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world. Difficulties of organization may well require its segregation in the future into several economically autonomous, yet closely linked organizations, with different specified tasks. Nevertheless, an organic unity of personnel should be preserved as the only guarantee of harmonious development. In this way it can become a model for similar institutions badly needed by all forward-looking communities.

### MESSAGE FROM SRI C. D. DASHMUKH, PRESIDENT, INDIAN STATISTICAL INSTITUTE TWENTYFIRST FOUNDATION DAY REUNION, 20 DECEMBER, 1952

It would have given me great pleasure to be present on the occasion of the Foundation Day Reunion of the Indian Statistical Institute on the 20th December 1952 in Calcutta, but my preoccupations in Delhi make this impossible. This year's Foundation Day marks the completion of 21 years since the inception of the Institute—a period of continuous development and an enviable record of achievement.

This year's Foundation Day also marks, so to say, the coming of age of the Institute. It was but natural, therefore, that the Institute should have been asked to share increasing responsibilities in the field of statistics. The high reputation of the Institute in India and abroad has been duly recognised by the Government of India, who have decided that the Institute would be developed as the focal centre for professional training and research on the same lines as a Higher Technological Institute. The facilities provided by the Institute will be also utilized to the full to give training to the officers of the Government in statistical work.

The integrated training including theoretical studies and practical project work has been a notable feature of the Institute. In the National Sample Survey, perhaps the biggest and most comprehensive survey of its kind undertaken in any country of the world, the entire technical work is being done by the Institute. The first Report of the NSS which has just been submitted to Government bears testimony to the contribution made by the Institute to this great national venture. The time may not be far when the project section of the Institute will be worked on the lines of a National Statistical and Computational Laboratory for technical and large scale applied work in the processing and analysis of statistical data.

For the last two years the Institute has been maintaining very successfully, in collaboration with the International Statistical Institute, the International Statistical Education Centre. So useful has been the ISEC that Government have decided to provide funds to continue its work for the present on existing lines. I send my best wishes for the trainees of the fourth term who have come from different countries of Asia and who would receive certificates of study on the 20th December.

Under the inspiring guidance and direction of Prof. Mahalanobis, the Institute has won this confidence on the strength of its achievements, the ability and devotion of its workers and the high standard of their work. With the increasing tasks that are being entrusted to it, its responsibilities have likewise increased and it has become all the more necessary for it to maintain and improve the quality of its work. Let it be the aspiration of its workers to set a model for integrity, ability and efficiency and thus fulfil the expectation of the many friends and admirers of the Institute in India and other countries of the world.

## INDIAN STATISTICAL INSTITUTE

### THE PRIME MINISTER'S STATEMENT IN LOK SABHA ON 14 DECEMBER 1959 ON THE INDIAN STATISTICAL INSTITUTE BILL\*

This Institute is well known. Nevertheless, I should like to give just a few facts in regard to it. It was started in the early thirties, and has grown since then very considerably. Till now, it is not only the only but the very big Institute doing statistical work in Calcutta, and in fact, all over India. There can be no doubt about its importance. In fact, its importance is recognised internationally, all over the world. It is one of the noted statistical institutes in the world, not only in India; in India, of course, there is no other doing that type of work.

I should have thought that there was no need to lay stress on this fact of its intrinsic importance, and its importance as a national institution. It is almost a formality that I am observing now by bringing forward this Bill before the House. So, I was surprised when I found an Hon. Member referring just now to something which I could not understand, about some processes having to be gone through. I do not know what those processes are, except that a Bill is placed before this House for its acceptance now.

I do not propose at this stage to take the time of the House in referring to its importance and to the work it has done. Statistical work of this kind is always important, but now, today, with our planning etc., it is of the utmost importance. There can be no planning without statistical work on a big scale..... In fact, Government today is largely based and would become progressively more and more based on accurate statistical information. Of course, we have had statistical information in the census statistics and so many other things; the censuses are important, and they do take place from time to time, but there are so many other types of statistics which are essential, production, this, that and the other. These statistics, no doubt, are collected separately also by our Ministries to suit their purposes, and that is all right. But there is no other way to collect them in various ways, apart from those special matters, than through this Institute in India.

I may point out that a fairly large sum of money is shown in this Bill and in these papers as having been given to or spent by the Statistical Institute. Of that, a considerable sum of money, a little over Rs. 50 lakhs, is for the National Sample Surveys which are done more or less on a contractual basis. That is, in fact, previously, though, I think, not now, it was a pure contract; the Government of India used to give this piece of work, and whatever was left over from the money, they kept; it is not a profit-making organization; so, that went into their other work. Now, I do not think that is done exactly like that. But the point is that all this National Sample Survey work is done even now on a more or less contractual basis.

This Institute has become a big centre, a developing centre of research, education and training in Statistics. It has organized statistical quality control, national sample survey and studies in connection with problems of economic development. The Institute was a private Institute, to begin with, and is still a private autonomous Institute, which did work for Governments, whether Central or State, and received payment for work done,

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\* Extracts from the statement made by the Prime Minister, in moving for consideration of the Bill to declare the Indian Statistical Institute, Calcutta, to be an institution of national importance.

as I said, more or less on a contractual basis. In addition, it has received in recent years some sums of money for specific types of activity. It has also received some money from UNESCO for having an International Training Centre in Statistics to which the Government of India has also contributed.

There can be no doubt about its vital importance in the scheme of things and secondly also in regard to its being one of the recognised institutions of this kind in the world and respected greatly for not only its normal work but for certain original work which it has done and which has benefited and profited the science of Statistics or, rather, the practice of it.

The whole question that arises in this matter is really how best to deal with this institution. Some people think that an Institute of this kind should, more or less, be a government organization. This Bill is not meant to convert this into a government organization. After very careful thought, we have come to the conclusion that it should maintain and retain the autonomous character which it has had thus far, subject to various checks etc., which Government or Parliament may have.

Now this is a wider question which I should like to place before the House. We have been progressively coming to the conclusion that too much centralization of our activities is not a good thing. Of course, Central control in some matters is a good thing, but too much centralization and departmentalization of our activities is not a good thing. However that may be for our other activities, one thing is quite certain, in my opinion, that science and matters connected with science cannot be or should not be dealt with by the normal governmental routine methods. Art in a sense cannot be dealt with, or should not be dealt with, in that way. There are other subjects too. You cannot have creative impulses dealt with by routine methods. That is why wherever science has grown very considerably—let us say, in the United States of America or in the Soviet Union, two entirely different types of countries with different structures of government—they give the widest latitude, both of them, to their scientific apparatus to grow. Naturally they have checks to see that money is not wasted. But they give them latitude. These institutions do not have to come for sanctions to people who usually have no ghost of an idea of science or that special thing. What happens in the governmental apparatus, normally, is that it is looked at, very competently looked at, but not looked at from the particular scientific or like point of view.

We want science to grow, and I think it is quite essential that we should accept this broad approach to this question, that scientific work should have a certain latitude. Therefore, we have decided that in this particular matter, this should continue to be an autonomous organization....

It may be that if this type of approach is a successful approach, one may even consider enlarging it so that it may cover some of our own State-owned governmental enterprises, because as our work grows, as State-owned governmental enterprises grow, it becomes very difficult for them to grow if there is constant reference back to governmental agencies. However fast they may work there is delay, and delay is the most wasteful thing from every point of view that one can have.

So that we are thinking, more or less, in terms of greater autonomy, whether in the administrative sphere or any other. If I may refer to something that is not perhaps quite relevant, in the administrative sphere, this House knows that many State Govern-

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ments are going in for a great deal of devolution of authority and power to panchayats and the like—which is a very happy sign. That, of course, has no application here. It only represents a certain mental approach of devolution of authority with checks at the right places and not continuous references and the like.

For this reason and many others, we feel that scientific organizations should be treated in this way. In the present Bill, therefore, we have accepted this basis for the Indian Statistical Institute to function as an autonomous organization. But having said that, we hope to put in quite a large number of ways in which Government can see that the work is done according to its wishes. Various checks and counter-checks are provided. But we have definitely and deliberately not put in Government Directors etc., which changes the whole nature of it. I believe there are eminent men in it. The present President of this Institute is Sri C. D. Deshmukh who has been there for some years.

If I may draw attention to some of the principal clauses of this Bill, one is the authority to give degrees and diplomas in Statistics. By some previous Act, it is stated that degrees and diplomas could only be given by Universities. Now this goes slightly outside that scope, but in this particular sphere of Statistics, there can be no doubt at all that this is as competent a body as you can have. Some people have suggested, or may suggest, that these should be given with the approval of Government. Now, I happen to be a humble member of Government, but this proposal that some Secretary or Deputy Secretary should decide who should get the degree or diploma seems to be quite remarkable in a specialized subject.

Therefore, we have stated that they should give degrees and diplomas. As a matter of fact, I believe this Institute has in the last six or seven years trained 8,000 statisticians of various degrees and kinds. It has trained several hundred foreign people who have come for training here—I think 200 and more. So that it follows naturally that it should be authorized to give these degrees and diplomas in these specified subjects with which it deals.

A question has arisen in this connection about the audit of the funds of the Institute. There have been two viewpoints; one was that the Comptroller and Auditor-General should undertake the audit and the other, that it should continue to be done by private auditors. This is an interesting question and much can be said for either side, though, personally, I have for some time past held the opinion that it is better for such institutions—not only this but some other institutions too—that the Comptroller and Auditor-General be not charged with the audit of these institutions.

Not that I doubt the capacity or ability of the Comptroller and Auditor-General, but I doubt the capacity of the governmental methods of audit suiting such institutions because they are meant for governmental types of work.

Perhaps, Hon. Members might remember what Mr. Appleby said about it. One might agree or disagree with Mr. Appleby. Anyhow, in his report he strongly opposed this. He saw everywhere, quite rightly, the spectre of bureaucratic control checking growth. It is partly true and partly may not be true. Anyhow, he specially wrote a section in his report about this because essentially the auditor sees that the amount that has been spent has been spent properly or not. If it has the sanction, well and good. The auditor has nothing more to say and the auditor's function is not to challenge the policies governing it. He has just to see that proper sanctions have been accorded for the money spent.

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The type of scientific work is somewhat different, obviously, from other types of routine office work. It is very difficult to judge of scientific work except by a scientist or a group of scientists. So the problem comes up before us as to how one cannot give full scope for even a scientific organization just to do what it pleases. About the money one must have checks.

The really important thing in this as in other matters is for an audit, if I may use that word, of performance; what has been achieved or what is being done. All our audits are to see that certain sanctions are there and that money is spent according to certain sanctions. That is necessary, of course, for normal governmental work. But what should be even more necessary, even for normal governmental work, is how much has been achieved by the money that has been spent. And, I hope that gradually we shall be able to bring in this test of achievement in all our activities. Of course, it is very difficult to see the achievement in government offices.

The O. & M. Division sometimes considers this matter; how many letters have been received in an office; how many have been disposed; five thousand in a week or whatever the period may be. That is a check, perhaps, but not a very adequate check, because there may be formal letters and there may be very difficult letters.

In the Ministry of External Affairs we may send a letter, let us say, to the Prime Minister of China. That letter may take us weeks to consider how to deal with it, while hundreds and thousands of other letters are passing through, so that the relative importance of these things is not checked by the numerical issue—how many papers have been issued. May be, in the licensing department of the Ministry of Commerce and Industry that might hold good. Therefore, it is desirable to introduce this system of audit or check by performance as far as possible.

In fact, that system could really apply to each individual worker, I think. That is, it should be a check of what is the result of his work, not how many hours he sits in an office or factory, but what is the result. After all, the piece-rate system is one method of doing it. That is not so easy to apply it to an office. Anyhow, even in this Statistical Institute, an attempt has been made to apply to each individual worker this check of work done and giving encouragement to those who show greater promise and greater work.

Therefore, in this Bill it is proposed that the Institute shall appoint—of course, they shall have regular chartered accountants and auditors—

“such auditors as the Central Government may, after consultation with the Comptroller and Auditor-General of India and the Institute, select.”

So, the first thing is that although it is done by so-called private auditors, they will, in fact, be selected by the Central Government in consultation with the Comptroller and Auditor-General. Further,

“The Central Government may issue such directions to the auditors in the performance of their duties as it thinks fit.”

Then, there are various other clauses about the previous approval by the Central Government being obtained before the Institute can alter, extend or abridge any of the

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purpose for which it has been established or amend its memorandum or do various things, sell any property which is acquired from Government funds and so on.

Further—and this is important—

“The Central Government may constitute as many Committees as and when it considers necessary consisting of such number of persons as it thinks fit to appoint thereto and assign to each such Committee all or any of the following duties, namely :—

(a) the preparation and submission to the Central Government as far as possible before the commencement of each financial year, of statements showing the programmes of work agreed to be undertaken by the Institute during that year for which the Central Government may provide funds, as well as general financial estimates in respect of such work; and

(b) the settlement on broad lines of the programme of such work.”

I would particularly invite the attention of the House to this and this ought to be our future approach to those problems elsewhere too.

“The Central Government may constitute a Committee consisting of such number of persons as it thinks fit to appoint thereto for the purpose of—

(a) reviewing the work done by the Institute and the progress made by it ;

(b) inspecting its buildings, equipment and other assets;

(c) evaluating the work done by the Institute; and

(d) advising the Government generally on any matter which in the opinion of the Central Government is of importance in connection with the work of the Institute.”

The House will notice these all-embracing terms, 'in regard to any matter'. This Committee can advise Government, evaluate the work in every possible way and make recommendations to Government. That is what I call an audit of performance or achievement which is far more important—you see what you are getting out of it—than the otherwise technical audit of the money spent which is really the work of normal auditors. I think that this is a greater check and more useful from the point of view of Government or Parliament than those simple audits. The House will notice that all these various things that I have read give very considerable power to Government to deal with any situation that might arise.

I may add that after that committee has reported, the committee on performance, the Central Government will naturally have the right to issue any directions to the Institute which must carry them out. The directions may be broad and may include even the amendment of the memorandum or alteration of priorities of work to be undertaken etc.

Finally, if there is default on the part of the Institute in carrying out the directions of Government, the Central Government may ask it to show cause to the satisfaction of the Central Government for any purpose named and it may even, ultimately, if the cause is not shown to its satisfaction, take direct charge of the whole Institute, and the organization as it exists now will not function then, the Chairman, Members of the Executive Council and all that. Government will take direct charge. Naturally, this is the last and most serious step.

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Thus, we have tried to combine two major things in this, one flexibility and the other non-interference with its work. It can do its work properly and, at the same time, all kinds of subsequent checks will be there to find out whether it has done its work properly, with the ultimate authority to take over completely or for a period. I think it is on the whole a satisfactory compromise between these two different approaches, both of which have certain merit—the approach of autonomy and flexibility and other approach of the Government seeing that public funds are not wasted, and applied in the proper way in carrying out the policies laid down by the Government and ultimately having authority for even taking over this whole institute for a period. I cannot imagine any more stringent provisions. ....

But the main thing is the approach of this House to this Bill and it is that the institution should remain a non-Governmental, autonomous institution. If a decision is arrived at that it must be taken over by the Government and run by the Government, the whole structure of course changes. I find that many people have suggested this kind of thing. I do not think it would be a proper approach because it is a scientific institute, all the time probing into new avenues of thinking and action and all that which are not normally done by the Government offices. Government offices look to precedents and do not probe into the future. Individuals in Government offices may, but I am talking of an institution. I do not want our scientific institutions to get tied up in precedents and all that, but I do want proper checks to see that work is done properly and the money is not wasted. I submit that these are provided for fully here.

The Institute has been publishing annual reports—very full reports for several years. I believe they are all in the Library of Parliament. Apart from them, it publishes a magazine and I think it is a quarterly periodical—*Sankhya*—dealing with statistical matters. It is a high-class paper and it also gives full account of the activities. Hon. Members who wish to keep in touch with these matters can always see these reports. I believe that the last annual report plus a pamphlet giving the history of this institution have been circulated to all the Hon. Members. I need not go into all these details. I can assure the House that as a matter of regular practice these annual reports, accounts, etc., will be placed on the Table of the House and I do not think it is desirable to put a positive clause in the Bill that this must be placed. They have been placed and they will be placed. I, therefore, submit that this Bill is a desirable Bill, meriting not only consideration of this House but passing by it.

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### Appendix 2 : List of Office-Bearers & Members of Committees

*President* : Sri Chintaman D. Dashmukh.

*Vice-Presidents* : Dr. P. N. Banerjee, M.A., D.Sc.; Dr. S. K. Banerji, D.Sc.; Professor S. N. Bose, F.R.S.; Professor D. R. Gadgil, M.A., M.Litt.; Dr. Zakir Hussain, Ph.D.; Professor D. G. Karve, M.A.; Professor K. B. Madhava, M.A., A.I.A.; Sir Shri Ram.

### THE COUNCIL : 1959-60

*Chairman* : Sir D. N. Mitra.

*Vice-Chairmen* : Sri K. P. Goenka; Sri D. N. Mukherjee, M.L.A.; Dr. D. S. Kothari, D.Sc., Ph.D., F.N.I.; Sri S. C. Ray, M.A., B.L.; Professor N. R. Sen, M.A., D.Sc.

*Treasurer* : Dr. Satya Churn Law, M.A., B.L., Ph.D., F.N.I., F.Z.S., M.B.O.U.

*Secretary* : Professor P. C. Mahalanobis, F.R.S., D.Sc.

*Joint Secretaries* : Sri Nihar Chandra Chakravarti, M.A.; Sri Asokananda Das, M.Sc.; Sri Pitambar Pant, M.Sc.

*Members* : Sri S. K. Acharyya, Bar-at-Law; Sri Raghunath Banerjee, I.A.S.; Srimati Chameli Bose, B.Sc. (London); Sri V. M. Dandekar, M.A.; Sri Mohanlal Ganguly, B.Sc. (London); Professor H. C. Ghosh, M.A., F.R.S.; Dr. Q. M. Hussain, M.A., Ph.D.; Sri D. B. Lahiri, M.Sc.; Srimati Nirmal Kumari Mahalanobis; Sri P. C. Mathew, I.C.S., Sri N. T. Mathew, M.A., M.Sc.; Sri Asok Mitra, I.C.S.; Sri Samar Mitra, M.Sc.; Sri Moni Mohan Mukherjee, M.A.; Dr. C. R. Rao, M.A., Ph.D.; Sri Vishnu Sahay, I.C.S.; Dr. N. Sundararama Sastry, M.A., M.Sc., Ph.D. (London); Sri S. C. Sen, B.A. (Cantab); Sri Sadasiv Sengupta, B.Sc. (London) M.Sc. (Dacca); Sri Satis Chandra Sen, M.A., LL.B.; Sri S. P. Sinha, I.A.S.

### GOVERNING BODY OF THE RESEARCH AND TRAINING SCHOOL : 1959-60

Sir D. N. Mitra, *Chairman (ex-officio)*; Professor P. C. Mahalanobis, *Director-Secretary (ex-officio)*; Sri Baliram Bhagat, *Union Deputy Minister*; Sri Vishnu Sahay, I.C.S., *Secretary to the Cabinet, Government of India*; Dr. N. S. R. Sastry, M.A., M.Sc., Ph.D. (*Reserve Bank of India*); Dr. B. N. Prasad, *Head, Mathematics Department, Allahabad University; (National Institute of Sciences of India)* Dr. U. S. Nair, M.A., Ph.D., F.N.I. (*Inter University Board*); Mr. George Barrell, *Managing Editor, Capital (Private) Ltd. (Associated Chambers of Commerce of India)*; Sri G. Basu, B.A., F.C.A., F.S.A.A., F.C.I.S., F.I.C., W.A., M.L.C., J.P. (*Federation of Indian Chambers of Commerce and Industry*); Professor S. N. Sen, M.A., Ph.D. (*Indian Economic Association*); Dr. S. K. Banerjee, D.Sc.; Professor S. N. Bose, F.R.S., D.Sc.; Sri Nihar Chandra Chakravarti, M.A.; Sri K. B. Madhava, M.A., A.I.A., F.N.I.; Sri Pitambar Pant, M.Sc.; Dr. C. R. Rao, M.A., M.Sc., Ph.D. (Cantab); Sir Shri Ram (*Council of the Indian Statistical Institute*).

### COMMITTEE OF THE GOVERNING BODY

-r D. N. Mitra (*ex-officio*); Professor P. C. Mahalanobis (*ex-officio*); Sri N. C. Chakravarti; Mr. G. Barrell; Dr. N. S. R. Sastry; Sri Vishnu Sahay, I.C.S.; Sri A. C. Bose.



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COMMITTEES OF THE COUNCIL

FINANCE COMMITTEE

Sri Snehangahu Acharyya; Sri A. Das; Dr. S. C. Law, Treasurer (*ex-officio*); Professor P. C. Mahalanobis, Honorary Secretary (*ex-officio*); Sir D. N. Mitra, Chairman (*ex-officio*); Sri D. N. Mukherjee; Sri S. C. Ray; Sri Vishnu Sahay or his representative; Sri S. C. Sen; Sri S. P. Sinha, and Sri N. C. Chakravarti, Joint Secretary (*Member-Secretary*).

EXAMINATIONS COMMITTEE

Dr. N. S. R. Sastry (representative of the Governing Body); Sm. C. Bose; Sri N. C. Chakravarti; Sri V. M. Dandekar; Sri M. Ganguli; Sri N. C. Ghosh; Sri D. Y. Lele; Professor K. B. Madhava; Professor P. C. Mahalanobis; Sri N. T. Mathew; Sri P. C. Mathew, Director, Central Statistical Organization; Sri M. Mukherjee; Sri Pitambar Pant; Dr. C. R. Rao; Dr. J. Roy; Dr. S. N. Sen (representative of the Governing Body); Sri J. M. Sen Gupta; Sri Sadasiv Sen Gupta; Sri M. A. Telang, and Sri S. Raja Rao (*Member-Secretary*).

JOURNAL COMMITTEE

Dr. R. R. Bahadur; Dr. D. Basu; Professor S. N. Bose; Dr. V. S. Huzurbazar, Professor of Statistics, Poona University; Sri D. B. Lahiri; Professor K. B. Madhava; Professor P. C. Mahalanobis, Editor, *Sankhyā* (*ex-officio*); Sri N. T. Mathew; Sri P. C. Mathew, Director, Central Statistical Organization; Sri M. Mukherjee; Dr. B. N. Prasad, Representative of the Governing Body of the Research and Training School; Dr. C. R. Rao; Sri G. Basu, Representative of the Governing Body of the Research and Training School; Dr. G. R. Seth, ICAR, and Sri A. Mahalanobis (*Member-Secretary*).

JOINT AD HOC COMMITTEE FOR ALLOCATION OF EXPENDITURE

Professor P. C. Mahalanobis, Sri. N. C. Chakravarti, Dr. C. R. Rao, Sri Vishnu Sahay and Professor K. B. Madhava.

BOMBAY BRANCH

*President*: Dr. Jivraj N. Mehta.

*Vice-Presidents*: Dr. N. S. R. Sastry; Sri G. R. Saraiya; Sri M. G. Kotibhaaskar; Dr. C. Nanjundiah.

*Secretary*: Sri M. A. Telang.

*Joint Secretary*: Sri V. V. Divatia.

*Treasurer*: Dr. D. T. Lakdawala.

*Members of the Executive Council*: Dr. R. L. N. Iyengar; Professor M. C. Chakrabarti; Sri T. P. Venkatasahari; Sri P. K. Bhaumik; Dr. V. N. Patankar; Dr. S. A. Palekar; Professor V. B. Kamat.

MYSORE STATE BRANCH

*President*: Sri A. Ananthpadmanabha Rau.

*Vice-President*: Sri R. Ramaswami.

*Secretary*: Sri Srinagabhusana.

*Joint Secretary*: Sri S. M. Sundara Raju.

*Treasurer*: Sri M. C. Satyanarayana.

*Members of the Executive Committee*: Sarbasri S. K. Ekambaram; R. Natarajan; H. S. Narayana Rao; Ravi L. Kirloskar; C. A. Setty; N. S. Srinivasan.

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### Appendix 3 : Visitors to the Institute

The following visitors and visiting professors came to the Institute during April 1959-March 1960. The dates and duration of visits are noted against their names which are given alphabetically.

#### *Afghanistan*

BAYAT, Director, Statistics Department, Ministry of Commerce.

HASSANEIN, Senior Economic Adviser.

YUSUFZAI, Director-General, Research & Statistics Department, Ministry of Planning.

The above were members of a Government delegation from Afghanistan. 9 June.

#### *Africa*

BINGOET, A., Chief of Division, Botanical Physiology, Yangambi, Belgian Congo. 15 July.

#### *Australia*

McFARLANE, B. J., Lecturer, Faculty of Economics, University of Sydney. December 1959-February 1960.

#### *Cuba*

ARQUIN, JOSE (LT.); FERNANDEZ, OMAR (CAPTAIN); GAROLA, FRANCISCO (LT.); GUEVARA, ERNESTO (COMMANDER), Union Head of Cuba; RABILERO, ARMANDO, *Prensa Latina*, (*Latin American Press Agency*).

The above were members of a Government delegation from Cuba. 10 July.

#### *Czechoslovakia*

BERNASKOVA, ALENA, Member, Cultural Committee, Laureate of State Prizes; CERMAK, JOSEPH, Member, Board of National Assembly and Budget and Economic Committee, National Assembly, also Chief of Production Enterprise; V. I. LENIN (former Skoda Works); DANIS, JAN, Member, Council of Deputies, Constitutional Committee, National Assembly; KALECKA, ANTONIN, Academician, Laureate of State Prizes; President, Academy of Agricultural Sciences; member, Agricultural Committee, National Assembly; KURIN, MIROSLAV, Secretary of Parliament and Secretary of Delegation; OTRADOVEC, ANTONIN, Chief of Trade Union, Ministry of General Machinery; SAFARIK, JOSEPH, Deputy Chairman, Cultural Committee, National Assembly; TONHAUSER, PAVEL, Chief Secretary, Regional Committee of Communist Party, Banska-Byarica Slovak; VACHA, ZDENEK, Chief, I Section, Office of National Assembly and Secretary of Delegation; ZAVODNY, FRANTISEK, Doctor of Delegation.

The above members of a parliamentary delegation from Czechoslovakia visited the Institute on 12 January 1960 accompanied by Sri P. K. PATNAIK, Deputy Secretary, Lok Sabha.

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*Denmark*

WOHLERT, VILHELM, educational architect, Copenhagen; Ford Foundation adviser to Government of India. 17 March.

*Finland*

TORNQUIST, LEON, Professor of Statistics, University of Helsinki; accompanied by Mrs. TORNQUIST. 21-24 January.

*France*

AMADO, PIERRE, Director, Centre Cultural Français, Calcutta. 11 April.

PIROCHE, PIERRE, tourist. 7 July.

VAILLANT-COUTURIER, MARIE-CLAUDE, Vice President, Women's International Democratic Federation; former Vice President, French Parliament. 11 February.

*Germany (Democratic Republic)*

BENCKE, OTTO, M. P.

HENNECKE, ADOLF, M.P.

NEUMANN, ANNI

WOLFF, FRITZ, M.P., Deputy Mayor, Berlin;

members of a parliamentary delegation from the German Democratic Republic accompanied by

VOELKER, D., Deputy Trade Representative in India. 25 April.

*Germany (Federal Republic)*

TAUBE, HANS, Consul-General in India. 11 September.

THAUER, R., Director, William C. Kerchoff Herzforschung Institute of Max-Planck-Gesellschaft. 20 January.

*Ghana*

QUARTRY, J. A. K., Lecturer in Chemistry, University College, Ghana. 1-7 February.

*India*

AHMED, RAIS, Aligarh University

DE, Dr., Pure Chemistry Department, Calcutta University

LYNGAR, M. S., Central Fuel Research Institute

MOHSIN, S. N., Regional Research Laboratory, Hyderabad

MITRA, Dr., Applied Chemistry Department, Calcutta University

RAHMAN, A., Central Building Research Institute

RAO, Y. H., Defence Department, Kanpur

RAMAN, M. R., Defence Department, Kanpur

ROY, D. K. Dr., Institute of Biochemistry & Experimental Medicine

SINGH, BALDEV, Regional Research Laboratory, Hyderabad

VARMA, D. V., Defence Department, Kanpur.

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The above were members of the Central Executive Committee of the Association of Scientific Workers. *11 August.*

- ABRAHAM, T. P., Indian Council of Agricultural Research. *18 December.*
- ALI, SALIM, Padmabhusan, Bombay Natural History Society. *3-4 April.*
- BALAGOPAL, M., Madras Government Cinchona Department. *21 December.*
- BANERJI, PARITOSH, Professor of Economics, Lucknow University. *30 January.*
- BASAK, N., Brahmananda Keshav Chandra College, Baranagar. *28 January.*
- BOSE, A. M., Assistant Director of Industries, West Bengal. *20 August.*
- BOSE, D. M., Deputy Director of Industries, West Bengal. *20 August.*
- CHATTERJI, U., Joint Director of Industries, West Bengal. *20 August.*
- DASGUPTA, S. N., Assistant Director (Publications), Government of India. *16 December.*
- DILWALI, P. N., Power Samas Accounting Machines. *4 April.*
- DURUSWAMY, K., Madras Government Cinchona Department. *21 December.*
- GUHA, BANDKANTA, Tata-Steel Corporation of Bengal. *7 July.*
- GUHA, S., Deputy Director, Small Industries Service Institute, Calcutta. *17 March.*
- GUPTA, K. L., Secretary, Central Office, Life Insurance Corporation of India, Bombay. *10 March.*
- HAZRA, A. K., Assistant Director, Haffkine Institute, Bombay. *3 February.*
- KADAM, V. B., Economics Department, Reserve Bank of India, Bombay. *18 March.*
- KHUSRO, A. M., Professor of Economic Development, Delhi School of Economics. *3-7 October.*
- MAJUMDAR, S. K., Principal, Brahmananda Keshav Chandra College, Baranagar. *28 February.*
- MUKHERJEE, J. B., Defence Research Laboratory, Government of India. *3 February.*
- PADMANABHAN, C. V., Director, Central Coir Research Institute. *18 January.*
- PAUL, M. L., Deputy Director (Industries) Small-Scale, West Bengal. *16 December.*
- RAGNEKAR, S. B., Professor of Economics, Punjab University, Chandigarh. *5 March.*
- RAMA, S., Manager, International Computers and Tabulators (I) Ltd. *14 January.*
- RANADIVE, S. T., actuary, Life Insurance Corporation, Bombay. *10 March.*
- RANGACHARI, S., Professor, Annamalai University. *1-2 October.*
- RAO, GOPAL N., Delhi School of Economics. *3-10 October.*
- RAO, M. MOHAN, Madras Government Cinchona Department. *21 December.*
- RAO, RAJA, Under Secretary, Central Cabinet Secretariat. *29 May.*
- REDDY, M. Y., Delhi School of Economics. *3-10 October.*
- SAXENA, J. S., Ministry of Food & Agriculture, Government of India. *4 April.*
- SEN, N. N., S. S. Karnani Memorial Hospital, Calcutta. *3 March.*
- SHAW, MAUREK, Sales Manager, India Cables Ltd. *2 November.*
- SINGH, B. N., Principal Scientific Officer (Air), Ministry of Defence. *23 December.*
- VAHNI, D. C., Department of Statistics, Gujarat University, Ahmedabad. *28 January.*

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*Japan*

ARAI, T., Chief, Sector for Industrial Statistics, Ministry of Industry & Trade, and member, delegation of Small Industries to India. 20 August.

HACHIYA, KINTARO, research staff, Institute of Asian Economic Affairs. 22 February.

KISHI, KOICHI, Chief, Library Services Division, Institute of Asian Economic Affairs. 7 January.

NAOYAMA, SADANORI, research staff, Institute of Asian Economic Affairs. 19-20 February.

ROYAMA, MASAMICHI, member, Constitution Investigation Commission, Government of Japan. 4 March.

SUENIRO, K., Vico-Consul for Japan in India. 20 August.

SUKEGAWA, HIROSHI, research staff, Institute of Asian Economic Affairs. 19-20 February.

YOSHINOBUKE, JIN, Director, Japanese Management Association; International House of Japan. 10-14 April.

YOSHIOE, SATORU, Deputy Director, Planning Bureau Government of Japan; International House of Japan. 10-14 April.

*Netherlands*

RUDOLPHY, J. E., representative of *Jan de Poortier* (Dutch firm), 7 September.

*Pakistan*

HENEMIER, S., Statistical Adviser, Pakistan I.C.A. 16 October.

*Singapore*

PUTHUCHERY, JAMES, Manager, Singapore Industrial and Commercial Board. 16 December.

*Sudan*

AHMED, SYED, University of Khartoum. 5 June.

*Thailand*

SNIDVONGONS, P., mathematician

LOWCHINDA, CHINTANA

TAN BUNYEN, SNOH, Chairman, Department of Mathematics, Chulalongkorn University, Bangkok. 1-3 February.

*United Kingdom*

ARNO, J., Chief, Ferranti Computer Laboratory. 2 November.

CHAPLIN, J. H., Air Commodore, D.S.O., D.F.C., Imperial Defence College, London. 10 September.

COALEN, JOHN F., Department of Engineering, University of Cambridge; accompanied by MRS. COALEN. 22-23 January.

COOPER, F. W., Education Officer, Institute of Production Engineers. 14 January.

GLASS, RUTH, University College, London. 10 April.

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- LAWSON, C. O., Senior Assistant Secretary, Colonial Service, Imperial Defence College, London. 10 September.
- POUT, H. W., Senior Principal Scientific Officer, British Admiralty, Imperial Defence College, London. 10 September.

### *United States of America*

- AMES, KENNETH, Foreign Correspondent in India, *Business Week*. 10 December.
- BARRON, EDWIN S., U.S. Department of State. 14 December.
- BERKOWITZ, MONROE, Associate Professor of Economics, Rutgers University. 10 October.
- BOUGE, DONALD J., University of Chicago. 26 June.
- CALHOUN, EVERETT S., Senior Industrial Economist, Stanford Research Institute, Marketing Consultant and Development Commissioner (S.S.I.), Ministry of Commerce & Industry, Government of India. 23 July.
- CHEN, KUAN I., Fairleigh Dickenson University, Teaneck, New Jersey. 9 July.
- CHENIAK, EDWARD, Assistant Director of Admissions, Wayne State University. 14 August.
- COLM, PETER, U.S. State Department. 11 April.
- COWLES, JOHN T., Professor of Psychology & Associate Director, Office of Educational Research, University of Pittsburgh. 14 August.
- DOBZHANSKY, T., Professor, Department of Zoology, Columbia University, New York. 9-15 February.
- DRAGOSITZ, ANNA, Director, Evaluation & Advisory Service, Education Testing Service, Princeton, New Jersey. 14 August.
- FATEMI, N. S., Fairleigh Dickenson University, Teaneck, New Jersey; accompanied by Mrs. S. H. S. FATEMI. 9 July.
- FULLER, KENNETH C., U.S. State Department. 20 October.
- GHURVY, S. G., Northwestern University, Evanston. 27-31 August.
- HOLLISTER, WILLIAM W., U.S. Department of State. 14 December.
- KEMPFER, HOMER, Adviser in Adult Education, National Fundamental Education Centre, Ministry of Education, Government of India. 27 August.
- KENT, SHERMAN, Staff member, National Security Council. 1 December.
- KIRK, ALICE J., Dean, School of Home Economics, Stout State College, Wisconsin, technical consultant to Viharilal College of Home & Social Sciences under T.C.M. 21 October.
- MACKENZIE, KENNETH M., Fairleigh Dickenson University, Teaneck, New Jersey. 9 July.
- MILLER, WAYNE S., U.S. State Department. 20 October.
- PARK, RICHARD L., Professor, University of California. 23 June.
- PATTY, PAT, U.S. Vice Consul in India. 1 December.
- RUFFNER, RALPH W., Chief Education Adviser, U.S. Technical Cooperation Mission to India. 18 April.
- ROY, ROSTOM, Professor of Geochemistry, Pennsylvania State University. 24 September.
- SCHATTMAN, M., lawyer; accompanied by Mrs. SCHATTMAN. 12 February.

