

INDIAN STATISTICAL INSTITUTE

Twentyfirst Annual Report : 1952-53

INTRODUCTORY

The Indian Statistical Institute completed twentyone years of its existence during the year under review. It is a happy coincidence that several significant developments occurred in the year of the Institute's attaining majority. The Government of India made far-reaching decisions about its future. The Research and Training School of the Institute would be developed as the focal centre for professional training and research in statistics on the lines of a higher technological institute and given powers to award diplomas of professional training and qualifications. Arrangements would be made for training selected Government officials in the Institute. Government also decided to continue the International Statistical Education Centre in Calcutta in close association with the Institute, and gave its support, in principle, to the proposal of establishing an Asian Statistical Institute as an international organization of Asian countries with an operating centre to work in collaboration with the Institute. It was also decided that the Project Branch would be worked on the lines of a National Statistical and Computational Laboratory of India for technical and large scale work in applied statistics.

General Activities

The activities of the Institute cover a wide range and fall into six broad groups.

(i) Basically the Institute is a non-profit 'learned society' (registered under Act XXI of 1880) with society-type branches in different parts of India and with *Sankhya*, the Indian Journal of Statistics, as its official organ.

(ii) The Research and Training School of the Institute offers post-graduate course leading to the professional Associateship of the Institute which ranks as a junior doctorate. Admission to the School is restricted normally to candidates who have already taken an honours or a master's degree. Shorter courses are also offered for computers and junior technicians; individual guidance is given to a limited number of advanced workers in selected fields.

(iii) The International Statistical Education Centre, which was started in 1950 under the sponsorship of the UNESCO for participants from different countries of Asia and the Far East, is now maintained by the Institute with the help of a grant from the Government of India as a closely associated unit of the Research and Training School.

(iv) Since 1938 the Institute has been awarding a Statistician's Diploma and Computer's Certificate and Field Survey Certificate for which external examinations are held by the Institute at different centres of India. The Institute is also awarding the Associateship of the Institute (A.I.S.I.) from this year.

(v) The Projects Branch, or the Statistical Laboratory, undertakes statistical surveys and enquiries of various kinds. Since February 1949 (when Professor P. C. Mahalanobis has been working as Honorary Statistical Advisor to the Cabinet, Government of India) the Institute is being more and more associated with Government work and is working in

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close association with the Central Statistical Office (Cabinet Secretariat), the National Income Unit and the Department of Economic Affairs (Ministry of Finance). Since 1950 it has been handling the entire technical work (design of survey and analysis of data) of the National Sample Survey and associated enquiries of the Government of India.

(vi) There is also another closely associated unit, viz., the Statistical Publishing Society which was established in 1935 on the initiative of the Institute as a separate organisational unit (registered under Act XXI of 1860) working in close association with the Institute. It maintains a well-equipped printing press and publishes *Sankhya*, the Indian Journal of Statistics.

Increasing Demand for Statistics

The need of more and better statistics is being increasingly realized; and during the last three or four years, the Institute is being called upon by Government to undertake new projects. Some of the important statistical activities of the Institute during the year are mentioned below.

National Sample Survey : The Scope of the National Sample Survey which was started in 1950 has increased considerably during the year under review. Details of work done are described in Part II.

Fact Finding Committee : In December 1952, the Government of India desired that the Institute should participate in the work of the Fact Finding Committee set up by it to report on the refugee rehabilitation work in West Bengal; this entailed a rapid sample survey in a number of selected centres besides releasing Satyabrata Sen, a senior worker, for a time to enable him to serve as a member of the Fact Finding Committee. The Fact Finding Committee used the information collected by the Institute in preparing its report which was submitted to Government in March 1953.

UN Project of SQC Training : At the request of the Government of India the United Nations Technical Assistance Administration sent a team of experts who organized intensive courses of training in Statistical Quality Control in New Delhi, Calcutta, Madras and Bombay from October 1952 to January 1953. The grant from the Government of India was sponsored by the Central Statistical Organization (CSO) and a committee was set up by the Planning Commission with Sri V.T. Krishnamachari as Chairman, Sir Shri Ram as Vice-Chairman, Professor P. C. Mahalanobis as Secretary and Professor K. B. Madhava and Sri S. C. Sen as Joint Secretaries to look after local arrangements. The CSO was in charge of arrangement in Delhi; the Indian Statistical Institute acted as the host society and made necessary arrangements in Calcutta in co-operation with the Indian Society of Quality Control; the local Branch of the Institute, under the guidance of Professor K. B. Madhava, was in charge of arrangements in Madras; and the local Branch guided by Dr. N. S. R. Sastry was in charge in Bombay.

The UN SQC training project created a great deal of interest among Government departments as well as private industrialists. The Institute, which has been taking a continuous interest in SQC for nearly twenty years, has been helping in the formulation of the follow-up programme in continuation of the UN project.

Programme of Capital Expenditure : In view of the rapidly expanding activities of the Institute and increasing demands on its services consolidated proposals submitted to the Government of India in January 1953 for capital expenditure to the extent of Rs. 45 lakhs during the remaining period of the Five Year Plan.

Participation in Outside Work

PROFESSOR P. C. MAHALANOBIS attended the International Economic Conference in Moscow, as an observer, in April 1952. In September 1952 he acted as the leader of the Indian delegation to the Second Regional Conference of Statisticians in the ECAFE at Bangkok and was elected Chairman of the conference. In February 1953 he attended, as the representative of India, the UN Statistics Commission in New York. During the year under review Prof. Mahalanobis was elected an Honorary Member of the International Statistical Institute of which he has been an ordinary member since 1936 and Vice-President since 1947. His election is a recognition of the contribution of India to Statistical Science.

DR. H.C. SINHA, a founder member and an ex-Joint Secretary to the Institute, presided over the Statistical Section of the annual session of the Indian Science Congress at Lucknow in January 1953.

SRI S. B. SEN went to Bangkok as a member of the Indian delegation to the Regional Conference of Statisticians mentioned above. During the year he has also worked as a member of the Fact Finding Committee on refugee rehabilitation appointed by the Government of India.

DR. C. R. RAO acted as a member of the Board of Studies and of the Board of Examiners in Statistics in the universities of Aligarh, Andhra, Banaras, Calcutta, Dacca, Gauhati, Lucknow, Madras and Travancore. He was elected an ordinary member of the International Statistical Institute; this brings up the number of Indian members to seven.

SRI J. M. SENOFFTA acted as a member of the Special Cinchona Committee appointed by the Government of India.

I

THE ADMINISTRATION

Membership and the Council

Membership of the Institute is open to all persons interested in statistics, irrespective of nationality, creed, caste or sex. The total number of members at the end of the year was 180, inclusive of 20 new entrants. The general body of members of the Institute elect each year the President, the Treasurer, the Secretary (and Joint Secretaries, if any) and the Council which controls the work of the Institute and has powers to make necessary changes in the rules.

The executive comprises of (a) The Council and (b) The Governing Body for the Research and Training School which started functioning in the year under review. Both the Council and the Governing Body have various committees for the administrative work and also purely internal committees for the functional operations of the Institute.

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The Council* held ten meetings during the year. After the creation of the Governing Body of the Research and Training School the Council made a review of the activities of all sections and branches of the Institute and thought they should continue to be done on a unitary basis; this view was fully supported by the Governing Body.

The Council appointed a Standing Committee of eight members for the award of Associateship of the Indian Statistical Institute. The byelaws for the award of the Associateship are given in Appendix III.

The Council suffered during the period under review an irreparable loss in the sudden death of Sri Amulya Ratan Sinha (Retired Deputy Director General of Commercial Intelligence and Statistics) who was intimately connected with the Institute since its foundation and had rendered valuable services to it as a member of its Council for many years and more recently as a teacher of the Research and Training School and the International Statistical Education Centre.

The International Statistical Education Centre in Calcutta had been established in October 1950 by collaboration between the International Statistical Institute, with financial support from the UNESCO. This arrangement terminated in 1952, but work was decided to be continued with the help of an earmarked grant from the Government of India, and the Council also decided to continue the management of the ISEC under a joint Board on the lines of the original agreement between the two Institutes.

Governing Body of the Research and Training School

The Governing Body of the Research and Training School (established by the Council with the approval of the Government of India) started functioning in the year under review. The constitution of the Governing Body for the Research and Training School had been reported last year. The names of the members of the Governing Body are given in Appendix II.

The first meeting of the Governing Body was held on 19 July 1952 in New Delhi under the chairmanship of Sri C. D. Doshmukh, President of the Institute and was attended by 14 members out of a total of 17.

It was agreed that the present system of integrated work of the different departments on a unitary basis—particularly between the Research and Training School and the Project Branch of the Institute—should be continued. The budget of the Research and Training School on the basis of such integrated work approved and directed to be forwarded to the Government after securing the concurrence of the Council of the Institute. The Governing Body approved the continuance of the practice of inviting Visiting Professors from outside India, and accepted in principle the proposal of securing part-time participation of Government officers in the research and training programme.

The Governing Body appointed the Finance Committee and the Selection Committee for the appointment of the technical staff and nominated representatives to the Journal Committee and the Examinations Committee of the Institute.

It was decided that proposals for the appointment of Fellows and Scholars would be put up after inviting applications by advertisement in different parts of India.

* The names of the members of the Council are given in Appendix I.

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Committees: Since 1950-51 the Institute has been moving towards the decentralisation of administration through the establishment of a series of working committees. The first of these viz., the Technical Committee consisting of heads of technical sections was established by Prof. Mahalanobis in 1950-51 to deal with technical questions including the administration and organisation of technical work, and was given a good deal of delegated powers to take urgent action when necessary in anticipation of sanction by the Director. The Technical Committee has been meeting regularly with a rotation system of chairman (with a change over every two months) and has been carrying a great deal of effective responsibility. The successful work of the Technical Committee led to two other committees being set up in the year under review, namely, a Works Committee to look after all construction and maintenance operations and a House Committee to deal with questions of accommodation, transport, canteen, and amenities for the workers. The Committees have been working satisfactorily.

Offices and Office Staff

The Institute, founded in 1931-32, had its headquarters in the Statistical Laboratory (which had started functioning in an informal way several years earlier in the rooms of Professor P. C. Mahalanobis) in the Presidency College, Calcutta, where practically the whole of the work used to be done in earlier years. In 1942, on account of the conditions created by World War II a considerable part of the work was removed to 'Amrapali', Professor P. C. Mahalanobis's residence at 204, Barrackpore Trunk Road at Baranagore in the suburbs of Calcutta and to 'Mahua' belonging to Mrs. Mahalanobis at Giridih in Bihar (where camp branches used to be opened during the Puja vacation every year for a long time, and where the camp branch started in October 1951 had been intentionally kept functioning that year). The administrative headquarters, however, continued to remain in the Presidency College, Calcutta, together with the Research and Training School.

BARANAGORE OFFICE : The volume of work at Baranagore gradually increased and the Institute acquired in 1949, through the land acquisition procedure of the Government of West Bengal, a plot of land measuring about three acres at 203 Barrackpore Trunk Road, Calcutta-35, adjacent to 'Amrapali'. The construction of a building on this land was started in 1950-51, and a large block was formally opened by Sir Ronald A. Fisher on December 17, 1951 on the twentieth anniversary of the foundation of the Institute. With the help of a grant from the Government of India additional blocks were constructed during the year under review. The foundation day reunion of the Institute was celebrated at Baranagore on the 20th December 1952. The Research and Training School and the International Statistical Education Centre and a major portion of the Library were shifted from the Presidency College to the new building in Baranagore during the earlier part of 1953. The bulk of the Institute is now housed in the new building; this is convenient in every way and should promote closer integration of research, training and projects. There are however no adequate lecture rooms or halls in the new building and the accommodation available at present is still quite inadequate. The trainees found great difficulty in securing residential accommodation at Baranagore, and it became necessary to open two hostels for the trainees under the direct control of the Institute in two premises at 206 Barrackpore Trunk Road and 204/1 Barrackpore Trunk Road. The ISEC students are, however, still residing in Calcutta, which is extremely inconvenient.

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In order to accommodate the training section some space had to be found in the main building at Baranagore, and a portion of the project section had, therefore, to be sent back to the Presidency College. The computer's training classes are also located in the Presidency College. The fact that the ISEC trainees have to reside in Calcutta scattered all over the city is a serious difficulty. It hampers the fostering of closer personal relations and cultural activities. An international hostel is urgently needed and would be of great help in achieving the real objects of the ISEC.

Additional accommodation for the RTS and an international hostel for the ISEC are needed very urgently. With the approval of the Council, an application for a non-recurring grant was submitted to the Government of India in January 1953.

Construction and maintenance : An Estate Office created some years ago has been looking after construction and maintenance of the Institute buildings. During the year under report, extension of the new building at Baranagore in a westerly direction provided a floor space of 17,500 sq. ft. in addition to the 19,000 sq. ft. available at the beginning of the year. The total cost incurred on this building upto 31 March was Rs. 4,93,000.

CALCUTTA OFFICE : The training classes for computers, a portion of the projects branch, and a section of the library were located in the Presidency College, and in a hired room in the Albert Hall near the College throughout the year under review. Meetings of the Council and various committees also continued to be held in the Presidency College. A city office is in fact indispensable not only for contact with the general public but also for the convenience of operational work.

GIRIDIH OFFICE : As already mentioned, a camp branch had been functioning at Giridih since October 1937 which was rapidly expanded to function as an operating branch from February 1942 ; and at one time during the War, the total number of workers at Giridih exceeded 250. Giridih having been found to be a very convenient location for an auxiliary working branch, it was decided by the Council to establish a permanent centre at that place. Proceedings were originally started in 1944 under the land acquisition act of the Government of Bihar for a large plot of land contiguous to 'Mahua' where the Giridih office of the Institute was located since 1941. After many years of negotiations and with the active help of Sri Chintaman Deshmukh, President of the Institute, possession of the land, measuring 35 acres (and bounded by the river Usri on one side), was obtained in July 1952.

Precision experiments on crop-estimate surveys were conducted during the *aghani* season in November and December 1952 on some of these lands ; a brief account of these experiments is given in a later section. The centre at Giridih can be very usefully developed as an experimental station for statistical studies relating to agriculture. It can also serve as a convenient centre for the professional students in statistical sampling of various kinds. Furthermore, Giridih would be a convenient place to store the large mass of Hollerith punched cards and other records which were being thrown up every month by the National Sample Survey.

Arrangements were made during the year to enclose the land with barbed wire fencing ; and to have a trial boring in the river to explore the possibility of irrigation from shallow tube wells sunk into the river bed.

DELHI OFFICE : A small office was established in Delhi to assist Prof. P. C. Mahalanobis when he started his work as Statistical Adviser to the Cabinet in February 1949 and to keep in touch with the Central Government generally. With the increasing association of

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the Institute with the statistical work of the Government of India, this office has proved extremely useful, and is serving as a nucleus for much of the developmental activities in statistics in the Central Government. A bigger and more permanent operational branch in Delhi would be of great advantage; and the Council has accordingly approached the Government of India for funds for the purchase of land and construction of a building in New Delhi.

