

area of these many farms devoted to experiments on this subject; but the keen interest taken by the staffs in scientific investigation in other parts of the world and the enthusiasm in the work of William Farrer and other Australian investigators cannot fail to impress the visitor. A whole meeting at Sydney was not sufficient to exhaust the papers and discussion on cereal breeding. The papers read were as follows:—"The Migration of Reserve Material to the Seeds in Barley, considered as a Factor in Production," by Mr. E. S. Beaven; "Wheat Improvement in Australia," by Mr. F. B. Guthrie; "William Farrer's Work, Methods, and Success: a Short Sketch," by Mr. J. T. Pridham; "Wheat Breeding in Australia," by Mr. A. E. V. Richardson. Prof. Bateson, Mr. A. D. Hall, Prof. T. B. Wood and others took part in the discussion. The value of the Mendelian theory in providing a speedy and certain method for the practical man, and in directing his problems on scientific lines was illustrated by Mr. Beaven's work on barley. He showed that the ratio of the dry matter accumulated in the seed, to the total dry matter of the plant when fully ripe, frequently influences the produce of grain to a greater extent than any other factor. This "coefficient of migration" differs with different races of barley within the gross productive power which is a product of the environment.

A joint discussion with Section B (Chemistry) on metabolism, which took place at Sydney, will be reported in an article on the work of that section. Other papers contributed included "Flax as Paying Crop," by Mr. C. P. Ogilvie; "Bacterial Toxins in Soil," by Dr. Greig Smith; "The Estimation of Condition in Cattle," by Mr. J. A. Murray; "A Review of Work on Soil Inoculation," by Dr. H. B. Hutchinson, and Mr. J. Golding; and "The Effects of Caustic Lime and Chalk on Soil Fertility," by Dr. H. B. Hutchinson and Mr. K. MacLennan.

Highly satisfactory as they were, the proceedings of the section in session cannot be taken as a measure of the work achieved in 1914, for the unique advantages which members of the section gained by a visit to so rich and varied a field of agricultural endeavour cannot fail to bear fruit rich in its benefit to the science of agriculture.

It is only possible briefly to refer to the numerous and valuable agricultural excursions which were specially arranged, not only to meet the wishes of the whole section, but also to enable individual members to make independent visits to farms and districts where the branches of agriculture in which they had specialised were seen to the best advantage.

In Western Australia the latter type of excursion prevailed, and, under the personal guidance of Mr. W. Catton Grasby, Mr. J. L. Sutton, Prof. Paterson, Dr. Stoward, and Mr. A. E. Weston, visits were made to see the great developments which have recently taken place in corn growing, fruit growing, and other departments of agriculture in the great south-west area of this promising State.

From Adelaide excursions were made to Angaston, Seppeltsfield, and Tanunda. Mr. Charles Angus entertained a large party to lunch at Angaston. Vineyards and the agricultural land in the neighbourhood were afterwards visited. Roseworthy Agricultural College was the objective of a most interesting excursion from Adelaide. The instruction given to students is of a very practical nature, the buildings and laboratories are good, and the farm very well laid out in experiments on crops and stock. The introduction of Berseem (*Trifolium alexandrinum*) on an irrigated plot of four acres had proved very successful, twenty-five cows having been kept on the produce of the plot for

five months during the winter, the yield of green food being 36 tons per acre.

In Victoria the principal agricultural excursion was to the Central Research Farm at Werribee. Although only started in 1912, this farm of more than 1000 acres is admirably laid out in experiments on dry farming, irrigation, and live stock. The organisation was quite a model for similar institutions; a large party was conducted over it in a most thorough manner, all the experiments being ably explained by the staff and authorities from Melbourne.

From Sydney a three days' excursion was arranged which included visits to the Wagga Experiment Farm, Mr. Anthony Brunskill's 12,000 acre farm, and two days in the interesting Murrumbidgee irrigation area, including the Yanco Government Irrigation Farm and Works. Motor-cars were provided, and nights were spent in a special sleeping car.

