the past. There was no lack of scientific knowledge in this country and if the industrialists and scientists could be brought together and the latter realised the full value of scientific research, the industrial problem of India would be solved in no time.

Whatever might be the case with other countries, continued Sir Ramaswami Mudaliar, we must adapt ourselves to conditions in this country and it would be a most profitable mixture or amalgam to bring industrialists and scientists together in this Body and it was in that belief that this Body had been constituted. As a result of such co-operation he hoped that the Board of Scientific and Industrial Research would grow from shape to shape and from strength to strength.

He assured the members of the Board that his whole heart was with them and that he would continue to do what all he could for that Body to establish itself on a sound and permanent basis.

THE CENTENARY OF THE ROTHAMSTED EXPERIMENTAL STATION

THIS year the Rothamsted Experimental Station, which is the oldest agricultural experiment station in the world celebrated its hundredth anniversary. Most people have heard or read of the Rothamsted Experiment Station; many have either studied at the Station or visited it; but very few know of the history of the origin and development of this well-known agricultural experiment station which has done so much for the development of scientific agriculture.

Rothamsted is a village near Harpenden in Hertfordshire in England and belonged to John Bennet Lawes, a young English squire, who took great interest in farming. Lawes was born in the year 1814. His favourite hobby as a boy was experiments in chemistry. At the early age of twenty years, Lawes took into his hands the management of his farm at Rothamsted. One of the first things he did was to convert one of the barns into a chemical laboratory. With his close association with the farm and its crops Lawes soon became interested in the study of the growth of plants and began pot experiments with different crops and manures. He found that plants grew well in pots that received an application of animal charcoal, which was a waste product. He further found that plants grew even better if, before application, the animal charcoal was treated with sulphuric acid. Lawes had the vision to see a good business proposition in the results of these experiments and set up a factory for the treatment of animal charcoal, bones and phosphatic minerals, with sulphuric acid, and the production of super-phosphate. Thus were laid the foundations for the artificial fertiliser industry, which in subsequent years developed to enormous dimensions.

In 1840, Liebig enunciated his new theory of plant nutrition. Lawes carefully studied the principles underlying the theory. He had already his own ideas about plant nutrition and was, therefore, not convinced that Liebig's theory was entirely sound. He found that while the theory was sound in principle it was faulty in detail. He wanted to test it and correct it and for doing so, he required the help of a trained chemist. He engaged Joseph Henry Gilbert. The two worked together for nearly sixty years and laid the foundations not only of the Rothamsted Experiment Station but of agricultural science also.

It was in 1843 that Lawes and Gilbert laid at Rothamsted the first set of field experiments which were destined to become classical and which happily continue to this day. The Centenary of Rothamsted is thus really the centenary of these classical field experiment plots. The two young scientists could not possibly imagine then, that their experimental plots would be continued. If now they could come to life and visit their experimental plots at Rothamsted and the several hundreds of such plots since laid all over the world they would nod their warm approval with justifiable pride. Few partnerships in the field of science continued so long and with such fruitful results.

A few years before his death in 1900 Lawes established a trust under the name of Lawes Agricultural Trust and endowed it with £100,000 so that the great work which he initiated might be continued. He had the vision to realise that work must progress in consonance with the advance of science in the future and made the terms of the trust sufficiently wide to prevent unnecessary limitations. And what is more, he allowed for one hundred years the use of an area of over fifty acres for the continuance of his classical experiments.

After the death of Lawes in August 1900 A. D. Hall (later Sir Daniel Hall) became the first Director in 1902. Hall started his career as a lecturer on matters of interest to farmers, and before he became the Director of the Rothamsted Experimental Station was the Principal of the College of Agriculture at Wye. He collated the results of the experiments of Lawes and Gilbert, and wrote a book which is full of interesting and instructive tables besides a good deal of other useful information. Hall was succeeded by Dr. E. J. Russell (now Sir John Russell) as Director in the year 1912 and his retirement after thirty-one years as the Director coincides with the celebration of the Centenary. Dr. Ogg has now succeeded Dr. Russell as the Director of the Rothamsted Experimental Station.

