

No. IV-1/1640.

INDIAN INSTITUTE OF TECHNOLOGY,
6, Esplanade East,
Calcutta, the 21st December, 1950.

My dear Dr Pal,

I enclose a draft of the Report of the Inspection Commission appointed by the University of Travancore to review the work of the Central Research Institute. I shall be glad if you will kindly return this draft to me with your observations at an early date; if no comments are received within a week, I shall take it that the draft has your approval.

I am,
Yours sincerely,

J. C. Ghosh
(J.C. Ghosh)

Dr B. N. Pal,
Jt Director,
Indian Agricultural
Research Institute,
Pusa, New Delhi.

My dear Dr Ghosh,
Pl. refer
9
to your
return with the
draft as desired. I
have no comments to
make. I will like
to have a copy of the
report as finally sent. *28/12*

urgent

28/12

P.S. My initials are
B.P. & not B.N.

no. 25138

Dated the 28th Dec., 50

My dear Dr. Ghosh,

Please refer to your D.O. No. IV-1/1640 dated the 21st December, 1950. I return herewith the draft as desired. I have no comments to make. I should like to have a copy of the report as finally sent.

With kind regards

Yours sincerely,

(B.P.Pal)

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KOP 28/12

Dr. J.C.Ghosh,
Director,
Indian Institute of Technology,
6, Esplanade East,
Calcutta.

P.S. My initials are B.P. & not B.N.

997/2034.

Telegram: "Educindeast, Calcutta."

Telephone: Bank 2926



INDIAN INSTITUTE OF TECHNOLOGY

5, Esplanade East,
CALCUTTA-1.

The 5th January 1951

DR. J. C. GHOSH,
DIRECTOR.

My dear Dr Pal,

JKX

JKM

Many thanks for your letter of the
December, 1950. I enclose, for your informa-
tion, a copy of my letter to the Vice-Chancellor
of the University of Travancore together with a
copy of the Report of the Commission.

With best wishes for the New Year,

I am,

Yours sincerely,

J. C. Ghosh

Encl:

Dr B. P. Pal,
Joint Director,
Indian Agricultural Research Institute
Pusa, New Delhi.

Submitted

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*Director
rec^d
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INDIAN INSTITUTE OF TECHNOLOGY.

5, Esplanade East,
CALCUTTA.

5th January 1951

Dear Mr Vice-Chancellor,

I invite your attention to your letter of the 27th June 1949 requesting me to act as the Chairman of the Commission, which the University of Travancore appointed for the inspection of the Central Research Institute, Trivandrum, Travancore. My colleagues on the Commission and I visited the Central Research Institute at the end of March 1950 for the above purpose. I have pleasure to submit now the Report of this Commission. The other Members on the Commission have approved the Report.

With best wishes for the New Year,

I am,

Yours sincerely,

/s/ J.C.Ghosh.

The Vice-Chancellor,
University of Travancore,
TRIVANDRUM.

R E P O R T
O F
THE COMMISSION FOR
THE INSPECTION OF THE
CENTRAL RESEARCH INSTITUTE
TRIVANDRUM, TRAVANCORE.

MARCH 1950.

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INSPECTION COMMISSION

for the inspection of the

**CENTRAL RESEARCH INSTITUTE,
TRIVANDRUM, TRAVANCORE.**

CHAIRMAN

Dr J. C. Ghosh,
Director-General of
Industries & Supplies,
Government of India.

MEMBERS

Dr K. S. Krishnan, F.R.S.,
Director,
National Physical Laboratory,

Dr Bani Frashad,
Fisheries Development Adviser
to the Government of India.

Dr C. G. Pandit,
Secretary,
Indian Research Fund Association.

Dr B. P. Pal,
Joint Director,
Indian Agricultural Research Institute.

CHAPTER I

Origin of the Central Research Institute.

