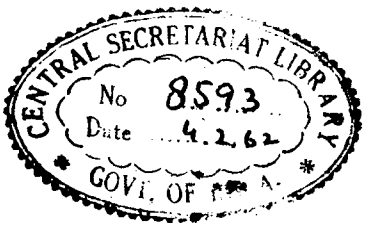
AGRICULTURAL EDUCATION IN INDIA

AGRICULTURAL EDUCATION IN INDIA

INSTITUTES AND ORGANISATIONS



By

K. C. NAIK

B. Ag. (Bombay), M.Sc., PH.D. (Bristol), Chief of Agricultural Education,
INDIAN COUNCIL OF AGRICULTURAL RESEARCH
NEW DELHI

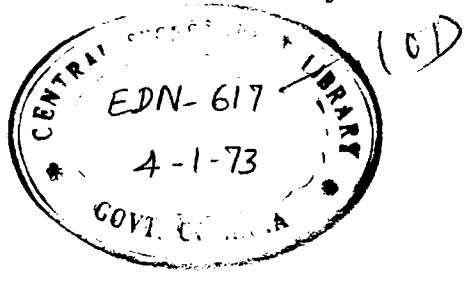
***

INDIAN COUNCIL OF AGRICULTURAL RESEARCH
NEW DELHI

I.C.A.R. Education Series No. 4

First Printed April, 1961

Chief Editor : D. RAGHAVAN
Editor : P. L. JAISWAL



PRINTED AT THE NATIONAL PRINTING WORKS, DELHI (INDIA)

FOREWORD

It is now recognised widely that agriculture affords unlimited opportunities for improvement through well-trained men and women and that it is only by lifting agriculture to a highly technical business involving scientific knowledge and management ability that the country can hope to develop an economy so buoyant as to stimulate all aspects of national progress, and so necessary for securing human welfare and social justice. Our success will depend on our ability to attract the talented youth to agriculture, the resourcefulness with which we train them, and the zeal, vision and dedication that we instil in them. For in the ultimate analysis, it is the planning of our agricultural training programmes today that will determine the quality of all work and progress in agricultural sector to-morrow. Without this basic strength and quality in agricultural education programmes, the very spring-board for progressive improvement in any of the branches of agricultural production—research, extension, vocational skill and administrative understanding—real advancement will be impossible. The greatest challenge we face today, therefore, lies in the sphere of agricultural education.

The effectiveness of future development of the country will depend on the strength of agriculture. No education is of greater importance to the country than the agricultural education, as the medium of achieving a high level of competence in the farmer, scientist, extension worker and the administrator.

The present book gives an idea of the vast ramifications inherent in our agricultural training programmes, the diversified agencies and administrations that are responsible for such programmes, and the current trends. The publication of this book at this juncture, though delayed, is to be welcomed. Over a year ago, I had desired that a book of this type should be compiled, but this work could not be seriously taken up till Dr. Naik joined I.C.A.R. as the Chief of Agricultural Education. I must congratulate Dr. Naik on his enthusiasm in compiling the information on Agricultural Education in India. I feel that the material collected is very useful and it would be of considerable practical use not only to educational authorities who are concerned with agricultural education, but also to the students and others.

M.S. RANDHAWA
D.Sc., F.N.I., I.C.S.
VICE-PRESIDENT,
INDIAN COUNCIL OF AGRICULTURAL RESEARCH

NEW DELHI
February 16, 1960

INTRODUCTION

No educational system in India can be satisfactory if it does not meet the needs of the rural areas and if it does not have the following objectives in view:

(i) Training of farmers' sons who will go back to their farms and work on them more effectively,

(ii) Training of a variety of persons for education, extension work, etc., and

(iii) Training for research.

The plea forcefully advanced in the report of the University Education Commission for a vast expansion of facilities for agricultural education, the formulation of an agricultural policy for the country, and for ensuring that agricultural education reflects the national agricultural policy, represents in effect the cardinal features that should influence the economic development, social change and democratic growth, which the nation has decided to promote under the national Plans.

With the rapid development of agriculture in the country within recent years, the need has arisen to adjust the agricultural and veterinary education to suit the changing conditions. Improvised solutions or *ad hoc* methods to cope up with the immediate problems, have necessarily to be replaced by a long-term approach which may foster agricultural education and develop it on an ever-expanding scale. Recognising the basic fact that farming provides the biggest avenue of employment and is the basic source of food and other human needs, there can be nothing more important to the country than a suitable system of education for imparting a sound knowledge of agriculture. The Government who owe the responsibility of maintaining proper standards in higher education, have been concerned not only with the task of promoting and maintaining the technical efficiency but also with relating it to the larger problems of national life.

In the present context of building up a Welfare State, the strength and effectiveness of future development will, no doubt, depend to a great extent, on the quality of personnel available for the numerous tasks ahead. Achieving a high level of competence in those to be trained at various levels of agricultural education, therefore, forms a major task of the present stage of our development. Emphasis on the qualitative, rather than on the quantitative aspect, is necessary at all times, but it becomes specially important when an unprecedented momentum in national development, is being envisaged. Shortage of personnel of high calibre, inadequacy of equipment and facilities, unsuitable procedures and administrative difficulties are some of the large number of problems that confront us at this stage when a high level of competence has to be equated with a large number of trained personnel. As the planning of today would determine the quality of agricultural educational programme of to-morrow, the setting up of an effective national agency is essential to formulate plans based on vision and imagination of the representatives of most effectively arranged and organised institutions, as also to develop the agricultural educational pattern to serve the increasing needs of the country. This is the task that the Indian Council of Agricultural Education has set before itself.

At a time when the national needs for increased agricultural production are para-

mount and trained technical personnel are required in large numbers both in public and private sectors, to make our soils yield more and better crops, the value of a book dealing with our Agricultural Education in all its facets in the country, as a whole is obvious. It is with the hope of meeting this need for a volume for ready reference to all those interested in agricultural advancement of this country and more particularly, to the growing number of agricultural students and teachers, that this work has been undertaken under the auspices of the Indian Council of Agricultural Education, which may rightly be termed as the educational arm of the Indian Council of Agricultural Research.

Agricultural education is at the moment in a state of flux. An Agricultural University is being established and more are expected to be set up in the near future. An autonomous Post-graduate Institute of Agriculture has been set up at I.A.R.I., New Delhi, with some regional Institutes ; many States are also planning to develop their Agricultural Colleges into strong centres of Post-graduate training. New Agricultural Colleges, Agricultural Schools, Manjri type of Vocational Agricultural Schools and Multipurpose High Schools with agricultural courses are springing up in large numbers. Teacher training institutions, refresher courses or in-service training centres are being organized; existing institutions are being strengthened; adult education programmes in agriculture are being expanded and improved and changes in curricula, teaching methods, examinations, student-teacher relationships and in other aspects of academic life are being devised both in public and private sectors. A book on agricultural education at this momentous period of our progress may prove very useful. The release of the book with some shortcomings, most of which are due to reasons beyond the control of the Indian Council of Agricultural Education, is justified on the ground that while meeting the present needs, it would foster and assist the process of change in academic standards, and that the shortcomings in the book could be rectified ere long when a revision is made to keep pace with the times.

ACKNOWLEDGEMENT

This book is the result of the co-operative efforts of a large number of educationists and officers. Shri L.S.S. Kumar, the first Chief of Agricultural Education, initiated the work of securing data for this book over a year go. The work of compilation of information from a large number of Principals or other Heads of Institutes throughout the country was actively pursued by the author after he joined the I.C.A.R. in August, 1959.

With the co-operation of Shri L. Sahai, Animal Husbandry Commissioner with the Government of India, Shri R.N. Mohan, Assistant Animal Husbandry Commissioner, attempted the compilation of material relating to veterinary education, but the inadequacy of available material and the fact that a publication on the subject had been previously issued by the I.C.A.R., it was decided to leave out this partially compiled information from the scope of this book. The material presented under Rural Institutes has been furnished by Shri Sham Narayan, Assistant Education Adviser, Ministry of Education, that on Vocational Schools of the Manjri type by Dr. B.S. Kadam, Joint Director of Agriculture, Bombay State, on Agricultural Schools of Uttar Pradesh by Dr. B.K. Mukerji, Director of Agriculture, Uttar Pradesh, on Multi-purpose High Schools by Mr. M.K. Luthur of Ohio University now working as Consultant with

the Ministry of Education, on Agriculture in Junior High Schools by Shri L.P. Singh, Sahayak Shiksha Sanchalack (Basic) of the U.P. Education Department, on Home Science Colleges by Dr. (Smt.) R.P. Devadas, Joint Director, Extension Directorate, Department of Agriculture, on Dairy Education by Dr. N.N. Dastur, Principal, Dairy Science College, National Dairy Research Institute, Karnal and also Dr. K.K. Iya, Director, National Dairy Research Institute, Karnal, on Agricultural Marketing Training Course by Dr. M. Srinivasan, Senior Marketing Officer, Directorate of Marketing and Inspection, Nagpur, and on Education in Agricultural Statistics by Dr. V.G. Panse, Statistical Adviser, I.C.A.R. Shri J.V.A. Nehemiah, Extension Commissioner with the Government of India and Dr. (Smt.) R.P. Devadas have also scrutinized the material presented in Chapter IX. Shri P.L. Jaiswal, Editor, I.C.A.R., is responsible for editing and processing the manuscripts for publication and Shri N.S. Bisht, Director of Arts, I.C.A.R. for getting the maps prepared for this book. Shri J.B. Bali's services were made available by the I.C.A.R. for compiling the information presented in appendices VI and VII. Shri Vasudev, Under Secretary, I.C.A.R., and Shri B.K. Gupta helped in making necessary arrangements for the publication of this book. Above all is the inspiration received from Dr. M.S. Randhawa, Vice-President, I.C.A.R., but for which this book could never have seen the light of day. To all these the author is deeply indebted.

K.C. NAIK
CHIEF OF AGRICULTURAL EDUCATION,
INDIAN COUNCIL OF AGRICULTURAL RESEARCH

NEW DELHI
February 16, 1960

CONTENTS

		Page
Foreword		5
Introduction		6
Chapter I.	INDIAN COUNCIL OF AGRICULTURAL EDUCATION	11
Chapter II.	AGRICULTURAL UNIVERSITIES	29
Chapter III.	POST-GRADUATE EDUCATION IN AGRICULTURE	35
	1. Post-graduate School, I.A.R.I., New Delhi	35
	2. Post-graduate Institute, Coimbatore	41
	3. Post-graduate College of Agriculture, Nagpur	44
	4. Other Post-graduate Institutes	45
	5. Institute of Agricultural Statistics of ICAR	51
	6. Training Course in Agricultural Marketing	54
	7. Post-graduate Education in Dairy Science	54
Chapter IV.	UNDERGRADUATE INSTITUTIONS	57
	1. Agricultural College, Bapatla	59
	2. University College of Agriculture, Hyderabad	59
	3. Assam Agricultural College, Jorhat	61
	4. Ranchi Agricultural College, Ranchi	63
	5. Bihar Agricultural College, Sabour	64
	6. B.A. College of Agriculture, Anand	65
	7. Agricultural College and Rural Institute, Vellayani	66
	8. M.B. College of Agriculture, Gwalior	69
	9. College of Agriculture, Jabalpur	71
	10. Government Agricultural College, Rewa	71
	11. R.A. Kidwai Agricultural Institute, Sehore	72
	12. Agricultural College, Chidambaram	73
	13. Agricultural College and Research Institute, Coimbatore	74
	14. College of Agriculture, Akola	76
	15. College of Agriculture, Nagpur	76
	16. Government Agricultural College, Parbhani	77
	17. College of Agriculture, Poona	78
	18. College of Agriculture, Dharwar	80
	19. Agricultural College, Hebbal, Bangalore	80
	20. Utkal Krishi Vidyalaya, Bhubaneswar	81
	21. Khalsa College, Amritsar	84
	22. Government Agricultural College & Research Institute, Ludhiana	84
	23. Government College of Agriculture, Jobner	87
	24. Dayanand Agricultural College, Ajmer	88
	25. Rajasthan College of Agriculture, Udaipur	88
	26. Balwant Rajput College, Agra	90

27. Allahabad Agricultural Institute, Allahabad 91
28. Jat Vedic College, Baraut 93
29. Shri Durgaji Degree College of Agriculture, Chandesar 93
30. Government Agricultural College, Kanpur 94
31. Amar Singh Jat College, Lakhaoti 95
32. College of Agriculture, Varanasi 95
33. Birla College of Agriculture, Haringhatta 95
Under-graduate Courses in Agricultural Engineering 96

CHAPTER V. DAIRY EDUCATION 98

CHAPTER VI. HOME SCIENCE COLLEGES 101

CHAPTER VII. SISTERHOOD ARRANGEMENTS WITH LAND-GRANT UNIVERSITIES IN THE U.S.A. 109

CHAPTER VIII. RURAL INSTITUTES 111

CHAPTER IX. EXTENSION TRAINING CENTRES 118

(i) For Gram Sevaks 118
(ii) For Gram Sevikas 120
(iii) For Instructors 121

CHAPTER X. VOCATIONAL AGRICULTURAL SCHOOLS 122

(i) Manjri-type schools 122
(ii) Agricultural Schools 123
(iii) Agricultural Training Centre for the Blind 125
(iv) Agriculture in Junior High Schools 126

CHAPTER XI. AGRICULTURAL EDUCATION IN THE MULTI-PURPOSE SCHOOLS 128

CHAPTER XII. THE I.C.A.R. LIBRARY 134

APPENDICES

I. Recommendations of the First Seminar on Teaching Methods 143
II. Recommendations of the Second Seminar on Teaching Methods 153
III. Organisation of the Collge of Agriculture, Rudrapur University 160
IV. ,, ,, ,, Veterinary Science, ,, 162
V. ,, ,, ,, Basic Sciences, ,, 163
VI. General Information about Agricultural Colleges 164
VII. General Information about Veterinary Colleges 169
VIII. Institutions offering Home Science 171
IX. Agricultural Schools 173
X. Suggested Pro-forma for Personal Data (Confidential) 174
XI. Form of Rating Scale for Teachers 176
List of References 188

CHAPTER I

INDIAN COUNCIL OF AGRICULTURAL EDUCATION

The value of scientific methods of farming and training persons in agriculture was realised in India even as far back as 1870, when a few institutes were set up, to teach agriculture and veterinary sciences. By 1907, a few colleges became affiliated to Universities. The expansion of agricultural education at different levels posed many problems, which fell outside the sphere of the University Grants Commission, which was mainly concerned with academic standards at the University level. The absence of any department or agency at the Centre, responsible either for co-ordinating agricultural education in the country or assisting agricultural and veterinary colleges to equip themselves adequately for a high standard of teaching, was keenly felt. When agriculture was transferred to the administration of the Provincial Governments as a result of the Montague Chelmsford Reforms in 1921, the need for co-ordination of agricultural activities in the country became very acute and this led the Royal Commission in 1928 to recommend the establishment of the Indian (then Imperial) Council of Agricultural Research in 1929 for promoting, guiding and co-ordinating agricultural and animal husbandry research in the country. The I.C.A.R. has also served as an advisory body to the Government of India in matters relating to agriculture and animal husbandry. The education and development work in agriculture were also brought later within the scope of the activities of the Council.

In its capacity as the national co-ordinating agency for agricultural education, the Indian Council of Agricultural Research convened a conference of the State Ministers of Agriculture, Vice-Chancellors and Deans of the Faculty of Agriculture, at New Delhi on the 3rd and 4th November, 1951, to consider the question of reorganisation of agricultural education in the country. The Council was encouraged to take this step as a result of a recommendation made by the Agricultural Education Committee of the Central Advisory Board of Education, to the effect that " with the growth of a large and comprehensive system of agricultural education, it has become necessary to ensure that the institutions concerned maintained proper standards of instruction and training." The Committee suggested that:

(i) The Indian Council of Agricultural Research might set up a Council of Agricultural Education (including education in Animal Husbandry and Dairying);

(ii) The functions of this Council might be mainly advisory although it would be one of its important duties to keep itself acquainted with the standards of instruction prevailing in the higher agricultural institutions;

(iii) With a view to ensuring proper standards, it might be given the power to endorse diplomas and certificates issued by higher institutions of agricultural education; and

(iv) It might make recommendations to the appropriate authorities in regard to the standards of agricultural instruction and examinations in Universities.

These recommendations were placed before the Advisory Board of the Indian Council of Agricultural Research in its meeting held in March, 1947. The Board

accepted the proposal to set up a Council of Agricultural (including Animal Husbandry and Dairying) Education but recommended that the functions of the Council be purely advisory, to co-ordinate educational programmes so that a uniform standard of agricultural education might be achieved and that it should not endorse diplomas or certificates awarded by agricultural institutions, but it might prepare model syllabi for adoption in the various teaching institutions.

ESTABLISHMENT OF INDIAN COUNCIL OF AGRICULTURAL EDUCATION

This proposal was referred to State Governments, Chief Commissioners, and Registrars of all Universties for their comments. All these were considered by the conference of State Ministers for Agriculture, Vice-Chancellors and Deans of the Faculty of Agriculture, and the conference passed among others the following important resolutions:

(i) The conference resolves that an Indian Council of Agricultural Education be set up under the aegis of the Indian Council of Agricultural Research to co-ordinate educational programmes in the country so that a uniform standard of agricultural education in tune with the present-day requirements of the country might be achieved.

(ii) The conference approves of the formation of sisterhood between Indian and American Universities with a view to promoting mutual exchanges of professors and students.

The Governing Body of the Indian Council of Agricultural Research in its meeting held in December, 1951, approved the proposal and accordingly, a Government of India notification was issued on the 27th February, 1952 setting up the Indian Council of Agricultural Education.

PERSCNNEL OF THE I.C.A.E.

The composition of the Council is as given below:

1. The Hon'ble Minister for Food and Agriculture—President
2. The Vice-Chancellors of the Universities having under them colleges imparting education in agriculture, animal hubsandry or veterinary science with the Deans of Faculty of Agriculture as alternate members of the Council
3. Nine Principals of Agricultural Colleges
4. Four Principals of Veterinary Colleges
5. Vice-President, Indian Council of Agricultural Research
6. Joint Vice-President, Indian Council of Agricultural Research
7. Director, Indian Agricultural Research Institute
8. Director, Indian Veterinary Research Institute
9. Director, Indian Dairy Research Institute
10. The President, Forest Research Institute
11. A representative of the Inter-University Board of India
12. A representative of the Ministry of Education of the Government of India
13. A representative of the Ministry of Food and Agriculture, Government of India
14. The Agricultural Commissioner with the Government of India
15. The Animal Husbandry Commissioner with the Government of India

16. The Agricultural Extension Commissioner with the Government of India
17. The Inspector-General of Forests
18. Three members nominated by the Government of India
19. The Secretary, Indian Council of Agricultural Research, (*Ex-officio* Secretary)

FUNCTIONS OF THE I.C.A.E.

(a) The Council will be purely an advisory body ;
(b) It will co-ordinate agricultural education (including education in Animal Husbandry and Dairying) programmes so that a uniform standard of agricultural education might be achieved throughout the country ;
(c) It will concern itself with only the broad principles of agricultural education and will advise State Governments on such problems as will be referred to it ; and
(d) It may prepare model syllabi for adoption in the various teaching institutions concerning Agriculture, Animal Husbandry and Dairying.

The Council will function through two Executive Committees—one for Agricultural and the other for Animal Husbandry (Dairying being included in the latter) subjects. These two Executive Committees will be concerned with the disposal of matters solely pertaining to their own individual subjects and the Education Council as a whole, will be concerned with the general matters of policy affecting both the sides.

The *ex-officio* members and the Vice-Chancellors will hold office so long as they hold official positions by virtue of which they hold membership of the Council. The three members to be nominated by the Government of India and the member to be nominated by the Inter-University Board will hold office for a period of three years. The Principals appointed will hold office for a period of three years or till such time as they hold their office of Principal, whichever is less. If, for any reason, a member vacates office before the expiry of the full term, the vacancy will be filled by nomination of another member for the remaining period.

REVISED COMPOSITION AND FUNCTIONS

The Joint Indo-American Team appointed by the Government of India to make recommendations for improving the facilities for agricultural education and research in India, suggested in 1955 that the Indian Council of Agricultural Education should play an increasingly important role in the development of higher education in agriculture, veterinary science and other related fields, both at the undergraduate and post-graduate levels. Having regard to this recommendation of the Team, the Government of India, in consultation with the Indian Council of Agricultural Education, decided to make certain modifications in the constitution of the Council. The revised composition and functions of the Council as laid down in the Government of India (Ministry of Agriculture) Notification dated the 8th January, 1957, were as follows:

PERSONNEL OF THE RECONSTITUTED I.C.A.E.

1. Union Minister for Food and Agriculture—President
2. Union Minister for Agriculture—Vice-President
3. The Vice-Chancellors of the Universities having under them colleges imparting

education in Agriculture, Animal Husbandry, Veterinary Science or Home-Science with Deans of Faculty of Agriculture as alternate members of the Council

4. Principals of all Agricultural Colleges in India
5. Principals of all Veterinary Colleges in India
6. Principals of all colleges in India, imparting degree in Home-Science
7. One Principal of Rural Institute
8. Vice-President, Indian Council of Agricultural Research
9. Agricultural Commissioner with the Government of India
10. Animal Husbandry Commissioner with the Government of India
11. Agriculture Extension Commissioner with the Government of India
12. Financial Adviser, Indian Council of Agricultural Research
13. Secretary, Indian Council of Agricultural Research
14. Inspector General of Forests
15. Director, Indian Agricultural Research Institute
16. Director, Indian Veterinary Research Institute
17. Director, National Dairy Research Institute
18. President, Forest Research Institute
19. One representative of the Inter-University Board of India
20. One representative of the Ministry of Education, Government of India
21. One representative of the Ministry of Agriculture, Government of India
22. One representative of the Planning Commission
23. One representative of the Ministry of Community Development
24. One representative of the Interim Indian Veterinary Council
25. One member to be nominated by the Government of India
26. Chief Home Economist, Ministry of Food & Agriculture
27. A representative of the National Council of Rural Higher Education
28. A representative of Bharat Krishak Samaj
29. Chief of Agricultural Education in the Indian Council of Agricultural Research—(*Ex-Officio* Secretary)

FUNCTIONS

(a) The Council will be purely an advisory body.

(b) It will co-ordinate agricultural education (including education in Animal Husbandry and Dairying) programmes so that a uniform standard of agricultural education might be achieved throughout the country.

(c) It will concern itself with only the broad principles of agricultural education and will advise State Governments on such problems as may be referred to it.

(d) It may prepare model syllabi for adoption in the various teaching institutions concerning Agriculture, Animal Husbandry and Dairying.

The Council will function through an Executive Committee. The Executive Committee will normally transact business through two Working Groups, one dealing with Agriculture and the other with Veterinary subjects. The Executive Committee and Working Groups will be assisted by Standing Committees constituted to deal with special subjects.

The *ex-officio* members will hold office as long as they hold official position by

virtue of which they hold membership of the Council. Other members will normally hold office for a period of three years.

The Second Joint Indo-American Team (1959), also recognised the important role that the Indian Council of Agriculura Education has to play in moulding the agricultural education in India and, therfor, made a strong recommendation that the technical staff of the Council should be strengthened to enable the Council to discharge its duties properly. This is a recommendation that is yet to be considered by the Government of India.

FIRST SESSION OF THE I.C.A.E.

The first session of the I.C.A.E. was held in April, 1952, at Hyderabad. Important recommendations made by this Session are given below in brief.

I. Courses in Agricultural Colleges

(i) The course in agriculture should consist of (a) a basic course leading to the degree of Bachelor of Science in Agriculure covering a period of four years after Matriculation or three years after Intermediate in Science ; and (b) a specialised course leading to the degree of Master of Science or Diploma-in-Agriculture covering a period of two years. There should be no specialisation in any subject during the basic course but provision should be made for specialisation after the basic course in research, extension or education.

(ii) The students should do practical work in rural surroundings in addition to the practical work on the college farm. To provide facilities for this additional work it may become necessary to provide financial assistance to meet a part of the cost.

(iii) It was recognised that the students of the agricultural colleges should have knowledge of History, Geography, Psychology and allied subjects, but it was felt that these should receive attention in the extra-curricular activities of the colleges.

(iv) Agronomy should be substitute for Agriculture as a subject in the course.

II. Post-Graduate Education

(i) It was agreed that M.Sc. degree be awarded on the basis of written, practical and oral examinations and thesis.

III. Agriculture below College Level

(i) Agriculture should be introduced in all primary and middle schools in the form of nature study in primary schools and elements of agriculture and animal husbandry in middle schools so as to make all the students agriculture-minded. For Basic Education schools, agriculture should be the main craft, where students may work on a standard farm.

(ii) Folk schools should be established at suitable centres in rural areas.

(iii) There should be as many high schools as possible with Agriculture (including Animal Husbandry) as the main optional subject, and to start with, there should not be less than one such school per district. These should be situated in rural areas and a small farm should be attached to each such school.

(iv) Arrangements should be made for writing suitable text books for students of primary, middle and high schools.

IV. Teacher Training

The agricultural colleges and schools should make arrangements for training of teachers who have to teach nature study or agriculture in primary and secondary schools. The teachers should come from schools by rotation. This training would give to the teachers a proper agricultural outlook which would enable them to impart instruction to their pupils more efficiently.