When Lawes and Gilbert began their experiments chemistry appeared to be the only science that had a bearing on agriculture and for a long time that was the only science used at Rothamsted. Hall realised that chemistry and fertilisers were not the only ones that mattered and that other sciences were equally important in agriculture and invoked the aid of botany, physics, microbiology, organic chemistry, entomology and plant pathology, in the study of problems concerned with soil conditions and plant growth. The development of biological research required mathematical methods for the sifting and evaluation of experimental data, and this need has been met by the addition of a section of statistics.

Since the time of director Hall and during the time of director Russell the Rothamsted Experimental Station marched from progress to progress and to-day the Station is well equipped for research on all problems in soil management and crop production. The work is carried out in a number of sections and subsections dealing with botany, soil physics, soil chemistry, microbiology, field experiments, statistics, crop physiology, insect pests, and plant diseases. The contributions of these different sections to the science and practice of agriculture are great and enduring.

The fields of work initiated at Rothamsted a hundred years ago by Lawes and Gilbert and subsequently developed by those that followed them are still yielding rich harvests. The founders started their programme of work on fundamental scientific problems. They did not base their programme of work to deal with the then problems of immediate practical importance even though that would have been justifiable in those difficult days called "the hungry forties" when more and cheap food was in great demand. Had they done so we would not have to-day the results which are so widely beneficial and permanent in value. Lawes and Gilbert laid emphasis on gaining knowledge as they had the vision and insight to realise that knowledge is essential for advance. The world to-day cannot be too grateful to these pioneers. Rothamsted celebrated its Centenary by extending the laboratories and facilities for scientific work and that is a fitting and enduring expression of gratitude to the great founders of the Rothamsted Experimental Station a hundred years ago.

B. VISWA NATH.

STUDIES ON THE PRESERVATION OF GLANDS

II. Preservation of Pituitary Glands

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ADRENALINE AND THYROXINE are typical examples of hormones which can be isolated in pure crystalline condition and which can, therefore, be correctly dosed in the preparation of injectules. The posterior pituitary, on the other hand, is very often administered as a crude extract ('Pituitrin'), which is prepared by extracting the desiccated powder with 0·25 per cent. acetic acid and then distributed into ampoules after bioassay, such that each c.c. contains ten international units. Any decrease in the potency of the powder would necessitate more of powder to be extracted to give the same volume of solution: this would naturally involve the presence of more of extraneous protein in the final extract—which is highly undesirable. The study of the conditions for the proper collection and preservation of the pituitary glands is, therefore, of great significance.

Vitamin C is an important constituent of the pituitary glands (where it is present in greater concentration than in the adrenal glands) and a study of the changes in the vitamin content during collection and storage of the glands should give an insight into the stability of the glands. A detailed study was, therefore, undertaken of the vitamin C content of the glands collected and stored under different conditions: the methods used were firstly the titration method with the oxidation reduction indicator 2:6 dibromophenol-indophenol, and secondly, titration with standard iodine solution. As in the case of a previous study[1] on the preservation of adrenal glands, the iodine titration method was found to give consistently higher values than the indicator method, indicating the presence of extraneous reducing agents.

Tables 1 to 6 represent the figures for vitamin C (expressed as mg. of vitamin per g. of whole gland) obtained for the pituitary glands of cattle and sheep collected, (1) in 'dry ice' (− 80°), (2) in freezing mixture (− 18°) and (3) melting ice (0°), soon after the animals were slaughtered and analysed within two to three hours (the time taken for transport of the glands from the abattoir to the laboratory).

Cattle Glands

TABLE 1 *Collected in 'dry ice'* | TABLE 2 *Collected in freezing mixture*

Indicator	Iodine	Indicator	Iodine
1·43	1·68	1·38	1·71
1·41	1·67	1·36	1·78
1·45	1·72	1·31	1·68
Average 1·43	1·69	Average 1·35	1·72

Cattle Glands TABLE 3 *Collected in ice* | *Sheep Glands* TABLE 4 *Collected in 'dry ice'*

Indicator	Iodine	Indicator	Iodine
1·29	1·55	1·72	2·04
1·30	1·60	1·70	2·01
1·31	1·59	1·84	2·18
Average 1·30	1·58	Average 1·75	2·08