The University of Travancore was established in 1937; and soon after Dr K. L. Moudgill was deputed to various centres of scientific research in India to prepare a scheme for the development of scientific and industrial research in the State of Travancore. It was on the basis of the scheme prepared by him that the Department of Research was established under the auspices of the University "in order to bring within one organization the Scientific Units attached to different Government Departments, and the Science Departments of the University". To implement the scheme Dr Moudgill was appointed the Director of Research, and the Head of the Central Research Institute, which was expected to be "in most matters the major agency through which the Department *would* functions." It now consists of the following Divisions : Applied Biology; Applied Chemistry; Marine Biology and Fisheries, Public Health Laboratory, the Observatory, and Statistics, and a General Division which includes items not coming directly under the purview of these Divisions. Many of the Government institutions which previously were engaged in scientific work, like the water analysis section of the water works, the Public Health Laboratory, were transferred inter alia to this Central Institute. As part of the original arrangement with the Government and the University, it was laid down that "those Departments of the Government which have no laboratories of their own, should be assured of Laboratory service by the Central Research Institute." Unfortunately the second world war broke out soon after the Central Research Institute was established, and

scientific ...

scientific equipment, pilot plants and technical books required for various sections of the Institute could not be imported from foreign countries, except in rare cases with the greatest difficulty. Even if funds were available for adequate staffing of the Institute, the staff, for lack of laboratory facilities, could not have been gainfully employed. On the cessation of hostilities, the situation considerably improved; and now that the restrictions on import of scientific instruments have been relaxed, the laboratories, it is hoped, will before long be adequately equipped with upto date apparatus.

Dr Moudgill continued in the service of the University as Director of Scientific Research till August 1948; and on his retirement Dr C. C. John was in addition to his normal duties appointed acting Director of Research.

We have discussed with the research staff their programmes of work and the progress they have made. We have also read carefully the Septennial and the Annual Reports on the work of the Institute. A brief but critical review of the researches carried out under the auspices of the Institute is given in the next chapter.

CHAPTER II

Review of the research work carried out in the Central Research Institute from its inception in 1939.

Division of Applied Chemistry.

This Division is in charge of a Professor of Applied Chemistry and has four officers - Agricultural Chemist, Public Analyst, Water Analyst and Industrial Chemist. These officers have separate sectional laboratories which are accommodated in the Applied Chemistry Buildings and located very near the Chemical Laboratories of the University College. Close collaboration is, therefore, possible between the workers in the pure science of chemistry and those whose main interest lies in applied science.

Work in this Division, except in the section of Industrial Chemistry, has been mostly of a routine nature. The section of Agricultural Chemistry devoted its attention mainly to soil surveys. The need of such surveys for securing the maximum benefit from the use of fertilizers is now generally recognised, and Government's decision to complete this work at an early date by the appointment of additional analytical staff is, therefore, welcome. It is to be hoped that this survey will be carried out along lines approved by the Indian Council of Agricultural Research. Much information has already been obtained regarding the deficiency in nitrogen, phosphorous and potash in soils of several talukas; this will be useful in connection with the "Grow more Food Campaign". Studies on the effect of saline water on paddy fields should be pursued with greater enthusiasm, not only because of the general interest of such studies under tropical conditions, but also for the utilisation of such knowledge in

future ...

future plans of land reclamation in this densely populated area. Unlike survey work, successful study and solution of this problem would require research and administrative ability of a very high order, and it is hoped, that ^{due} consideration will be given to these qualifications in selecting the personnel for this work.

The major duties of the Public Analyst's section consist in the routine examination of samples of food stuffs submitted by officers of municipalities which have come under the operation of the Travancore Food Adulteration Act. On an average some seven hundred samples have been analysed every year; of those less than fifty percent only were found to be free from adulteration. The small penalty of Rs.33/- per conviction has not proved a deterrent, and it is, therefore, time that the Government decide either to inflict a deterrent punishment or abandon this work altogether.

The Water Analyst's section is responsible for routine analyses of samples of water received from protected water supply systems in Travancore. It is noted that due to the limited supply of reagents, the number of analyses decreased from 3645 in 1939-40 to 1981 in 1944-45. It is hoped that this has not resulted in the deterioration of the quality of water. In any case the frequency of examination of samples should be restricted to what is really necessary for ensuring the safety of public health.

The Industrial Chemistry section is rightly devoting more attention to problems of applied research than to routine analyses of samples. As a matter of fact, in 1948-49 only 590 samples were analysed of which 394 were of spirituous preparations.

One of the major problems which this section
has ...

has studied with considerable success was improvement in the quality of salt manufactured in Travancore by solar evaporation and the recovery^{of} by-products. The results achieved in this laboratory were translated to industrial practice in a model salt factory which was inspected by the Expert Salt Committee of the Government of India. The Committee have expressed high appreciation of this work.

Another problem which is being studied now is the proper utilisation of the wood-tar which the Fertilizer and Chemicals Ltd., are producing at the rate of some ten tons a day. It is to be hoped that this investigation would be pursued^u energetically and on an adequate scale so that valuable materials of commercial significance may be economically recovered from this by-product at an early date.