V. Short Courses

There should be provision for short courses for sons of cultivators at the agricultural colleges and schools.

SECOND SESSION OF THE I.C.A.E.

The second session of the Council was held at Lucknow from the 20th to 22nd August, 1956. The more important recommendations made by this meeting are given below.

I. Maintenance of Proper Standards of Education

(i) The proper students-teacher ratio prescribed by various Universities should be adhered to by the colleges and, as a matter of principle, no relaxation should be allowed, or where temporary relaxations were allowed in an emergency, the relaxation should be removed within a reasonable time. For the purpose of working out the students-teacher ratio, all the different categories of teaching staff should be taken into consideration. The work load per teacher should be suitably limited and properly defined. This work load should on no account be enhanced to the advantage of the employing authorities.

(ii) The quality of students seeking admission to agricultural colleges is rather low. In order to attract better type of students, the prospects of employment of successful agricultural graduates should be widened and made more attractive. While making appointments in departments dealing with rural subjects such as revenue, co-operatives or extension work, agricultural graduates should, other requirements being equal, be given preference.

(iii) The agricultural colleges should be provided with better facilities in the form of building, equipment, library, etc. Austerity standards applied in an emergency to other ordinary buildings should not apply to buildings of educational institutions which have to offer many years of service.

(iv) In-service training of teachers, by introducing short refresher courses and seminars is very essential. The initiative in the beginning should be taken by the I.C.A.E. and with the progress of time such work should be increasingly taken over by regional centres of research and teaching. Seminars should be arranged on the following subjects to begin with: (a) Teaching methods in agriculture, (b) Extension work, and (c) Plant Breeding.

The Council in consultation with the regional colleges should draw up a list of

suitable subjects with a view to holding future seminars. The Central Government should allocate every year a suitable sum to arrange such seminars in existing State and Central teaching and research institutions.

(*v*) While making appointments, teachers with experience of research, farm or extension work, should be given a higher start in their salary scale. Teachers in agricultural colleges should actively undertake research work in their special fields of study.

II. *Funds for Educational Schemes*

(*i*) The Indian Council of Agricultural Education should confine its attention primarily to the agricultural/veterinary education at the University level.

(*ii*) To enable the Indian Council of Agricultural Education to function effectively, the Government should provide Secretariat staff with a whole-time Secretary.

(*iii*) The Council may continue to be an Advisory Body, but it should be more closely associated by the Government in administering the funds earmarked for agricultural and veterinary education.

(*iv*) The Central Government should make available to the Indian Council of Agricultural Research, an annual non-lapsable grant of Rs. 20 lakh to be specifically utilised for agricultural and veterinary education.

(*v*) This grant should be administered by the Indian Council of Agricultural Research on behalf of the Central Government, in accordance with the recommendations of the Indian Council of Agricultural Education.

III. *Trained Technicians for Looking after Scientific Apparatus*

(*i*) An instrument technician, preferably with M.Sc. degree in physics should be provided in each agriculture/veterinary college for handling the scientific apparatus and equipment.

(*ii*) Provision should be made for training of such technicians at suitable institutions, such as the National Physical Laboratory, the National Chemical Laboratory, etc.

(*iii*) The technician appointed should be provided with the necessary facilities required for maintenance and repair of the scientific appratus.

IV. *Strengthening of Post-Graduate Education in Agriculture and Veterinary Science*

(*i*) A first class post-graduate college should be a broad-based institution for higher studies and research, and its activities should not be restricted to only one branch of specialised study. It should provide instruction in several branches so that the student coming out of the institution is fitted to take up responsibilities in the field of agriculture on a wide basis and pursue the research work for which he has been trained.

(*ii*) It is also desirable to strengthen some of the existing institutions, which have specialised facilities in a particular branch, for imparting specialised post-graduate training and awarding of degrees in its own particular field.

(*iii*) These post-graduate research centres be located on regional basis taking into consideration the various important institutions run by State and Central

Governments, because with adequate help coming from these two sources, these institutions could easily be developed into really first rate post-graduate and research centres.

(*iv*) In a vast country like India, only five post-graduate institutions for Agriculture (as recommended by the Joint Indo-American Team) are rather inadequate. The number of such institutions to be developed in the field of Agriculture should be definitely more than five. In the field of Veterinary Science, five institutions as recommended by the Team will suffice for the present.

(*v*) In view of the fact that the States have been re-organised, it is necessary to re-examine the matter and locate centres in suitable places so that the States and the Centres are able to further the activities proposed above.

V. *Co-operation for providing Post-Graduate Training*

The recommendation made in para 41* of the summary of recommendations by the Joint-Indo-American Team on Agricultural Research and Education (*vide* page 88 of the Report) has been accepted with the proviso that any additional institutions which come up to the standard and are acceptable to the universities may be included in the list.

VI. *Training Conferences for Staff of Veterinary Colleges*

The recommendation of the Joint Indo-American Team for organising special training conferences for the benefit of veterinary teachers was accepted.

VII. *Curricula of Agriculture and Veterinary Colleges*

Recommendation 50** of the Joint Indo-American Team on Agricultural Research and Education (*vide* page 89 of the Report) with regard to curricula of Veterinary Colleges was accepted.

As regards laying down a new syllabus, in view of the impending changes resultant on the introduction of the three years degree course in all the Universities in India, new syllabi might be framed taking into account the courses in the basic and pre-professional courses in the Science Colleges so as to make them suit the requirements of the new set up mentioned above.

VIII. *Overhauling the University Examination System*

The practice varies from University to University. In order that the students may be made to work regularly, credit should be given for day-to-day work assessed periodically by the instructor. Further, there should be a University examination at the end of each year through the degree course.

---

* It is recommended that the excellent facilities available at the Indian Dairy Research Institute, Central Rice Research Institute, the Central Potato Research Institute and the Jute Agricultural Research Institute for post-graduate research work on dairying, rice, potato and jute be co-operatively utilised by the agricultural teaching institutions in the vicinity for providing post-graduate training in these subjects and awarding post-graduate degrees by affiliation to appropriate Universities.

** The curricula of the Veterinary Colleges should be overhauled by a Committee of highly qualified veterinary educationists, such as the Sub-Committee of the Indian Council of Agricultural Education. This Committee should prepare and recommend the minimum essentials of a well balanced curriculum, and this recommendation after approval of the Veterinary Council, should be adopted and put into practice by the State Colleges of Veterinary Science and Animal Husbandry.

IX. *Improvement of Library Facilities*

(*i*) The libraries in agricultural and veterinary colleges should be kept open at a time when the students are free from class-room study as also on holidays. For this purpose, the library staff should be suitably strengthened, wherever necessary.

(*ii*) The librarian should be able to guide the students and the staff in using available library facilities to the maximum extent.

(*iii*) Library Committees should be organised in all the agricultural and veterinary colleges where they do not exist at present. These Committees should be responsible for selection of books to be purchased for the libraries.

(*iv*) The person appointed as a Librarian should be suitably qualified.

(*v*) Funds at present placed at the disposal of the colleges for purchase of library books are very inadequate. The grants for purchase of library books should be suitably enhanced.

X. *Organisation of Home Science Colleges*

Recommendation No. 63 of Joint Indo-American Team for the establishment of more Home Science Colleges for imparting training to women with village background was accepted.

XI. *Organisation and Functions of the I.C.A.E.*

1. The composition of the Indian Council of Agricultural Education may be suitably revised so as to include, among others, all the Principals of the agricultural, veterinary and home science colleges and at least one Principal of rural institutes in India.
2. There should be an annual meeting of the Council to be held preferably in a State Agricultural or Veterinary College.
3. The Council should function through an Executive Committee instead of the present Standing Committee or two Executive Committees as provided in the present Constitution. The Executive Committee will normally transact business through two Working Groups, one dealing with agriculture and the other with veterinary subjects. The Working Groups and the Executive Committee will be assisted by five Standing Committees to deal with special subjects.
4. The Constitution of the Executive Committee and the Working Group should be as follows:

EXECUTIVE COMMITTEE

1. Vice-President, Indian Council of Agricultural Research—*Chairman*
2. Agricultural Commissioner in the ICAR
3. Animal Husbandry Commissioner in the ICAR
4. Agricultural Extension Commissioner in the Ministry of Agriculture
5. Director, Indian Veterinary Research Institute, Izatnagar
6. Director, Indian Agricultural Research Institute, New Delhi
7. President, Forest Research Institute, Dehra Dun
8. Five Principals of State Agricultural Colleges (one from each region by rotation)

9. Five Principals of State Veterinary Colleges (one from each region by rotation)
10. One Principal of a University College of Agriculture (by rotation from north and south)
11. One Principal of a private Agricultural College (by rotation)
12. One Principal of a Home Science College (by rotation)
13. One Principal of a Rural Institute
14. The Chief of Agricultural Education in the I.C.A.R.—*Convener*

The Executive Committee may co-opt a member of the U.S. Land Grant College Team working in India.

5. The term of members of the Executive Committee other than *ex-officio* members will be for a period of three years, one-third retiring each year.

6. The Executive Committee and the Working Groups together should meet at least thrice a year, and one-third of the members of each of the agencies should comprise the quorum.

7. The composition of the respective Working Groups will be as follows:

AGRICULTURE

1. Agricultural Commissioner in the ICAR—*Chairman*
2. All Agricultural Experts (including Home Economist) on the Executive Committee—*Members*

VETERINARY AND ANIMAL HUSBANDRY

1. Animal Husbandry Commissioner in the I.C.A.R.—*Chairman*
2. All Animal Husbandry experts on the Executive Committee—*Members*

The Chief of Agricultural Education in the I.C.A.R. will be the convener for both these Working Groups.

XII. *Production of a Journal on Agricultural Education*

It was strongly recommended that a quarterly journal on agricultural education should be brought out by the Indian Council of Agricultural Education.

XIII. *Recognition of Agricultural and Veterinary College Teachers as University Professors*

The recommendation was considered with particular reference to veterinary teachers. It was recognised that normally a University would apply the yardstick of educational qualifications in approving teachers to be appointed as professors.

In the case of veterinary science, however, the veterinary degree was instituted very recently, as veterinary diploma course was in vogue for a long time. Consequently, most of the teachers in the degree colleges at present are only diploma-holders. Many of them, however, have long experience by virtue of which they could, with suitable relaxations, hold positions, as professors. In view of the shortage of veterinary professors with suitable high educational qualifications, the Universities may be approached, as an emergency measure, to make relaxations in favour of

really capable veterinary teachers to be approved as veterinary professors. It is recognised that there would be difficulties in applying suitable yardsticks in approving a diploma holder for the position of a professor, but in the peculiar circumstances of the case, experienced teachers with sufficient research and educational achievements, particularly by way of publications, could be approved as professors.

XIV. *Setting up of Rural Universities and Vocational Type Schools, Rural Universities Versus Rural Institutes, as recommended by the Committee of Rural Higher Education*

The Council is in agreement with the idea of a Rural University summarised in paragraph 77* of the summary of the recommendations made by the Joint Indo-American Team on Agricultural Research and Education (*vide* their report page 93). It further suggests that rural universities should be started in suitable areas where there is a possibility of developing an existing Agricultural College into a University by the introduction of studies in various allied branches likely to benefit life in rural areas.

XV. *Formation of Scientific Societies*

The Council strongly recommends that there be established a single Indian Society of Agricultural Science (using Agriculture in the broadest sense) and that one representative from each of the existing Scientific Societies be represented on this society. The Indian Council of Agricultural Education should pay due consideration to the recommendation of this body for sanctioning amounts in favour of the Societies, particularly in support of their journals. The Council strongly supports the recommendation of the Joint Indo-American Team that professional Societies relating to Agriculture should be strengthened or activated with a view to providing an opportunity for scientists to meet at least once annually to exchange information and ideas. These meetings should be held in different parts of India to enable large number of scientists to attend such meetings at least once in two or three years with the minimum of travel cost. The Council suggested that the Central and State Governments should adopt a more liberal policy in providing funds for travel to scientists in their employment to permit their attendance at national and international scientific meetings.

XVI. *Preparation of Text Books for Agricultural Courses*

The Council recognised:

(i) That the art of writing text-books on technical subjects was very difficult

* The Team endorses the recommendation of the University Education Commission that a Rural Uuiversity should include "a ring of small resident, under-graduate colleges with specialised and University facilities in the centre." For the complete development of a Rural University, the Team would envisage in the beginning the location on the same campus and in close juxtaposition, a College of Agriculture and a College of Veterinary science to which should be added in due course a College of Home Science, a fourth College of 'applied' liberal Arts and Science, a college of Technology using this term in the broad sense of engineering and industries, and with a group of villages to be used as a laboratory for students. While one would hope that the students entering a Rural University would come largely from the villages, other students would not be excluded. The Rural University should have exactly the same autonomy as is accorded to other Universities, and the degrees which it may confer should have the same standing and prestige as those conferred by other Universities.

and the work should be entrusted only to eminent scientists, and preferably to a group of scientists, with experience of writing text-books ; and

(*ii*) That a careful survey was necessary to find out the text-books already available, the gaps existing, and the authors of text books in different agricultural and animal husbandry subjects.

XVII. *Introduction of Agricultural Economics in the Syllabus of Agricultural Colleges*

Although provision exists for teaching Agricultural Economics to the students of agriculture, there is a wide variation in the contents of the course. It is desirable that courses on Agricultural Economics should be standardised in all agricultural colleges. It is recommended that the syllabus developed should be circulated to all the agricultural colleges and their reactions examined.

XVIII. *Introduction of Ornamental Gardening in the Syllabus of Agricultural Colleges*

Ornamental gardening should be included in the syllabi of agricultural colleges, wherever it is not so included at present. In order to emphasise the importance of the subject, a certain percentage of marks in horticultural papers should be ear-marked for questions on ornamental gardening.

XIX. *Teaching of Agriculture below College Level*

In the higher secondary stages, agriculture should continue to be an elective subject in the syllabi as at present. In the lower levels, it would be desirable to have agriculture included in the courses of study as a craft to serve both as an educative medium and also as a means intended to help in earning a livelihood.

XX. *Financial Assistance to Private Institutions engaged in Agricultural Education*

Considering the limited resources available for improving the facilities of agricultural education, the Ministry of Food & Agriculture should mainly concentrate its available funds for improving the educational facilities in the agricultural and veterinary colleges run by the State Governments and private institutions. There is, however, no objection to financial assistance being provided for certain definite experiments in the field of agricultural education especially for young farmers. It is accordingly recommended that future requests, if any, for financial assistance from private institutions imparting agricultural education below college level, should not be sanctioned without giving an opportunity to the Indian Council of Agricultural Education to discuss the matter in its all-India aspects.

XXI. *F.A.O. Recommendations on Training in Veterinary Medicine*

(*i*) There should be facilities whereby young graduates who show inclination for teaching should pass through stages as demonstrators and junior lecturers before they can be accepted for senior posts. Young teachers should be encouraged to study methods of teaching in other countries.

In view of the shortage of experienced teachers in the various subjects of Veterinary Science and Animal Husbandry, it might not be always feasible to implement this recommendation, but it should be regarded as an objective. It was

suggested that for recruitment to Professor's post, at least five years' teaching or research experience should be insisted upon, and for recruitment to Lecturer's post, at least three years' teaching or research experience should be prescribed. With regard to the second part of the recommendation, it was felt that the institutions concerned should take full advantage of the training programmes of the Colombo Plan, FAO, TCM, etc.

(*ii*) Measures should be taken to make veterinary colleges an integral part of Universities, enjoying all the usual privileges accorded to University faculties.

It was recalled that out of the 14 veterinary colleges in India, there was only one college, namely, the Veterinary College in Hyderabad which was maintained by a University, the remaining 13 being maintained by the different State Governments. It was felt that the question of making veterinary colleges as integral parts of universities could not be considered in isolation from that of other professional colleges, such as medical, agricultural, engineering, etc. It was, nevertheless, considered highly desirable that the link between the veterinary colleges and the Universities should be made as close as possible, so that the veterinary students may take full advantage of the life and activities of the Universities and come in close contact with the students of other colleges, whereby they may understand the aims, objects and the place in the world to be taken by their fellow students, and students of other subjects may learn to appreciate the important part the veterinarians have to play in the economy and welfare of the country. To achieve this, the following measures were suggested:

(a) In the event of the present Matriculation examination being replaced by the Higher Secondary School examination, it would be desirable that the veterinary students spend the pre-professional year along with the students of other faculties, like the medical, general science, agriculture, etc., so that isolation does not take place earlier than absolutely necessary.

(b) Wherever it becomes necessary to start a new college or to shift an existing one, it should be located, as far as possible, near an agricultural college.

(c) Literary contests, sports activities and other social functions may be arranged between students of veterinary colleges and those of other colleges as frequently as possible.

(d) Eminent teachers and scientists from other faculties should be invited to give occasional extra-mural lectures to veterinary students, and *vice-versa*. Adequate provision should also be made for imparting extra-curricular instruction in humanities.

(e) General study tours should be arranged frequently for veterinary students, preferably along with students from other faculties, to enable them to get acquainted with various activities in the educational world and outside. The veterinary colleges should enjoy all the usual privileges accorded to other university faculties, and wherever veterinary interests in a university have been entrusted to some other faculty, early steps should be taken to set up an independent faculty of Veterinary Science and Animal Husbandry, so that veterinary education finds a favourable atmosphere for healthy growth, and its interests are not subordinated to other interests.

(*iii*) In teaching of infectious diseases, every opportunity should be availed of to allow students to discuss measures of control and to observe sick animals in their natural environments.

(a) The veterinary colleges should be provided with necessary equipment including adequate means of conveyance, so that every minute is utilized to the maximum benefit of the students.

(b) Arrangements should be made to inform the Principal telegraphically, whenever an important or a rare disease breaks out in the State.

(c) All animal husbandry extension and disease control work in an area of a few square miles around the college should be entrusted to the Principal of the Veterinary College.

(*iv*) Food hygiene should be taught as a separate subject, by an adequately trained teacher, and it should include hygiene of water, milk and meat along with other aspects of veterinary public health (including Zoonoses).

It was generally felt that, although the subjects mentioned in these recommendations were already included in the curriculum of all the veterinary colleges, it would be a distinct advantage to group them together into one subject. It was suggested that this recommendation be forwarded to the States and the Universities concerned for adoption and that it should also be considered when a new model syllabus is prepared.

(*v*) Some elementary instructions in the basic principles of agriculture would be desirable in order to give the students a general picture of the background of this work.

This recommendation was endorsed and it was considered desirable to include in the veterinary curriculum some general background knowledge of agriculture and its importance in the economy of the country, cultivation of livestock feeds and fodder crops, different varieties of soils, and other allied matters.

(*vi*) It would be advisable to include early, in the veterinary course, some instructions in Statistics as this is essential for understanding Population Genetics. It would be of value in other subjects as well.

It was recalled that the application of Statistics in Animal Genetics, Nutrition and Diseases, especially in the fields of Population Genetics, Feeding Trials, Immunology and Epizootology was becoming more and more important. In view of this, it was recommended that the teaching of theory and practice of Elementary Statistics should find place in the veterinary curriculum.

(*vii*) Students should be given not less than six weeks' extra-mural training at a hospital approved by the Principal of the college and this extra-mural course should be an integral part of the college course.

It was felt that it would be extremely desirable to arrange such training in those colleges where adequate facilities for clinical training did not exist. It was not, however, considered necessary to make it compulsory for the students to undergo this training in all the veterinary colleges.

(*viii*) The subjects of Abstetrics, Gynaecology, Sterility and Surgery of the

reproductive part tract, which have lately assumed very great importance in veterinary work, should be grouped together as one subject as the responsibility of one department.

Steps have been taken to implement this recommendation in at least six of the veterinary colleges, with the help of the Indian Council of Agricultural Research. It was considered advisable that the remaining veterinary colleges should take early steps to create independent chairs in this subject and to have their officers stuitably trained.

XXII. *Reduction in Duration of the D.T.V.Sc. Course and Introduction of Six New Diploma Courses at the I.V.R.I.*

It would be necessary to review the position with regard to the proposed courses, especially in view of the proposal to establish a post-graduate college at Izatnagar in the near future.

XXIII. *Admission of Veterinary Course Trainees to the B.V.Sc. Course*

It was generally agreed that, as far as possible, steps should be taken to make the two-year course trainees more useful to the country by adequately improving their knowledge and training. The trainees who possess the requisite qualifications for admission into veterinary colleges should be allowed to join the colleges at a stage considered appropriate by the University, allowing them adequate concession in view of their having undergone two years' training and their field experience. In the case of those who do not possess the qualifications for admission to the degree course, the prescribed condition for admission should be waived and they should be allowed to join the first year class of the degree course.

XXIV. *Graded Courses on Statistical Methods*

It is desirable to introduce graded courses in statistical methods at the under-graduate and post-graduate level. The draft syllabus prepared by the Statistical Adviser, Indian Council of Agricultural Research, should be circulated to the universities and colleges to elicit their opinion regarding its suitability for introduction.

THIRD SESSION OF THE I.C.A.E.

The third session of the Indian Council of Agricultural Education was held at Bangalore in August, 1958. The principal recommendations are given below.

I. *Trained Persons for Looking after the Scientific Apparatus in Colleges*

It was approved that the services of a technician from the U.S.A. might be obtained under the University Contract Agreement, to organise a workshop for training one instrument technician or a staff member from each college. It was further suggested that the Indian Council of Agricultural Research should employ a few technicians on regional basis to supervise the maintenance of equipment in the agricultural/veterinary colleges. The regional technicians should periodically go round the colleges in the region and inspect the maintenance of instruments and help the college technicians in undertaking repairs.

II. *Development of the Post-Graduate School at I.A.R.I.*

It was recommended that the syllabus prescribed for the post-graduate courses at the Indian Agricultural Research Institute should with suitable modifications be adopted for similar courses proposed to be started at the four State Agricultural Colleges selected for development as regional centres of post-graduate education. It was further recommended that the post-graduate school at the Indian Agricultural Research Institute and the regional post-graduate schools should develop a system of periodic consultations for promotion of common objectives and procedures.

III. *Integration of Research, Teaching and Education in Colleges*

The Agricultural and Animal Husbandry Departments should take early steps to bring about effective co-ordination of research, teaching and extension at the agricultural and veterinary colleges by providing adequate staff and funds for the purpose.

IV. *Agricultural College for Temperate Region*

A separate College of Agriculture for the temperate Himalayan region be established.

V. *Agricultural Universities in India*

The need for development of Agricultural Universities in India on the lines of Land Grant Colleges in the U.S.A. with suitable modifications in the light of Indian conditions was duly recognised.

VI. *Manjri-Type Vocational Schools*

It was recognised that vocational agricultural schools of Manjri-type have an important role to play in the agricultural educational system below college level and serve a very useful purpose in the training of young farmers who could after training assume positions of leadership in the rural communities. It was accordingly recommended that the Government should take suitable steps to organise at least one such school in each district in the country. Surplus capacity available in the Basic Agricultural School-cum-Extension Training Centres intended for training of Village Level Workers should also be utilized for conversion into Manjri-type training.

VII. *Units for Providing Service and Information to Farmers*

Agricultural and veterinary colleges should organise Farmers' Days to enable farmers to come in contact with specialists at the colleges. Museums should also be established in these colleges to serve as a perennial source of interest and instruction to the visiting farmers. Information centres should be set up at each college for providing service and information to the farmers.

VIII. *Short Courses for Farmers in Colleges*

Short courses in the following specialized fields for the benefit of professional farmers be organized in agricultural colleges: (*i*) Poultry keeping, (*ii*) Dairying, (*iii*) Horticulture, (*iv*) Fruit preservation, (*vi*) Plant protection, (*vii*) Crop production (Sugarcane, Plantation Crops, Paddy), (*viii*) Fertilizer application (*ix*) Tractor driving.

These courses should be of two to three months' duration.

IX. *Criteria for Admission to Agricultural and Veterinary Colleges*

Better prospects should be provided to attract more intelligent students to agricultural profession.

The following should be the criteria for admission of students to agricultural and veterinary colleges:

(*a*) Securing a minimum of 45 per cent. of marks in science subjects in a pre-university or equivalent examination;

(*b*) Students should indicate an aptitude for agricultural or veterinary science and be prepared to work under rural conditions when called for;

(*c*) In regard to admitting students to agricultural and veterinary colleges, other things being equal, preference should be given to candidates from agricultural families;

(*d*) Physical fitness for agricultural and veterinary work;

(*e*) Evidence of having undertaken social work in villages, youth leadership, membership of Farmers' Forum, Farm Youth Club, etc.; and

(*f*) Effective participation in extra-curricular activities such as (*i*) N.C.C. (*ii*) A.C.C. (*iii*) Boy Scouts (*iv*) Ambulance Corps (*v*) Elocution and essay competitions and (*vi*) Athletics and sports, etc.,

X. *Integrated Degree Course in Agricultural Sciences*

The five-year Degree Course in Agriculture after Matriculation be adopted by all the universities.

XI. *Six Months Compulsory Practical Training on a Farm before the Award of Degrees or Diploma*

The students of agricultural and veterinary colleges should undergo practical training on a farm before they are granted a degree. This training should be fitted into the five-year course. The manner in which this training should be fitted into the curriculum should be left to the universities to decide.

XII. *In-service Training of Officers of the Department of Agriculture, Veterinary Services, Community Development, Cooperation and Panchayats at Agricultural and Veterinary Colleges*

The procedure followed by the Madras Government for imparting in-service training to their Agricultural Officers was recommended for adoption by other States.