Mr. Wade, who himself conducted the party over the irrigation area, gave a lecture and showed lantern slides and plans of this great scheme, which will provide nearly 7000 farms and support a population of 100,000 people on land which until the scheme was taken up by the Government was used as sheep runs. The famous Hawkesbury Agricultural College was also visited from Sydney, where accommodation for 200 resident students is provided; the farm comprises some 3440 acres of land. All branches of farming, especially the orchard, dairy, piggery, and poultry farm, were well worth a visit.

The cultivation of sugar cane and a sugar mill in full work was inspected at Nambour, Queensland, by a large party, and opportunities were afforded for smaller parties to see the work on the eradication of the prickly-pear, and to visit large sheep farms, etc.

The most striking feature in the visits to experimental farms in most parts of Australia was the response shown by the crops to phosphatic manures, even when, as is the practice, very small dressings were applied with the combined manure and seed drill. In one case in Western Australia 30 lb. of superphosphate added per acre had doubled the yield of wheat (9 bushels raised to 18). Sixty to 80 lb. of superphosphate per acre were commonly used in this excellent drill.

The section met with the greatest kindness and hospitality on all sides, and it is invidious to particularise amongst such a number of generous and indefatigable hosts, but special thanks are due to Mr. W. Hutchinson, Minister of Agriculture for Victoria, Dr. Cameron, Dr. Cherry, and Mr. Richardson, of Melbourne, and to Prof. R. D. Watt, of Sydney, for the part they took in carrying out the many and valuable excursions.

BUDGETS AND STUDENTS OF UNIVERSITIES AND UNIVERSITY COLLEGES IN RECEIPT OF STATE GRANTS.

THE reports for the year 1912-13 from those universities and university colleges in Great Britain which are in receipt of grant from the Board of Education have been published in two Blue-books (Cd. 7614 and Cd. 7615). The tabular matter, which precedes the separate reports from the places of higher education dealt with, contains detailed information as to the income and expenditure of the various institutions concerned. The following summaries have been compiled from the tables, and make clear the amount available for higher education and research in the universities and university colleges receiving Treasury grants, and how the income is expended.

UNIVERSITIES AND UNIVERSITY COLLEGES.

(1) ENGLAND.

(a) Income.

	Amount £	Percentage of total
Fees	183,880	27·8
Endowments	95,045	14·4
Donations and subscrip- tions	22,381	3·4
Annual grants from local authorities	103,650	15·7
Parliamentary grants	232,821	35·2
Contributions from hospi- tals, etc., for services rendered	2,338	0·4
Other income	20,486	3·1
	660,601	

(b) Expenditure.

Administration	68,329	10·3
Maintenance of premises	68,670	10·4
Educational expenses	425,515	64·3
Superannuation	22,840	3·4
Other expenditure in re- spect of maintenance	30,219	4·6
Expenditure not in re- spect of maintenance	46,288	7·0
	661,861	

(2) WALES.

(a) Income.

	Amount £	Percentage of total
Fees	17,456	27·7
Endowments	4,448	7·1
Donations and subscrip- tions	2,330	3·7
Annual grants from local authorities	3,441	5·5
Parliamentary grants	34,217	54·3
Other income	1,132	1·7
	63,024	

(b) Expenditure.

Administration	8,020	11·8
Maintenance of premises	4,597	6·8
Educational expenses	48,232	71·0
Superannuation	1,733	2·5
Other expenditure in re- spect of maintenance	497	0·7
Expenditure not in re- spect of maintenance	4,891	7·2

Total £67,970

On comparing the statistics with those of the previous year, it is noticed that in England the total income of the institutions has risen by 38,000*l.*, which is made up as follows: the fee income has risen by 3000*l.*, the income from endowment by more than 9000*l.*, that from local authority grants by nearly 8000*l.*, while Parliamentary grants supplied nearly 18,000*l.* additional assistance, though part of the income from this last-mentioned source, is derived from grants which are referable to previous years.