Investigations on the auto-oxidation of shark-liver oil have resulted in the production of a substance "Autoxyl"; this is a simple derivative of gallic acid and has given very good results as a stabiliser.

In addition to the study of the above problems, research in this laboratory has centred round studies on (a) active principles of indigenous drugs, (b) plant pigments, (c) oil seeds from Travancore forests. These researches have been mostly carried out by science graduates, under the guidance of the Director or the Professor of Applied Chemistry, for incorporation in theses for the M.Sc. degree. The level of these researches is naturally not of a high order.

Division of Medical Research:

As medical research has centred round the Public Health Laboratory, it is necessary here to review briefly the history of that laboratory. As mentioned

in the Septennial report, the Public Health Laboratory was constituted primarily to meet the needs of the Public Health Department along with the re-organisation of that department in 1932. The Laboratory was then an integral part of the Public Health Department and was under the administrative control of the Director of Public Health. After its transfer to the University as one of the major units of the Central Research Institute, the laboratory continued to render the same type of service as it had been doing while it was under the control of the Public Health Department.

The activities of this laboratory can be summarized under the following main heads :

- (1) A clinical Pathological Laboratory;
- (2) A laboratory for the manufacture of essential biologicals, such as anti-rabic vaccine, small-pox vaccine and cholera, TAB and other bacterial prophylactic vaccines;
- (3) A section of Nutrition; and
- (4) Other miscellaneous activities.

It has to be stressed that most of the activities carried on in the laboratory are of a routine nature. The section of Nutrition, however, according to the report quoted above, was designed specially for promoting research in nutritional problems in general and those relating to the State in particular.

The Septennial Report points out that "volume of the routine work has increased rapidly and new items have been added without any substantial increase in the staff." The research problems dealt with have arisen in the course of the routine work and were investigated mostly as a spare time activity. It would appear that most of the research schemes have not actually been carried to fruition. As the authors of the Septennial Report point out, "some of these

studies would have been fuller and more useful had there been more leisure and better facilities for research."

Division of Marine Biology and Fisheries.

A Department of Marine Biology and Fisheries was instituted as a part of the University in 1938, and Dr C. C. John, Head of the Department of Zoology in the Agra College, was appointed as the Professor-in-Charge. The new building of the Aquarium and the Marine Biological Laboratory was ready for occupation in October 1940. With the formation of the Central Research Institute in 1939, this Department formed one of its Divisions.

Owing to the abnormal conditions resulting from the second world war and the urgent necessity for developing the Fisheries resources of the State, the Research Department since 1940 was saddled with the administration and management of the Fisheries of the State. Department ~~since 1940~~. As has been pointed out in the Report of the Department of Research for the Septennium 1939-46, the "routine administrative activities such as collection of revenue, issue of licenses, patrol duty, legal processes and the like were too burdensome and made too large a demand on the time and energies of the technical and research staff." Incidentally, it may be noted that this research staff was very small and could hardly be expected to achieve the objectives, for which the Research Department had been founded if it had in addition to carry on administrative duties in connection with the Fisheries Department. Consequently since 1944, administrative activities were separated and placed under the charge of the Superintendent of Fisheries in a new Department under the direct control of

From 25th August 1943, Dr C. C. John, Professor of the Government. Another unfortunate factor which was responsible for additional duties having to be entrusted to the Professor of Marine Biology and Fisheries was that the post of the Professor of Zoology in the University College which fell vacant in 1941 could not be filled and the Professor of Marine Biology and Fisheries had to carry on, in addition, teaching and other duties of the Professor of Zoology of the University College till May 1943. Finally, while research and training of post-graduate research students were to be the primary functions of the Department, the Professor of Marine Biology and Fisheries had to organise a special course in 1943 for the training of officers required for the Fisheries Department of the State. Since 1944, further, this Division was also responsible for implementing joint schemes of Fisheries Development and research, which had been approved by the Government of India as a part of their Grow More Food Campaign and which were to be conducted jointly on a collaborative and expenditure sharing basis by the Governments of India and Travancore.