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- SCHULER, EDGAR A., Michigan State University; working with East Pakistan Academy for Village Development Committee. 23 December.
- SLATS, HERMAN M., Professor, Argonne National Laboratory, Illinois and Associate Editor, *American Journal of Human Genetics*. 30 October.
- SPIELMAN, HENRY, Officer-in-charge, Economic Affairs for South Asia, U.S. State Department. 16 November.
- WALKER, HELEN M., Fulbright lecturer, International Christian University and Tokyo University; Professor Emeritus, Teachers College, Columbia University, New York. 2 January.
- WEEMS, CLARENCE NORWOOD, Fairleigh Dickinson University, Teanock, New Jersey. 9 July.

*Union of Soviet Socialist Republic*

- CHRELYNSHEV, E. P., Philologist, delegate to Afro-Asian Solidarity Conference. 1-6 April.
- DOBROKHOTOV, Assistant Minister of Agriculture. 12 February.
- ERSHOV, YURI, Ministry of Foreign Trade. 23 November.
- KARAKULOV, Professor, Head, Department of Epidemiology, Kazakh State Medical Institute; Corresponding Member, Academy of Sciences, Kazakh S.S.R., member of delegation from Soviet-Indian Cultural Society. 9 December.
- KARY-NIVAZOV, T. N., Academician, mathematician, history of sciences, Uzbek SSR Academy of Sciences. 13 January.
- KHORAVA, A. A., Peoples' Artist, delegate to Afro-Asian Solidarity Conference. 1-6 April.
- KLECHKOVSKY, Moscow Agricultural Academy. 12 February.
- KONOFLEV, V. V., senior engineer, Scientific Research Institute of Computing Machinery, Moscow. 16 January.
- KRIPALOVA, Secretary, delegation to Afro-Asian Solidarity Conference. 1-6 April.
- LANSCHIKOVA, O. P., engineer-interpreter, Scientific Research Institute of Computing Machinery, Moscow. 16 January.
- LEBEDEV, S. A., Academician, Director, Institute of Computing Techniques, Moscow. 13 January.
- LONDAREV, V. V., Vice-Consul in India. 16 September.
- MALOV, A. F., Indologist, scientific worker, Institute of Oriental Studies. 13 January.
- MOROZOV, U.S., research worker, Moscow University. 16 September.
- NEPENOV, D. N., Minister for Public Health, Turkmen Republic; delegate to Afro-Asian Solidarity Conference. 1-6 April.
- ORLOV, P. S., senior engineer, Scientific Research Institute of Computing Machinery, Moscow. 16 January-5 April.
- PETROVA, T. N., Foreign Department, USSR Academy of Sciences. 13 January.
- SEREBNYAKOV, First Secretary, USSR Embassy in New Delhi. 9 December.
- SDASSYIK, GALINA, economic geographer and research worker, Moscow University. 16 September & 8-15 October.

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- SHERBAKOV, D. I., Academician, Head, USSR Geological Survey. *13 January.*
- SINEV, V. T., economist, Trade Representative of USSR in India. *8 March.*
- TROPHIMOVA, Ministry of Agriculture. *12 February.*
- TATSIN, N. V., agro-botanist; Director, Main Botanical Gardens, USSR Academy of Sciences; President, Soviet-Indian Cultural Society. *9 December..*
- ULYANOVSKI, R. A., Indologist, Deputy Director, Institute of Oriental Studies. *13 January.*
- VLADIMIRSKY, L., economist, Trade Representative of USSR in India. *8 March.*
- YERSHOVA, Interpreter, delegation from Soviet-Indian Cultural Society. *9 December.*

### *Yugoslavia*

- MARTONOVIC, PETAR, Scientific Adviser, Institute of Nuclear Sciences ("Boris Kidric" Institute), Belgrade; Corresponding Member, Yugoslav Academy of Sciences. *20-25 January.*
- KVEDER, MRS., wife of Yugoslav Ambassador to India.
- OSOLNIK, MAHJAN, expert in Asian affairs.
- POPOVIC, MILENTIJE, Union Minister of Yugoslavia; member, Federal Executive Council; Chairman, Yugoslav Planning Committee.
- VILFAN, MARJKA, leader of Socialist Alliance.

The above four visitors were members of a goodwill delegation from Yugoslavia. *17 November.*

### *Colombo Plan Bureau*

- THOMPSON, J. K., Director, Colombo Plan Bureau. *15-18 March 1960.*

### *Food & Agriculture Organisation*

- ERUS, N. D., Statistician, Chief of Production & Means Sections; member, FAO fertiliser study team in South-East Asia. *30 September.*

### *United Nations*

- FRITCH, RUDOLPH, Deputy Director, UNESCO, South-Asia Science Co-operation Office, New Delhi. *14 November.*
- KEEN, JAMES, UNTAA representative, New Delhi. *17 April.*
- KITAMURA, HUROSHI, Chief, Economic Development Branch, UN-ECAFE Secretariat, Bangkok, Professor of Economics, Tokyo Metropolitan University. *23 May.*
- MARSHALL, T. H., Director, Department of Social Sciences, UNESCO. *10 November.*
- MEAD, ELSIE, staff-member, U.N. Statistical Office. *8-14 February.*
- ORLOFF, C., UNESCO Technical Assistance Mission assignment with Indian Institute of Technology. *10-23 November.*
- RAO, SUBBA, economist, U.N., headquarters. *16-19 September.*
- SCHUBERT, H., Assistant Trade Representative UNTAB, New Delhi. *9 December.*
- WALTERS, DOROTHY, U.N. expert in National Income Statistics in Malaya, Short-term lecturer in ISEC. *24 October-8 November.*



**Appendix 4: Professor Mahalanobis' Tours Abroad (23 April—28 June 1959)**

*Moscow* (24 April-24 May 1959) : Professor P. C. Mahalanobis, accompanied by Mrs. Mahalanobis, left for Moscow on 23 April 1959, and stayed there for one month as guests of the USSR Academy of Sciences. On 24 April, he had discussions with Academician A. N. Nesmeyanov, President of the USSR Academy of Sciences, and other Academicians in the morning and in the Institute of World Economy in the afternoon; the next day there were discussions in the Central Statistical Board with Professors V. N. Starovskii, Director, and Deputy Directors Malyshev and A. I. Ezhov. During the next few days there were discussions in the GKES. (State Commission for Economic Aid), the President of the Academy of Sciences, and in the Institute of Oriental Studies on problems on Indian planning. Professor Mahalanobis delivered a lecture on "Problems of Underdeveloped Countries" at the Institute of World Economy on 27 April and a lecture on Rabindranath Tagore at the Institute of Oriental Studies on 5 May 1959 followed by a group discussion; opened the next day a discussion in the Institute of World Economy on "The Use of Interpenetrating Net-work of Samples" for the study of errors in censuses and surveys.

On 7 May 1959 Professor Mahalanobis had an interview with H. E. Mr. Khrushchov which lasted for two and half hours. The discussion covered possibilities of strengthening scientific and economic collaboration between USSR and India. Another question discussed was the organization of meetings and conferences with participants from different countries, at a technical and non-governmental level, to consider problems of economic development of the less advanced countries; H. E. Mr. Khrushchov showed much interest in this matter.

In the evening, at a meeting held on the occasion of Rabindranath Tagore's birth anniversary in the Library of Foreign Languages, Mrs. Mahalanobis gave a talk on her reminiscences of Tagore, and Professor gave a short speech. Professor Mahalanobis visited the Institute of Metallurgy with Academician Bardin, Vice-President of the USSR Academy of Sciences, on 7 May, the Nuclear Physics Institute at Dubna on 8 May, had discussions in the Trade Union of the Scientific and Educational workers on 11 May and in the Institute of Iron & Steel Metallurgy on 12 May, and further discussions in the GKES on 13 May, and in the Institute of Electronic Control Equipment and with Dr. Bruk and his colleagues on 14 May. He had discussions with Dr. Yu V. Linnik and Professor Prohorov of Moscow University on "Theoretical Problems connected with Fractile Graphical Analysis" on 9 May.

On 11 May there was a brief ceremony in the Academy of Sciences when Academician A. N. Nesmeyanov conferred on Professor Mahalanobis the title of Foreign Member of the USSR Academy of Sciences.

Professor Mahalanobis attended with the Indian delegation, headed by Sri Swaran Singh, Minister of Steel and Fuel, the discussion on Soviet economic aid to India in the GKES. on 15 May 1959; had further discussions at the Institute of Oriental Studies and the Institute of World Economy on 16 and 20 May, visited the Botanical Gardens on 20 and 22 May, and had discussions with the Director, Academician Tsitsin; on 19 May gave a lecture on sample surveys, which was followed by discussion, at a meeting of the Sample Survey Methodological Committee of the Central Statistical Board with Academician Ryabushkin in the chair.

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On 20 May 1959 Professor Mahalanobis went as a member of a delegation of the World Federation of Scientific Workers for an interview with H. E. Mr. Khrushchov. On 23 May 1959 Professor Mahalanobis had an interview with H. E. Mr. A. N. Kosygin, Vice-Premier and Chairman of the State Planning Commission (GOSPLAN) at which H.E. Sri K. P. S. Menon, Indian Ambassador of India was present.

In the USSR, in course of lectures and discussions possibilities were explored of strengthening scientific, cultural, and economic collaboration between the USSR and India. There were discussions on international meetings, at a technical and non-governmental level, on economic development with Professor J. K. Galbraith of the Harvard University and Professor Lloyd G. Reynolds of the Yale University, U.S.A., who happened to be in Moscow at that time.

*Warsaw (24-27 May)*: Professor Mahalanobis had discussions with Dr. Oskar Lange on the same day; and with Professor Michael Kalecki and others in the Planning Commission on 25 May; gave a lecture on fractile graphical analysis at the University of Warsaw and had discussions in the Economic Faculty on 26 May.

*Zurich (27-28 May)*: The party reached Zurich on 27 May and Geneva the same evening. Professor Mahalanobis gave a lecture on fractile graphical analysis in the Faculty of Mathematics at the Federal Technological University of Zurich which was followed by discussions.

*Paris (28-30 May)*: On 29 May Professor Mahalanobis delivered a lecture on "Problems of Industrialization in Underdeveloped Countries" at the new Institute of Development Economy which was followed by discussions; and opened group discussions on long-term planning in the Economic Affairs Section of the Ministry of Finance on 30 May.

*Cambridge (1-6 June)*: There were a series of discussions on Indian planning and problems of economic development in which Messrs. Austin Robinson, J. R. N. Stone, Richard Kahn, N. Kaldor, J. B. Reddaway, S. Adler, Milton Gilbert, Amartya Sen, and other economists participated. Professor Mahalanobis also had discussions with Mr. E. M. Foster, Dr. and Mrs. P. A. M. Dirac, Sir James Grey, Professor and Mrs. Joseph Needham, Dr. J. S. Kendrew and other friends, and spoke at an evening meeting of Indian students.

On 3 June 1959 Professor Mahalanobis was inducted into the Honorary Fellowship of King's College at Cambridge in the College Chapel and was the chief guest at the Hall Dinner.

*London (30-31 May)*: (6-15 June): Professor Mahalanobis made a short speech at the Rabindra Jayanti meeting on 7 June; gave a lecture on Fractile Graphical Analysis at a seminar in Birkbeck College on 8 June which was attended by, among others, Messrs E. S. Pearson, M. G. Kendall, G. A. Barnard, David Cox and other statisticians, and a lecture on Perspective Planning at the India Society on 11 June.

He also had a series of discussions regarding the organization of international studies and conferences, at a technical and non-governmental level, with a large number of persons among whom may be mentioned the Hon'ble Mr. Heathcoat Amory, M.P. (Chancellor of the Exchequer), Sir Harry Campion, Mr. R. G. H. Crossman, M.P., Dr. & Mrs. D. V. Glass, Sir Robert Hall (Economic Adviser), the Rt. Hon'ble John Strachey and the Rt. Hon'ble Harold Wilson, M.P., and also with Professor J. K. Galbraith, Mr. and Mrs. Leon Keyserling of the USA and Dr. Gunnar Myrdal of Sweden who were in London at that time. He also had discussions with Professor P. M. S. Blackett, Professor P. B. Medawar, Professor

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J. D. Bernal, Dr. Frank Yates, Professor J. Rotblat, Dr. G. A. Barnard and other British scientists and with Dr. A. T. A. Learmonth who came from Liverpool to see him.

*The Hague* (16-18 June): Professor Mahalanobis had discussions with Dr. Jan Tinbergen, Dr. E. Lunenberg and others, and visited Dr. and Mrs. Burno Mendel in Bussum.

*Moscow* (18-27 June): There were further discussions at the Institute of World Economy and the Academy of Sciences regarding the proposed international conference on economic development; and visits to the Exhibition of the Seven-Year Plan, the Institute of Electronic Control Equipment, the Trade Union of Educational and Scientific Workers, and the Central Statistical Board. Professor and Mrs. Mahalanobis left Moscow on 27 June 1959 and arrived in New Delhi the next day.

**Appendix 5 : List of Research Papers, Reports and Scientific Lectures**

RESEARCH AND TRAINING SCHOOL

5.1 PUBLISHED PAPERS

A. *Theoretical Statistics*

- P1 BAHADUR, R. R. (1960): Some Approximations to the Binomial Distribution Function. *Ann. Math. Stat.*, pp. 43-54.
- P2 ——— (1960): Simultaneous Comparison of the Optimum and Sign Tests of a Normal Mean. *Contributions to Probability and Statistics—Essays in Honor of H. Hotelling*. Stanford University Press, pp. 79-88.
- P3 ——— (1960): Stochastic Comparison of Tests. *Ann. Math. Stat.*, pp. 276-295.
- P4 ——— (1960): On the Asymptotic Efficiency of Tests and Estimates. *Sankhyā*, 22, 229-252.
- P5 BASU, D. (1959): The Family of Ancillary Statistics. *Sankhyā*, 21, 247.
- P6 CHAKRAVARTI, I. M. (with Roy, J.) (1960): Estimating the Mean of a Finite Population. *Ann. Math. Stat.*, 31, 392-398.
- P7 HALDANE, J. B. S. (1959): The Analysis of Heterogeneity. *Sankhyā*, 21, 209-216.
- P8 ——— (1960): The Addition of Random Vectors. *Sankhyā*, 22, 213-220.
- P9 JOHN, S. (1960): On Some Classification Statistics. *Sankhyā*, 22, 300-316.
- P10 ——— (1960): On Some Classification Problems. *Sankhyā*, 22, 301-306.
- P11 ——— (1959): The Distribution of Wald's Classification Statistics, When the Variance-Covariance Matrix is Known. *Sankhyā*, 21, 371-376.
- P12 ——— (1959): On the Evaluation of the Probability Integral of the Multivariate Normal Distribution. *Sankhyā*, 21, 367-370.
- P13 MAHALANOBIS, P. C. (1960): A Method of Fractile Graphical Analysis. *Econometrica*, 28,
- P14 MITRA, SUJIT KUMAR (1959): Some Remarks on the Missing Plot Analysis. *Sankhyā* 21, 337-344.

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- P15 MITRA, SUJIT KUMAR (1960): On the  $F$ -test in the Intra-Block Analysis of a Balanced Incomplete Block Design. *Sankhyā*, 22, 230-284.
- P16 ——— (1960) (with E. L. Diamond and S. N. Roy): Asymptotic Power and Asymptotic Independence in the Statistical Analysis of Categorical Data. Bulletin of the International Statistical Institute, Vol. XXXVII, 1960.
- P17 RAO, C. R. (1959): Expected Values of Mean Squares in the Analysis of Incomplete Block Experiments and Some Comments Based on Them. *Sankhyā*, 21, 327-336.
- P18 ——— (1960): Multivariate Analysis: An Indispensable Statistical Aid in Applied Research. (*Proc. 47th Session of Indian Science Congress, Presidential Address*. Also reprinted in *Sankhyā*, 22, 317-338.)
- P19 ———, (1960): Experimental Designs with Restricted Randomization. *Bull. de l'Inst. Int. de Stat.*, (1960), 397-404.
- P20 RANGA RAO, R. (with Varadarajan, V. S. (1960): A Limit Theorem for Densities. *Sankhyā*, 22, 261-266.
- P21 ROY, J. (1960): Tests for Independence and Symmetry in Multivariate Normal Populations. *Sankhyā*, 22, 267-278.
- P22 ——— (1960): Non-null Distribution of the Likelihood-ratio in Analysis of Dispersion. *Sankhyā*, 22, 289-294.
- (P6) ——— (with Chakravarti, I. M.) (1960): Estimating the Mean of a Finite Population. *Ann. Math. Stat.*, 31, 392-398.
- P23 SETHURAMAN, J. and SUKHATME, B. V. (1959): Joint Asymptotic Distribution of  $U$ -Statistics and Order Statistics. *Sankhyā*, 21, 280-298.
- (P20) VARADARAJAN, V. S. (with Ranga Rao, R.) (1960): A Limit Theorem for Densities. *Sankhyā*, 22, 261-266.

B. Biometry

- P24 DAS, B. C. (1959): Comparative Effects of Vitamin B<sub>12</sub> Cobalt Nitrate and Ruminant Stomach Extract on the Survival Rate of Indian Carp During the First Three Weeks of Life. *Indian Journal of Fisheries*, 6, 211-221.
- P25 ——— (with Krishnamurthy, H.) (1959): Comparative Effects of Yeast, Vitamin B Complex, and Vitamin B<sub>12</sub> on the Survival Rate of Indian Minor Carp During the First Two Weeks of Life. *Proc. National Institute of Sciences of India*, 25, Part B, 300-306.
- P26 ——— (1960): Effectiveness of Yeast, Vitamin B<sub>12</sub> and Alternative Treatments on Survival of Indian Carp During the Early Period of Life. *Canadian Journal of Biochemistry and Physiology*, 38.
- P27 ——— (1960): An Investigation of the Relationship Between Diastolic and Systolic Blood Pressure, Age, Weight, and Serum Cholesterol in Adult Male Bengalis. *Clinical Science*, 19, 430-448.
- P28 DAVIS, T. A. (1960): Clonal Propagation in Coconuts. *Current Science*, 29, 273.
- P29 ——— (1960): Aerial Layering in *Areca Catechu*. *Areca Nut Journal*, 11, 9-11.

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- P30 HALDANE, J. B. S. (1959) : The Non-violent Scientific Study of Birds. *Jr. Bom. Nat. Hist. Soc.*, 56, 375-386.
- P31 ——— (1959) : Suggestions for Research on Coconuts. *Ind. Coconut Jr.*, 12, 1-9.
- P32 ——— (1959) : The Scope of Biological Statistics. *Sankhyā*, 20, 195-206.
- P33 ——— (1960) : Genetics in Relation to Medicine. *Proceedings of the Academy of Medical Sciences, Andhra Pradesh*, 1, no. 4, 216-241.
- P34 ——— (1960) : Suggestions for Research on Human Physiology in India. *The Medico*, J. Gandhi Medical College, Hyderabad, 1-4.
- P35 ——— (1960) : The Interpretation of Carter's Results on Induction of Recessive Lethals in Mice. *J. Genet.*, 57, no. 1, 131-136.
- P36 JAIN, S. L. (1959) : Some Observations on Monogenetic Trematodes of Indian Fresh Water Fishes. *Current Science*, 28, 332-333.
- P37 ——— (1959) : New Dactylogyrid Parasites from the Gill Filaments of Cyprinid Fishes from India. *Zeitschrift für Parasitenkunde*, Berlin. 19. 432-441.
- P38 ——— (1959) : Neosprostonia, A New Name for Sprostonia. *Parasitology*, Cambridge, 49, (3 and 4).
- P39 ——— (1960) : Monogenea of Indian Fresh Water Fishes XII, A New Dactylogyrid Trematodes from the Gill Filaments of Cyprinidae and Gobioid Hosts. *Sobreiro Ad Libro Homenji al Dr. Eduardo Caballero Y Caballero Mexico*, pp. 161-171.
- (P25) KRISHNAMURTHY, H. (with Das, B. C.) (1959) : Comparative Effects of Yeast Vitamin B Complex, and Vitamin B<sub>12</sub> on the Survival Rate of Indian Minor Carp During the First Two Weeks of Life. *Proceedings of the National Institute of Sciences of India*, 25, Part B, 300-306.
- P40 ROY, S. K. (1959) : The Regulation of Morphogenesis in an Oleaceous Tree, *Nyctanthes Arbor-Tristis*. *Nature*, 183, 1410.
- P40 ——— (1959) : Second Flowering in *Oryza Sativa* (var. *Indica*). *Nature*, 184, 1458.
- P42 ——— (1960) : Variation in Indian Cattle, Buffaloes, and Goats. *Proceedings of the Centenary and Bicentenary Congress of Biology, Singapore*, 1958.
- P43 ——— (1960) : Variation of Leaves and Flowers on the Same Plant. *Proceedings of the Centenary and Bicentenary Congress of Biology, Singapore*, 1958.
- P44 ——— (1960) : Interaction Between Rice Varieties. *Journal of Genetics*, 57, no. 1, 137.

C. Econometrics and Economic Planning

- P40 CHAKRAVARTI, I. M. (with Laha, R. G. and Roy, J.) (1959) : A Study of Concentration Curve as Description of Consumption Pattern. *Studies Relating to Planning for National Development*. No. 2. Studies on Consumer Behaviour. Indian Statistical Institute, pp. 73-82.
- P41 DHAR, S. K. (with Roy, J.) (1960) : A Study on the Pattern Consumer Expenditure in Rural and Urban India. *Studies Relating to Planning for National Development*. No. 2. Studies on Consumer Behaviour. Indian Statistical Institute, pp. 56-72.

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- (P40) LAHA, R. G. (with Chakravarti, I. M. and Roy, J.) (1959) : A Study of Concentration Curves as Description of Consumption Pattern. *Studies Relating to Planning for National Development*. No. 2. Studies on Consumer Behaviour. Indian Statistical Institute. pp. 73-82.
- P42 ——— (with Roy, J.) (1959) : Preliminary Estimates of Relative Increase in Consumer Demand in Rural and Urban India. *Studies Relating to Planning for National Development*. No. 2. Studies on Consumer Behaviour. Indian Statistical Institute. pp. 9-16.
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- P43 BISWAS, SUDDHENDU (1957) : On a Method of Evaluation of Epidemic Indices Relating to Cholera. *Indian Journal of Public Health*. pp. 180-187.
- P44 ——— (1958) : A Note on a Method of Estimating Birth and Death Rates from Registration Data. *Calcutta Statistical Association Bulletin*, 8, nos. 30-31, pp. 65-72.
- P45 ——— (with Mukherjee, S., R. G. Kar Medical College and Hospital) (1959) : Birth Weight and Its Relationship to Gestation Period, Sex, Maternal Age, Parity and Socio-economic Status. *Journal of the Indian Medical Association*, 32, no. 10, 389-397.
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- P61 BASUMALLIK. TAPAN (1959) : Reliability of Essay Type Examination : A Review of Studies. *Journal of Education and Psychology, 17, 127-156.*
- P62 BHAGOLWAL, B. S. (1960) : A Work Study Technique for Non-repetitive Work : Development, Reliability and Validity. *Journal of Psychological Researches, 4(2), 44-53.*
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- P66 ——— (1960) : Applications of Fractile Graphical Analysis to Psychometry : I. Item Analysis. *Psychological Studies, 5, 11-18.*
- P67 ——— (1960) : Comparison of Worker Analysis Ratings Based on Job Description and Motion-Time Study. *Occupational Psychology, 34, 141-147.*
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- P69 KALRA, P. N. (with Sharma, K. N.) (1959) : An Experimental Investigation of Job Analysis Reliability, Methods and Results. *Journal of Psychological Researches, 3 (3), 102-104*
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- P70 ——— (1960) : The Scientific Work of J. S. Haldane. *Nature*, 187, 102-105.
- P77 MAHALANOBIS, P. C. (1960) : Note on Problems of Scientific Personnel. Mimeographed by the Scientific Personnel Committee and circulated for comments.
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- P79 SUSIHL KUMAR (1960) : A Table of Proportions and Percentages. *Journal of Psychological Researches*, 4(2), 85-93.

5.2 PAPERS SUBMITTED FOR PUBLICATION

(The journal to which the paper is submitted for publication is mentioned within brackets)

A. Theoretical Statistics

- S1 BHADUR, R. R. : On the Number of Distinct Values in a Large Sample from an Infinite Discrete Distribution. (*Jubilee Vol. of Nat. Acad. Sc. Ind.*).
- S2 ——— (with Ranga Rao, R.) : On Deviations of the Sample Mean. (*Ann. Math. Stat.*).
- S3 BHATTACHARYA, P. K. (with Parthasarathy, K. R.) : Limit Theorems in Regression Theory. (*Sankhyā*).
- S4 HALDANE, J. B. S. : Simple Approximations to the Probability Integral and  $P(X^2)$  when both are small. (*Sankhyā*).
- S5 ——— (with Jayakar, S. D.) : The Distribution of Extremal and Nearly Extremal Values in Samples from a Normal Distribution. (*Sankhyā*).
- (S5) JAYAKAR, S. D. (with Haldane, J. B. S.) : The Distribution of Extremal and Nearly Extremal Values in Samples from a Normal Distribution. (*Sankhyā*).
- S6 MATTHAI, A. : Planning Sample Selection from Item-lots and Bulk Lots. (*Indian Society for Quality Control Journal*).
- S7 MITRA, SUJIT KUMAR : Asymptotic Approximations to Distribution and the Normal Limit to the Generalized Hypergeometric Law. (*Ann. Math. Stat.*).
- S8 PARTHANATHY, K. R. : On the Estimation of the Spectrum of a Stationary Stochastic Process. (*Ann. Math. Stat.*).
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- (S3) ——— (with Bhattacharya, P. K.) : Limit Theorems in Regression Theory. (*Sankhyā*).

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- S10 RAO, C. R.: On a Consistency Condition Leading to Least Squares Estimates in the Gauss-Markoff Model. (*Ann. Math. Stat.*)
- S11 RANGA RAO, R.: Some Theorems on Weak Convergence of Measures and Applications. (*Ann. Math. Stat.*)
- (S2) ——— (with Bahadur, R. R.): On Deviations of the Sample Mean. (*Ann. Math. Stat.*)
- S12 ——— (with Varadarajan, V. S.): On the Decomposition of Haar Measure in Compact Groups. (*Fundamenta Mathematicae*).
- S13 SETHURAMAN, J.: A Theorem on Conditional Distributions. (*Sankhyā*).
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- S15 SHAH, K. R.: A Note on Variance in Reinforced Incomplete Block Designs. (*Journal of the Indian Society of Agricultural Statistics*).
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- S17 SUSHIL KUMAR: A Rapid Method of Calculating Tri-serial Correlation. (*Psychometrika*).
- (S12) VARADARAJAN, V. S. (with Ranga Rao, R.): On the Decomposition of Haar Measure in Compact Groups. (*Fundamenta Mathematicae*).

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- S18 DAS, B. C.: Growth Rates of *Calla calla* and *Labeo rohita* in Confined Waters. (*Science and Culture*).
- S19 ———: An Investigation of Diastolic and Systolic Blood Pressure in Relation of Age and Weight in Adult Male Bengalis. (*Biotypologie*).
- S20 ———: Effect of Density on Survival of Indian Freshwater Carp during the First Two Weeks of Life. (*Journal of Animal Ecology*).
- S21 ———: A Comparative Study of the Blood Biochemistry of Several Species of Indian Carp. (*Transactions of the American Fisheries Society*).
- S22 DRONAMRAJU, K. R.: Non-genetic Polymorphism in *Bauhinia acuminata* L. (*J. Genet.*).
- S23 ———: Selective Visits of Butterflies to Flowers, a Possible Factor in Sympatric Speciation. (*Nature, London*).
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- S26 ——— (with Spurway, H.): Constancy to Horticultural Varieties Shown by Butterflies, and its Possible Evolutionary Significance. (*Journal of Bombay Natural History Society*).
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- S28 ———: Physiological Variation and Evolution. (Sent to the University of Baroda).
- S29 ———: The Mathematical Theory of Natural Selection. (*Golden Jubilee Number, Calcutta Mathematical Society*).
- S30 ———: Natural Selection in Man. (*Progress in Medical Genetics, Ohio*).
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- S32 ———: A Statistical Analysis of Lord Avebury's Observations on Wasps. (*Notes & Records of Royal Society*).
- S33 JAIN, S. L.: Monogenea of Indian Freshwater Fishes XI, Three New Trematodes Belonging to the Genus *Dactylogyrus* Diesing, 1850. (*Proc. of First All-India Congress of Zoology, Jabalpur*).
- S34 ———: Three New Species of *Urocleidus* Muller, 1934, with Proposal of Its Synonymy with *Haploleidus* Mueller, 1937. (*Annals of Zoology*).
- S35 SPURWAY, H. (with Asit Kumar): On Variation under Domestication, with a Description of Tussock Silk Cultivation. (*Proceedings of the Darwin Wallace Centenary and Linnaeus Bi-centenary Congress, Singapore*).
- S36 ——— (with Callan, H. G.): The Vigour and Male Sterility of Hybrids between the Species *Triturus vulgaris* and *T. helveticus*. (*J. Genet.* 57).
- (S26) ——— (with Dronamraju, K. R.): Constancy to Horticultural Varieties Shown by Butterflies, and its Possible Evolutionary Significance. (*J. Bombay Nat. Hist. Soc.*).

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- S37 RAO, V. L. S. P.: Urban Survey for Regional Planning: The Need for Regional Approach. (*Journal of the Institute of Town Planners, India*).

G. Psychology

- S38 BHAGOLIWAL, B. S.: The Personality Profile of a Sample of Indian M.Sc. Students on the Sixteen Personality Factor Questionnaire. (*Journal of Education and Psychology*).
- S39 ———: A Study Method for Transforming Raw Scores into Standard Scores, Percentiles and Staines. (*The Journal of Psychological Studies*).
- S40 BHATTACHARYYA, K. P.: A Motion and Time Study Experiment: Usefulness for Redesigning Workplace Layouts and Observer Reliability. (*Journal of National Productivity Council*).
- S41 DAN, RHEA S.: Quantitative Methods for Selection of Managers. (Management Topics Yearbook for 1960. *India Needs Trained Managers*).
- S42 ———: A Review of Admission Procedures Used in Colleges and Universities Abroad. (*Report of the U.G.C. Examinations Reform Committee*).
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 S45 ———: "Dox" or "Order of Magnitude?" (*Nature*).  
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 S47 SPURWAY, H.: Vaishnava and Saiva Biology. Bernhard Rensch Festschrift. (*Zoologische Jahrbücher*).

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- S48 DAS, B. C.: A Review of Education in the United States in the Perspective of Indian National Development. (*Vidya Vihar Educational Journal*).

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- C1 BANDYOPADHYAY, SURAJ: A Study on Some Aspects of the Role of Informants in a Socio-economic Survey. (*Fourth All-India Sociological Conference, Calcutta, 1959*).
- C2 ——— (with Chattopadhyay, K.): A Note on the Use of Societal Factors for Stratification in Social Surveys. (*Fifth All-India Sociological Conference, Lucknow, 1960*).
- C3 BASUMALLIK, TAPAN: Validity of Personality Trait Ratings of High School Students by Their Teachers. (*Indian Science Congress, Bombay, 1960*).
- C4 BETELLE, ANDRE: A Note on Some Aspects of a Village as a Societal Unit. (*Fourth All-India Sociological Conference, Calcutta, 1959*).
- C5 BHAGOLIWAL, B. S.: A Work Study Technique for Non-Repetitive Work: Development, Reliability, Validity. (*Indian Science Congress, 1960*).
- C6 BHAT, L. S.: Population Concentration—A Regional Approach. (*Indian Council of Geographers, Bombay 1960*).
- C7 ———: Changing Peri-urban Landscapes. (*Indian Council of Geographers, Bombay, 1960*).
- C8 ——— (with Sathyanarayana, S.): Industries in South India—A Study in Methodology. (*Indian Council of Geographers, Bombay, 1960*).
- C9 CHATTERJI, S. (with Mukerjee, Manjula): Construction of a Table for Estimation of Item Validity Indices in Terms of Davis Discrimination for Criterion Groups Based on Median Split. (*Indian Science Congress, Bombay, 1960*).
- C10 ——— (with Mukerjee, Manjula): Validity Study of a College Aptitude Test Battery. (*Indian Science Congress, Bombay, 1960*).
- (C2) CHATTOPADHYAY, K. (with Bandyopadhyay, S.): A Note on the Use of Societal Factors for Stratification in Social Surveys. (*Fifth All-India Sociological Conference, Lucknow, 1960*).

