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THE FIRST SESSION OF THE INDIAN STATISTICAL CONFERENCE, CALCUTTA, 1938.

INTRODUCTION.

The question of starting an Indian Statistical Conference was first raised in September, 1934, and the Hon'ble Sir James Grigg, Finance Member of the Government of India, strongly supported the proposal; but no action could be taken immediately owing to the departure from India of Dr. D. B. Meek, then Director-General of Commercial Intelligence and Statistics, who had been actively helping in this matter. The proposal was considered by the Council of the Institute in August 1936, and the Honorary Secretary was asked to elicit public opinion and report to the Council at the earliest opportunity. Statistical workers all over India were found to be definitely in favour of organizing some kind of an annual conference for the discussion of statistical questions. The Honorary Secretary, at this stage, informally explored the possibilities of starting a Section for Statistics in the Indian Science Congress; but the proposal was not received with favour by the authorities of the Science Congress. After careful consideration of the question in April, 1937, the Council of the Institute finally approved of the principle of organizing the Indian Statistical Conference with an independent constitution of its own but in co-operation with the Indian Science Congress and the Indian Economic Conference. It was also decided to hold the first Conference in Calcutta in January, 1938. One important reason for making this decision was that the Jubilee Session of the Indian Science Congress was going to be held at the same time in Calcutta and was to be attended by a large number of distinguished scientists from abroad.

OFFICIAL AND ACADEMIC RECOGNITION.

The Government of India, the different provincial Governments, important Indian States and most of the Indian Universities gave official recognition to the Conference, and in many cases either sent official representatives or permitted officers under their control to attend the Conference.

PATRON : HIS EXCELLENCY THE RIGHT HON'BLE LORD BRABOURNE, G.C.I.E., M.C.,
GOVERNOR OF BENGAL.

His Excellency the Right Hon'ble Lord Brabourne, G.C.I.E., M.C., Governor of Bengal, very kindly agreed to be the Patron of the Conference and also to perform the Opening Ceremony.

FIRST PRESIDENT : PROF. R. A. FISHER.

A little earlier, the Indian Statistical Institute, with the active co-operation of the University of Calcutta, had sent an invitation to Prof. R. A. Fisher, F.R.S., Galton Professor in the University of London, to visit India during the cold weather of 1937-38. It was unanimously decided that he should be asked to act as the First President of the Indian Statistical Conference.

LOCAL RECEPTION COMMITTEE.

A representative Reception Committee was formed in Calcutta with Mr. S. P. Mookerjee, Vice-Chancellor of the Calcutta University, as Chairman and a large number of influential persons

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in academic, official, and business circles as members. A number of Committees for Programme, Finance, Entertainment, etc., were also appointed.

The Local Committee of the Indian Science Congress actively co-operated in arranging the programme of the Statistical Conference, and a number of joint sessions were held and attended by members of both the bodies.

THE OPENING CEREMONY : 7TH JANUARY, 1938.

The Opening Ceremony was performed in the Senate House of the Calcutta University at 10.0 A.M. on Friday the 7th January, 1938. A distinguished gathering of over four hundred persons including members of the Statistical Institute, delegates to the Statistical Conference, and invited guests among whom were Sir James Jeans and other members of the Overseas Delegation to the Science Congress, were present on the occasion.

His Excellency the Lord Brabourne accompanied by the President of the Conference, the Chairman of the Reception Committee, and the Vice-Presidents and Office-bearers of the Indian Statistical Institute entered the Senate Hall in procession. Mr. S. P. Mookerjee, in welcoming the delegates and guests on behalf of the Reception Committee and the Calcutta University, referred to the work of the Indian Statistical Institute in organizing statistical studies and researches in India, the importance of the application of statistics to problems of national welfare, and the need of liberal assistance from Government in this connexion. He stressed the fact that Universities in India must play their part by providing facilities for training in statistics with a view to guaranteeing an adequate supply of trained statisticians in future.

In the absence out of India of Sir Edward Benthall, the President of the Statistical Institute, the Hon'ble Mr. N. R. Sarker, Finance Minister to the Government of Bengal and Vice-President of the Institute, made a short speech welcoming His Excellency, Prof. Fisher, delegates and members of the Statistical Conference. He said that lack of reliable statistics was keenly felt in India, but he hoped that the deliberations of the Conference would help the Government to improve their machinery for the collection and interpretation of statistics.

The Hon'ble Sir James Grigg, Finance Member of the Government of India, referred to the importance of the study of analytical statistics and the valuable work done by the Statistical Institute in this connexion. He hoped that the Government of Bengal would follow the lead given by the Government of India by sanctioning grants for the Institute.