From the above brief outline, it will be clear that ever since its foundation, the Division of Marine Biology and Fisheries with its nucleus research staff and limited equipment has had to carry out various extraneous duties at the cost of the primary functions for which the Division was founded, and it is, therefore, but natural that the progress of the work of the Division has not been as satisfactory as one would have liked it to be. Finally, since the retirement of Dr K. L. Moudgil, the first Director of Research and Vice-Chairman of the Council of Research

from 25th August 1948, Dr C. C. John, Professor of Marine Biology and Fisheries was appointed as the Acting Director of Research and Vice Chairman of the Council of Research. Naturally, therefore, he could spare very little time for the successful carrying out of his legitimate duties as the Professor of Marine Biology and Fisheries.

Accommodation and Equipment.

As has been pointed out in the Septennial Report, it was not possible for the Division to start various important lines of work for want of essential apparatus and equipment, and it had, therefore, to concentrate on field studies of a general character. The Aquarium which is located on the ground floor of the building is a fine institution of its type and provides special facilities for research besides being an attractive educative resort for the public and the student community.

Brief Review of the Research Work.

In this Report, we are not concerned with the work done by the technical staff of the Division with regard to the developments of fishery resources, as we regard it as being outside the scope of the functions of the Department of Research, and therefore confine our remarks to the Research work carried out under its auspices. The Research work done by the Division may be considered under the four main headings :-

- (a) Fish.
- (b) Prawns.
- (c) Miscellaneous aquatic products.
- (d) General biology and oceanography.

Under the first of these four main heads, investigations on various problems connected with fresh-water fish culture, fisheries of inland lakes, food and food habits ...

work of the Section has been that on tapioca. As far as we know, work on this crop on this scale is not being done anywhere else in India. This work derives its inspiration mainly from Dr A. Abraham, who was in charge of the Economic Botany Section for some years and is now Professor of Botany in the Travancore University. At present also he exercises technical supervision over the work. The main work is being done at the Tapioca Farm, Trivandrum, which comprises an area of about 15 acres (20 more acres are to be acquired). Nearly 200 varieties and hybrids are under study, the largest collection being from Travancore itself. The collection, ~~being from Travancore~~ however, includes foreign varieties from Brazil, Malaya, etc. While the average yield outside the Farm is 4 to 5 tons per acre, on the Farm it is about 10 tons per acre. Individual plants on the farm have given as much as 130 pounds each. A number of promising varieties are now available for final testing and distribution. Interesting work is also being done on the genetics and cytology of tapioca. Selection has been done to get pure strains which will be further crossed to obtain hybrid vigour. Since tapioca is vegetatively propagated it would be easy to exploit hybrid vigour in this crop. An interesting line of work is that of crossing tapioca with ceara-rubber. The hybrids of this crop have been back-crossed to the tapioca parent. The desirable characteristics obtained from the ceara-rubber are longer tubers and more convenient disposition of tubers. A five year scheme of research on the breeding and cultivation of tapioca has been submitted to the Indian Council of Agricultural Research. Trials of tapioca hybrids are also being conducted at Chengannoor in central Travancore

habits of shoal fishes and their general correlation with plankton distribution, weed destroying habits of some fishes, food of post-larval fishes, crabs of Travancore State, larval and post-larval stages of a fish found on the Travancore Coast and the development of some fishes have been carried out. With regard to the prawns, the work was initiated for reviving and improving the prawn industry of the State, and with this end in view a survey of the prawns of the area with studies on the bionomics and life histories and development of some species of economic importance and the spoilage of dried prawns were carried out. The chief work under Miscellaneous Marine Products relates to survey of the lime-shell resources of the State which consist of large deposits of various shells of bivalve molluscs over an extensive area. In the last section, major part of the work has been confined to a study of the plankton and preliminary surveys of the bottom fauna and bottom deposits of the Travancore Coast within the 13 fathom line.

A number of the research students as a result of the work carried out under the aegis of this Division have submitted their theses for the M.Sc. degrees of the University and qualified to receive this degree, and some work of direct economic importance in connection with the development of the fishery industries of the State particularly with reference to the shark liver oil and the lime shells, salted and dried fish and prawns has also been carried out.

Research pertaining to Agriculture.

(a) Economic Botany: This is the largest and the most important section of the Central Research Institute dealing with agriculture. The outstanding

Paddy breeding was undertaken in the earlier years and has continued a Kayamkulam under the Central Research Institute and also elsewhere under the Department of Agriculture. Some assistance with regard to rice schemes was obtained from the Indian Council of Agricultural Research.

Work is also in progress on sesamum and one or two other plants. More recently at the Tapioca Farm work has been started on sweet potatoes and the related species of Ipomea, also on plantains and pine-apples.