Distribution of workers at different centres : The following table shows the distribution of workers at Baranagore, Calcutta, Giridih and Delhi. Figures are also given for the Field Branch maintained under the direct control of the Institute for sample survey and special enquiries.

<i>centres</i>	<i>workers & scholars</i>		<i>bearers</i>		<i>total</i>	
	1952	1953	1952	1953	1952	1953
Baranagore	252	338	57	84	309	422
Calcutta	21	22	12	14	33	36
Giridih	47	48	10	18	57	66
Delhi	6	4	3	2	9	6
Statistical	326	412	82	118	408	530
Field Branch	125	121	39	37	164	158
Total :	451	533	121	155	572	688

Changes in staff : Dr. R. Vaidyanathaswamy, the well known mathematician who retired as professor of Mathematics in the University of Madras in 1952, joined the Institute as professor of Mathematics in October 1952. Sri Das Raj of the Lucknow University joined in March 1953 as a Research Fellow. Sri J. K. Choudhury, Retired Principal of Vidyanagar College, joined in December 1952 as part-time Special Officer in the International Statistical Education Centre.

Sri Surapati Chakravorty also joined the Institute in December 1952 and has been working in the Development Office. Two young statisticians, Sri E. M. Paul and Sri H. N. Kamath, were taken as research scholars during the year.

The following workers of the Institute left during the year to take up appointments elsewhere: Govinda Chandra Mondal, Kamal Chandra, Prnfulla Kumar Mukherjee, Anukul Chandra Das; Tarapada Choudhury, a member of the teaching staff, went on leave in September 1952 to study in the London School of Economics.

The Institute suffered a great loss in the sudden and untimely death on June 28, 1952 of Sri Heramba Chandra Ghosal, Chief Accountant, who was one of the oldest workers of the Institute, and served it with great devotion and untiring zeal for 14 years winning the respect of his colleagues by his integrity of character and painstaking attention to details.

Welfare Measures

Medical Unit : During the year under report the medical unit at Baranagore was provided with better accommodation and equipment. The unit attended to 4409 cases at the Institute, made 875 visits to the residences of workers, and the compounder dispensed medicines worth about Rs. 2,500/-.

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Canteen : A canteen was opened last year at Baranagore and soon became very popular and had to be further developed rather extensively. It is now located on the ground floor in the main building with good sitting arrangements, furniture and fixtures, fan, light, crockery and refrigerating unit. It caters to more than 400 workers, and a staff of 3 supervisors and 12 workers are kept fully busy from morning till night. Financially, the canteen is not yet self-supporting, and the deficit is being met from the Institute funds through a subsidy.

Workers' Club : A workers' club for social and cultural activities was started at Baranagore during the year. A similar club has been functioning at Giridih for a long time. The funds for running the two clubs were provided partly from members' subscription and partly from subsidies by the Institute. Arrangements have been made for football, field sports and some indoor games. Competitive prizes were awarded to the winners. Some social functions were organized, of which the "Basant Utsav" (Spring Festival) was the most notable event.

II

FUNCTIONAL UNITS RESEARCH AND TRAINING SCHOOL

The work in the Research and Training School falls broadly under three heads, namely, (1) training, (2) scientific enquiries, and (3) research which is organised in two divisions: theoretical and applied, scientific enquiries and training.

Theoretical Research

The main lines of research on the theoretical side were as follows*:

(1) *Classificatory problems* (6, 19, 35): In the problem of classification it is generally assumed that the alternative populations to which an individual may belong are completely specified. But in practical situations such a knowledge is not complete and information about the alternative population may be available only through samples. A general theory has been developed based only on the sample information (when the parameters of the population distributions are unknown).

(2) *Statistical decision functions* (1, 2): The condition for existence of minimax solutions (proposed by Wald) have been studied in a number of cases. It was shown that such a solution need not exist when the loss function is unbounded or the parameter space is not restricted.

*The serial numbers within brackets give references to the list of papers in Appendix IV

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(3) *Minimum variance estimation* (3, 4, 5, 8, 10, 28, 31, 32, 40): The general properties of minimum variance estimates and the necessary and sufficient condition under which they exist have been determined. Using the concept of Hilbert space a complete characterization of minimum variance estimates has been obtained.

(4) *Biometric methods and mathematical genetics* (10, 23, 36, 37, 41): The most efficient method of using multiple measurements in problems of genetic differentiation and genetic selection in breeding programmes has been worked out in some details.

The distributions in the blood group gene frequencies under Hindu marriage systems have been determined.

It was shown that better estimates of relative potency in a biological assay can be obtained by considering multiple measurements.

Conditions under which Mahalanobis's D^2 converges to enable a stable classification of a number of groups have been investigated.

(5) *Problems in Quality Control* (20, 29): Various problems in Quality Control have been considered using the range instead of the standard deviation. Extensive tables are under preparation. These tables are important in view of the fact that range admits simple calculation, while the standard deviation is very complicated. Some problem of estimation and tests of hypothesis based on 'go no go' data have been solved.

(6) *Multivariate distributions* (11, 12, 25, 34, 38, 39, 42): Some general methods of deriving multivariate distributions have been found. Several problems arising out of canonical correlations, partial canonical correlations etc. have been successfully solved.

(7) *Truncated distributions* (14, 15, 17, 18): The problem of estimation of parameters from truncated distributions has been studied and the necessary computational procedures have been worked out.

(8) *Technique of Sample Surveys* (9, 13, 26, 27, 31): Some fundamental problems of sampling designs for estimating the field characteristics such as averages or other parameters, and more generally for mapping the field (determining the relative location of each elementary unit with respect to other units, and the dimensional distribution of the variate over the field) which were under investigation for some time under the guidance of Professor Mahalanobis have now been formulated in definite terms and some methods of solving these problems suggested.

Estimation formulae in some sampling procedures have been determined. A simple method of choosing a random sample in large scale sample surveys has been discovered. Co-variance analysis applied to two-stage sampling has been worked out.

(9) *Miscellaneous* (7, 16, 21, 22, 23, 25, 30): A number of problems relating to general statistical methodology have been considered.

Applied Research

A list of scientific enquiries handled by the Institute is given in Appendix V. The research and training school considered a number of applied problems (which mostly arose out of scientific enquiries) and some of which are mentioned below:

(1) The determination of oxygen requirement and other precautions to be taken to reduce the mortality of fish in long distance transportation.

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(2) The construction of a health index of the growth of fish to discriminate between methods of culture, tanks etc.

(3) Devising a method for a rational regional classification of districts in the Madras State based on agriculture, meteorological factors, population density etc.

(4) Classification of the people of India on the basis of ABO blood group gene frequencies.

(5) Analysis of anthropometric measurements on about 3000 individuals in undivided Bengal.

A number of enquiries arising out of research as in medicine, psychology and other sciences were also answered.

Research in connection with the National Sample Survey: The Institute staff was engaged in a good deal of applied research in connection with the National Sample Survey and other projects. Such researches ranged from the use of the theory of probability in developing efficient designs of sample survey to improving the efficiency of the processing of statistical data and of the methods of collection of statistical information in the field.

During the year under review the Institute prepared the General Report No. 1 of the National Sample Survey giving a general account of the first round of the NSS (October 1950-March 1951), which was published by the Department of Economic Affairs, Ministry of Finance, Government of India in December 1952. A number of other reports on the National Sample Survey were under preparation during the year.

Experimental studies carried out at Giridih are described below:

(1) *Bias in small size cuts*: Special crop-cutting experiments were conducted by the Institute at its Giridih Branch in December 1952 on winter paddy. Experiments were made with cuts of very small size, in the shape of circles of radii 1 foot, 2 feet, and 4 feet. An overestimating tendency of the order of 10%—15% in cuts of 2' radius had usually been observed in earlier crop-cutting surveys conducted by the Institute. The special procedure adopted in this experiment for the demarcation of bordering plants (i.e. those falling on the circumference of the sample-cuts) effectively eliminated this bias; and cuts as small as 3.14 sq. ft. taken in the shape of circles were found to be practically free from bias. Trials on a more extensive scale will be undertaken in future; if small cuts of these dimensions can be used without bias then the efficiency of sampling will be appreciably increased.

(2) *Estimation of yield of paddy from auxiliary characters*: Intensive studies were conducted at Giridih on the correlation of the final yield of paddy with a number of auxiliary plant characters such as height, number of tillers per unit of area, length of ear, grains per ear etc. The correlation between height and yield was about 0.75, which is encouraging and further studies would proceed.

(3) *Extent of errors in eye-estimation of yield rate of paddy*: Experiments were conducted on making eye-estimation of the yield of paddy on a demarcated plot 7' x 7' (= 49 sq. feet) in size. The demarcated square was harvested after the predictions were made, and the harvested paddy was directly weighed, and the weight declared before the next plot was taken up. This enabled the contestants to improve themselves. Prizes were awarded on marks scored taking into account (1) accuracy, (2) consistency and (3) rate of improvement. It appears that there are individuals who have a special aptitude and who can be probably trained to be good eye-estimators. If this is possible there would be no difficulty in making

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early prediction of the yield of paddy per acre based on eye-estimation (combined later with actual crop-cutting experiments on a much smaller scale).

(4) *Enquiry into the household consumption of food and non-food articles by a day-to-day accounting* : The enquiry was started in 1952 and covered (a) sample of the Institute workers' own households in Giridih proper, and (b) households selected at random in the rural area. The villages chosen were of two types, (i) near the city and (ii) far from the city. The enquiry will be continued for at least one year.

(5) *Special studies of sampling techniques for cadastrally unsurveyed area* : A few experiments on a very small scale were tried out at Giridih in March and April 1952, with a view to studying suitable field techniques for a sample survey of the area under crops in villages for which cadastral survey maps are not available. The experiments covered the direct measurement of the area under the crop in all fields containing the relevant crop, and, comparison of results based on a complete plot by plot enumeration ; cost and accuracy of locating points at random on the sample village ; cost of chain sampling in making a straight line cruise ; preparation of a rough sketch of the village showing individual fields approximately true to size, shape and relative position by eye-estimation alone ; location of points at random in space and drawing a rough sketch map of fields (about 1.8 acre in size) contained within or intersected by a circle of radius 150' about this point. In addition, studies on sampling method based on 1941 census enumeration slips of Hazaribagh district was continuing at Giridih.

Research Seminars

Seminars were an important feature of the activities of the RTS and the following may be specially mentioned: (1) Dr. M. Masuyama on (a) sampling estimation of timber volume ; and (b) on graphical inference ; (2) Prof. S. N. Roy on (a) statistical inference ; and (b) multivariate analysis ; (3) Dr. H. Theil on econometric models ; (4) Dr. S. Tsuru on national income ; (5) Dr. R. Vaidyanathaswamy on (a) probability, and (b) mathematics ; and (6) Dr. C. R. Rao on classificatory problem.

Training Courses

The Institute offers three types of training :

(1) professional training for statisticians at the post-graduate level for which admissions are normally restricted to candidates who have obtained a first class honours or a master's degree or have equivalent qualification ;

(2) training for computers primarily with a view to turning out junior technicians ; and

(3) training for individual scientists and statisticians who come to the Indian Statistical Institute on deputation from recognised institution for advanced studies in their own respective lines of work.

Training classes : Owing to the larger accommodation, which became available from 1951-1952, the number of admission to the post-graduate statisticians course could be increased from 23 in 1951-52 to 37 in 1952-53. The number in the computer's course increased from 51 to 61, and the number of officer-on-deputation increased from 5 to 9 so that the total number in the Research and Training School was 107 in 1952-53 as against 59 in 1951-52 showing total increase of 48.

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During the year under report, 8 candidates of the professional training course appeared in the final examination and all the eight passed (list in Appendix IX). Thirteen candidates of the junior class appeared in the first year examination of whom 11 passed. Six candidates who had either passed the M.Sc. examination in Statistics or the B.Sc. (Hons.) degree in statistics after going through a 3-year course were directly admitted to the second year class, thus raising the strength of the second year class to 17. To the first year class 20 fresh admissions were made. A list of trainees in the two year course is given in Appendix VII.

The distribution of students by Universities is shown below:

Sr. no.	University	first year		second year		total	
		1951-52	1952-53	1951-52	1952-53	1951-52	1952-53
1.	Agra	-	4	-	-	-	4
2.	Allahabad	-	1	-	-	-	1
3.	Andhra	-	1	-	-	-	1
4.	Banaras	1	-	2	-	3	-
5.	Calcutta	3*	2	1	1	4	3
6.	Kashmir	-	-	1	-	1	-
7.	Madras	6	3	2	11	8	14
8.	Mysore	-	1	1	1	1	2
9.	Nagpur	1*	-	-	-	1	-
10.	Patna	1	2	-	1	1	3
11.	Punjab	-	6	-	-	-	6
12.	Rajasthan	1	-	1	1	2	1
13.	Travancore	2	-	-	2	2	2
Total :		15	20	8	17	23	37

*One candidate discontinued

A special feature of the training in the second year was that the students were assigned certain problems in sampling which required handling and analysing live data. Besides this, the students went to villages and conducted crop-cutting experiments to gain first hand experience of field work.

During the period under review, 9 officers from different Indian States departments or educational institutions came for training. Of them 4 remained at the end of the year. A list of officers on deputation is given in Appendix VI.

As in last year a six-month Computer's Training course with 24 students in the junior section and 17 in the senior section was given from July to December 1952. A similar course was started in January 1953 with 26 in the junior section and 13 in the senior section.

Professional Examinations

During the year under report the first batch of 6 candidates were registered for the award of the professional associateship of the Indian Statistical Institute and 5 of them were awarded the associateship after examination.

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The Statistician's Diploma Examination was held in August 1952, simultaneously at Bombay, Calcutta, Delhi, Lucknow, Madras and Poona. Seventy five candidates registered themselves for examination in different papers, of whom 49 appeared and 28 passed in one or more papers.

The Computer's Certificate Examination, Part I was held in June 1952 simultaneously at Bombay, Calcutta and Giridih. Out of 129 candidates who registered themselves for different sections of the examination 119 appeared and 39 passed in one or more sections.

The Statistical Field Survey Examinations (Junior and Senior) were also held in June 1952 in Calcutta only; 29 candidates registered themselves for different papers of the examination, of whom 15 appeared and 5 passed in one or more papers.

The names of successful candidates in different examinations are given in Appendix IX.

Scholarships and Prizes: A number of students were awarded scholarships and prizes for good performance in the fortnightly preliminary and final examinations of the two-year professional course.