His Excellency the Lord Brabourne, Governor of Bengal, endorsed in his representative capacity the welcome extended to the delegates and the distinguished company of scientists. In referring to Prof. Fisher, His Excellency stated that the progress of statistics in India as applied to agriculture was a triumph of the methods devised by him. The Statistical Laboratory had actively co-operated with the Government of Bengal in examining the extent and degree of rural indebtedness and the conclusions reached had formed the basis of legislation and administrative organisation for debt reconciliation. Important investigations were being carried out under the direction of the Laboratory to devise methods for improving official crop forecasts. His Excellency observed that the phenomena of political and economic life are so complex that there was no possibility of experiments in these subjects being undertaken by administrators. In such cases, he, as a layman, would always look to statistical science for help in research and interpretation of facts of observation. With the hope that the Conference would lead to a sustained interest being henceforward taken in these important questions by the public and Government, he had much pleasure in declaring open the First Indian Statistical Conference.

Prof. R. A. Fisher, in his presidential address, briefly reviewed the evolution of the science of statistics and its tools from early beginnings down to the present day.

Statistics, he said, originally meant the science of statecraft. The business of official statistics was to provide to the rulers of states relevant political and economic information in figures; by degrees it fell to this science to provide public information. Statistical work was also largely employed as a means to internal efficiency in large Government departments, and lately the statistician has been in great demand in connexion with large projects for handling difficult quantitative problems. He pointed out that India should take a lesson from English experience, and try to avoid the great gap that separates academic and official statistics in England much to the detriment of both.

Sometime ago what the statistician would do with a mass of observational data was to calculate certain average values, or at best certain probable errors connected with them. The discovery and use of what are now known as tests of significance, initiated by the late W. S. Gossett in 1908 and now widely developed, grew comparatively recently out of the need (which

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confronts all practical statesmen and a larger class of experimentalists) of having to make decisions and to take action on a limited amount of knowledge. The development of exact tests of significance had been based on the solution of what are known as distribution problems, and this in time led to the theory of estimation which solves the problem, "what is the best method of arranging or combining the data in hand so as to elicit the best information on some definite issue." Through the very fruitful concept of the quantity of information, the theory of estimation placed in the hands of every statistician tools by which he could tell not merely the best way of combining the data but also very often the best way of collecting the primary material so as to prevent waste and largely eliminate the possibility of error.

He pointed out the very useful part the science of statistics can play in national life, and ended by expressing the hope that, in the great task of the effective organization of her national life and the fruitful utilisation of her natural resources, India will not be slow to avail herself of the recent developments of statistical science.

SECTION FOR THEORETICAL STATISTICS.

On the afternoon of Friday the 7th January 1938, the Section for Theoretical Statistics was held jointly with the Physics and Mathematics Section of the Indian Science Congress under the Chairmanship of Prof. R. A. Fisher. The first paper read at the session was on "The Sampling Distribution of the D^2 -Statistic" by Messrs. R. C. Bose and S. N. Roy (*Statistical Laboratory*). In the discussion that followed Prof. Fisher pointed out the connexion of the present distribution with an earlier work of H. Hotelling and with his own work on "discriminant functions" and on the distribution of the multiple correlation coefficient. Prof. Mahalanobis gave a short history of the origin of the D^2 -Statistic and referred to some of its practical applications. This was followed by papers on "The Performance Test" by S. R. Savur (*India Meteorological Department*), "Tippett's Random Sampling Numbers" by K. R. Nair (*Statistical Laboratory*); "On Fisher's combinatorial Methods giving Moments and Cumulants of the Distribution of k -Statistics" by P. V. Sukhatme (*Statistician, Imperial Institute of Sugar Technology, Cawnpore*), "The Semi-invariants of two Variates and Their Additive Properties" by A. A. K. Ayyangar (*University of Mysore*) and "On a New Bessel Function Distribution" by S. S. Bose (*Statistical Laboratory*).

SECTION FOR AGRICULTURAL STATISTICS.

The Section for Agricultural Economics started at 9-30 A.M. on Saturday, the 8th January 1938, under the chairmanship of Dr. P. N. Banerjee, M.L.A. In his opening remarks Dr. Banerjee stressed the urgent need for an intensive and scientific study of different aspects of agriculture in India, and pointed out that the defects of Indian Agricultural Statistics were due to lack of statistical knowledge on the part of persons in charge of collection of data, their interpretation and analysis. Mr. N. C. Mehta, I.C.S., (*Secretary, Imperial Council of Agricultural Research*), opened the discussion by stating that one serious defect of Indian agricultural statistics was due to lack of co-ordination between various Government departments. He stressed the difficulties in interpreting the results owing to defective statistical technique in the compilation of the data. Mr. H. P. V. Townsend, I.C.S. (*Development Commissioner, Bengal*) and Prof. Fisher emphasized the need for the application of statistical methods to projects relating to agriculture and irrigation.

A symposium on the application of statistics to agricultural field experiments was held jointly with the Agriculture Section of the Indian Science Congress under the Chairmanship of Prof. Fisher at 11-30 A.M. on the same day. Mr. V. G. Panse (*Institute of Plant Industry, Indore*) opened the discussion with a short paper on "Sampling Studies in Cotton, Barley, and Wheat". Messrs. J. Banerji (*Indian Forest Service*) and B. Sant Ram (*Forest Research Institute, Dehra Dun*) discussed some applications of statistical methods to Silvicultural problems. Mr. S. S. Bose (*Statistical Laboratory*) discussed the method of reconstructing missing yields in the case of two or more mixed up yields. Mr. K. R. Nair (*Statistical Laboratory*) showed how confounded designs may be constructed to suit various specifications in factorial experiments.