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- C11 DAS, BEBRA S.: Personnel Selection Methods. (*Seminar on Industrial Psychology, Madras, 1959*).
- C12 DAS GUPTA, S.: Statistical Methods in Item Analysis. (*Indian Science Congress, Bombay, 1960*).
- C13 DEONAMRAJU, K. R.: Choice of Flowers by Insects. (*Fifth Annual Session of Assam Science Society, Gauhati, 1959*).
- C14 ———: Bimodal Distribution of the Style Lengths in a Horticultural Plant *Bauhinia acuminata* L. (*Indian Science Congress, Bombay, 1960*).
- C15 HALDANE, J. B. S.: The Addition of Random Vectors. (*Indian Science Congress, Bombay, 1960*).
- C16 HALDANE, J. B. S. (with V. T. Kordo, S. K. Roy, and H. Spurway): The Biometry of Asymmetry. (*Indian Science Congress, Bombay, 1960*).
- C17 ———: Asymmetry in the Caterpillars of *Antheraea Mytilis*. (*Indian Science Congress, Bombay, 1960*).
- C18 ———: The Biological Work of the Indian Statistical Institute. (*Indian Science Congress, Bombay, 1960*).
- C19 JAIN, S. L.: New Dactylogryid Parasites from the Gill Filaments of Cyprinid Fishes from India. (*First All-India Congress of Zoology, Jabalpur, 1959*).
- C20 LAHIRI, D. B. (with Mahalanobis, P. C.): Analysis of Errors in Censuses and Surveys with Special Reference to Experience in India. (*32nd Session of the International Statistical Institute, Tokyo, 1960*).
- C21 MAHALANOBIS, P. C.: Labour Problems in a Mixed Economy. (*Labour Economics Conference, Madras, 1960*).
- C22 ———: Address of Unemployment. (*Chairman's address to the Indian Journal of Labour Economics, 1959*).
- C23 MAHALANOBIS, P. C.: Recent Developments in the Organization of Science in India. (*6th General Assembly and Scientific Symposium of the World Federation of Scientific Workers, Warsaw, 1959*).
- C24 ———: Address (to the Association of Scientific Workers for Vinankarmee).
- C25 ———: Perspective Planning. (*Third Session of the SEANZA Central Banking Course in Bombay, 1960*).
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- (C10) ——— (with Chatterjee, S.): Validity Study of a Colloge Aptitude Test Battery. (*Indian Science Congress, Bombay, 1960*).
- C26 MUKHERJEE, RAMKRISHNA: Some Consideration on Social Research. (*Presidential Address to the Sociology Section of the Fifth All-India Sociological Conference, Lucknow, 1960*).

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- C27 MUKHERJEE RAMKRISHNA : A Note on Village as Unit or Variable for Studies of Rural Society. (*First Convention of Social Anthropologists, Lucknow, 1960*).
- C28 PAKRASI, KANTI BHUSAN : A Study on Some Aspects of the Types of Household and Family Organization in Rural Bengal, 1940-47. (*Fourth All-India Sociological Conference, Calcutta, 1959*).
- C29 ——— : A Study on Some Aspects of Structural Variations Among the Immigrants to Durgapur, West Bengal. (*Fifth All-India Sociological Conference, Lucknow, 1960*).
- C30 PAL, M. N. : Quantitative Delimitation of Regions. (*Indian Science Congress, Bombay, 1960*).
- C31 ——— (with Subramanian, O.) : Some Methodological Aspects of Population Forecasting with Reference to Regional Planning. (*Indian Council of Geographers, Bombay, 1960*).
- C32 RAMAN, N. M. : A Note on Investigators' Difference in Social Surveys. (*Fourth All-India Sociological Conference, Calcutta, 1959*).
- C33 RAO, C. R. : Some Aspects of Multivariate Analysis. (*32nd Session of the International Statistical Institute, Tokyo, 1960*).
- C34 ——— : Apparent Anomalies and Irregularities in Maximum Likelihood Estimation. (*32nd Session of the International Statistical Institute, Tokyo, 1960*).
- C35 ——— : Asymptotic Efficiency and Limiting Information (to appear in the *Fourth Berkeley Symposium on Probability and Statistics*).
- C36 RAO, V. L. S. P. (with Learmonth, A. T. A.) : Trends in Urbanization in Mysore State, India. (*Seminar, 1960 Urbanization in India, University of California*).
- C37 RANGA RAO, R. (with Varadarajan, V. S.) : A Limit Theorem for Densities. (*Indian Science Congress, Bombay, 1960*).
- C38 ——— (with Varadarajan, V. S.) : A Note on Distributions in Hilbert Space. (*Indian Science Congress, Bombay, 1960*).
- C43 ROY, S. K. : Interaction in Rice. (*Fifth Annual Session of Assam Science Society, Gauhati, 1959*).
- C44 ——— : Asymmetry in Nipples of Cattle, Buffaloes and Goats, and Leaves. (*Indian Science Congress, Bombay, 1960*).
- C45 ——— : Variation in Organs on the same Plant (*Indian Science Congress, Bombay, 1960*).
- (C16) ——— (with Haldane, J. B. S., Korde, V. T. and Spurway, H) : The Biometry of Asymmetry. (*Indian Science Congress, Bombay, 1960*).
- C47 ——— : Different kinds of Sterilitybarriers. (*Institute of Genetics, University of Lund, Sweden, 1960*).
- C48 ——— : Interaction among Plants. (*Plant Breeding Institute, Swedish Seed Association, Svalof, Sweden, 1960*).
- (C8) SATHYANARAYANA, S. (with Bhat, I. S.) : Industries in South India—A Study in Methodology. (*Indian Council of Geographers, Bombay, 1960*).

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- C39 SETHURAMAN, J.: Some Limit Theorems Connected with Fractile Graphical Analysis. (*Indian Science Congress, Bombay, 1960*).
- C40 ———: A Theorem of Conditional Distributions. (*Indian Science Congress, Bombay, 1960*).
- C41 SPURWAY, H.: The Tussock Silk Moth. (*Fifth Annual Session of Aream Science Society, Gankhati, 1959*).
- (C31) SUBRAMANIAN, C. (with Pal, M. N.): Some Methodological Aspects of Population Forecasting with Reference to Regional Planning. (*Indian Council of Geographers, Bombay, 1960*).
- C42 VARADHAN, S. R. S.: Stochastic Approximation to an Allocation Problem. (*Indian Science Congress, Bombay, 1960*).
- (C37) VARADARAJAN, V. S. (with Ranga Rao, R.): A Limit Theorem for Densities. (*Indian Science Congress, Bombay, 1960*).
- (C38) ——— (with Ranga Rao, R.): A Note on Distributions in Hilbert Space. (*Indian Science Congress, Bombay, 1960*).

5.4 WORKING PAPERS, NOTES AND REPORTS

- W1 BANDYOPADHYAY, SURAJ : A Note on the Possible Variations in Family Structures due to Different Time-periods Chosen to Enumerate Their Members.
- W2 ———: An Analysis of the Distribution of Villages Being Homogeneous in One or More Respects Around Giridih Township.
- W3 ———: On the Relative Use of Handicraft and Machine made Products in 3 Villages Around Giridih, Bihar.
- W4 ——— (with Chattopadhyay, Kumarananda): A Note on the Relative Usefulness of Stratification of Villages Made by Village Distances from the Nearest Urban Centre and the Nearest Communication Point, and by Village 'Size'.
- W5 ——— (with Pakraai, K.): An Analysis of Rural Family Structures by Districts and Ecological Zones: West Bengal, 1947.
- W6 ——— (with Pakraai, K.): A Comparative Analysis on Some Aspects of Social and Economic Characteristics of 'Households' and 'Families' of Rural West Bengal, 1956.
- W7 BHAGOLWAL, B. S.: Reliability Formulae: Their Reliability, Validity and Applicability in Hindi.
- W8 BEAT, L. S.: Land Use Potential in the Malnad (Mysore State).
- W9 BHATTACHARYYA, K. P.: Individual Differences in Susceptibility to Industrial Monotony.
- W10 ———: Psychological Factors Affecting Textile Preferences.
- W11 CHATTERJI, S. (with Mukherjee, Manjula): Comparative Study Between Different Available Methods of Interpreting Test Results in Terms of Vocational Guidance.
- W12 ——— (with Mukherjee, Manjula): Relation Between Interest and Achievement.
- W13 ——— (with Mukherjee, Manjula): Review of Different Methods Available for Efficiency Appraisal.

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- W14 CHATTERJI, S. (with Mukherjee, Manjula): Reports on a Pilot Study on Efficiency Appraisal, nos. 1-10.
- (W4) CHATTOPADHYAY, KUMARANANDA (with Bandyopadhyay, Suraj): A Note on the Relative Usefulness of Stratification of Villages Made by Village Distances from the Nearest Urban Centre and the Nearest Communication point, and by Village 'Size'.
- W15 DAS, RHEA S.: An Outline of the Procedure for Comparing the Performances of Different Groups on a Battery of Tests by Discriminant Function Analysis. (Studies in Industrial Psychology no. 591).
- W16 DRONAMRAJU, K. R.: Further Observations on Intervarietal Selection by Pollinators.
- W17 ———: Inbreeding in Andhra Pradesh.
- W18 ———: Further Pedigress Showing Holandric Inheritance in Man.
- W19 HALDANE, J. B. S.: More Precise Expressions for the Cost of Natural Selection.
- W20 ———: The Effects of Selection of Slowly Increasing Intensity. I.
- W21 JAIN, S. L.: Some Fishes from Kota Beds.
- W22 ———: Some Fishes from Lameta Beds.
- W23 MATTHAI, A.: Sampling Inspection Tables (Indian Standard).
- (W11) MUKHERJEE, MANJULA (with Chatterji, S.): Comparative Study between Different Available Methods of Interpreting Test Results in Terms of Vocational Guidance.
- (W12) ——— (with Chatterji, S.): Relation between Interest and Achievement.
- (W13) ——— (with Chatterji, S.): Review of Different Methods Available for Efficiency Appraisal.
- (W14) ——— (with Chatterji, S.): Reports on a Pilot Study on Efficiency Appraisal, nos 1-10.
- W24 MUKHERJEE, RAMKRISHNA: On the Classification of Family Structures.
- W25 ———: On the Measurement of Kinship Distance.
- W26 PAKRASI, K.: A Structural Analysis of Rural Families of Undivided Bengal, 1946-47.
- (W5) ——— (with Bandyopadhyay, S.): An Analysis of Rural Family Structures by Districts and Ecological Zones: West Bengal, 1947.
- (W6) ——— (with Bandyopadhyay, S.): A Comparative Analysis on Some Aspects of Social and Economic Characteristics of 'Households' and Families' of Rural West Bengal, 1956.
- W27 PAL, M. N. (with Subramanian, C.): Experimental Mapping of the Data from National Sample Survey.
- W28 RAO, V. L. S. P. (with members of the Regional Survey Unit): South India: Regional Patterns of Resource Distribution and Trends in Development.
- W29 ROBINSON, PAMELA L. (with Roy Chowdhury, T. and Smith, A.): Geology of the Angrez-palli Outlier, Andhra Pradesh.
- W30 ROY CHOWDHURY, T.: Reptilian Fauna of the Maleri Beds.
- (W28) ——— (with Robinson, Pamela L. and Smith, A.): Geology of the Angrez-palli Outlier, Andhra Pradesh.
- W31 SPURWAY, H.: Biometry of *Antheraea mylitta*.
- W32 ———: Sexual Cycles and Life Tables of *Lebistes reticulatus*.
- (W27) SUBRAMANIAN, C. (with Pal, M. N.): Experimental Mapping of the Data from National Sample Survey.



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### 5.6 BOOK REVIEWS AND ABSTRACTS OF PAPERS

Professor J. B. S. Haldane reviewed a number of books during the year. A list of these books (together with references to the journals where the reviews are published), is given below :

1. Biochemistry of Human Genotios (*J. Genet.*, 57, 153-158); 2. Breeding of Field Crops (*J. Genet.*, 57, 159-159); 3. Subcellular particles and Development Cytology (*J. Genet.*, 57, 159-160); 4. Balkeslee—The genus *Datura* (*J. Genet.*, 57, 160-162); 5. Getreide—Umwandlung und Artproblem, Eine historische Orientierung (*J. Genet.*, 57, 162-163); 6. Byeways of Human Metabolism (*J. Genet.*, 57, 163-164); and 7. Health Physics in Nuclear Installations (*J. Genet.*, 57, 165).

The Research and Training School helped in the preparation of abstracts of statistical papers published in India and Pakistan for the International Journal of Abstracts issued by the International Statistical Institute. Dr. C. R. Rao was the regional editor and the following members of the staff reviewed one or more articles each :

P. K. Bhattacharya, N. S. Iyengar, S. John, P. K. Kumaran, S. K. Mitra, N. S. Nanjamma, G. Parthasarathy, K. R. Parthasarathy, K. Rajaraman, R. Ranga Rao, Y. R. Raw, J. Roy, J. Sethuraman, K. R. Shah, V. S. Varadarajan.

## PLANNING DIVISION

### 5.6 LIST OF MANPOWER AND TECHNICAL STUDIES

no.	title
1.	A Report on the Coverage and Quality of Information regarding Engineers in the National Register of Technical Persons. (April 1957).
2.	A Preliminary Study of the Pattern of Engineering Employment in Manufacturing Industries in India. (May 1957).
3.	A Preliminary Study of Engineers in Public Electricity Supply Undertakings : Present Position and Basis for Estimating Future Requirements. (July 1957).
4.	A Preliminary Study of Training and Employment of Agricultural Graduates in India. (August 1957).
5.	Engineers in India : Number & Distribution, 1955. (October 1957).
6.	A Preliminary Study of Chemists and Chemical Technologists in India, 1955. (November 1957).
7.	A Preliminary Study of Physicists in India, 1955. (March 1958).
8.	Approach to Manpower Planning. (April 1958).
9.	Educated Persons in India, 1955. (May 1958).
10.	Occupational Pattern in Manufacturing Industries in India, 1955. (May 1956).
11.	Study of Geologists in India : 1955. (July 1958).
12.	A Study of Biologists in India : 1955. (July 1958).
13.	A Preliminary Report on Wastage in Technical Education. (May 1956).
14.	A Preliminary Report on Wastage in Agricultural Education. (June 1959).
15.	Doctors in India : A Statistical Study, 1955 (August 1959).
16.	Scientists in India : A Statistical Study, 1955 (August 1959).

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### 5.7 PAPERS COMPLETED FOR PUBLICATION OR READ AT CONFERENCES

1. BISWAS, A. K.: Estimation of Increase in the Demand for Food and Cereals during Third Five Year Plan Period. Read at the Preliminary Conference of Indian Econometricians, January, 1960.
2. CHAKRAVARTI, A. K.: On Factors Influencing Raising of Coal. Read at the Preliminary Conference of Indian Econometricians, January 1960.
3. ———: Inter-industry Relations Study in India (Preliminary Country Report). Read at the Preliminary Conference of Indian Econometricians, January 1960.
4. CHATTERJEE, I.: An Estimate of the Food Costs of Maintenance and Milk Production of India's Cows and She-buffaloes in Terms of Nutrition Standards and Money Values: I: On the Basis of India as a Whole. Read at the Indian Science Congress, January 1960.
5. ———: An Estimate of the Food Costs of Maintenance and Milk Production of India's Cows and She-buffaloes in Terms of Nutrition Standards and Money Values: II: On the Basis of Regions and States. Read at the Indian Science Congress, January 1960.
6. ———: Effect of Manure on the Yield, Economy and Nutritive Value of Pasture Grass. Read at the Indian Science Congress, January 1960.
7. ———: Nutritive Value of Straws from Pure Rice Strains. Read at the Indian Science Congress, January 1960.
8. DEY, B. and SANYAL, A.: National Income and Standard of Living. Submitted to *Jugantar*.
9. IYENGAR, N. S.: On the Standard Error of the Lorenze Concentration Index. Submitted to *Sankhyā*.
10. ———: On a Method of Computing the Engel Elasticities from the Concentration Curves. Submitted to *Econometrica*.
11. ———: On A Problem of Estimating Increase in Consumer Demand. Read at the Preliminary Conference of Indian Econometricians, January 1960.
12. ———: An Extension of Dr. Prais's "Whose Cost of Living?" Submitted to *Review of Economic Studies*.
13. ——— and KRISHNA MOORTHY, S.: On Concentration of Employment in the Major Indian Manufacturing Industries. Read at the Preliminary Conference of Indian Econometricians, January 1960.
14. KRISHNA MOORTHY, S.: On the Effect of Changes in Reference Period in Consumer Expenditure Surveys. Read at the Preliminary Conference of Indian Econometricians, January 1960.
15. ——— and IYENGAR, N. S.: On Concentration of Employment in the Major Indian Manufacturing Industries. Read at the Preliminary Conference of Indian Econometricians, January 1960.
16. MAITRA, T.: On the Variations in Prices between States of India. Read at the Indian Science Congress, January 1960.

16. MUKHERJEE, M.: A Particular Formulation of Correlation in Space. Read at the Preliminary Conference of Indian Econometricians, January 1960.
17. PIPLAI, T.: Life of Railway Tracks in India and the USSR. Submitted to *Indian Railway*.
- (6). SANYAL, A. and DEY, B.: National Income and Standard of Living. Submitted to *Jugantar*.

5.8 PUBLISHED PAPERS

1. BISWAS, A. K.: Input-output Analysis, National Income Accounting and Planning. *Arthaniti* III, 1.
2. BETTELHEIM, CHARLES: Scheme of a Model of Reasoning for the Elaboration of the Second Five-Year Plan of India, *Studies Relating to Planning for National Development*. No. 5. Some Basic Planning Problems. Indian Statistical Institute, 1960.
3. ———: Investment Allocation and Increase in National Income. *Studies Relating to Planning for National Development*. No. 5. Some Basic Planning Problems. Indian Statistical Institute, 1960.
4. ———: Some Observations on Social and Economic Policy. *Studies Relating to Planning for National Development*. No. 5. Some Basic Planning Problems. Indian Statistical Institute, 1960.
5. ———: Observations on the Social Conditions necessary for a Rapid and Planned. Economic Development. *Studies Relating to Planning for National Development* No. 5. Some Basic Planning Problems. Indian Statistical Institute, 1960.
6. ———: Foreign Trade and Planning for National Economic Development. *Studies Relating to Planning for National Development*. No. 5. Some Basic Planning Problems. Indian Statistical Institute, 1960.
7. ———: Planned Economic Growth and Foreign Trade. *Studies Relating to Planning for National Development*. No. 5. Some Basic Planning Problems. Indian Statistical Institute, 1960.
8. DEV KUMAR: Expenditure Consumption Curves for Some Selected Consumer items. *Studies Relating to Planning for National Development*. No. 2. Studies on Consumer Behaviour. Indian Statistical Institute, 1959.
9. CHAKRAVARTI, A. K.: On Discrimination of Consumer Patterns. *Studies Relating to Planning for National Development*. No. 2. Studies on Consumer Behaviour. Indian Statistical Institute, 1959.
10. CHAKRAVARTI, S. K., DATTA, UMA and SRINIVASAN, V.: Share of Urban and Rural Sectors in the Domestic Product in India in 1952-53. *Papers on National Income and Allied Topics*. Vol. 1, 1960.
11. DATTA, UMA and PRAKASH, VINOD: An Estimate of the Reproducible Tangible Wealth in India 1949-50. *Papers on National Income and Allied Topics*, Vol. 1, 1960.
- (10). DATTA, UMA, CHAKRAVARTI, S. K. and SRINIVASAN, V.: Share of Urban and Rural Sectors in the Domestic Product in India in 1952-53. *Papers of National Income and Allied Topics*. Vol. 1, 1960.
12. FRISCH, RAONER: Planning in Underdeveloped Economy. *Studies Relating to Planning for National Development*. No. 3. Planning for India: Selected Explorations in Methodology. Indian Statistical Institute, 1960.

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13. ———: Some Applications: The Experimental Plan-Frame No. 1. *Studies Relating to Planning for National Development*. No. 3. Planning for India: Selected Explorations in Methodology. Indian Statistical Institute, 1960.
14. ———: Organisation of Information and the Mathematical Method. *Studies Relating to Planning for National Development*. No. 3. Planning for India Selected Explorations in Methodology. Indian Statistical Institute, 1960.
15. GANGULY, AMALENDU: Consumption Patterns in Different Occupation Groups. *Studies Relating to Planning for National Development*. No. 2. Studies on Consumer Behaviour. Indian Statistical Institute, 1959.
16. INTER-INDUSTRY RELATION SECTION, Indian Statistical Institute: Inter-Industrial Relations in the Indian Union, 1951-52. *Papers on National Income and Allied Topics*. Vol. I, 1960.
17. IYENGAR, N. S. and KRISHNA MOORTHY, S.: On some Economic Model for India. *Arthaniti* II, 2.
18. KRISHNA MOORTHY, S.: A Note on Adjusting Frisch's Transaction Matrix. *Arthaniti*, III, 1.
- (17). ——— and IYENGAR, N. S.: On some Economic Model for India. *Arthaniti* II, 2.
19. KANSAL, S. M.: On the Deflation of the National Income in India by the Final Expenditure Approach, *Papers on National Income and Allied Topics*. Vol. I, 1960.
20. MAZUMDAR, H.: Business Saving in India; an estimate and an analysis in relation to profitability and the growth of the National Saving Rate. J. B. Wolter's Publishing Company. Groningen-Holland, 1959.
21. ———: Level and Fluctuations of Dividend in Four High Income and Low Income Countries: A Comparative Study with Theoretical Analysis and Conclusions. *Netherland Economic Institute, Rotterdam*, 1959.
22. ———: Distribution and rate of Saving by Sectors. *Economic Weekly*.
23. MUKHERJEE, M.: On the Appropriateness of the Price Average to be used for Obtaining the Value of Output in Agriculture. *Papers on National Income and Allied Topics*, Vol. I, 1960.
24. MUKHERJEE, M. and SASTRY, N. S. R.: An Estimate of Tangible Wealth in India. *Income and Wealth Series VIII*, 1959.
25. PITLAI, T.: Some Gaps in the Railway Plan. *Economic Affairs*, Annual Number, 1959.
26. PRAKASH, VINOD: An Estimate of Stock of Precious Metals in India. *Papers on National Income and Allied Topics*, Vol. I, 1960.
- (11). ——— and DATTA, UMA: An Estimate of the Reproducible Tangible Wealth in India 1949-50. *Papers on National Income and Allied Topics*, Vol. I, 1960.
27. RUDRA, ASHOK and ROY, BINA: Some results in Consumption Studies. *Studies Relating to Planning for National Development*. No. 2. Studies on Consumer Behaviour. Indian Statistical Institute, 1959.
- (27). ROY, BINA and RUDRA, ASHOK: Some Results in Consumption Studies. *Studies Relating to Planning for National Development*. No. 2. Studies on Consumer Behaviour. Indian Statistical Institute, 1959.
28. SANDES, J.: A Demonstration Planning Model for India. *Studies Relating to Planning for National Development*. No. 4. A Demonstration Planning Model for India. Indian Statistical Institute, 1960.

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- (24). SASTRY, N. S. R. and MUKHERJEE, M.: An Estimate of Tangible Wealth in India. *Income and Wealth Series VIII*, 1959.
- (10). SRINIVASAN, V., DATTA, UMA and CHAKRAVARTI, S.: Share of Urban and Rural Sectors in the Domestic Product in India in 1962-63. *Papers on National Income and Allied Topics*, Vol. 1, 1960.

5.9 WORKING PAPERS AND NOTES

(Working paper number/dates of release are given in brackets)

1. AHMED, M. and NROY, K.: The Small-scale Industry in India in 1954-55. (163/21 April 1959).
2. BANERJEE, N. and MUKHERJEE, G. P.: A Study on Localization and Productivity of Jute Textile Industry of India. (191/1 March 1960).
3. BHATTACHARYA, D.: Improvement in Cottage Industries as a Consequence of Provision of Certain Facilities: An Experimental Study. (104/28 March 1960).
4. BISWAS, A. K.: Estimation of Increase in the Demand for Food and Cereals during the Third Five-Year Plan Period. (107/32 May 1959).
5. ——— and BOSE, D. K.: Consumption Projections of Selected Items Over the Period of Third Five-Year Plan. (198/10 July 1960).
- (5). BOSE, D. K. and BISWAS, A. K.: Consumption Projections of Selected Items over the Period of Third Five-Year Plan. (108/10 July 1960).
6. CHAKRAVARTI, A. K.: Inter-industry Relations Studies in India (Preliminary country report). (186/13 January 1960).
7. CHAKRAVARTI, A. K.: On Factor Influencing Raising of Coal. (189/19 January 1960).
8. ———: Analysis of Demand for Wheat (British India, 1924-25 to 1941-42). (197/24 June 1960).
9. ———: On Some Aspects of the Structure of the Indian Economy (1933-54). (190/29 August 1960).
10. CHAKRAVARTI, A. K. and PANDE, S. B.: On Estimation of Increase in the Demand of Road Transports in India (1954-55). (166/20 May 1959).
11. CHATTERJEE, A.: Trends in Labour Productivity and Wages in Fourteen Manufacturing Industries (1948-1953). (160/2 April 1959).
12. ———: Factor Shares in National Income of India. 1956-57. (171/15 June 1959).
13. CHATTERJEE, G. S.: A Note on Per Capita Contribution to National Income from Professions and Liberal Arts and Domestic Services for Rural and Urban Sectors of India (based on NSS 4th Round, April 1952 to September 1952). (202/12 September 1960).
14. ———: On Per Capita Contribution to National Income from Professions and Liberal Arts and Domestic Services for the Rural Sector of India (based on NSS 4th round, April 1952 to September 1952 and NSS 5th round, November 1952 to March 1953). (210/12 December 1960).
15. ——— and SINHA, MIRA: National Income Estimates of India, 1944-45 to 1947-48—A Review. (204/17 October 1960).
16. CHATTERJEE, I.: An Estimate of Food Costs of Maintenance and Milk Production of India's Cows and She-buffaloes in Terms of Nutritive Standard and Money Value (A preliminary study). 1. On the Basis of India as a Whole. (180/30 November 1950).

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17. ——— : An Estimate of Food Costs of Maintenance and Milk Production of India's Cows and She-buffaloes in Terms of Nutritive Standards and Money Value. 2. On the Basis of Region and States. (181/30 November 1960).
18. ——— : Nutritive Values of Straws from Puro Rice Strains. (182/5 December 1960).
19. ——— : The Effect of Manure on the Yield Economy and Nutritive Value of Pasture Grass. (184/31 December 1959).
20. ——— : The Estimation of Area Cultivated per Pair of Working Animals in India. (185/23 December 1960).
21. ——— : Studies on the Economics of Livestock Industry. (211/13 December 1960).
22. ——— : Studies on the Economics of Livestock Industry. (212/13 December 1960).
23. CHATTERJEE, N. K.: India's Imports in the Years 1949-50 to 1958. (160/30 May 1959).
24. ——— : India's Exports in the Years 1949 to 1958. (173/23 July 1959).
25. CHATTERJEE, N. and LAHRI, R. K.: Cost of Production of Cotton Textile Industry in India, 1948-56. (206/20 October 1960).
26. CHATTERJEE, N. and SANYAL, A.: A Note on Urban Distributive Margins (1953-54 1954-55). (190/15 February 1960).
27. DEY, B. and SANYAL, A.: Production, Utilization and Cost Structure of Mining in India, 1954-55. (208/2 November 1960).
28. GANAPATHI, R., PIELAI, TAPAN and SANYAL, ARUN : On Some Aspects of Rural Transport in India, 1955-56. (201/9 September 1960).
29. IYENGAR, N. S.: On a Problem of Estimating Increase in Consumer Demand. (188/10 January 1960).
30. ——— and TINTNER G. : A Special Form of Demand Function. (200/29 August 1960).
31. IYENGAR, N. S. and KRISHNA MOORTHY, S.: On Concentration of Employment in the Major Indian Manufacturing Industries. (170/15 June 1959).
- (31). KRISHNA MOORTHY, S. and IYENGAR, N. S.: On Concentration of Employment in the Major Indian Manufacturing Industries. (170/15 June 1959).
32. ——— : On the Effect of Changes in Reference Period in Consumer Expenditure Surveys. (187/15 January 1960).
- (25). LAHRI, R. K. and CHATTERJEE, N.: Cost of Production of Cotton Textile Industry in India, 1948-56. (206/20 October 1960).
33. ——— and SANYAL, A.: A Note on Year to Year Variation in Crop Output. (193/21 March 1960).
34. LANGE, OSKAR : Economic Planning and Management in the Socialist Economy of Poland. (174/17 August 1959).
35. MAHALANOBIS, B. and SARKAR, D. N.: Some Aspects of the Working of the Kalyan-shree. (195/31 March 1960).
36. MAITRA, T.: On the Variations in Price between States of India. (175/20 August 1959).
37. ——— : On the Dollar-Ruppee and Yuan-Ruppee Exchange Rate. (183/17 December 1959).

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38. MANTAKIN, V. I.: Statistics of Agricultural Output. (103/1 May 1959).
39. MAZUMDAR, H.: The Finance of Indian Capital Formation. (213/26 December 1960).
40. ——— and SOLOMON, MORRIS, J.: Inventory Holding by Manufacturers in India and the United States. (203/15 October 1960).
41. MUKHERJEE, M.: Mahalanobis Model and Price Changes. (164/29 April 1959).
42. ———: A Note on the Distribution of Households by Size Classes of Personal Income. (172/22 June 1959).
43. ———: A Note on the Magnitude of the Incremental Net-output Investment Ratio in Periods of Rising and Falling National Income. (176/7 September 1960).
44. ———: A Particular Formation of Correlation in Spaco. (178/30 September 1959).
45. ———: On the Effect of Changes in Expenditure Distribution on Consumer Demand. (179/20 October 1959).
46. ———: On the Available Estimates of the Breakdown of National Income by Distributive Shares in India. (192/8 March 1960).
47. ———: A Review of Series Estimates of National Income in India, 1900-1958 (196/24 June, 1960).
48. ———: A Preliminary Study of The Growth of National Income in India, 1857-1957. (207/21 October 1960).
- (2). MUKHERJEE, G. P. and BANERJEE, N.: A Study on Localization and Productivity of Jute Textile Industry of India. (191/1 March 1960).
- (1). NEOGY, K. and AHMED, M.: The Small-scale Industry in India in 1954-55. (163/20 April 1959).
- (10). PANDR, S. B. and CHAKRAVARTI, A. K.: On Estimation of Increase in the Demand of Road Transporte in India (1954-55). (160/20 May 1959).
49. PAUL, G.: Tables of Equivalents. (161/9 April 1959).
50. PIPLAI, T.: Contribution of Financial Intermediaries to National Income of India during 1954-55. (205/18 October 1960).
51. ———: Input-output Structure in the Indian Railways during 1954-55 and 1955-56. (177/24 September 1959).
- (28). ———, SANYAL, A. and GANAPATHI, R.: On Some Aspects of Rural Transport in India, 1955-56. (201/9 September 1960).
52. ROY, P. and ROY, S.: Pattern of Consumer Expenditure : A Historical Study. (162/13 April 1959).
53. ———: Trends in Industrial and Agricultural Real Wages in India, 1888 to 1922. (168/30 May 1959).
- (52). ROY, S. and ROY, P.: Pattern of Consumer Expenditure : A Historical Study. (162/13 April 1959).
- (53). ———: Trends in Industrial and Agricultural Real Wages in India, 1888 to 1922. (168/30 May 1959).
- (26). SANYAL, A. and CHATTERJEE, N.: A Note on Urban Distributive Margins (1953-54 and 1954-55). (100/15 February 1960).

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- (27). ——— and DEB, B.: Production, Utilization and Cost Structure of Mining in India, 1954-55. (208/2 November 1960).
- (33). ——— and LANTRI, R. K.: A Note on Year to Year Variation in Crop Output. (193/21 March 1960).
- (28). ———, PILLAI, T. and GANAPATHI, B.: On Some Aspects of Rural Transport in India, 1955-56. (201/9 September 1960).
- (35). SARKAR, D. N. and MAHALANOBIS, B.: Some Aspects of the Working of the Kalyan-shree. (195/31 March 1960).
- (15). SINHA, MIRA and CHATTERJEE, G. S.: National Income Estimates of India, 1944-45 to 1947-48—A Review. (204/17 October 1960).
51. SOLOMON, M. J.: Pattern for Optimum Plant Utilization in India. (209/29 November 1960).
- (40). SOLOMON, M. J. and MAZUMDAR, H.: Inventory Holding by Manufacturers in India and the United States. (203/16 October 1960).
- (30). TINTNER G. and IVENOAR, N. S.: A Special Form of Demand Function. (200/29 August 1960).

5.9.1 WORKING PAPERS PRODUCED IN THE DELHI UNIT OF THE PLANNING DIVISION

1. AHMED, MAHFOOZ: A Study of Economic Coefficients for Small-scale Industries in India. July 1959.
2. ———: The Capital and Labour Requirements of Small Factories. March 1960.
3. ———: Input Coefficients for Small-scale Industries in India.
4. ———: A Study of Personal Saving, Tax Structure and Consumption.
5. BHAGWATI, JAODISH: Notes on Excess Capacity in the Indian Economy. January 1959.
6. BHAGWATI, JAODISH, PRAKASH, VINOD and KANSAL, S. M.: An Outline of Financial Policy for the Third Plan. February 1960.
7. KANSAL, S. M.: National Income: 1955-70: Estimates and Projections Income Details. February 1960.
8. KANSAL, S. M. and SALUJA, M. R.: An Estimation of National Income for the year 1959-60.
9. KANSAL, S. M., PRAKASH, VINOD and UPADHYAY, P. K.: Structure of the Indian Economy: 1960-61 to 1965-66.
10. PANDALEY, M. S.: Scientists in India. July 1959.
11. ———: A Study of the Requirements of Schools and Teachers.
12. ———: Wastage in Technical Education.
13. PRAKASH, VINOD: Planning System and Economic Growth in Yugoslavia. March 1960.
14. PRAKASH, VINOD and GRACE, T. V.: A Study of Economic Coefficients for Organized Industries. April 1959.



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15. ——— : Investment, Output, Value added and Employment in Organized Manufacturing Industries in the Third Plan. May 1960.
16. PRAKASH, VINOD, GRACE, T. V., SHARMA, H. C., DUTTA CHAUDHURY, M. and RAMASWAMI, C. : Study of Investment-output Employment Relationships, Phasing of Investments and Time-lags in Organized Manufacturing Industry. March 1960.
17. PRAKASH, VINOD, GRACE, T. V., SHARMA, H. C., RAMSUNDAR, A. V. and RAMASWAMI C. : Input Coefficients of Organized Manufacturing Industries. September 1960.
18. UPADHYAY, P. K. : Working Capital Coefficients of Manufacturing Industries.
19. UPADHYAY, P. K. and GRACE, T. V. : Private Investment in the Organized Manufacturing Industry and Mining and its Financing during the Third Plan Period. August 1960.
20. UPADHYAY, P. K. and SHARMA, H. C. : Public Finance and Tax Policy in the Third Plan. May 1960.