(b) Plant Pathology: Attention has been paid mostly to the diseases of the coconut palm, and this work has been done mainly with the assistance of a grant from the Indian Council of Agricultural Research. Under this scheme a plant pathologist and the requisite subordinate staff were provided. The work on coconut diseases will now be taken up by the newly established Indian Central Coconut Committee.

Work is also in progress on bunchy-top diseases of plantains and cardamum diseases etc.

(c) Entomology: The Entomology Section was also originally under the Department of Agriculture. In 1939 it was transferred to the control of the Department of Research and was incorporated in the Central Research Institute along with other sections dealing with agricultural investigations and research. The work is now centralised in Trivandrum and there is a rice swarming caterpillar station at Pallom. Temporary stations have also been set up from time to time for work on special problems such as those relating to cardamum thrips.

An insect collection is maintained in the Entomology Section.

(2) Other Biological Research:

There is a small Section of Pharmacognosy. This consists of a small unit to identify the plants used in Ayurvedic medicine. The work is controlled by a small committee which includes the Professor of Ayurveda. Work in progress includes biochemical assay; drawings are made and Indian names are catalogued in this section.

(3) University Department.

We also visited the Botanical Laboratory where Professor Abraham and his postgraduate students are engaged on cytogenetical studies. In these studies material grown at the Tapioca Farm is utilised. The close cooperation between the Department of Botany and the Economic Botany Section of the Central Research Institute has been beneficial to both and has resulted in good work. The Botany Laboratory, which is now in a new building, is well equipped.

CHAPTER VII.

General Review and Recommendations.

We agree with the principle, underlying the establishment of a Central Institute of Research, as only by such co-ordination of work maximum benefits can result from limited resources. A co-ordinating authority was, therefore, necessary in the State for developing research activities. It should be remembered, however, that research flourishes best in an atmosphere of comparative freedom. It is, therefore, essential that a proper balance between the rigidity of bureaucratic control in the name of co-ordination, and freedom to the research worker in the choice of his methods, and necessarily his tools, for solving any problem, must be maintained. A Director of Research may maintain such a balance if he has wide sympathies and is not tied down to red-tape. But it may happen that a Director of Research, eminent though he may be in his field of special knowledge, may not be able to appreciate and assess the quality of research in various branches of science. And when that happens, research divisions, in which he is not interested, must suffer through chronic neglect, or constant friction. We do not suggest that this state of affairs exists at present, but we feel that it is better to be forewarned and create a type of organisation which will minimise this danger.

We recommend that the following major divisions of the Central Research Institute -

- (1) Applied Chemistry and Industrial Research,
- (2) Agricultural Research,
- (3) Medical Research, and
- (4) Marine Biology and Fisheries Research,

should be retained.

Each ...

Each of the Divisions should be placed in charge of a Research Professor responsible for guiding all research activities in his subject. For co-ordinating the research activities in the State we recommend that a Co-ordinating Committee of the Council of Research, with the Vice-Chancellor as Chairman, the four professors as ex-officio members, the Dean of the Faculty of Science of the Travancore University and one representative of the Council of Research, should be constituted. The Co-ordinating Committee will elect every year from among the professors of research a Vice-Chairman to whom such executive powers may be delegated as is considered necessary by the Vice-Chancellor and the Co-ordinating Committee. If this recommendation is accepted by the University, the post of Director of Research will have to be necessarily abolished.

It is hoped that this Co-ordinating Committee will work in close collaboration with the other executive bodies of the University. To ensure this, we have recommended the inclusion of the Dean of the Faculty of Science as an ex-officio member of this Co-ordinating Committee.

We also recommend that all Professors of research in the Central Research Institute should be ex-officio Professors of the University, and should take considerable part in post-graduate teaching and guidance of research work in the University. We are anxious that there should be a proper and balanced development of pure science in the University Science laboratories, and applied science in the laboratories of the Central Research Institute, and the closest contact and collaboration is maintained between the workers engaged in researches in allied branches of science.

New knowledge in pure science improves our general understanding of Nature and her laws, and often points to the solution of various practical problems. It is for the researcher in applied science to get the complete answer to such problems by utilising the existing knowledge in pure science. Their work is complementary. They are members of one family and should not be isolated from one another. We feel that the grant available for fundamental research in the various departments of the University during the period under review is meagre. Though it is not within our ~~terms~~ ^{terms} of reference, we recommend strongly that the research side of the departmental laboratories of the University should be considerably strengthened by providing adequate laboratory and other facilities, and also by instituting research scholarships and fellowships for each of the departments separately. We were informed that at present the scholarships are few and common to all the departments, so that the professor of a subject which is not quite popular has little chance of training a research scholar in that subject.