International Statistical Education Centre

As already mentioned the International Statistical Education Centre (ISEC) was shifted from the Presidency College to the new building of the Institute at Baranagore from the beginning of the fifth term in January 1953. It would be recalled that the ISEC in Calcutta was initiated in October 1950 by collaboration between the International Statistical Institute and the Indian Statistical Institute under the sponsorship of the UNESCO and was being administered by a Board of Directors, jointly appointed by the International and the Indian Statistical Institutes. During the first two years the expenses of the ISEC were met partly out of the contributions from the UNESCO through the International Statistical Institute and partly by the Indian Statistical Institute, but during the year under review the grant from the UNESCO was diverted by the International Statistical Institute to establish a new Centre in Beirut. Fortunately, the Government of India sanctioned a grant of Rs. 63,600 in 1952-53 through the Indian Statistical Institute to enable the work of the ISEC in Calcutta being continued on the existing scale.

The liaison work with different countries was being done from the very beginning from the London Office of the Education Committee of the International Statistical Institute, and the International Institute has kindly agreed to continue such liaison work at its own expense. This cooperation on the part of the International Statistical Institute is much appreciated.

Upto the end of 1952 the Education Committee of the International Statistical Institute provided a large number of teachers from outside India financed out of the UNESCO grant. The Government of India have recently sanctioned a grant of \$9,000 to the International Statistical Institute to enable it to continue to provide teachers from abroad in 1953.

The United Nations and some of the Specialised Agencies like the FAO had also arranged from the very beginning to send some of their officials and experts to participate in the work of the ISEC in Calcutta. Such help was continued during 1952-53 and was greatly appreciated. It is hoped that the United Nations Technical Cooperation Administration would provide visiting teachers for the ISEC in larger numbers in future.

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Number of trainees: The year under review covered the third, fourth and fifth terms of the International Statistical Education Centre in Calcutta. The third term (which opened on January 1952 and terminated on 20 June 1952 in the first quarter of the year under review) had 40 participants from 12 Asian countries distributed as follows: Afghanistan—1, Burma—3, Cambodia—1, Ceylon—2, India—12, Indonesia—2, Iraq—1, Japan—1, Malaya—1, Pakistan—6, Philippines—8, Thailand—4, Total—40.

The fourth term opened on 14 July and closed on 20 December 1952 with a distribution of 37 participants as shown below: Burma—7, Cambodia—1, Ceylon—1, India—10, Japan—1, Nepal—1, Pakistan—10, Philippines—4, Thailand—2, Total—37.

The fifth term opened on 12 January 1953 and was carried over to the financial year, 1953-54. The thirty participants were distributed as follows: Burma—2, India—5, Indonesia—1, Nepal—1, Pakistan—13, Philippines—6, and Thailand—2, Total—30.

A list of trainees in different terms is given in Appendix VIII.

Fellowships: The Government of India have awarded in each term a large number of fellowships under the Colombo Plan carrying an allowance of about Rs. 380/- per month plus certain travel and contingent allowances, the number of such awards being 16 in the 3rd term, 14 in the 4th term and 16 in the 5th term. In addition, 1 trainee in the 4th term was awarded a junior fellowship by the Government of India, and 4 trainees in the 4th term were awarded fellowships by the International Labour Office.

Teaching work: Teaching work in the ISEC was shared between the staff of the Indian Statistical Institute and the visiting professors who came from abroad under the auspices of the Education Committee of the International Statistical Institute and other international agencies.

A total of 1850 hours of teaching was provided during the period April 1952—March 1953. More than half of this time was spent on laboratory, project and field work and the remaining portion devoted to lectures on theory. The teaching work consisted of 535 hours of lectures and 573 hours of practical work in the 3rd term, 413 hours of lectures and 525 hours of practical work in the 4th term, and 323 hours of lectures and 574 hours of practical work in the 5th term.

A Radio Listener Survey on the basis of the random sample in Calcutta was carried out by the trainees in the 4th term, and a sample survey of Road Traffic in Calcutta was organized by the trainees in the 5th term. These enquiries created a good deal of enthusiasm among the trainees and gave them some first hand experience of sample surveys.

In addition to the work in the Indian Statistical Institute, the trainees visited a number of statistical offices in Calcutta. In the 4th term the trainees spent a part of the time in Delhi and Simla where they visited some of the important statistical offices of the Government of India. In the 5th term also the trainees spent a part of their time in Delhi. On both occasions the Central Statistical Office arranged the whole programme including courses of lectures and practical demonstrations which were highly appreciated by the trainees. The Institute is grateful to the C.S.O. and the statisticians in the Central Ministries for their active cooperation in the matter.

There is an association of the trainees called the ISEC Association which arranged a number of excursions and socials in each term. Arrangements were also made for the trainees to visit Agra and Banaras and one or two other places in continuation of their trip

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to Delhi in the 4th and 5th terms. Beginning from the 3rd term, the ISEC trainees have been publishing a printed souvenir assisted by the Institute.

The trainees are awarded certificates on the completion of their training but no attempt is made to administer any formal tests. Emphasis is placed on their gathering useful experience and not on passing examinations. The continuing demand indicates that the ISEC is meeting a real need in this region.

Training in Statistical Quality Control : An event of significant statistical importance in India during the year under review was a course of training in Statistical Quality Control (SQC) in the four capital cities, Delhi, Calcutta, Madras and Bombay under the auspices of the United Nations Technical Assistance Administration (UNTAA) and the Government of India.

The C.S.O. was in charge of local arrangements in Delhi, while the Indian Statistical Institute acted as the host society in Calcutta, Madras and Bombay.

The programme was initiated in Delhi by Sri C. D. Deshmukh in his capacity as the Minister of Finance. The total number of trainees was 40 and of observers 3. The course in Calcutta lasted from 10 November to 28 November 1952 and local arrangements were made by the Institute working in collaboration with the Indian Society of Quality Control. The total number of trainees in Calcutta was 40, while 10 others were admitted as observers. The Institute had 2 trainees and 2 observers in the course.

In Madras, Professor K. B. Madhava (a founder-member of the Institute and actively associated with its work from the beginning) looked after the arrangements on behalf of the Institute. Here 35 trainees and 5 observers attended the course.

The Bombay Branch of the Institute (which had been giving short courses in SQC for several years under the guidance of Dr. N. S. R. Sastry) was in charge of local arrangements ; 38 trainees and 8 observers attended the courses.

At every centre visits were also arranged to industrial establishments to study the application of quality control. The UN experts also has numerous contacts with industrialists and explained to them the value of SQC in production processes. The project created a great deal of serious interest among industrialists and, what is even more important, established a nucleus of trained personnel. The Institute has been actively pursuing the development of a follow-up programme, and it may be mentioned (although it falls outside the year under review) a whole-time SQC Unit of three was established in the Institute with the help of financial support from Government.

Visiting Professors and Guest Teachers

Since 1938 the Indian Statistical Institute has been inviting distinguished scientists as visiting professors. This has helped the workers and students of the Institute to maintain contact with advancing front of research in other countries. The visit of foreign statisticians has also helped materially in building up a considerable fund of goodwill for the Institute and for India throughout the world.

As in previous years, the Institute was fortunate in having a large number of guest teachers from abroad and other institutions in India. These visits were either sponsored by the Education Committee of the International Statistical Institute (ICI), or the United

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Nations (UN) and its Specialized Agencies in collaboration with the International Statistical Institute, or were arranged directly by the Institute. A list is given below* :

(1) DR. MOTOSABURO MASUYAMA, *University of Tokyo, Tokyo, Japan* (EC : ISEC 4 & 5) : gave lectures in addition to his work in ISEC on a large number of applied problems, such as estimation of timber volume by sampling, the use of probability paper, statistical application in medicine, physics etc. He also worked on certain problems on the design of sampling in the Projects Section.

(2) PROFESSOR SAMARENDRA NATH ROY, *Institute of Statistics, University of North Carolina, U.S.A.* (EC : ISEC 4) : gave besides his lectures in the ISEC a course of lectures on statistical inference and Seminars on multivariate analysis in the training classes.

(3) DR. Y. P. SENO, *University of Malaya, Singapore* (EC : ISEC 4) : participated mainly in the work of the ISEC but also gave some lectures in the training classes.

(4) DR. H. THEIL, *Central Planning Bureau, Government of Netherlands, The Hague* (EC : ISEC 4) : dealt with problems of econometric models and their use in national planning in the course of lectures in the training classes in addition to his work in the ISEC.

(5) MR. A. WEBER, *University of Geneva, Switzerland* : stayed in the Institute for one year and participated actively in its work.

Besides the visiting teachers mentioned above who made an extended stay of several months in the Institute, a number of other guest teachers from abroad gave shorter courses of lectures or occasional talks. A list is given below :

(6) PROF. P. M. S. BLACKETT, *University of Manchester, U.S.A.* : spoke on operational research.

(7) DR. PHELPS BROWN, *London School of Economics, London* (EC : ISEC 5).

(8) MR. T. F. CORCORAN, *Bureau of Census, U.S.A.* (UN : ISEC 4).

(9) DR. D. J. FINNEY, *Lecturer in the analysis and design of experiments, Institute of Statistics, University of Oxford* (FAO) : gave three lectures on biological assays.

(10) PROF. JOHN COVER, *Bureau of Business and Economics Research, Maryland, U.S.A.* (EC : ISEC 5).

(11) DR. ROE GOODMAN, *The Survey Research Centre, University of Michigan, Ann Arbor, U.S.A.* (UN : ISEC 3) : gave lectures on sample surveys.

(12) DR. TSUTAU HANADA, *Quality Control Consultant, Quality Control Laboratory, Kyoto, Japan* : gave a short intensive course on Statistical Quality Control and on time and motion studies.

(13) DR. PHILLIP HAUSER, *former Director, U.S. Bureau of Census, University of Chicago, U.S.A.* (UN : ISEC 3) : gave lectures on demography and other problems.

(14) DR. N. KEYFITZ, *Dominion Bureau of Statistics, Canada* (UN : ISEC 5).

(15) DR. C. P. G. J. SMIT : lectured on agricultural statistics.

(16) DR. SHIGERO TSURU, *Head of the Institute of Economics Research, Hirosubashi University, Kunitachi, Japan* : gave lectures and seminars on national income.

*The sponsoring agency is shown by initials within brackets, the absence of a bracket indicating arrangements were made directly by the Institute. When the arrangement was made specially for the International Statistical Education Centre, the actual term 3rd or 4th or 5th is indicated by ISEC 3, or 4 or 5, as the case may be.

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(17) UN TEAM OF SQC EXPERTS, consisting of Prof. E. R. Ott, Dr. P. Clifford and Dr. M. Wescott of the U.S.A., and Prof. A. Hald of Denmark gave special lectures to the training section of SQC and application of statistics in technology.

In addition to visiting professors from abroad a beginning was made in a small way to have guest teachers from other institutions in India.

(18) DR. KALI SHANKAR BANERJEE, *West Bengal Bureau of Statistics, Calcutta* : gave a course of lecture on the construction of cost of living index numbers.

(19) DR. K. R. NAIR, *Forest Research Institute, Dehradun* : spent one week in the Institute and gave some lectures on linear measures of dispersion and their use in SQC.

(20) DR. H. SINHA, *University of Calcutta* : delivered a course of lectures on index numbers.

(21) DR. S. P. VASWANT, *Ahmedabad Textile Industry Research Association* : gave a lecture and had discussions on the work on SQC and application of statistics in industry at Ahmedabad.

Projects

The National Sample Survey : As reported in previous reviews, the Indian Statistical Institute is in charge of the entire statistical work of the National Sample Survey (NSS). The fourth round of the socio-economic enquiry which formed the first round of the year, was started in April 1952 and was completed in September 1952. This was followed by a pilot survey of land-utilisation in November 1952. The second round of socio-economic investigation for the year which formed the fifth round counted from the beginning was started in December 1952 and was completed in March 1953.

Rural Area : The sample design for the rural area was revised on the basis of the information collected during the 1951 Census, but there was no change in the design for the urban part. The salient features of the revised rural sample design are as follows :

(a) The entire country was stratified into 52 natural divisions, which were mostly groups of continuous districts with similar geographical, geological, climatic and cropping patterns (these natural divisions were defined by the Census Commissioner for demographic Census purposes). It was decided to select 480 *tehsils* out of a total of about 2,500 and to allocate them to the natural divisions in the proportion of their respective contributions to total consumer expenditure which could be broadly estimated on the basis of the first round of the survey. Each natural division was stratified further into an appropriate number of sub-stratum so that it could be possible to select two *tehsils* from such sub-stratum. This further stratification was based on the criterion of the population per unit area of the *tehsils* comprising the stratum. The density levels separating one stratum from another within the same natural division were fixed so as to equalise the population of each stratum.

(b) Three-stage sampling was adopted in each sub-stratum with the *tehsils* or revenue *thanas* forming the first stage, the villages within sample *tehsils* the second stage, and the households within sample villages the third stage. The sample units for the first two stages were selected with replacement and with probability proportional to the size of the unit. The size criterion of the unit was either geographical area or the 1951 population.

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(c) In each sample *tehsil* two villages were selected ; and within a village an appropriate proportion of households was prescribed to be surveyed, so that the overall sampling fraction was made constant.

Besides the revision of the sample design on the above lines, an interpenetrating network of samples was attempted in the fourth round in order to collect data on reference period-cum-investigator bias problems. Eighteen sample villages in the rural areas and sample blocks in the urban areas were allotted to a party of four investigators under the control of one immediate supervising officer (inspector). The four workers of a unit would form six pairs of workers. To each pair three sample villages or blocks were allotted in three successive haltages, so that in eighteen sample units three replicates would be obtained. Within a sample village or block, two investigators worked on separate sample households, and for each, two alternative reference-periods, viz., the last week and the last month were prescribed for investigation in separate sample households.

Socio-Economic Survey: The investigation consisted of the usual lines of socio-economic inquiry, viz., consumer expenditure and household enterprises. Besides household inquiries, inquiry for land-utilisation was continued as a measure of training of investigators and methodological experimentation. An experimental land utilisation survey was conducted in November 1952 in order to obtain cost-data relating to survey in village clusters. Alternative types of village clusters and plot clusters were tried in one of the two sample villages in each sample *tehsil* selected for the fourth round survey. The survey was based on plot inquiry.

The fifth round of socio-economic survey was conducted on the same sampling design as in the fourth round. The interpenetrating network of samples was not attempted again in this round but the usual procedure of one investigator instead of two working simultaneously in the same sample village or block was adopted, but the provision for collecting consumption data with two alternative reference periods, namely, the last week and the last month was retained. The survey was completed by the end of the year.

Special studies and surveys: Certain special studies and investigations were made during the year under report. Field investigations on the suitability of various types of sample were carried out in West Bengal with the help of the Institute Field Branch in order to collect data for experimentation leading to the improvement of the sampling and investigation designs of future rounds of the NSS. In order to decide on a suitable sample design for conducting a countrywide survey of agricultural holdings, basic data were collected in various parts of the country for assessing the variability and the cost of survey.