5.10 LIST OF NATIONAL SAMPLE SURVEY REPORTS UPTO MARCH 1960

(Number within parenthesis indicate draft reports)

serial no.	report no.	title
1	1	General Report No. 1 on the First Round (October 1950-March 1951), <i>December 1952.</i>
2	2	Tables with notes on the Second Round (April-June 1951), <i>December 1953.</i>
3	3	Tables with notes on the Third Round (August-November 1951), <i>March 1954.</i>
4	4	Survey of persons in the "Live-Register" of Delhi Employment Exchange (August-September 1953), <i>ad hoc, March 1954.</i>
5	5	Technical Papers on some aspects of the development of the sample design, <i>March 1954.</i>
6	6	Survey of Faridabad Township (March-April, 1954), <i>December, 1954.</i>
7	7	Couple fertility. Second Round (April-June, 1951) and Fourth Round (April-June), <i>December 1955.</i>
8	8	Report on Preliminary Survey of Urban Unemployment (September 1953), <i>ad hoc, March 1956.</i>
9	9	Sample Survey of Displaced Persons in the Urban Area of Bombay State (July-September 1953), <i>ad hoc, October 1957.</i>
10	10	First Report on Land Holding (Rural Sector: July 1954-March 1955), <i>February 1958.</i>
11	11	Report on Sample Survey of Manufacturing Industries, 1950, <i>September 1958.</i>
12	12	A Technical Note on Age Grouping, <i>October 1958.</i>
13	13	Report on Small-scale Transport Operation (7th Round, October 1953-March 1954), <i>November 1958.</i>

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serial no.	report no.	title
14.	14	Some Characteristics of the Economically Active Population, (Fourth to Seventh Rounds: April 1952-March 1954), <i>March 1959.</i>
15	15	Report on Sample Survey of Manufacturing Industries, 1951, <i>December 1953.</i>
16	16	Report on Sample Survey of Employment and Unemployment (May-November 1955), <i>May 1959.</i>
17	17	Calcutta Employment Survey (September 1953), <i>May 1959.</i>
18	18	Tables with Notes on Fourth Round Consumer Expenditure Survey (April-September 1952), <i>September 1959.</i>
19	19	Report on Small-scale Manufacturing: Household Enterprise (October 1953-March 1954).
20	20	Pattern of Consumer Expenditure (Second to Seventh Rounds: April 1951-March 1954).
21	21	Report on Small Manufacturing Establishments (Ninth Round: May-November 1955).
22	22	Report on Sample Survey of Manufacturing Industries 1952.
23	23	Report on Sample Survey of Manufacturing Industries 1953.
24	24	Report on Household Retail Trade (Seventh to Ninth Rounds: October 1953-September 1955).
25	25	Sample Survey of Live-stock Census, 1956.
26	26	Preliminary Report on Housing Conditions (Seventh Round: October 1953-March 1954).
27	27	Some Basic Information about Sample Villages (Ninth Round: May-November 1955).
28	28	Report on Sample Survey of Manufacturing Industries, 1954: Fourth Round.
29	29	Tables with Notes on the Land Utilization Survey and Crop-Cutting Experiments (Tenth Round: December 1955-May 1956).
30	30	Report on Operational Land Holdings. Rural Sector (July 1954-March 1955).
31	31	Tables with Notes on Household Transport Operations (Eighth to Ninth Rounds: July 1954-May 1956).
32	32	Some Aspects of Costs of Cultivation (major crop) (Fifth to Seventh Rounds: October 1952-March 1954).
33	(22)	Notes on Investigator's Time Records, (Eighth Round: July 1954-April 1955).
34	(31)	Report on Wages, Employment, Income and Indebtedness of Agricultural Labour Households (Eleventh and Twelfth Rounds: August 1956-August 1957).
35	(32)	Tables with notes on Consumer Expenditure of Agricultural Labour Households (Eleventh and Twelfth Rounds: August 1956-August 1957).
36	(33)	Report on the Ownership Aspects of Land Holdings, Rural Sector (July 1954-March 1955).

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serial no.	report no.	title
37	(36)	Preliminary Estimates of Birth and Death Rates and of the Rate of Growth of Population (Fourteenth Round : July 1958-July 1960).
38	(39)	Tables with Notes on Employment and Unemployment Survey (Tenth Round : December 1955-May 1956).
39	(40)	Some Results of the Land Utilization Survey and Crop-Cutting Experiments (Thirteenth Round : September 1957-May 1958).
40	(41)	Some Aspects of Cost of Cultivation of Minor Cereal Crops, Pulses and Sugarcane (Fifth to Seventh Rounds : November 1952-March 1953, May 1953-August 1953, November 1953-March 1954).
41	(42)	The National Sample Survey Tables with Notes on Consumer Expenditure Survey (Ninth Round : May-September 1955).
42	(43)	Tables with Notes on Employment and Unemployment (Eleventh and Twelfth Rounds : August 1956-August 1957).
43	(44)	Tables with Notes on Employment and Unemployment (Thirteenth Round : September 1957-May 1958).
44	(45)	Tables with Notes on Consumer Expenditure (Tenth Round : December 1955-May 1956).
45	(46)	Report on Land Holdings (4) Rural Sector (Some aspects of operational holdings—population zones and all India). (Eighth Round : July 1954-April 1955).
46	(47)	Vital Rates (Seventh Round : October 1953-March 1954).
47	(48)	Tables with Notes on Consumer Expenditure (Eighth Round : July 1953-March 1954).
48	(49/1)	Preliminary Estimates of Rural Retail Prices (Fourteenth Round : July 1958-June 1959).
49	(50)	Notes on the Results of the Land Utilization Survey and Crop-cutting Experiments (Twelfth Round : March 1957-August 1957).
50	(51)	Report on Small-scale Manufacture (Household enterprise smaller than Registered Factories). (Seventh and Eighth Rounds : October 1953-April 1955).
51	(52)	Tables with Notes on Small-scale Manufacture (Household enterprise smaller than Registered Factories). (Ninth and Tenth Rounds : May 1955-May 1956).
52	(53)	Survey of Book Readers' Preference in India (Thirteenth Round : September 1957-May 1958).
53	(54)	Household Retail Trade (Tenth Round : December 1955-May 1956).
54	(55)	A Note on Profession, Service and Financial Operations (Fourth to Eighth Rounds : April 1952-April 1955).
55	(56)	Tables with Notes on Internal Migration (Ninth, Eleventh, Twelfth and Thirteenth Rounds : May 1953-May 1958).

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serial no.	report no.	title
56	(57)	Report on Employment and Unemployment (Ninth Round : Supplementary, May–November 1955).
57	(58)	Tables with Notes on Livestock Products (Fifth to Seventh Rounds : April 1952–March 1954).
58	(59)	Report on Sample Survey of Manufacturing Industries 1954 (2) Exploratory Survey of Scheduled Industries (Fourth Round).
59	(60)	Notes on the Results of the Land Utilization Survey and Crop-cutting Experiments (Eleventh Round : August 1956–February 1957).
60	(61)	Some Results of the Land Utilization Survey and Crop cutting Experiments (Fourteenth Round : July 1958–June 1959).
61	(62)	Report on Sample Survey of Manufacturing Industries 1955 (1) Survey of Scheduled Industries (Fifth Round).
62	(63)	Report on Morbidity (Thirteenth Round).
63	(64)	Tables with Notes on Pattern of Household Ownership and Possession of Land in Rural Areas (1950-51 to 1953-54 Eighth Round : July 1954–April 1955).
64	(65)	Tables with Notes on Housing Condition (Tenth Round : December 1955–May 1956).
65	(66)	Report on Sample Survey of Manufacturing Industries 1956 (1) (Sixth Round).
66	(67)	Indian Villages. A Study of some Social and Economic Aspects (Tenth to Twelfth Round).
67	(68/1)	Tables with Notes on Small-scale Manufacture—Rural (Fourteenth Round : July 1958–June 1959).
68	(69)	Consumer Expenditure by Levels of Household Expenditure (Thirteenth Round : September 1957–May 1958).
69	(70)	Tables with Notes on Farming Condition and Practices in Rural Indian Areas 1953-54.
70	(71)	Tables with Notes on Housing Condition (Eleventh Round : August 1956–January 1957).
71	(72)	Tables with Notes on Consumer Expenditure (Eleventh Round : August 1956–January 1957).

5.11 RESULTS SUBMITTED TO THE GOVERNMENT NOT INCLUDED IN THE LIST GIVEN  
IN APPENDIX 5.10.

1. Some Tables on Family Living Surveys—Middle Class—for the 4 metropolitan centres—Bombay, Calcutta, Delhi and Madras.
2. Some Tables on Family Living Surveys—Working Class—for the priority centres—Bombay, Calcutta, Madras, Kanpur, Delhi, Jamshedpur, Saharanpur, Monghyr-Jamalpur, Sholapur, Bhopal, Gwalior, Coimbatore, Guntur, Amritsar, Yamunanagar and Ajmer.

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5.12 LIST OF WORKING PAPERS AND NOTES

- NSS/W.1. JOSHI, K.: A Note on the Nature of the Basic Data on Large Industries Establishments in India.
- NSS/W.2. DAS, RHEA and MITRA, S. B.: Evolution of the NSS 11th Round Training and Discussion Conference of July 1956.
- NSS/W.3. MAJUMDAR, M.: Growth of Urban Delhi.
- NSS/W.4. SARKAR, B. N.: Concept of Household Membership in National Sample Survey.
- NSS/W.5. SARKAR, D. N.: Baranagar: A Demographic Study. Growth of Population and Population Characteristics.
- NSS/W.6. MURTHY, M. N. and SETHI, V. K.: Self-Weighting Design at Tabulation Stage.
- NSS/W.7. SOM, R. K., PILLAI, B. T., DE, A. K. and MUKHERJEE, H. L.: A Note on the Testing of Experimental Census Questionnaire of Adachi Machi, Japan.
- NSS/W.8. DATTA MAZUMDAR, D. K.: Reliability of NSS Estimates of Milk and Milk Products.
- NSS/W.9. SANYAL, S. K., SINHA, S. K. and SAHA, R. P.: Some Suggestions for Agricultural Census, 1960.
- NSS/W.10. SOM, R. K. and DE, A. K.: Rates of Birth, Death, and Growth from the National Sample Survey Rounds, 1953-59.
- NSS/W.11. DE, A. K.: Rates of Births occurred in the Household Premises: NSS 13th round (rural): September 1957-May 1958.
- NSS/W.12. DATTA MAZUMDAR, DEB KUMAR: Pattern of Consumer Expenditure on Milk and milk products.
- NSS/W.13. MUKHERJEE, G. P. and BANERJEE, NANDADULAL: A Statistical Study of the Size-efficiency Relationship of the Jute Textile Industry of India.
- NSS/W.14. PILLAI, B. T. and SOM, R. K.: A Note on Family Planning: NSS Type Study on Population and Vital Statistics, 1958-59: March 1960.
- NSS/W.15. DAS, N. C. and MUKHERJEE, H. L.: Pre-testing of 1961 Census of India Draft Questionnaire: April 1960.
- NSS/W.16. SOM, R. K. and BOSE, S. S.: A Note on Household Expenditure: May 1960.
- NSS/W.17. GANGULY, AMALENDU and DAS, NITAI CRANDRA: Progress of Literacy in West Bengal Household Comparative Study: 1955 May 1960.
- NSS/N.1. SENGUPTA, J. M.: On Perimotor Bias in Sample Cuts of Small Size.
- NSS/N.2. ———: On the Use of Motor Vehicles in Crop-cutting Surveys.
- NSS/N.3. ——— and ROY, A.: Some Studies on the Estimated Rates of Food Consumption based on Household Interviews with varying Lengths of Reference Period.
- NSS/N.4. SENGUPTA, J. M., DATTA, N. C. and ROY, S.: Experimental Land-utilization Survey in Cadastrally Unsurveyed Areas through direct Plot-to-Plot Observation, Bihar, 1956-57.
- NSS/N.5. SENGUPTA, J. M. and TALUQDAR, J. N.: The Possibilities of an Indirect Estimation of Paddy yield from Auxiliary Plant Characters.

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- NSS/N.6. SENGUPTA, J. M., ROY, A. and TALUQDAR, J. N. : Some Studies relating to the Variation in rates of Consumption and Purchase for a few Selected Food Items.
- NSS/N.7. ——— and SINHA, A. : Some Studies on the Consumption of Food and Clothing.
- NSS/N.8. ——— : Special Crop Survey Experiments at Jalpaiguri and Murshidabad 1958-59.
- NSS/N.9. ——— : A Study of the Field Coat for the Collection of Household Consumption Data by an Interview Method.
- NSS/N.10. ———, TALUQDAR, J. N. and SEN, T. : A Pilot Study on the Consumption of Patent Drugs in Calcutta.
- \*PD153/7. MUKHERJEE, G. P. and DAS, PRANBANDHU : How far Size affects Productivity of the Industrial Unit—A Study of the India's Major Industries.
- \*PD.NSS.WP/59(191). BANERJEE, NANDADULAL and MUKHERJEE, G. P. : A Study on Localization and Productivity of Jute Textile Industry of India.

### 5.13 LIST OF PUBLISHED PAPERS

1. MURTHY, M. N. and NANJAMMA, N. S. (1959) : Almost Unbiased Ratio Estimates based on Interpenetrating Sub-samples, *Sankhyā*.
2. MURTHY, M. N., NANJAMMA, N. S. and SETHI, V. K. (1959) : Some Sampling Systems providing Unbiased Ratio Estimates, *Sankhyā*.
3. MUKHERJEE, G. P. (1958) : Our Industrial Progress since Independence—A Bird's eye View, *Economic Affairs*, Vol. III, No. 9, September.
4. ——— (1959) : Effect of Location on the Productivity Aspect of Jute Textile Industry of India, *Economic Affairs*, Vol. IV, No. 2, February.
5. MUKHERJEE, G. P. and BANERJEE, NANDADULAL (1959) : Structure of Indian Industries—I. *Economic Affairs*, Vol. IV, No. 7, July.
6. ——— (1959) : Structure of Indian Industries—II. *Economic Affairs*, Vol. IV, No. 8, August.
7. ——— (1959) : Structure of Indian Industries—III. *Economic Affairs*, Vol. IV, No. 11, November.
4. SOM, R. K. (1959) : Self-weighted Sample Design with an equal Number of Ultimate Stage Units selected in each of the Penultimate Stage Units. *Bull. Calcutta Statistical Assn.*
5. SOM, R. K. and DE, A. K. (1960) : Current Population Estimates for India. *Indian Sociological Conference*, Lucknow.
6. SOM, R. K. (1960) : Note on Household Size and Composition in India. *Indian Sociological Conference*, Lucknow.
7. SOM, R. K. (1959) : On recall Laps in Demographic Studies. *International Population Conference*, Lucknow.

\* Working paper of the Planning Division.

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Appendix 6 : Electronic Computer Division

6.1 LIST OF COMPUTER PROGRAMMES

Type of Problem	Sponsoring Authority	Numerical Method and Check	Programmed by
1. Matrix Multiplication upto 32nd order (floating point)	Department	Sum Check	S. M. Mukherjee
2. Calculation of Standard Error (N.S.S. Population Studies)	N.S.S. Department	Arithmetic Check	-do-
$S_{pa}^2 - \frac{1}{y_k} \left( S_{pa}^2 + r_{pa}^2 S_{pa}^2 - 2hr_{pa} S_{pa} S_{ah} \right)$			
3. Analysis of Variance Tables (Stratum, State, Zones and All-India level)	N.S.S. Department		-do-
4. Latent Roots of Symmetrical Matrices upto Order 28	Saha Institute of Nuclear Physics, Calcutta	Jacobi's Method Invariance of Norm & Trace	-do-
5. Latent Vectors of Matrices upto Order 20 when roots are found	-do-	Cayley-Hamilton Theorem	-do-
6. Reciprocal of any number upto 700 places of decimal	Department	—	-do-
7. Selection of Shift Register Code for Infix Application (Posthuma Sequence)	Department	—	A. Sen Gupta
8. Calculation of Mean, Standard Deviation & Correlation Coefficients of Rainfall Data	Meteorological Department, Poona.	—	-do-
9. Determination of Structure Factor of Crystal Structure Analysis	Indian Institute of Technology, Kharagpur	—	-do-
10. Fractile Graphical Analysis on NSS data	Director	—	-do-
11. Inversion of Matrix of Order of 36	Planning Division	Pivotal Condensation	P.K. Mitra
12. Inversion of Matrix of Order 13	-do-		-do-
13. A problem in External Ballistics	Ministry of Defence	Runge & Kutta	-do-
14. Least Square Solution of 27 linear equations with 7 variates	Indian Institute of Technology Bombay	Pivotal Condensation	-do-
15. Tabulation of a certain class of Probability functions by Numerical Integration	R.T.N.	—	-do-
16. Standard Error Calculation (Consumer Expenditure)	N.S.S.	—	R.N. Bose

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Type of Problem	Sponsoring Authority	Numerical Method and Check	Programmed by
17. Rapid Inversion of Matrix Order 18	Department	Pivotal Condensation	-do-
18. Computation of the Error Matrix of the Inverted Matrix		Matrix Multiplication and Addition	-do-
19. Continuation of the Work of Computation of Latent Roots and Vectors of Symmetrical Matrices	Andhra University	Jacobi's	M. K. Paul
20. -do-	Saha Institute of Nuclear Physics, Calcutta		-do-
21. Calculation of critical values for non-parametric test	R.T.S.		-do-
22. Maximum Likelihood estimates of O-A-B Blood Group gene frequencies	Biometry, R.T.S.		-do-
23. Integration of the Differential Equation	Tata Institute	Rungo & Kutta	-do-
		$\frac{d^2\phi}{dx^2} = \frac{\phi}{x^2} \left[ 1 + \lambda \left\{ \frac{3d\phi}{dx} - \frac{x}{\phi} \left( \frac{d\phi}{dx} \right)^2 \right\} \right]$	
		by finding the initial slope by trial	
24. A problem on Orthogonal Latin Squares	R.T.S.	—	Miss E. Seidon

6.2 LIST OF SUB-ROUTINES AVAILABLE IN THE PROGRAMME LIBRARY

For *HEC2M*

1. Evaluation of the  $n$ th root of a proper fraction.
2. Multiplication of two Square Matrices upto an order 18.
3. Evaluation of the Eigen Values of Real Symmetric Matrix.
4. Calculation of the Eigen Vectors of a Real Symmetric Matrix by a finite iteration process with predetermined Eigen Values.
5. Multiplication of two rectangular matrices with check.
6. Inversion of Matrix upto order 16 by the Pivotal Condensation method.
7. Solution of Linear Equations upto a maximum of 22 variables.
8. Linear Programming by Simplexing Method for a maximum of 500 elements.
9. Calculation of the square root of a number.
10. Computation of  $\sin x$  and  $\cos x$  by the method of Chebyshev's polynomials.
11. Multiplication of Rectangular Matrices (with sum check) of orders  $m \times n$  and  $n \times p$  where  $mn + np = 750$ .



*For URAL*

1. Matrix Multiplication of two matrices each upto 36 order in floating point arithmetic.
2. Determination of Latent Roots (Eigen Values) of Symmetrical Matrices upto 28 order.
3. Determination of the Latent Vectors (Eigen Vectors) of Matrices upto 20 order when all the roots are known.
4. Inversion of Matrix upto 60 order by Pivotal Condensation.
5. Rapid Inversion of Matrix upto order 18.
6. Evaluation of square root of a number.
7. Evaluation of exponential, sine, cosine and logarithmic functions.

6.3 LIST OF RESEARCH PAPERS PUBLISHED

1. DUTTA MAJUMDER, D.: A Track Switching System for Magnetic Drum Memory. Electronic Engineering; December, 1958.
2. ———: On the Optimum Design of Magnetic Drum Store. J. I. T. E., September, 1959.
3. NADLER, M. and SEN GUPTA, A.: Shift Register Code for Indexing Applications. Comm. A. C. M., pp. 40-43; Vol. 2, No. 10, 1959.

6.4 LIST OF PAPERS COMMUNICATED FOR PUBLICATION

1. DUTTA MAJUMDER, D.: A Magnetic Drum Digital Storage System.
2. ———: Recording of Digital Data on Magnetic Drum.
3. BASU, S. and NADLER, M.: Hazardless Transistor Elementary Logical Circuit.

6.5 LIST OF PAPERS COMPLETED

1. SINGHA ROY, P. K. and DUTTA MAJUMDER, D.: A Transducer for Microseism Pickup from Milne-Shaw Seismograph.

**Appendix 7 : A Note on Demographic Research**

RESEARCH

Population problems began to receive serious attention in the 1930's. The only sources of data available at that time were the successive decennial censuses and the vital statistics provided by the registration departments, the latter known to be wholly inadequate both in quality and quantity. Professor Mahalanobis pointed out in 1937 (1) that long range forecasts of the growth of population were not reliable and of little value, but the growth of population in the immediate future was of supreme importance to national welfare. He emphasized that scientifically planned sample surveys could adequately meet the needs for demographic research, provide estimates of population growth, and furnish useful information for the study of differential fertility and mortality and the factors associated with them. He further stated that demographic data secured through inter-causal sample surveys could also supply independent external checks on the decennial census returns.

Although the collection of the primary data was completed in the population census of 1941, tabulation was severely cut down owing to war conditions. Fortunately, a two-per-cent systematic sample census slip (called the Y-sample, after Mr. M. W. M. Yeatts,

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the Census Commissioner) had been preserved. At the instance of the Indian Statistical Institute, the Government of India agreed to entrust the Institute with the task of tabulation of the 1941 census data on the basis of the 2 percent *Y*-sample in respect of certain important census characteristics such as age, sex, means of livelihood, etc. The Government of India also sanctioned a grant to this Institute to conduct experimental studies on sampling census slips for sample tabulation. Work on this project based on the 1941 census slips of Hazaribagh district (Bihar) was initiated in this Institute by D. B. Lahiri and others (2). As a result of this study valuable information was obtained for the preparation of efficient designs of sample selection of census slips for tabulation purposes as well as for sample surveys of population. Besides, some analytical work in the sphere of graduation of birth rates and labour measurement from census were done in the Institute (3).

After the 1951 census further work on population sampling was carried out in this Institute for the National Sample Survey (NSS) on the basis of the census frames. Construction of a suitable frame for urban sample selection was conducted by S. J. Poti and others (4) and currently this problem has been taken up on an all-India scale by the NSS Programmes Committee. A good deal of useful demographic data are being systematically collected in the National Sample Survey. In the second and fourth rounds of the National Sample Survey, detailed information was collected on the fertility history of the couples and other demographic characteristics on an all-India basis. The past trend in fertility and its differentials with respect to socio-economic characteristics were studied in great detail by A. Das Gupta and his associates (5). Extensive data on urban and rural employment (6), rural urban migration, etc. were collected in the subsequent rounds of the NSS. Further, a detailed study of some characteristics of the economically active population based on the demographic data collected in the fourth to the seventh rounds of the NSS was carried out by R. K. Som and others (7).

Besides the collection and analysis of demographic data, studies of methodological importance were carried out in this Institute. An assessment of the validity of demographic statistics based on interpenetrating sub-samples was made by Mahalanobis and Das Gupta (8). Further, notable contributions in this field have been made by D. B. Lahiri, A. Das Gupta and R. K. Som. In this connexion the works done by D. B. Lahiri (9) on the validity of statistics collected by census and sample surveys, on recall lapse in the reporting of vital events by R. K. Som (10) and on the accuracy of age reporting by A. Das Gupta (11) deserve special mention. Besides these, an extremely interesting study on the comparability of census economic data was carried out at the Bombay branch of the Institute by Daniel and Alice Thorner (12).

Pilot surveys are also being carried out for the purpose of developing suitable techniques for special purposes. In this connexion, reference may be made to the health survey conducted in West Bengal wherein the validity of morbidity and other health statistics collected through the usual agencies of the NSS were assessed by S. J. Poti and his associates (12). The Government of India is interested at present in assessing the current growth rate of the population for the formulation of the Third Five-Year Plan. On the recommendation of the Working Group in Vital and Health Statistics of the Planning Commission, a major item was included in the NSS fourteenth round to collect relevant population data for studying growth rates in rural areas. Results of a provisional analysis based on the sample of the sub-rounds have been given in a series of working papers (14).

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With the help of a grant from the Ministry of Health a centre for demographic research has been recently established in this Institute to study factors associated with fertility and mortality. A team including S. J. Poti, M. V. Raman and some young research workers have been engaged in such research projects since the latter part of 1957. A number of research topics have been dealt with by this centre among which the study on social mobility and their demographic effects (15) and the enquiry on prevalence of contraceptive practices and their effect on fertility (16) may be mentioned here. A study of existing information on population for development planning in India was carried out at the instance of the United Nations by S. J. Poti and others (17).

### TRAINING

In the curriculum for the advanced professional course in Statistics provided by the Research and Training School of the Institute, training in demographic techniques forms one of the important topics. A number of lectures and practical classes are held for the first and second year post-M.Sc. students along with the special course in Biometry conducted by Professor J. B. S. Haldane who himself has been giving a series of lectures on the biological aspects of fertility and mortality. Poti, Raman and Malaker dealt with the general demographic methods including mathematical theory of population, health statistics, demographic surveys and census methods. Students of the third or final year of the Research and Training School who seek specialization in demography are given training lasting for a year in advanced demographic methods and are required to submit the results of their studies in the form of thesis on assigned topics. This specialization course was started in 1957-58 and already one student in 1957-58, four in 1958-59 and one in 1959-60 have been trained.

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2. LAURI, D. B. (1957) : Studies in Population Sampling, Volume 1, Indian Statistical Institute, 1957.  
(This report is based on the experimental study on 1941 census slips of Hazaribagh district (Bihar) carried out at the instance of the Government of India).
3. SARKAR, B. N. (1951) : Graduation of Birth Rates.  
(This paper discusses the relative merits of different methods of fertility rate graduation with reference to weaving survey (1930) data and F-sample data (1941).
4. POTI, S. J. (1954) : A Population Sample Frame for Calcutta City. Indian Statistical Institute, 1954.  
(Maps showing geographical boundaries of 30 census circles in Calcutta city comprising a population of about 2 lakhs and of the blocks within them have been included in this note).
5. DASGUPTA, A., SUM, R. K., MAJUMDAR, M. and MITRA, S. N. (1955) : Couple-Fertility. Report No. 7, National Sample Survey, Government of India, 1955.  
(Demographic data from the second and fourth rounds of the NSS were used for this study. The fertility rates have been analysed in great detail to bring out the trend in fertility during the period 1910-19 and to study differential fertility with respect to social classes.)

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- 6(a). **REPORT ON PRELIMINARY SURVEY OF URBAN UNEMPLOYMENT, September, 1953.** Report No. 8, National Sample Survey, Government of India, 1956.  
(This is a preliminary study carried out in 1953 covering towns with population about 50,000 but excluding the four big cities of Calcutta, Bombay, Madras and Delhi for the purpose of formulating suitable concept and definitions and developing suitable designs of surveys of employment, unemployment and under-employment in future. Besides offering a number of statistical tables of gainfully occupied and unemployed persons, the report gives considerable amount of demographic data on migration, level of living, education, intensity of employment, etc.)
- d(b). **REPORT ON EMPLOYMENT AND UNEMPLOYMENT, PRELIMINARY, May-November, 1955.** Report No. 16, National Sample Survey, Government of India, 1959.  
(This survey undertaken in the ninth round of the NSS is the first of its kind to be carried out on an all-India basis. The demographic particulars of the gainfully occupied and unemployed persons have been extensively analysed in this report. The problem of under-employment has also been dealt with in considerable detail.)
- 6(c). **REPORT ON CALCUTTA EMPLOYMENT SURVEY, PRELIMINARY, September 1953.** Report No. 17, National Sample Survey, Government of India, 1959.  
(This is a preliminary study carried out in 1953 in Calcutta City. This survey was undertaken to formulate the concepts and definitions and for developing suitable designs of surveys of employment, unemployment and under-employment. Besides offering a number of statistical tables of gainfully occupied and unemployed persons, the report gives considerable amount of demographic data on migration, education, intensity of employment, etc. In this survey 5,000 households were selected by multi-stage sampling, the household being the ultimate sampling unit.)
7. **REPORT ON SOME CHARACTERISTICS OF THE ECONOMICALLY ACTIVE POPULATION.** Report No. 14, National Sample Survey, Government of India, 1958-59.  
(This report is based on demographic data collected in the different surveys included in the fourth to seventh rounds of the NSS, covering about 90,000 sample households spread over the entire country. In this report, labour force participation in different sectors of industry by age groups and other demographic characteristics have been analysed in detail. Further, comprehensive studies on working life expectancy, intensity of employment, reasons for under-employment and occupational mobility have also been made.)
8. MAHALANOBIS, P. C. and DASGUPTA, A. (1954): The Use of Sample Surveys in Demographic Studies in India. World Population Conference, Rome, 1954. (F/CONF-13/194).  
(This paper discusses how the accuracy of demographic statistics from the point of view of both sampling and non-sampling errors could be quickly assessed by the method of inter-penetrating sub-samples.)
9. LAHIRI, D. B. (1958): Recent Development in the Use of Techniques for Assessment of Errors in Nation-wide Surveys in India. *Bulletin de l'Institut International de Statistique*, Stockholm, 1958.  
(This paper discusses various method of external and internal checks for assessing errors in censuses and large scale demographic surveys with particular emphasis on the method of 'self-validation' in demographic data.)

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10. SOM, R. K. (1959) : On recall Lapse in Demographic Studies in India. International Population Conference, Vienna, 1959.  
(In this paper the errors introduced in historical demographic data and those found in the reporting of vital events due to lapse of memory on the part of the respondents have been studied in detail.)
11. DASGUPTA, A. (1958) : A Technical Note on Age-grouping. Report No. 12, National Sample Survey, Government of India, 1958.  
(Digit preference on the part of the respondents in the reporting age has been studied in detail for the purpose of adopting suitable grouping of ages in future age classifications.)
12. THORNER, D. and THORNER, A. (1958) : Comparability of Census Economic Data 1881-1951. Indian Statistical Institute, Bombay Branch, 1958.  
(This paper deals with the comparability of economic classifications adopted in the successive Indian censuses from 1881-1951. As a result of this study the authors have made a number of valuable suggestions for future collection of census economic data.)
13. POTI, S. J., RAMAN, M. V., BISWAS, S. and CHAKRABORTY, B. (1959) : A Pilot Health Survey in West Bengal, 1955, *Sankhyā*, 21, parts 1 and 2.  
(This pilot survey was undertaken with the object of evolving suitable method for the collection of morbidity, disability and medical care statistics. It also deals with the relative accuracies in the classification of causes of morbidity by medical and non-medical investigators.)
14. PRELIMINARY ESTIMATES OF BIRTH AND DEATH RATES AND OF THE RATE OF GROWTH OF POPULATION. National Sample Survey (fourteenth round).  
(Provisional estimates of birth and death rates obtained in the various sub-rounds are available in a series of working papers.)
15. POTI, S. J. and DUTTA, S. : Pilot Study on Social Mobility and Differential Fertility, West Bengal, 1956.  
(About 800 rural households selected from 24 villages in West Bengal and about 500 urban households selected from Calcutta city were covered in this survey. Inter-generational occupational mobility in rural and urban areas and its association with fertility and infant mortality have been studied. Further, differential fertility with respect to social classes have also been studied in some detail. The report has been submitted for publication.)
16. POTI, S. J., MALAKER, C. and CHAKRABORTY, B. (1959) : Enquiry into the Prevalence of Contraceptive Practices in Calcutta city, 1956-57. Report of the Proceedings of the Sixth International Conference on Planned Parenthood, 1959, New Delhi.  
(This study relates to an assessment of the prevalence of different types of contraceptive practices and their effect in the reduction of pregnancies among three major social classes in Calcutta city. It also deals with some important cultural characteristics of these social classes and their relation to family planning.)
17. POTI, S. J., *et al.* (1957-58) : A Study of existing Information on Population in relation to Development Planning in India. Indian Statistical Institute, 1957-58.  
(This report prepared at the instance of the U.N. gives an integrated summary of the findings of various demographic surveys and censuses so as to present a picture of the past demographic trends in India. Attempts have also been made to utilize those results to estimate future population for development planning.)

## INDIAN STATISTICAL INSTITUTE

### Appendix 8: Library, Central Records and Museum

The increasingly acute space problem of the Central Library could not be solved even though the administrative authorities gave considerable attention to the matter and the Library had to work under tremendous difficulties due to extreme congestion of the collections for shortage of storage space, curtailment of the display of reading materials and inadequate provisions for reading room and catalogue area. This pressing space problem kept the Library much too preoccupied with the shifting and rearrangements of the book stock on several occasions and consequently the Library service suffered greatly. The Library could not undertake any developmental programme and there were few changes in its internal organization.

*Special Collection* : Scientific and technical books in Russian, Japanese and Chinese languages were received as in previous years through exchange arrangements with learned societies and institutions in the USSR, Japan and China. The processing of these publications proceeded satisfactorily.

The collection of photo-duplicated material in the library now consists of 252 micro-film rolls running to over 2200 feet and containing 22000 exposures and 8756 pages of paper prints.

*News Clippings* : Clippings of newspaper articles and news items relating to statistics, economics and planning were made regularly from 24 representative Indian dailies. The number of clippings made and processed during the year totalled 4775 bringing the total to 32,480. Altogether 14088 newspapers were sorted and 188 relevant articles were indexed from newspapers and periodicals.

*Circulating Library* : 1238 persons used the Workers' Circulating Library, against 1167 workers last year. 98 new members were enrolled as against 143 in the previous year. 2103 Bengali, 336 English, 178 Hindi and 52 Urdu books were added to the Circulating Library, bringing the total to 12596 volumes. As in previous years the stock was rotated among the different branch libraries. Books issued from Calcutta and Giridih totalled 30267 and of these, 90% issued from the Calcutta centre were fiction.

*Museum* : The acquisition and indexing of original materials (including correspondence, manuscripts, photographs, research papers, curios and other materials of permanent or historical value) proceeded satisfactorily. Altogether 108 items have been treated (64 letters, 34 photographs, 96 miscellaneous documents and 5 curios) and arranged systematically in suitable filing cabinets.

*Records Unit* : About 9162 office files were checked and classified during the year. The preliminary scrutiny of 3127 old files was completed and of these 2066 were processed and 290 indexed. 5,641 sheets of maps were sorted and 2,54,432 sheets of C.S. & P.S. maps were classified and indexed. 2160 sheets of maps were mended and mounted.

*Photographic Unit* : Documentry reproduction work consisted of 1822 frames of microfilm, 1744 photoprints from microfilms and 1340 photostat prints. The Unit took 684 photographs of important functions, visitors, guests, and workers and made 1718 bromide enlargements. Other work included the preparation of 83 lantern slides, 40 colour photographs and 47 photo reproduction of old subjects.

