

the Southern Railroad at Washington (Hollerith—audit, disbursement distribution, and freight accounting); the Pennsylvania Railroad at Pittsburg (Hollerith and Powers in combination—freight accounting and statistics); the New York Central Railroad at New York (Hollerith—freight accounting and labour-cost statistics); the Boston and Maine Railroad at Boston (Powers—freight accounting). In each I obtained sets of the cards and forms used, &c., for reference after my return, and, as I fully discuss the merits, &c., of these machines subsequently, I need not further deal with them here.

In Washington, D.C., I spent a good deal of time in the United States Bureau of Census and Statistics, and was interested to observe that while the population census was being handled on the Department's own electric tabulating-machine, the agriculture statistics were being tabulated on a Hollerith outfit, one of the largest installations in existence, consisting of 488 punches, 49 verifying-punches, 65 sorters, and 59 tabulators.

The United States Census Bureau is quite a large establishment, there being over four thousand people employed when I was there, and additions were still being made. The point which impressed me here, apart from their excellent mechanical appliances and organization, was the number of qualified statisticians employed to study and write up the data handled. For the proper organization of a central statistical office, it has to be remembered that its work, unlike that of most Government Departments, which are mainly concerned with some one special duty, ranges over the whole field of the social and economic activities of the people. Obviously, therefore, the ideal statistical office should include on its staff a number of professional men and technical experts in the various fields, with a knowledge and experience of statistical methods and work; and it is essential for the production of good work that there should be sufficient specially qualified and able men on the staff. In the Canadian office, where centralization was so largely effected, the Officer in Charge of Transport and Power Plant Statistics (railways, waterways, tramways, electric- and water-power works, &c.) held engineering degrees, and while I was there a mining engineer was being added to the staff to take care of the examination and scrutiny of the returns collected for mining-production statistics. While I strongly hold that our own Statistical Office should have only properly qualified and able men in the responsible positions, I recognize that New Zealand is such a small country that the volume of statistical work is not sufficient to warrant technical specialists of this nature; such assistance should rather be obtained from the professional men and technical experts in the several administrative departments concerned; and the problem, therefore, in our case is to find a *modus operandi* whereby the technical and professional knowledge of the administrative departments may be closely linked up with and made available for the Statistical Office.

I saw over the branch (housed in a separate building) of the United States Bureau of Statistics dealing with vital statistics, which were tabulated on the Department's own electric tabulating-machines, and also the mechanical branch of the same bureau where these machines were made and experiments carried on for the further improvement of the machines—punches, sorters, and tabulators.

In the Post Office Audit Office at Washington I saw one of the most efficient Hollerith plants seen during my tour. The system adopted for the audit of the money-orders issued and paid was extremely simple, economical, and effective. The same cards which were punched and used for checking the money-order-paying office accounts were kept, resorted, and used for audit of the issuing office, thus establishing an absolute check on the two offices.

In the office of the Army Medical Statistical Division I was interested to learn they were just completing the tabulation of statistics in regard to the medical examination of men for their selected drafts, and also of the casualties in camp and overseas. Several tables shown me of the examinations of men rejected for the army were very informative as to the causes of rejection, &c. Before I left New Zealand it was arranged that the particulars as to casualties of the New Zealand Expeditionary Force should be tabulated in the Census and Statistics Office with the assistance and advice of a medical officer of the Defence Department, and bearing this in mind I arranged for sets of the forms, cards, &c., showing exactly what they were doing at Washington, to be sent to New Zealand for our consideration when on this work. The work was being carried out on a Hollerith machine outfit. If a tabulating-machine installation, either Hollerith or Powers, is obtained for our Statistical Office I would strongly recommend the tabulation of statistics of our New Zealand Expeditionary Force medical rejections also, which are probably even more important than statistics of the casualties.

In the Inland Revenue Income-tax Office at Washington there was a most efficient installation of Powers sorting and tabulating machines at work, on which very exhaustive and complete statistics of the incomes of the people were being compiled. The cards used were retained for some time and employed to ascertain various kinds of information for the Government, such as the effect of altering the rates of tax, or the numbers, size, and location of certain industries, &c. Much more use for statistics could be made of the information on our income-tax returns in New Zealand than is done, and I have already recommended my conferring with the Commissioner of Taxes for co-operation in the development of these statistics.

I also visited the offices in Washington of the Southern Railroad, the Department of Trade and Commerce (to see how the returns received from their Customs Statistical Division in New York, previously referred to, were dealt with), the offices and card-factory of the Hollerith Company, the offices of the Powers sorting and tabulating and Dalton adding machine companies.

An interesting office at Washington is the Efficiency Department, under Dr. Brown. The office, a small one, is staffed with experts in office organization, &c., charged with the duty of investigating the methods employed in the various Government Departments, and advising as to how economy can be promoted and efficiency raised throughout the service, with special reference to the introduction of mechanical and labour-saving devices where suitable.

From Washington I went to Pittsburg to see the Pennsylvania Railroad machine installation, then back to New York, and on to Boston to see the Boston and Maine Railroad installation. From there I went on to Ottawa, where I spent nearly a fortnight visiting Government offices. The Government Bureau of Statistics at Ottawa was only recently created as a separate Department, and I found the statistical work still in course of reorganization.