Special Crop Survey in West Bengal: During this year two surveys were made in West Bengal, one during the jute-*aus* season and another during the *aman* season, for estimating the area and yield of jute, *aus*, *aman*, and a few other crops. The main purpose of this survey was to try modifications in the design and to get reasonably dependable estimate for the State as a whole (but not for each district separately).

The designs for the survey of area under crops conformed to stratified three stage sampling, the selection at each stage being with assigned unequal probabilities and with replacement. The first, second and third stage units were the unions, plot clusters and plots within clusters respectively. The design for the survey of yield per acre was similar to that of the area survey with the addition that there was a fourth stage unit namely the cut (which was actually harvested).

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The volume of data collected by direct observations on the field is shown in the table below :

	jute and <i>aus</i> paddy		<i>aman</i> paddy	
	area	yield	area	yield
no. of unions	596	125	532	118
no. of clusters of plots (50 to 100 plots).	6,845	921	5,246	1,149

The field work for jute-*aus* area and yield-*aus* was done in the interval between the third week of July 1952 to the end of October 1952. The field surveys in *aman* paddy season were done from second week of October to third week of January 1953; fifty to sixty investigators were engaged on these surveys, the actual number varying from time to time according to requirements.

The tabulation was done by hand consuming 131 man-months of work for jute and *aus* paddy and 57 man-months of work for *aman* paddy.

Refugee Survey: A pilot survey was conducted by the Institute in December 1952 for ascertaining the condition of the refugee population residing in Government rehabilitation camps. The camps were stratified into three broad classes: agricultural, urban, and others. The survey was confined to three typical regions of West Bengal, namely, Midnapore, 24-Parganas, and Nadia. The selection was made in two stages, camps in the first stage being drawn with a probability proportionate to size (i.e., number of families as per camp register), and families in the second stage, drawn with an equal probability. The sampling fraction was kept constant for each of the strata. The registers were subsequently found either to be incomplete or not upto date in many cases, thereby increasing the computational labour. The broad findings were that the majority of families had a very low standard of living, and that a considerable proportion of Government loans were spent for purposes other than for which they were granted (mainly food).

An opinion survey on the efficacy of anti-malarial drugs: An all-India survey for the assessment of preferences in the use of anti-malarial drugs was made by the Institute in October 1952. The statistical work was done under the guidance of Sri J. M. Sengupta. The survey was conducted by the mail enquiry method and a random sample of medical practitioners was drawn from the list published by the Government of India. The total list was stratified into a number of classes—(i) private, (ii) Government service, (iii) rural practitioner, (iv) tea gardens and factories. The enquiry brought out a very favourable attitude towards quinine both as medicine as well as prophylactic. The number of non-respondents was considerable. A sub-sample of non-respondents, residing in greater Calcutta was drawn, and opinion was collected by the personal interview method. The results obtained from non-respondents were found to be in excellent agreement with those obtained from respondents.

In addition to this, a small scale special enquiry was conducted in a sample of villages in West Bengal, and the opinion of the villagers suffering from malaria as well as of the medical practitioners of the villages was collected. The general opinion was consistently in favour of quinine.

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Machine Tabulation Section : The volume of work handled as also the variety of jobs increased considerably in the year under review ; and the strength of the different units had to be increased substantially. In spite of this, the work at the peak-period had to be handled through overtime and double-shift arrangements. Shortage of floor-space became more and more acute and still remains to be solved.

The equipment at the end of the year consisted of 80 punchers and verifiers in the punching unit ; and 3 sorters, 3 tabulators, 4 reproducers, 1 collator, 1 multiplier and also an electronic statistical machine with a summary punch in the machine unit. The following table gives the hours worked and card-passages through different machines :

machine	hours worked	card-passage in thousands
Punches	20,589	1,591
Verifiers	14,533	1,367
Sorters	6,105	71,834
Tabulators	5,930	6,891
Reproducers	4,160	6,308
Collators	940	4,591
Multiplier	2,938	2,025
E.S. Machine	1,738	13,814

The Technical Unit, started last year, began to function properly during this year and maintained statements and charts of quality control. The Unit also organised a storage and record service. Previously, the punched cards, numbering about 11 millions pertaining to about 1,000 different card designs and stored in 142 full and half cabinets, had been distributed in different premises. These dispersed collections were brought together under one roof, systematically arranged and properly catalogued.

The work of the Section covered the following projects during the year under review : (i) National Sample Surveys, 1st to 4th round ; (ii) model sampling experiments in connection with crop surveys ; (iii) special studies in crop-cutting surveys ; (iv) serial correlation studies ; (v) analysis of some anthropometrical data of Bengal ; (vi) sampling studies on 1941-Census slips of Hazaribagh district ; (vii) U.N. and Government of India population survey of Mysore ; (viii) special crop acreage survey, December 1951 ; (ix) analysis of data for sample survey of cinchona ; (x) sample survey of refugees in West Bengal ; (xi) sample survey of manufacturing industries. Some commercial jobs were also accepted on a small scale, particularly in Insurance-accounts.

The Library

Location : The Central Library of the Institute was shifted from Calcutta to Baranagore by the end of December 1952, and has been divided into two broad sections. The central section, comprising all books and a valuable collection of official reports and statistics of different countries, is housed in the new Institute premises. The reference section, comprising all journals and special documents and reprints, is located at 'Amrapali',

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204 Barrackpore Trunk Road. Comfortable and well furnished reading rooms have been provided in both sections, and for the convenience of readers the service period of the reference section was extended to 7-30 p.m. on working days. Regular routing of current issues of important journals to research workers was introduced this year. A service branch is maintained at Giridih and an issue-centre in the Presidency College, Calcutta.

Administration : Certain control forms which were introduced to record the work done by individual workers and units were found very effective as indicators of the current working position and also as aid to planning for better service. During the year, 15 group-discussions were arranged for the senior staff of the library at which questions of policy, administration and general services were discussed.

Bibliographical services : The Library issues a monthly bulletin showing new acquisitions, and a quarterly "Index to Current Periodicals". The Library started publishing early in 1953 a bi-monthly "Newsletter" giving news of interest to workers, members and associates of the Institute together with cumulated accession lists. Several bibliographies were prepared among which mention may be made of the (1) bibliography of socio-economic surveys in India 1940-52, and the (2) bibliography of national income. A portion of the latter has been incorporated in the "International Bibliography of Income and Wealth".

Acquisitions : During the year under review the library arranged for the exchange of *Sankhya* : The Indian Journal of Statistics, with 15 foreign and 3 Indian societies and institutions (in addition to 123 foreign and 37 Indian institutions with whom exchange arrangements had been made in previous years). The distribution by countries of the new exchange arrangements was as follows : France 2, Germany 1, Israel 1, Italy 1, Japan 2, Netherlands 2, Thailand (ECAFE) 1, U.K. 1, U.S.A. 2, and U.S.S.R. 3.

An arrangement has been made with (1) the Lenin Library, Moscow, (2) the Fundamental Library of Social Sciences, Moscow and (3) the USSR Academy of Sciences, Leningrad by which the Institute Library will receive Russian books in exchange of Indian publications of equal value ; the lists of books will be prepared by the recipient in each case.

By extending its personal and institutional contacts the Library has been able to arrange for its name to be put on the free mailing lists of 12 foreign and 4 Indian agencies (in addition to 152 agencies with whom similar arrangements were in force previously). The distribution by countries is as follows : China 1, Japan 2, Dominion Republic 1, U.S.A. 5, Italy 1, U.S.S.R. 1 and an International Agency 1.

The Library added 949 books to its stock (against 578 last year), of which 97 were received as gifts from scientists and learned societies of various countries. With these additions the accession figure came to 25,746 volumes (excluding periodicals, off-prints and monographs). The Library received a total of 789 periodicals and annuals (against 734 last year), of which 173 were subscribed for, 356 were received in exchange and 260 were gifts from scientific societies, government departments and research departments of commercial firms.

Through the courtesy of Dr. M. Maoyama and Prof. T. Kitagawa the Library received a gift of 20 books and 42 off-prints in the Japanese language on statistical and allied subjects. The Library also received an anonymous donation of 125 dollars from America for the purchase of "Current Digest of Soviet Press", which was thankfully accepted.

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Asian section : An Asian section has been formed in the Library which is collecting materials on all aspects of the life, culture and problems of Asian countries and which, it is hoped, would promote better understanding and cultural contact among members of Asian countries.

Service : The number of Library members increased from 408 to 510. The total number of books and journals served was 26,050, of which 5,139 were issued from the lending section and 20,911 from the reference section. The number of issues, which had gone up from 15,404 in 1949-50 to 30,035 in 1951-52, showed a small decrease due to the dislocation caused by the process of transfer of the library from Calcutta to Baranagore. The proportion of unfulfilled requests was brought down to about 8% (from 30% in the previous year) of the total requests received.

Statistical workers' circulating library : This library is being modelled on public library lines. An up-to-date and time-saving charging system of reservation of books has been introduced, which is gaining in popularity among those using this library. The circulating library was able to add 215 English, 177 Bengali and 80 Hindi books to its stock thus bringing up the total to 4583 volumes. The number of books issued from Calcutta, Baranagore and Giridh were 789 ; 7,527 and 1,942 respectively, so that the total number of issues came to 10,267 against a stock of 4583 volumes, giving a turnover which is probably far above the average.

PHOTOGRAPHIC SECTION : The Photographic Section was again transferred to a new location in order to provide for better working facilities. The new equipment added to the section consisted of an up-to-date enlarger and a refrigerator. The year's work included more than 5,000 microfilms, about 4,000 prints from the microfilms, about 4,000 photoostat prints of maps, about 750 photo-enlargements and about 70 exposures in connection with a sampling apparatus.

THE WORKSHOP : The Workshop at Baranagore, started last year in a small way, expanded considerably during the year under review, having acquired a number of machines and increased its general equipment. At the end of the year there were 11 large machines consisting of lathes, presses, grinder and filing and milling machines. The workshop is now engaged in (1) repair and maintenance of desk-calculators, (2) designing and fabrication of a new desk calculator, (3) construction of implements and gadgets for use in the Institute and (4) repair and maintenance work of a general nature.

In repairing desk-calculators the workshop handled 249 jobs, including replacement of 160 spare parts. Preparations for making a new desk-calculator made good progress. Other work carried out by the workshop during the year includes construction of a gadget for drying Hollerith cards, an apparatus for crop-cutting work, spare parts of monotype casters, cine-talkie projectors and vocatrons. The workshop also helped in the construction of an analogue computer, which can be used for solving linear equations, inversion of matrices etc.

III

THE BRANCHES

The Bombay Branch : During the year under review 3 meetings of the Council were held. Dr. K. S. Rao, Joint Secretary of the Branch, proceeded to U.K. in August 1952 as a Fellow of the Nuffield Foundation.

Sample Survey : The field work of the National Sample Survey in Bombay city continued to be carried out by the Branch on behalf of the parent Institute. The staff in the NSS unit consists of one supervisor and four investigators. This staff participated, on an honorary basis, in the sample enquiry to assess the effect of the withdrawal of subsidy on overseas foodgrains undertaken by the Government of Bombay in June 1952. The staff also worked in cooperation with the students of the School of Economics and Sociology in conducting a social tension survey.

In October 1952, the Branch proposed that a sample survey of small-scale industrial establishments be conducted in Bombay City to assess the value added by manufacture in relation to capital investments during a given period etc., and the parent Institute sanctioned a grant of Rs. 10,000 for this purpose. A detailed scheme of the survey was prepared by Sri V. V. Divatia and was approved by the Branch Council.

Econometrics : Computations involved in the project on the application of mathematical statistics to economic data were completed during the year.

Quality Control : The Branch has been conducting promotional work in SQC in many ways. A Board of Management for SQC is in charge of this work. As already reported this Board looked after all local arrangements for the SQC course given by the UN expert team in Bombay. Sri S. S. Divedi and Sri G. Hariharan were selected to attend this course.

Experimental work on the application of statistical quality control methods in the textile industry was undertaken in 5 Mills (Khatau, Shri Ram, New Kaiser-I-Hind, Shree Niwas and Seksaria). It is gratifying to note that Shri Niwas Mills have appointed a statistician to continue the application of SQC methods in their mills.

On the completion of the above training course, a study-group was formed with Dr. N. S. R. Sastry as its chairman. It meets every month when papers are read by members on the application of SQC methods.

Institute Examinations : On behalf of the parent Institute, the Bombay Branch conducted the Statistician's Diploma Examination in the Bombay centre in August, 1952.

Other activities : A field training course for post-graduate students was conducted during two months, May and June 1952.

Professor P. C. Mahalanobis visited the Branch in August 1952, when the Branch arranged for a lecture by him to the members of the Branch and others interested in its activities.

Other Branches are functioning as in previous years.

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IV

VISITORS FROM ABROAD

Visitors : Besides the visiting professors mentioned in a preceding part of the report the Institute had the pleasure of receiving a large number of visitors.

Dr. C. Chandrasekharan (UN World Population Census); Mr. Barrie Davies (UN Statistical Office); Dr. Esterling (Cultural Officer to US Information Service in Calcutta); Prof. and Mrs. D. R. Gadgil (Gokhale Institute of Economics and Politics, Poona); Dr. S. M. Ghosal (Patna); Dr. A. E. Harper (Allahabad); Prince Athiponbonse Kaemsri (Head of the Central Statistical Office of Thailand, Bangkok); Mr. D. Y. Lele (Directorate of NSS, New Delhi); Prof. K. B. Madhava (Madras); Sir D. N. Mitra (Government of India); Dr. Gorachand Nandi (Calcutta); Dr. Chanan Oppenheimer (Israel); Sri J. K. Pande (Bureau of Economic Statistics, Uttar Pradesh); Mr. M. Soendemko (Cultural Attache to the USSR Embassy); Mr. Hugh C. Stanton (UN Statistical Office); Dr. Christopher Tietze (US Embassy, New Delhi); Dr. P. K. Whelpton (UN World Population Census); Dr. Frank Yates (Rothamsted Experimental Station, U.K.); Dr. T. Y. Yu (ECAFE).

A number of Government officials came to the Institute in connexion with various official work among whom may be mentioned the names of :

Sri J. Dayal and Sri M. V. Rangachari (Ministry of Finance);

Sri P. Pant (Ministry of Rehabilitation, Government of India); Dr. B. Ramamurti and Mr. S. Subramanian (CSO, Government of India).

The Institute had the pleasure of also receiving Mrs. P. M. S. Blackett, Mrs. T. F. Corcoran, Mrs. D. J. Finney, Mrs. D. R. Gadgil, Mrs. S. Krishna, Mrs. E. R. Ott and Mrs. S. Tsuru accompanying visiting professors or visitors.