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LIST OF DOCUMENTS TRANSLATED INTO ENGLISH

RUSSIAN :

1. *Belkin, V.* : On the relations among the national income, national product and prices in planning; methods for plan calculations using electronic computers (Primary reports of the higher school: Economic Sciences, no. 4, 1958.).
2. *Krylov, M. N.* : Sampling method in statistics (Vyborschnyy metod v statistike) 1957.  
Essence of the sampling method—changes in sampling methods depending on the character of the subject of investigation—sampling methods in industrial statistics—sampling methods in agricultural statistics—sampling methods in trade statistics—sample survey of working class family budgets—history of the application of sampling—outlines of the development of sampling methods.
3. *Mahalanobis, P. C.* : Study of the problems of industrialization in the underdeveloped countries (Izucheniye problem industrializatsii slabo razvitykh stran, *Sovremennyy Vostok*, no. 9, September 1959).
1. *Mahalanobis, P. C.* : Industrialization—a key to the consolidation of independence (Industrializatsia—kliuch k ukrepleniiu nezavisimosti, *Sovremennyy Vostok*, no. 12, Dec. 1958).
5. *Maniakin, V. I.* : Family Budget Enquiry (from manuscript of V. I. Maniakin, Central Statistical Administration, USSR).
6. *Malliev, Dimitr* : "Roem"—A new method of blood sedimentation.
7. *Shmirov, P. V.* : Militant programme of union activities in higher schools. (From the Journal 'Higher School Review', no. 2, 1958).
8. *Strukov, A. P.* : Methods of industrial production planning.
9. *Strumilin, S. G.* : Problems of labour economics (Problemi ekonomiki truda) Moscow, State Publishing House for Political Literature. 1957, pp. 733.  
On the question of classification of labour—problems of rationalization of labour—study of labour qualifications—economic significance of national education—on the problem of birth rate among the labour class—methodology of the study of working class budgets—study of labour-class living in the USSR—living standard with reference to household effects—labour conditions in agriculture—labour conditions in industry—trend in labour conditions in the USSR during 1917-1927—problems of labour productivity.
10. *USSR Central Committee of the Trade Union of the Workers of Mass Education*. Higher Education and Scientific Institutions: Trade unions—active participants in the reorganization of schools (*Uchitel'skaya Gazeta*, 13 December 1958).
11. *USSR Central Statistical Administration* : Level of education, national composition and age structure of the population of the USSR according to the all Union Population Census of 1959.
12. *USSR Trade Unions of Educational, Higher Educational and Scientific Workers of the USSR* : Byo-laws adopted at the first congress on 14 May, 1958.

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### CHINESE :

1. *State Statistical Bureau, China* : Collection of statistical data on socialist construction (first five-year plan). 1956.
2. *State Statistical Bureau, China* : Explaining some of the problems of compiling the constant price of industrial products in 1957. (Statistical Work no. 10, 1957).
3. *Statistical Work Data Collecting Section, China* : Basic situation of planned purchase and supply of foodgrains in China (Statistical Work no. 19, October 1957).
4. *Statistical Work Data Collecting Section, China* : Position of the capital fund in the industries of the whole country (Statistical Work no. 1, 1957).
5. *Provincial Statistical Bureau, Honan* : Some preliminary progress in the analysis and the application of the farmer's family budget survey data (Statistical Work, no. 1, 1957).
6. *Mo Yueh Ta* : Development of the Agricultural Co-operative movement in China, 1957.

Agricultural mutual aid co-operatives in China before the establishment of People's Republic—agricultural producers' mutual aid co-operatives during the period of rehabilitation of the national economy.

### JAPANESE :

1. *Hosono, Koichi* : Outline of small enterprise financing in Japan. 1960. (translation series no. 7).
2. *Economic Planning Agency, Japan* : Structural changes and investment of transportation in Japan. 1959. (trans. series no. 3).
3. *Planning Bureau, Japan* : Unit consumption and commodity balances of selected industries. 1959. (trans. series no. 2).
4. *Translation Unit, Tokyo, Japan* : Structure of food demand, post-war period. 1959. (trans. series no. 4).
5. *Translation Unit, Tokyo, Japan* : Structure of food demand, pre-war period. 1959. (trans. series no. 1).
6. *Kojima, Kiyoshi* : Economic development and import dependence of Japan. 1960. (trans. series no. 5).
7. *Okita, S. and Okawa, K.* : Economic planning in Japan. 1960 (trans. series no. 6).
8. *Tsuji, Hideo* : Wage structure in Japan—as observed by size of firm and age group. 1960. (trans. series no. 8).

### GERMAN :

1. *Stromer, E.* : Desert-fish *Ceratodus Ag1838* and its mesozoic and caenozoic kins.
2. *Würzer, Rudolf* : Regional plan for the Worth Lake ("Raumforschung und Raumordnung" in Space Research and Space Engineering, 1956, pt. 1, pp. 1-13.).

### FRENCH :

1. *Bettelheim, Charles* : How economic science can serve economic and social progress. Summary of the draft of the introductory report to the 3rd section of the symposium on "Science, Progress and Welfare of the Nations". (Resume du projet de rapport introductif de la Section 3 du Symposium sur "La Science, le Developpement et le Bien-être des Peuples.")



**Appendix 9 : Medical Welfare Unit**

The Medical Welfare Unit which is now in the sixteenth year was set up on a modest scale in February 1945. Since the shifting of the Institute's headquarters from Calcutta to Baranagar, the Unit has been making steady progress under the charge of Dr. R. Maitra. The benefits of the Unit which are available to the workers, members of their families as well as students and guests include free consultation and service, visit to residences at subsidized rates and the supply of medicines on a cost basis. The number of workers seeking medical aid has been increasing steadily, as will be evident from the accompanying Table :

*Preventive Measures :* Half-yearly inoculations against typhoid and cholera and yearly vaccinations against small-pox were given as usual during the year to the entire Institute staff, both at headquarters and the city offices. The anti-malarial measures, which had so far been confined to the Institute workers at Baranagar, were extended to cover the entire field staff also.

*Expansion :* A substantial expansion of the present medical facilities is being considered and the first step has already been taken by the appointment of Dr. B. Goswami, as consultant, Dr. S. C. Sen (Resident Medical Officer) and Dr. A Banerjee. The scheme of expansion includes addition and alteration to the existing building, provision of adequate facilities for indoor treatment, arrangement for pathological examination in collaboration with the Biometry Unit and carrying out health surveys.

*Girdih :* Regular medical aid, as in Baranagar, is also provided to workers at Girdih. The medical unit is in charge of Dr. N. K. Das who works on a part-time basis. A 50% rebate was allowed on medicine supplied to workers. A Health Home for workers was constructed at Girdih in 1958.

year	number of				value of medicine supplies
	patients	home visits	consultations, injections, etc.	prescriptions	
(1)	(2)	(3)	(4)	(5)	(6)
<b>BARANAGAR</b>					
1946-47	900	207	197	703	400
1951-52	2,053	385	441	2,512	1,293
1954-55	7,440	740	688	7,241	7,877
1955-56	8,810	830	757	9,079	10,332
1956-57	10,803	1,114	1,100	10,911	13,497
1957-58	15,139	1,595	3,300	16,210	18,553
1958-59	23,138	1,765	7,239	25,180	28,255
1959-60	25,597	1,818	7,801	25,705	36,382
<b>GIRDIH</b>					
1953-54	—	154	n.s.	1,552	1,476
1954-55	—	293	n.s.	1,492	1,930
1955-56	—	377	n.s.	9,073	2,425
1956-57	—	436	1,270	2,374	2,675
1957-58	—	538	4,314	3,606	5,348
1958-59	—	355	3,841	3,036	4,928
1959-60	—	—	—	—	—

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Appendix 10  
10.1.1 NUMBER OF STUDENT PARTICIPANTS IN INTERNATIONAL STATISTICAL EDUCATION CENTRE  
REGULAR COURSES

(The figures in brackets are the number of Govt. of India junior fellowships awarded under TCS of Colombo Plan)

country	Terms : duration (months)														total
	1 1950-51	2 1951	3 1952	4 1953	5 1953	6 1953	7 1954	8 1954-55	9 1955-56	10 1956-57	11 1957-58	12 1958-59	13 1959-60	14 1960-61	
1. Afghanistan	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2
2. Burma	4	4	3(1)	1(3)	2(1)	2(2)	2(2)	1(1)	-	2(2)	2(2)	1(1)	1(1)	-	32(17)
3. Cambodia	-	1	1	1	-	-	-	-	-	-	-	-	-	-	2
4. Ceylon	-	2(2)	2(2)	1(1)	-	1(1)	-	1(1)	-	2(2)	1(1)	2(1)	1(1)	2(2)	10(14)
5. India	3	10	12	10	5	7	12	15	5	11*	3	3	8*	7	108
6. Indonesia	-	-	2(2)	-	1(1)	3(2)	3(3)	3(3)	-	-	-	5(5)	7(7)	3(3)	27(27)
7. Iran	-	-	-	-	-	-	-	2	-	-	1	3	-	2	8
8. Iraq	-	1	1	-	-	-	-	-	-	-	-	-	-	-	1
9. Japan	1	1	1	1	-	2	-	-	-	4(3)	2(2)	2(2)	1(1)	2(2)	17(10)
10. Laos	-	-	-	-	-	-	-	-	-	-	-	-	1(1)	-	1(1)
11. Malaya	-	-	1(1)	-	-	-	-	-	-	-	-	1(1)	1(1)	1(1)	4(4)
12. Nepal	-	2(2)	-	1(1)†	1(1)	1(1)	1(1)	-	-	-	-	-	-	1(1)	7(7)
13. New Zealand	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1(1)
14. Pakistan	8	10(9)	6(3)	10(4)	13(3)	6(6)	1(1)	3(2)	3(3)	4(4)	-	-	-	-	64(54)
15. Philippines	-	-	0(4)	4(4)	6(5)	3(3)	3(3)	3(3)	3(3)	2(2)	4(4)	6(6)	4(4)*	8(8)	51(69)
16. Sarawak	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1(1)
17. Singapore	-	-	-	-	-	-	-	-	-	2(2)	1(1)	1(1)	-	-	4(4)
18. South Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
19. Syria	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
20. Thailand	-	-	3(1)	4(3)	2(2)	-	-	-	-	2(2)	4(4)	3(3)	4(4)	1(1)	25(22)
21. Viet. Nam	2	2	-	-	-	-	2(2)	-	-	-	-	-	-	-	6(2)
Total	18	36(11)	40(10)	37(15)	30(16)	25(16)	24(12)	27(9)	11(6)	29(17)	18(14)	27(20)	26(21)	30(20)	378(193)

\*One student each did not complete the Term.

†Senior scholarship (not junior fellowship)

2. SPECIAL COURSES

Country : United Arab Republic; Period : May-August 1959; Number of students: 2

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10.1.2 TRAINEES AT THE INTERNATIONAL STATISTICAL EDUCATION CENTRE, CALOUTTA  
Thirteenth Term : July 1959-April 1960

List of trainees : Against each country is shown within brackets the number of applications received followed by a list of trainees admitted. All foreign students got Colombo Plan Fellowships.

Burma (1)

1. U. Tin, *General Statistical and Economic Department, Rangoon*

Ceylon (1)

2. D. P. R. Paranawidana, *Directorate of Census and Statistics, Colombo*

India (7)

3. Lal Chand, *Central Water and Power Commission, New Delhi*  
4. \*K. S. Kanthamani (Miss), *Office of the State Statistician, Bangalore*  
5. M. Ramiah, *Office of the State Statistician, Bangalore*  
6. V. N. Gupta, *Planning Department, Srinagar*  
7. R. O. Praed, *Co-operative Department, Patna*

Indonesia (7)

8. Artojo, *Central Bureau of Statistics, Djakarta*  
9. Ibban Insan, *Central Bureau of Statistics, Djakarta*  
10. Ibrahim Linggo, *Central Bureau of Statistics, Djakarta*  
11. Juakanto Partodirjo, *Central Bureau of Statistics, Djakarta*  
12. Soekarnen Kusumawidjaja, *Central Bureau of Statistics, Djakarta*  
13. Alois Soekandar Raden, *Ministry of Information, Djakarta*  
14. Ismail Kairupan, *Ministry of Information, Djakarta*

Japan (1)

15. Koichi Igarashi, *Ministry of Education, Tokyo*

Laos (1)

16. Keut Inthakoumane, *Directorate of National Education, Vientiane*

Malaya (2)

17. P. O. Thomas, *Rubber Research Institute, Kuala Lumpur*

New Zealand (1)

18. Douglas Hallam White, *Social Security Department, Wellington*

Philippines (10)

19. Rodolfo Perez Madrid, *Agricultural and Natural Resources Department, Manila*  
20. John B. Ferraro, *University of Philippines, Manila*  
21. Dometrio M. Adiarco, *Bureau of Census and Statistics, Manila*  
22. \*Jose C. Abaroa, *Bureau of Private Schools, Manila*

Thailand (4)

23. Mayoora Swangwan, *Department of Commercial Intelligence, Bangkok*  
24. Capt. Samroong Udayavarana, *Army Medical Department, Bangkok*  
25. Miss Auraporn Bobhatirut, *Chulalongkorn University, Bangkok*  
26. Lt. Procha Lavanaputra, *Royal Thai Army, Thonburi*

Examinations : Following examinations were held : Periodical tests : General Principles of Statistics; Probability and Auxiliary Mathematics including Numerical Mathematics; Statistical Analysis; Statistical Methods and Sample Survey (Theory); Statistical Methods and Sample Surveys (Practical). Final Examination : Descriptive Statistics Sample Surveys (Theory); Tests of Significance; Design of Experiments; Econometrics & Planning Methods including Family Budget Analysis; Tests on Subjects of Specialization

\* Did not complete the Term.

## INDIAN STATISTICAL INSTITUTE

*Calendar* : Number of working days, including training at CSO and Field Training at Giridih : 220.

Lectures :	15 July 1959-28 November 1959
Field Training at Giridih :	30 November-6 December 1959
General lectures, including specialization courses :	7 December 1959-20 February 1960
Training at CSO, Delhi	1 March 1960-31 March 1960
Consolidation Lectures :	4 April 1960-12 April 1960.

### 10.2.1 OFFICERS ON DEPUTATION

The list below gives the names of officers on deputation, the deputing authority, subject and duration of special training at the Institute :

1. Sri V. S. Narasimhaiah, *Central Mining Research Station, Dhanbad* : sampling and size analysis of air-borne dust (March 1959-June 1959).
2. Sri Prabhu Narain, *Institute of Social Sciences, Kashi Vidyapeeth, Varanasi* : sample surveys (apphd). (March 1959-June 1960).
3. Sri Udai Pratap Singh, *Assistant Professor of Mathematics, University of Gorakhpur* : maximum likelihood estimates (May 1959-July 1959).
4. Mrs. Nira Chatterji, *Lecturer, Maharaja Bir Bikram College, Agartala, Tripura* : statistical analysis of test scores (May 1959).
5. Sri Gorachand Kundu, *Department of Anthropology, Government of India, Calcutta* : Research on Neuroticism (July 1959-December 1960).
6. Sri Biswanath Sarkar, *National Institute of Sciences* : statistical methods (August 1959-February 1960).
7. Sri Om Prakash Ahluwalia, *Birla Higher Secondary School, Delhi* : psychometric methods (September 1959-October 1959).
8. Sri Ramnath Kundu, *Instructor in Psychology, Department of Psychology, Calcutta University* : Psychometry (October 1959-November 1959).
9. Sri Kalipada Banerjee, *Lecturer, Maharaja Manindra Chandra College, Calcutta* : Entomological research (February 1960-August 1960).
10. Mrs. Madhureso Bose, *Department of Psychology, University College of Science, Calcutta* : Psychometric methods (February 1960).

### 10.2.2 STATISTICAL OFFICERS COURSE

(Jointly by the Indian Statistical Institute and the Central Statistical Organization)

*List of trainees* : Sponsoring authority, duration of training and subject of specialization, if any, are shown against each name.

1. K. C. Agarwal, *Horticultural Research Institute, U.P.* (9 months, Sampling Theory and Techniques).
2. A. K. Ahuja, *Central Statistical Organization* (9 months, Planning Statistics/Linear Programming).
3. P. L. Awaro, *Central Statistical Organization, New Delhi* (9 months, Economic Statistics).
4. S. Muthu Basavan, *Bureau of Statistics, Pondicherry* (9 months, National Income & Regional Income Estimation).
5. Kulter Singh Bahl, *Transport & Communication (Department of Tourism), New Delhi* (9 months, Machine Tabulation).
6. S. C. Choudhuri, *Department of Industries, Jammu & Kashmir* (9 months, Industrial Statistics).
7. Narain Das, *Transport & Communication (Department of Transport), New Delhi* (9 months, Machine Tabulation).
8. Jagdish Lal Kapoor, *Central Statistical Organization, New Delhi* (9 months, Economic Statistics).
9. Prem Prakash Malhotra, *Irrigation and Power, New Delhi* (8 months).

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10. Manmohan Mohanty, *Bureau of Statistics & Economics, Orissa* (6 months).
11. Sunil Chandra Nag, *Department of Economics & Statistics, Assam* (9 months, Planning Statistics).
12. Batla Krishnama Naidu, *Planning & Development Department, Andhra Pradesh* (3 months, Planning Statistics).
13. G. S. Nogi, *Food & Agriculture, Forest Research Institute & College* (9 months, Sampling Theory & Techniques).
14. K. Mallorum Porumal Pillai, *Department of Statistics, Kerala* (9 months, Economic Statistics).
15. Giridhar Prasad, *Bureau of Economics & Statistics, Bihar* (9 months, Sampling Theory and Techniques).
16. Gurudas M. Rajadhyaksha, *Bureau of Economics & Statistics, Bombay* (9 months, Machine Tabulation).
17. K. Rajagopalan, *Commerce and Industry, New Delhi* (6 months).
18. Syed Shabbear, *Office of Commissioner of Labour, Mysore* (9 months, Sample Surveys of Labour & Employment Statistics).
19. Gyan Prakash Sharma, *Home Affairs, Registrar General's Office, New Delhi* (9 months, Vital Statistics & Census).
20. Ram Dayal Sharma, *Election Commission of India, New Delhi* (6 months).
21. Miss Shuchi Bela, *Planning Commission, New Delhi* (9 months, Vital Statistics & Census).
22. Uendromban Ahanjoo Singh, *Statistical Bureau, Manipur* (6 months).
23. Vijai Shankar Singh, *Planning Research & Action Institute, U.P.* (6 months).
24. R. P. Srivastava, *Office of the Cane Commissioner, Lucknow* (9 months, Agricultural Statistics).
25. K. C. Suri, *Economics and Statistics, Himachal Pradesh* (9 months, Planning Statistics).

*Examinations :* Examinations were held on the following subjects: Techniques of computation, Descriptive statistics, Economics & Economic statistics, Probability, Statistical methods, Sample Surveys, Theory of estimation, Tests and significance, Design of experiments, Project Training.

### 10.3 RESEARCH SCHOLARS AND ADVANCED STUDENTS

(with fields of research)

1. Tapan Kumar Basumallik, M.A. (Psychology), (Calcutta); *Psychometry*.
2. B. S. Bhagolival, M.A. (Psychology), (Agra); L.T.; *Industrial Psychology*.
3. K. P. Bhattacharyya, M.A. (Psychology), (Calcutta); *Industrial Psychology*.
4. P. K. Bhattacharyya, M.Sc. (Statistics), (Calcutta); *Statistical Inference*.
5. S. Das Gupta, M.Sc. (Statistics), (Calcutta); *Psychometry*.
6. K. R. Dronamraju, M.Sc. (Botany), (Agra); *Genetics*.
7. S. John, M.Sc. (Statistics), (Travancore); *Multivariate Analysis*.
8. K. R. Parthasarathy, M.A. (Mathematics), (Madras); *Information Theory*.
9. R. Ranga Rao, M.A. (Mathematics), (Madras); *Mathematical Statistics*.
10. S. K. Ray, M.Sc. (Statistics), (Lucknow), M.A. (Statistics), Columbia; *Inference*.
11. J. Sathuraman, M.A. (Statistics), (Madras); *Statistical Inference*.
12. K. N. Sharma, M.A. (Psychology), (Agra); L.T.; *Market Research*.
13. K. R. Saha, M.Sc. (Statistics), (Bombay); *Design of Experiments*.
14. S. R. Sreenivasa Varadhan, M.A. (Statistics); *Stochastic Processes*.
15. V. S. Varadarajan, M.Sc. (Mathematics), (Madras); *Probability*.

## INDIAN STATISTICAL INSTITUTE

### 10.4 THREE-YEAR ADVANCED STATISTICIAN'S COURSE

(in collaboration with the Central Statistical Organization, Government of India)

#### 10.4.1 THIRD YEAR

The list of trainees, together with the fields of specialization and in-service training and the Institution attended for training is given below :

##### *Planning* (Planning Division, Indian Statistical Institute, Calcutta)

- |   |                                       |
|---|---------------------------------------|
| 1. C. L. Bambrro, M.A. (Lucknow)              | 5. R. Narayanan, M.A. (Madras)        |
| 2. Miss P. Jain, B.A. (Hons.), (Delhi)        | 6. K. K. Rao, B.Sc. (Hons.), (Andhra) |
| 3. P. N. Kapoor, M.A. (Punjab)                | 7. M. R. Seluja, M.A. (Delhi)         |
| 4. P. K. Kumaran, B.Sc. (Hons.), (Travancore) | 8. P. N. Singh, M.Sc. (Banaras)       |

##### *Industrial Statistics* (SQO Unit, Indian Statistical Institute, Calcutta, Delhi, Bombay and Bangalore)

- |  |  |
|--|--|
| 9. Dev Swarup Ahluwalia, B.A. (Hons.), (Delhi) | 13. A. K. Rao, B.Sc. (Hons.), (Andhra) |
| 10. A. K. Jain, B.Sc. (Hons.), (Delhi)         | 14. L. Salyanarsyana, M.Sc. (Andhra)   |
| 11. D. Prakash, M.Sc. (Allahabad)              | 15. N. Srinivasan, M.A. (Madras)       |
| 12. K. S. Ramachandramurty, M.A. (Andhra)      | 16. N. C. Tyagi, M.Sc. (Banaras)       |

##### *Biometry* (Biometric Unit, Indian Statistical Institute, Calcutta)

17. S. D. Jayakar, M.Sc. (Lucknow)

##### *Applied Economics* (National Council of Applied Economic Research, New Delhi)

18. K. M. Sharma, M.A. (Andhra)      19. Miss N. V. Lakshmi, M.A. (Madras)

##### *Organization of Large-scale Sample Survey* (Indian Statistical Institute, Calcutta)

20. P. B. Rao, M.A. (Andhra)

##### *Operational Research* (Indian Statistical Institute, Calcutta)

21. K. Rajaraman, M.A. (Madras)

#### 10.4.2 SECOND YEAR

Trainees promoted to the second year class or admitted directly to the second year (indicated by \*) in August 1950 listed according to the subject of specialization at the ISI during the second year.

##### *Planning and Econometrics*

- |  |   |
|--|---|
| 1. R. Ganapathy, M.A. (Madras)               | 6. D. Ramkotiiah, M.A. (Andhra)             |
| 2. Miss Pushpam P. Koola, M.Sc. (Travancore) | 7. V. Balasubramanian Sarna, M.A. (Madras)  |
| 3. T. Krishnan, M.A. (Madras)                | 8. G. Sitaramacharyulu, M.A. (Venkateswara) |
| 4. K. S. Natarajan, M.A. (Madras)            | 9. *S. S. Suryanarayanan, M.A. (Madras)     |
| 5. C. Parthasarathy, M.A. (Madras)           | 10. M. Thiruviam, M.A. (Madras)             |

##### *Statistical Quality Control*

- |                                     |  |
|-------------------------------------|--|
| 11. H. S. Ahluwalia, M.A. (Punjab)  | 16. Y. Raghunandan Rau, M.A. (Madras)  |
| 12. *S. J. Apte, M.Sc. (Poona)      | 17. *B. Rajput, M.Sc. (Lucknow)        |
| 13. K. K. Banerjee, M.Sc. (Patna)   | 18. K. Sarveswara Rao, M.Sc. (Banaras) |
| 14. *N. M. Govardhan, M.A. (Madras) | 19. T. S. Govinda Rau, M.Sc. (Madras)  |
| 15. *M. S. Kulkarni, M.Sc. (Bombay) | 20. *C. D. Tripathi, M.Sc. (Lucknow)   |

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*Statistical Quality Control/Electronics*

21. T. Krishnamurthi, M.A. (Madras)

*Genetics and Demography*

22. T. V. Hanumantha Rao, M.A. (Andhra)

23. \*Chinmoy Kolay, M.Sc. (Calcutta)

*Examinations (1959-60)* : The mid-term examination was held on the following general subjects : Statistical Methods, Analysis of Variance, Estimation and Tests of Hypotheses, Design and Experiments, Multivariate Analysis, Sample Surveys; and on the following Special Subjects : Planning & Econometrics, Quality Control, Genetics & Demography.

The final examination was held on the following general subjects : Sophistication, Statistical Methods, Design of Experiments, Large-scale Sample Surveys, SQC/Planning; and on the following Special Subjects : Genetics & Demography, Planning & Econometrics, Quality Control.

*Calendar (1959-60)* : Total number of working days including training at the Central Statistical Organization (CSO), Government of India, New Delhi and field training at Giridih, excluding examination, etc. 186.

Lectures	1 August 1959 to 28 November 1959
First terminal examination	3 December 1959 to 5 December 1959
	17 December 1959 to 19 December 1959
Field training at Giridih	6 December 1959 to 13 December 1959
Vacation	20 December 1959 to 17 January 1960
Lectures	18 January 1960 to 22 April 1960
Final examination	2 May 1960 to 13 May 1960
Training at the CSO	18 May 1960 to 30 June 1960

10.4.3 FIRST YEAR

List of trainees admitted in August 1959 (degree and university are noted against each). Those who discontinued the course during the year are indicated by \*.

- |  |   |
|--|---|
| 1. *Vishweswar Nath Agarwal, M.Sc. (Allahabad) | 14. V. S. Rajamani, M.A. (Madras)               |
| 2. Basudev Banerjee, M.Sc. (Calcutta)          | 15. Eranki Venkateswara Rao, M.A. (Banarasi)    |
| 3. Kamal Kanti Chakravarti, M.Sc. (Calcutta)   | 16. K. Govinda Rajulu, M.A. (Madras)            |
| 4. *Brij Mohan Chhabra, M.Sc. (Agra)           | 17. Kishora Sasanka V. Rao, M.A. (Andhra)       |
| 5. R. Gopalan, M.A. (Karnatak)                 | 18. P. V. A. Rama Rao, M.A. (Andhra)            |
| 6. Venkateswara Gopalan, M.A. (Annamalai)      | 19. Ramayamantry V. R. Rai, M.A. (Andhra)       |
| 7. *Satish Kumar, M.A. (Delhi)                 | 20. T. R. Rao, M.A. (Andhra)                    |
| 8. Niduthavolu Krishnaji, M.A. (Andhra)        | 21. Miss Kalkuri Venkata Rukmini, M.A. (Madras) |
| 9. Telikicherla Krishna Kumar, M.A. (Andhra)   | 22. *Miss Tanima Roy, M.Sc. (Calcutta)          |
| 10. Tharavath Sankaran Kuttu, M.A. (Madras)    | 23. Bhanu Dutta Singh, M.Sc. (Lucknow)          |
| 11. *Ramesh Chandra Manglik, M.Sc. (Agra)      | 24. Ravindra Singh, M.Sc. (Agra)                |
| 12. B. K. Moorthi, M.A. (Madras)               | 25. P. R. Sreenath, M.A. (Osmania)              |
| 13. P. Srookumaran Nair, M.Sc. (Agra)          | 26. *Umamaheswaram Suram, M.A. (Venkateswara)   |
|  | 27. S. S. Swaminathan, M.A. (Madras)            |

*Student Seminar* : As a part of their training, the first year trainees are required to undertake, in small groups, small-scale statistical investigations which involve collection of data using a proper design, statistical analysis and preparation of a report. A board of

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examiners examine the reports submitted and conduct a viva. List of topics for investigation and the trainees in the different groups are as follows :

### *Collection of Prices for the Construction of Cost of Living Index Number*

- |                      |                     |                      |
|----------------------|---------------------|----------------------|
| 1. P. V. A. Rama Rao | 3. Bhanu Dutt Singh | 2. K. Govinda Rajulu |
|----------------------|---------------------|----------------------|

### *Rainfall Patterns of Jalpaiguri and Darjeeling Districts,*

- |                 |                      |                       |
|-----------------|----------------------|-----------------------|
| 4. S. V. R. Rao | 6. S. S. Swaminathan | 5. B. Krishna Moorthi |
|-----------------|----------------------|-----------------------|

### *Operational Research : ISI Telephone Exchange*

- |                      |                       |
|----------------------|-----------------------|
| 7. T. Krishna Kumar  | 9. Miss K. V. Rukmini |
| 8. Ramalingeswar Rao | 10. Ravindra Singh    |

### *Operational Research : ISI Transport*

- |                      |                    |
|----------------------|--------------------|
| 11. Satish Kumar     | 13. V. S. Rajamani |
| 12. Basudev Banerjee | 14. B. M. Chhabra  |

### *Diurnal Variation in Stature*

- |                    |                         |
|--------------------|-------------------------|
| 15. P. R. Sreenath | 16. P. Sreekumaran Nair |
|--------------------|-------------------------|

### *Traffic Census on the Road*

- |                         |                   |
|-------------------------|-------------------|
| 17. Umamaheswaram Suram | 18. R. C. Manglik |
|-------------------------|-------------------|

### *Measurement of Systolic and Diastolic Blood Pressures*

- |                  |                         |
|------------------|-------------------------|
| 19. N. Krishnaji | 21. V. K. S. Sekhar Rao |
| 20. T. S. Kulty  | 22. V. Gopalan          |

### *Construction of Educational Tests*

- |                |                         |
|----------------|-------------------------|
| 23. R. Gopalan | 24. E. Venkateswara Rao |
|----------------|-------------------------|

*Examinations (1959-60)* : Periodical examinations were held on the following subjects : Statistics; Probability; Economics; Techniques of Computation; Statistical Methods; Estimation & Large Sample Theory; Statistical Quality Control; Sample Surveys; Large Sample Theory & Non-parametric Methods; Testing of Hypothesis.

The preliminary examination was held on the following subjects : Statistics I, II, III, IV; Economics I, II; Probability; Statistical Orientation.

The final examination was held on the following subjects : Principles of Economics; Indian Economics; Probability; Estimation; Testing of hypothesis; Sophistication. Practical on estimation and tests of significance. Theoretical and Practical on Data reduction, Discrete and continuous models, Numerical calculus, Analysis of variance and covariance, Large Sample Test and Estimation, Non-parametric methods, Design of experiments, Vital Statistics, Sample Surveys and Statistical Quality Control.

*Calendar* : Total number of working days, excluding preparatory holidays, examinations etc.: 227.

Lectures	4 August 1959 to 5 December 1959
Preliminary examinations	10 December 1959 to 19 December 1959
Vacation	20 December 1959 to 17 January 1960
Lectures	18 January 1960 to 4 June 1960
Preparatory holidays for examination	5 June 1960 to 12 June 1960
Final examination	13 June 1960 to 24 June 1960



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10.5. SHORT-TERM STATISTICIAN'S COURSES

10.5.1 JUNIOR COURSE (CALCUTTA) : MARCH-SEPTEMBER, 1959 SESSION

(Total number of working days : 92)

*List of successful trainees :* 53 students were originally admitted, out of which 31 satisfied the minimum attendance requirements, and the following 10 were awarded certificates of successful completion of the course.

- |   |  |
|---|--|
| 1. Tulshidas Haridas Ashar, B.Sc. (Gujarat) | 6. Himangshu Kumar Mukherjee, M.Sc. (Calcutta) |
| 2. Rupendra Mohan Benerjee, B.A. (Calcutta) | 7. Viahnu Dhundiraj Paluskar, B.Sc. (Banarus)  |
| 3. Goury Shankar Chandra, M.Sc. (Calcutta)  | 8. Bonoy Roy, B.Sc. (Calcutta)                 |
| 4. Parimal Roy Chowdhury, M.Sc. (Calcutta)  | 9. Chandil Charan Sinha, B.Sc. (Calcutta)      |
| 5. Rajinder Singh Duggal, B.A. (Punjab)     | 10. Shyamapada Roy, M.A. (Calcutta)            |

Two trainees of earlier terms were also awarded certificates of successful completion of the course on the basis of the final examination held this term.

- |   |                                      |
|---|--------------------------------------|
| 1. Surendra Kr. Chowdhury, B.Sc. (Punjab) | 2. C. Hanumantha Rao, B.Sc. (Amthra) |
|---|--------------------------------------|

*Examinations :* Three periodical tests were held. There were six papers in the final examination : Paper 1—Probability and Inference, Paper 2—Official Statistics and Statistical Methods, Paper 3—Design of Experiments and Sample Surveys, Paper 4—Statistical Quality Control, Vital Statistics and Economic Statistics, Paper 5—Practical on subjects covered in Papers 1 and 2, Paper 6—Practical on subjects covered in Papers 3 and 4.

10.5.2 SENIOR COURSE (CALCUTTA) : MARCH-SEPTEMBER 1959 SESSION

(Total number of working days : 70)

*List of successful trainees :* 10 students were originally admitted, out of which 8 satisfied the minimum attendance requirements and the following 6 were awarded certificates of successful completion of the course.

- |   |                                      |
|---|--------------------------------------|
| 1. Jagrup Ch. Gupta, B.A. (Punjab)      | 4. M. S. S. Prasanna, B.Sc. (Mysore) |
| 2. Kahtra Gopal Hazra, B.Sc. (Calcutta) | 5. N. Chinnam Raju, B.Sc. (Andhra)   |
| 3. Binal Kumar Nayak, B.Sc. (Calcutta)  | 6. A. Somewara Sarna, B.Sc. (Andhra) |

*Examinations :* Three periodical tests were held. There were seven papers in the final examination : Paper 1—Algebra, Linear Estimation, Analysis of Variance, Multivariate Analysis; Paper 2—Estimation, Tests of Hypothesis and Sampling Distributions; Paper 3—Practical on subjects covered in Papers 1 & 2; Paper 4—(Special subject) Statistical Quality Control; Paper 5—(Special Subject) Sample Surveys; Paper 6 and 7—Practical on subjects covered in Papers 4 and 5 respectively.

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### 10.5.3 JUNIOR COURSE (CALCUTTA) : SEPTEMBER 1959-MARCH 1960 SESSION

(Total number of working days : 85)

*List of successful trainees :* 53 students were originally admitted, out of which 31 satisfied the minimum attendance requirements, and the following 10 were awarded certificates of successful completion of the course.

- |  |   |
|--|---|
| 1. Kallash Nath Anand, B.Sc. (Allahabad)     | 6. Mallampaty Radhakrishnamurty, B.Sc. (Andhra) |
| 2. M. Thomas Baby, B.Sc. (Kerala)            | 7. Deb Rajan Sen, M.Sc. (Poona)                 |
| 3. Ajit Singh Bhatti, B.A. (Punjab)          | 8. C. Subramanian, B.A. (Madras)                |
| 4. Debidasa Chatterjee, M.Sc. (Calcutta)     | 9. Nukala Venkanna, B.A. (Andhra)               |
| 5. T. V. S. Ramachandra Murty, M.A. (Madras) | 10. Ramaswamy Alwar, B.Com. (Utkal)             |

Two trainees of earlier terms were also awarded certificates of successful completion of the course on the basis of the final examination held in this term.