XIII. *Creation of a Revolving Fund for Publication of Text books for Students in Agricultural and Veterinary Colleges*

Considering the importance of publication of text books for students of agriculture and veterinary science it was recommended that:

(*i*) A minimum amount of rupees five lakh should be set apart by the Indian Council of Agricultural Research for creating a Revolving Fund for publication of text books for students in agricultural and veterinary colleges. Receipts from the sale of books should be credited to the Fund.

(*ii*) As the publication fund will not be able to bring out more than a few

text books at a time, suitable arrangements may be made to entrust publication of some of the text books to well-known publishing concerns such as, the Macmillan & Co., Oxford University Press, McGraw Hill Publishing Co., etc.

(*iii*) Suitable royalty and incidentals should be paid to authors.

(*iv*) With a view to ensuring that the price of text books is kept low, it is necessary that these books deal only with general principles. Other information regarding crops and their production should be incorporated in popular publications like Farm Bulletins, etc.

(*v*) With regard to publications brought out in foreign countries and which could be used in India, foreign authors and publishers should be approached to bring out cheap editions for Indian students. A list of such books should be prepared by the Indian Council of Agricultural Research in consultation with the Principals.

(*vi*) In so far as books which will have to be adapted to suit Indian conditions are concerned, the matter may be taken up with the foreign publishers and authors. If agreement with the foreign publishers and authors is reached, the I.C.A.R. should select Indian authors who may be entrusted with the job of adapting the material to suit Indian conditions.

(*vii*) Private publishing concerns interested in bringing out text books on behalf of the I.C.A.R. should be required to fix their sale price in consultation and with the approval of I.C.A.R.

SEMINARS

Realising the need to periodically consider the various aspects of technical or professional education in the field of Agricultural and Veterinary Sciences with the object of recommending measures for raising the standard of education, the Indian Council of Agricultural Education organized the first Seminar on Teaching Methods in Agricultural and Veterinary Sciences at Trivandrum from 14th to 18th of May, 1957. This Seminar was attended by 56 teachers and Principals of agricultural and veterinary colleges and 14 members of the American Land-Grant Colleges Team now working in agricultural and veterinary colleges in India. The recommendations made by this Seminar covered a wide ground. A summary of the recommendations is given in Appendix I.

The Second Seminar was held at Mussoorie from 12th to 16th of May, 1958, and was attended by 53 Principals and teachers of agricultural and veterinary colleges in India and nine members of the American Land-Grant Colleges Team, working in the country under the Inter-Institutional arrangements. A summary of the recommendations is presented in Appendix II.

CHAPTER II

AGRICULTURAL UNIVERSITIES IN INDIA

In the middle of the 19th century, steps were taken for the first time to develop Indian agriculture on scientific lines by promoting research and agricultural education in the country. The U.S.A. was also attempting at about the same time to build up her agricultural education system almost from a scratch. In 1862, President Lincoln signed the Morril Act envisaging to establish the now well-known Land-Grant Colleges. In India, the foundation for agricultural education and research was laid with the establishment in 1868 of a model farm at Saidapet near Madras, which was later converted into an agricultural school. The Indian educational system in agriculture proceeded, as was natural, on the British model, while U.S.A. made a conscious attempt to evolve a system of education to suit her national requirements.

LAND-GRANT COLLEGES

The Land-Grant College is so named because these colleges were started with a grant of land by the Federal Government to each State. The Land-Grant pattern was not conceived at one time. It underwent several changes, for instance in 1887 by integrating agricultural experiment stations with the Colleges and again in 1914 when the integration of extension services was effected with these colleges. At present, the Land-Grant Colleges in the U.S.A. constitute what may be called as residential Universities comprising several colleges devoted to Science, Technology, Humanities, etc., all co-operating in offering a type of education suited to different aptitudes and where research, education and extension service in Agriculture, Home Economics, etc. are fully integrated. By providing completeness in residential education programme and combining it with an adult education programme outside the campus through extension services, these Land-Grant institutions have come to occupy a position of exceptional importance and popularity in the present day life of people in the U.S.A.

In the post-independent India the University Education Commission presided over by Dr. S. Radhakrishnan, after a study of the system, recommended its adaptation in this country. The inter-institutional agreement which brought a number of participants from India to various Universities in the U.S.A., and the observation tours undertaken by many Indians with the help of grants from Rockefeller or Ford Foundations or T.C.M., served to create further awakening in India and gradually an urge grew for an early change in the Indian agricultural education pattern. The First and Second Joint Indo-American Teams reviewed the agricultural education, research and extension programmes in India and their recommendations for improvement have a large bearing on the adaptation of the Land-Grant pattern to Indian conditions.

The main feature of the Land-Grant system is the 'Community of Scholars'. The scholars from all areas of learning constantly associate and co-operate with each other, and even compete, so that this results in a steady growth of the intellectual level

of the staff members, in the quality of training and teaching done by them and also in the variety and quality of services offered to the people.

The Land-Grant system provides scope for training of an increasing number of specialists needed by the modern society. In India the number of subjects for specialization in colleges is limited and there is no choice of elective courses. The education is limited in scope and does not permit any combination of courses to suit the aptitude or requirements of a candidate. Again, unlike the Land-Grant System, the colleges in India omit general and cultural education as a result of which the development of students is unbalanced.

HOW INDIAN SYSTEM DIFFERS

There are a few residential Universities in India with closely situated colleges of Arts, Science, Technology, etc., but they differ from the Land-Grant colleges in that they do not offer course programmes on the same campus such as to enable the students to take courses in any college.

A one-campus University with integrated course programmes among the colleges, integration of teaching, research, extension and educational services, and where there is a community of scholars, would certainly fulfil the essential aims of education. The need for such institutions was felt by the University Education Commission, which prepared the blue-print of such a University.

The Rural University or the 'Agricultural University' as it is also called now, should according to the Commission, include a ring of small, resident, undergraduate colleges, with specialized and university facilities at the centre. This was amplified fully by the First Joint Indo-American Team, which envisaged in the beginning "the location on the same campus and in close juxtaposition, a College of Agriculture and a College of Veterinary Science." The teaching of Animal Husbandry, Forage Production, Animal Breeding, Animal Nutrition, and Genetics would be shared by the two colleges. As soon as practicable, a third college on the campus of the Rural University—a College of Home Science (or Home Economics) should be added, while a fourth addition should be a college of 'Applied' Liberal Arts and Science to give basic training in the sciences and arts, *but with special emphasis upon their application.* The Team further suggested the inclusion in the Rural University in its final development, a college of technology, using this term in the broad sense of engineering and industries. The University should not emphasise only on higher education, but research as well. Without adequate opportunities for research, no technical institution can do its job and a college whose faculty is not actively interested in productive research is incomplete. The team contemplated that the Rural University should have the same autonomy as is accorded to other Universities and recommended that "the Indian Council of Agricultural Education should take such appropriate steps as may be advisable to implement the development of two or more Rural Universities in India."

AGRICULTURAL UNIVERSITY, UTTAR PRADESH

The first Agricultural University established in India is located at Rudrapur, district, Nainital in Uttar Pradesh. The aim of this University is, as its Vice Chancellor put it, "to make it the pivot on which the development of agriculture in Uttar Pradesh

will rest," and to be, " the fountain-head to which all those interested in agriculture, whether it be the small farmer or the large landholder, the professional worker, the scientist or the extension agent, may look for guidance. The University is the place to which all interested in agriculture may look for troops of earnest friends who are there to help them to solve their problems."

The objectives as outlined in the Act are as follows:

(a) Making provision for the education of rural people of Uttar Pradesh in agriculture, rural business and industry and other allied subjects ;
(b) Undertaking field and extension programmes ; and
(c) Furthering prosecution of research particularly in agriculture and other allied sciences.

The University will have five colleges, *viz.*, (i) College of Agriculture, (ii) College of Veterinary Science, (iii) College of Agricultural Engineering, (iv) College of Home Science and (v) College of Basic Sciences and Liberal Arts. A phased programme has been drawn up according to which the first three colleges are to be established by 1960, and the rest subsequently. The service courses in Basic Sciences and Liberal Arts may also be started from 1960. All the Colleges will be on a common campus on a farm of about 16,000 acres in Tarai, with facilities of laboratories, libraries, hospital, etc., to be shared by all.

Board of Management

The administrative pattern includes both a Board of Management with full powers to deal with policy matters and an Academic Council which would deal with all academic matters. The University will be an autonomous body and there will be no State control over it. The Board shall approve the budget, appoint members of the academic and administrative staff, hold and control the property and funds of the University, accept the transfer of any moveable or immoveable property on behalf of the University, administer any funds placed at the disposal of the University, borrow money for capital improvements and make suitable arrangements for its repayment and regulate and determine all matters concerning the University in accordance with the Act and Statutes.

Academic Council

The Academic Council shall be responsible for setting and maintenance of standards of instruction, education and examination. It is to be the representative body of the faculty and shall consist of Professors, Deans of Colleges, Directors of Institutes, Heads of Departments and some representatives of the junior staff. In matters of detail as to courses, curricula, etc., the Council will act on the advice of lower academic bodies such as the Boards of Faculties in a college and departments etc.

Executive of the University

The Governor of Uttar Pradesh will be the Chancellor of the University. All Statutes, as approved by the Board, will have to be approved by the Chancellor finally. He shall also, by virtue of his office as Head of the University, preside when present, at any Convocation of the University.

Vice-Chancellor: The Vice-Chancellor will be the Principal Executive and

Academic Officer of the University and Chairman of the Academic Council. He shall exercise general control over the affairs of the University and shall be responsible for the due maintenance of discipline. His duties may be divided into three categories:

(i) The Vice-Chancellor shall always look on the Board as the policy makers of the University and himself as the Chief Executive Officer, responsible for all administrative, financial or academic matters.

(ii) As the Chief Academic Officer and *ex-officio* Member and Chairman of the Academic Council, the Vice-Chancellor has to represent the Faculty's point of view at the Board meetings. He has also to recognise and implement the several safeguards to ensure both faculty participation and academic freedom.

(iii) As the main spokesman of the University, the Vice-Chancellor is responsible for setting the whole tone of the University, and is concerned with the welfare of the students and has to deal with the parents and the public.

Comptroller: The Comptroller will be a whole-time officer, who shall be appointed by the Board on the recommendation of the Vice-Chancellor. He will manage the property and investments of the University and advise in regard to financial policy. He shall draw up the budget of the University initially for presentation to the Vice-Chancellor, who will present it to the Board. He will also ensure that no unauthorised expenditure is incurred by the University.

Registrar: The Registrar will be mainly responsible for admissions, the maintenance of records and the conduct of examinations.

Dean of Student Welfare: The Dean of Student Welfare will be a whole-time officer, who, besides welfare activities, will be responsible for making arrangements for the employment of students during their stay at the University. A students' self-help programme will be introduced which will enable students to earn part of their expenses. It is further intended to set up a Placement Bureau for graduates, who leave the University.

Integration of Research, Teaching and Extension

The integration of teaching, research and extension has to be one of the basic features of this University. However, unlike the Land-Grant Colleges of the U.S.A., the research and extension organizations were already in existence in U.P. and have been working for several decades. To replace or alter these organizations is, therefore, not an easy task. The problem is under consideration of the Uttar Pradesh Government and the University.

CURRICULA

The curricula or courses of study will be laid down by the Faculty, when appointed. However, the curricula may be roughly classified into three parts:

(i) University requirements,
(ii) General requirements,
(iii) Professional requirements.

The University requirements would consist of English, Hindi, and Physical Education. General requirements comprise basic training in the Physical Sciences, the Biological Sciences, Sociological Sciences and the Humanities. The professional

part will consist of courses of detailed study. A list of courses provisionally drawn up is given below:

Agriculture

First Semester: General Botany or Elements of Zoology and Bacteriology, Chemistry, or Mathematics, Introducion to Animal Science or Elementary Horticulture, Elements of Agricultural Economics or Elements of Agricultural Engineering, English *or* Hindi.

Second Semester: Elements of Agricultural Economics or Elements of Agricultural Engineering, Chemistry, Geology or Mathematics, Field Crops or Elements of Animal Hygiene, General Botany or Elements of Zoology and Bacteriology, English or Hindi.

Veterinary Science

First Semester: Bio-Chemistry or General Microbiology, Introduction to Animal Science, Gross Anatomy, Histology and Embryology, English or Hindi.

Second Semester: Bio-Chemistry or General Micro-biology, Elements of Agricultural Economics, Elements of Animal Nutrition, Gross Anatomy, Histology and Embryology, English or Hindi.

It is assumed that English and Hindi both should be taught. However, it is understood that a student will take only one language course in one semester. With proper tests and screening, students can be divided between English and Hindi classes during the first semester. Following their performance during the first semester, they can either continue in the language in which they started or register in the other language for the second semester.

It is assumed that physical education will be required for at least four semesters and a time period of two hours per week would be sufficient for the purpose.

Since plans are being made for work programme which might take ten hours per week of each student's time, this may become a part of his programme and may be scheduled to fit in his class-programme.

Students will have option to choose from various courses which may help in equalizing the load on the few Professors and Assistant Professors who will be available during the first year. This also allows for variations in student's background, e.g., if a student has had a good general Chemistry course and is advanced in Mathematics, he could choose some other subjects or a more advanced course in Chemistry or Mathematics.

Some courses cannot be taken without pre-requisites; Field Crops, for example, should not be studied until the student has had a course in General Botany; Geology should not be studied until the student has had one course in Chemistry.

Micro-biology and Bio-chemistry would be available for veterinary college students in the first year.

The programme for agricultural college students would provide each semester with two courses in Agriculture, two courses in Basic Sciences and Humanities and either English or Hindi.

ALLOCATION OF SUBJECTS

The suggested allocation of subjects in the three Colleges during the four-year course to be started in 1960, is as shown in Appendices III, IV and V.

EXAMINATIONS

The system of examinations proposed to be adopted would comprise: (i) Weekly Test, (ii) Class-room Discussion or Seminars, (iii) Periodical Examinations, about one or two per term and (iv) Final Terminal Examination.

The University has started functioning from July, 1960. It is hoped that with the starting of this new experiment in agricultural education in India, a new era of agricultural progress will unfold itself in this country.

CHAPTER III

POST-GRADUATE EDUCATION IN AGRICULTURE

Although agricultural and veterinary colleges as institutions of higher education existed from the beginning of the century, post-graduate teaching in agricultural and veterinary services could be organized only after the colleges and institutes were affiliated to Universities about 20 years later. Actually, recognition of these colleges or institutes as post-graduate training centres leading to the degrees of M.Sc., and Ph.D., was secured in most cases only after 1930.

The Indian Agricultural Research Institute located at Pusa, however, had instituted in 1923 a post-graduate course of two years' duration, leading to the Diploma of Associateship, but it was not until 1945 that regular syllabi of studies were framed and regular courses of instruction, consisting of lectures, laboratory practicals and field-work were introduced. The courses were followed by a regular examination of the students, for which senior external examiners, drawn from the Universities or government agricultural institutions, were invited.

In the States or Provinces, the post-graduate training generally consisted in permitting selected persons to work on a research problem under the guidance of a Professor or research worker approved by the concerned University. It was only recently that some of the Universities in India introduced changes providing for qualified persons to secure higher degrees of M.Sc., or Ph.D. by taking regular course work or partly by research and partly by course work.

Post-Graduate Diploma Courses: Besides these post-graduate training facilities leading to higher degrees, a few institutes were offering post-graduate Diploma courses in different subjects, more or less on the lines of Associateship at the Indian Agricultural Research Institute. For several years, the Indian Veterinary Research Institute has been offering specialised training in a number of fields of veterinary science and animal husbandry and awarding diplomas or certificates to successful trainees. The Indian Dairy Research Institute now located at Karnal with a branch at Bangalore has also been offering post-graduate training facilities leading to the award of a diploma. The Department of Agriculture, Madras instituted a post-graduate diploma course in Horticulture which was later affiliated to the Madras University. This course has now been suspended.

POST-GRADUATE SCHOOL, I.A.R.I., NEW DELHI

On the recommendations of the First Joint Indo-American Team on Agricultural Research and Education and with the aid of the Rockefeller Foundation, a new Post-Graduate School of Agriculture was established at I.A.R.I. in 1958. The post-graduate programme leads to award of degrees of M.Sc. and Ph.D. The pattern of organisation and instruction represents a very significant departure from the traditional methods followed in India.

The academic year starts from the first week of October and is divided into three

trimesters, running from October to December, January to April and July to September, respectively.

The programme of post-graduate education in Agriculture is under the overall supervision of the Dean of Post-graduate Studies, responsible directly to the Director.

Post-graduate Council: The Dean of Post-graduate Studies is supported by a Post-graduate Council. The Post-graduate Council consists of the Dean of Post-graduate Studies as Chairman, the Director of the Institute, *ex-officio* senior representatives of the various Divisions, the Adviser on Post-graduate Education, certain representatives of the Faculty, and the Registrar as Secretary. The Post-graduate Council is the final authority on all academic matters and decides all matters pertaining to the Post-graduate School. The Council also determines the equivalence of degrees of candidates applying for admission from other Universities. Major matters of policy in the Post-graduate School which are of general concern to the Institute, may, at the discretion of the Director, be referred to the Institute Council for final review. Proceedings of the Post-graduate Council meetings are sent to the Institute Council.

Post-graduate Faculty: The Post-graduate Faculty is presided over by the Dean of Post-graduate Studies. To a very large extent, the faculty members have joint responsibilities for education and research, but a certain defined and definite portion of their efforts and time is allotted to Post-graduate instruction. The Heads of the respective Divisions are resposible for overall supervision of the teaching as well as research responsibilities of the Divisions. Members of the Post-graduate Faculty in each Division are administratively responible to the Head of the Division.

ADMISSION

All candidates shall be required to appear for interview before the Council at New Delhi at their own expense.

The maximum number of students to be admitted in an academic year will be 100 for the M.Sc. and 50 for the Ph.D. course.

Qualifications for Admission

(a) M.Sc. Degree: An applicant for admission in M.Sc. should possess at least a good Second Class B.Sc. degree of a recognized University in Agriculture or Chemistry or Botany or Zoology, according to the subject he desires to take up.

(b) Ph.D. Degree: The candidate for Ph.D. degree must have obtained the M.Sc. degree of the School, or Assoc. I.A.R.I. or M.Sc. degree of any other recognized University, in the relevant field of science.

POST-GRADUATE STUDIES

The programme of training in the school is designed to give students, who are condidates for the M.Sc. and the Ph.D. degrees, a sound mastery in their respective fields of concentration, not only in the immediate field of their specialization, but also in the closely supporting scientific disciplines.

Two academic years are ordinarily required for the programme of course work, research, thesis, preparation and examinations leading to the award of M.Sc. degree.

A minimum period of two years after the M.Sc. programme, is required for the Ph.D. degree. Associates of the Institute, and candidates holding the M.Sc. degree of other recognized Universities, are eligible for admission to the Ph.D. course. The student, in addition to having mastery in his local Indian language and Hindi, shall be expected to be able to speak, read and write English fluently and be able to prepare high quality technical reports in English.

For Ph.D. candidate a reading knowledge of German or French (usually German) shall be required. The candidate, with the approval of his adviser, shall file in the Post-graduate School office, his plans for meeting the requirements of the foreign language. He will also be required to produce a certificate of proficiency in the language before he is admitted to the examination for his degree.

Course Credits: Courses are organized as units or blocks of subject-matter and are assigned a certain number of credits. One credit represents: (a) approximately twelve hours of lecture (one hour per week for twelve weeks) and the necessary reading and preparation outside the classes required for mastery of the subject-matter, or (b) approximately twelve practicals of approximately three hours' duration each.

Each course shall, in general, be planned so that it can be completed within a given trimester. A student's programme may not include more than fifteen credits in any one trimester.

A minimum of 45 credits of successful post-graduate course work is required of students preparing for the M.Sc. degree, in addition to any courses required to make up deficiencies in the undergraduate training and the preparation of the thesis. Course work shall usually receive primary emphasis during the first part of a student's programme, so as to give him the requisite background in the scientific disciplines, and the later part of the programme puts greater emphasis on research.

The exact minimum number of the credits of course work required for Ph.D. candidates is not specified, but would be determined individually by the Students' Advisory Committee and approved by the Dean of Post-graduate Studies.

PROGRAMME OF STUDY

Each student will have an adviser from the candidate's major field of studies. The student's programme will be planned on the basis of his previous academic training, so as to provide a core of subjects in the general field of the student's major specialization and secondary group of courses in the fields of at least one minor supporting discipline in the case of candidates for the M.Sc. degree and at least two minor supporting disciplines in the case of candidates for the Ph.D. degree. The Students' Advisory Committee will be given considerable latitude in the choice of courses in the major field and in the distribution of courses among the minor fields taking due account of the requirement to provide training for high level scholarship and research in his particular field. Such programmes will have the final approval of the Dean of Post-Graduate Studies.

EXAMINATIONS

The Instructors shall be responsible for judging and grading the students' performance and their mastery of the facts in the various courses. Students failing to secure satisfactory marks in an individual course may not receive credit on this

course towards a degree. A student is allowed to repeat only once a course in which he has failed. Any student, who fails to make satisfactory marks on two or more courses in his major field, or three courses in total, will not be permitted to become a candidate for a post-graduate degree.

After successfully completing his course work as judged from the grading, each student's general mastery of the requisite scientific disciplines and his general fitness for becoming a candidate for a degree is tested by a series of comprehensive examinations given under the direction of a committee including representatives from his major and minor fields and external examiners. These comprehensive examinations consist of papers in the various subjects of his major and minor fields followed by an oral examination given by the Committee as a whole in the session.

The number of papers, marks and other details regarding these examinations are determined for each candidate by his adviser and the representatives from his major and minor fields.

These comprehensive examinations are given not later than two full trimesters in advance of the date of completion of the student's programme of post-graduate studies. Students, who fail to get satisfactory marks in the comprehensive examination, may not be allowed to appear for re-examination until the expiry of at least one trimester. Those who fail in this examination for the second time do not remain eligible for taking examination again, and neither do they qualify for the Post-graduate degree.

Thesis: After admission, each student has to submit, with the approval of his adviser, the title of his thesis and a complete programme of work to be offered for the degree. The thesis must be on a topic falling within the field of the major subject and the research work for the Ph.D. degree must be of a higher order and definitely of an original nature. The title of the thesis and programme of work must have the approval of the Students' Advisory Committee and the Dean of Post-Graduate Studies. A candidate is required to submit his thesis to the Registrar eight weeks in advance of the date of completion of the Post-Graduate Studies.

The thesis for M.Sc. degree shall be examined by Adviser of the candidates and an external examiner appointed by the Post-Graduate Council.

The thesis for the Ph.D. degree shall be examined by a committee of three members appointed by the Post-Graduate Council.

An oral examination for the M.Sc. degree and the Ph.D. degree on the subject of the thesis will be held jointly by the examiners of the thesis after adjudication of the thesis. A student must make a satisfactory defence of the thesis as judged by the examining committee, failing which the examining committee prescribes the additional requirements for the candidate.

All students, unless specially exempted by the Dean of Post-Graduate Studies, are required to reside in the hostels attached to the Institute.

MAJOR AND MINOR FIELDS AND COURSES OFFERED

The courses offered in Agronomy are furnished below in detail to illustrate the scope and nature of the training imparted in the Institute.

Major fields: Crop Husbandry ; Soil and Water Management ; Farm Management ; Agricultural Extension.

Minor fields: A student taking a major subject in one of the above fields may elect to take one minor in another of the above major fields within the Division, but must take at least one minor in another field of work outside the Division such as: Botany ; Plant Physiology ; Plant Breeding and Genetics ; Crop Protection ; Soil Science ; Experimental Statistics ; Pomology ; Olericulture.

The students are expected to take at least one course in Experimental Statistics. Certain individual courses given by other Divisions may, on recommendation by the Division and approved by the Dean of Post-Graduate Studies, be included in the basic programme of a given major or minor field.

COURSES OFFERED BY THE DIVISION OF AGRONOMY

Principles of Crop Production (3 Credits Lecture): The history of Agronomy ; the art and science of crop production ; plants and plant growth ; crop plants in relation to environment ; composition of soil ; soil moisture and land drainage ; crop sequence and maintenance of soil fertility ; tillage in agriculture ; conservation and storage of farm crops.

Crop Geography and Ecology (3 Credits Lecture): Scope ; factors (physical and social) determining crop distribution ; classification of climate ; bio-climatic zones ; physiological limits ; crop yield and variability in relation to the ecological optimum ; adaptation ; humidity provinces ; photo and thermo-periodism ; geographic distribution of crop plants ; growth and development ; relationships of developmental physiology ; manipulation of developmental physiology of crops.

Weed Control (3 Credits Lecture, 1 Credit Practical): Common Indian weeds and their characteristics ; principles and methods of weed control, cultural and chemical ; weedicides and their application with special reference to field crops ; field technique of application of weedicides ; identification of weeds and seeds.

Cereal and Pulse Agronomy (3 Credits Lecture, 1 Credit Practical): Origin and history ; production and distribution ; development and nutrition of the plant ; soil and climate ; classification; cultivation.

Industrial Crops (Sugarcane, Fibre crops, Oilseeds, etc.) (3 Credits Lecture, 1 Credit Practical): Origin and history ; distribution ; economic importance ; soil and climate ; cultivation ; industrial uses.