V

PROFESSOR MAHALANOBIS'S TOURS ABROAD

Professor P. C. Mahalanobis went abroad on three occasions during the year under report. At the invitation of the Initiating Committee, he attended as an observer the International Economic Conference held in Moscow from April 3 to 10, 1952. He stayed about a month in the U.S.S.R., visited the Central Statistical Board and several scientific and cultural institutions, and met many scientists among whom were Messrs. A. N. Kolmogorov, the probabilist, K. V. Ostrovityanov, I. S. Malyshev, I. Y. Pisarev and other economists and statisticians. He discussed with the presidium of the U.S.S.R. Academy of Sciences ways and means of maintaining scientific contact between U.S.S.R. and India.

TWENTYFIRST ANNUAL REPORT : 1952-1953

From Moscow he went to Warsaw at the invitation of Professor Oscar Lange. Professor Mahalanobis gave lectures and conferences at the Polish Economic Society, the Institute of Planning and Statistics, and the Institute of Mathematics. He had some useful discussions at the Central Statistical Office and visited the Planning Commission where he met the Minister in charge of planning and saw the work in some detail. He visited Lodz by car and on the way back saw a village of peasant proprietors of the old type, and also a kolkhoz or peasant cooperative of the new type.

From Warsaw he went to Prague and visited the Institute of Oriental Studies (where Dr. V. Leany, an old friend of India, was still working) and the Institute of Statistics; and had a long discussion in the Czechoslovak Central Statistical Office.

He spent about 10 days in Switzerland, and worked in the Federal Statistical Office at Berne, and at the United Nations office in Geneva where Professor G. Myrdal gave him special facilities in the Economic Commission for Europe to work on certain aspects of the growth of national income. He next went to London where he spent some time in the National Institute of Economic and Social Research and visited the Department of Applied Economics at Cambridge and other scientific institutions. He returned to India in the first week of June 1952.

Professor Mahalanobis, accompanied by Mrs. Mahalanobis, went to Bangkok to attend the second Regional Conference of Statisticians in the ECAFE area, held in Bangkok from September 1 to 13, 1952 as the leader of the Indian delegation of which the other members were Satyabrata Sen of the Indian Statistical Institute and G. D. Mathur of the Ministry of Commerce & Industry. The conference was organized jointly by the ECAFE, the UN Statistical Office, and the FAO and the Asian countries represented were Burma, China (Taiwan), Cambodia, India, Indonesia, Japan, Korea, Laos, Malaya, Pakistan, Philippines, Thailand and Viet-Nam; representatives of the associated countries, France, U.K. and U.S.A. also attended. Professor Mahalanobis was elected chairman of the Conference which made good progress in reaching agreement on concept and definitions of special regional interest. The Indian delegation explained the advantages of using sample surveys to collect data for national income, and gave a general account of the National Sample Survey of India in which the members of the Conference showed keen interest. Professor Mahalanobis's visit to Bangkok was useful in establishing contacts with a large number of Asian statisticians, and in reviewing informally the problem of providing statistical training in this region.

In February 1953 Professor Mahalanobis, accompanied by Mrs. Mahalanobis, visited the U.S.A. to attend the seventh session of the United Nations Statistical Commission in New York from February 2 to 13. In the UN Statistical Commission he suggested that the UN Statistical Office should undertake a critical examination on the reliability of the data on National Income and related statistics. In his capacity as chairman of the Sub-Commission he presented the report of the fifth session of the UN Sub-Commission on Statistical Sampling held in Calcutta in December 1951. The Statistical Commission considered it necessary to give continuing attention to the promotion of sampling methods and were of the opinion that experts in statistical sampling should be brought together from time to time to review the progress of sampling methods and to make appropriate recommendations in special fields.

INDIAN STATISTICAL INSTITUTE

Prof. Mahalanobis attended a meeting of the Education Committee of the International Statistical Institute held in New York on the 11th February 1953, and reported that since 1952 the Government of India had been taking an active interest in the International Statistical Education Centre in Calcutta and had sanctioned grants for its maintenance. There was general appreciation of the generosity of the Government of India in giving active support to the ISEC in Calcutta, and it was hoped that the UN would find it possible to cooperate actively in this matter.

Besides the work of the Statistical Commission, Prof. Mahalanobis explored in various ways possibilities of securing technical aid in statistics with special reference to national planning and development. He had discussions with the United Nations Technical Assistance Administration in New York, United States Technical Cooperation Administration in Washington, D.C., the Unitarian Service Committee at Boston, and the Ford Foundation in New York in this connexion. He visited and had scientific discussions at the National Bureau of Economic Research and the Columbia University in New York; the U.S. Bureau of Census (where he gave a lecture on the National Sample Survey) and the office of Statistical Standards at Washington, D.C.; the Massachusetts Institute of Technology—and—Harvard Centre of International Studies at Cambridge, Mass. (where he gave 2 lectures and discussions on the development of statistical work with special reference to planning in India). At Philadelphia he had talks with Professor Simon Kuznets about national income studies in India. Professor Mahalanobis had several talks with Dr. W. A. Shewhart and with Messrs. Ellis R. Ott, Mason E. Weecott, and Paul C. Clifford (three members of the UN team of SQC experts who had visited India in 1952-53) about a follow-up programme to promote the use of Statistical Quality Control and related methods in India.

On his way home, Professor Mahalanobis halted in London at the end of March and in early April; and had, as usual, many scientific and statistical discussions. He visited Manchester to see the Ferranti high-speed electronic computer, and had discussions with Professor P. M. S. Blackett about certain problems of operational research relating to Indian economy. Professor Mahalanobis participated, by invitation, in a symposium on statistics organized at the Federal Institute of Technology at Zurich in April 1953, and spoke on "the Foundations of Statistics". He returned to India by the end of April.

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TWENTYFIRST ANNUAL REPORT : 1962-63

STATEMENT OF ACCOUNTS

Indian Statistical Institute : Receipts and Payments Account for the year ending 31 March 1963

Dr.	Rs.	As. P.	Rs.	As. P.	Rs.	As. P.	Rs.	As. P.	Cr.
To Opening Balance : Cash in hand ..		2,437 4 4							
Suspense A/C ..		71,806 0 1							
" Membership subscriptions ..			74,043 4 5						
" Training fees ..			2,415 0 0						
" Examinations ..			3,855 0 0						
" Miscellaneous receipts ..			7,482 10 0						
" Block grants from the Government of India : Ministry of Finance : (i) Research, Training & General (ii) Multipurpose National Sample Survey ..			5,20,000 0 0						
" (iii) Manufacturing Industries Survey (Statistical Analysis) ..			18,75,000 0 0						
" (iv) Preliminary enquiries for survey of Agricultural holdings in Non-ferrous metal areas ..			25,000 0 0						
" (v) International Statistical Education Centre at Calcutta (including \$ 4600 as ear-marked grant to the International Statistical Institute, The Hague) ..			10,000 0 0						
" Funds received from the Government of India for the equipment to IIRC ..			86,000 0 0						
" Technical Co-operation Scheme of Colombo Plan : Opening Balance ..			6,684 9 0						
Receipts during (1962-63) ..			75,706 7 0						
By Salary, Dearness Allowance & Honorary etc.:									
(i) Statistical Section ..							973,108 14 9		
(ii) Field Section ..							2,63,086 13 0		
(iii) Transfer of savings against Government of India ..								24,000 0 0	
(iv) Contribution to Development Fund ..								57,545 8 0	
Travelling allowances : (i) Statistical Section ..							33,622 3 3		
(ii) Field Section ..							33,904 12 0		
Overtime Allowances ..								67,536 15 3	
Transfer to leave salary fund ..								24,779 9 0	
Transfer to Scholarships, Stipends, Visiting Professors & Fellows Fund ..								70,000 0 0	
Prizes to workers for initiative and outstanding performance ..								40,000 0 0	
Disbursement of Fellowship Allowances to ISEC trainees under Colombo Plan ..								4,985 0 0	
Hire and Maintenance of Tabulating Machine etc. (including cost of cards, cabinets etc.) ..								70,000 0 0	
Printing and Publications (including Society Typo Activities and examination expenses) ..								87,587 9 0	
Books and Journals (including cost of binding and consumable Library stores) ..								2,27,546 13 0	
									37,151 16 3
									19,965 4 2
									15,467 8 3

INDIAN STATISTICAL INSTITUTE

(Contd.)				
" Other receipts :				
" (i) Metropolitan Insurance Co., Ltd. (Work on Bonus Cards) ..	2,637	4	0	18,731
" (ii) Government of East Bengal (Patna)—outstanding on s/o of 1950-51	2,000	0	0	14
" Amount received from the Government of India, Ministry of Finance, outstanding from the previous year on account of printing and despatch of N.S.S. statistics in 1951-52 on behalf of the N.S.S. Field Directorate	14,306	11	0	47,194
" Deposits account	1,490	9	3	35,803
" Advances taken from Supervision fee fund	20,000	0	0	2,315
				62,484
				51,093
				43,051
				40,192
				62,626
				4,033
				80,000
				30,000
				43,352
				8,050
				61,412
				6,211
				13,001
				22,362
				35,304
				25,34,399
				6
				6
				8

Examined and found correct
in accordance with the
Chartered Accountants.
Auditors

6, HALDINGS STREET, CALCUTTA
The 25th October, 1952.

TWENTYFIRST ANNUAL REPORT : 1952-53

Indian Statistical Institute : Receipts and Payments for the year ending 31 March 1953

Dr.	Rs.	As. P.	Rs.	As. P.	Cr.
To Opening balances (out of funds received from Government of Mysore, Government of Madras and Government of Kerala) for Financial Year 1951-52 for disbursement to ISEC Fellows under the Technical Cooperation Scheme, Colombo Plan)			5,684	9 0	
" Block grant received from the Government of Madras (Rs. 21,400) including Rs. 4,500 for disbursement to ISEC Fellows under the Technical Cooperation Scheme, Colombo Plan)			85,000	0 0	
" Funds received from the Government of Mysore (Rs. 21,400) including Rs. 4,500 for disbursement to ISEC Fellows under the Technical Cooperation Scheme, Colombo Plan)	74,083	9 0			
(i) From the Ministry of Finance					
(ii) From the Ministry of Education	1,612	14 0			
			75,706	7 0	
					Rs. 1,66,391 0 0
By Salary, allowances and honoraria (including Government's contribution) to the President, Leave Salary and Gratuity Funds)					45,793 0 3
" Travelling expenses					2,305 3 0
" Printing and publications					1,903 9 0
" Books and journals					1,848 12 0
" Stationery and stores					1,646 14 6
" Repairs					3,330 15 9
" Postage, furniture and fittings etc.					2423 13 3
" Postage, electricity and other contingencies (including rent etc.)					2,355 0 0
" Transport and catering arrangements for the staff and students					87,587 9 0
" Disbursement of Fellowship allowances to the Fellows under Colombo Plan					
" Closing Balance :					
(i) out of the block grant (including the amount of Rs. 21,400) earmarked as grant to the Institute, Mysore					23,393 12 3
(ii) out of the block grant (including the amount of Rs. 21,400) earmarked as grant to the Institute, The Hague)					13,823 7 0
(iii) out of Fellowship funds					
					Rs. 1,66,391 0 0

Examined and found correct
P. C. NANDI & Co.
Chartered Accountants,
Auditors

S. HARISHANKAR SWAMY, Calcutta
The 28th October, 1953.

Indian Statistical Institute : Receipts and Payments for the year ending 31 March 1953

Dr.	<i>Research and Training School, Society type activities and General purposes Account</i>		Cr.		
	Ra.	As. P.			
To Opening Balance	561	12 7	By Salary, allowances & Honoraria (including Employer's contribution to Provident Fund)	2,71,075	0 9
" Block Grant received from the Government of India, Ministry of Finance	5,20,000	0 0	" Transfer of savings against salary of Prof. P. C. Mahalanobis	24,000	0 0
" Membership fees	2,415	0 0	" Over-time allowances	2,734	2 0
" Training fees	8,855	0 0	" Contribution to Leave Salary & Gratuity Funds	31,988	0 0
" Examination fees	7,492	10 0	" Travelling allowances	21,407	11 6
" Other receipts	2,768	0 0	" Transfer to Scholarship, Stipends, Visiting Professors and Fellows Fund	40,000	0 0
" Advance from Supervision fee fund	2,000	0 0	" Fire and maintenance of tabulating machines and cost of printing	38,779	15 0
			" Printing and publications (including cost of paper)	12,033	11 0
			" Society type activities	12,111	8 11
			" Examination expenses	7,853	10 3
			" Rents, rates and taxes	11,956	1 3
			" Books and journals	11,080	8 3
			" Photographic, Optical and Workshop equipment & Stationeries and consumable stores	4,812	2 3
			" Repairs and replacement of equipment, accessories, furniture and fittings etc.	1,211	5 0
			" Postage, telephone, electric charges etc.	6,354	2 9
			" Other miscellaneous contingent charges, including Auditors' fees, Bank charges and interest, advertisement charges, postage, telephone charges of offices, land and buildings and petty constructions	6,714	0 0
			" Workers' welfare, amenities and transport arrangements (including canteen and transport facilities for students)	13,625	8 9
			" Development activities (small enquiries and expert-mental surveys)	15,144	15 9
			" Closing Balance	2,862	11 0
				566	16 8
	Ra.	As. P.	Ra.	As. P.	Ra.
	5,45,082	6 7		5,45,082	6 7

6, Hartmann Street, CALCUTTA
The 26th October, 1953.