- |                                    |  |
|------------------------------------|--|
| 1. Satya Pall Gupta, B.A. (Punjab) | 2. Ved Prakash Malhotra, B.A. (Punjab) |
|------------------------------------|--|

*Examinations :* Three periodical tests were held. There were six papers in the final examination : Paper 1—Probability and Inference; Paper 2—Official Statistics and Statistical Methods; Paper 3—Design of Experiments and Sample Surveys; Paper 4—Statistical Quality Control, Vital Statistics and Economic Statistics; Paper 5—Practical on subjects covered in Papers 1 and 2; Paper 6—Practical on subjects covered in Papers 3 and 4.

### 10.5.4 SENIOR COURSE (CALCUTTA) : SEPTEMBER 1959-MARCH 1960 SESSION

(Total number of working days : 74)

*List of successful trainees :* 15 students were originally admitted, out of which 9 satisfied the minimum attendance requirements, and the following six were awarded certificates of successful completion of the course.

- |  |   |
|--|---|
| 1. Rajaram Bhal-Chandra Bhalo, B.Sc. (Poona) | 4. Mrs. Rebecca Mukherjee, M.Sc. (Calcutta) |
| 2. Surendra Kumar Chowdhury, B.Sc. (Punjab)  | 5. C. Hanumantha Rao, B.Sc. (Andhra)        |
| 3. Rajinder Singh Duggal, B.A. (Punjab)      | 6. Parimal Roy Choudhury, M.Sc. (Calcutta)  |

*Examinations :* Three periodical tests were held. There were seven papers in the final examination : Paper 1—Algebra, Linear Estimation, Analysis of Variance, Multivariate Analysis and Design of Experiments; Paper 2—Estimation, Tests of Hypothesis, Sampling Distributions and Sample Surveys; Paper 3—Practical on subjects covered in papers 1 and 2; Paper 4—(Special Subject) Statistical Quality Control; Paper 5—(Special Subject) Planning and Economic Statistics; Papers 6 and 7—Practical on subjects covered in Papers 4 and 5 respectively.

10.6. ONE-YEAR EVENING COURSE IN STATISTICS, NEW DELHI (MARCH 1959-FEBRUARY 1960)

(In collaboration with the Central Statistical Organization)

List of trainees: degree & sponsoring authority are noted against each name.

- |  |  |
|--|--|
| 1. Dharam Pal Agarwal, M.A. (Mathematics), (Planning Commission)                   | 22. Prem Das Mukherji, M.A. (Economics), Ph.D. (Planning Commission)                       |
| 2. Sudarshan Kumar Aggarwal, M.A. (Mathematic), (Central Statistical Organization) | 23. Subramanian Murugan, M.A. (Economics), (National Council of Applied Economic Research) |
| 3. Jagdev Parkash Anand, M.A. (Economics), (Ministry of Defence)                   | 24. S. Noolakantan, B.A. (Hons.), (Ministry of Commerce and Industry)                      |
| 4. R. Anantharaman, B.A. (Hons.), (State Trading Corporation)                      | 25. Radha Raman Nim, B.A. (Directorate of Posts and Telegraphs)                            |
| 5. Sukumar Benerji, M.A. (Mathematics), (Directorate-General of Observatories)     | 26. Kastoor Chand Palta, M.A. (Mathematics), (Delhi Polytechnic)                           |
| 6. Vijander Bhalla, M.A. (Anthropology), (Delhi University)                        | 27. U. V. A. Pantulu, M.Sc. (Chem. Tech.).   |
| 7. Harcharan Singh Bhatia, M.A. (Mathematics), (Ministry of Commerce & Industry)   | 28. Shyam Sundor Phorwalli, B.A. (Directorate-General of Supplies & Disposals)             |
| 8. Nand Lal Bhatia, M.A. (Economics), (Punjab National Bank Limited)               | 29. Harnesh Kumar Puri, M.A. (Economics), (Ministry of Commerce & Industry)                |
| 9. Balwant Singh Bhole, M.A. (Economics), (Ministry of Commerce & Industry)        | 30. Raj Kumar Sachdeva, M.A. (Economics), (Ministry of Labour & Employment)                |
| 10. Yogesh Chandra, M.Sc. (Mathematics), (Private)                                 | 31. Yash Pal Sahni, B.Sc. (Indian Statistical Institute)                                   |
| 11. Madan Lal Chawla, M.A. (Economics), (Ministry of Food & Agriculture)           | 32. Ravi Prakash Sawhney, M.A. (Mathematics), (Central Water & Power Commission)           |
| 12. Mrs. Santosh Chowdhury, M.A. (Economics), (Delhi School of Economics)          | 33. Mohan Murari Saxena, M.A. (Economics), (Ministry of Commerce & Industry)               |
| 13. Krishna Kumar Gupta, M.A. (Mathematics), (Ministry of Labour & Employment)     | 34. D. L. Sharma, M.A. (Mathematics), (Ministry of Education)                              |
| 14. Sushil Kumar Jain, M.A. (Economics), (Ministry of Commerce & Industry)         | 35. Prem Suraj Sharma, M.A. (Economics), (Ministry of Food & Agriculture)                  |
| 15. Mass Amrit Kaur, M.A. (English), (Planning Commission)                         | 36. Shantagni Vatali Sharma, M.A. (Mathematics), (Directorate-General of Observatories)    |
| 16. Sukh Dev Lal Khorana, M.A. (Mathematics), (Central Statistical Organization)   | 37. Asha Singh, M.A. (Economics), (National Buildings Organization)                        |
| 17. Rajendra Kumar Hoon, M.A. (Mathematics), (National Sample Survey)              | 38. Sampurnan Singh, M.A. (Mathematics), (National Sample Survey)                          |
| 18. Hindi Lal, M.A. (Mathematics), (Directorate-General of Observatories)          | 39. Jaguu Nalli Tanuja, M.A. (Mathematics), (Central Statistical Organization)             |
| 19. Sukumar Mazumdar, M.A. (Mathematics), (Directorate-General of Observatories)   | 40. Mohendra Singh Verma, M.A. (Mathematics), (Ministry of Finance)                        |
| 20. Ram Suraj Mohita, M.A. (Mathematics), (Ministry of Defence)                    | 41. Om Prakash Vig, M.A. (Mathematics), (Ministry of Health)                               |
| 21. Mohendra Swarup Mittal, M.A. (Mathematics), (Central Road Research Institute)  |  |

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Observers who attended lectures on some topics.

- |   |  |
|---|--|
| 1. K. C. Agarwal, M.A. (Ministry of Food and Agriculture) | 4. Miss C. Ramaswami, M.A. (Indian Statistical Institute)      |
| 2. J. L. Kapoor, M.A. (Central Statistical Organisation)  | 5. Dr. R. Anantha Krishnan (Director-General of Observatories) |
| 3. Raisuddin, B.A. (Ezardar Dewakkana)                    | 6. Miss Sheila, M.A. (Planning Commission)                     |

10.7 ONE-YEAR EVENING COURSE IN STATISTICS, BOMBAY  
(MAY 1960-APRIL 1961)

*List of trainees* : degree and university are noted against each name,

- |  |  |
|--|--|
| 1. S. S. Betrabot, B.Sc. (Poona), B.Sc. (Tech. (Bombay)) | 16. A. R. Narayan, M.A. (Andhra)       |
| 2. P. K. Chelippa, B.A. (Madras)                         | 17. K. V. Natarajan, B.Sc. (Madras)    |
| 3. V. G. Choubal, B.Sc. (Bombay)                         | 18. N. Nikanthan, B.Sc. (Madras)       |
| 4. D. Eswaran, B.A. (Madras)                             | 19. S. Padmanabhan, B.Sc. (Madras)     |
| 5. P. V. George, B.A. (Travancore)                       | 20. S. G. Padwal, M.Sc. (Bombay)       |
| 6. T. N. Hariharan, B.Sc. (Madras)                       | 21. D. S. Patil, B.A. (Karnatak)       |
| 7. E. C. L. Henderson, B.A. (Bombay)                     | 22. C. K. Pradhan, M.Sc. (Nagpur)      |
| 9. M. Ramaswamy Iyengar, B.A. (Andhra)                   | 23. S. G. Pradhan, B.A. (Bombay)       |
| 10. M. D. Joshi, B.A. (Bombay)                           | 24. L. N. Ramaswamy, B.Sc. (Madras)    |
| 10. M. G. Mulkarni, B.Sc. (Bombay)                       | 25. Rana Pratap, B.Sc. (Banars)        |
| 11. M. S. Kaashyapath, B.Sc., LL.B. (Mysore)             | 26. K. R. C. Reddy, B.E. (Andhra)      |
| 12. V. R. Marathe, B.Sc. (Bombay)                        | 27. M. T. Samant, M.Sc. (Bombay)       |
| 13. A. H. Merchant, B.Sc. (Bombay)                       | 28. V. S. Shastrabudhe, M.Sc. (Bombay) |
| 14. G. S. Mate, B.Sc. (Poona)                            | 29. N. S. Subramanian, M.A. (Madras)   |
| 15. S. Nagarajann, B.Sc. (Madras)                        | 30. R. N. Swamy, B.Sc. (Bombay)        |
|  | 31. S. Venkatakishnan, B.Sc. (Madras)  |
|  | 32. T. C. Viswanathan, B.Sc. (Bombay)  |

10.8 COMPUTER'S TRAINING COURSE. JUNIOR AND SENIOR (CALCUTTA)

*List of trainees* : degree and university are noted against each name.

JUNIOR CLASS (MORNING) : MARCH-SEPTEMBER 1959

- |   |   |
|---|---|
| 1. Prasanta Kumar Chandra, I.Sc. (Calcutta) | 6. Prasanta Kumar Chaudhuri, B.Sc. (Calcutta) |
| 2. Sunil Kumar Das, I.Sc. (Calcutta)        | 7. Binal Ch. Dhandia, B.Sc. (Rajshaha)        |
| 3. Tarak Nath Das, I.Sc. (Calcutta)         | 8. Mukta Ram Mondal, H.Com. (Calcutta)        |
| 4. Santosh Kumar Sarkar, I.Sc. (Calcutta)   | 9. Binal Chandra Pal, B.Sc. (Calcutta)        |
| 5. P. Vishnu, I.Sc. (Mysore)                | 10. Pankaj Kumar Sengupta, B.Sc. (Dacca)      |

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**JUNIOR CLASS (EVENING) : MARCH-SEPTEMBER 1959**

- |   |  |
|---|--|
| 1. Pradip Kumar Basu, B.Com. (Calcutta)       | 7. Tarapada Bhattacharjee, I.Sc. (Calcutta)  |
| 2. Balalob Bandopadhyay, B.Sc. (Calcutta)     | 8. Miss Manjula Dhar, B.Sc. (Calcutta)       |
| 3. Sibdas Bhowmik, I.Sc. (Rajshahi)           | 9. Deb Prasad Ohoah, B.Sc. (Calcutta)        |
| 4. Tarak Nath Dutta, I.Sc. (Calcutta)         | 10. Jaharal Kar, B.Sc. (Calcutta)            |
| 5. P. J. Mathew, B.Sc. (Kerala)               | 11. Tarak Prasad Mukherjee, B.Sc. (Calcutta) |
| 6. Subhas Chandra Mukherjee, I.Sc. (Calcutta) | 12. Baral Kumar Sarkar, B.A. (Calcutta)      |

**SENIOR CLASS (EVENING) : MARCH-SEPTEMBER 1959**

- |  |   |
|--|---|
| 1. Deba Prasad Barinba, B.Sc. (Calcutta)       | 8. Dilip Kumar Ohoah, I.Sc. (Calcutta)        |
| 2. Dilip Kumar Dhar, B.Sc. (Calcutta)          | 9. Barendra Narayan Goswami, I.Sc. (Calcutta) |
| 3. Prasanta Kumar Majumdar, I.Sc. (Calcutta)   | 10. Anil Kanta Pan, I.Sc. (Calcutta)          |
| 4. Paritosh Majumdar, I.Sc. (Calcutta)         | 11. Banker Roy, B.Sc. (Calcutta)              |
| 5. Gobinda Chandra Mukherjee, B.Sc. (Calcutta) | 12. Kanaleendra Roy Sircar, I.A. (Calcutta)   |
| 6. Prasun Kumar Mukherjee, B.Com. (Calcutta)   | 13. Jadesh Chandra Sarkar, B.A. (Calcutta)    |
| 7. Sekhar Sen, I.Sc. (Calcutta)                | 14. Pal Krishna Sarma, I.Sc. (Punjab)         |

**JUNIOR CLASS (MORNING) : SEPTEMBER 1959-MARCH 1960**

- |  |   |
|--|---|
| 1. Tilak Chand Berman, I.A. (Calcutta)           | 9. Aniya Kumar Ohoah, B.Sc. (Calcutta)      |
| 2. Ajit Kumar Basak, I.Sc. (Calcutta)            | 10. Biswajit Mazumdar, I.Sc. (Calcutta)     |
| 3. Manotosh Bhattacharjee, I.Sc. (Calcutta)      | 11. Asok Kumar Banerjee, I.Sc. (Calcutta)   |
| 4. Dulalchandra Chattopadhyay, I.Sc. (Calcutta)  | 12. Amalendu Das, I.Sc. (Calcutta)          |
| 5. Nirmalya Prasun Chakravorty, B.Sc. (Calcutta) | 13. Milan Kanti Dutta, I.Com. (Calcutta)    |
| 6. Chinmoy Kumar Chowdhury, I.Sc. (Calcutta)     | 14. Jyoti Ohoah, I.Com. (Calcutta)          |
| 7. Nitya Ranjan Chakravarty, B.Sc. (Calcutta)    | 15. Dilip Kumar Ohoah, I.Sc. (Calcutta)     |
| 8. Bimal Chandra (Jangopadhyay) I.Sc. (Calcutta) | 16. Achyut Kumar Mazumdar, B.Sc. (Calcutta) |
| 17. Habibullah Tarque Ahmad, I.Sc. (Calcutta)    |   |

**JUNIOR CLASS (EVENING) : SEPTEMBER 1959-MARCH 1960**

- |  |  |
|--|--|
| 1. Bajrang Lal Bajoria, B.Com. (Calcutta)  | 10. S. Krishnan, I.Sc. (Madras)              |
| 2. P. T. Basu, M.Sc. (Texas)               | 11. Susanta Kumar Kundu, I.Com. (Calcutta)   |
| 3. Sunil Krishna Basu, B.Com. (Calcutta)   | 12. Shyam Chand Laha, I.Sc. (Calcutta)       |
| 4. Samar Kanti Bose, M.A. (Agra)           | 13. Mihir Kumar Lahiri, I.Sc. (Calcutta)     |
| 5. Sanat Kumar Bose, I.Sc. (Calcutta)      | 14. Mohit Kumar Mazumdar, I.Sc. (Calcutta)   |
| 6. Hrishikesh Chakravarty, I.A. (Calcutta) | 15. Anil Kumar Sardar, B.Com. (Calcutta)     |
| 7. Aait Kumar Chatterjee, B.Sc. (Calcutta) | 16. Adwaita Chandra Sarkar, I.Sc. (Rajshahi) |
| 8. Niranjan Das, I.Sc. (Calcutta)          | 17. Subodh Chandra Sarkar, B.Com. (Calcutta) |
| 9. Kashinath Gupta, I.Sc. (Calcutta)       | 18. Miss Sipra Sengupta, B.Sc. (Calcutta)    |

**SENIOR CLASS (EVENING) : SEPTEMBER 1959-MARCH 1960**

- |  |   |
|--|---|
| 1. Baldeb Bandopadhyay, B.Sc. (Calcutta)   | 5. Subhas Chandra Mukherjee, I.Sc. (Calcutta) |
| 2. Prasanta Kumar Chanda, I.Sc. (Calcutta) | 6. Tarak Prasad Mukherjee, B.Sc. (Calcutta)   |
| 3. Sunil Kumar Das, B.Sc. (Calcutta)       | 7. Binal Chandra Paul, B.Sc. (Calcutta)       |
| 4. Dobaprosad Ohoah, B.Sc. (Calcutta)      | 8. Tarun Kumar Sur, B.A. (Calcutta)           |

## INDIAN STATISTICAL INSTITUTE

### JUNIOR CLASS (MORNING) : MARCH-SEPTEMBER 1960

- |  |   |
|--|---|
| 1. Mrs. Saraswati Amma, B.Com. (Kerala)        | 11. Ranendra Nath Deb, I.Sc. (Calcutta)     |
| 2. Ajit Kumar Banerjee, B.Sc. (Calcutta)       | 12. Narayan Chandra Ghosh, I.Sc. (Calcutta) |
| 3. Manindra Chandra Banerjee, B.Sc. (Calcutta) | 13. Md. Noor Azam Khan, I.Sc. (Calcutta)    |
| 4. Dilip Kumar Bose, I.Sc. (Calcutta)          | 14. Narottam Lal Manucla, B.Sc. (Agra)      |
| 5. Rathindra Kumar Bose, I.Sc. (Calcutta)      | 15. Sambhunath Mukherjee, I.Sc. (Calcutta)  |
| 6. Samar Kanti Bose, M.A. (Calcutta)           | 16. Dohabrata Munshi, I.Sc. (Calcutta)      |
| 7. Nirmalya Kumar Choudhury, M.A. (Calcutta)   | 17. Sukharanjan Sarkar, B.Com. (Calcutta)   |
| 8. Gopal Krishna Chakraborty, I.Sc. (Calcutta) | 18. Alok Kumar Sen, I.Sc. (Calcutta)        |
| 9. Samir Kumar Das, I.Sc. (Calcutta)           | 19. Senkar Sengupta, B.Sc. (Calcutta)       |
| 10. Somosh Chandra Das, B.Sc. (Calcutta)       | 20. D. S. Supkar, Matric (Bombay)           |

### JUNIOR CLASS (EVENING) : MARCH-SEPTEMBER 1960

- |  |   |
|--|---|
| 1. Saktipada Banerjee, M.Sc. (Calcutta)        | 11. Pankaj Kumar Maity, I.Sc. (Calcutta)    |
| 2. Ranjit Kumar Banik, B.Com. (Calcutta)       | 12. Murari Mohan Mitra, I.Sc. (Calcutta)    |
| 3. Asim Kumar Bhattacharyya, I.Sc. (Calcutta)  | 13. Sakti pasha Mitra, B.Sc. (Calcutta)     |
| 4. Sunil Kumar Bhattacharjee, I.Sc. (Calcutta) | 14. Sunil Kumar Mukherjee, I.Sc. (Calcutta) |
| 5. Phani Bhusan Chatterjee, B.Sc. (Calcutta)   | 15. Banasibhari Nanli, I.Sc. (Calcutta)     |
| 6. Santi Ram Chatterjee, I.Sc. (Calcutta)      | 16. Sumit Kumar Noogi, B.Com. (Calcutta)    |
| 7. Gora Chand De, I.Sc. (Calcutta)             | 17. Radha Nath Ray, B.Sc. (Calcutta)        |
| 8. Subal Chandra Debnath, I.Sc. (Dacca)        | 18. Pulin Behari Roy, I.Sc. (Calcutta)      |
| 9. Dayamoy Dutta, I.Sc. (Calcutta)             | 19. Sujit Kanti Roy, B.Sc. (Calcutta)       |
| 10. Kahuliran Maiti, I.Sc. (Calcutta)          | 20. Nimai Chand Sinha Roy, I.Sc. (Calcutta) |

### SENIOR CLASS (EVENING) : MARCH-SEPTEMBER 1960

- |  |   |
|--|---|
| 1. Habibulla Tareque Ahmed, I.Sc. (Calcutta)     | 8. Sumania Kumar Kundu, I.Com. (Calcutta)       |
| 2. Bajrang Lal Bajoria, B.Com. (Calcutta)        | 9. Himat Chandra Gangopadhyay, I.Sc. (Calcutta) |
| 3. Sunil Krishna Basu, B.Com. (Calcutta)         | 10. Dilip Kumar Ghosh, I.Sc. (Calcutta)         |
| 4. Nirmalya Prasun Chakraborty, B.Sc. (Calcutta) | 11. Aniya Kumar Ghosh, B.Sc. (Calcutta)         |
| 5. Chinmoy Kumar Choudhury, I.Sc. (Calcutta)     | 12. Kuslinath Gupta, I.Sc. (Calcutta)           |
| 6. Nilratan Das, I.Sc. (Calcutta)                | 13. Subodh Chandra Sarkar, B.Com. (Calcutta)    |
| 7. Sunil Kumar Das, B.Sc. (Calcutta)             | 14. Misa Sipra Sengupta, B.Sc. (Calcutta)       |

### 10.9 SHORT COURSE ON OPERATIONAL RESEARCH (2-14 MAY 1960)

The list of participants and the organizations deputing them are as follows:

- |  |   |
|--|---|
| 1. T. Bose, Indian Aluminium Co., Ltd., Howrah                       | 8. Ishwari M. Naik, Golden Chemicals Private Ltd., Bombay-37  |
| 2. R. S. Chakraborty, Planning Commission, New Delhi                 | 9. I. R. Oza, The Arvind Mills Ltd., Ahmedabad  |
| 3. Praybhata Genguly, Textile Machinery Corporation Ltd., Bihariya.  | 10. J. N. Shah, Alambic Chemical Works Co., Ltd., Harola-3  |
| 4. S. Ganguly, Burn & Co. Ltd., Howrah Iron Works, Howrah            | 11. O. Sivaraman, Office of the Jute Commissioner, Ministry of Commerce and Industry, Government of India, Calcutta-1 |
| 5. P. P. George, Jay Engineering Works Ltd., Calcutta-31.            | 12. Bhavynkant F. Vahalia, Golden Tobacco Co. Private Ltd., Bombay  |
| 6. S. Kumar, Central Glass & Ceramic Research Institute, Calcutta-32 |   |

TWENTYEIGHTH ANNUAL REPORT : 1960-60

10.9.1 NUMBER OF TRAINEES IN DIFFERENT COURSES FROM 1932 TO 1960  
(Year given as academic year, July-June)

course	1932	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	total
	-50	-51	-52	-53	-54	-55	-56	-57	-58	-59	-60		
<b>I. INDIAN TRAINEES</b>													
1. Research & Advanced Studies	25	2	3	2	8	9	12	13	12	17	15		118
2. One/Two/Three Year Professional Statistician's													
2.1 first year	100	12	13	16	13	16	30	33	28	27	27		315
2.2 second year	7	0	8	17	17	16	18	20	32	25	23		182
2.3 third year	—	—	—	—	—	—	—	18	25	35	21		90
3. Officers' Training	—	—	—	—	—	—	18	25	19	22	25		106
4. Short-term Statistician's													
4.1 Junior													
first 6 months	—	—	—	—	—	—	55	52	53	35	53		248
2nd 6 months	—	—	—	—	—	—	32	53	40	35	53		222
4.2 Senior													
first 6 months	—	—	—	—	—	—	—	—	12	10	10		32
2nd 6 months	—	—	—	—	—	—	—	—	12	8	0		41
4.3 Evening courses in New Delhi	—	—	—	—	—	—	—	—	40	41	41		122
4.4 Evening courses in Bombay (started in April 1960)	—	—	—	—	—	—	—	—	—	—	—	32	32
5. Officers on deputation	30	3	5	13	8	8	6	6	1	5	10		95
6. Computer's Training													
6.1 Junior													
first 6 months	—	—	31	24	32	30	42	45	25	22			264
2nd 6 months	—	—	31	30	25	35	30	45	30	30	35		290
6.2 Senior													
first 6 months	—	—	—	13	15	17	12	10	13	14			103
2nd 6 months	—	—	—	16	16	16	19	20	15	8			110
7. ISEC													
7.1 Regular course													
first 6/9 months	—	—	10	10	7	15	5	10	3	3	5		68
2nd 6 months	—	3	12	5	12	—	—	—	—	—	—		32
7.2													
8. Other special courses	—	—	—	—	—	—	—	82	37	16	11		146
total (Indian)	162	20	82	124	143	162	260	442	442	369	420		2644
<b>II. FOREIGN TRAINEES</b>													
1. Research & Advanced Studies	1	—	1	—	—	1	1	—	1	1	2		8
2. Training in special fields	—	25	—	—	—	—	—	7	5	8	—		45
3. ISEC													
3.1 Regular course													
1st 6/9 months	—	—	26	27	18	12	6	18	15	24	21		167
3.2 2nd 6 months	—	15	28	25	12	—	—	—	—	—	—		80
3.3 Training in special fields	—	—	—	—	—	—	—	—	—	3	—		3
total (foreign)	1	40	55	52	30	13	7	25	21	36	23		303
total (all)	163	60	137	176	173	175	270	467	463	405	443		2947

Note: In addition about 2600 technical apprentices and others were trained through participation in projects during the years 1932 to 1960.

INDIAN STATISTICAL INSTITUTE

10.9.2 NUMBER OF CANDIDATES REGISTERED FOR DIFFERENT EXAMINATIONS

centre	September 1959			April 1960	
	Statisticians' Diploma	Computer's Certificate	Field Survey Certificate	Statisticians' Diploma	Computer's Certificate
(1)	(2)	(3)	(4)	(5)	(6)
Calcutta	.. 48	85	5	59	59
New Delhi	.. 54	8	5	48	5
Bombay	.. 18	—	—	12	1
Bangalore	.. 7	3	7	4	6
Oldidih	.. 1	11	1	—	8
Lucknow	.. 9	—	—	—	—
Poona	.. 8	—	—	—	—
Trivandrum	.. —	1	12	—	—
total	.. 145	108	30	123	77

Appendix 11 : List of Successful Candidates in Professional Examinations

(Roll numbers are mentioned within brackets after the names)

11.1.1 STATISTICIAN'S DIPLOMA EXAMINATION, SEPTEMBER 1959

A. GENERAL PAPERS

Paper I (Theoretical)

- |   |  |
|---|--|
| 1. Srichandra Basu Ray (C25), B.Sc. (Calcutta)          | 9. Chitrapu Hanumantha Rao (C11), B.Sc. (Andhra)     |
| 2. Chuni Gopal Bhattacharya (C41), B.Sc. (Calcutta)     | 10. Kakumanu Varasprada Rao (G1), B.Sc. (Anilura)    |
| 3. Jagdishwar Dayal (D51), B.Sc. (Hons.), (Delhi)       | 11. Sris Chandra Roy (C10), M.Sc. (Dacca)            |
| 4. Nikhil Ranjan Dhar (C24), B.Sc. (Calcutta)           | 12. Vidya Sagar (D40), M.A. (Punjab)                 |
| 5. Pritam Pal Garg (C43), M.Sc. (Agra)                  | 13. R. D. Saxena (D38), M.Sc. (Agra)                 |
| 6. Hari Raghunath Kulkarni (P4), B.Sc. (Hons.), (Poona) | 14. Awasdheh Kumar Singh (L9), M.Sc. (Allahabad)     |
| 7. Parthasarathi Mallela (D31), B.A. (Hons.), (Andhra)  | 15. Kharg Bahadur Singh (D3), M.A. (Punjab)          |
| 8. Sourindra Mohan Mukherji (C22), B.Sc. (Calcutta)     | 16. Rajendra Kumar Tripathi (L3), M.Sc. (Allahabad). |

Paper II (Theoretical)

- |   |   |
|---|---|
| 1. Ranbir Rai Bagga (D45), M.A. (Punjab)              | 8. Sunil Kumar Mazumdar (C1), B.Sc. (Calcutta)            |
| 2. Bopal Basu Mallick (C24), B.A. (Hons.), (Calcutta) | 9. Shyam Sunder Narula (D44), B.A. (Punjab)               |
| 3. Chuni Gopal Bhattacharya (C41), B.Sc. (Calcutta)   | 10. Shroeram Ganesha Pandey (B9), M.Sc. (Bombay)          |
| 4. Pranabendu Das (C23), B.Sc. (Hons.), (Calcutta)    | 11. Venkatasubramanian Radhakrishnan (BB2), M.Sc. (Poona) |
| 5. Jagdish Narain Garg (D6), M.A. (Delhi)             | 12. Dhara Singh Sharma (D17), M.A. (Agra)                 |
| 6. Pritam Pal Garg (C43), M.Sc. (Agra)                | 13. Awantosh Kumar Singh (L0), M.Sc. (Punjab)             |
| 7. Srinivasa Kalyanaswami (BB8), B.A. (Annamalain)    | 14. Kharg Bahadur Singh (D3), M.A. (Punjab)               |
|   | 15. Lal Singh (D14), M.A. (Punjab)                        |
|   | 16. Surendra Nath Sinha (L1), M.Sc. (Agra)                |



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*Paper III (Theoretical)*

1. Jagdish Jha (C46), M.A. (Patna)
2. Chhakkilal Prajapat (L4), M.Sc. (Agra)
3. Kakumasa Vnesprasaada Rao (G1), B.Sc. (Andhra)
4. Shanti Sagar Tandon (D6), M.A. (Punjab)

*Paper VI (Practical)*

1. Robindra Nath Mukherjee (C43), B.A. (Calcutta)

*Paper VII (Practical)*

1. Brij Mohan Pal Khullar (P3), M.A. (Punjab)
2. Avudhesh Kumar Singh (L9), M.Sc. (Allahabad)

**B. SPECIAL PAPERS**

*Papers IV and V (Theoretical)*

*Design of Experiments (Applied)*

1. Pawan Kumar Jain (D9), M.Sc. (Agra)
2. Ashim Kumar Mookherjee (C4), B.Sc. (Calcutta)
3. N. Purnashottam Roddy (P8)\*, B.A. (Orissania)

*Psychology and Education*

1. Makhan Lal Razdan (D21), M.A. (Agra)

*Mathematical Theory of Sampling Distributions*

1. Banwari Lal (D23), M.A. (Agra)

*Statistical Quality Control*

1. Suraj Bandyopadhyay (C17), B.Sc. (Calcutta)
2. Surendra Kumar Chowdhury (C21), B.Sc. (Punjab)
3. Sumanirai Chhotubhai Doshi (B8), M.A. (Bombay)
4. Rajendra Kumar Goswamy (C7), B.A. (Punjab)
5. Jagraj Chand Gupta (C19), B.A. (Punjab)
6. Krishan Lal Koldi (D41), B.A. (Punjab)
7. Kalavagunia Suguna Bhaskara Rao (P5), B.Sc. (Andhra)
8. Jitender Kumar Vorma (C44), M.Sc. (Agra)

*Sample Surveys (Theory)*

1. Krishna Chandra Agarwal (D8), M.Sc. (Agra)
2. Dharam Pal Aggarwal (D40), M.A. (Delhi)
3. Jatinder Singh Malini (D10), M.A. (Punjab)

*Sample Surveys (Applied)*

1. Dharam Pal Aggarwal (D46), M.A. (Delhi)
2. Bsdal Basu Mallick (C34), B.A. (Hons.), (Calcutta)
3. Viewadnan Chattopadhyay (C29), B.Sc. (Calcutta)
4. Sudhendra Sokhar Das (C33), B.Com. (Calcutta)
5. Nikhil Ranjan Dhar (C24), B.Sc. (Calcutta)
6. Upendra Muralikrishnan (P8), B.Sc. (Andhra)
7. Viewanath Nikoro (C5), M.Sc. (Lucknow)
8. Nanduri Chinnam Raju (C47), B.Sc. (Andhra)
9. Kulwant Singh (D29), M.A. (Punjab)
10. Sampurnan Singh (D21), M.A. (Punjab)
11. Jitender Kumar Vorma (C44), M.Sc. (Agra)

*Economic Statistics*

1. Monoj Chatterjee (C26) B.A. (Calcutta)
2. C. L. Gupta (D30), M.A. (Punjab)
3. Motilal Jindal (D42), B.A. (Punjab)

*Vital Statistics and Population Studies*

None passed

*Papers VIII and IX (Practical)*

*Psychology and Education*

1. Brij Mohan Pal Khullar (P3), M.A. (Punjab)

\*Indicates for distinction.

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*Design of Experiments (Applied)*

None passed

*Statistical Quality Control*

- |   |  |
|---|--|
| 1. Sowak Ram Chauhan (D28), B.A. (Hons.), (Delhi) | 6. Jagrup Chand Gupta (C19), B.A. (Punjab)       |
| 2. Surendra Kumar Chowdhury (C21), B.Sc. (Punjab) | 6. K. Jayanandran (B14), M.A. (Madras)           |
| 3. Sumantrai Chhotubhai Desai (B8), M.A. (Bombay) | 7. Brij Mohan Pal Khullar (P3), M.A. (Punjab)    |
| 4. Rajendra Kumar Goswami (C7), B.A. (Punjab)     | 8. Krishna Lal Kohli (D41), B.A. (Punjab)        |
|   | 9. Chhakkilal Projavat (L4), M.Sc. (Agra)        |
|   | 10. Bibhas Chandra Samal (C14), B.Sc. (Calcutta) |
|   | 11. Jitender Kumar Verma (C44)*, M.Sc. (Agra)    |

*Sample Surveys (Theory)*

1. Rajendra Kumar Tripathi (L3), M.Sc. (Allahabad)

*Sample Surveys (Applied)*

- |   |   |
|---|---|
| 1. Dharani Pal Aggarwal (D46), M.A. (Delhi) | 2. Sridi Chandra Basu Roy (C25), B.Sc. (Calcutta) |
|   | 3. Asoke Kumar Das Gupta (C30), B.Sc. (Calcutta)  |

*Economic Statistics*

- |  |   |
|--|---|
| 1. Raghunath Shankar Abhyankar (B2), B.Sc. (Poona) | 2. Monoj Chatterjee (C20)*, B.A. (Calcutta)   |
|  | 3. Y. Shiva Rao (D4), M.A. (Punjab)           |
|  | 4. A. Mathu Subramaniam (B14)*, M.A. (Madras) |

11.1.2 STATISTICIAN'S DIPLOMA EXAMINATION, APRIL 1960

A. GENERAL PAPERS

*Paper I (Theoretical)*

- |  |   |
|--|---|
| 1. C. Subramaniam (C55), B.A. (Madras) | 2. Bhagwati Prasad Dyandi (D13), B.A. (Allahabad) |
|--|---|

*Paper II (Theoretical)*

- |  |  |
|--|--|
| 1. Jitender Kumar Verma (B6), M.Sc. (Agra)           | 5. Ramaswari Prasad Srivastava (C40), M.A. (Lucknow) |
| 2. Vanudas Ramchandra Karkhanis (B0), B.Sc. (Poona)  | 6. Rabintra Nath Banerjee (C43), B.Sc. (Calcutta)    |
| 3. Akhil Nath Bhattacharyya, (C34), B.Sc. (Calcutta) | 7. Motilal Jindal (D2), B.A. (Punjab)                |
| 4. Chandrashekar Shankar Joshi (C38), M.Sc. (Nagpur) | 8. Umrao Singh (D16), M.Sc. (Rajasthan)              |
|  | 9. Banwari Lal (D17), M.A. (Agra)                    |
|  | 10. Dharani Pal Aggarwal (D25), M.A. (Delhi)         |

*Paper III (Theoretical)*

- |  |  |
|--|--|
| 1. Priyam Pal Garg (C16), M.Sc. (Agra)               | 3. Shyam Sundar Narula (D31), B.A. (Punjab)      |
| 2. Ramachvar Prasad Srivastava (C40), M.A. (Lucknow) | 4. Awaloshi Kumar Singh (D47), M.Sc. (Allahabad) |

*Paper VI (Practical)*

- |  |  |
|--|--|
| 1. Govind Bajirao Joshi (B1), M.Sc. (Bombay)         | 7. Somdevi Chandra Saha (C17), B.Sc. (Calcutta)      |
| 2. Ashok Kanchanlal Parikh (B3), B.Com. (Gujrat)     | 8. Prakash Chandra Kuslu (C22), B.Sc. (Calcutta)     |
| 3. Suraj Bandyopadhyay (C8), B.A. (Calcutta)         | 9. Aditi Kumar Mookherjee (C36), B.Sc. (Calcutta)    |
| 4. Kulter Singh Bodi (C10), M.A. (Punjab)            | 10. Makhan Lal Razdan (D37), M.A. (Agra)             |
| 5. Gurrankonlu Mamaswamy Naidu (C12), B.A. (Andhra)  | 11. Rajendra Kumar Tripathi (D46), M.Sc. (Allahabad) |
| 6. Chuni Gopal Bhattacharyya (C13), B.Sc. (Calcutta) | 12. Awaloshi Kumar Singh (D47), M.Sc. (Allahabad)    |

*Paper VII (Practical)*

- |  |   |
|--|---|
| 1. Raghunath Shankar Abhyankar (B8), B.Sc. (Poona) | 3. Kamosh Prasad Srivastava (C40), M.A. (Lucknow) |
| 2. Ram Kishore Gupta (D3), M.A. (Delhi)            | 4. Kripa Shankar (D23), M.Sc. (Agra)              |

\* Indicates distinction.