Fodder and Pasture Grasses and their Management (3 Credits Lecture, 1 Credit Practical): Introduction ; forage crops ; valuation ; cultivation ; utilization ; conservation ; ley farming ; ecology ; pasture management ; turf management. (Emphasis will be placed on the production and use of these crops for cattle feed under Indian conditions, but including a review of principles and practices in other parts of the world.)

Soil Fertility, Fertilizers and Management (3 Credits Lecture, 2 Credits Practical) Factors affecting soil fertility and its conservation ; role of organic matter in crop production ; history of development of fertilizer usage, plant nutrient deficiencies, nutrient needs of plants and methods of investigations ; fertilizer application ; soil fertility in relation to physical and chemical characteristics of soils, recent advances in fertilizer use.

Irrigation—Principles and Practices (3 Credits Lecture, 2 Credits Practicals): Role of water factor in plant development and crop production ; place of irrigation

in world and Indian agriculture ; measurement of water for irrigation ; soil and water relation ; optimum soil moisture and plant growth ; time of irrigation ; consumptive use of water ; methods of determining irrigation requirements ; irrigation requirements of important farm crops ; cropping pattern in relation to water supplies ; irrigation efficiency ; methods of water application ; implements for irrigated farming ; inter-relation of irrigation and drainage ; systems of drainage ; salt problem ; quality of irrigation water ; reclamation and management of saline and alkaline soils.

Soil and Water Conservation (*3 Credits Lecture, 2 Credits Practical*) (Given jointly by Divisions of Soil Science and Agricultural Chemistry and Agronomy) : Introduction ; analysis of causes for decline or increase in soil productivity ; factors affecting erosion of various types and methods of control ; run-off and its measurement ; soil conservation surveys and their interpretation and use ; land use capability classification ; soil conservation and watershed management practices ; development of farm conservation plans ; water conservation principles and practices ; techniques and problems of soil reclamation.

Rural Sociology (3 *Credits Lecture*) : Rural life, its social problems and means of solution ; structure ; functioning and change of rural social systems ; historical evolution ; ecological characteristics and demography of the rural community ; social processes ; stratification conflict and co-operation as manifested in rural society.

Methods in Extension (*3 Credits Lecture, 2 Credits Practical*) Philosophy, history and development of agricultural extension, evolution and principles of teaching methods, such as direct contact, result demonstration, method demonstration, working with village leaders, village group action, visual aids, etc., conditions affecting the usefulness of these extension methods ; visits to villages.

Genesis of Community Development (*3 Credits Lecture, 2 Credits Practical*) : Objectives of the Community Development and National Extension Programmes; philosophy and basic principles of extension education ; administration pattern of Community Projects and N.E.S. Blocks ; place of technical departments of Government in the Community and National Extension programmes ; training of extension personnel ; phasing of programme ; development of village leaders, Field trips and visit to important Community Projects and N.E.S. Blocks of the country.

Extension Evaluation: (*3 Credits Lecture*) : Principles of evaluation ; different methods of evaluation and their utility under various conditions ; use of statistics in evaluation work ; evaluation of relative efficiency of various extension methods ; training programme and the progress of Community Projects and National Extension Service Blocks.

Rural Economics (*3 Credits Lecture*) : Fundamental concepts and principles of Economics ; organization of agriculture ; analysis of rural economic problems of agriculture ; types of farming ; land use problems ; farm tenancy ; farm labour ; credit in land use ; marketing of farm products ; prices of farm products.

Farm Management and Cost Accounting (*2 Credits Lecture, 1 Credit Practical*) : Principles ; farm planning, budgeting and linear programming techniques ; agronomic research and its relation to farm planning and farm budgeting ; the role of farm management in agricultural extension service ; techniques of processing farm management data ; size of the farm ; economics of different systems of farming ; critical examination of farm management economics report, cost of production of

farm enterprises ; cost accounting and survey methods ; case studies.

Production Economics—(3 *Credits Lecture*, 1 *credit practical*) : Scope ; the production function ; input-output relationship in agriculture ; choice in resource allocation ; substitution and factor relationships ; resource combination and cost minimization ; enterprise combinations ; choice between products and resource uses ; returns to scale ; indices of production, their construction and use.

Agricultural Marketing (3 *Credits Lecture*, 2 *credits practical*) : Scope ; marketing functions ; price influences and relationships ; buying and selling problems ; domestic and export trade ; grain trade organizations and regulations, regulated markets, advances in marketing technology ; work simplification techniques in marketing. hedging, futures trade and speculation, produce exchanges, standardization of weights and measures.

Agricultural Prices (4 *Credits Lecture*) : Inter-relationships between prices and production, demand for agricultural products, cyclic and seasonal fluctuations in prices ; general price level, index numbers of prices, their construction and use ; stabilization and control of agricultural prices.

Grades and grading (*2 Credits Lecture*) : Standardization of agricultural commodities ; grades and market information ; grades and prices ; grading legislation ; agricultural marketing and grading acts and the Indian Standards Institution ; consumers' role in the crystallization of grades.

Agricultural Co-operation (*3 Credits Lecture*) : Forms of business organization ; principles of co-operation ; history of the co-operative movement in India and abroad ; co-operative farming ; co-operative purchase and sales organizations, multi-purpose co-operatives ; role of co-operatives in developing Indian village life.

Special Topics : Suitable topics will be allotted. (Provision will be made for studying the place of farm animals and mixed farming in agriculture and the economics of cattle enterprise).

Seminar in Agronomy (*1 Credit Lecture*) : Details of programmes and description of courses offered in other divisions of I.A.R.I. are not furnished here, and a reference may be made to the Calendar of the Institute for the information on them.

POST-GRADUATE INSTITUTE, COIMBATORE

The Post-Graduate Institute, Coimbatore, was the first regional post-graduate institute set up on the recommendations of the First Joint Indo-American Team, in 1958. Actually, the Agricultural College and Research Institute at Coimbatore had been recognized by the University of Madras about 25 years ago as a suitable centre for post-graduate studies for degrees of M.Sc., and Ph.D. by research. The creation of a regional post-graduate school to impart training through regular courses and training in research was, therefore, a logical step, for which necessary adjustments were made.

ADMISSIONS

Only 40 candidates are being admitted annually for post-graduate training to both the M.Sc. and Ph.D. degrees, and of these 20 seats are reserved for applicants from other States of the Indian Union.

The course for the degree of M.Sc. (Agri.) extends over a period of two academic years, but the thesis for Ph.D. can be submitted any time after a year's research after M.Sc.

Only those candidates who have passed in at least Second Class the B.Sc. (Agri.) Degree examination of Madras University or of any other University recognised by the Syndicate of Madras University as equaivalent thereto can be admitted to M.Sc. degree course.

COURSES OF STUDY

The course of study shall comprise, according to the syllabus which may be prescribed from time to time, one of the following subjects: (a) Agronomy, (b) Plant Pathology, c) Entomology,) (d) Horticulture, (e) Agricultural Chemistry (Soil Science and Animal Science), (f) Agricultural Economics, (*g*) Agricultural Botany (Plant Physiology, Cytogenetics and Plant Breeding).

SYLLABUS

A specimen of the syllabus for M.Sc. (Agri.) as adopted at Coimbatore for Agronomy subject is given below:

THEORY

PAPER I—AGRONOMY—GENERAL

Climate and Crops: World climatic patterns in relation to crop distribution, agricultural seasons in India, micro-climate in relation to crop production, photo-periodism, crop weather studies, crop forecast, climatic factors influencing the pests and diseases of crops, forecasting the incidence of pests and diseases.

Soils and fertilizer chemistry (*a*) *General*: Origin, formation, composition and classification of soils; important physical, chemical and biological properties of soils in relation to plant growth—availability, loss and importance of plant nutrients.

(*b*) *Properties of soils*: Mechanical composition of soil, soil colloidal behaviour, soil structure and consistency, soil water and air, forms of moisture, mulch and diffusion, swelling, shrinkage and sticky point. Soil solutions, micro-nutrient elements, their relation to rocks and their distribution in different soils. Cation and Anion, properties soil reaction, pH etc.

(*c*) *Soil Fertility*: Principles underlying maintenance of soil productivity; factors influencing soil productivity, climate, soil-type, moisture regime, and cropping system, injurious factors, mechanism of mineral nutrition of plants, major and micro-nutrients, their deficiencies, supply of deficient elements through manures and fertilisers, value of different types of organic manures, farmyard manure, compost, oilcake, green manures, etc., Fertilizers—single and in combination, placement of fertilizers, soil amendments—fertilizer requirement of Indian soils—reclamation of alkali soils.

Soil Moisture: Irrigation; Irrigation system; methods and efficiency; duty of water; underground water resources; tapping and lifting methods and efficiency; irrigation experiments and drainage; water in relation to crop production; soil moisture constants; characteristics of soil moisture; moisture tension and availability.

Soil Microbiology: Soil microflora; microbial decomposition of organic matter in the soil, nitrification, nitrogen fixing bacteria, micro-biological processes in the preparation of farmyard manure and compost, etc.

Tillage: Tilth; forced tilth; methods of tillage for crops; local and improved methods; farm implements and machinery; indigenous and improved farm mechanization.

Soil Conservation: Different types of soil erosion; causes or agents for the soil erosion; wind etc.; conservation practices adopted; study of work done on erosion control methods.

PAPER II—FIELD CROPS INCLUDING AGRICULTURAL STATISTICS

Crops: Classification—cereals, pulses, oil-seeds, sugar crops, fibre crops, root crops, condiments, tobacco, green manure crops, their cultivation and preparation for the market, crop breeding principles and practices of major crops.

Seeds and Seed Selections: Preservation and multiplication; seed farms; their organization.

Weeds and their Control: A knowledge of common pernicious weeds of crop plants, their identification, means of control, weedicides and their action.

Agrostology: Forage and fodder crops in India, their distribution and nutritive values, grassland management, grassland soil fertility, fodder conservation; ley farming.

Statistics: General principles and uses; mean and standard deviation, standard error, statistical significance, sampling and analysis of small samples, co-efficient of variation; probable error.

Chisquare test, analysis of variance and co-variance, correlation and regression, simple, partial, multiple variables—'t' test and 'z' test.

Field Experiments: General rules and principles, randomised blocks, latin square, annual and perennial crop experiments, statistical analysis of data, split plot experiments, complex experiments, confounded and latin design, their analysis.

Diseases and Pest Control Measures: Types of plant diseases, general symptoms and dissemination of plant diseases, effect of environment on the spread and development of epiphytotics, physiologic specialization.

Principles of Insect Control: Cultural, mechanical, chemical, biological and legislative methods, recent developments in plant protection and storage methods in general; plant protection in Madras State, principles governing pest legislation and quarantine measures in India and abroad.

PAPER III—FARM MANAGEMENT ORGANIZATION AND AGRICULTURAL EXTENSION

Farm Management: Farm organization and management, characteristics of crop production, farming systems, crop husbandry in relation to arable, mixed and dry farming conditions, lay-out of farms, equipping farms, cropping systems, rotation of crops, farm labour and its management, farm accounts, cost of production of crops, study of holdings, farm mechanization.

Agricultural Economics: Organization of farming, small holdings, economic

holdings, co-operative farming, collective farming, agricultural production and prices, trends, stabilization of agricultural prices, agricultural marketing, grading and standardization of agricultural produce, agricultural produce (Grading and Marketing) Act, warehousing, co-operative marketing, regulated markets, farm finance, co-operative and other credit, rural credit problems, agricultural finance Acts.

Agricultural Extension Methods: demonstration and propaganda, progress of agricultural extension work, extension agencies, lay-out of demonstration, observation and trial plots, organization of seed farms, etc.

PRACTICAL

The students will take active part in all farm operations connected with the cultivation and management of crops in the Central Farm, maintaining the crop cultivation sheets and other records of the farm individually. They will themselves lay-out experimental plot on an agronomic problem and work out the result of experiments statistically and interpret them. They will make enquiries into the economics of six representative farm holdings and submit detailed records. They will also undergo practical training in a National Extension Service or Community Development Block in extension methods. The students will be taken on study tour to representative agricultural tracts and research stations in India to study the existing agricultural practices and research in agronomy. Tour records and farm records will be submitted for the examination.

THESIS

The thesis is required to be a type-written matter embodying the results of research done by the candidate during his two-year course of study on the subject assigned to him. It shall not ordinarily exceed 50 pages of type-written matter. The dissertation is to be a brief report of the original investigation or of a critical review to serve as a measure of knowledge of methodology and techniques.

POST-GRADUATE COLLEGE OF AGRICULTURE, NAGPUR

The College of Agriculture, Nagpur has been providing facilities to candidates desirous of getting M.Sc. (Agri.) degree through the medium of published papers or thesis submitted to the Nagpur University since 1935, and for Ph.D. degree in the Faculty of Agriculture from 1941. The Government of Bombay selected Nagpur as the venue for locating the Regional Post-Graduate Institute, on the recommendations of the First Joint Indo-American Team to set up one such Institute in the State.

ADMISSIONS

A candidate who has passed the B.Sc. (Agri.) Examination of Nagpur University or of any Indian University recognised as equivalent thereto, in Second Division securing not less than 50 per cent of marks in the subject in which he or she intends to pursue post-graduate studies, is eligible for admission in the course for M.Sc. (Agri.) degree.

For Ph.D., any person possessing the degree of M.Sc. or B.Sc. (Honours) of the

Nagpur University or of any University recognised by the Nagpur University as equivalent thereto, is eligible for admission.

The M.Sc. (Agri.) Course is of two-years' duration with M.Sc. (Agri.) Part I Examination at the end of first-year. At the end of the second year, each student is required to submit a thesis in partial fulfilment of the course unless otherwise directed by the Principal.

For Ph.D., a thesis is submitted two years after the candidate's application has been sanctioned. However, the Academic Council may, after considering the recommendation of the Faculty, have the option of reducing this period under certain circumstances.

COURSES OF STUDY

Under the new set-up, the College offers the students facilities to prepare for M.Sc. (Agri.) Degree in the following subjects: Agronomy, Horticulture, Plant Pathology, Agricultural Extension, Agricultural Chemistry, Agricultural Botany, Agricultural Entomology and Agricultural Economics.

EXAMINATION

The thesis for M.Sc. (Agri.) or Ph.D. is required to be submitted within a period of three years from the date on which the application was sanctioned by the Faculty of Agriculture or the Academic Council. The thesis is examined by two examiners and the candidate may have to present whenever required for oral test. If the thesis is not accepted, the candidate may have to re-submit an amended or a fresh thesis after a specified time. In that case a fresh subject can be selected with the approval of the Faculty of Agriculture.

OTHER POST-GRADUATE INSTITUTES

A large number of agricultural colleges throughout the country provide facilities for post-graduate training either by research or by course-work or by both.

GETTING DEGREES BY RESEARCH

For securing M.Sc. degree by research, a candidate has to work on a problem under an approved guide in an approved institution. Generally, the Universities insist that a candidate should be considered eligible to secure M.Sc. degree only after 3 years' research work after passing B.Sc. in Agriculture or in other sciences. The candidate has to submit published papers approved by the Faculty of Agriculture or more generally, a thesis embodying the results of research on a subject within the purview of the Ordinance relating to the degree of B.Sc. in Agriculture. Not less than 18 months in some cases and two years in others, should be devoted by the candidate on his training, (from the date of registration to the submission of the thesis). Several Universities permit candidates to carry on research work under a guide or supervisor residing within their territorial jurisdiction. The candidate may be tested orally or by means of one or more written papers or by both. A candidate whose thesis is not accepted for the degree, may either resubmit an amended thesis or a

fresh thesis on a different subject, under such conditions as the University may prescribe.

Persons who have passed M.Sc., or B.Sc. with Honours, or possess Associateship of I.A.R.I. or other similar institutes are generally permitted to offer themselves as candidates for the degree of Doctor of Philosophy. Every candidate has to submit a thesis embodying the results of research on a subject within the purview of the Faculty of Agriculture. The research has to be carried out under a recognised or approved supervisor or guide within or outside the territorial jurisdiction of a given University or may be done independently by the candidate if he already possesses the degree of M.Sc. The thesis has to be submitted two years after the registration of the candidate. The examination may be oral, or by written papers and oral combined.

DEGREES BY WRITTEN PAPERS AND RESEARCH

The entrance requirements and duration are the same as for the degrees by research. There is, however, some diversity between the institutions with regard to the courses offered, programme of study and examinations. The syllabus and examination system described under the Regional Post-Graduate Institute, Coimbatore, represents one type, while the following systems adopted at Sardar Vallabbhai Vidyapeeth under the Faculty of Agriculture at Anand represents the second type.

Programme of Study at Anand

(*i*) *Major and Minor subjects*: The subject for which the student is admitted for advanced training is called the major subject or division of study and more than 50 per cent of his course work (theoretical and practical studies) and almost all the research work is to be confined to this subject. The guiding Professor in the subject is called the Major Professor who plans out the programme of studies for every student working under him. In addition to the major subject of study, every student registered either for M.Sc. or Ph.D. degree course, has to choose under the guidance of his Major Professor one allied subject of study which is called the minor subject or division. The Professor guiding the studies of the minor subject or division is called the Minor Professor.

(*ii*) *Course Work and Credit Requirements*: With a view to giving thorough training to the students in the major and minor fields of studies, more emphasis is laid on course work that consists of either lectures or practicals or both in a course to be offered under a specified field of study.

A minimum of 12 credit course work in the major field of study and six credit course work in the minor field of study, in addition to other courses required to be undertaken to make up deficiencies of the undergraduate studies, have to be successfully carried out by the student registered for M.Sc. (Agri.) degree ; while the minimum number of credits for the course work to be undertaken by a Ph.D. candidate depends upon his previous training and, therefore, is decided individually. Both for M.Sc. (Agri.) and Ph.D. candidates, the requirements of course work are decided by a committee consisting of the candidate's Major and Minor Professors and two other post-graduate teachers to be selected by the Major Professor. The Committee meets in the beginning of the academic year, preferably before 31st of July and

decides the candidate's requirements of course work and reports the same to the University through the Director of the Institute.

One credit course work in a subject means minimum of 40 minutes of lecture or one and a half hours of practical per week for both the terms of an academic year. A student preparing for M.Sc. (Agri.) or Ph.D. degree examination is ordinarily not allowed to take up more than 12 credit course work at a time.

(*iii*) *Language Requirements*: All the students admitted to the post-graduate course are expected to have good reading and writing knowledge of English. The students registered for Ph.D. degree course are required to acquire reading knowledge of one foreign language as approved by the guiding Professor and have to pass a proficiency test called 'Ph.D. Translation Test' conducted by the University at least six months before they submit the thesis on their research work.

EXAMINATIONS

Two examinations, one at the end of the first term and the other at the end of the second term in each of the courses of study are held during the year. Ordinarily, there are 100 marks for examination for each of the courses of study other then seminar and research. The evaluation of students' performance in such examinations is made by the teachers, separately for each of the courses offered by them.

Every post-graduate teacher offering a course or courses during the academic year has to maintain records of students' performance in the examinations and submit the final results (Average of the total marks obtained at the aforesaid two examinations conducted in a subject) to the University at the end of each academic year.

As to the evaluation of research work and seminar, a certificate is issued by the Professor-in-charge (Major Professor or Minor Professor as the case may be). He submits the same to the University as and when the candidate working under him fulfils his requirements.

PRELIMINARY EXAMINATION

If a candidate registered either for M.Sc. (Agri) or Ph.D. degree course, has successfully completed the course work assigned to him in the first year of his study and has made satisfactory progress in his research work, he is permitted to appear at a comprehensive oral test, called 'Preliminary Examination' earliest by the end of the third term of his study for the respective degree. A Committee consisting of at least four members, *viz.*, the candidate's Major and Minor Professors and two other teachers to be selected by the Major Professor, and approved by the University, examines the candidate orally and decides the fitness of the student to become a candidate for the degree he is registered for . A candidate who fails in the oral examination is given three chances, each chance after three months from the date of the first oral examination.

THESIS

Every student admitted for M.Sc. (Agri) or Ph.D. degree course has to carry out research on the subject of his major field of study. The student has to decide under the guidance of his Major Professor, a problem and line of research work for the first

term of his study. The research work for the thesis for Ph.D. degree is required to be of high order and of fundamental nature. The candidate has to communicate to the University the title of his thesis before he appears at the 'Preliminary (oral) Examination'. Three months after the date of passing the oral examination, he has to submit his thesis to the University along with a certificate from his Major Professor stating that the work reported in the thesis is the candidate's own research work carried out under his guidance.

The thesis submitted in partial fulfilment of the requirements for the degree of Master of Science (Agriculture) or Doctor of Philosophy, is examined jointly by the candidate's Major Professor and an external referee in the case of M.Sc. (Agri.) and two external referees in the case of Ph.D. thesis. The external referees are appointed by the University.

COURSES OFFERED

An idea of the courses offered at the Institute can be had from the details about the Agronomy course given below.

AGRONOMY

Intensive study of the following crops or group of crops with special emphasis on problems and practices followed under different conditions and research work done so far in India :

Cereals	Paddy, Jowar (sorghum), wheat, bajra (pearl millet) and maize (3 credits)
Pulses	Indian beans, pigeon pea, gram, black gram, china gram, and kidney beans (2 credits)
Oil seeds	Castor, groundnut, sesamum, safflower and linseed (2 credits)
Tobacco	2 credits
Cotton	2 credits
Sugarcane	2 credits
Vegetables-I	Stems, roots and bulbs (2 credits)
Vegetables-II	Fruits and pods (2 credits)

Forage Production (3 Credits)

Origin, uses, climatic and soil adaptation of forage plants in western India ; recommended types and varieties ; methods for establishment and management ; seed production and weed control ; pasture improvement and management practices.

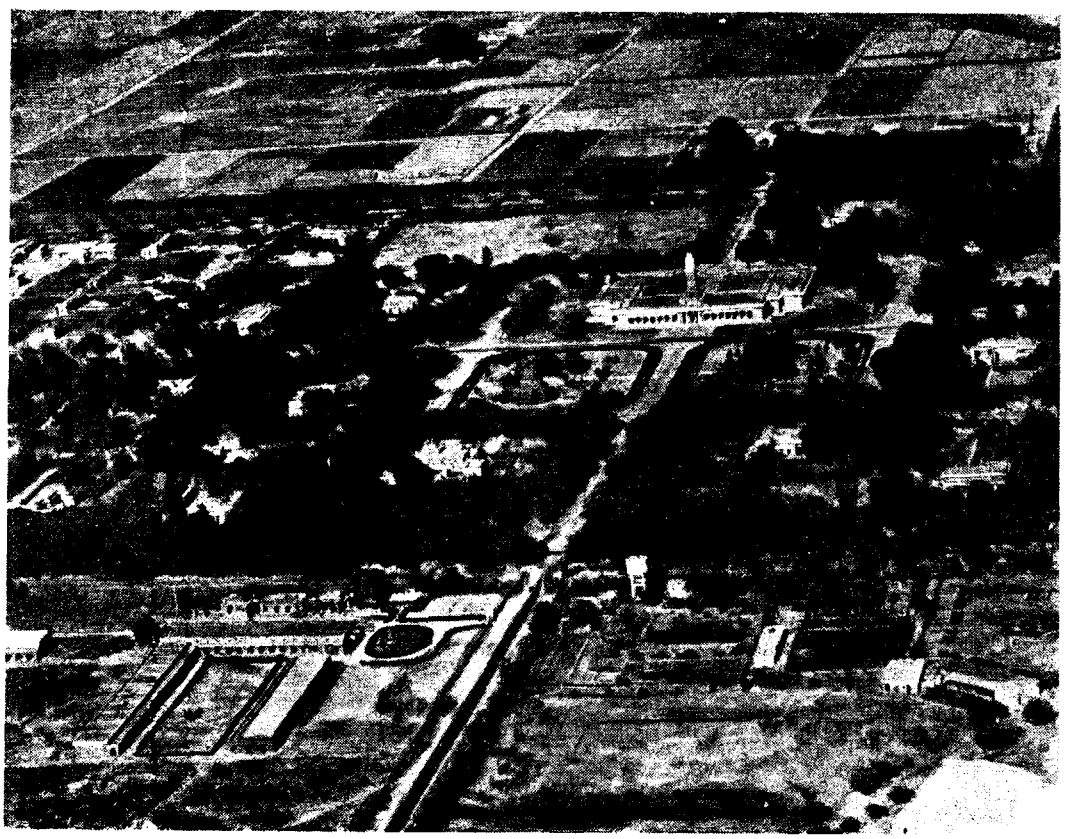
Advanced Soil Management (3 *Credits*)

Recent practices and methods of soil management with reference to tillage, manures and manuring, irrigation, drainage, dry farming, rotations and mixtures etc. for increased production of crops and maintenance of soil fertility.