Examined and found correct
F. C. Mazor & Co.
Chartered Accountants,
Auditors

TWENTYFIRST ANNUAL REPORT: 1962-53

Indian Statistical Institute : Receipts and Payments for the year ending 31 March 1953

	Dr.				Cr.
		Rs.	As. P.		
To Opening Balance			2,513 3 0		
" Block Grant received from the Government of India, Ministry of Finance :-					
(i) For N.S.S. work	15,98,000	0 0			
(ii) Institute's Supervision fees .. .	80,000	0 0	16,78,000 0 0		
" Advance from Supervision fee fund .. .			8,000 0 0		
By Salary and allowances (including Employer's contribution to Provident Fund)					9,44,284 2 6
" Contribution to Leave Salary and Gratuity Funds .. .					22,535 7 0
" Travelling allowances					1,49,931 0 0
" Prizes to workers for initiative and outstanding performance					43,813 0 8
" House rent and taxes					4,985 0 0
" Hire of motor cars and taxicabs					37,884 8 4
" Cost of cards, cabinets etc.					1,27,713 3 3
" Printing & publications (including cost of paper) .. .					52,723 1 8
" Books and journals					53,197 10 8
" Photographic, Optical & Workshop equipment and accessories and consumable stores					6,540 4 0
" Repairs and replacement of Calculating, Punching and other equipment, accessories, furniture and fittings, survey instruments, maps etc.					14,119 12 0
" Postage, telephone, electric charges etc. .. .					25,014 0 9
" Transport charges for staff and office .. .					37,609 7 9
" Workers' welfare and amenities					30,342 14 6
" Development activities (small enquiries and experimental work)					41,444 4 6
" Contribution to F.A.O., U.N., Agricultural acqisition etc.					1,180 13 8
" Other miscellaneous contingent charges including Auditor's fees, Bank charges and interest, Law charges, crop cutting labour charges and repairs and maintenance of offices land and buildings and petty constructions					24 3 0
" Transfer to Supervision fee fund					52,540 0 6
" Closing Balance					90,000 0 0
			Rs. 18,86,613 3 0		Rs. 18,86,613 3 0

6. HARIZO STRAZER, CALCUTTA
27th 28th October, 1953.

Examined and found correct
By C. N. NAYAK, C.A.,
Chartered Accountant,
Auditors

INDIAN STATISTICAL INSTITUTE

Indian Statistical Institute: Receipts and Payments for the year ending 31 March 1953

Dr.		Rs.	As. P.		Rs.	As. P.
<i>A/C: Statistical work on Manufacturing Industries Survey</i>						
To Grant received from the Government of India, Ministry of Finance		25,000	0 0		14,730	0 3
				By Salary and allowances (including Employer's contribution to Provident, Leave Salary and Gratuity Funds)	4,525	13 0
				" Hire and maintenance of telelabing machines and cost of cards etc.		
				" Printing, stationery, Auditor's fees, postage, electric charge and other contingencies including house rent etc.	2,570	0 3
				" Welfare and amenities to staff including transport arrangements	1,995	2 0
				" Closing Balance	1,178	10 6
		25,000	0 0		25,000	0 0
<i>A/C: Statistical work on P.A.O., U.N., Agricultural Enquiries</i>						
To Grant received from the Government of India, Ministry of Finance		10,000	0 0		8,744	0 0
				By Salary and allowances (including Employer's contribution to Provident, Leave Salary and Gratuity Funds)		
				" Contingencies including Auditor's fees, stationery, postage, welfare and amenities to staff etc.	1,280	3 0
				" Amount received as contribution from the N.S.S. A/o to meet deficit	24	3 0
				" Closing Balance	10,024	3 0
		10,024	3 0		10,024	3 0

Examined and found correct
P. C. NARAY & Co.
Chartered Accountants,
Auditors

6, HASTING STREET, CALCUTTA
The 29th October, 1953.

Indian Statistical Institute : Receipts and Payments for the year ending 31 March 1953

Dr.	Cr.
<i>A/C: Statistical work on Population Census Data 1941</i>	
Ra.	Ra. As. P.
To Opening Balance	18,232 2 9
By Salary and allowances (including Employer's contribution to Provident, Leave Salary and Gratuity Funds)	10,905 0 0
" Advance from Supervision fee fund	1,828 14 3
" Hire and maintenance of tabulating machines and cost of cards etc.	7,938 14 3
" Contingencies including Auditor's fees, stationary wage and amitties to staff etc.	1,317 2 9
<u>Ra.</u>	<u>20,061 1 0</u>
<u>Ra.</u>	<u>20,061 1 0</u>

G. HARRISS SMYTHE, CALCUTTA
7th 26th October, 1953.

Examined and found correct
W. C. VEDRI & Co.
Chartered Accountants,
Auditors

INDIAN STATISTICAL INSTITUTE

Indian Statistical Institute : Receipts and Payments Account for the year ending 31 March 1953

Dr.	<i>Buildings Construction Account</i>		Cr.	
	Ra.	As. P.	Ra.	As. P.
To Opening Balance	653	10 0		
“ Unadjusted suspense of 1951-52	17,625	12 0	18,281	6 9
“ Capital Grant received from the Government of India, Ministry of Finance		2,00,000	0 0	
“ Advances taken from Institute's Supervision Fee Fund		85,000	0 0	
“ Advances taken from Institute's Gratuity Fund		10,000	0 0	
By Repayment of the temporary advance for account of expenditure incurred for construction of Institute's Buildings as per audited accounts of 1951-52 :—			23,000	0 0
(i) Development Fund			27,000	0 0
(ii) Supervision Fee Fund			21,800	0 0
(iii) Statistical Publishing Society			71,800	0 0
“ Expenses incurred on account of Institute's Buildings in 1952-53 :—				
(i) Construction materials and stores purchased			1,25,231	12 6
(ii) Labour charges paid to the contractors			77,987	5 6
(iii) Electrical and sanitary fittings (including labour)			32,100	1 0
(iv) Miscellaneous overheads and transport charges			1,981	4 0
“ Unadjusted suspense at the end of year			2,37,300	7 0
“ Closing Balance :—				
Cash in hand & at Banks			1,855	5 6
			2,325	10 3
			4,180	15 9
	Ra.	As. P.	Ra.	As. P.
	3,13,281	6 9	3,13,281	6 9

6, HARTISCA STREET, CALCUTTA
The 26th October, 1953.

Examined and found correct
P. C. NAYD & Co.
*Chartered Accountants,
Auditors*

TWENTYFIRST ANNUAL REPORT : 1952-1953

Indian Statistical Institute : Receipts and Payments Account for the year ending 31 March 1953

Dr.		Cr.			
Capital Expenditure Account					
	Rs.	As. P.	Rs.	As. P.	
To Advance taken from Institute's Leave Salary Fund ..	80,000	0 0	..	7,799 3 6	
			..	21,894 3 6	
			..	46,474 14 6	
By Advance taken from Institute's "Gratuity Fund" ..	55,000	0 0	..	5,000 0 0	
			..	12,905 14 0	
			..	5,052 14 3	
			..	11,907 11 0	
			..	2,040 12 6	
			..	1,924 0 9	
	Rs.	1,15,000 0 0		Rs.	1,15,000 0 0

6, BASTINGS STREET, CALCUTTA
The 26th October, 1953.

Examined and found correct
P. C. NATHU & Co.
Chartered Accountants
Auditors

INDIAN STATISTICAL INSTITUTE

Indian Statistical Institute : Receipts and Payments Account for the year ending 31 March 1953

Dr.	Scholarships, Stipends, Visiting Professors and Fellows Fund		Cr.	
	Rs.	As. P.	Rs.	As. P.
To Amount of Budget Provision for award of scholarships and stipends, transferred from General A/c for funding	20,000	0 0		
.. Amount of Budget Provision for Visiting Professors and Fellows, transferred from General A/c for funding		20,000		
			3,000	0 0
			2,520	0 0
			1,500	0 0
			1,200	0 0
			461	5 0
			419	6 0
			321	0 0
			300	0 0
			300	0 0
			103	9 0
			103	9 0
			10,353	4 0
			4,092	13 3
			1,100	0 0
			3,186	0 0
			2,131	18 9
			1,864	15 9
			12,887	5 0
			16,147	7 9
			40,000	0 0
			40,000	0 0

Examined and found correct
P. C. NANDI & Co.
Chartered Accountants.
Auditors

6, EASTON STREET, CALCUTTA
7th 26th October, 1953.

TWENTYFIRST ANNUAL REPORT : 1952-1953

Indian Statistical Institute : Receipts and Payments Account for the year ending 31 March 1953

Dr.	Cr.
<i>Leave Salary Fund</i>	
	Rs. As. P.
To Amount of Budget Provision for Leave Salary transferred from General A/c.	70,000 0 0
	By Leave Salary paid (including payments in lieu of leave)
	" Temporary Advance to Capital Expenditure A/C of the Institute
	" Closing Balance :
	Cash in hand and at Banks
Rs. 70,000 0 0	Rs. 70,000 0 0
<i>Gratuity Fund</i>	
	Rs. As. P.
To Amount of Budget Provision for Gratuity to temporary staff transferred from General A/c.	70,000 0 0
" Amount of Budget Provision for payment of compassionate gratuity to Field staff discharged in 1951	20,000 0 0
	By Part payments of compassionate gratuity to some of the discharged field staff
	" Advance to Capital Expenditure A/C of Institute
	" Advance to Building Construction A/C.
	" Closing Balance :
	Cash in hand and at Banks
Rs. 90,000 0 0	Rs. 90,000 0 0

6, HASTINGS STREET, CALCUTTA
The 26th October, 1953.

Examined and found correct.
P. C. NANDI & Co.
Chartered Accountants,
Auditors

INDIAN STATISTICAL INSTITUTE

Indian Statistical Institute : Receipts and Payments Account for the year ending 31 March 1953

Dr.	Supervision Fee Fund		Cr.	
	Rs.	As. P.	Rs.	As. P.
To Opening Balance :				
Cash in hand	1,703	12 7	1,07,601	1 5
Land at Baranagar and Giridih at cost			725	0 6
" Land at Baranagar and Giridih at	1,07,601	1 5	1,08,326	1 11
" Amount received in repayment of the advance made to Land & Buildings A/C in 1951-52			85,000	0 0
" Amount of supervision fees charged and received on account of Multi-purpose National Sample Survey works conducted by the Institute during 1952-53	27,000	0 0	2,000	0 0
" Closing Balance :			20,000	0 0
Cash in hand				
	1,07,000	0 0	978	12 1
	2,16,304	14 0	2,16,304	14 0

6, HARTDORN STREET, CALCUTTA
The 30th October, 1953.

Examined and found correct.
P. C. NANDI & Co.
Chartered Accountants,
Auditors

TWENTYFIRST ANNUAL REPORT : 1952-1953

Indian Statistical Institute: Receipts and Payments Account for the year ending 31 March 1953

Dr.	<i>Development Fund Account</i>		Cr.
	Ra.	As. P.	
To Opening Balance : Cash in hand	1,000	0 0	By Advance to Statistical Publishing Society and others ..
" Amount received in repayment of advance made to Land & Buildings A/C in 1951-52 as per last audited statement	23,000	0 0	" Advance for additions and alterations in 204, B.T. Rd. premises for Development Office (pending adjustments),
" Rental value of accommodation in 'Amrapali' for 1952-53 transferred from General A/C as per Council resolution dated 28 March 1951	10,320	0 0	" Closing Balance : Cash in hand and at Banks
" Contribution from General A/C out of savings from Director's Salary	24,000	0 0	223 1 3
" Rental value of accommodation in 'Amrapali' for 1951-52 transferred from General A/C as per Council resolution dated 28 March 1951	10,320	0 0	
	Ra.	Ra.	
	68,640	0 0	68,640 0 0

INDIAN STATISTICAL INSTITUTE

Indian Statistical Institute : Receipts and Payments Account for the year ending 31 March 1953

Dr.	<i>Statistical Workers' Provident Fund Account</i>		Cr.	
	Rs.	As. P.	Rs.	As. P.
To Opening Balance :				
(i) Government paper at cost ..	1,67,705	13 8		
(ii) Cash in hand and at Banks ..	1,39,249	12 4		
	<u>3,06,955</u>	<u>10 0</u>		
.. Loans to Members ..		18,130 0 0		
.. Workers' own subscription to the fund ..	57,545	8 0		
.. Institute's contribution to the fund ..	57,546	8 0		
		<u>1,15,091 0 0</u>		
.. Interest received against loan given to members ..		1,399 8 0		
.. Interest on investments :				
(i) Government paper ..		2,638 12 0		
(ii) Institute ..		4,874 0 0		
		<u>7,510 12 0</u>		
.. By Repayment of workers' own contributions ..			7,149 5 0	
.. Payment of Institute's contribution to workers withdrawing their accounts ..			4,517 2 0	
.. Payment of interest to workers withdrawing their accounts ..			607 9 0	
.. Loan to Members :				
.. Outstanding from previous years ..		18,130 0 0		
.. Since added during the year 1952-53 ..		77,313 0 0		
		<u>95,443 0 0</u>		
.. Less amount realised during 1952-53 ..		87,030 0 0		
			<u>8,413 0 0</u>	
.. Closing Balance :				
(i) Investment in G.P. Notes (face value—3,40,000/-) ..			3,06,034 4 8	
(ii) National Savings Certificate (Present value 12,000/-) ..			10,000 0	
(iii) Cash in hand and at Banks ..			89,987 7	
			<u>4,06,701 12 0</u>	
		<u>Rs. 4,49,388 12 0</u>		<u>Rs. 4,49,388 12 0</u>

6, HASTINGS STREET, CALCUTTA
The 25th October, 1953.

Examined and found correct
P. C. NAYAK & Co.
Chartered Accountants,
Auditors

APPENDICES

Appendix I

THE COUNCIL

President : The Hon'ble Sri C. D. Deshmukh.

Vice-Presidents : Prof. S. N. Bose, Prof. D. R. Gadgil, Sri K. P. Goenka, Sri G. L. Mehta, Dr. P. N. Banerjee, Sri Birendranath Mookerjee, Dr. Shyama Prasad Mookerjee, Sri B. Rama Rao, Sri Shri Ram.

Treasurer : Dr. Satya Churn Law.

Secretary : Prof. P. C. Mahalanobis.

Joint Secretaries : Sri Nihar Chandra Chakravarti, Sri S. C. Sen.

Members : Dr. S. K. Banerjee, Srimati Chameli Bose, Prof. K. N. Chakravarti, Sri Mohanlal Ganguli, Prof. H. C. Ghosh, Sri Nimai Charan Ghosh, Prof. K. B. Madhava, Sri K. C. Mahindra, Prof. Bholanath Mukherjee, Dr. U. S. Nair, Sri Pitambar Pant, Dr. B. Ramamurti, Dr. C. R. Rao, Dr. V. K. R. V. Rao, Sri S. C. Roy, Dr. N. Sundarama Sastry, Sri J. M. Sen, Sri Sadasiv Sengupta, Sri A. R. Sinha.

Appendix II

GOVERNING BODY OF THE RESEARCH AND TRAINING SCHOOL

Sri C. D. Deshmukh, President of the Institute (*Chairman*).

Prof. P. C. Mahalanobis, Secretary and Director of the Institute (*ex-officio member*).

Prof. K. N. Chakravarti, Registrar of the Institute (*ex-officio member*).

Sri Bali Ram Bhagat, M. P. (*Representative of the Government of India*).

Sri M. V. Rangachari, Joint Secretary, Ministry of Finance, Government of India (*Representative of the Government of India*).

Dr. N. S. R. Sastry (*Representative of the Reserve Bank of India*).

Dr. P. B. Patnaik (*Representative of the Inter-University Board*).

Mr. J. A. R. Tainsh (*Representative of the Associated Chamber of Commerce*).

Sri D. N. Mukherjee (*Representative of the Federation of Indian Chambers of Commerce and Industry*).

Dr. P. N. Krishna Iyer (*Representative of the National Institute of Sciences of India*).

Prof. J. P. Niyogi (*Representative of the Indian Economic Association*).

Prof. S. N. Bose, Sri Shri Ram, Dr. S. K. Banerjee, Prof. K. B. Madhava, Sri Nihar Chandra Chakravarti, Sri Mohanlal Ganguli, Dr. C. R. Rao (*Representatives of the Indian Statistical Institute*).