**B. SPECIAL PAPERS**

*Papers IV & V (Theoretical)*

(i) *Statistical Quality Control*

- |  |  |
|--|--|
| 1. Rajaram Bhalchandra Bhale (B7), B.Sc. (Poona)     | 5. Samir Kumar Basu (D20), B.Sc. (Calcutta)      |
| 2. Raghunath Shankar Abhyankar (B8), B.Sc. (Poona)   | 6. Vod Prakash Malhotra (C41), B.A. (Punjab)     |
| 3. Nanduri Chinnam Raju (C11), B.Sc. (Andhra)        | 7. Kanakendra Nath Dutta (C44), B.Sc. (Calcutta) |
| 4. Chuni Gopal Bhattacharyya (C13), B.Sc. (Calcutta) | 8. Bhyamalendu Ganguly (C46), B.Sc. (Calcutta)   |
|  | 9. Aji Singh Bhatti (C57), B.A. (Punjab)         |
|  | 10. Ranbir Rai Bagga (D30), M.A. (Punjab)        |
|  | 11. Awadesh Kumar Singh (D47), M.Sc. (Allahabad) |

(ii) *Sample Surveys (Theory)*

- |  |  |
|--|--|
| 1. Shrikant Atanur Alavani (D4), B.Sc. (Bombay)      | 3. Pawan Kumar Jain (D14), M.Sc. (Agra)  |
| 2. Rameshwar Prasad Srivastava (C40), M.A. (Lucknow) | 4. *Makhan Lal Razdan (D37), M.A. (Agra) |

(iii) *Sample Surveys (Applied)*

- |   |   |
|---|---|
| 1. Bibhas Chandra Samal (C5), B.Sc. (Calcutta)        | 6. Surendra Kumar Chowdhury (C42), B.Sc. (Punjab)   |
| 2. Raj Kumar Nandy (C24), B.Sc. (Calcutta)            | 7. Asim Kumar Dutta (C48), B.Sc. (Calcutta)         |
| 3. Rajendra Kumar Goswami (C32), B.A. (Punjab)        | 8. Ajoy Kumar Ghosh (C56), B.Sc., B.Com. (Calcutta) |
| 4. Ashim Kanti Biswas (C30), B.Sc. (Calcutta)         | 9. Motilal Jindal (D2), B.A. (Punjab)               |
| 5. *Rameshwar Prasad Srivastava (C40), M.A. (Lucknow) | 10. Krijan Shanker (D23), M.A. (Agra)               |

(iv) *Design of Experiments (Applied)*

1. Chuni Gopal Bhattacharyya (C13), B.Sc. (Calcutta)

(v) *Psychology and Education*

1. Anil Kumar Mallik (C4), M.Sc. (Calcutta)      2. Hanuman Prasad (D36), M.A. (Punjab)

(vi) *Probit Analysis*

1. Awadesh Kumar Singh (D47), M.Sc. (Allahabad)

(vii) *Mathematical Theory of Sampling Distributions*

1. S. Viswanath Tulpule (B11), M.Sc. (Bombay)

*Papers VIII and IX (Practical)*

(i) *Statistical Quality Control*

- |  |  |
|--|--|
| 1. Rajaram Bhalchandra Bhale (B7), B.Sc. (Poona)   | 5. Samir Kumar Basu (C20), B.Sc. (Calcutta)      |
| 2. Raghunath Shankar Abhyankar (B8), B.Sc. (Poona) | 6. Mrinal Kanti Samanta (C37), B.Sc. (Calcutta)  |
| 3. Kullar Singh Bedi (C10), M.A. (Punjab)          | 7. Kanakendra Nath Dutta (C44), B.Sc. (Calcutta) |
| 4. Nanduri Chinnam Raju (C11), B.Sc. (Andhra)      | 8. Krijan Shanker (D23), M.Sc. (Agra)            |
|  | 9. Brij Mohan Malhotra (D34), M.A. (Punjab)      |
|  | 10. Awadesh Kumar Singh (D47), M.Sc. (Allahabad) |

(ii) *Economic Statistics*

1. Sisiram Gausuli Puro (B3), M.Sc. (Bombay)

(iii) *Sample Surveys (Theory)*

1. Kharg Bahadur Singh (D7), M.A. (Punjab)

(iv) *Sample Surveys (Applied)*

- |  |  |
|--|--|
| 1. Nanduri Chinnam Raju (C11), B.Sc. (Andhra)  | 3. Nikhil Ranjan Dhar (C30), B.Sc. (Calcutta)        |
| 2. Rajendra Kumar Goswami (C32), B.A. (Punjab) | 4. Rameshwar Prasad Srivastava (C40), M.A. (Lucknow) |

\* Denotes distinction.

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(v) *Design of Experiments (Applied)*

- |  |  |
|--|--|
| 1. *Ashim Kumar Mookherjee (C35), B.Sc. (Calcutta) | 4. *Bhagwati Prasad Dymali (D13), B.A. (Allahabad) |
| 2. Rabindra Nath Banerjee (C43), B.Sc. (Calcutta)  | 5. *Pawan Kumar Jain (D16), M.Sc. (Agra)           |
| 3. *Kharg Bahadur Singh (D7), M.A. (Punjab)        | 6. *Chhakkilal Prajapat (D43), M.Sc. (Agra)        |

(vi) *Psychology and Education*

1. \*Makhan Lal Rastan (D37), M.A. (Agra)

(vii) *Probit Analysis*

1. Awadeh Kumar Singh (D47), M.Sc. (Allahabad)

(viii) *Mathematical Theory of Sampling Distributions*

1. S. Viawanath Tulpule (B11), M.Sc. (Bombay)

11.2.1 COMPUTER'S CERTIFICATE EXAMINATION—SEPTEMBER 1959

*Part IA Section I*

- |  |   |
|--|---|
| 1. A. Andiappoo (D4), S.S.L.C. (Madras)          | 5. Prasanta Kumar Chandra (C12), I.Sc. (Calcutta) |
| 2. Belbir Krishan Bhatia (D6), B.A. (Punjab)     | 6. Ratan Lal Garg (D5), B.Com. (Lucknow)          |
| 3. Shibdas Bhowmick (C23), I.Sc. (Rajshahi)      | 7. Tarak Prasad Mukherjee (C13), B.Sc. (Calcutta) |
| 4. Jajneswar Chakravarty (C10), B.Sc. (Calcutta) | 8. A. P. Narayana Poduval (D2), B.A. (Madras)     |
|  | 9. Durga Prasad Sarkar (C14), B.Sc. (Calcutta)    |

*Part IA Section II*

- |   |  |
|---|--|
| 1. Dulal Chandra Banerjee (C30), I.A. (Calcutta)      | 9. Paritosh Mazumdar (C5), I.Sc. (Calcutta)        |
| 2. Jajneswar Chakravarty (C10), B.Sc. (Calcutta)      | 10. Tarak Prasad Mukherjee (C13), B.Sc. (Calcutta) |
| 3. Prasanta Kumar Chandra (C12), I.Sc. (Calcutta)     | 11. Bimal Chandra Pal (C16), B.Sc. (Calcutta)      |
| 4. Manindra Narayan Choudhury (C21), B.Sc. (Calcutta) | 12. A. P. Narayana Poduval (D2), B.A. (Madras)     |
| 5. Manoharan De (C80), B.Sc. (Calcutta)               | 13. Haridas Roy (C76), S.F. (S.E.B., W.B.)         |
| 6. Manjula Dhar (C85)*, B.Sc. (Calcutta)              | 14. Durga Prasad Sarkar (C14), B.Sc. (Calcutta)    |
| 7. Asim Kumar Dutta (C50), B.Sc. (Calcutta)           | 15. Jadab Chandra Sarkar (C26), B.A. (Calcutta)    |
| 8. Ratan Lal Garg (D5), B.Com. (Lucknow)              | 16. Mysore Seetharama (B11), B.Sc. (Mysore)        |
|   | 17. Gurbachan Singh (D1), B.Sc. (Agra)             |

*Part IB Section I*

1. Balkrishana Aggarwal (D7) I.Sc. (Punjab)

*Part IB Section II*

- |  |   |
|--|---|
| 1. Balkrishana Aggarwal (D7), I.Sc. (Punjab)         | 9. Manindra Narayan Choudhury (C21), B.Sc. (Calcutta) |
| 2. Samarendra Barua (C22), B.A. (Calcutta)           | 10. Sukeah Ranjan Dobnath (C68), S.F. (S.E.B., W.B.)  |
| 3. Anil Kumar Bhattacharjee (C38), I.A. (Calcutta)   | 11. Hari Bhushan Dutta (C20), I.Com. (Calcutta)       |
| 4. Senti Priya Bhowmik (C83), I.Sc. (Calcutta)       | 12. Manoj Kanti Ghosh (C56), M.A. (Patna)             |
| 5. Marut Baran Chakravarty, (C40), I.Com. (Calcutta) | 13. Paritosh Mazumdar (C5), I.Sc. (Calcutta)          |
| 6. Nidhir Chakravarty (C31), M.A. (Calcutta)         | 14. Subodh Kumar Mukherjee (C37), B.Sc. (Calcutta)    |
| 7. Prasanta Kumar Chandra (C12), I.Sc. (Calcutta)    | 15. Bimal Chandra Pal (C16), B.Sc. (Calcutta)         |
| 8.* Saik Kumar Das (C52), I.Sc. (Calcutta)           | 16. Hanjit Kumar Roy (C44), I.Com. (Calcutta)         |

*Part IC Section I*

- |  |  |
|--|--|
| 1. Manindra Chandra Basu (C50), B.Sc. (Calcutta)   | 6. Saik Kumar Das (C52), I.Sc. (Calcutta)        |
| 2. Gopal Chandra Biswas (C80), B.Sc. (Calcutta)    | 7. Ranu Chandra Mitra (C58), I.Sc. (Calcutta)    |
| 3. Ajit Kumar Chatterjee (C46), I.Sc. (Calcutta)   | 8. Somnath Chandra Saha (C65), B.Sc. (Calcutta)  |
| 4. Kalidas Chatterjee (C75), M.A. (Calcutta)       | 9. Nironira Nath Sarkar (C42), B.Com. (Calcutta) |
| 5. Nirmal Krishna Chaudhuri (C8), B.Sc. (Calcutta) | 10. Amiya Kumar Sinha (C54), I.Sc. (Calcutta)    |

*Part IC Section II*

- |  |  |
|--|--|
| 1. Gopal Chandra Biswas (C80), B.Sc. (Calcutta)  | 3. Ajit Kumar Chatterjee (C46), I.Sc. (Calcutta) |
| 2. Deb Kumar Chatterjee (C8)*, B.Com. (Calcutta) | 4. Atul Krishna Pal (C17), B.Sc. (Calcutta)      |

\* Denotes distinction

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11.2.2 COMPUTER'S CERTIFICATE EXAMINATION—APRIL 1960

*Part I Section I*

- |  |  |
|--|--|
| 1. Dilukhraj Fatechand Mehta (B1), S.S.L.C. (Bombay) | 9. Kaashi Nath Gupta (C44), I.Sc. (Calcutta)         |
| 2. *Mysore Sreetharama (BB2), B.Sc. (Mysore)         | 10. Balalob Bandyopadhyay (C46), B.Sc. (Calcutta)    |
| 3. K. V. Sreerangachar (BB4), I.Sc. (Mysore)         | 11. Amiya Kumar Ghosh (C51), B.Sc. (Calcutta)        |
| 4. P. Narayan (BB6), S.S.L.C. (Madras)               | 12. Habibullah Tarique Ahmed (C52), I.Sc. (Calcutta) |
| 5. *Bajrang Lal Bajoria (C33), B.Com. (Calcutta)     | 13. Biswanath Bhattacharyya (C53), B.Sc. (Calcutta)  |
| 6. Sunil Kumar Das (C38), B.Sc. (Calcutta)           | 14. Nabendu Kumar Mustafy (C56), B.A. (Calcutta)     |
| 7. Manjula Dhar (C39), B.Sc. (Calcutta)              | 15. Sushanta Kumar Kundu (C59), I.Com. (Calcutta)    |
| 8. Subhas Chandra Mukherjee (C42), I.Sc. (Calcutta)  | 16. Mohinder Chandna (D1), B.Sc. (Rajputana)         |

*Part IA Section II*

- |  |  |
|--|--|
| 1. M. Ourunathan (BB5), Dip. in Elcet. Eng. (Mysore) | 4. Prasun Sen Gupta (C27), B.A. (Calcutta)         |
| 2. Kabirole Bhari Roy (C10)                          | 5. Bajrang Lal Bajoria (C33), B.Com. (Calcutta)    |
| 3. Ranajit Kumar Ray (C20), I.Com. (Calcutta)        | 6. Manik Lal Pal (C34), B.Sc. (Calcutta)           |
|  | 7. Biswanath Bhattacharyya (C53), B.Sc. (Calcutta) |

*Part IB Section I*

- |   |  |
|---|--|
| 1. Tapan Das Gupta (C16), I.Sc. (Calcutta)  | 3. Baladeb Bandyopadhyay (C46), B.Sc. (Calcutta) |
| 2. Atul Krishna Pal (C30), B.Sc. (Calcutta) | 4. Bajrang Lal Bajoria (C33), B.Com. (Calcutta)  |
|   | 5. Santi Priya Bhowmik (C55), I.Sc. (Calcutta)   |

*Part IB Section II*

- |   |  |
|---|--|
| 1. Panchanan Mashoharuk (C13), B.Sc. (Calcutta) | 3. Manjula Dhar (C39), B.Sc. (Calcutta)          |
| 2. Bajrang Lal Bajoria (C33), B.Com. (Calcutta) | 4. Baladeb Bandyopadhyay (C46), B.Sc. (Calcutta) |
|   | 5. Debabrata Baridhan (G6), B.A. (Calcutta)      |

*Part IC Section I*

- |   |   |
|---|---|
| 1. Sukeah Ranjan Debnath (C18), S.F. (W.B.) | 2. Ranajit Kumar Ray (C20), I.Com. (Calcutta) |
|---|---|

*Part IC Section II*

- |   |  |
|---|--|
| 1. *Manindra Chandra Basu (C11), B.Sc. (Calcutta) | 7. Manoj Kanti Ghosh (C29), Matrio (Patna)         |
| 2. Samarendra Barua (C14), B.A. (Calcutta)        | 8. Biswanath Bhattacharyya (C53), B.Sc. (Calcutta) |
| 3. Sukeah Ranjan Debnath (C18), S.F. (W.B.)       | 9. Santipriya Bhowmik (C55), I.Sc. (Calcutta)      |
| 4. Manoharan De (C26), B.Sc. (Calcutta)           | 10. Madhai Lal Mukhopadhyay (D3), B.Sc. (Calcutta) |
| 5. Syamal Kumar Sen (C25), B.Sc. (Calcutta)       | 11. Bharat Kumar Mitra (G3), B.Sc. (Calcutta)      |
| 6. Prasun Sen Gupta (C27), B.A. (Calcutta)        |  |

11.3 STATISTICAL FIELD SURVEYS CERTIFICATE EXAMINATION  
SEPTEMBER—1959

*Part I Section A*

- |   |  |
|---|--|
| 1. R. Chellappan Achari (T1), S.S.L.C. (Kerala) | 2. M. N. Gopinatha Kurup (T0), S.S.L.C. (Kerala) |
|   | 3. M. C. Mathai (T3), U.P.E. (Kerala)            |

*Part I Section B*

None passed

*Part I Section C*

None passed

*Part 2 Section A*

- |   |  |
|---|--|
| 1. A. N. Ananthaswamy Rao (BB2), I.Sc. (Mysore) | 2. K. A. Subramanian (BB1), M.A. (Annamalai) |
|---|--|

*Part 2 Section B*

- |   |  |
|---|--|
| 1. J. R. Doroswamy Iyer (BB4), I.Sc. (Mysore) | 3. Pynro Lal Sharma (D4), M.A. (Punjab)      |
| 2. M. B. Rangaswamy (BB3), B.Sc. (Mysore)     | 4. K. A. Subramanian (BB1), M.A. (Annamalai) |

\* Indicates distinction.

INDIAN STATISTICAL INSTITUTE

11.4 SUMMARY OF RESULTS IN EXTERNAL EXAMINATIONS FOR ALL PAPERS,  
FROM 1951 TO 1960 (NOVEMBER)

A. STATISTICIAN'S DIPLOMA EXAMINATION

Paper	year										total	
	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58	1958-59	1959-60	April 1960		
I	R	42	59	66	69	69	62	67	53	111	35	696
	A	24	37	43	45	42	72	61	47	92	27	490
	P %	6	9	4	8	18	29	20	13	32	2	141
II	R	38	47	60	48	41	82	57	30	59	22	470
	A	18	27	33	28	21	39	50	24	51	16	307
	P %	7	9	17	10	9	21	18	11	33	10	145
III	R	31	42	45	44	42	77	40	33	61	28	447
	A	16	22	29	28	25	43	22	29	44	22	280
	P %	6	9	10	11	4	11	15	15	15	4	100
VI	R	22	22	37	34	23	42	66	45	106	41	428
	A	15	10	32	31	10	37	51	41	100	40	385
	P %	3	1	6	15	2	12	18	5	16	12	89
VII	R	22	22	34	31	24	41	52	23	63	26	338
	A	15	10	29	27	30	38	47	21	60	25	301
	P %	3	4	4	4	4	6	11	8	10	4	58
IV	R	19	13	23	23	27	60	64	54	52	31	372
	A	14	9	20	20	22	41	56	45	46	25	306
	P %	13	4	17	14	7	10	32	20	31	10	173
V	R	19	12	23	10	27	37	45	20	63	30	264
	A	14	8	18	14	22	23	41	27	55	24	246
	P %	12	22	9	7	15	14	24	14	27	14	138
VIII	R	13	9	13	14	23	37	48	35	50	32	280
	A	10	8	13	13	21	20	30	34	54	30	251
	P %	4	4	2	3	7	9	14	16	26	13	98
IX	R	13	3	10	20	23	33	39	35	67	33	281
	A	10	3	15	17	20	31	34	34	66	29	250
	P %	3	2	6	6	9	12	3	10	14	12	77
All Papers	R	217	220	306	300	292	548	468	337	628	277	3602
	A	136	162	232	223	212	353	401	302	570	238	2816
	P %	57	44	74	78	75	133	155	112	203	87	1018
		42	29	32	35	36	38	30	37	35	36	36

Note: (a) R = number registered; A = number appeared; P = number passed and % = percentage of pass (approx.)

(b) Since 1956-57 the examination is held twice in the year.

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B. COMPUTER'S CERTIFICATE EXAMINATION

Paper	year											total
	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58	1958-59	1959-60	April 1960		
IA(I)	R	123	50	66	37	144	234	129	50	83	30	966
	A	93	54	00	34	124	205	120	44	70	34	847
	P	48	19	31	16	88	105	84	12	17	16	436
	%	52	26	52	47	71	51	70	27	21	47	51
IA(II)	R	131	76	78	51	162	320	203	70	103	41	1234
	A	98	68	67	48	138	280	194	60	95	37	1083
	P	28	26	10	11	38	71	48	20	22	7	281
	%	26	34	15	23	28	25	25	33	23	19	26
IB(I)	R	87	68	79	52	132	243	168	66	84	43	1021
	A	67	57	65	49	108	215	162	50	70	41	902
	P	4	4	0	2	27	22	54	4	11	5	142
	%	8	7	14	4	26	10	33	7	14	12	16
IB(II)	R	88	63	72	47	130	275	144	74	90	30	1019
	A	61	52	60	43	90	233	136	64	88	33	869
	P	12	9	7	0	9	60	14	8	28	5	162
	%	20	17	12	0	9	26	10	13	32	15	17
IC(I)	R	34	34	31	19	43	135	87	40	49	15	497
	A	34	22	28	12	34	123	85	37	46	16	447
	P	6	3	5	2	1	39	22	8	12	2	100
	%	18	9	18	16	3	32	26	12	20	13	22
IC(III)	R	32	30	26	20	37	95	60	33	37	17	390
	A	23	20	22	14	20	87	66	30	34	17	351
	P	4	6	6	10	16	47	10	5	6	11	130
	%	17	21	27	71	65	54	20	17	18	65	37
All Papers	R	505	330	353	226	648	1302	800	332	446	191	5132
	A	376	283	302	200	530	1143	763	294	421	177	4409
	P	102	67	68	41	170	344	241	49	96	46	1233
	%	27	23	23	20	34	30	32	17	23	23	28

Note : (a) R = number registered; A = number appeared; P = number passed and % = percentage of pass (approx.)

(b) Since 1956-57 the examination is held twice in the year.

## INDIAN STATISTICAL INSTITUTE

### C. STATISTICAL FIELD SURVEY CERTIFICATE EXAMINATION : JUNIOR AND SENIOR

	Paper	year									total
		1951 -52	1952 -53	1953 -54	1954 -55	1955 -56	1956 -57	1957 -58	1958 -59	1959 -60	
IA	R	323	10	9	37	98	72	18	4	17	588
	A	210	7	6	32	58	54	17	1	16	400
	P	88	1	4	9	22	31	6	—	3	164
	%	42	14	67	38	38	57	35	—	20	41
IB	R	323	18	10	36	98	86	23	3	17	613
	A	206	13	7	32	55	64	20	1	15	413
	P	44	4	5	15	18	38	9	—	—	131
	%	21	31	71	47	33	56	45	—	—	32
IC	R	159	13	8	30	92	79	20	3	18	420
	A	85	9	5	21	50	58	16	1	15	280
	P	24	3	4	9	10	30	9	1	—	96
	%	28	33	80	43	20	62	58	100	—	37
2A	R	29	1	10	25	92	123	25	2	8	315
	A	17	1	9	19	66	88	24	2	6	232
	P	4	0	4	10	23	32	13	1	2	89
	%	24	0	44	53	35	36	54	50	33	38
2B	R	28	3	12	20	92	131	36	3	14	348
	A	17	3	11	24	67	99	30	3	11	265
	P	0	0	5	14	13	18	2	1	4	57
	%	0	0	45	58	10	18	7	33	36	22
All Papers	R	862	45	49	157	472	491	121	15	72	2284
	A	535	33	38	128	296	363	107	8	82	1570
	P	160	8	22	57	86	153	39	3	9	537
	%	10	24	58	45	29	42	36	58	14	34

Note: (a) R = number registered; A = number appeared; P = number passed and % = percentage of pass (approx.)

(b) During 1954-55, 1956-57 and 1957-58 the examinations were held twice in the year.



**Appendix 12 : C. D. Deshmukh's Inaugural Address at Bombay—Training Courses in Statistics**

[Dr. C. D. Deshmukh, President of the Institute, gave the following speech at the inaugural function of the training courses in Statistics held in the office of the Bombay Branch of the Institute on 12 May 1960].

Dr. Sastry, his colleagues in the Bombay Branch of the Indian Statistical Institute, Distinguished Guests and Trainees of the course which I have been requested to inaugurate,

I am very glad to note that this opportunity has been given to me of rectifying something in which I have been, as you have just heard from Dr. Sastry, very remiss. Although I have for the last 15 years, that is to say, since I became the President of the Indian Statistical Institute, Calcutta, taken keen interest in matters statistical as well as the work of its Bombay Branch, because in those days my headquarters was in Bombay, I must confess that I never had occasion to pay even formal visits to the operations of the Bombay Branch. I am glad, therefore, that by this means it has become possible for me to get an idea of the atmosphere and to see the Bombay Branch, which is one of the six branches of the Indian Statistical Institute.

The organization is such that the relations of the branches with the parent body are not very rigidly defined. Nevertheless, the ISI of Calcutta derives a great deal of support from these branches, which are essentially learned societies in themselves, and whenever there is any job of work to be done it is only natural that the ISI should think of vesting that responsibility in its branches and it is in accordance with this trend that the Bombay Branch has been charged with the responsibility of conducting the National Sample Survey operations in certain definite fields. It is also natural that the branch should supplement the efforts of the parent body in regard to the training of statisticians. The Institute has been charged by Government with organizing the work of Statistical Quality Control and advising it in regard to policy, and in this field, the Bombay branch has been playing a notable part indeed. It would be correct to say that the first important working unit of Statistical Quality Control was located in Bombay under the auspices of the Bombay Branch and continues to have this importance in spite of many vicissitudes. As a particularly significant movement, it has now spread to many other centres, and, as in Bombay, in one or two other places we are entrusting the promotion of the work to the other branches of the ISI, as for instance, in Bangalore.

As regards other activities, it must be said to the credit of the Bombay Branch that they have always shown a lively awareness of their responsibilities as a branch of the Statistical Institute. Dr. Sastry himself has been taking a great deal of initiative and I am quite certain that behind him is the support—the willing support—of many of his colleagues. In the course of his observations, he has told you that in spite of abundant enthusiasm and in spite of the readiness of many to undergo training in statistics, the scope of operations in this particular field is restricted on account of the inadequacy of resources in men and materials, particularly calculating machines. That is a difficulty with which, alas, we are only too familiar and it is only by dint of special effort that we shall be able to surmount these difficulties. In other words, I cannot see any ready solution of the sort of difficulties to which allusion was made by Dr. Sastry.

## INDIAN STATISTICAL INSTITUTE

### NEW STATUS OF ISI

You are aware that the status of the parent body, the Indian Statistical Institute of Calcutta, has recently been elevated by its conversion into an institute of national importance. It is not for me, as President to say how well this exaltation was deserved, but I must confess to a deep sense of gratification that some recognition was at least given to the pioneer efforts of the Institute, which began somewhere towards the end of the year 1931, that is to say after nearly 30 years of separate and autonomous existence, not regulated by any Act of the legislature.

Before the conferring of this status, the ISI, Calcutta, had been running a large number of courses—about 6 or 7—most of them of a high level and it was towards this particular work that the Government of India was kind enough to extend an adequate measure of assistance. That is to say, the total operations of the ISI were separated into categories—its work as a learned society and its work as a research and training institute and its work as a laboratory capable of taking up projects either for the Central Government or for the State Governments or for any other organization for the matter of that. Now apart from the research and training school—we need to call it a school—and apart from its work as a learned society reflected in its organ, the *Sankhyā*, printed in its own excellent press—the rest of the work was more or less contract work on projects, but it has very great value because theoretical research was accompanied by practical application. If you reflect over it that is really the root of success of research in any field, particularly in the field of statistics.

### NATURE OF STATISTICS

Statistics, which is a fusion of two separate trends or disciplines, in its aspect of the bare collection of facts has prevailed in this country from time to time for thousands of years and at various periods of our history, for instance at the time when Kautilya's *Arthashastra* was written, at the time of *Ain-i-Akbari*, at the time when the East India Company conducted the survey of economic conditions in certain districts in the Eastern region of India. The other discipline arises from the theory of chance and probability, that is to say the mathematical presentation of statistics and throughout the history of statistics these two strains have had to be kept in mind. In other words, it must not be a subject purely for the academician although the academician has naturally a very important place in the development of the theory of statistics. But statistics has very little meaning unless they are applied for the conduct of practical affairs. Indeed if you look into the etymology of the word, according to some history of statistics, statistics mean collection of facts which are all very relevant to the work of statesmen. Unlike the Indian very word Sankhyā, statistics have etymologically nothing to do with numbers at all. Our Indian word Sankhyā means both numbers as well as a definition of measurement and, therefore, it is nearer to the modern conception of statistics. Nevertheless, they are of real interest to the statesmen, that is to say those who are charged with the responsibility of administering our affairs and I suppose within the term statesmen we can include also those who manage any private enterprise—anyone who has to manage any kind of enterprise has to make use of statistics—that is to say facts and figures collected in a systematic way.

### UNIVERSITY COURSES IN STATISTICS

Now, that being the nature of statistics, it follows that there should be a comparable variety in the kind and number of training courses that are to be organized at the one end; the universities have lately introduced courses in both statistics as a subject and statistics as

a complete subject for a degree. The Bombay University for instance, as you have been told, have started courses in statistics and today there are many others. They have organized graduate courses and then they have undergraduate courses in statistics and today there are many other universities which have organized those courses. And now the University Grants Commission feels that the time has come for introducing a certain measure of coordination in these university courses. We have recently appointed a body to review the whole matter under the Chairmanship of Professor Mahalanobis, who is our admitted expert in the field of statistics. But the theoretical statistics that is taught in our universities is not sufficient for all purposes; in the nature of things it is more on the side of theory and is bare mathematical rather than applied statistics. But in numerous ways statistics has significance only if it is applied, and behind the application there must be some form of measurement about which a numerical statement has to be made including the trends and field and so on and so forth, whether for formulating or implementing a policy or for watching the way in which targets are being achieved. We do not require bare numerical statements and measurements without the field of application; and that causes the difficulty of organizing courses of training in statistics. As I said, the parent body itself has five or six courses and although the Bombay Branch is really experimenting in various kinds of courses they have adjusted their own endeavours to the needs of the moments and they have shown a great degree of adaptability. I may say, in organizing suitable courses.

#### COURSES AT BOMBAY

In the beginning they organized a course which was comparable to the University courses which they found was taken over by the University and I am sure that they were glad that the University had made a beginning because they gave formal status to the subject. Then they have taken over the subject of Statistical Quality Control, which course is bearing its own fruit and now they have started diploma courses for officials either in the public sector or in the private sector who are going there with their problems and who need a certain amount of theoretical background as well as the acquisition of knowledge peculiar to their particular fields; that, I suppose, explains the institution of a course like this. I am very glad that they have organized this course and I am happy to note that the number of applications are far more than the number of admissions, which means that those who have been admitted to the course are a very select body indeed. Out of 100 or 90 applicants, about 70 were called for interview and only about 35 were actually selected. This carries a sort of built-in guarantee of the interest and the earnestness of those who are going to undergo these courses and I am sure that will be the best reward for those who have organized this course and I am sure that the employers who have made it possible for the trainees to elect for this course will be more than satisfied that they gave the permission; because I am quite sure that after this training the trainees will go back far more equipped to shoulder the statistical material which they will be called upon to handle.

#### NEW DEGREE COURSES OF ISI

So far as the parent body is concerned, they have now moved in another direction. As you know, the legislation which has conferred on the Institute the character of an institution of national importance, contains a provision which allows the Institute to confer degrees and I think the intention of the Institute now is to establish the B.Stat. and M.Stat. i.e. to say Bachelor of Statistics and Master of Statistics degrees. These will be very high level courses extending over three or four years and I am quite certain that the selection will

## INDIAN STATISTICAL INSTITUTE

be very rigorous. At present, we are engaged in having the syllabus which we have drawn up and which we have generally approved in the meeting of the Governing Body of the Council reviewed by a panel of experts. We have appointed a panel which will consider the objectives, so to say, of this particular course of education. It is not merely a professional training. It should play the role of a course of education and the conception that was in the minds of those who framed the syllabus amongst whom are Professor Haldane and Dr. Rao who is the Director of our Research and Training School was very wide indeed; and I should not be surprised if in addition to Statistics proper, the syllabus includes instructions in humanities and sciences not to the extent to which they constitute a faculty in a university, but as an ancillary discipline. Acquaintance with science, economics and so on and so forth is essential because unless we relate statistics organically to the field of measurement all those data could not possibly be applied in the way in which they should be applied. Therefore, it is our hope that we should have a very challenging kind of syllabus for our new course and they will supplement whatever has been done by the universities. The majority of those who will go through the Indian Statistical Institute course will be furnished by the universities, though I believe—I am speaking from memory—that there will be channels open for other people also who can give evidence that they possess the necessary foundations. It is not absolutely necessary that they must have a university degree. They should rather be those who have specialized in statistics and should show that they have the necessary foundation. They will also be given admission. That is shown by the information given to you by Dr. Sastry; he gave an analysis of the figures of the members of the Royal Society in the U.K. and he pointed out that little less than 20% were non-degree holders, as it should be.

Therefore, I think it is right to say that in the field of statistics we are on the verge of a very fascinating development. Historically it has taken a great deal of time for statistics to develop or to be recognised in its proper place in this country. The first committee in regard to statistics was appointed in 1862 and the first Director of Statistics was appointed by the then Government in 1865—was Hunter, who belonged to the service to which I also belonged. Therefore, there is nothing strange that I am also speaking on statistics today, although I am neither a statistician nor a mathematician but a man from the Civil Service. It was only in the thirties of the current century that statistics really made some sort of a beginning both on the government side as I have already stated and by the establishment of the ISI as a purely private endeavour and almost as a hobby of Professor Mahalanobis, as I told you, towards the end of the year 1931. But now I think, especially after the advent of Independence that we can claim that statistics has come into its own and that is because of the logic of the time. The now independent Government of India have found that there is a big leeway to make up and have logically proceeded to the idea of a planned economic development and it now needs no argument, certainly not to statisticians, that you cannot proceed very far in formulating plans of economic development unless you have a very wide foundation of facts and figures which means statistics as well as a forecast of the future, which means perspective planning. All that now hangs on statistics. Whether it is policy-making or forecasting or measuring achievement, there is no branch in which statistics is not badly needed.