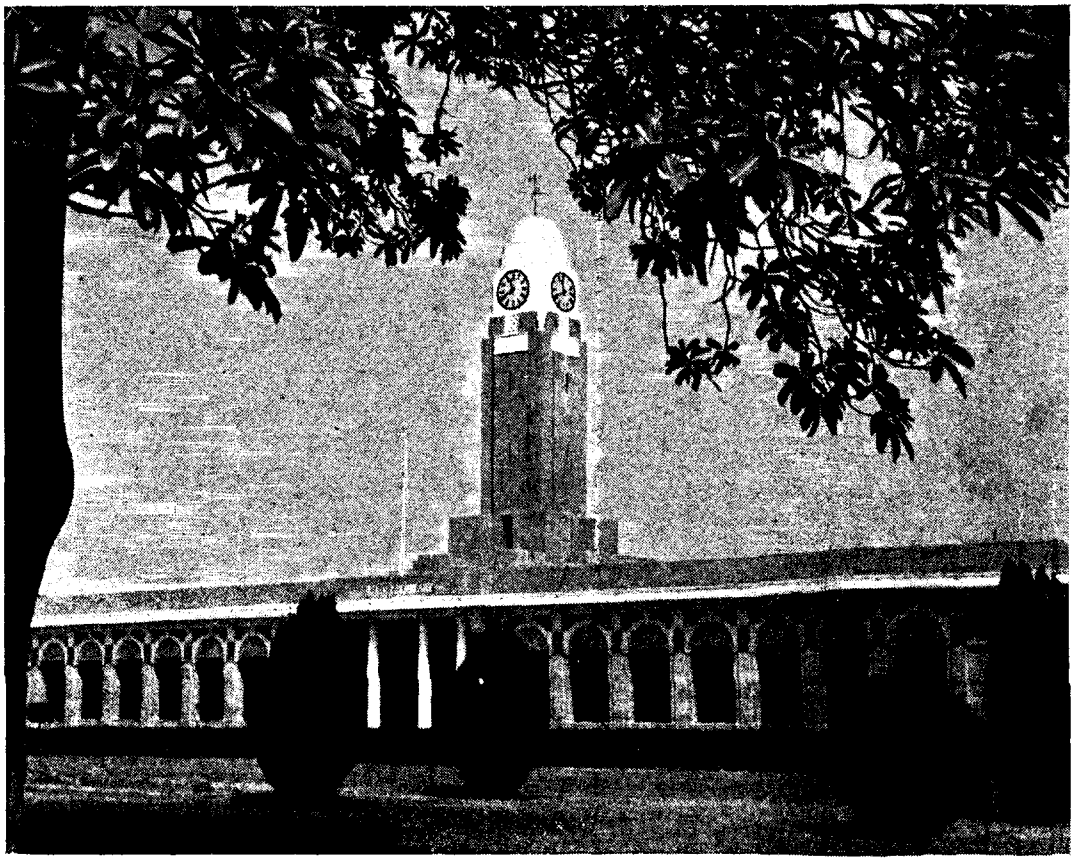
Weed Control (3 *Credits*)

Weeds and their classification ; identification of weeds, their seeds and fruits ;

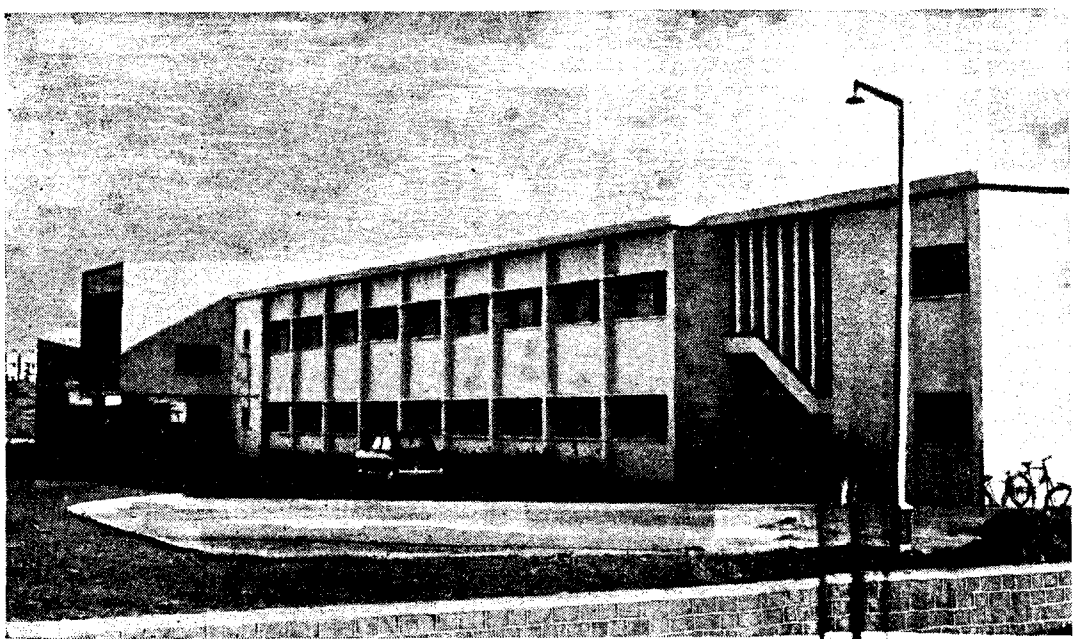
SHRI AJIT PRASAD JAIN INAUGURATING THE POST-GRADUATE SCHOOL OF AGRICULTURE, AT THE INDIAN AGRICULTURAL RESEARCH INSTITUTE, NEW DELHI



AERIAL VIEW OF THE INDIAN AGRICULTURAL RESEARCH INSTITUTE, PUSA



LIBRARY OF THE INDIAN AGRICULTURAL RESEARCH INSTITUTE, PUSA



INSTITUTE OF AGRICULTURAL RESEARCH STATISTICS OF THE INDIAN COUNCIL OF AGRICULTURAL RESEARCH

study of their habits of growth ; principles of weed control ; cultural, chemical and biological methods of weed control.

Seed Technology, Production and Distribution (3 *Credits*)

Problems related to dormancy, germination and treatments of seeds, moisture determination, seed identification, testing, grading and analysis.

Commercial methods of seed production ; agronomic factors affecting production, harvesting, drying and storage of seed. Seed certification and seed laws.

Experimental Designs (3 *Credits*)

Procedure in planning and lay-out of biological experiments ; various experimental designs, their implications and practical utility ; randomised block, factorial, confounding, split-plot and lattice designs ; analysis and interpretation of data.

Research Methods in Agronomy (1 *Credit*)

Problems in agronomical research and their implications ; ways and means of tackling such problems ; compilation and interpretation of research data ; modern trends in agronomica research.

Special Problem (2 *Credits*)

Under this head a candidate shall be required to undertake either a survey or a special study relating to his research work or he may be required to take additional course either in any of the prescribed minor fields of study or outside. Number of credits will depend upon the type of work or the course to be undertaken.

Seminar (1 *Credit*)

Review of literature on assigned topics and/or preparation of formal papers and their presentation to the seminar group of staff and post-graduate students.

INSTITUTE OF AGRICULTURAL RESEARCH STATISTICS, ICAR

With the expanson of research and agricultural statistics, the need was felt for institution of training courses for agricultural research personnel and for professional statisticians. For some years, the I.C.A.R. has been providing necessary training on an individual basi. Some of the Universities also have facilities for training undergraduates in staistics even up to the Honours stage. Regular courses have been recently started by the I.C.A.R. to meet the growing demand for workers trained in agricultural statistics.

Training at postgraduate level is being given at the Institute of Agricultural Research Statistics since 1945 (then the Statistical Branch of the Council). There were at that time two courses, namely, the Certificate Course and the Diploma Course. Special training course for officers deputed by the Central and State Governments were also organised. The training courses were organised for ; (*i*) students whose main interest was not statistics as such but for whom knowledge of modern statistical methods was important for their work in Agriculture, Animal Husbandry, etc. and (*ii*) those who were to be trained professional statisticians, with special knowledge of

Statistics as applied to Agriculture, Animal Husbandry and related fields.

The Certificate Course was organized for students of the first category and the Diploma Course for students of the second category.

Since the backgrounds of the students of the first category are different and since not all of them can afford to stay away from their work long enough, it was found useful to split up the Certificate Course into two courses, *e.g.*, the Junior Certificate Course and the Senior Certificate Course. Each of these courses is complete in itself, the second being a continuation of the first. The Junior Certificate Course extends over a period of five months while the Senior Certificate Course runs for a period of one year.

Since courses on theoretical statistics are now increasingly available in the various Universities, the emphasis in the training of the second category students is mostly on Applied Statistics, specially Agricultural Statistics, the selection of such students being restricted to those already having some post-graduate education in Statistics.

COURSES OFFERED

The students are trained at two levels, *i.e.*, the Professional Statisticians' Certificate Course and the Diploma Course. A student completing successfully the Professional Statisticians' Certificate Course is expected to acquire mastery of the fundamentals of statistical science and their application to Agriculture and Animal Husbandry. A student of the Diploma Course, in addition to completing successfully the Professional Statisticians' Certificate Course, is required to produce in the second year, a satisfactory written report on some aspects of statistical work of a research project with which he is associated. This report has to be of a sufficiently high standard.

The students admitted to the Junior and Senior Certificate Courses are mostly employees of either the State Governments, Commodity Committees or Central Institutes who are nominated by their respective institutions to attain proficiency in the application of statistical methods in their research work. At present, facilities are available for giving training to 10 students in the Junior Certificate Course and 15 students in the Senior Certificate Course. The Courses begin in August and the examination for the Junior Course is held about the end of December while the examination for the Senior Course is held in June.

ENTRANCE REQUIREMENTS AND SELECTION

For admission to the Professional Statisticians' Certificate Course and the Diploma Course, a student should have some post-graduate training in Statistics and since the specialisation is confined to Agricultural Statistics, a new scheme for recruitment has been now introduced. Under the scheme, a Joint Selection Board consisting of the representatives of the Institute of Agricultural Research Statistics, Indian Statistical Institute, Central Statistical Organization (and at a later date Union Public Service Commission) is set up for the selection of candidates, who are selected on the basis of an admission test held by the Indian Statistical Institute. Such selected candidates undergo training in basic statistical methods in the Indian Statistical Institute for one year and among the successful candidates those desiring to specialise

in Agricultural Statistics are admitted to the Professional Statisticians' Certificate Course of the Institute of Agricultural Research Statistics. A few candidates holding a good Master's degree in Statistics who do well in the admission test may also be considered for direct admission to this Course. The total number of students admitted annually to the Professional Statisticians' Certificate Course is at present restricted to 10. Each student admitted to this Course is given a fellowship of Rs. 150/- per month for one year. Admission to the Diploma Course is confined to those completing successfully the Professional Statisticians' Certificate Course. A maximum of six fellowships of Rs. 200/- per month are awarded to students admitted to the Diploma Course. The duration of the Professional Statisticians' Certificate Course is usually August to June.

TRAINING

The training programme of the Junior and Senior Certificate Courses includes lectures on statistical methods and descriptive statistics and the design and analysis of experiments, sampling techniques, agricultural statistics in India and practical laboratory work on the use of different statistical techniques. The training programme for the Professional Statisticians' Certificate Course includes lectures, laboratory practicals and field work pertaining to topics grouped under the following heads:

(*i*) Design and analysis of experiments;
(*ii*) Sampling techniques and their applications;
(*iii*) Statistical aspects of genetics and of plant and animal breeding;
(*iv*) Biometric methods;
(*v*) Scope, content and systems of collection of agricultural statistics in India and the official publications dealing with agricultural statistics.

Besides these courses, lectures on advanced topics in statistical theory are also provided from time to time for the benefit of students pursuing the professional courses.

In all the courses of training, emphasis is laid on practical laboratory work based on actual data collected from the Council's research schemes. The students are also actively associated with projects of the Institute. Study tours are also arranged for students to get first hand idea about the experimental conditions.

Facilities for research work by advanced students in Statistics leading to the Ph.D. Degree of a University are also available.

According to the estimates of the Agricultural Personnel Committee of the Planning Commission, the demand for statistically trained personnel during the ensuing perod will be considerable. To meet this situation, the Institute has a plan for the expansion of its training activities under which the annual capacity of training in Professional Statisticians' Certificate Course and the Junior and Senior Certificate Courses will be increased from 10 and 25 respectively at present to 30 and 40 respectively.

There is a hostel attached to the premises of the Institute and the students are required to stay in the hostel to ensure uninterrupted work.

TRAINING COURSES IN AGRICULTURAL MARKETING

The Directorate of Marketing and Inspection of the Ministry of Food and

Agriculture, New Delhi, have organized certain training courses to train the personnel of the State Marketing departments and Market Committees. One of these, *i.e.*, the training course in Agricultural Marketing is of 12 months' duration and is arranged at Nagpur, while two training centres have been set up at Sangli in Bombay State and Hyderabad in Andhra Pradesh for the training of Market Secretaries of Regulated Market Committees. The latter courses are of four months' duration each and are held twice a year. The former course which is open primarily to graduates, starts on the first of August and lasts till July of the following year.

ADMISSIONS

The following personnel of the State Marketing Departments deputed by the respective State Governments are admitted for the training course in Agricultural Marketing.

(*i*) Agricultural Graduates ;
(*ii*) Economics Graduates ;
(*iii*) Commerce Graduates ;
(*iv*) Veterinary and Dairy Graduates, as also Science Graduates working in Agricultural Departments or in the Indian Council of Agricultural Research Schemes or Marketing Departments of the States or Centre.
(*v*) Others who have completed a minimum of five years of service in the State and the Central Marketing Organization, if specially permitted by the Agricultural Marketing Adviser.

At present the number of students admitted to this course ranges from 15 to 30. Arrangements also exist for admission of five private candidates.

COURSES OF STUDIES

Lectures are given on the marketing of over 40 agricultural, animal husbandry and fishery products. The trainees are also taken on tours—to North India, East India and South India. They are also sent on a Community Project Survey, so that they could study intensively the marketing of one agricultural and one animal husbandry product and write a report on their findings.

EXAMINATIONS

At the end of the Course, the examinations are held consisting of two papers and *viva-voce*, after which a certificate is awarded to the successful students.

POST-GRADUATE EDUCATION IN DAIRY SCIENCE

M.Sc. (*Dairying*) course is proposed to be started at the Dairy Science College, National Dairy Research Institute, Karnal under the auspices of the Panjab University. The duration of the course will be two years. For the present, the training will be confined to Dairy Chemistry, Dairy Husbandry, Dairy Microbiology and Dairy Technology. The details of the syllabi of courses in broad outline will be as follows :

Dairy Chemistry

Major subjects (compulsory)	(*a*) Dairy Chemistry

(*b*) Research Technique
(*c*) Statistical Technique

Minor subjects (any two to be offered)
(*a*) Organic Chemistry
(*b*) Physical Chemistry
(*c*) Dairy Microbiology
(*d*) Biochemistry
(*e*) Dairy Technology

Dairy Husbandry

Major subjects (compulsory)
(*a*) Dairy Husbandry
(*b*) Research Technique
(*c*) Statistical Technique

Minor subjects (any two to be offered)
(*a*) Agronomy
(*b*) Physiology of Dairy Animal
(*c*) Physiological Genetics
(*d*) Dairy Cattle Breeding
(*e*) Dairy Microbiology
(*f*) Dairy Chemistry

Dairy Microbiology

Major subjects (compulsory)
(*a*) Dairy Microbiology
(*b*) Research Technique
(*c*) Statistical Technique

Minor subjects (any two to be offered)
(*a*) Biochemistry
(*b*) Industrial Microbiology and Microbiology of Foods
(*c*) Dairy Technology
(*d*) Dairy Chemistry
(*e*) Dairy Husbandry

Dairy Technology

Major subjects (compulsory)
(*a*) Dairy Technology
(*b*) Research Technique
(*c*) Statistical Technique

Minor subjects (any two to be offered)
(*a*) Chemical Engineering
(*b*) Industrial Microbiology & Microbiology of Foods
(*c*) Dairy Microbiology
(*d*) Dairy Chemistry
(*e*) Dairy Engineering

The minimum qualification for admission will vary with the subject of specialization as follows:

For Dairy Chemistry

(a) B.Sc. (Dairying)
(b) B.Sc. (Chemical Engineering & Technology)
(c) B.Sc. (Agriculture), with Chemistry as a major subject
(d) B.Sc. Hons. in Chemistry, or
(e) B.Sc. with Chemistry Honours

For Dairy Husbandry

(a) B.Sc. (Agriculture)
(b) B.V.Sc.

For Dairy Microbiology

(a) B.Sc. (Dairy)
(b) B.Sc. (Microbiology)
(c) B.Sc. (Special subject Microbiology)
(d) B.Sc. (Agriculture, with Chemistry as major subject)
(e) M.B.B.S., or
(f) B.V.Sc.

For Dairy Technology

(a) B.Sc., (Dairying), or
(b) B.Sc., (Chemical) Engineering & Technology

Other Post-Graduate Courses: Honorary research workers will be admitted for post-graduate research work in any branch of Dairy Science including Dairy Chemistry, Dairy Engineering, Dairy Economics, Dairy Microbiology, Dairy Husbandry and Dairy Technology at the National Dairy Research Institute. The candidates will be permitted to submit their results for the purpose of securing M.Sc. or Ph.D. degrees to any University in India with which they will be registered. The usual duration of training (no fees are charged) will vary from two to three years. There will be provision for admission of 17 research workers at the N.D.R.I., Karnal and eight research workers at the S.R.S. of the National Dairy Research Institute (Hosur Road, Bangalore-1).

In addition to the above, the Agra University has provision for specialization in Animal Husbandry and Dairying under its M.Sc. (Agri.) Course. The duration of the course covering class-work and part thesis is two years. Graduates in Agriculture are admitted to the course.

CHAPTER IV

UNDERGRADUATE INSTITUTIONS

Higher or collegiate education in Agriculture is a relatively recent growth in India. The agricultural education at the college level received University recognition in India in 1906, while the veterinary education, received University affiliation in 1946.

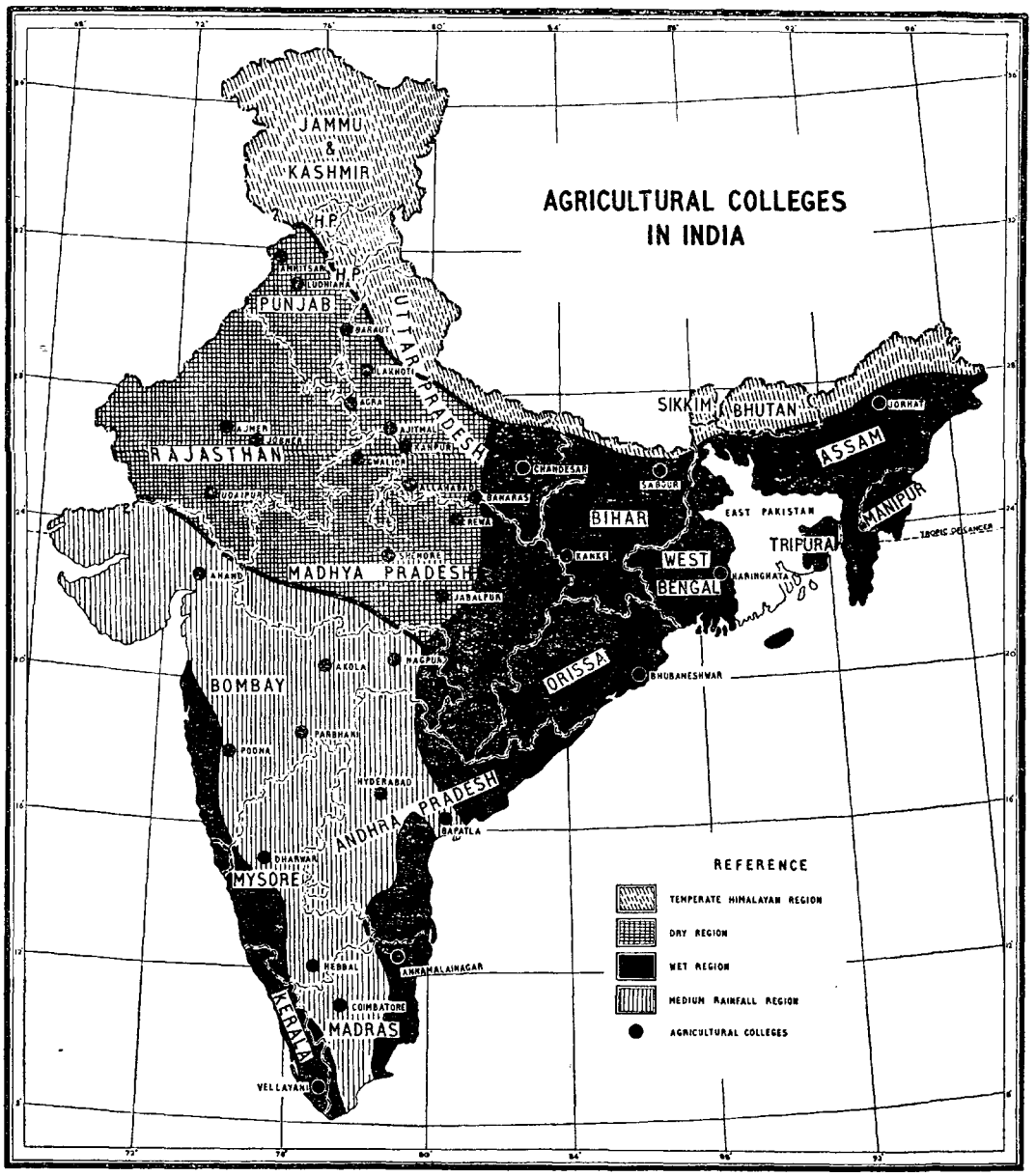
At present there are 33 agricultural colleges and 16 veterinary colleges in India. There are some colleges which teach Agriculture up to the intermediate stage. These colleges are either Government owned or private, though the latter also are subject to University regulations and standards. The colleges differ in their capacity to accommodate students. Most of them are purely teaching centres, but some have a system of education in which teaching and research functions are integrated. A few colleges have extension sanctions and a block of villages is attached to them to serve as an extension laboratory for the students. The courses, duration and quality or standard of teaching are governed by the qualifications prescribed by the Universities.

ADMISSION REQUIREMENTS

With the adoption of the general pattern of a four-year degree course after Higher Secondary or Pre-University course, a new one-year course has to be introduced in the agricultural and other professional colleges by the name of Pre-professional course. This will mean that the agricultural colleges where the entrance requirement was Intermediate examination and the duration of the Degree course was three years, will have to switch over to a four-year course after the Pre-University course, by integrating the Pre-professional course in the agricultural colleges. Some Colleges have done it and others have arranged the Pre-professional course in science colleges as a temporary measure during the transition period. In agricultural colleges where the entrance requirement was Intermediate in Agriculture (as in Uttar Pradesh) or a pass in High School, necessary changes are being made to introduce the new pattern of four-year course in Agriculture after higher Secondary or Pre-University course. In a few years this pattern is likely to be adopted uniformally by all Universities in India.

RELATION BETWEEN POST-GRADUATE AND UNDERGRADUATE TEACHING

Post-Graduate courses in Agriculture have been generally associated with research institutes in the country, since the degrees of M.Sc., Ph.D. and D.Sc. were for a long time awarded generally on the basis of a dissertation or thesis. With the strengthening of research wings or research personnel in agricultural colleges, post-graduate teaching also developed in these colleges. Recently, course work with specialization in a field of choice has come to be regarded as the most appropriate course for M.Sc. in Agriculture, while for Ph.D. and D.Sc., a thesis on the basis of original research is still the general pattern followed in India. Except at I.A.R.I., New Delhi and I.V.R.I.,


AGRICULTURAL COLLEGES
IN INDIA
JAMMU
&
KASHMIR
H.P.
PUNJAB
HARYANA
RAJASTHAN
UTTAR PRADESH
SIKKIM
BHUTAN
ASSAM
MANIPUR
TRIPURA
EAST PAKISTAN
BIHAR
WEST
BENGAL
ORISSA
MADHYA PRADESH
BOMBAY
ANDHRA PRADESH
MYSORE
KERALA
MADRAS
PANTNAGAR
LUDHIANA
PARBHANI
HYDERABAD
DHARWAR
COIMBATORE
VELLAYANI
BHUBANESHWAR
REFERENCE
TEMPERATE HIMALAYAN REGION
DRY REGION
WET REGION
MEDIUM RAINFALL REGION
AGRICULTURAL COLLEGES

Izzatnagar, the post-graduate institutes are connected with undergraduate institutes, both enjoying common facilities and under unified management on the same campus.

In the following pages are furnished the important details about the subjects taught and other facilities provided in the agricultural colleges now functioning in the country.

AGRICULTURAL COLLEGE, BAPATLA

The Agricultural College, Bapatla, was established and affiliated to Andhra University in 1945. In 1952, the College was recognized as a centre for training persons for the M.Sc. (Agri.) degree.

A farm extending over 450 acres is attached to this college. One tractor workshop and a mechanical engineering workshop are also established on the same campus. Soil Testing, Bacteriolgy, Cyto-genetics, Entomology and Mycology laboratories are attached to the College.

ADMISSION

For B.Sc. (Agri.) Course, the entrance requirement is a pass in the Inter Science examination with one of the following subjects as optional:

Mathematics, Biology, Natural Science, Botany, Agricultural Zoology with Chemistry as the compulsory subject.

For M.Sc. (Agri.) degree by Research, the minimum admission requirement is the B.Sc. (Agri.) degree. The duration of the B.Sc. (Agri.) degree course is three years, while for the M.Sc. (Agri.) degree by research, a period of two years has been prescribed. The college has a capacity to enrol 144 students per year for the degree course, while for the M.Sc. (Agri.), four candidates can be admitted annually under each research section.