The University Education Commission have made certain observations for the training of students in methods of research work. We give below an extract from their report, with which we are in general agreement :-

"At one or two universities (e.g. Bombay and Travancore) we gathered that pass B.As and B.Sc.s were immediately given problems for research to work for their master's degree; but most of the teachers themselves acknowledged that this arrangement was very unsatisfactory, both from the point of view of the student whose knowledge of the fundamentals of of his subject always remained weak

and who had to spend one or two years in mastering the methods and techniques of research, and from the standpoint of research itself, as the student's research was generally of an inferior quality and was more often a working up of his teacher's ideas and methods. Even the one year M.A. or M.Sc. course for the honours graduate varies at different universities : at some places the examination for it is based entirely on a thesis, at others only on papers, while at others on papers and a thesis combined. The common experience of teachers and examiners is that M.A. and M.Sc. theses produced in a few months, are generally incomplete or unsatisfactory and are seldom worthy of publication."

(Page 143 of the Report of the University Education Commission, Dec.1948 - Aug.1949, Vol.I).

We consider, however, that it is the primary duty of the Central Research Institute to train brilliant young men as researchers in the field of applied science; and we hope that sufficient funds will be placed at the disposal of the Institute by way of scholarships which will attract able students to stay in the Institute for a period of three years after taking their M.Sc. degree and by presentation of theses secure the degree of Doctor of Philosophy of the Travancore University.

In our review of the research work carried out in the Central Research Institute, we have noted that in practically all its Divisions routine work is so heavy that workers find little time for carrying through any well-planned programme of research. In the Septennial Report, it is stated that "routine work is obligatory and has to take precedence over research work". In the initial stages, such a policy may have been ...

-15-

been necessary, with a view to ensure that adequate laboratory service is rendered by the Institute to the various departments of Government. But if the Research Institute is to progress on healthy lines, some elastic classification of the junior staff into research workers and routine laboratory workers must be devised. As a matter of fact, for actually carrying out routine laboratory work, well qualified scientific workers are not necessary. For such repetitive work, women have greater aptitude. Young girls who have passed the I.Sc. examination could easily be trained as technicians for a few specific types of laboratory work. It is probable that such girls, under the supervision of Heads of Divisions or Senior research workers, will render more efficient service as contended^t employees than M.Sc.s who are naturally on the look out for better jobs. The authorities of the Institute may give due consideration to this suggestion. We also feel that the routine laboratory service being free, there has been a tendency to draw on it a little too generously even where the actual requirements of the Departments did not quite justify it. Levy of a small fee, even if it be a token one for such routine tests, will, in our opinion, reduce the volume of such demands.

It is desirable that the routine work assigned to the members of the staff who are classified as research workers should be minimised. We have found that the Heads of some of the Divisions, in their enthusiasm to be helpful to various departments of the Government, have taken on themselves much more routine work than is necessary or healthy. This is particularly the case in the Division of Statistics which is under the charge of a Statistician of some eminence and whose abilities could be better

utilised ...

utilised for advancing our knowledge in the Science of Statistics.

There is a tendency, which is quite understandable for research problems of topical interest to be given high priority. Ad hoc problems of research are also taken up for enquiry if a worker is particularly interested in them. Due to the worker losing interest in these problems or leaving the Institute for a better job, such enquiries are, however, rarely carried to a stage when results of definite value are obtained. Such wastage of effort must be eliminated. It is necessary that the Institute should have a five year programme of research in each of its divisions, and be allotted staff and funds which will enable the Institute to carry through this programme. There should be a critical review at the end of each year regarding the progress of work, and in the light of this review, such modifications of the original programme as are considered necessary should be adopted. Research can flourish and research workers can devote themselves to the solution of problems with confidence only if continuity for a period of some five years is assured. We are also of the opinion that a programme of research which has not yielded results of definite value within this period, either from the point of view of theory or practical application, should be abandoned. The authorities of the Institute should then concede that with the resources available in scientific talent and laboratory facilities, the problem was too difficult for solution. We accordingly suggest that the Budget of the Central Research Institute should provide for the following heads of expenditure :-

I. Salary ...

I. Salary and Establishment charges -

- (a) Staff intended mainly for routine work;
- (b) Permanent supervisory Research Staff;
- (c) Junior Research Staff holding tenure posts for five years, each member being shown against an enquiry which has been approved at the beginning of the five year period;
- (d) Research scholars of the University.

