

§ 15. Department of Chemistry, South Australia.*

In South Australia, a Department of Chemistry was formed in 1915. The Department is principally engaged in general routine chemical examinations and analyses in pursuance of various Acts of Parliament and for Government Departments, but the chemical investigation of local products and industries forms an important branch of its work. In this connexion a series of Bulletins is in course of preparation. Up to July, 1918, nine Bulletins have been issued, as indicated below. Although publication of Bulletins had to be suspended for a time, it is hoped to continue the series as soon as possible.

No. 1.—*Paper Making*: An investigation into the prospects of establishing a paper-making industry in South Australia. A number of local materials have been investigated, and special attention is directed to straw as the most valuable available material, owing to the very large supply obtainable at a low price and near to the principal sea-ports. No. 2.—*Potash*: Its economic sources in South Australia. Many local sources have been investigated, and wool scour is indicated as especially worthy of attention. *Lanoline*: A process for obtaining wool fat from locally scoured wool is described. No. 3.—*Cream of Tartar*: An examination of local grape products as sources of cream of tartar. No. 4.—*Marine Fibre*: The fibrous portion of the leaf sheath of the sea plant *Posidonia Australis* grows abundantly in the shallow waters around the coasts of South Australia, and on other parts of the Australian Coast. This Bulletin has been written to gather together and publish all the available information respecting it. The sum of £220,000 has already been spent in this industry, and a large amount of experimental work has been done in finding methods of collection and purification and market uses. No. 5.—*Boiler Waters*: Foaming and priming of boiler waters have been studied with a view to the suggestion of a remedy for these faults. No. 6.—*Grass Tree*: An investigation of the economic products of the species *Xanthorrhœa*. The trunk, leaves, and resin were examined. Special attention is drawn to the resin as similar to the high-priced resins, such as dragon's blood, benzoin, etc. It was found that 8 per cent. of para-oxy-benzoic acid was readily obtained from the gum. No. 7.—*Gypsum and Plaster of Paris*: An investigation of the gypsum deposits in South Australia and their uses, with special reference to the manufacture of plaster of paris. No. 8.—*Alcohol as a Source of Power*: This Bulletin discusses the use of alcohol as a motor fuel, details tests carried out under practical conditions, and indicates sources from which alcohol can be obtained. No. 9.—*Bonedust*: Its adulteration with Phosphate Rock. The results of this particular form of adulteration are dealt with, and a method of detection described.

§ 16. Anthropometrical Measurements of Military Cadets.

1. *General*.—Under the Defence Act of 1910, the principle of compulsory training was brought into operation in Australia on 1st January, 1911. Advantage was taken of this to secure a record of certain measurements and other particulars in respect of the cadets subjected to inspection, and an analysis of the data so obtained concerning height, weight, and minimum chest measurement, according to age, was given in Official Year Book No. 11, pages 1203-1209, for the year ended 30th June, 1912.

§ 17. Characteristics of the Development of the Population of Australia and the Effect of the War thereupon.

The population of Australia at 31st December in each of the years 1900 to 1919 is shewn in the following table. Figures are also given shewing the relative populations, that at the date (1st January, 1901) on which the Commonwealth came into existence being taken as 10,000. An analysis of the variations in the population is also furnished in the columns which shew the natural increase (excess of births over deaths), the net

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**CHARACTERISTICS OF THE DEVELOPMENT OF THE POPULATION OF 1127
AUSTRALIA AND THE EFFECT OF THE WAR THEREUPON.**

migration (the difference between arrivals and departures), and the total increase for the several years.

**CHARACTERISTICS OF THE DEVELOPMENT OF THE POPULATION OF THE
COMMONWEALTH OF AUSTRALIA DURING THE FEDERATION PERIOD,
1901 TO 1919 INCLUSIVE.**

Year.	Population at 31st December.	Relative Population that at 31st December, 1900 = 10,000.	Natural Increase (Excess of Births over Deaths).	Net Immigration (Excess of Arrivals over Departures).	Total Increase.	Total Increase Per Cent. Per Annum for Year Ended.
1900 ..	3,765,339	10,000	..	..	..	%
1901 ..	3,824,913	10,158	56,615	2,959	59,574	1.58
1902 ..	3,875,318	10,292	54,698	4,293	50,405	1.32
1903 ..	3,916,592	10,402	51,150	9,876	41,274	1.07*
1904 ..	3,974,150	10,555	60,541	2,983	57,558	1.47
1905 ..	4,032,977	10,711	61,427	2,600	58,827	1.48
1906 ..	4,091,485	10,866	63,557	5,049	58,508	1.45
1907 ..	4,161,722	11,053	65,042	5,195	70,237	1.72
1908 ..	4,232,278	11,240	65,119	5,437	70,556	1.70
1909 ..	4,323,960	11,484	69,899	21,783	91,682	2.17†
1910 ..	4,425,083	11,752	71,211	29,912	101,123	2.34†
1911 ..	4,568,707	12,134	74,324	69,300	143,624	3.25†
1912 ..	4,733,359	12,571	80,911	83,741	164,652	3.60†
1913 ..	4,872,059	12,939	83,925	54,775	138,700	2.93†
1914 ..	4,940,952	13,122	86,263	17,370	68,893	1.41‡
1915 ..	4,931,988	13,098	82,089	91,053	8,964	- 0.18‡
1916 ..	4,875,325	12,948	77,229	133,892	56,663	- 1.15‡
1917 ..	4,935,311	13,107	81,936	21,950	59,986	1.22‡
1918 ..	5,030,479	13,360	75,490	19,678	95,168	1.93
1919 ..	5,247,019	13,935	56,360	160,180	216,540	4.30§