COURSES OF STUDIES

The subjects taught include Agronomy, Agricultural Economics, Agricultural Botany, Agricultural Chemistry, Agricultural Entomology, Agricultural Engineering, Mycology and Plant Pathology, Animal Hygiene and Horticulture. The course is modelled more or less on the same lines as that of the Agricultural College, Coimbatore affiliated to University of Madras. (see page 75).

EXAMINATIONS

The examinations too are, more or less, on the pattern of that mentioned under the Agricultural College, Coimbatore affiliated to the University of Madras.

UNIVERSITY COLLEGE OF AGRICULTURE, OSMANIA UNIVERSITY, HYDERABAD (DECCAN)

Established in 1946, as a constituent college of Osmania University, the University College of Agriculture, Hyderabad has received contributions both from the State and Central Governments.

Some research facilities are available for the teaching staff at this College at present, though the College is not directly connected with any research work in Agri-

culture, which is under the control of the State Department of Agriculture. There are, however, experimental laboratories attached to the Departments of Agricultural Botany, Entomology, Plant Pathology, Agricultural Chemistry and Animal Husbandry ; and the College also maintains an experimental farm. The staff includes four Professors, seven Readers, 16 Lecturers and 19 Field Instructors. The capacity for enrolment is 96 for B.Sc. (Agri.) and 40 for M.Sc. (Agri.) degree, and adequate hostel accommodation is available.

ADMISSION

The B.Sc. (Agri.) course extends over a period of three years, while for M.Sc. (Agri.) a candidate has to spend two years. The qualifications for admission to the former course is a pass in Intermediate or Pre-professional course with Botany, Physics, and Chemistry or Geology as part of the course. For M.Sc. (Agri.), a pass in B.Sc. (Agri.) with 50 per cent marks in the subject concerned, or two years' service in the Department of Agriculture after securing B.Sc. (Agri.) degree, is necessary.

Particulars relating to the courses offered at this College and the examinations held are given below.

B.Sc. (Agriculture)

The following subjects are taught in B.Sc. (Agri.) :

Agronomy, Agric. Botany, Agric. Chemistry, Entomology & Agric. Zoology, Plant Pathology, Horticulture, Animal Husbandry, Agric. Engineering, Agric. Economics and Extension.

The subjects taught and the scheme of examinations followed at this College for M.Sc. (Agri.) examinations are set out below.

M.Sc. (Agriculture)

The following subjects are taught in M.Sc., (Agri) :

Agronomy, Agricultural Botany, Agricultural Chemistry, Entomology, Plant Pathology, Horticulture, Animal Husbandry and Agricultural Economics.

SCHEME OF EXAMINATIONS

M.Sc. (Agri.), Previous, Part A

Written : Theory Paper I of 3 hours duration
Theory Paper II of 3 hours duration

Practical : Paper III of 4 to 8 hours duration including valuation of record and Viva Voce

Part B

The topic of Research is to be intimated to the Principal and the thesis to be submitted for final examination as per rules prescribed.

M.Sc. (Agri.) Final : Part A

Written : Theory Paper I of 3 hours duration
Theory Paper II of 3 hours duration

Practical: Paper III of 4 to 8 hours duration including valuation of Record and *Viva Voce*

Part B

Thesis and Viva Voce

ASSAM AGRICULTURAL COLLEGE, JORHAT

The Assam Agricultural College, Jorhat, was started in 1948. It is affiliated to Gauhati University. A farm of about 120 acres is attached to the Institution, along with a cattle farm and a poultry section. The Government nursery and orchard is also within the campus. An engineering workshop and the science laboratories form part of the college facilities. Hostel accommodation is available for 105 students only at present. The staff consists of eight Professors, 15 Lecturers and three Assistant Lecturers, besides the Principal. The capacity for enrolment is 80 students.

ADMISSION

For the first year, I.Sc. (Agri.) candidates who have passed Matriculation examination or an equivalent examination are eligible for admission, while for the 2nd year I.Sc. (Agri.) a pass in Inter Science with Biology as a subject, is prescribed as the entrance requirement. Admission to the 3rd year B.Sc. (Agri.) class is restricted to those who have passed I.Sc (Agri.) or its equivalent examination.

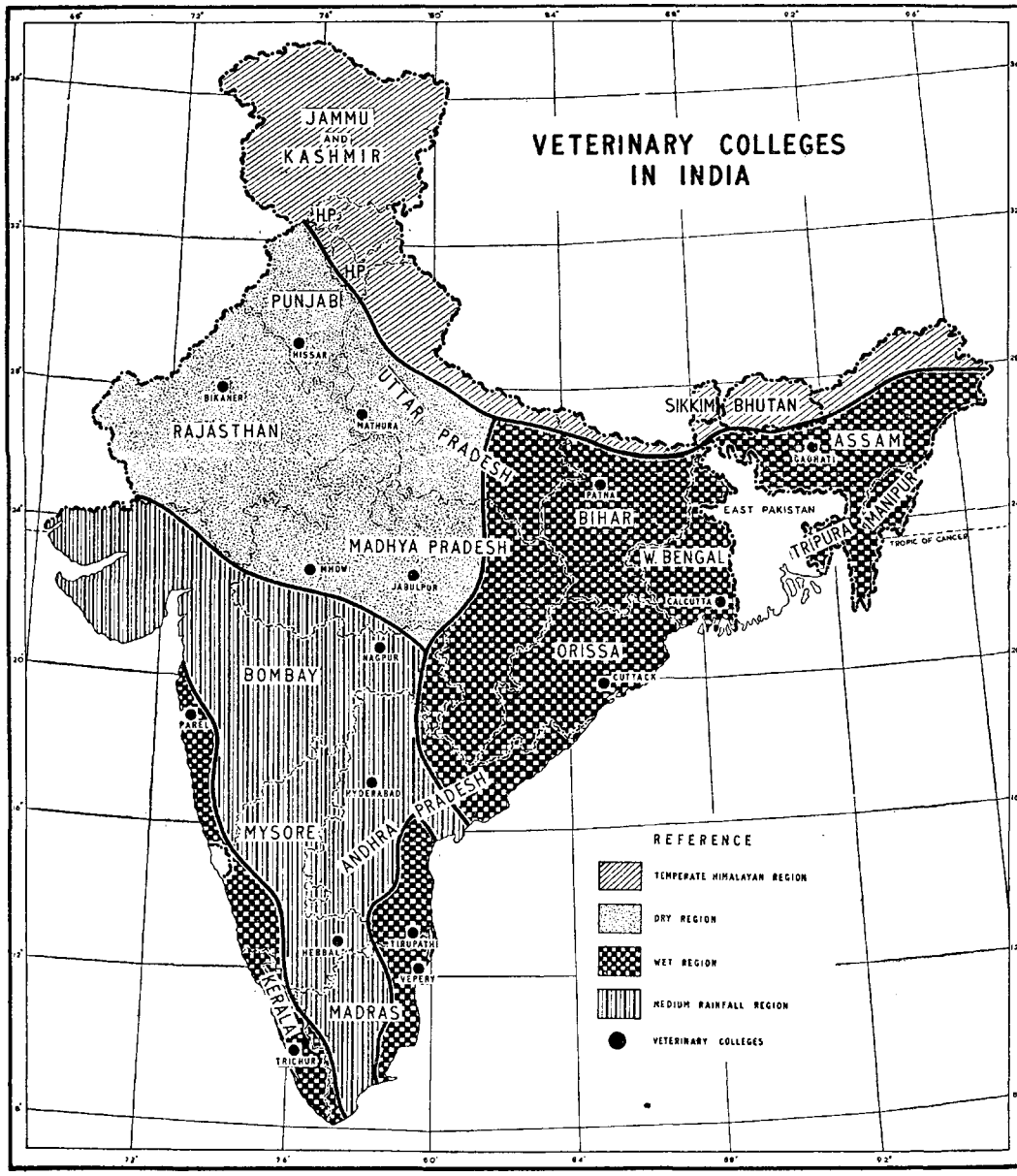
COURSES OF STUDY

The degree course in agriculture extends over four years. The subjects taught in I.Sc. (Agri.) are Agronomy, Botany, Elementary Zoology, Chemistry and Soil, Animal Husbandry and Veterinary Science, Physics, Climatology and Mathematics, English and Indian languages. For the B.Sc. (Agri.) course, the subjects covered are Agronomy, Agricultural Botany, Plant Pathology and Bacteriology, Agricultural Chemistry, Dairying, Entomology, Agricultural Engineering, Horticulture, Agricultural Economics and Tea.

EXAMINATIONS

The particulars of the theoretical and practical examinations conducted annually for Intermediate in Agricultural Sciences are given below:

GROUP I	*Agronomy*	Introduction, Tillage implements and agricultural operations and Field and Fodder Crops
GROUP II	*Botany*	Morphology, Systematic Botany, Cytology and Histology, Elementary Zoology
GROUP III	*Chemistry*	General and Inorganic Chemistry, Organic Chemistry
	Soils	Agric. Geology and Soil Physics
GROUP IV	*Animal Husbandry*	..
	Veterinary Science	..
GROUP V	*Physics and Climatology*	..
	Part—A. PHYSICS.	
	B. CLIMATOLOGY	
	Mathematics	..


VETERINARY COLLEGES
IN INDIA
JAMMU AND KASHMIR
H.P.
PUNJAB
HISSAR
BIKANER
RAJASTHAN
MATHURA
UTTAR PRADESH
SIKKIM
BHUTAN
ASSAM
PATNA
BIHAR
EAST PAKISTAN
TRIPURA
MANIPUR
TROPIC OF CANCER
MADHYA PRADESH
KHOW
JABULPUR
W. BENGAL
CALCUTTA
NAGPUR
ORISSA
CUTTACK
BOMBAY
PAREL
HYDERABAD
MYSORE
ANDHRA PRADESH
TIRUPATHI
HEBBAL
VEPERY
KERALA
MADRAS
TRICHUR
REFERENCE
TEMPERATE HIMALAYAN REGION
DRY REGION
WET REGION
MEDIUM RAINFALL REGION
VETERINARY COLLEGES

GROUP VI *English and Indian Languages.*
Part A.
Part B.

To pass the Intermediate Examination in Agricultural Science, a candidate must obtain 20 per cent or more marks in each theoretical paper and 30 per cent or more marks in each practical paper of Groups I to VI and in the aggregate of each group 30 per cent in the practical papers.

A candidate must obtain in aggregate 60 per cent or more marks for First Division ; 45 per cent for Second Division and 35 per cent for Third Division.

A candidate is marked a star (*) if he secures 75 per cent or more marks in the aggregate. Candidates securing 80 per cent or more marks in a subject are declared to have passed with distinction in that subject.

The details of the examinations, both theoretical and practical, conducted by the Gauhati University for the Bachelor of Science Degree in Agriculture are as under:

Agronomy	Soil Management, Special crops, Farm Management
Agricultural Botany	Plant Physiology, Genetics, Crop-Breeding, Botany of Crop plants
Agricultural Chemistry	Soil Science, Physiological & Plant Chemistry

The other subjects are Dairy Farming and Dairying, Entomology, Plant Pathology, Bacteriology, Agricultural Engineering, Horticulture, Statistics, Agricultural Economics.

A candidate must pass in all the subjects obtaining 30 per cent or more marks in the theoretical papers and 40 per cent or more marks in the practical to pass the B.Sc. Examination in Agriculture.

In order to get a First Class a candidate must obtain in the aggregate 60 per cent or more marks and 45 per cent for Second Class. Candidates obtaining 34 per cent or more marks but less than 45 per cent are declared to have passed the examination.

With effect from the examination of 1953, 100 marks have been alloted to Theory and 100 marks to Practical for the examination in Tea Course.

RANCHI AGRICULTURAL COLLEGE, RANCHI

In January 1955, a Regional Research Institute was established at Ranchi, and in the following August of the same year the Ranchi Agricultural College was started. It thus became the Second Agricultural College in the State of Bihar.

The College is situated about six miles north of Ranchi town and caters to a special agro-climatic sector and social system of Chota Nagpur region of the State. A large State farm with a dairy and poultry had existed at the site even before the College was set up there. The farm of 360 acres extent as well as the Regional Agricultural Research Institute are linked with the College, all being under the control of the Principal, who is also designated as the Regional Director of Agriculture.

The College consists of eight sections:

Agronomy including Animal Husbandry and Veterinary wings, Agricultural Extension including Agricultural Economics and Social Sciences wing, Agricultural Botany, Agricultural Chemistry, Agricultural Engineering, Entomology, Horticulture, and Plant Pathology.

The Regional Agricultural Research Institute consists of following specialists having their separate laboratories.

Crop Physiologist, Pulses Specialist, Assistant Cerealist, Assistant Rice Specialist, Assistant Entomologist, Assistant Plant Pathologist, Assistant Agricultural Engineer, Agrostologist, Fruit Specialist, Assistant Agronomist, Assistant Oilseeds Specialist.

The staff consists of five Professors, 12 Assistant Professors with one or two Demonstrators attached to each section.

The College has its own press.

ADMISSION

The number of candidates for admission to this College has been recently almost doubled, so that there are now 104 students in the first year.

COURSES OF STUDY AND EXAMINATIONS

Similar to the Bihar Agricultural College, Sabour.

BIHAR AGRICULTURAL COLLEGE, SABOUR (BHAGALPUR)

Bihar Agricultural College, Sabour was started as a school in 1907-1908 for training personnel in Agricultural Sciences to meet the requirement felt at that time. Gradually it developed into an Agricultural College, and the degree course was introduced only in 1945 with affiliation to the Patna University. Since 1952 the College has been affiliated to the Bihar University. In 1955 post-graduate training was started in five branches of Agricultural Science leading to the degree of M.Sc., in Agriculture, *viz.*, Agronomy, Horticulture, Entomology, Plant Pathology and Agricultural Extension.

The College is located five miles to the east of Bhagalpur on a site extending over about 600 acres. The Regional Research Institute is located on the same campus and it functions under the control of the Principal, who is also designated as the Regional Director of the Research Institute. The Research Sections located here are those dealing with Economic Botany, Horticulture, Agricultural Chemistry, Entomology, Plant Pathology, Agronomy, Agricultural Engineering and Extension. The college farm has dairy and poultry units, a workshop, botanical and horticultural gardens, besides the experimental areas of research sections. The senior teaching staff consists of eight Professors and 11 Assistant Professors, besides the Principal and Dean of the College.

ADMISSION

The number of candidates for admission is limited to 70 per year. The minimum qualification for admission is a pass in Inter Science with Physics, Chemistry and either Botany, Zoology or Biology or an equivalent Examination recognised by the Bihar University.

Apart from 277 undergraduates on the rolls, there were 68 candidates undergoing post-graduate training in this College during 1959.

COURSES OF STUDY AND EXAMINATIONS

The following are the details of the subjects to be studied in each of the three years and the examinations conducted annually by the Bihar University.

B.Sc. Agri. Junior (First year): Agronomy, Animal Husbandry, Agric. Chemistry, Botany, Zoology & Entomology and Engineering.

B.Sc. Agri. Previous (Second year): Agronomy, Agril. Chemistry, Botany, Bacteriology and Mycology, Zoology and Entomology, Agric. Economics, Agric. Engineering and Horticulture.

B.Sc. Agri. Final (Third year): Agronomy, Farm Management, Statistics and Accounts, Animal Husbandry, Plant Pathology, Agric. Economics, Horticulture, Veterinary Science and Rural Extension.

BANSILAL AMRITLAL COLLEGE OF AGRICULTURE, ANAND (GUJERAT)

The Bansilal Amritlal College of Agriculture, Anand was started in 1947. It owes its origin to an offer made by Late Sardar Vallabhai Patel and Shri K.M. Munshi on behalf of the Sheth Mansukhlal Chaganlal Trust and Sheth Mugalal Goenka Trust, of a total sum of Rs. 15 lakhs to the Government of Bombay to establish School of Animal Husbandry, Dairying and Agriculture and an Institute of Animal Genetics and Nutrition at Anand. Both these Institutes were established in 1940. In 1946 Sheth Amritlal Hargovindas of Ahmedabad offered a donation of Rs. 5 lakh to the Governing Body of the above Institute to establish an agricultural college on the same campus to perpetuate the memory of his son, after whom the present College is named.

During the past 12 years the Institute has been able to develop facilities for post-graduate study in Agronomy, Agricultural Botany, Agricultural Chemistry and Soil Science, Agricultural Economics, Agricultural Entomology, Animal Husbandry, Bacteriology, Dairy Science, Horticulture and Plant Pathology.

The Government of Bombay acquired a farm of over 850 acres and handed over to the Institute. Besides this, a 2,200-acre cattle farm at Chharodi in Ahmedabad District known as the North-Cote Cattle Farm with a Kankrej herd of 500 cattle and a 50 acre farm at Surat, owned by the Government were also transferred to the Institute.

Along with these facilities, a policy of providing advanced training to the staff members was adopted. There are at present 16 Ph.D. degree holders on the establishment and 16 more members are under training.

The organizational chart of this Institute of Agriculture comprises three branches—Research, Teaching and Extension, all having been gradually developed to a position of strength. Under research both Plant Sciences and Animal Sciences are receiving considerable attention in several departments. The undergraduate teaching is the responsibility of 11 Departments, while post-graduate education is of nine Departments. Diploma courses in Agriculture and in Home Science are also being offered in the Sheth M.C. School of Agriculture. The Extension Wing has a Gram Sevak Training Centre and runs certain short term refresher courses for service personnel and farmers.

COURSES OF STUDY & EXAMINATIONS

The subjects of studies and the examinations for each year of the degree course as prescribed by the University are furnished on next page:

Pre-University Examination (Preparatory course)	*First Year Science in Agriculture*	*Second year Science in Agriculture*	*Bachelor of Science in Agriiculture*
General Agriculture	Agronomy	Agronomy	Agronomy
Botany	Animal Science	Animal Science	Animal Science
Zoology	Plant Physiology	Genetics	Plamt Breeding
Chemistry	Agricultural Chemistry	Agricultural Chemistry	Plamt Pathology
Physics	Soils General	Biometry and Statistics	Agricultural Entomology
Mathematics	Bacteriology	Horticulture	Experimental Designs
Carpentry & Smithy	Physics	Agricultural Economics	Agricultural Engineering
Gujarati or Additional English	Mathematics	Agricultural Extension	Agricultural Ecology
Hindi	Elements of Economics		Agricultural Extension
English	English Hindi		
	Gujarati or Additional English		

The present strength of the College is as under:

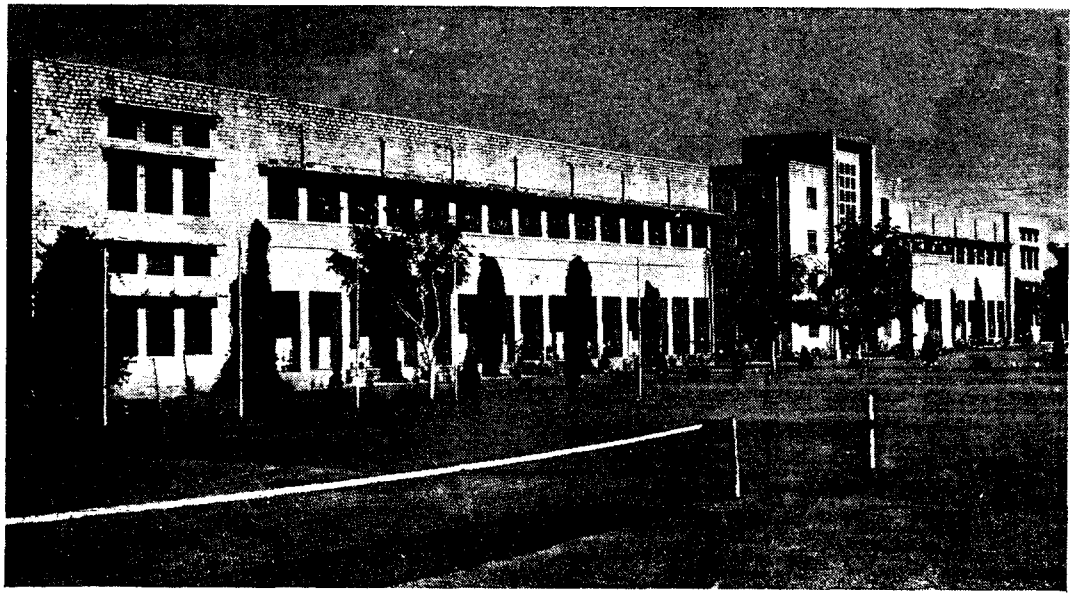
(i)	Pre-University Course in Agriculture	—	257
(ii)	First Year Science in Agriculture	—	158
(iii)	Second Year Science in Agriculture	—	102
(iv)	Bachelor of Science in Agriculture	—	72
(v)	Trainees for Post-graduate Degree	—	41

The candidates for admission to B.Sc. (Agri.) Course should have passed the Matriculation or equivalent examination.

AGRICULTURAL COLLEGE AND RESEARCH INSTITUTE, VELLAYANI (KERALA)

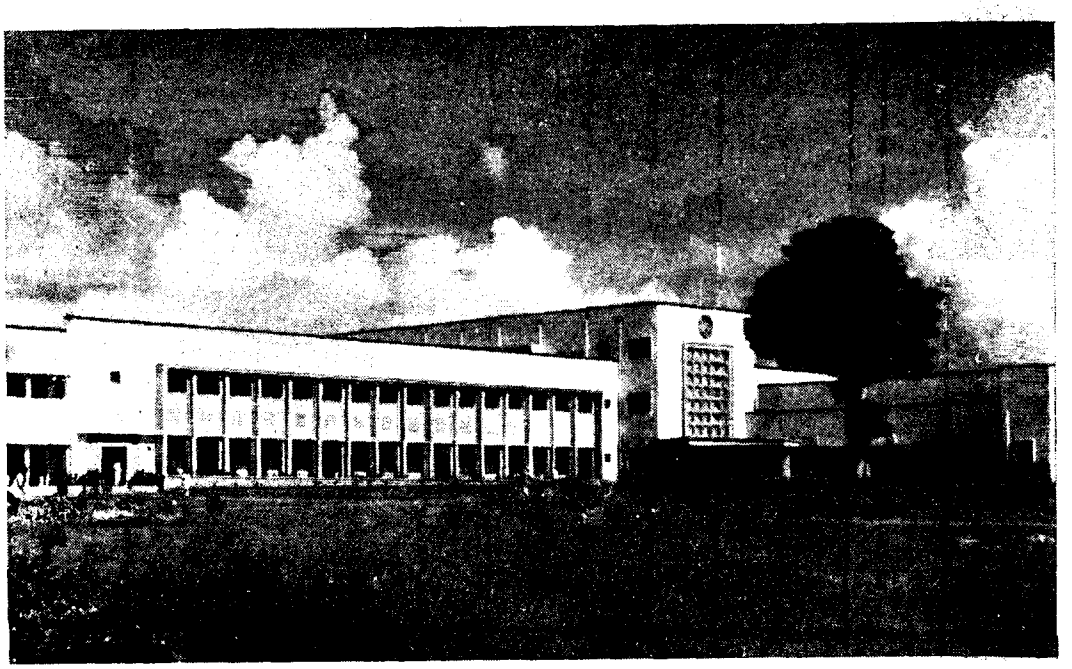
The Agricultural College and Research Institute, Vellayani, was started in 1955 and is located eight miles off Trivandrum. This is the only Agricultural College in Kerala State. It is affiliated to the University of Kerala, Trivandrum.

The College is housed in a building which is able to meet the requirements of the present B.Sc. (Agri.) course. The Pre-professional course in Agriculture is being conducted now in other Government Colleges owing to lack of accommodation. The farm attached to the College runs in 100 acres of garden land and 300 acres of wet land. A veterinary dispensary is being organized. The staff includes, besides the

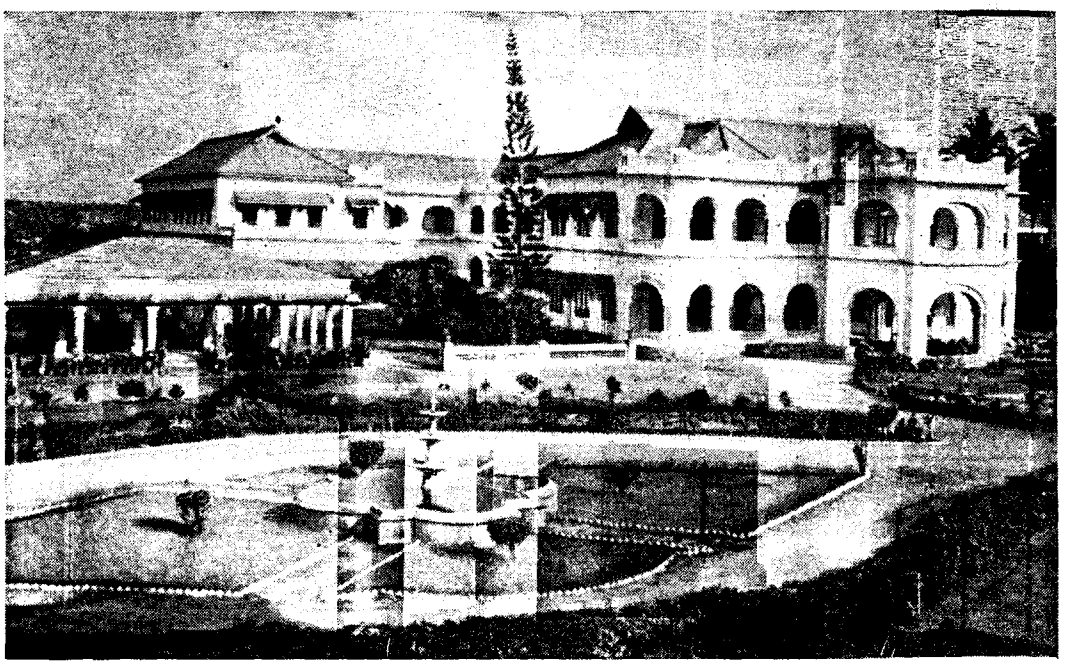


M.B. College of Agriculture, Gwalior

Government Agricultural College, Rewa



AGRICULTURAL COLLEGE, RANCHI



AGRICULTURAL COLLEGE AND RESEARCH INSTITUTE, VELLAYANI, KERALA

Principal, who is also designated as the Additional Director of Agriculture (Research), three Professors, seven Junior Professors, 14 Lecturers and two Teaching Assistants.