Certain individual figures are interesting. Manchester University has an income from endowment of rather more than 22,500*l.*, and Liverpool University one of nearly 15,000*l.* Reading University College has an endowment income of practically 9000*l.*, which represents more than 31 per cent. of its total revenue. The largest proportions of income derived from grants from local authorities are found at the University Colleges of Southampton and Nottingham, in both of

which cases nearly 40 per cent. of the income is provided from this source. Similarly, 29 per cent. of the income of Sheffield University is obtained from grants from local authorities.

The total expenditure in England has risen by nearly 60,000*l.* Nearly 4000*l.* of this increase is accounted for by administration, nearly 5000*l.* by cost of maintenance of premises, rates, etc., and more than 30,000*l.* by expenditure on teaching salaries and equipment. More than 9000*l.* additional expenditure was incurred on superannuation provision, for which increased grants have recently been made. Seven per cent. of the total expenditure at all institutions was made in respect of charges of a non-maintenance character. The highest percentages for these charges are at Sheffield, 18·5 per cent.; Birmingham, 14 per cent.; King's College for Women, 12·3 per cent.; and Bedford College, 10·2 per cent.

A new table indicates the amount of grant aid given to university institutions under the provisions of the "Statements of grants available from the Board of Education in aid of technological and professional work in universities in England and Wales" in the financial years 1912-13 and 1913-14. The total amount of grant aid under these provisions rose from 41,647*l.* in the financial year 1912-13 to 44,623*l.* in 1913-14. The total amount of Exchequer grants in England in aid for universities and university colleges in the year 1912-13 was 170,000*l.*, and, in addition, 31,000*l.* was paid to university colleges in Wales.

In addition to the financial statistics, the reports contain much useful information concerning the number of students in the various colleges, their ages, the subjects they are studying, and so on; and the following tabular statements will serve to summarise them. It is necessary to point out that the numbers concern only the following institutions:—The Universities of Birmingham, Bristol, Durham (Armstrong College), Leeds, Liverpool, Manchester, Sheffield, London (including University College, King's College, Bedford College, School of Economics, and East London College), and also the University Colleges of Nottingham, Reading, and Southampton. The University of Wales includes the University Colleges of Aberystwyth, Bangor, and Cardiff.

NUMBER OF FULL-TIME STUDENTS.

Degree Students:—	England	Wales
Training college	1397	420
Others	3402	648
Total	4799	1068
Non-graduate (diploma) students:—		
Training college	644	8
Others	1113	98
Total	1757	106
Post-graduate students:—		
Training college	29	—
Others	479	76
Total	508	76
Other courses	602	39
Total	7666	1289

NUMBER OF PART-TIME STUDENTS.

Day.	England	Wales
Degree	229	4
Non-graduate (diploma)	182	29
Other courses	3406	297
Post-graduate	1023	19
Carried forward	4840	349

Brought forward (Day)	4840	349
Evening.		
Degree	363	—
Non-graduate	704	—
Other courses	7576	—
Post-graduate	255	—
Total	13,798	349

In England the total number of full-time students at these institutions of higher education in 1912-13 was 7666, as compared with 7827, in the previous year. The total number of part-time students has, on the other hand, increased from 13,348 to 13,798. The fall in the total number of full-time students is due to a decrease of fifty-six in the number of training college students and of 105 other students, making 161 in all. The number of full-time post-graduate students has risen by fifty-four, and the number of full-time diploma students by 103. On the other hand, there has been a fall of 159 in the number of students reading for degrees, and another of 159 in the number of students of undergraduate standing who were not reading for a degree.

It would appear, the report points out, that the rate of increase in the number of full-time students has been diminishing for some years past. The position is not satisfactory from the wider national point of view. There is little doubt that the commercial prosperity of the country during recent years has had a good deal to do with this diminution in the number of students who are seeking a university education. Furthermore, the bulk of the parents of the boys and girls in the State-aided secondary schools of the country have little sense of the value of a university education. Only a minority of these schools send students to the universities unless they happen to be placed in or very near to the university towns. It is not suggested that it would benefit all boys to go to a university without regard to their means or their ability and without a careful selection of their course of study, but there are grounds for thinking that the demand for healthy and able young men with a university training is beginning to outrun the supply. The openings for administrators of various kinds and for teachers in the Indian Empire and in the Crown Colonies are increasing in number, while suitable candidates are not. Nor is the demand confined to service abroad.