We come to the conclusion that as in many other cases personnel—trained personnel—is the real bottleneck. It is astonishing that in spite of those courses being in operation for several years today there is a great shortage of trained personnel—personnel who have been adequately trained in the sector of statistics.

STATISTICS IN JAPAN

There was a time I suppose when India perhaps could claim to be in advance of some of the countries in South and South East Asia. I had just been to Japan and I have reason to believe that they have gone ahead of us in the organization and the use of statistics. They are very greedy of statistics and they are definitely ahead of us and are perpetually measuring something or the other and they have a great deal of excellent publications in Japanese in regard to statistical matters in which we may be interested. Professor Mahalanobis visited Japan under the Distinguished Guests Programme last year. He discussed with the Director of the International House, Tokyo, Mr. Matsumoto, a very distinguished person indeed, arrangements for translating some of the material for us and decided that a small committee should be organized for getting interesting Japanese material in statistics translated into English. We have thus got a translation unit in Japan. We could arrange to get upto 50 copies of the translations if finance is available. When I visited Japan recently, I looked into the affairs of this Translation Unit. The Finance Ministry should take a reasonably kind view of the continuance of this work. I shall be happy if they will enable us to continue to do this work in which case I hope to be able to extend the publication for academic purposes, that is to say, I hope that we shall be able to secure a larger number of copies without having to pay for copyright. These publications will be useful to the universities as well as to learned societies like the branches of the ISI and any other research organization which are engaged in cognate matters.

Many countries have awakened to the importance of statistics and so have we. I have not necessary figures for comparison. I have here a very detailed analysis of the number of statisticians that we have; there are 6,000 employed by the Central Government at a cost of Rs. 1.8 crores and about 6,000 statisticians employed by the various organizations in the State Governments at a cost of Rs. 1.4 crores—therefore, that makes about Rs. 3.2 crores for 12,000 statisticians and yet that is not enough. Every limb of government, every organ of government, every responsible person in the private sector wants statisticians of some kind or the other and we have, therefore, decided that we should make a forecast of the personnel requirements in this field as in other fields and then try to do our best in order to train out the necessary personnel. As Dr. Sastry said today it is possible to do so because many altruistically-minded gentlemen like Dr. Sastry are prepared to spare a little of their time. They come and give lectures but a time will come when we shall have to organize these on a more stable and more formal meeting and that really means the availability of teachers. I suppose it is that particular need that the ISI now in its new form will be trying to fulfil.

DEVELOPMENT OF SQC

While the expansion of statistical services is inevitable I have no doubt that, after whatever initial hesitation one might experience, the necessary funds or resources would be made available for it. But that still leaves the question of making people aware of the importance of statistics in certain specialized fields, as for instance Statistical Quality Control. I have taken a great deal of interest in this matter right from the year 1948 when Professor Mahalanobis and Dr. Varman of the Indian Standards Institution and myself as Governor of the Reserve Bank decided to invite Dr. Shewhart, the recognised father of SQC, for a promotion tour of India, so as to introduce the idea of SQC. Our efforts perhaps have at long last begun to show some fruit. I think about 64 different concerns

## INDIAN STATISTICAL INSTITUTE

are now taking advantage of our organization and may be there are a few more who secured expert advice one time or other from other quarters.

What we really desire is that a larger and larger number of private enterprises should institute a formal statistical organization and well-informed SQC, which will lead to a great deal of economy and avoidance of wastage. But here again we are in a dilemma. While we may intensify today this promotion work, we are not quite sure that we shall be able to meet the demand for trained workers that will arise in due course. If our efforts in that direction succeed we do not want to find ourselves in the awkward position of having a great deal of demand on our hands which we are unable to fulfil. It is always a question of delicate balancing how much promotion work one should carry on and how one should organize the training of the necessary personnel; but I have no doubt that with a certain amount of experience and with the wider understanding of the problem that is in evidence all these difficulties will be overcome. It all takes a little time.

Finally, assuming that all these things happen, there is the question of "Statesmen" making good use of the statistics: that is where one finds oneself unsure and diffident. Statistics in the sense of the cost of living, etc. are very uncomfortable things. Statesmen do not like the way they are going up or coming down. Still a lot of reconciliation remains to be done in the particular field of statistics of agricultural production. Indices problem has now been fairly solved, although I am not quite certain. 1953 has been taken as the base for the cost of living or price indices and we should start measuring the variations from that as a base; that is comparable to the base which has been selected in many other countries. There is still a great deal of uncertainty in the field of measurement of food statistics. Precise techniques of sampling, what kind of agencies should be used, what results would be finally accepted by the Food and Agriculture Minister—these questions have not yet been resolved. The differences have to be resolved and efforts to that end are being made now and again.

I think that the indications are good for better and wider use of statistics—one may derive a little comfort from figures which are not facts but then they cease soon to comfort. The logic of facts and figures must triumph. The trends and indications are good. Therefore, I believe the sort of course which I am inaugurating today, which I do with great pleasure, will be of increasing use and will prove to be very popular, as evidence is to be had of the advantages of having personnel trained in this way. I conclude by extending my very best wishes to the trainees who have been selected for this course and I should like to express the hope that they will play a role which will be regarded as ample reward for sparing them for the training by their employers.

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Appendix 13 : Distribution of Staff as on 31 March 1960

division		staff
(1)		(2)
1. Research and Training School & ISEC		98
2. Planning Division		125
2.1 Calcutta <sup>1</sup>	103	
2.2 Delhi	22	
3. National Sample Survey		818
3.1 Calcutta	654	
3.2 Delhi <sup>2</sup>	9	
3.3 Giridih	155	
4. Electronic Computer Division		107
4.1 Computer <sup>3</sup>	35	
4.2 Development Workshop	72	
5. SQC		54
5.1 Bangalore	6	
5.2 Bombay	14	
5.3 Baroda	7	
5.4 Calcutta	11	
5.5 Coimbatore	7	
5.6 Delhi	6	
5.7 Madras	3	
6. Library		64
7. Administration		457
7.1 Estate Office <sup>3</sup>	228	
7.2 General	138	
7.3 Welfare	91	
8. Field Branch		233
8.1 West Bengal	217	
8.2 Bombay	16	
total		1956

<sup>1</sup> Including workers employed on a piece rate basis.

<sup>2</sup> Excluding staff sanctioned strength up to 60 through Army Statistical Organisation.

<sup>3</sup> Including workers employed on a daily basis.

# INDIAN STATISTICAL INSTITUTE

## Appendix 14 : List of Scientific and Technical Staff

- \*1. Mahalanobis, Prasanta Chandra (*Director*), B.Sc. (Hons. Physics, *Cal.*), B.A. (Math. and Physics, *Canab.*), M.A. (*Canab.*), D.Sc. (*Hony.*), F.N.I., F.R.S., Hony. President, International Statistical Institute; Foreign Member, USSR Academy of Sciences.

### 14.1 RESEARCH AND TRAINING SCHOOL

#### STATISTICS (*General theory and methods*)

- \*2. Rao, C. Radhakrishna (*Professor and Head of the Division of Theoretical Research and Training*), M.A. (Math., *Stat.*), Ph.D. (*Stat., Canab.*), F.N.I., Member, International Statistical Institute; Fellow, Institute of Mathematical Statistics.
- \*3. Haldane, John Burdon Sanderson (*Research Professor*), B.A. (Classics, *Oxon*), M.A. (*Oxon*), M.A. (*Canab.*), D.Sc. (*Hony.*), Dr. de l'Univ. (*Paris*), LL.D. (*Hony.*), Hony. Dr. (*Poiniers*), Hony. F.N.I., F.R.S.; Foreign Member, USSR Academy of Sciences; Hony. Member, Genetical Society; Member, Royal Danish Academy of Science; Member, Humboldt Academy, Berlin.
- \*4. Bahadur, Raghu Raj, M.A. (Math.), Ph.D. (*Stat., North Carolina*), F.N.I., Fellow, Institute of Mathematical Statistics.
- \*5. Basu, Debabrata, M.A. (Math.), A.I.S.I., D.Phil. (*Stat., Cal.*)
- \*6. Chakravarti, Indra Mohan, M.Sc. (*Stat.*), A.I.S.I., D.Phil. (*Stat., Cal.*)
- \*7. Chaudhuri, Tarapada, M.A. (Math., *Stat., Econ.*), B.T., Ph.D. (*Econ., London*)
- \*8. Dhar, Samarendra Kumar, B.Sc. (*Stat.*)
- \*9. Laha, Radha Govinda, M.Sc. (*Stat.*), D.Phil. (*Stat., Cal.*)
- \*10. Maitai, Abraham, M.Sc. (*Stat.*), A.I.S.I., D.Phil. (*Stat., Cal.*)
- \*11. Mitra, Sujit Kumar, M.Sc. (*Stat.*), Ph.D. (*Stat., North Carolina*)
- \*12. Ramakrishnan, Chittur Sivaramakrishnan, M.A. (Math.), ISI Training, A.I.S.I.
- \*13. Roy, Jogabrata, M.Sc. (*Stat.*), A.I.S.I., D.Phil. (*Stat., Cal.*)

#### BIOMETRY

14. Das, Bhupendra Chandra (*Head*), M.Sc. (Phy. \*16. Spurway, Helen, Haldane (Mrs.), B.Sc., (*Zool., siol.*), Ph.D. (*Physiol., Illinois*) *London*), Ph.D. (*Genet., London*)
15. Roy, Subodh Kumar, M.Sc. (*Botany*) 17. Verma, Brijesh Kumar, M.Sc. (*Anthrop.*)

#### PSYCHOMETRY RESEARCH SERVICE

18. Chatterjee, Shibabrata, M.A. (*Psych.*) 20. Mukherjee, Manjula (Miss), M.A. (Math.),  
ISI Training
- \*19. Das, Rbosa, S. (Mrs.), M.A. (*Psych.*), Ph.D. (*Psych., Illinois*) 21. Kumar, Sushil, M.A. (*Psych.*)

#### DEMOGRAPHY

- \*22. Poti, S. Janardan (*Head*), M.A. (Math), S.M. 25. Gupta, P. B., M.Sc. (*Physics*), A.I.A. (*Part-time*)  
(*Public Health, Harvard*)
- \*23. Biewra, S., M.Sc. (Math.) \*26. Malakar, Chitta Ranjan, M.Sc. (*Stat.*)
- \*24. Chakravarti, B., M.Sc. (Math.) \*27. Raman, M. V., M.A. (*Econ.*)

#### SOCIOLOGY

28. Mukherjee, Ramkrishna (*Head*), M.Sc. (*Anthrop.*), Ph.D. (*Anthrop., Canab.*) 30. Pakraai, K. B., M.Sc. (*Anthrop.*)
29. Bandyopadhyay, Suraj, B.A. 31. Chattopadhyay, Kurnarananda, M.Sc. (*Anthrop.*)

#### REGIONAL SURVEYS

32. Rao, V. L. S. P. (*Head*), M.Com., D.Phil. 33. Bhat, L. S., M.Sc. (*Geog.*)  
(*Geog., Cal.*) 34. Pal, M. N., M.Sc. (*Stat.*)

\* Denotes participation in teaching work during the session 1958-60.



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### GEOLOGICAL STUDIES

35. Jain, Sohan Lal, M.Sc. (Zool.), Ph.D. (Zool., Lucknow)      36. Roy Chowdhury, Tapan Kumar, M.Sc. (Geol., Cal.)

### FLOOD RESEARCH

37. Bose, N. K. (Head), M.Sc. (Math.), Ph.D. (Göttingen, Germany), F.N.I.      38. Dutta, S. K., M.Sc. (Math.), Ph.D. (Math., London)  
\*39. Sinha, A. K., M.A. (Math.), ISI Training

### RESEARCH SCHOLARS

- \*40. Bhattacharyya, Pradyot Kumar, M.Sc. (Stat.)      \*45. Ranga Rao, Rameswamy Iyoy, M.A. (Math.), ISI Training  
\*41. Dasgupta, Somoeb, M.Sc. (Stat.)      \*46. Ray, Sontoab Kumar, M.Sc. (Stat., Lucknow), M.A. (Columbia)  
\*42. Dronamraju, K. R., M.Sc. (Botany)      \*47. Sethuraman, Jayaram, M.A. (Stat.)  
\*43. John, Soota, M.Sc. (Stat.)      \*48. Shah, K. R., M.A. (Stat.)  
\*44. Parthasarathy, Kalyanasapuram, R. M. A. (Math.), ISI Training      \*49. Varadhan, S. R. Srinivasa, M.A. (Stat.)

## 14.2 PLANNING DIVISION

### CALOUTTA UNIT

- \*50. Mukherjee, Moni Mohan (Head), M.A. (Econ.); Member, International Association for Research into Income and Wealth; Member, Indian Conference for Research in National Income  
51. Bhattacharjee, Durgaprasad, B.A.  
52. Bhattacharyya, Nikhilesh, M.Sc. (Stat.)  
\*53. Biswas, Ajit Kumar, M.A. (Econ.); A.M. (Boston); Member, Indian Conference for Research in National Income  
54. Chakravarti, Ashish Kumar, M.Sc. (Stat.); Member, Indian Conference for Research in National Income  
\*55. Chatterjee, Anil Kumar, M.A. (Econ.)  
56. Chatterjee, Gaurishanker, M.A. (Math.)  
57. Chatterjee, Indubhuan, M.Sc. (Agri.)  
58. Chatterjee, Nirmal Kanti, M.A. (Econ.)  
59. Chowdhury, P., M.A. (Econ.), on lien  
60. Dey, Banamali, M.A. (Commerce)  
\*61. Iyengar, N. S., B.Sc. (Hons. Stat.), ISI Training  
62. Lahiri, Ranjit Kumar, M.A. (Econ.)  
63. Maitra, Tarash, M.Sc. (Math.), ISI Training  
\*64. Mazumdar, Harendra Kumar, M.A. (Econ.), M.S.S. (Econ. & Soc., The Hague); Ph.D. (Rotterdam); Research Member, Netherlands Economic Institute (from October 1959).  
65. Naqvi, S., M.A. (Econ.)  
66. Narsu, A. V., B.A. B.L.  
67. Piplai, Tapan, M.A. (Econ.)  
68. Roy, Utra, Mrs., M.A. (Econ.)  
69. Roy, Srinivasa, M.A. (Econ.)  
70. Rudra, Asook, B.Sc. Ph.D. (London)  
71. Sinha, Mihir, M.A. (Econ.)

### DELHI UNIT

- \*72. Pant, Pitambar (Head), M.Sc. (Physics), Chief, Division of Perspective Planning, Planning Commission  
73. Ahmed, Malfoos, M.A. (Econ.)  
74. Bhugwail, Jagdish, M.A. (Econ., Cantab) (from October 1959)  
\*75. Grace, T. V. (Miss), M.A. (Math.), ISI Training  
\*76. Gulati, D. V.  
\*77. Kansal, S. M., M.A. (Math.), ISI Training  
78. Katragadda, G., I.Sc., B.E. (Elec.)  
79. Upadhyay, P. K., M.A. (Econ.), Ph.D. (Econ.)  
80. Verma, R. K.  
\*81. Vinod Prakash, M.A. (Math.), ISI Training  
\*77. Chaudhuri, Tarapada, M.A. (Math., Stat. & Econ.), Ph.D. (Econ., London)

\* Denotes participation in teaching work during the session 1959-60.

## INDIAN STATISTICAL INSTITUTE

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|--|--|
| 165. Sanyal, Sali K., M.Sc. (Math.)              | 173. Sinha, Sunil Kumar, M.Sc. (Math.), ISI Training                           |
| *166. Sastri, G. A., M.Com., LL.B.               | *174. Som, Ranjan Kumar, M.A. (Stat.), Member. International Population Union. |
| 167. Son, Asoke, M.A. (Econ.)                    | 175. Swamy, V. S., M.Sc. (Math.), ISI Training                                 |
| 168. Son, Tarakanath, M.Sc. (Math.)              | 176. Taluqdar, Jitendra Nath, Comp. Cert. I.                                   |
| 169. Son Gupta, Suranjan, M.A. (Math.)           | *177. Venkateswarulu, G., M.Sc. (Stat.)  |
| 170. Sharma, S. M. Umakanta, M.Sc. (Stat.)       | 178. Verwal, G., Comp. Cert. I.  |
| *171. Sharma, V. R. R., M.Sc. (Math.)            |  |
| 172. Sinha, Anil Kumar, B.A., I.C.W.A., F.S.A.A. |  |

14.4 LIBRARY

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|--|--|
| 179. Saha, Jibananda (Head), B.A., Dip. Lib., Training in Special Library Methods (Columbia Univ.) | 189. Narayan Ranga Nathn, Certificate in Librarianship           |
| 180. Benerji, Sarat Chandra, B.Sc. (Hons. Math.), Dip. Lib.  | 190. Niyogi, Manoj Kumar, B.A., Dip. Lib.                        |
| 181. Basu, Sunit Kumar, B.Sc., Dip. Lib.   | 191. Roy, Debabrata, B.A. (Hons. Math.), Linguist (Russian)      |
| 182. Bhaduri, Rama, B.A., Dip. Lib.  | 192. Roy, Biswajit, M.A. (Eng.), Dip. Lib.                       |
| 183. Chatterjee, Arun, B.A., Dip. Lib.   | 193. Roy, Subinoy, B.Sc.   |
| 184. Chowdhury, Saroj Kumar, B.Sc., Linguist (Japanese)  | 194. Roy, Sudhindra Kumar, B. Com., Certificate in Librarianship |
| 185. De, Birendra Chandra, B.A., Dip. Lib.   | 195. Roy Chowdhuri, Jyotiprakash, B.A., Linguist (Chinese)       |
| 186. Dutta, Premosi, Certificate in Librarianship.   | 196. Saha, Kalyan, Certificate in Librarianship                  |
| 187. Ghosh, Nirmalendu, Certificate in Librarianship   | 197. Sanyal, Ranajit Kumar, Certificate in Librarianship         |
| 188. Mukherjee, Subhas, B.Com., Certificate in Librarianship                                       | 198. Sinha, Brojo Kishore, Photographer                          |
|  | 199. Subbarao, C. V., M. A. (Econ.), Dip. Lib.                   |

14.5 ELECTRONIC COMPUTER DIVISION

ELECTRONIC COMPUTER

- |  |   |
|--|---|
| *200. Mitra, Samarendra Kumar (Head), M.Sc. (Chem.), M.A.C.M. (New York) | 208. Dutta, Asoke Kumar, B.Sc. Hons. (Physics)                          |
| *201. Nadler, Morton (Design Specialist)                                 | 209. Dutta Majumdar, Dwijesh, M.Sc. (Tech.)                             |
| 202. Basu, Saileshkaha, M.Sc. (Tech.)                                    | 210. Ghosh, Ambarish, M.Sc. (App. Math.), Ph.D. (Marsoiloe), Dr.-se-So. |
| 203. Biswas, Hara Prasad, M.A. (Econ. and Stat.)                         | 211. Mitra, Prabhat Kumar, B.Sc. (Physics)                              |
| 204. Bose, Rabindra Nath, B.Sc.  | 212. Mukherjee, Sourindra Mohan, B.Sc.                                  |
| 205. Bose, Soumendra Mohan   | 213. Ray, Amaresh, B.Sc. (Math.)  |
| *206. Chatterjee, Jnan Sharan, M.Sc. (Physics), A.M.I.E.E.E., Ph.D.      | 214. Sen, Ajoy Kumar, B.E. (Elec.)                                      |
| 207. Chaudhuri, Debdas, M.S., M.E.E. (Elec.)                             | 215. Sen, Ashis Kumar, M.Sc. (Tech.)                                    |
|  | 216. Sengupta, Amalendu, B.Sc., Stat. Dip.                              |
|  | 217. Sinha Roy, Prabhat Kumar, M.Sc. (Tech.)                            |

DEVELOPMENT WORKSHOP

- |   |   |
|---|---|
| 218. Bhattacharjee, Satya Prasanna (Head), M.Sc.      | 222. Mukherjee, Sourendra Mohan, B.Sc.                |
| *219. Banerjee, Gurudev, B.E., A.M.I.E. (India)       | 223. Biswas, A. K., B.Com.                            |
| *220. Chatterjee, Bimalendu, B.Sc.                    | 224. Pal, Gobinda Kumar, B.Sc.                        |
| *221. Mukherjee, Hara Kumar, B.M.E., A.M.I.E. (India) | 225. Sen, Sib Prasad, B.Sc., B.M.E., A.M.I.E. (India) |
|   | 226. Viswanathan, H., B.Sc.                           |

\* Denotes participation in teaching work during the session 1959-60.

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14.6 STATISTICAL QUALITY CONTROL

227. Sen, S. C. (Joint Director and Hony. Adviser), B.A. (Ounjab)

CALCUTTA

- |   |   |
|---|---|
| 228. Dutta, K. N., B.Sc.                                    | *232. Pasha, S. H., B.Sc. (Hons. Stat.), ISI Training |
| *229. Murthy, K. G. K., B.Sc. (Hons. Stat.), ISI Training   | 233. Raja Rao, B. K., M.Sc. (Stat.)                   |
| 230. Munshi, M., B.A. (Hons. Math.)                         | 234. Sapro, M.N., M.Sc. (Math), ISI Training          |
| *231. Narasimhan, R. G., B.Sc., Statistioian's Diploma, ISI | 235. Sarkar, B. K., B.M.E.                            |

BOMBAY

- |   |  |
|---|--|
| 226. Bopardikar, A. P., M.Sc. (Stat.)                     | 238. Hanumantha Rao, P., B.A.                        |
| 237. Gopalakrishnan, P., B.A. (Hons. Math.), ISI Training | 239. Prasad, C. R., B.A. (Hons. Math.), ISI Training |
|   | 240. Sivaramakrishnan, P. V., B.Sc., ISI Training    |

DELHI

- |  |   |
|--|---|
| *241. Mathew, N. T., M.A. (Math.), M.Sc. (Stat.) | 243. Nankana, A. N., M.A. (Math.), ISI Training |
| 242. Hariheran, G., B.A., ISI A.I.S.I. Training  | 244. Narayana, V., M.Sc. (Stat.)                |

BANGALORE

- |                                 |  |
|---------------------------------|--|
| 245. Setty, C. A., B.E. (Mech.) | *246. Sringsabhushana, B.Sc., F.T.I., F.T.A. |
|---------------------------------|--|

COIMBATORE

- |                                     |                                       |
|-------------------------------------|---------------------------------------|
| 247. Anantha Rao, R., M.Sc. (Stat.) | 248. Desikan, G. V. S., B.Sc. (Tech.) |
|                                     | 249. Ranganna, Y., B.Sc.              |

BARODA

- |  |                                       |
|--|---------------------------------------|
| 250. Bhanumurthy, K., M.A. (Math.), ISI Training | 253. Mohta, S. J., M.Sc. (Stat.)      |
| 251. Chowdhuri, S., B.Sc. (Hons.)                | 254. Paluskar, V. D., B.Sc.           |
| 252. Krishnakumar, K., B.Sc.                     | 255. Ramamurthi, K. G., M.Sc. (Stat.) |

MADRAS

- |                                 |  |
|---------------------------------|--|
| 256. Bhado. M. G., M.Sc. (Stat) | 267. Rao, M. P., M.Sc. (Math. Physics) |
|                                 | 258. Sударareju, S. M., B.Sc. (Hons.)  |

\* Denotes participation in teaching work during the session 1959-60.

1 Head, Army Statistical Office; Honorary, part-time.

2 Principal S.K.B.J. Technological Institute, Bangalore, Honorary, part-time.

Appendix 15

15.1 MEMBERS OF THE EXPERT COMMITTEE TO ADVISE ON THE SYLLABUS, ETC. FOR THE NEW DEGREE COURSES

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| 1. Sri P. C. Mathew, Director of the Central Statistical Organization (in the chair) | } Central<br>Statistical<br>Organization                       |
| 2. Sri S. K. Bose, Joint Director  |  |
| 3. Dr. K. R. Nair, Joint Director  |  |
| 4. Dr. S. G. Tiwari, Officer on Special Duty   |  |
| 5. Dr. Utkam Chand, Officer on Special Duty  |  |
| 6. Sri Jagdish Prasad, Deputy Director   |  |
| 7. Sri M. P. Srivastava, Deputy Director   | }  |
| 8. Sri K. S. R. Avadhany, Research Officer   |  |
| 9. Dr. V. G. Panse, Statistical Advisor to ICAR                                      |  |
| 10. Dr. G. R. Seth, Deputy Statistical Advisor to ICAR                               |  |
| 11. Dr. M. Macaura, UNTAA-NCAER  |  |
| 12. Dr. A. K. Mukherjee—NCAER  |  |
| 13. Sri S. Viswanath, University Grants Commission                                   |  |
| 14. Dr. A. K. Geyen, Indian Institute of Technology, Kharagpur                       |  |
| 15. Sri S. Subramaniam, Director General of Commercial I & S, Calcutta               |  |
| 16. Sri Banwari Lal, Statistician, C.B.R.  |  |
| 17. Sri P. B. Brahma, Deputy Director, D.G.S. & D.W.H. & S.                          |  |
| 18. Sri S. C. Chaudhuri, Deputy Economic & Statistical Adviser, E.E. & S.F.A.        |  |
| 19. Sri T. Chellaraswami, Research Officer, L. & E.                                  |  |
| 20. Sri D. Y. Lele, Deputy Director, Directorate of NSS                              |  |
| 21. Sri N. T. Mathew, Chief Statistical Officer, ASO                                 |  |
| 22. Sri G. D. Mathur, C. & I.  |  |
| 23. Sri P. S. B. Pillai, Statistician, C.B.R.  |  |
| 24. Sri V. R. Rao, Director, Administrative Intelligence, C. D. & C.                 |  |
| 25. Dr. K. L. Saxena, Director, Statistics, C. & I.                                  |  |
| 26. Sri B. Sitaraman, Assistant Economic Advisor, C. & I.                            |  |
| 27. Sri M. A. Tolang, Director, Bureau of Economics & Statistics, Bombay.            |  |
| 28. Professor J. B. S. Haldane   | } Research and Training School<br>Indian Statistical Institute |
| 29. Dr. C. R. Rao  |  |
| 30. Dr. T. Choudhuri   |  |
| 31. Dr. V. L. S. Prakash Rao   |  |
| 32. Professor P. C. Mahalanobis  |  |

15.2 MEMBERS OF THE SYLLABUS COMMITTEE FOR THE NEW DEGREE COURSES

- |   |             |                                |
|---|-------------|--------------------------------|
| 1. Professor S. N. Bose, National Professor   |             |                                |
| 2. Dr. P. K. Bose, Head of the Department of Statistics, Calcutta University                            |             |                                |
| 3. Dr. B. N. Ganguli, Director, Delhi School of Economics, Delhi  |             |                                |
| 4. Dr. D. S. Kothari, Scientific Adviser, Defence Science Organization, New Delhi                       |             |                                |
| 5. Sri P. C. Mathew, Director, Central Statistical Organization, New Delhi                              |             |                                |
| 6. Dr. V. G. Panse, Chief Statistical Officer, Institute of Agricultural Research Statistics, New Delhi |             |                                |
| 7. Professor P. Maheswari, Professor of Botany, Delhi University, Delhi                                 |             |                                |
| 8. Dr. B. C. Roy, Director, Geological Survey of India, Calcutta  |             |                                |
| 9. Professor T. R. Seshadri, Professor of Chemistry, Delhi University, Delhi                            |             |                                |
| 10. Professor B. R. Seshaschar, Professor of Zoology, Central College, Bangalore                        |             |                                |
| 11. Professor J. B. S. Haldane  | } Conveners | } Indian Statistical Institute |
| 12. Sri Pitambar Pant   |             |                                |
| 13. Sri M. Mukherjee  |             |                                |
| 14. Dr. C. R. Rao   |             |                                |
| 15. Dr. Raghu Raj Bahadur   |             |                                |

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### Appendix 16 : External Activities

Professor J. B. S. Haldane and Dr. H. Spurway continued to serve on the Zoological Sub-Committee of the University Grants Commission and in this capacity visited the universities and affiliated college departments at Agra, Aligarh, Allahabad, Annamalai, Banaras, Cochin, Delhi, Hoshiarpur, Hyderabad, Madras, Srinagar and Waltair; also the Central Marine Fisheries Station at Mandapam. Professor Haldane gave lectures at a number of these universities. He gave a lecture on the biological work being done in the Indian Statistical Institute and presented papers on mathematical statistics and biometry at the 47th session of the Indian Science Congress held in Bombay in January 1960.

Professor J. B. S. Haldane, Dr. H. Spurway, S. K. Roy and K. R. Dronamraju attended the meeting of Assam Science Society, Gauhati in December 1959 and read papers to the Society.

Professor Mahalanobis delivered the Presidential Address at the Third All-India Labour Economics Conference in Madras on 2 January 1960; the subject of the address was "Labour Problems in a Mixed Economy". He went to Bombay from Madras to deliver the Presidential Address at the Annual Meeting of the Association of Scientific Workers of India on 4 January 1960. He gave a lecture on Fractile Graphical Analysis in the statistics section of the 47th session of the Indian Science Congress in Bombay; went to Delhi from Bombay on 5 January 1960 but came back to Bombay again on 12 January and gave a lecture at the Third Session of the South East Asia, New Zealand and Australia (SEANZA) Central Banking Course in the Reserve Bank of India on 13 January. He had discussions with Dr. Bhabha and visited the Atomic Energy Plant and gave a talk at the Tata Institute of Social Science. He went to Giridih on 22 December 1959 and addressed the Anniversary Meeting at the Giridih Branch of the Indian Statistical Institute.

Professor Mahalanobis worked in Delhi, roughly half the time he was in India throughout the year, in the Planning Commission and assisted in statistical work as Honorary Statistical Adviser to the Cabinet, Government of India; he also looked after some of the Delhi work of the Institute as well as its general work.

Dr. C. R. Rao presided over the Statistics Section of the 47th session of the Indian Science Congress. The subject of the presidential address was "Multivariate Analysis, an Indispensable Tool in Applied Research". Dr. Rao served as a member of the Mathematics Review Committee of the Indian University Grants Commission. In this capacity he attended the Committee meetings held at the Indian Institute of Technology (Kharagpur), Madras University and the Indian Statistical Institute (Calcutta).

Dr. Ramkriahna Mukherjee presided over the Sociology Section of the Fifth All-India Sociological Conference at Lucknow in March 1960 and gave an address on "Some Considerations on Social Research". He also attended the First Convention of Indian Anthropologists in March 1960 and several other conferences and discussions organized by the UNESCO Research Centre in Calcutta.

Sri M. Ganguli, National Sample Survey, attended, as a delegate from the Institute, the meeting of the Technical Advisory Committee on Cost of Living Index Numbers on 9 April 1959 at the Central Statistical Organization, New Delhi. He also attended the eighth Conference of Central and State Statisticians in Delhi from 7 to 12 December 1959.

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Sri N. C. Ghosh, National Sample Survey, attended, as a delegate from the Institute, the 19th Annual Conference of the Indian Society of Agricultural Economics at Baroda during 25-27 December 1959. He also attended a meeting of the Committee of Direction of All-India Survey of the Pattern of Graduate Employment held in July 1959 in the Directorate General of Rehabilitation and Employment, New Delhi.

Sri Moni Mohan Mukherjee, Planning Division, attended the Advisory Committee on National Income Conference in Delhi in May 1959. He read a paper at the Preliminary Conference of the Indian Science Congress at the Indian Statistical Institute in January 1960.

Sri S. J. Poti, Demography Unit, attended the Advisory Committee on Demography Conference in Delhi in August 1959.

Sri K. G. C. Nair, National Sample Survey, attended the Departmental Committee meeting on Agricultural Conference in Delhi in September 1959. He also attended the eighth Conference of Central and State Statisticians in Delhi from 7 to 12 December 1959.

Sri R. K. Som, National Sample Survey, attended the eighth Conference of Central and State Statisticians in Delhi in December 1959.

Sri I. Chatterjee, Planning Division, read papers at the Medical and Veterinary Section and the Agricultural Sciences Section of the Indian Science Congress. He also attended the meetings of the West Bengal State Board of Agriculture and Animal Husbandry, West Bengal Agricultural Research Committee, the Faculty of Agriculture of the Calcutta University, and the Selection Committee for Non-gazetted Appointments in the Veterinary College and Directorate.

Dr. H. Mazumdar, Planning Division, attended the Indian Economic Conference at Annamalai and the Labour Economics Conference at Madras in January 1960.

Among the delegates from the Institute who read papers at the Preliminary Conference of Indian Econometricians held at the Indian Statistical Institute in January 1960, were Sarbasri M. Mukherjee, A. Biswas, A. K. Chakravarti, N. S. Iyengar and T. N. Maitra. Sarbasri N. S. Iyengar and T. Maitra read papers at the 47th session of the Indian Science Congress.

The following research workers of the Sociological Studies Unit attended the Indian Sociological Conference : K. Pakrasi, K. Chattopadhyay and S. Bandyopadhyay.

Dr. N. K. Bose, Flood Research Unit, delivered a course of lectures at the Water Resources Development Centre, University of Roorkee from 6 to 9 January 1960.

Dr. Rhea S. Das, Psychometry Unit, presented a paper on "Personnel Selection Methods" to the Seminar on Industrial Psychology in Madras on 5 December 1959. She also gave lectures at Saugar University, M.P. on "Statistical Methods in Social Sciences" and "Statistical Methods in Anthropology".

Dr. S. L. Jain, Geology Unit, was Recorder for a section in the First-All-Indian Congress of Zoology held in Jabalpur (M.P.) in October 1959.

Sri L. S. Bhat, Regional Survey Unit, attended the eighth Conference of Central and State Statisticians held in Delhi in December 1960 and participated in the discussions on regional surveys for planning. He also read papers at the Indian Council of Geographers Seminar in Bombay in January 1960 and participated in the discussions.

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Sri M. N. Pal, Regional Survey Unit, read papers at the Indian Council of Geographers Seminar in Bombay and participated in the discussions.

The following workers (besides others whose names have already been mentioned) attended as delegates the 47th session of the Indian Science Congress held in Bombay from 3 to 9 January 1960 : Dr. J. Roy, Dr. R. R. Bahadur, Sarbasri S. R. S. Varadhan, K. R. Shab, P. K. Bhattacharyya, J. Sethuraman (Research and Training School); N. Iyengar, T. Maitra (Planning Division); B. R. Panesar, S. K. Goswami, Miss N. S. Nanjamma (National Sample Survey); M. N. Paul, L. S. Bhat (Regional Survey Unit); Dr. S. L. Jain (Geological Studies).



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#### JOINT AD HOC COMMITTEE FOR ALLOCATION OF EXPENDITURE

Professor P. C. Mahalanobis, Sri N. C. Chakravarti, Dr. C. R. Rao, Sri Vishnu Sahay and Professor K. B. Madhava.

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