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Appendix III

BYE-LAWS FOR ASSOCIATESHIP AND ASSOCIATE FELLOWSHIP OF THE INDIAN STATISTICAL INSTITUTE

The Indian Statistical Institute will award Associateship and Associate Fellowship of the Institute to candidates who have satisfied the conditions laid down in these bye-laws.

2. *Standing Committee*

2.1. There shall be a Standing Committee for recommending the award of Associateship and Associate Fellowship of the Institute consisting of

2.1.1. the President, the Director of the Institute and the Secretary of the Institute as ex-officio members,

2.1.2. four members to be elected by the Council of whom not less than two shall be fellows of the Institute, and

2.1.3. such representatives of the Government of India and other organizations as may be decided by the Council, from time to time.

2.2. Members selected by the Council shall hold office for two years. The retiring members will be eligible for re-election.

2.3. The Standing Committee shall be responsible for the conduct of examinations and for taking other actions as required by these bye-laws.

2.4. Four members will constitute a quorum in all meetings of the Standing Committee.

3. *Associateship*

3.1. Each candidate for the Associateship must satisfy the following requirements:—

3.1.1. He must have attained the age of 18 years.

3.1.2. He must have undertaken a course of training or have worked in the Indian Statistical Institute for not less than three terms or for one academic year inclusive of the period of professional work for four months mentioned in clause (3.1.4.) below.

3.1.3. He must have passed—either—

3.1.3.1. all the examinations in the two years' training course of the Indian Statistical Institute, or

3.1.3.2. the examination for Statisticians Diploma except for such parts thereof from which he may be exempted in accordance with the bye-laws for the conduct of that examination, or,

3.1.3.3. an examination or examinations accepted by the Standing Committee as equivalent to the examinations for Statistician's Diploma.

3.1.4. After passing any of the qualifying examinations referred to in (3.1.3), each candidate must complete a period of professional work in statistics for a period of not less than (a) one term in the Indian Statistical Institute or (b) one year in other organization recognized for the purpose by the Standing Committee.

3.1.5. Each candidate shall send an application in the prescribed form for Associateship together with (a) certificates from not less than two members of the Institute testifying

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that in habit and character he is a proper candidate for admission to Associateship, (b) four copies of the report on the professional work done by him under clause (3.1.4), (c) a fee of Rs. 100/-.

4. *Examinations*

4.1. The Standing Committee shall appoint a Board of Examiners consisting of not less than three members for examining the reports submitted by candidates under clause (3.1.5) and for conducting a viva voce examination.

4.2. The Board of Examiners shall submit a report to the Standing Committee giving their assessment of the standard of professional competence attained by each candidate and their opinion as to the suitability of the candidate for the award of the Associateship.

4.3. The Standing Committee shall consider the report of the Board of Examiners and shall determine in each case whether the candidate shall or should not be admitted to the Associateship in accordance with their relevant bye-laws, and shall report to the Council accordingly. The Associateship shall be awarded by the Council on the basis of the decisions of the Standing Committee.

5. *Privileges*

5.1. Every Associate shall be entitled to use the letters A.I.S.I. after his name as a mark of his professional attainment.

6. *Associate Fellowship*

6.1. Each candidate for Associate Fellowship of the Institute must satisfy the following conditions —

6.1.1. He must have attained the age of 21 years.

6.1.2. He must, either

6.1.2.1. have been admitted to the Associateship and have thereafter worked for at least three terms, or one academic year, in the Indian Statistical Institute or any other organization that may be recognized by the Standing Committee for the purpose, or

6.1.2.2. have obtained the Statistician's Diploma or have passed an examination accepted as equivalent thereto by the Standing Committee and have thereafter worked for three years as a professional statistician of which one year shall be in the Indian Statistical Institute, or

6.1.2.3. have worked as a professional statistician for five years of which at least three years shall be in the Indian Statistical Institute.

6.1.3. Each candidate shall send an application in the prescribed form for Associate Fellowship together with (a) certificates from not less than two members or fellows of the Institute testifying that in habit and character he is a proper candidate for admission to Associate Fellowship, (b) four copies of thesis on a special problem in statistics or dissertation or report on a professional project in statistics conducted by him either independently or in association with others, (c) a fee of Rs. 200/-.

7. *Examinations*

7.1. The thesis, dissertation or report mentioned in clause (6.1.3) shall be referred by the Standing Committee to a Board of at least three examiners.

INDIAN STATISTICAL INSTITUTE

7.2. After examining the thesis, dissertation or report, the Board of Examiners may require the candidate to appear before the Board for a viva voce examination, with reference to the thesis, dissertation or report submitted by him.

7.3. The Board of Examiners shall submit a report to the Standing Committee giving their assessment of the standard of professional competence attained by each Candidate together with their opinion as to the suitability of the candidate for the award of the Associate Fellowship.

7.4. The Standing Committee shall consider the report of the Board of Examiners and shall determine in each case whether the candidate should or should not be admitted to the Associate Fellowship in accordance with the relevant bye-laws, and shall report to the Council accordingly. The Associate Fellowship shall be awarded by the Council on the basis of the decisions of the Standing Committee.

7.5. The Council shall cause the name of each successful candidate to be published with the subject of his thesis, dissertation or report.

8. Privileges

8.1. A candidate who has been awarded the Associate Fellowship of the Institute shall be entitled to use the letters A.F.I.S.I. as a mark of professional attainments in statistics.

Appendix IV

LIST OF PAPERS COMPLETED DURING THE ACADEMIC YEAR, JULY 1952-JUNE 1953

BASU, DEBABRATA

1. On the minimex approach to the problem of estimation. *Proc. Nat. Inst. of Sciences of India* (28, 287).
2. On symmetric estimators in point estimation with convex loss function : *Sankhya*, 12, 45.
3. On a class of admissible estimators for the normal variance : *Sankhya*, 12, 57.
4. An example of non-existence of a minimum variance estimator : *Sankhya*, 12, 43.
5. An example where the maximum likelihood estimator does not possess the least asymptotic variance : *Proc. Ind. Science Congress*, 1953.
6. Choosing between two simple hypotheses and the criterion of consistency : *Proc. Nat. Inst. of Sciences of India* (in press).
7. (with R. G. Laha) : On some characterization of the normal distribution : *Sankhya*, 12 (in press).
8. The problem of minimum variance unbiased estimation : (Part of D. Phil. thesis, Calcutta University).
9. The optimum character of some estimators used in multistage sampling schemes : *Sankhya*, 13 (in press)
10. (with S. K. Mitra) : A note on the unbiased estimation on the Binomial proportion : *Proc. Nat. Inst. of Sciences* (in press).

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CHAKRAVARTY, INDRA MOHAN

11. On independence in the distributions of a system of canonical correlations : *Proc. Ind. Science Congress*, 1953.
12. On the relation between canonical and partial canonical correlations : *Proc. Ind. Sc. Congress*, 1953.
13. Use of the analysis of covariance in two-stage sampling : *Bull. Cal. Stat. Assn.*, 4, 127.

DES RAJ

14. On moments estimation of the parameters of a normal population from truncated samples : *Ganita*, 4.
15. Estimation of the parameters of Type III populations from truncated samples : *Journal of the American Statistical Association*, September 1953 (in press).
16. On Mill's Ratio for the Type III population : *Annals of Mathematical Statistics*, June 1953 (in press).
17. On estimating the parameters of bivariate normal populations from singly and doubly truncated samples : *Sankhya*, 13 (in press).
18. On a property of truncated distributions admitting sufficient statistics : *Sankhya*, 13 (in press).
19. On optimum selections from multivariate populations : *Sankhya*, 13 (in press).
20. Relative efficiency of gauging and exact measurement : (unpublished report).
21. On a prediction problem in time series : *Proc. Indian Science Congress*, 1953.
22. The inverse hyperbolic sine transformation on Students' 'T' for non-normal samples : *Sankhya*, 12, 105.

LAHA, RADHA GOVINDA

7. (with D. Basu) : On some characterisations of the normal distribution : *Sankhya*, 13 (in press).
23. On an extension of Geary's Theorem : *Biometrika*, 40, 1953.
24. On some problems in canonical correlations : *Proc. Ind. Sc. Congress* 1953. *Sankhya*, 13 (in press).
25. (with S. K. Mitra) : A note on the test of randomness in the recurrence of hysteric fits : *Sankhya*, 13 (in press).

MAHALANOBIS, P. C.

26. Some aspects of the design of sample surveys : *Sankhya*, 12, 1.
31. (with J. M. Sen Gupta). On the compensation of the perimeter bias in sample-
cuts of a small size in crop-estimating surveys : *Sankhya*, 13 (in press).

MATHAI, ABRAHAM

27. On selecting random numbers for large scale sampling : *Sankhya*, 12 (in press).

MITRA, SUJIT KUMAR

28. A note on minimum variance in unbiased estimation : *Proc. Ind. Sc. Cong.* 1953 : *Sankhya*, 13 (in press).

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10. (with D. Basu) : A note on the unbiased estimation of the Binomial proportion : *Proc. Nat. Inst. of Sciences* (in press).
29. A note on the use of range in setting tolerance limits : (unpublished report).
25. (with R. G. Laha) : A note on the test randomness in the recurrence of hysteric fits : *Sankhya*, 13 (in press).

NARASIMHAN, R. G.

30. (with J. Roy) : A note on a technique useful in studying the relationship between two variables. (unpublished report).

RAO, RADHAKRISHNA

31. Some theorems on minimum variance estimation : *Sankhya*, 12, 27.
32. Minimum variance estimation in distributions admitting ancillary statistics : *Sankhya*, 12, 53.
33. Discriminant functions for genetic differentiation and selection : *Sankhya*, 12, 230.
34. On transformations useful in the univariate problems of least squares : *Sankhya*, 12 (in press).
35. A general theory of discrimination when the information about alternative populations is based on samples for the Biometric Conference 1953 : Abstract in *Current Science*, 22, 109.
36. On the use and interpretation of distance functions in statistics. Submitted in the section of contributed papers of the International Statistical Conference, 1953.
37. Estimation of relative potency from multiple response data : *Biometrics* (in press).

ROY, JOGABRATA

38. Some results useful in analysis of dispersion : *Proc. Ind. Sc. Cong.*, 1953.
39. Some tests of significance in samples from bipolar normal distributions : *Sankhya*, 13 (in press).
40. A note on minimum variance estimators : *Sankhya*, 13 (in press).
41. On the effect of Hindu marriage systems on Blood-group frequencies. (unpublished report).
42. A computational scheme for test of independence of two sets of variates when a third set is fixed. (Part of the D. Phil. thesis under preparation).
30. (with R. G. Narasimhan) : A note on a technique useful in studying the relationship between two variables. (unpublished report).

SEN GUPTA, JITENDRA MOHAN

31. (with P. C. Mahalanobis) : On the compensation of the perimeter bias in sample cuts of a small size in crop-estimating surveys : *Sankhya*, 13 (in press).

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Appendix V

LIST OF SCIENTIFIC ENQUIRIES : 1952-53

- | | |
|--|--|
| 1. S. P. Basu,
All India Institute of Hygiene &
Public Health. | The oxygen requirements of the Indian
Carps with a view to study mortality in
fish culture and transport. |
| 2. Dr. V. G. Jhingran,
Central Inland Fisheries Research
Station. | A study of the length weight relationship in
Indian fish and the construction of a health
index of growing fish. |
| 3. Jagjit Singh,
Deputy Director, Rail Movement,
Moghalsarai. | Analysis of data regarding the interchange
of wagons at Moghalsarai. |
| 4. Jagjit Singh,
Deputy Director, Rail Movement,
Moghalsarai. | Analysis of the data on the working expenses
and the train miles (passenger and goods)
on the East Indian Railway. |
| 5. Dr. Nirod Mukherjee,
Head of the department of
Experimental Psychology,
University of Gauhati. | A study of the data on hysteric fits. |
| 6. Dr. S. C. Lahiri, M.D.,
Chittaranjan Medical College. | A study of the effect of DOCA on the
gastric secretions. |
| 7. Dr. V. L. S. Prakasa Rao,
Department of Geography,
Madras University, Madras. | Classification of the 24 districts of the
Madras State into homogeneous groups on
the basis of certain agricultural and meteor-
ological factors, population density etc. |
| 8. C. C. Bhattacharyya,
Lecturer, Calcutta University. | The prediction of abstract intelligence
scores from the performance test results. |
| 9. A. K. Mitra (M.O. Degree candidate)
Calcutta University. | A study of Research Section and the Obstet-
ric future of women after the operation,
based on 308 observations of the period
1946-51. |
| 10. A. P. Chakravarty (M.O. Degree
candidate),
Calcutta University. | A study of Pre-eclampsia of pregnant women
on observations in Eden Hospitals, Calcutta. |
| 11. C. S. Dawn (M.O. candidate),
Calcutta University. | (a) Nutrition survey, (b) study of Pre-
eclampsia in relation to intake of different
food items. |
| 12. Dr. S. C. Chowdhury,
Botany Deptt., Presidency College,
Calcutta. | Statistical analysis of varietal trial on the
growth etc. of sugarcane. |
| 13. Dr. P. Sen,
School of Tropical Medicine,
Calcutta. | Enquiry into the preferable conditions for
doctors to take the treatment of leprosy
cases. |
| 14. Dr. S. M. Banerji,
Professor of Physiology,
Medical College, Orissa. | Statistical analysis of certain Physiological
observations. |

INDIAN STATISTICAL INSTITUTE

Appendix VI
LIST OF OFFICERS-ON-DEPUTATION

<i>Name of trainee</i>	<i>Deputed by</i>	<i>Date of joining</i>	<i>Date of leaving</i>	<i>Nature of training</i>
1. M. C. Borborah, Statistical Assistant.	Directorate of Agriculture, Government of Assam, Assam.	6 August, 1951	31 July, 1952	Design and analysis of Experi- ments.
2. Dr. K. Rangaswamy Iyer, Associate Professor of Mathematics.	Annamalai University, Annamalainagar.	18 April, 1952	28 June, 1952	Mathematical Statistics.
3. Shaikat Abbas, Lecturer in Mathematics.	Muslim University, Aligarh.	5 May, 1952	20 June, 1952	General Statistical Methods.
4. S. Bahadur, Research Assistant.	Lucknow University, Lucknow.	13 May, 1952	22 September, 1952	Analysis of Anthropometric Data.
5. Prof. D. R. Handa, Lecturer.	Punjab University, Hoshiarpur.	1 August, 1952	12 December, 1952	General Statistical Methods.
6. Dr. U. B. Mathur, Statistical Officer.	Commerce & Industry Dept., Government of Rajasthan, Jaipur.	8 October, 1952	20 December, 1952	Economic Statistics & Crop Surveys.
7. Miss Sunilkee Duttia, Research Scholar.	Central Institute of Education, Government of India, Delhi.	1 January, 1953	Continuing	Education psychology.
8. O. Prakash, Senior Economic Investigator.	Board of Economic Inquiry, Punjab (India).	6 February, 1953	5 May, 1953	Economic investigations.
9. R. K. Mieru, Lecturer in Mathematics.	University of Saugar, Saugar.	28 March, 1953	continuing	General Statistical Methods.
10. V. Krishnamurthy, Lecturer in Mathematics.	Thiruvarejvar College, Madurai.	10 April, 1953	8 June, 1953	"
11. Arodyha Prasad, Junior Research Assistant.	Behar Agricultural College, Sabour (Bhagalpore).	15 April, 1953	continuing	Statistical applications in Genetics.
12. U. V. Ramamohana Rao, Research Scholar in Stat.	Andhra University, Anudhra.	15 April, 1953	"	Mathematical Statistics.
13. S. Rangachari, Lecturer in Maths.	Annamalai University, Annamalainagar.	8 May, 1953	9 June, 1953	General Statistical Methods.