II.(a) Contingencies and laboratory stores for general purposes;

- (b) Contingencies and stores for carrying out special approved programmes of research.

III. New Capital expenditure which is necessary to implement the approved programmes of development.

In our opinion, taking into consideration the ambitious nature of the work that is intended to be done in the various Divisions of the Institute, the present Budget provision appears to be inadequate.

The State has enormous potential resources in minerals. But the geological work in the State has not been adequately developed either in the University departmental laboratories or in those of the Central Institute. With the close collaboration of the Geological Survey of the State, it should not be difficult to establish a strong school of Geology. The Head of the Department of Geology who is a permanent official of the Geological Survey of England, will be returning to England shortly, if he has not already done so. He has done, in co-operation with his colleagues, some valuable prospecting work. It is very desirable that the Institute should obtain from him a

complete ...

complete report of the work that he has done and publish this report, if there is no cogent reason against its publication.

Here we would also like to draw special attention to the Observatory, which is one of the oldest in India, and has high scientific traditions, and has not been developed as well as it should be. The laboratory is close to the magnetic equator, and its position of special advantage may be utilised for founding and developing a first class magnetic and ionospheric observatory, in collaboration with the Department of Meteorology of the Government of India.

It was part of the original programme of the Institute to maintain "a central library of reference books and scientific journals". This part of the programme has not been implemented. Each of the Divisions has built a small library, mainly for its own use, but no attempt has been made to develop a central, or common library, which will cater to the needs of all the Departments. Especially on the side of scientific journals no attempt has been made even to continue subscriptions for important journals of which long continuous sets are available. It would be a pity if for want of adequate finance, these collections of scientific journals are not completed and brought upto date.

We are definitely of the opinion that the Division of Marine Biology and Fisheries, while it has made a fairly good start under rather difficult conditions, has so far been saddled with various extraneous duties, and consequently its progress has not been as satisfactory as would be desired. We also feel that while it was desirable to have a separate Division of Marine Biology and Fisheries, a certain amount of collaboration

with ...

with the Department of Zoology of the University would have materially helped in the furtherance of the work of the Division. The present staff of the Division is much too small for the efficient working of the Division and we, therefore, recommend that while the Division should not be saddled with any duties which are not directly concerned with the work of the Division, the staff should be strengthened by the appointment of at least two Assistants in the Lecturer's grade. This will enable the Division not only to work as an efficient research organisation but also carry out its duties as a training and educational centre. In addition, the available equipment and library facilities in the Division are very limited and we would, therefore, recommend that additional appropriations should be sanctioned for the Division.

From the record of work, we have reluctantly come to the conclusion that medical research has not advanced materially in the University by the amalgamation of the Public Health Laboratory as an integral part of the Central Research Institute. In reality, it still functions as a part of the Public Health Department, but without the added advantage of the support which that department would have been able to give in ~~an~~ matters of promoting research, at least in the public health fields. In considering our recommendations for the reorientation of the policy vis-a-vis this institution, we have also to take into account some recent developments which were brought to our notice by the Surgeon General with the Government of Travancore. We were told that in the additional wing especially built for the purpose the

Public ...

Public Health Laboratory would be called upon to undertake the teaching of students for the diploma course in Bacteriology and Hygiene. We were also informed that the University of Travancore had already decided to establish a full-fledged medical college in Trivandrum, plans for which had been drawn up and approved. We feel that in making our recommendations with regard to the promotion of medical research in the University, these two developments have to be taken into account. It is also necessary in that case to visualise the role to be played by the Public Health Laboratory as such in the new set-up.

We feel that when the above developments are materialised, the University of Trivandrum will have unique opportunities to develop a medical research programme on sound lines. The University will possess, in the first instance, a full-fledged department of Bacteriology in charge of a professor. We specifically mention this because in many universities the departments of Pathology and Bacteriology are under the charge of one university professor, i.e., the Professor of Pathology. In view of the peculiar conditions which exist in Trivandrum, we suggest that there should be a separate chair of Bacteriology in the University. The Professor of Bacteriology would then be able to guide not only research activities in his own department in the medical college, but would also be able to help materially the development of a field research programme in the public health laboratory. In this manner the under-graduate students of the University would be able to learn the basic principles of preventive medicine in all its aspects, particularly the special problems relating to the State. The

Professor ...