* The season 1902-3 was one of drought. † The large increases are due to immigration. ‡ This is the effect of emigration (despatch of soldiers oversea, etc.). § The large value is due to return of soldiers, and would have been appreciably larger but for the loss of about 14,000 through an epidemic of influenza.

The effect of the war was to stop immigration and to increase the number going abroad, as for example, the soldiers fighting for the Empire. Moreover, the gain by excess of births over deaths fell off from 86,263 in 1914 to 56,360 in 1919, the decline in the latter year being accentuated by the influenza epidemic. The rate of increase from 1st January, 1901, to 31st December, 1913, was 2 per cent. per annum. If this rate had been uniform, the increase for the years 1914 to 1919 would have been as shewn hereunder:—

**THE DEVELOPMENT OF POPULATION, HAD IT BEEN GOVERNED BY PRE-WAR
CONDITIONS.**

Year.	Population on Assumption of Uniform Increase of 2 Per Cent. Per Annum.	Increase on Basis of 2 Per Cent.	Actual Increase.	Excess of 2 Per Cent. Increase over Actual Increase.
1913 ..	4,872,059	..	..	..
1914 ..	4,969,500	97,441	68,893	28,548
1915 ..	5,068,890	99,390	8,964	108,354
1916 ..	5,170,268	101,378	56,663	158,041
1917 ..	5,273,673	103,405	59,986	43,419
1918 ..	5,379,146	105,473	95,168	10,305
1919 ..	5,486,729	107,583	216,540	- 108,957
Total ..	..	614,670	374,960	239,710

Hence the difference between the two may be regarded as very largely the consequence of the war, though of course other causes also have contributed. We may note, however, that, as shewn on the first table, the rate of increase was itself increasing. Thus, we might very fairly suppose that the rate from the end of the year 1907, which for the first year was 1.70 per cent. per annum, tended to increase uniformly 0.4 per cent. per annum. This would give for successive years 2.10, 2.50, 2.90, 3.30 per cent., which would be the increase of 1912 over 1911. Let us assume that this last rate, which is of course high, remained constant: then we should get the following figures for the successive years, viz., those shewn hereunder, and these may well have been the actual figures but for the incidence of the war if we had maintained steadily our large net immigration:—

Year.	Population as Computed.	Increase.	Year.	Population as Computed.	Increase.
		%			%
1907 ..	4,161,722	..	1913 ..	4,863,620	..
1908 ..	4,232,471	1.70	1914 ..	5,024,119	3.30
1909 ..	4,321,353	2.10	1915 ..	5,189,915	3.30
1910 ..	4,429,387	2.50	1916 ..	5,361,182	3.30
1911 ..	4,557,839	2.90	1917 ..	5,538,101	3.30
1912 ..	4,708,248	3.30	1918 ..	5,720,858	3.30
1913 ..	4,863,620	3.30	1919 ..	5,909,646	3.30

On 31st December, 1919, we should, on this supposition, have had a population of 5,909,646, or 662,627. more than the actual population (5,247,019). It is, therefore, abundantly clear that the population of Australia is between 240,000 and 660,000 less than it would have been but for the war.

In this connexion it may be mentioned that, with regard to the proposal to create a Capital at Canberra, the Commonwealth Statistician on the 23rd December, 1909, estimated the probable population for 1920 as 5,227,000. On the 31st March, 1920, it had reached 5,274,444, so that the increase prior to the war was somewhat larger than had then been anticipated. This, however, was due to the large net immigration which commenced in 1909, and continued till 1913 inclusive. The two results are thus in very fair agreement, since the prediction was for a point of time between ten and eleven years ahead. Of course, if the increase in the rate of advance for the years 1909 to 1913 could have continued, the loss would be still greater.

§ 18. The Influenza Epidemic of 1918-19.

In common with other countries, Australia was visited during 1918-20 by an epidemic of influenza, which was by far the most severe on record. In the following pages is given a brief analysis of its salient features. The average death rates per 100,000 of the mean population for the first three successive quinquennia of this century, for the four years 1915-18, and for 1919 are shewn hereunder:—

DEATH RATES, ALL CAUSES, PER 100,000, 1900-19.

Period.	Males.	Females.	Persons.
1900-4	1,322	1,052	1,194
1905-9	1,200	957	1,084
1910-14	1,189	945	1,072
1915-18	1,197	883	1,040
1919	1,466	1,098	1,288

This conspicuous increase during 1919 was largely due to deaths from influenza. Of the 65,930 deaths which were registered during that year, no less than 11,989 (7,046 males and 4,943 females) were classified as due to influenza.