ADMISSION

The admission to the three-year course at the College is a pass in the Pre-professional examination of the University of Kerala or an equivalent examination. As in the neighbouring Universities of Madras, the students entering the Pre-professional course are required to have passed the Pre-University examination, to which the S. S.L.C. passed or Matriculated candidates enter. The number admitted to the three-year degree course has gradually increased from 50 in 1955-56 to 80 in 1959-60.

COURSE OF STUDY

The subjects taught in the Pre-professional course are : English, Physics, Chemistry and Biology.*

EXAMINATIONS

The scheme of examination for B.Sc. (Agri.) course of the University of Kerala is as given below:

First Year: Agronomy, Agric. Chemistry, Agric. Botany, Agric. Bacteriology, Animal Husbandry, Agric. Entomology and Agric. Engineering.

Second Year: Agronomy, Agric. Chemistry, Agric. Botany, Animal Husbandry, Agric. Entomology and Agric. Engineering.

Final Year: Agronomy, Agric. Economics, Agric. Extension, Agric. Statistics, Horticulture, Plant Pathology and Veterinary Science.

M.B. COLLEGE OF AGRICULTURE, GWALIOR

The M.B. College of Agriculture was started at Gwalior in 1950 to teach Agriculture up to Intemediate standard. The B.Sc. (Agri.) classes were started from July, 1952 with the recognition accorded by the Agra University. After the establishment of the Vikram University at Ujjain, the College was affiliated in 1957-58 to this new University, which also permitted the College to train candidates for M.Sc. (Agri.) Degree in three subjects *viz.*, Plant Pathology, Chemistry, and Entomology including Zoology from 1957.

There were 289 students on rolls in 1958. Hostel accommodation was available for only 100. The Principal of the College also functions as the Joint Director of Research, thus integrating the two allied fields of activity. A State Agricultural Experimental Farm is attached to this College. The strength of the staff consists of one Principal, four Professors, three Junior Professors, 22 Lecturers and five Demonstrators.

ADMISSION

A pass in the High School examination or an equivalent examination entitles a candidate to get admission to the First Year class of I.Sc. (Agri.), while for the Second

*This course is now being conducted in five different colleges of Arts and Science in Kerala State.

year those who have passed the Intermediate Examination with Physics, Chemistry and Biology are eligible along with those who have passed the First Year of I.Sc. (Agri.). For M.Sc. (Agri.), the minimum admission requirement is B.Sc. (Agri.) degree.

COURSES OF STUDY AND EXAMINATIONS

The examination for the degree of Bachelor of Science in Agriculture consists of two parts:

(i) Part I
(ii) Part II

A candidate who after passing the Intermediate examination in Agriculture of the Board of Secondary Education, Madhya Bharat, or any other examination in Agriculture recognized by the University as equivalent thereto, has attended a regular course of study in an affiliated or constituent College for one academic year, is eligible for appearing at the Part I Examination for the B.Sc. (Agri.) degree.

A candidate who has passed Part I-B.Sc. (Agri.) examination of any other University may also be admitted to Part II-B.Sc. (Agri.) examination, provided that he offers for his Part I examination, a course of an equivalent standard with almost identical syllabus as is required for Part I examination of this University and has attended a regular course of study for one academic year in an affiliated or constituent College of the University.

A candidate who, after passing the B.Sc. (Agri.) Part I examination of the University has completed a regular course of study for one academic year in an affiliated or constituent College, is eligible for appearing at the B.Sc. (Agri.) Part II examination.

There are thus two examinations, one at the end of each year, the first being the B.Sc. (Agri.) Part I examination and the second B.Sc. (Agri.) Part II examination. The marks of the two examinations are counted together for a position on the pass list of the Paper II examination. No division is assigned on the result of the Part I examination.

The scheme of examinations is given below:

B.Sc. (Agri.) Part I

Paper I.	Crops & Cropping Schemes
Paper II.	Botany, Internal Morphology, Crop Systematic & Physiology
Paper III.	Soils, Plant Chemistry, Fertilizers and Manures
Paper IV.	Agricultural Entomology
Paper V.	Plant Pathology including Bacteriology
Paper VI.	Animal Husbandry & Veterinary Science
Paper VII.	Agricultural Economics

B.Sc. (Agri.) Part II

Paper I.	Farm Management, Soil Management & Field Experimentation
Paper II.	Farm Machinery
Paper III.	Dairying
Paper IV.	Horticulture
Paper V.	Botany, Genetics & Plant Breeding
Paper VI.	Dairy Chemistry & Animal Nutrition
Paper VII.	Agricultural Extension

Candidates have the option to choose Hindi or English as medium for answering questions. The candidates choosing the Hindi medium can write technical terms in English or Hindi.

COLLEGE OF AGRICULTURE, JABALPUR

The College of Agriculture, Jabalpur, was inaugurated in July 1955 with three members of the teaching staff and 62 students. In 1959, classes started for the M.Sc. (Agri.) degree course.

An experimental farm of about 640 acres is attached to the College. Besides the Principal, the College staff comprises two Professors and 22 Lecturers. Hostel accommodation is available for 200 students. The College is affiliated to the University of Jabalpur. It is not obligatory that teaching staff should take up part-time research work.

ADMISSION

The minimum admission requirements for B.Sc. (Agri.) degree course of four years' duration is a pass in the Secondary School Certificate Examination (S.S.C.E.) with Science and Mathenatics, but candidates who had taken Zoology, Biology or Botany are preferred. For M.Sc. (Agri.) degree of two years' duration, a Second Class pass in B.Sc. (Agri.) is prescribed as the entrance qualification. The number of students admitted for the first year is about 64 per annum.

COURSES OF STUDY

The following subjects are taught for B.Sc. (Agri.) degree course: Agricultural Extension, Agronomy, Botany, Entomology, Mycology & Plant Pathology, Agricultural Engineering, Animal Husbandry & Dairying, Agricultural Economics, Veterinary Science, Agricultura Chemistry and Horticulture.

For M.Sc. (Agri.) the subjects taught are only Rural Sociology, Extension and Horticulture.

GOVERNMENT AGRICULTURAL COLLEGE, REWA (M.P.)

Started as an Agricultural Institute in 1952 to train young farmers of the former Vindhya Pradesh State, the Government College, Rewa, initiated during the first Five-Year Plan a two-year course leading to the award of Diploma in Agriculture. In 1954, the diploma course was shifted to Laxmipur-Panna of the former Vindhya Pradesh, and instead the Intermediate classes in Agriculture, which were being held till then in the Durbar College (now known as the T.R.S. College) at Rewa, were moved into this Institute to enable the starting of a regular degree course in Agriculture with affiliation of the college to the University of Agra. In 1958, the control of the College passed from the Education to the Agricultural Department. In the following year, a further step was taken to introduce post-graduate courses in Agronomy and Horticulture, and the College was affiliated to the University of Saugar while the Intermediate classes in Agriculture were conducted under the overall control of the Madhya Pradesh Board.

The College is situated about 1½ miles from the centre of Rewa City across Vikram

Bridge. The present roll of the College in all classes of the undergraduate course is 303, while for M.Sc., it is 27(13 for Horticulture and 14 for Agronomy). The staff consists of two Professors, and 19 Lecturers, for a total of 12 Departments in the College. The area of the farm of the College is about 85 acres.

ADMISSION

Candidates seeking admission in first year must have passed the High School or an equivalent examination in Second division of any Board or University recognised by the Board of Secondary Education, Gwalior. Preference is given to the candidates who have offered Science and Higher Mathematics or General Science and Agriculture. Non-Science students of better merits may be admitted on condition that they would make up the deficiency in Science, in the first one or two months to the satisfaction of the Head of the Institution. Students who have passed the Intermediate Examination with Physics, Chemistry and Biology as their subjects, may be admitted to the second year class, subject to the availability of seats in that class and their past record. Admissions to second, third and fourth year classes are given to students passing examination of this college only and students passing requisite examinations from other institutions may be admitted subject to the availability of the seats in the classes.

COURSES OF STUDY

The course extends over four academic years. The following are the details of the subjects covered.

I. *Intermediate Science in Agriculture*: Elements of Soil Science, Tillage, Plant food, Crop-culture, Vegetable Farming, Irrigation and Drainage, Farm Machinery, Animal husbandry, Veterinary Science and Dairy Farming, Botany, Zoology, Chemistry, Physics, Elementary Economics, Mathematics, English (Text and Unseen), and Translation and Composition.

II. *Bachelor of Science in Agriculture Part* I: Crops and Cropping Schemes, Internal morphology, Crop Systematics & Physiology, Soils, Plant Chemistry, Fertilizers and Manures, Agricultural Entomology, Plant Pathology and Bacteriology, Animal Husbandry and Veterinary Science and Agricultural Economics.

III. *Bachelor of Science in Agriculture Part* II: Farm Management, Farm Machinery, Dairying, Horticulture, Genetics and Plant Breeding, Dairy Chemistry and Animal Nutrition and Agricultural Extension.

EXAMINATIONS

The following examinations are conducted at the end of each academic year.

1. Intermediate Science in Agri. (First year) conducted by College authorities.
2. Intermediate Science in Agri. (Second year) conducted by Board of Secondary Education, Gwalior.
3. Bachelor of Science in Agriculture Part I conducted by Saugar University.
4. Bachelor of Science in Agriculture Part II conducted by Saugar University.

RAFI AHMED KIDWAI AGRICULTURAL INSTITUTE, SEHORE (M.P.)

Rafi Ahmed Kidwai Agricultural Institute, Sehore was started in 1952 for teaching Intermediate classes in Agriculture. In 1955, the third and fourth year classes of the agricultural undergraduate courses were added. A year later facilities

were made available for post-graduate courses leading to the degree of M.Sc. in Agronomy and Botany. Very recently, the candidates have also been admitted for M.Sc. courses in Entomology and Agricultural Economics. The College is affiliated to Vikram University.

The College is working at present largely in temporary buildings. A portion of the new buildings has been occupied. The farm attached to the College extends to over 250 acres. Hostel accommodation is available for over 100 students. The staff comprises five Professors, four Senior Lecturers, two Demonstrators and 20 Lecturers.

ADMISSION

The present strength of admission is 60 candidates per year. A pass in the High School Certificate Examination makes a candidate eligible for admission to this College, after entering which he has to spend four years for securing B.Sc. (Agri.) degree and a further period of two years for the M.Sc. (Agri.) degree.

COURSES OF STUDY AND EXAMINATIONS

The courses of study and examinations are identical to that followed in the Gwalior Agricultural College, which is also affiliated to Vikram University. No examination is held for the first year except by the College, while the Intermediate Examination Board conducts the examination at the end of the second year. The Part I of B.Sc. (Agri.) examination at the close of third year and the Part II examination of B.Sc. (Agri) at the end of the four-year period are held by the University. For M.Sc. (Agri) also an examination is held by the University both after the close of the first year and the second year. It is open to a candidate to sit for the examination in six papers or prefer to sit for five papers and supplement this with a thesis.

AGRICULTURAL COLLEGE, CHIDAMBARAM

A Department of Agriculture was established in the Annamalai University in 1951 and Agriculture began to be taught as one of the two main subjects for B.Sc. pass course, and subsequently as one of the two optional subjects in B.A. In 1955, a Post-graduate course for M.Sc. (Agri.) in Horticulture was also instituted. From 1957-58, Agriculture was included as an optional subject in the Intermediate class. In 1958, the regular three-year Degree course in Agriculture was established. Simultaneously, the Intermediate course was abolished and the Pre-professional course in Agriculture was instituted. At the same time in the Post-graduate course, Horticulture was replaced by Microbiology.

At present there are only 48 students in the Pre-professional course in Agriculture and 24 in the first year B.Sc. (Agri.) class, with six trainees for the M.Sc. (Agri.) in Horticulture as the last batch and five freshly enrolled in Microbiology. The staff comprises one Principal, 11 Lecturers and four Demonstrators.

ADMISSION

The conditions for admission to the B.Sc. (Agri) degree course are as follows. Candidates for the Degree of Bachelor of Science in Agriculture shall be

required to have passed the Pre-professional course in Agriculture of this University or an equivalent examination of any other recognized University accepted by the Syndicate as equivalent thereto.

or

to have passed the Intermediate Examination in Arts and Science of this University or any other recognized University, having offered as optional subjects, Chemistry and any two of the following subjects: Mathematics, Physics, Natural Science, Biology, Botany, Zoology, Geology and Agriculture.

COURSE OF STUDY AND EXAMINATIONS

The course is nearly the same as adopted for the Agricultural College, Coimbatore affiliated to the University of Madras. The particulars are furnished below.

SCHEME OF EXAMINATIONS

At the end of the First Year: Agronomy (Practical work in National Extension Block—Record and Report), Botany, Chemistry, Zoology and Agricultural Engineering (Civil).

At the end of the Second Year: Agronomy—Plant Husbandry, (Students' Plot Cultivation), Agricultural Botany, Agricultural Chemistry, Agricultural Zoology, Agricultural Engineering and Animal Hygiene.

At the end of the Final Year: Agricultural Economics and Co-operation, Animal Husbandry and Dairying, Farm Management and Agricultural Extension (Practical Farm Management—Record and Report, Practical Extension—Record and Report), Agricultural Botany I, Plant Breeding & Genetics, Agricultural Botany II (Part I: Cryptogams, Part II: Plant Pathology), Agricultural Chemistry and Horticulture.

AGRICULTURAL COLLEGE AND RESEARCH INSTITUTE, COIMBATORE

The Agricultural College and Research Institute, Coimbatore was started in 1868 at Saidapet near Madras, as a small farm for demonstration and testing of implements. The school was raised to the status of a College in 1878 offering a three-year course in Agriculture leading to a diploma and a short practical course in Agriculture leading to the award of a certificate. In 1890, the College passed from the Education Department to Agricultural Department and the Certificate course was abolished the same year. In 1907, the College was shifted to its present site at Coimbatore, and in 1913, the courses of studies were reorganized and two courses, one leading to the award of Diploma and another of a Certificate were revived though in a form different from the original. In 1920, the College was affiliated to the University of Madras and the first batch of B.Sc. Agricultural graduates came out in 1923.

The college is located in an area of about 650 acres within a distance of about three miles from Coimbatore City Railway Station. Equipped originally to admit only 20 candidates per year, the strength increased to 48 in 1926 with the opening of a new block of buildings. A further increase in strength to 96 occurred in 1944, followed ultimately by 162 in 1959, when a new block of buildings, known as Golden Jubilee Block was opened by the Prime Minister of India.

With the development of the College into a Regional Post-graduate Institute, one more block of buildings as well as a new Hostel Block were put up by 1959. The location of the College, Post-graduate Institute, and the Research Institute of the Agricultural Department marks out this Institute as an example of integration of agricultural research and education.

ADMISSION

Candidates for the Degree of Bachelor of Science in Agriculture are required to have passed the Intermediate Examination in Arts, Science or Pre-Professional Examination for Agriculture, having taken certain groups of subjects like Biology, Chemistry, Physics or Mathematics.

COURSE OF STUDY

The syllabus includes the study of the following subjects: Agronomy, Agricultural Botany, Agricultural Chemistry, Agricultural Zoology, Agricultural Engineering, Animal Hygiene and Horticulture.

A course of practical farm training for a period of about six months at an Agricultural Research Station or farm in the State approved by the University is also provided for.

EXAMINATIONS

For the Degree of B.Sc. (Agri.) there are three University examinations. No candidate is eligible for the degree unless he has completed the course of study prescribed and has passed all the three examinations.

The first examination is held at the end of the first year of the course of study in the following subjects: Agronomy, Botany, Chemistry, Zoology and Agricultural Engineering (Civil).

The second examination is held at the end of the second year of the course of study in the following subjects: Agronomy—Plant Husbandry, Agricultural Botany, Agricultural Chemistry, Agricultural Entomology, Agricultural Engineering (Mechanical) and Animal Hygiene.

The final examination is held at the end of the third year of the course of study and in the subjects given below: Agronomy I—Agricultural Economics including Co-operation and Propaganda, Agronomy II—Animal Husbandry and Farm Management, Agricultural Botany I—Plant Breeding and Genetics, Agricultural Botany II—Plant Pathology and Cryptogams, Agricultural Chemistry and Horticulture.

Marks Qualifying for a Pass: A candidate who obtains 40 per cent of the marks in any subject in the first, second and final examinations shall be declared to have passed in that subject, provided he obtains a minimum of 33 per cent each in theory and practical examination in the subject. In the case of Agronomy II—Animal Husbandry and Farm Management in the final year, a candidate is declared to have passed the practical if he secures a minimum of 33 per cent of the aggregate specified for Practical, Practical Farm Management—Record books and oral.

A candidate is declared to have passed the first, second and final examinations

if he obtains not less than 40 per cent of the marks in each of the subjects prescribed for each of the above examinations subject to the minimum prescribed for theory and practical examinations.

COLLEGE OF AGRICULTURE, AKOLA

The College of Agriculture, Akola, was started in 1955 and is affiliated to the Nagpur University.

The college building is to be constructed on a 250 acre site, which when fully developed would have a farm, a dairy, a garden, etc. No research facilities exist at present. The staff includes a Principal, one Professor and 17 Lecturers. Hostel facilities are available for only 45 students at present (1958).

ADMISSION

About 75 students are admitted to the first year class. A pass in the Secondary School Certificate Examination in at least Second Division with Mathematics and Science is necessary for admission to I.Sc. (Agri.) which extends over two years and is followed by the B.Sc. (Agri.) course for another period of two years.

COURSE AND EXAMINATIONS

The subjects taught are Agronomy, Engineering, Chemistry, Botany, Mycology, Entomology, Economics, Dairying, Horticulture and English. The Syllabus and the scheme of examinations are the same as for the Agricultural College at Nagpur.

COLLEGE OF AGRICULTURE, NAGPUR

The Collge of Agriculture, Nagpur was started first in 1888 with provision for a 2-year course in Agriculture. Later in 1906 a 3-year diploma course was introduced. Ten years later the course was remodelled to a $3\frac{1}{2}$-year course leading to the award of Licentiate in Agriculture. In 1920, a further change was effected, whereby a certificate course of two years' duration for candidates who had passed the College Entrance Examination and a four year course leading to Diploma in Agriculture for those who had passed Matriculation were introduced. In 1925, the College was affiliated to Nagpur University and the Degree Course (B. Ag.) was started for the first time. In 1953, the B. Ag. was altered to B. Sc. (Agri.) and in 1957, the Pre-University (Agri.) course followed by 3 years' Degree course was instituted. By this time the College was also offering facilities for candidates to secure M.Sc. (Agri.) by publishing papers or thesis and Ph.D. in the Faculty of Agriculture by similar means. In 1958, however, affiliation to Nagpur University offered the candidates a chance to work regularly for the M.Sc. (Agri.) degree.

The College staff consists of a Principal, eight Professors and 35 Lecturers. The farm attached to the College extends over 249.80 acres, of which 62.96 acres are devoted for research and 29.63 acres for teaching purposes. The Regional Post-graduate Institute has been started here recently and some additional buildings for the hostel and for the post-graduate training are required.

ADMISSION

The minimum educational qualification ordinarily accepted for consideration

for admission is a Second Division in the Secondary School Certificate Examination of the Vidarbha or an examination recognised in accordance with the provisions of section 33 of the Nagpur University Act as equivalent thereto. Special preference is given to applications with direct agricultural connections. A candidate must in the Secondary School Certificate Examination offer any two of the following subjects: Mathematics, Physics-Chemistry, Agriculture, Botany-Zoology.

For admission to Part I of B.Sc. (Agri.) 3-year degree course, those who pass the Pre-University (Agri.) examination of the Nagpur University or an examination recognized as equivalent thereto are eligible. Alternatively, a pass in the Higher Secondary Certificate examination with agriculture group (General Agriculture, Horticulture and Botany, Agricultural Chemistry and Physics) of the Vidarbha Board of Secondary Education, Nagpur, or an equivalent examination recognized as an equivalent thereto, entitles the candidates to seek admission to Part I of the 3-year degree course.

The number of students on the roll has varied from 59 in 1950 to 213 in 1959.

COURSES OF STUDY

The preparation for the Pre-University examination in Science (Agri.) takes one year. This part of the course covers the elements of Agriculture, Geology and Climatology, the foundations of Agronomy, the technique of the cultivation of Field and Garden Crops, the Elements of General Botany, Inorganic Chemistry, Physics, English and Regional languages.

The first, second and third years are taken up entirely by the B. Sc. (Agri.) course. During this period, attention is devoted to Agricultural Economics, Farm Management, Farm and Cash Accounts, Advance studies in Agronomy, Horticulture, Animal Husbandry and Dairying, Field Surveying and Mathematics, Agricultural Engineering and Machinery, Agricultural Botany, Agricultural Chemistry, Plant Pathology and Entomology, Bacteriology, Zoology, Animal Anatomy and Veterinary Science and Agricultural Extension.

EXAMINATIONS

Bachelor of Science (*Agriculture*) : (1) Agriculture—Paper I—General Agriculture & Horticulture, Paper II—Farm Management, Farm Accounts and Elementary Cost Accounts, Paper III—Animal Husbandry & Dairying, Paper IV—Agricultural Economics, Paper V—Agricultural Machinery & Engineering, Thesis, Experimental Work, Practical Agriculture, Practical Dairy & Animal Husbandry, (Thesis submitted by the candidates for B.Sc. (Agri.), examination will be returned after a prescribed period to the Principal of the College of Agriculture for such use as he may propose to make of them. (2) Chemistry—Paper I, Paper II, Practical.

GOVERNMENT AGRICULTURAL COLLEGE, PARBHANI

The Government Agricultural College, Parbhani, was started in October, 1956 by the then Hyderabad Government. It was affiliated to Osmania University and had been conducting the B.Sc. (Agri.) course of three years after Inter Science. The control has since passed into the hands of Bombay State Government and now it is

affiliated to Marathwada University since October, 1958 and the 3-year course is now altered to a 4-year course after Matriculation.

The College had to function for the first few years in the Government Farm, Parbhani, pending the construction of new buildings. A farm of about 400 acres is attached to the College. Hostel accommodation is available for 50 students at present. No research sections are attached to the College. The staff comprises a Principal, 11 Lecturers and six Instructors.

ADMISSION

The B.Sc. (Agri.) degree course now extends over four years, and the prescribed qualification for admission to the course is a pass in S.S.C. examination conducted by the S.S.C. Examination Board of the Bombay State with English as one of the subjects or the H.S.C. (10th Standard) examination held by the S.S.C. Examination Board or any other examination recognised as equivalent to these two examinations.

COURSES OF STUDY AND EXAMINATIONS

At the end of each of the four years, a University examination is held. The subjects taught each year and the particulars of examinations held are furnished below.

First year—B.Sc. (Agriculture) Physics, Mathematics, Chemistry, Botany, Zoology, Social Studies, English, Hindi, Agronomy and Animal Husbandry.

Second year—B.Sc. (Agriculture) Agronomy, Animal Husbandry & Dairying, Agricultural Botany I, Agric. Chemistry I (Organic Chemistry of Plant & Anima Products), Agric. Engineering I, (Surveying, Farm Structure), Soils. (Agric. Geology & Elements of Soil Physics), English and Workshop.

Third year—B.Sc. (Agriculture) Agronomy, Animal Husbandry and Dairying, Agric. Botany II, Agric. Chemistry II, Agric. Engineering II, Agric. Entomology, and Agric. Extension I. (Rural Sociology, Elements or Extension).

Final year or fourth year—B.Sc. (Agriculture) Agronomy (including Clmatology), Statistics (including Biometry), Animal Husbandry & Dairying, Hrticulture, Plant Pathology (including Bacteriology) Agric. Economics and Agric. Extension.

COLLEGE OF AGRICULTURE, POONA

Among the notable results of the famine of 1877 in the Deccan was tle provision made for agricultural education. It is stated that the credit for the introduction of agricultural education in the Bombay State is due to Sir Richard Temple, Governor of the State from 1877-1880. The establishment of the Agricultural College at Poona is a direct result of his policy.