The Royal Commissioners on the Civil Service are evidently of opinion that the newer universities are not contributing a due proportion of candidates for the Home Services. "We should be glad," they say, "to see the Scottish, the Irish, and the young English and Welsh universities assert more vigorously their claim to share in Civil Service appointments." That they have not done so in the past is in part due, no doubt, to the character of the examination, but it is largely explained by the younger age at which their students graduate—in itself evidence of a hurried education—and partly by the diversion of some of the brightest minds in the schools to the practical world of business before the secondary stage of their education is complete. It is doubtful whether even the commerce of the country will benefit in the long run by this impatience; it is certain that the national and Imperial Services lose the variety of training and upbringing which is to be desired in their recruits.

By comparing the figures in England for 1911-12 with those for 1912-13 the following statistics are obtained:—

STUDENTS IN VARIOUS FACULTIES.			
	1911-12		1912-13
Arts	3529	..	3405
Science	1726	..	1704
Medicine	2597	..	2697
Engineering	1105	..	1059
Technology	347	..	361
Agriculture	186	..	206

This table shows the number of full-time students in all institutions coming within the scope of the report, arranged according to the faculties in which they are studying.

It will be noticed that the fall in students which has been previously mentioned is confined to the faculties of arts, science, and engineering. The greatest actual fall is in the arts faculty, but the relative fall is equally great in the faculty of engineering. In the faculties of medicine, agriculture, and technology there has been an increase.

AGE OF ADMISSION OF FULL-TIME STUDENTS. (1912-13.)

	England	Wales
Number admitted	3241	371
Percentage under 17	4.9	1.6
Percentage 17-18	12.7	8.9
Percentage 18-19	24.5	32.3
Percentage above 19	57.9	57.2

It should be pointed out that the number of students under England in this table includes 257 students at the nine medical schools of the University of London, and forty-two students at the College of Medicine, which is a constituent college of the University of Durham.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

GLASGOW.—The University has offered academic hospitality to accredited teachers and students of Belgian universities who have taken refuge in Glasgow. The heads of the several departments will afford them such facilities for study and research as it may be found practicable to provide.

The bequest of some 12,000l., left for the department of naval architecture under the will of the late Dr. Francis Elgar, has now accrued to the University. An equal amount is bequeathed to the Institution of Naval Architects.

Mr. S. Mavor, of Glasgow, has presented to the geological department a collection of more than 500 specimens, illustrative of the coal-beds of Great Britain and the continent of Europe.

Mr. A. Fleck, formerly demonstrator to Prof. Soddy, has been appointed physical chemist to the Glasgow Radium Committee, established to administer a large fund collected in the city for the purpose of acquiring and distributing radium for therapeutic purposes. A radiometric laboratory, under the auspices of the committee, has been fitted up at the University.

It is known that there are many Belgian medical graduates refugees in this country who may find it difficult to obtain suitable accommodation. To meet this need the committee of the London School of Tropical Medicine will be pleased to hear from Belgian medical men who may desire to avail themselves of the hospitality of the school to the extent of board and residence in the hostel attached thereto. The Committee also invites any graduate so resident to attend the various classes while the school is in session.

The first meeting of the re-constituted Agricultural (previously Rural) Education Conference was held on Tuesday, November 10, Lord Barnard being in the chair. The conference appointed a committee, composed partly of its own members and partly of women co-opted for the special purpose, to consider the following reference received from the Board of Agriculture and Fisheries: "To consider the provision made in England and Wales for the agricultural education of female students of sixteen years of age and upwards, and to report whether the existing facilities are sufficient, and if not, to what extent and in what direction these should be developed and improved."