endeavour does not seem to have been altogether exceptional.

Knibbs was responsible for the first Commonwealth Census conducted in 1911 and this involved major organizational effort. The final Census Report appeared in three volumes, comprising the Statistician's Report (Volume 1) which provided a commentary on the detailed tables of results making up Volumes 2 and 3. The most notable component of Volume 1 was its

Appendix A, Knibbs' "The Mathematical Theory of Population, of its Character and Fluctuations and of the Factors which Influence Them" which was subsequently printed separately (Knibbs (1917)).

This exhaustive treatise of 406 pages begins, after an introduction, with seven chapters devoted to methodology and then eleven further chapters giving a detailed discussion of the Australian population. In the methodological component Knibbs emphasized population distributions and the curves which represent them, and especially noteworthy is his discussion of smoothing.

Knibbs received almost universal praise for this treatise. Arne Fisher considered that it would "stand as one of the leading works on mathematical statistics of the twentieth century" and "it is equal to the French classics on the calculus of probability by Laplace and Poisson...". More qualified approval, however, was provided by Yule (q.v.), Elderton and R.A. Fisher (q.v.), who praised the work for its broad scope but found fault with various aspects of its theoretical content.

Yule and Elderton both took some exception to Knibbs fitting of his own "flexible curve" of the form $y = Ax^m \exp(nx^p)$ and to his rather cursory treatment of Pearson's system of frequency curves, while R.A. Fisher noted the complete absence of any discussion of goodness of fit. Knibbs had described the Pearson curves as having a limited range of shapes available and he sought to encompass as many as possible in a singler formula. However, his procedure for fitting these curves was less than straightforward. The work was widely referenced in the population literature of the time, but principally for its encyclopaedic nature and extensive tabulations rather than for particular items of methodological content.

Knibbs became a staunch advocate of what he termed "The New Malthusianism" and in his book *The Shadow of the World's Future* (1928) argued that if present growth continued the world would reach its maximum population in less than two hundred and fifty years. Knibbs also provided eugenic arguments for selective migration. He had earlier been active in the eugenics movement, and in 1921 was elected Vice-President of the 2nd International Eugenics Congress held at New York.

Knibbs resigned his position as Commonwealth Statistician in 1921 to become Director of the newly constituted Commonwealth Institute of Science and Industry (the forerunner of CSIRO). He was knighted in 1923. He was a man of strong opinions, forthright and public spirited, and was very much motivated by the special problems of his country and his times. He was a forceful advocate but his expectations were often unreasonably high and were

not fully met. Nevertheless, his achievements as Commonwealth Statistician were widely applauded internationally and were a model for others. He died in Sydney in 1929.

Bibliography

Bambrick, S. (1983). Knibbs, Sir George Handley (1858-1929). *Australian Dictionary of Biography*, Melbourne Univ. Press, Melbourne, Vol.9, 620-621.

Heyde, C.C. (1988). Official statistics in the late colonial period leading on to the work of the first Commonwealth Statistician, G.H. Knibbs. *Australian Journal of Statistics*, **30(B)**, 23-43.

Knibbs, G.H. (1917). The Mathematical Theory of Population, of its Character and Fluctuations and of the Factors which Influence Them. Appendix A, Vol. 1, *Census of the Commonwealth of Australia*, Aust. Govt. Printer, Melbourne.

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