SECTION FOR MEDICAL AND PUBLIC HEALTH STATISTICS.

The Medical and Public Health Section of the Conference was held at 1-30 P.M. on Saturday the 8th January under the chairmanship of Col. A. J. H. Russel, I.M.S., (*Public Health Commissioner with the Government of India*), who in course of his speech, said that the study of vital statistics in India was yet in its infancy, but hoped that the rate of progress would be accelerated. Describing the methods of compilation of vital statistics he was of opinion that, on an average,

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the inaccuracy was probably of the order of twenty per cent, due to omission of registration, and emphasized the great importance of the study of population problems in India. This was followed by a general discussion of methods of improving the vital statistics of India in which a large number of persons participated. Dr. R. B. Lal (*Offg. Director, All-India Institute of Hygiene and Public Health*) then described the chief results of a co-operative study of "Epidemiology of Cholera in Bengal," Mr. C. N. Nayagam (*Madras Public Health Department*) discussed methods of forecasting outbreaks of epidemics, and Capt. Mitra (*Bengal Public Health Department*) described the Bengal experiments on the use of plasmochin in anti-malarial work.

SECTION FOR ECONOMIC STATISTICS.

The Section for Economic Statistics was held on Sunday, the 9th January at 10-0 A.M., under the chairmanship of the Hon'ble Mr. N. R. Sarker (*Finance Minister of Bengal*). The Hon'ble Mr. Sarker, in his opening remarks, pointed out the importance of reliable statistics in commerce, industry, and administration, and pleaded for a critical use of statistics in the economic sphere. The first paper on "India's Food Supply in relation to Dietetic Requirements" by Dr. V. K. R. V. Rao (*Principal, Seth Lalbhai Dalpatbhai Arts College, Ahmedabad*) was, in his absence, presented by Dr. H. Sinha. This was followed by a paper by Prof. K. B. Madhava (*University of Mysore*) in which he referred to some recent work on correlation in time series and to some theoretical work on economic planning in order that incomes and outlays might balance. This was followed by papers on "India through the Depression" by Prof. J. C. Sinha (*Presidency College, Calcutta*) and Dr. H. Sinha (*University of Calcutta*), "The Size of Cotton Mills in India" by Mr. N. S. R. Sastry (*University of Madras*), "Economic Significance of Certain Statistical Concepts in Agricultural Economics" by Dr. B. Ganguli (*University of Delhi*), "Restriction of Output of Coal" by J. Guba Thakurta (*Statistical Laboratory*), "Statistical Analysis of Seasonal Fluctuations in the Trade Movements of Certain Agricultural Products in India" by Mr. W. John (*Department of Commercial Intelligence and Statistics*) and on "Presentation of Official Statistics" by Mr. J. M. Datta (*Calcutta*). Each paper was followed by a general discussion in which a large number of members took part.

A special discussion on "Standardisation in Industry" was arranged at 3-30 P.M. on Sunday, the 9th January, 1938, under the chairmanship of Prof. K. B. Madhava (*University of Mysore*) who referred to the work of Dr. W. A. Shewhart of the United States on the application of statistical methods to standardization in industry, and pointed out that a good deal of routine experiments and clear thinking was necessary for sound progress. Mr. R. C. Srivastava (*Director, Imperial Institute of Sugar Technology, Cawnpore*) in opening the discussion stated that the problem under consideration was to decide how much the quality of a manufactured article might be allowed to vary with safety and yet be said to conform to the specified standard. The limits should be so chosen that the manufacturer should not be penalised too much by rejection, and yet the consumer was not forced to accept sub-standard material. Dr. P. V. Sukhatme (*Institute of Sugar Technology*) discussed the problem of standardization so far as it concerned the grading of sugar; Mr. P. N. Nayer (*Tata Iron and Steel Corporation, Jamshedpur*) spoke on the specification of the quality of manufactured goods, and Mr. N. R. A. Iyer (*Tata Iron and Steel Corporation, Jamshedpur*) emphasized the desirability of uniformity in standardization of cost accounts.

SOCIAL FUNCTIONS.

Besides the scientific meetings, a number of social gatherings were also arranged. At 4-30 P.M. on Saturday the 8th January, the Reception Committee gave a tea party in the grounds of the Presidency College adjoining the Statistical Laboratory. On Sunday the 9th January, the members and delegates were invited to a luncheon party given by the Hon'ble Mr. N. R. Sarkar at Firpo's Restaurant. On the same afternoon they were invited to a tea party given by the University of Calcutta in the grounds of the University College of Science. Such social functions gave excellent opportunities for establishing personal contacts between workers from different parts of the country, and were highly appreciated by the members and delegates.

FUTURE PROGRAMME.

The First Conference was successful in every way, and it was unanimously decided that sessions should be organized every year in future. The general opinion was in favour of holding the session in the same place and at the same time as the Indian Science Congress, and Lahore was selected as the venue of the 1939 session.

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