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Appendix VII

LIST OF TRAINEES IN THE TWO-YEAR TRAINING COURSE

Second Year Class

1. Dubey, S. (Bihar), 2. *Ghosh, H. S. (West Bengal), 3. Gnanadeshikan, R. (Annamalainagar), 4. Gopalkrishnan, M. S. (Madras), 5. Gupta, K. R. (Madras), 6. Iyengar, K. R. R. (Madras), 7. Mukherjee, A. K. (Rajasthan), 8. Padmanabhan, M. (Madras), 9. Ramakrishnan, C. S. (Chittur Cochin), 10. Ramakrishnan, V. (Trivandrum), 11. Reddy, K. G. (Madras), 12. Srikantan, K. S. (Madras), 13. Srinivasan, V. (Madras), 14. Subramanian, T. A. (Madras), 15. Sundaram, P. M. (Trivandrum), 16. Sundarajan, T. V. (Madras), 17. Vikraman, V. (Madras).

First Year Class

1. Aikot, J. K. (Bihar), 2. Banerjee, A. D. (U.P.), 3. Banaal, J. P. (U.P.), 4. Balakrishnan, T. R. (Trivancore-Cochin), 5. Bhasin, K. K. (Punjab), 6. *Chakravorti, S. (West Bengal), 7. Gopal, M. V. (Mysore State), 8. Gupta, H. G. (Punjab), 9. *Gupta, H. R. (Himachal Pradesh), 10. *Gupta, R. L. (Punjab), 11. Gupta, R. S. (Punjab), 12. *Mukherjee, D. P. (West Bengal), 13. Prasad, C. R. (Madras), 14. Premi, K. K. (U.P.), 15. Ravi Kumar (Punjab), 16. Singal, M. S. (Punjab), 17. Singh, P. (Punjab), 18. Sinha, S. K. (West Bengal), 19. Sivaramakrishna, P. V. (Madras), 20. Sundaresan, K. S. (Madras).

*Discontinued.

Appendix VIII

LIST OF TRAINEES IN THE ISEC THIRD TERM (JANUARY TO JUNE 1952)

Country	Name
AFGHANISTAN	1. *Abdul Ali
BURMA	2. U. Khin Lat 3. Daw Sann Shin 4. Daw Tin Yi
CAMBODIA	5. Thach Sary
CEYLON	6. L. N. Perera 7. *Warnasena Rasaputram
INDIA	8. Mirza Husein Ali 9. O. P. Kapur 10. *Danendra Dov Jain 11. Shantaram Sadashiv Chiney 12. Dhananjoy Hota 13. Jan Mohamad 14. *Y. S. Naik 15. K. S. Reddy 16. O. C. Sharma 17. *M. L. A. Rao 18. N. C. Sinha 19. Bawa Ranbir Singh

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INDONESIA	20. Barli Halim
	21. Kwik Hok Hoo
IRAQ	22. Ali Al-Khalisi
JAPAN	23. Chujiro Ozaki
MALAYA	24. Laidin B. A. Musa
PAKISTAN	25. M. Ahmed
	26. *Abu Ali Ahmed Choudhury
	27. M. Zafirul Hasan
	28. A. M. M. Tabarok Hussain
	29. Syed Taqi Mohammed Naqvi
	30. Kazi Md. Jahir Uddin
PHILIPPINES	31. Lagrimas V. Abalos
	32. Loreto V. Alzate
	33. Manuel L. Garcia
	34. Serafin Sarmiento
	35. Mariano Varsovia
	36. Pablo Veridiano
THAILAND	37. Vichien Chayachinda
	38. Vichitrasakdhi Sa. asophana
	39. *C. Suvannakitti
	40. Janyong Wattana Sirikul

* (7) Trainees staying over from the previous term.

LIST OF TRAINEES IN THE ISEC FOURTH TERM (JULY TO DECEMBER 1952)

<i>Country</i>	<i>Name</i>
BURMA	1. *Khin Lat
	2. Yin Thaw
	3. Maung Maung Gale
	4. Tin U
	5. Maung Ohn Ngwe
	6. Aung Win
	7. Daw Khin Saw Kyi
CAMBODIA	8. *Thach Sary
CEYLON	9. W. S. M. Fernando
INDIA	10. K. C. Gupta
	11. Jogendra Nath Borah
	12. Parimal Chandra Sen
	13. Santi Ranjan Mukherjee
	14. M. Subramanian
	15. K. N. Natarajan
	16. K. B. Dangayach
	17. R. Venkataramana

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	18. B. L. Agarwal
	19. K. C. Saxena
JAPAN	20. Ryohei Magota
NEPAL	21. Bharat Lal Rajbhandary
PAKISTAN	22. *K. M. Zahiruddin
	23. *Muhammad Zariful Hasan
	24. *Syed Taqi Mohammed Naqvi
	25. Said Ud-din
	26. M. Abdur Rahim
	27. Wasi Ahmed Kamali
	28. Abdul Majid
	29. M. A. Rashid
	30. M. S. Zaman
	31. Muhammad Abdul Aziz
PHILIPPINES	32. *Serafin Sarmiento
	33. *Loreto V. Alzate
	34. *Mañuel L. Garcia
	35. Bibiane B. Arzadan
THAILAND	36. *Janyong Wattana Sirikul
	37. Chow Chavanich

* (9) Trainees staying over from the previous term.

LIST OF TRAINEES IN THE ISEC FIFTH TERM (JANUARY TO JUNE 1953)

<i>Country</i>	<i>Name</i>
BURMA	1. U. Saw Mung
	2. Daw Khin Thuang
INDIA	3. Promode Ranjan Ghose
	4. H. R. Gupta
	5. Jyotirmoy Karkun
	6. Radha Charan Khuntia
	7. H. C. Kothari
INDONESIA	8. Sedjono Notoadhiwinota
NEPAL	9. *B. L. Rajbhandari
PAKISTAN	10. *M. A. Majid
	11. *M. A. Rashid
	12. *M. S. Zaman
	13. Syed Rahmat Ali
	14. Ch. Riast Ali Khan Bajwa
	15. Mirza Mohamad Kazim Beg
	16. M. I. Haq
	17. Mahammed Hossain
	18. Mohammed Abdul Karim

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- | | |
|--------------------|-----------------------------|
| | 19. M. Amin Mir |
| | 20. Malik Ghulam Mohyyuddin |
| | 21. Khwaja Rashidullah |
| | 22. Sayad Shujaat Ali Shah |
| PHILIPPINES | 23. *P. V. Alzate |
| | 24. *M. Garcia |
| | 25. Domingo C. Alonzo |
| | 26. Felipe Rey Hipolito |
| | 27. Emilio A. Santos |
| | 28. Mira M. Sarda |
| THAILAND | 29. M. Krishnachinda |
| | 30. S. Limpisavasti. |

* (6) Trainees staying over from the previous term.

Appendix IX

SUCCESSFUL CANDIDATES IN DIFFERENT EXAMINATIONS : 1952-53

TWO-YEAR PROFESSIONAL COURSE

- | | |
|---|--|
| 1. Basu, S. (<i>West Bengal</i>) | 5. Lal, R. S. (<i>U.P.</i>) |
| 2. Dar, S. N. (<i>Kashmir</i>) | 6. Roy, D. (<i>West Bengal</i>) |
| 3. Hariharan, K. (<i>Madras</i>) | 7. Sarma, G. L. (<i>Rajasthan</i>) |
| 4. Krishnamurti, D. V. R. (<i>Madras</i>) | 8. Venkataraman, M. V. (<i>Mysore State</i>) |

STATISTICIAN'S DIPLOMA

A. GENERAL PAPERS

1. Theoretical

PAPER I

Roll No.	Name	Roll No.	Name
B6	C. G. Gopalakrishna	P5	G. A. Kulkarni
C8	A. Chatterjee	P7	K. Ramachandran
D5	O. P. Sharma	P11	Y. S. Ghaisas
M2	R. T. S. K. Tatachari	P14	N. N. Koti
		P21	S. K. Karandikar

PAPER II

C8	A. Chatterjee	P7	K. Ramachandran
D9	H. R. Sharma	P8	M. S. Pnndit
P3	T. Jacob	P10	P. Krishna
P4	A. R. Kulkarni	P11	Y. S. Ghaisas
		P21	S. K. Karandikar

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PAPER III

B6	C. G. Gopalakrishna	P7	K. Ramachandran
D9	H. R. Sharma	P9	K. R. Pradhan
D10	P. K. Ahuja	P11	Y. S. Ghaisas
I6	J. N. Srivastava	P16	P. R. Dogra
		P22	R. Rangarajan

2. *Practical*

PAPER VI

P22 R. Rangarajan

PAPER VII

C5	T. Chellaswami	P17	V. S. Tulpule
P11	Y. S. Ghaisas	P22	R. Rangarajan

B. SPECIAL PAPER

PAPER IV—(*Theoretical*)

<i>Roll No.</i>	<i>Name</i>	<i>Subject</i>
B7	K. Jayachandran	Mathematical Theory of Sampling Distribution
C7	T. K. Roy	Statistical Quality Control
D12	A. Singh	Design of Experiments
P16	P. R. Dogra	Statistical Quality Control

PAPER V—(*Theoretical*)

C8	A. Chatterjee	Sample Survey (Applied)
P16	P. R. Dogra	Probit Analysis

PAPER VIII—(*Practical*)

B4	Shalini Dhavle	Sample Surveys (Applied)
		Vital Statistics & Population Studies
B8	V. S. Honwad	Economic Statistics
		Statistical Quality Control
P16	P. R. Dogra	Statistical Quality Control
		Probit Analysis

The following candidate is declared to have passed in one half of paper VIII (in the subject mentioned against his name). He is required to pass in the other half in order to complete pass in Paper VIII.

<i>Roll No.</i>	<i>Name</i>	<i>Subject</i>
D4	S. Viswanath	Mathematical Theory of Sampling Distribution

INDIAN STATISTICAL INSTITUTE

The following candidates have previously passed in one half of Paper VIII are declared to have passed in the other half in the subject mentioned against their names. They are accordingly declared to have passed in Paper VIII fully.

		<i>Subject passed in 1961</i>	<i>Subject passed in 1962</i>
P9	K. R. Prathan	Statistical Quality Control	Probit Analysis
P16	H. Ramamurti	-do-	-do-

COMPUTER'S CERTIFICATE

PART IA—SECTION 1

<i>Roll No.</i>	<i>Name</i>		<i>Roll No.</i>	<i>Name</i>
C1	Pabitra Kumar Dasgupta		C40	Mrinalini Ghose
C2	Sailendra Kumar Guha		C43	Mohan Kisen Ogra
C8	Prabir Chandra Sen		C54	Ramesh Chandra Roy
C12	Baidya Nath Palit		C57	Nandita Dasgupta
C13	Sailendra Kumar Amin		BN9	Bishnu Charan Poddar
C20	Sunil Kumar Bose		BN11	Subir Kumar Roy
C33	Prasanta Kumar Bose*		BN17	Biraj Mohan Sengupta
C37	Nikhil Ranjan Chowdhury		BN52	Purnendu Bhusan Home Roy
C38	Tarak Nath Sarkar		BB2	Laxman Shripad Dandge
C39	Brajendra Lal Bhattacharjee			

PART IA—SECTION 2

C1	Pabitra Kumar Dasgupta*		C43	Mohan Kisen Ogra
C2	Sailendra Kumar Guha		C52	Ananta Kumar Adhikary
C4	Amalesh Chandra Dutta		C54	Ramesh Chandra Roy
C8	Pabir Chandra Sen		BN2	Birendra Kumar Nandy
C11	Sunil Kumar Dutta		BN9	Bishnu Charan Poddar
C12	Baidya Nath Palit*		BN11	Subir Kumar Roy
C13	Sailendra Kumar Amin		BN20	Nanda Kishore Prosad
C20	Sunil Kumar Bose		BN28	Arun Kanti Ghosal
C28	Mukti Bhattacharjee		BN33	Chittaranjan Banerjee
C31	Pratul Chandra Chowdhury		BN37	Hare Krishna Paul
C37	Nikhil Ranjan Chowdhury*		BN46	Nagendra Chandra Das
C38	Tarak Nath Sarkar*		BB2	Laxman Shripad Dandge*
C39	Brajendra Lal Bhattacharjee		G4	Subodh Kumar Palli

PART IB—SECTION 1

C5	Ajoy Kumar Guha		C38	Tarak Nath Sarkar
C37	Nikhil Ranjan Chowdhury		BN2	Birendra Kumar Nandy

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PART IB—SECTION 2

C11	Sunil Kumar Dutta	BN20	Nanda Kishore Prosad
C37	Nikhil Ranjan Chowdhury	BN62	Purnendu Bhusan Home Roy
BN5	Nihar Ranjan Mukherjee	BB2	Laxman Shripad Dandge
BN12	Subimal Kanti Majumdar	G8	Bijoy Krishna Taluqdar
BN15	Murari Mohan Rakshit		

PART IC—SECTION 1

<i>Roll No.</i>	<i>Name</i>	<i>Roll No.</i>	<i>Name</i>
C27	Leela Dasgupta	BB2	Laxman Shripad Dandge
BN16	Gaur Gopal Rudra		

PART IC—SECTION 2

C2	Saileendra Kumar Guha	C38	Tarak Nath Sarkar
B15	Abinash Chandra Sarkar	BN12	Subimal Kanti Majumdar
C37	Nikhil Ranjan Chowdhury	BN16	Gaur Gopal Rudra

FIELD SURVEY

PART IA

<i>Roll No.</i>	<i>Name</i>
11	Purnendu Prosad Bhattacharyya

PART IB

2	Sobha Ranjan Chakravarti
3	Ananta Kumar Adhikary
11	Purnendu Prosad Bhattacharyya
13	Sarat Chandra Halder

PART IC

3	Ananta Kumar Adhikary
11	Purnendu Prosad Bhattacharyya
12	Lal Mohan Banerjee

PART IIA

None passed

PART IIB

None passed