Professor of Bacteriology will also be conversant with the epidemic prevalence of diseases in the State, and would be able to transmit practical experience to the students in the teaching of preventive medicine. In making this recommendation we have considered the general set-up which one of us had opportunities to see in the University of Rochester (U.S.A.) To quote:

"The arrangements in Rochester were in some sense unique. Apart from the Strong Memorial Hospital which is the teaching hospital of the University, facilities provided by the Municipal Hospital which was situated very close to the former were utilised for the purpose. This Municipal Hospital unlike those in any other state, was part of the University and was administered as such. In its maintenance the city contributed a certain sum to the budget of the medical school on a pro rata basis of the total hospital expenditure. The city had no control whatsoever^{over} the staff of the hospital and had no hand in directing any policy connected with its administration. This hospital provided beds for poor patients as well as for cases of some infectious diseases. In the main building of the school and the hospital were also housed the health bureau laboratories. These were regarded as part of the department of bacteriology. These laboratories were utilised for the training of public health laboratory workers and non-medical graduate students working for postgraduate degrees, such as Ph.D., M.Sc., etc. The students were also given routine work in the laboratories. Another important feature which should be mentioned was that the above laboratories were also a part of the New York State Public Health System. The combination of the health laboratories with the University department of bacteriology ...

bacteriology provided a scientific basis to the general health programme in the city and the State. Frequent conferences with all health officials resulted in measures being undertaken to investigate outbreaks of epidemic diseases and the institution of suitable preventive measures. The department of bacteriology and the laboratories mentioned above were all under one head, namely, the Professor of Bacteriology. The Professor could thus see the whole epidemiological picture of diseases occurring in the State. This arrangement greatly facilitated the teaching of preventive medicine."

If the University of Travancore were to adopt some such sort of a scheme, they would be pioneers in starting an interesting experiment in the teaching of preventive medicine in India. It is assumed, of course, that any arrangements envisaged on the lines indicated above would automatically bring some senior member of the staff of the Public Health Department in association with the teaching of hygiene in the university, and in this manner the work of all the medical departments could be co-ordinated to the mutual benefit of both the University as well as the Public Health Department of the State. If these suggestions are accepted, it would not be necessary to disturb the existing arrangement whereby the Public Health Laboratory is a part of the university and not of the Public Health Department.

It is realised, however, that it would take some time before these developments are materialised. In the interim period the arrangement already suggested for co-ordinating research work through the constitution of a special Co-ordinating Committee should be given effect to. The officer-in-charge of

the Public Health Laboratory should be a member of the Council and should work in close cooperation with other University departments as well as the Public Health Department to further the interest of medical research in the State, both in the basic and the applied fields.

Our colleague, Dr Pal, is of the view that ultimately the Agriculture Department of this State will have to have its own research institute and also an agricultural college. In that case, a set-up similar to the States of Bombay and Madras, where the Departments of Agriculture maintain a research institute and an agricultural college, the latter affiliated to the local university, will be the model which may most advantageously be adopted. For the present, however, the Central Research Institute, which has done good work, especially on tapioca, should function as the centre of agricultural research on a few well defined items of which tapioca naturally should continue to be one. In order that the standard of work may be maintained, it would be better not to increase the number of crops dealt with beyond what is being investigated now. To assist the Professor of Research in his work, there should be two officers in the Lecturer's grade, one of whom will also act as the liaison officer to co-ordinate work with the Agriculture Department of the State. For the Farm, which should be named Tapioca Farm, there should be a farm-manager, a research assistant, a junior scientific assistant, a fieldman and other subordinate staff as may be considered necessary.

Sd/-
(J.C.Ghosh)
CHAIRMAN.



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No. F 8/23247 Dated 27-11-50.

Dr Jc. Ghosh

The Director,

Indian Institute of Technology,
Kharagpur (B.N.Phy.)

Dear Dr. Ghosh,

I am in receipt of
reference your letter no. also the

99T/618 dt: 16th 50 and telegram

dt: 22-11-50 reg. my report from

the Travancore Inspection Committee
on the inspection of the Travancore
Universities

The report is being prepared

and will be sent very
shortly. I refer to dt: 23/11/50

typed
23/12/51

Yours sincerely
J. C. Ghosh

(Director,
23/11/50
JcG