The College of Science, Poona, opened a branch for teaching Agiculture in 1879. In the following year, a farm of 72 acres was attached to the College to provide practical training to the students. It was in 1890 that the Bombay Univesity agreed to the proposal to institute a 3-year diploma course in Agriculture at the College of Science, Poona. This, however, did not find favour with the students, so that not a single candidate obtained the Diploma in Agriculture from the College of Science from 1897 to 1901. In 1899, the University instituted a regular course leading to the degree of Licentiate in Agriculture. In 1905, the Government decided to establish

a separate college of Agriculture on a site of 150 acres, though the imposing central building with its magnificent dome was completed only in 1911. The College of Agriculture was actually separated from the College of Science on 1st January, 1908, when the control was transferred from the Director of Public Instructions to the Director of Agriculture. In 1909, the Bombay University granted recognition to the College to train students for the degree course in Agriculture. In 1916, the University modified the regulations to enable the students to specialise in certain subjects and in the same year the Degree of Master of Agriculture was instituted.

A significant change was introduced in 1934, when the nomenclature of the degree awarded in the College was changed from B.Ag. to B.Sc. Simultaneously with this change the optional subjects were abolished.

A further change of a major character was introduced in 1950 when the earlier practice of admitting the students after Matriculation to the degree course was re-adopted with the difference that the course was extended from three to four years.

In accordance with the recommendations of the University Education Commission and the Secondary Education Commission, the University of Poona has approved a measure to upgrade the standard of admission to the College by adopting the three year integrated course of instruction in Agriculture. According to this only those who have passed the Higher Secondary Examination or the Pre-University Examination will be admitted to the Pre-professional Course in agriculture, on the completion of which they will pursue the three year integrated course in Agriculture for securing the B.Sc. (Agri.) degree.

The College celebrated its Golden Jubilee in 1958, a year after the Agricultural College at Coimbatore celebrated a similar event.

From its very inception, there has been close co-ordination between research and teaching at this College, although the research activities in Agriculture outside the College were not directly under the control of the Principal. The Central Virus Research Centre is located on the campus of the College, while in the vicinity there is the well-known National Chemical Laboratory. The college has well-equipped laboratories, farm, fruit orchards and nurseries and hostels, and provides necessary physical facilities to the students. The staff comprises one Principal, 11 Professors, 17 Lecturers or Assistant Professors, three Teaching Assistants and 26 Demonstrators.

ADMISSION

The present roll of the College in undergraduate class is 475, besides 55 under training for M.Sc. (Agri.) and four for Ph.D. The total number of graduates who have passed out of the College up to the end of 1959 is stated to be 2,691.

Candidates for the Degree of Bachelor of Science (Agri.) must have passed the Matriculation examination, or the S.S.C. examination or an examination held equivalent to it, and must pass three subsequent examinations, the Intermediate examination in Science (Agriculture), the Second examination in Science (Agriculture) and the examination for the Degree of Bachelor of Science (Agri.).

COURSES OF STUDY AND EXAMINATIONS

The particulars of courses of study and examinations are given on the next page.

Intermediate Examination in Science (Agriculture)

First year course: English, Agronomy and Animal Husbandry, Botany—I Chemistry—I, Mathematics & Biometry, Physics—I, Zoology and Carpentry and Smithy, (College Certificate).

Second Year Course: English, Agronomy, Animal Husbandry, Botany—II, Chemistry —II, Soils, General Bacteriology and Physics—II.

Second Examination in Science (Agriculture): Agronomy, Animal Husbandry, Agricultural Botany, Agricultural Chemistry, Elements of Economics, Plant Pathology and Agric. Entomology.

Examination for the Degree of B.Sc. (Agri.): Agronomy, Animal Husbandry, Dairying, Agricultural Engineering, Veterinary Science, Horticulture, Agricultural Economics and Essay writing and Public speaking (College Certificate).

COLLEGE OF AGRICULTURE, DHARWAR

The College of Agriculture, Dharwar, was started in 1947 at the Agricultural Farm, Dharwar. In 1948, it was shifted to its present site in Yettirgunda, three miles away from Dharwar.

The College has an impressive building providing accommodation for its ten departments entrusted with teaching duties. The present strength of students ranges from 75 in the Pre-professional year to 112 in the first year of the professional course. Twenty-five candidates are undergoing post-graduate training, of which one is for Ph.D. in Agricultural Botany, and the rest are working for M.Sc. in Plant Pathology, Horticulture and Agricultural Economics. Each of the ten departments is under the charge of a Professor assisted by 14 Lecturers and 11 Demonstrators.

ADMISSION

The Karnatak University to which this College is affiliated has sanctioned the introduction of Pre-professional course from June, 1959. The duration of the B.Sc. (Agri.) course continues to be four years inclusive of the Pre-professional course, after passing the Pre-University examination in Science of the Karnatak University, or an examination considered equivalent thereto. Students who have passed the Intermediate examination (B.Sc. Part I) of the Karnatak University are directly admitted to the first year Science class of the three year course.

COURSES OF STUDY AND EXAMINATIONS

A revised syllabus for the professional course has become necessary with the introduction of the Pre-professional course in the College. The first year of the course after the Pre-professional year is designated as First Year Science in Agriculture, F.Sc. (Agri.) and the subsequent years as S.Sc. (Agri.) and B.Sc. (Agri) respectively. There is a University examination for all the four years.

AGRICULTURAL COLLEGE, HEBBAL, BANGALORE

The Agricultural College, Hebbal, is located on the Bangalore-Bellary road about five miles north of Bangalore city. It was founded in 1946 and is affiliated to the University of Mysore and is administered by the Mysore Department of

Agriculture. It has arrangements for 96 admissions per year. From 1958-59, the erstwhile three-year degree course was changed to a four year integrated degree course.

The College has a farm which extends over 186 acres providing a training ground for the students and field space for experiments for the staff to conduct. The teaching staff is divided into 10 divisions having four Professors, nine Assistant Professors and 27 Lecturers.

ADMISSION

The minimum qualification required for admission to this course is a pass in the Pre-University Examination of the University of Mysore with any one of the following groups as subjects for optional study:

1. Chemistry, Botany, Zoology.
2. Physics, Chemistry, Biology.

COURSE OF STUDY

The subjects mentioned below are taught and examined at the end of each year:

I Year: English, Chemistry, Zoology, Statistics and Botany.

II Year: Agronomy, Agricultural Chemistry, Animal Hygiene, Agricultura Engineering (Civil), Agricultural Botany and Economic Zoology and General Entomology.

III Year: Agronomy, Agricultural Chemistry, Entomology, Horticulture, Agricultural Botany, Agricultural Engineering (Mechanical) and Animal Husbandry.

IV Year: Part A—Agronomy, Agricultural Botany, Agricultural Chemistry, Plant Pathology and Agricultural Economics.

Part B—Agricultural Extension. (Under this subject a stay of two months in villages for practical training is compulsory).

EXAMINATIONS

A University examination is held at the end of each of the four years. The maximum marks for each subject is 100 for theory and 50 for practicals and the minimum 40 per cent in the aggregate, are the marks required for a pass.

UTKAL KRISHI MAHAVIDYALAYA, BHUBANESWAR

The Utkal Krishi Mahavidyalya, also known as the College of Agriculture, Bhubaneswar, was established in 1954-55 in a temporary building with 32 students in the First Year class. It is affiliated to the Utkal University.

Permanent buildings for the College became available for occupation in July 1957. The farm attached to the College extends over about 300 acres. The staff consists of the Principal, three Readers, two Associate Lecturers and 20 Lecturers.

ADMISSION

The following are the qualifications prescribed for admission:

(*a*) Candidates for admission in the First Year class are required to have

passed at least the Matriculation Examination conducted by Secondary Board of Education, Orissa or from some other University recognized by the Utkal University. Candidates having passed any other examination recognized by the Academic Council of the Utkal University as equivalent to Matriculation examination or higher than Matriculation examination are also eligible for admission.

(*b*) Candidates for admission to the Second Year class are required to have passed the Intermediate examination in Science with Mathematics, Physics, Chemistry and Biology or Physics, Chemistry and Biology or Physics, Chemistry and Agriculture or Physics, Chemistry, Mathematics and Agriculture, from the Utkal University or from some other University recognized by the Utkal University.

(*c*) Other things being equal, candidates with agricultural bias will be given preference in selection.

The College was started with 32 students but the strength rose to 54 in 1958 for admission to the First Year class.

COURSES OF STUDY AND EXAMINATIONS

The subjects taught and the nature of examinations conducted in the different years are shown in the following statement:

		Subjects
I.Sc. (Agri.) Examination		
Group I	Paper I	English
Group 2A		
(Theory)	Paper I	Agronomy
	Paper II	Agronomy
	Paper III	Horticulture
	Paper IV	Animal Husbandry
	Paper V	Veterinary Science
Group 2B		
(Practical)	Paper I	Agronomy
	Paper II	Horticulture
	Paper III	Animal Husbandry
	Paper IV	Veterinary Science
Group 3A		
(Theory)	Paper I	Mathematics
	Paper II	Physics
	Paper III	Agricultural Engineering
Group 3B		
(Practical)	Paper I	Physics
	Paper II	Agricultural Engineering
Group 4A		
(Theory)	Paper I	Chemistry
	Paper II	Chemistry
Group 4B		
(Practical)	Paper I	Chemistry

Group 5A		
(Theory)	Paper I	Botany
	Paper II	Botany
	Paper III	Zoology
Group 5B		
(Practical)	Paper I	Botany
	Paper II	Zoology

First B.Sc. (Agri.) Examination

Group I—Agriculture		
(A) Theory	Paper I	Agronomy
	Paper II	Horticulture
	Paper III	Agricultural Engineering
	Paper IV	Agricultural Economics
(B) Practicals	Paper I	Agronomy
	Paper II	Horticulture
	Paper III	Agricultural Engineering
Group II—Botany		
(A) Theory	Paper I	Agricultural Botany
(B) Practical	Paper I	Agricultural Botany
Group III—Chemistry		
(A) Theory	Paper I	Agricultural Chemistry
(B) Practical	Paper I	Agricultural Chemistry
Group IV—Plant Protection		
(A) Theory	Paper I	Entomology
	Paper II	Mycology & Plant Pathology
(B) Practical	Paper I	Entomology
	Paper II	Mycology & Plant Pathology

Final B.Sc. (Agri.) Examination

Group I—Agriculture		
(A) Theory	Paper I	Agronomy
	Paper II	Animal Husbandry and Dairying
	Paper III	Agricultural Economics
	Paper IV	Statistics and Field Experimentation
	Paper V	Extension
(B) Practical	Paper I	Agronomy
	Paper II	Animal Husbandry and Dairying
Group II—Botany		
(A) Theory	Paper I	Agricultural Botany
(B) Practical	Paper I	Agricultural Botany
Group III—Chemistry		
(A) Theory	Paper I	Agricultural Chemistry
(B) Practical	Paper I	Agricultural Chemistry

KHALSA COLLEGE, AMRITSAR

The Khalsa College, Amritsar is a private college receiving annual grant from the Punjab Government. The Agricultural Faculty was started at the College in 1923 up to F.Sc. (Agri.), and the B.Sc. (Agri.) course was introduced in 1931. The College is affiliated to the Punjab University.

A farm of 400 acres is attached to the Khalsa College besides a student farm of 60 acres. There are no research sections functioning in the agricultural wing of the Khalsa College, except for a scheme partly financed by the I.C.A.R. on reclamation of alkaline lands.

ADMISSION

The course leading to the degree of B.Sc. (Agri.) extends over four years and a pass in the Matriculation examination of a recognised university is the minimum prescribed entrance qualification. Annually, 90 students are admitted to the first year class but recently the number has been increased.

COURSES OF STUDY & EXAMINATIONS

These are on the same lines as outlined under the Govt. Agricultural College, Ludhiana.

GOVERNMENT AGRICULTURAL COLLEGE AND RESEARCH INSTITUTE, LUDHIANA

The Government Agricultural College and Research Institute, Ludhiana was started in 1947 and offers facilities for training upto B.Sc. (Agri.) and M.Sc. (Agri.) degrees. The College has provision for training of about 100 undergraduate students and a few post-graduate courses.

A farm of 54 acres is attached to the College at present, but more land is being acquired. There is a dairy with about 70 heads of animals and a poultry with about 180 birds. This College is affiliated to the Punjab University, Chandigarh. It has 27 laboratories and five lecture theatres. The College has been offering post-graduate training in several subjects such as Crop Husbandry, Plant Breeding, Agricultural Chemistry, Biochemistry, Entomology, Plant Pathology, Agricultural Economics and Horticulture. A scheme to develop this College into one of the regional post-graduate institutions in Agriculture has been sanctioned. The Principal is also the Joint Director for Research and is assisted at the College by a staff comprising five Professors, 13 Assistant Professors and 17 Lecturers.

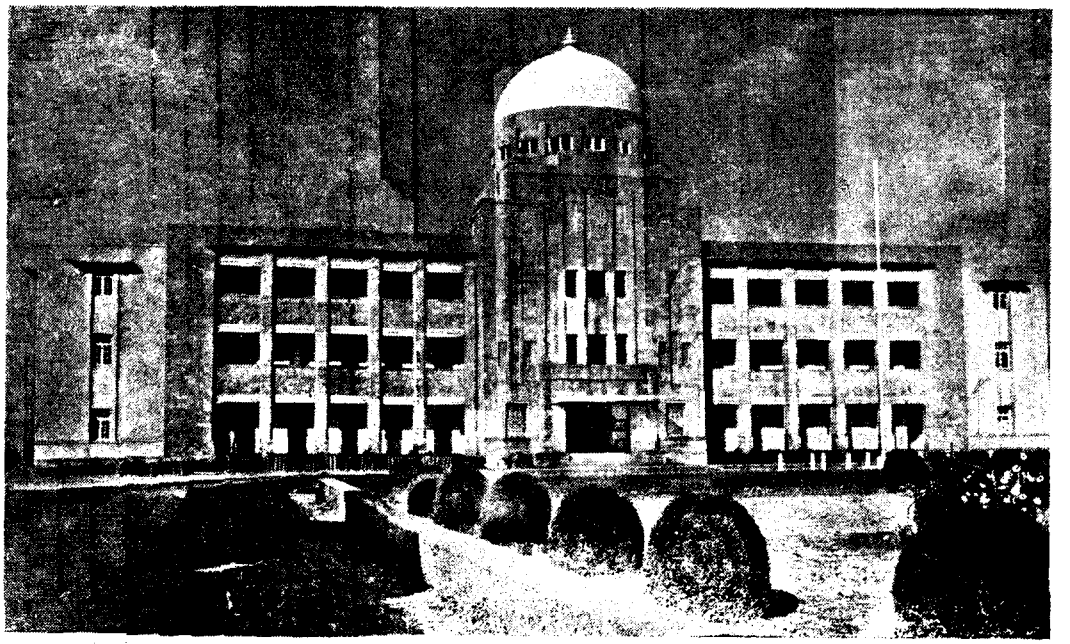
ADMISSION

The College offers a four-year course, to which the prescribed qualifications for admission are a pass in Matriculation examination of the Punjab University or its equivalent examination of other Universities. The strength of the first year class has gradually increased from 74 in 1954-55 to 103 in 1959-60.

COURSES OF STUDY AND EXAMINATIONS

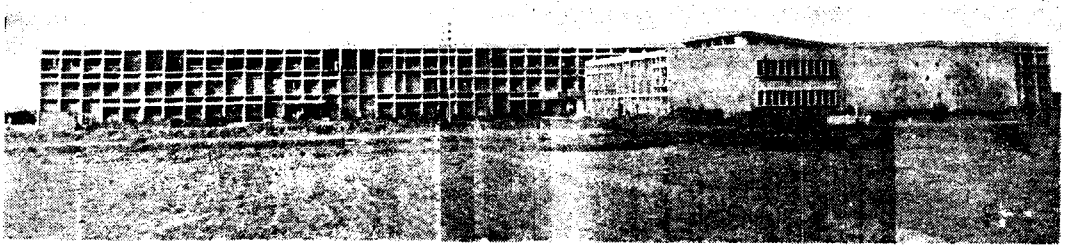
The subjects for which University examinations are held are given below:

F.Sc. (Agri.) I Year: Mathematics with Land Surveyng, Physics.

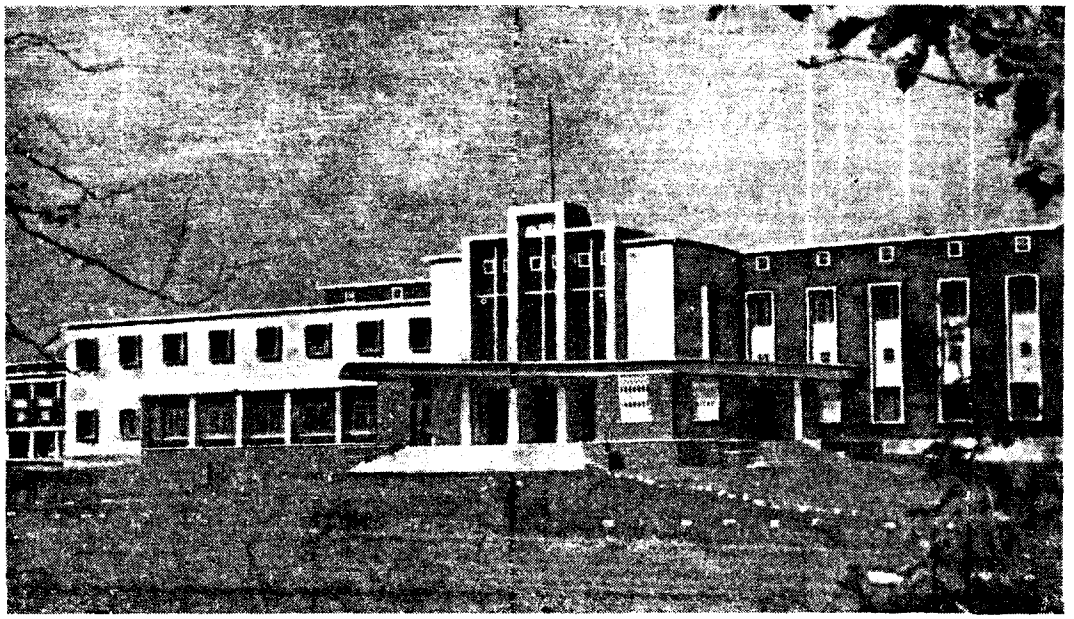


College of Agriculture, Dharwar

★



The main block of Government Agricultural College and Research Institute Buildings, Ludhiana



UTKAL KRISHI MAHAVIDYALAYA, BHUBANESWAR

S. K. N. GOVERNMENT COLLEGE OF AGRICULTURE, JOBNER

F.Sc. (Agri.) II Year: Agriculture, Chemistry, Botany, Zoology.

B.Sc. (Agri.) Part I: Dairying, Chemistry (Principal), Zoology and Entomology (Principal), Botany (Principal), Chemistry (Subsidiary), Botany (Subsidiary), English.

B.Sc. (Agri.) Part II: Agriculture, Agric. Economics, Chemistry (Principal), Botany (Principal), Horticulture (Principal), Zoology—Entomology (Principal), Botany (Subsidiary), Zoology—Entomology (Subsidiary).

GOVERNMENT COLLEGE OF AGRICULTURE, JOBNER

The Government College, Jobner, was founded by private benefaction in 1947, as the first College of Agriculture in Rajasthan. It was taken over by the Rajasthan Government in 1955.

The College is affiliated to the University of Rajasthan and is situated six miles from Asalpur Railway Station of the Western Railway. The Entomological Research Laboratory of the Department of Agriculture, Rajasthan, is located on the campus of the College. The College functions through eight sections, excluding the Library. The staff consists of four Professors excluding the Principal, 12 Lecturers and seven Demonstrators.

ADMISSION

Only 40 candidates are admitted annually for Intermediate Agriculture Part I. The Part I and Part II of the I.Ag. which represent the first two-year classes of this College are under the regulations of the I.Ag. Board of Secondary Education, Rajasthan, and this Board conducts examination at the end of each of these two academic years.

Students who have passed High School or Multipurpose Higher Secondary Examination of the Board of Secondary Education, Rajasthan or its equivalent examination recognized by the Rajasthan Board of Secondary Education and students who have passed the Intermediate Science examination with Biology of University of Rajasthan or of any other University Board at par are eligible for admission to the I.Ag. Part I and Part II respectively.

Those who have passed the Senior Cambridge Examination shall be admitted to I.Ag. Part I.

The B.Sc. (Agri.) course is also given in two Parts—I & II with a University examination at the end of each academic year. Students who have passed I. Agri. Part II or its equivalent are eligible to take this course.

COURSES OF STUDY

The subjects taught in I.Ag & B.Sc. (Agri.) courses are as under.

I.Ag.	*B.Sc. (Agri.)*
Part I	*Part I*
Botany	Agronomy
Zoology	Agricultural Botany
Chemistry	Entomology
Physics	Agricultural Economics and Statistics

English

Part II
Crops
Soils and Climatology
Chemistry
Agricultural Engineering
Animal Husbandry
Mathematics
Economics
Social Studies

Agricultural Chemistry I
Genetics, Animal Breeding and Veterinary Science

Part II
Animal Husbandry and Dairying
Plant Pathology
Horticulture
Agricultural Chemistry II
Agricultural Engineering
Farm Management Extension

EXAMINATIONS

The Board and the University have allotted 10 per cent marks on the examinations and tests conducted by the College in each subject, theory and practical, separately. These marks are called 'Sessional Marks'. Every month such examinations are held in regular class hours. In the month of February, a mean is taken of their results and submitted as 'Sessional 'Marks'. Besides these four examinations, there is one terminal examination at near the end of the first term. Its marks are also added in the 'Sessional Marks'.

DAYANAND AGRICULTURAL COLLEGE, AJMER

The Dayanand Agricultural College, Ajmer, was founded in 1888 as a small *Pathsala*. It has since grown into one of the biggest colleges in the State providing facilities to over 3,000 pupils to receive education in a number of fields. In 1955, Agriculture was introduced in Intermediate classes for the examination conducted by the Board of Secondary Education, Rajasthan, Jaipur. During 1959, the first batch of 29 students was enrolled for B.Sc. (Agri.) course. The College is affiliated to the Rajasthan University for degree course.

The College has a farm of 100 acres with a separate dairy farm and poultry on 25 acres of land. There is also a horticultural farm of five acres. The present staff includes the Principal, who is also the Professor and Head of Agronomy Department, two other Professors, ten Lecturers and other teachers.

ADMISSION

The eligibility standards are the same as outlined for the Government College of Agriculture, Jobner.

COURSE OF STUDY AND EXAMINATIONS

These are as prescribed by the Rajasthan University and have been briefly mentioned under the Government College of Agriculture, Jobner.

RAJASTHAN COLLEGE OF AGRICULTURE, UDAIPUR

The Rajasthan College of Agriculture, Udaipur, was started in 1955 and is administered by the Department of Agriculture, Rajasthan.

There are seven departments connected with teaching, each under the charge

of a Professor who is assisted by 16 Lecturers and 10 Demonstrators. This year a decision has been taken to double the number of students in the first year, and consequently, the number admitted in the current year was 159 as against 80 in the preceding year. Additional staff, buildings and equipment have been sanctioned to cope with the increased responsibilities of the College.

ADMISSION

The College admits to the first year class, candidates who have passed the High School Examination, and those who have passed the Intermediate Examination with Biology and the Higher Secondary Examination with Agriculture for the second year class of the four-year course. The entrance requirements laid down for each of the four years are as given below:

I.Sc. Agri. Part I— The applicant must have passed the High School examination conducted by a Board or University recognized by the Board of Secondary Education, Rajasthan. Applicants who have passed the Higher Secondary examination (with optionals other than Agriculture) are also eligible for admission to this class.

I. Sc. Agri. Part II—Intermediate Science in Agriculture Part I or Intermediate in Science with Biology and Chemistry as optional subjects of the Board of Secondary Education, Rajasthan or its equivalent. Those who have passed the Higher Secondary examination with Agriculture are also eligible for admission to this class.

B.Sc. Agri. Part I— Intermediate Science in Agriculture Part II of the Board of Secondary Education, Rajasthan or an examination equivalent thereto recognised by the University of Rajasthan.

B.Sc. Agri. Part II—B.Sc. Agri. Part I of the University of Rajasthan.

COURSES OF STUDY & EXAMINATIONS

There are four academic years of study and at the end of each year an examination is held. The examinations for the first two years of the courses of study are conducted by the Board of Secondary Education, Rajasthan. For the latter two years of study, the College is affiliated to the University of Rajasthan for the award of B.Sc. Agri. degree and the examinations are conducted by that body. The subjects and scheme of examination in force at present, are as follows:

I. Sc. Agri. Part I— Botany, Zoology, Chemistry, Physics, English.

I. Sc. Agri. Part II— Crops, Animal Husbandry, Agricultural Engineering, Soils & Climatology, Economics, Chemistry II, Mathematics, and Social Studies.

B.Sc. Agri. Part I— Agronomy, Genetics, Animal Breeding & Veterinary Science, Economics & Statistics, Agricultural Botany, Entomology and Agricultural Chemistry.

B.Sc. Agri. Part II— Animal Husbandry and Dairying, Farm Management and

Extension, Horticulture, Agricultural Engineering, Plant Pathology and Agricultural Chemistry II.

BALWANT RAJPUT COLLEGE, AGRA

The Balwant Rajput College was established at Agra, in 1885, but recognition for the degree classes in Agriculture was obtained only in 1940. It is affiliated to Agra University.

The U.P. Govt. has been giving annually a maintenance grant to this College for the past many years. The college has an agricultural and horticultural farm of about 433 acres at Bichpuri and a dairy farm of 50 acres at Kandhari. A herd of 100 cattle is also maintained at Bichpuri. Facilities for post-graduate training in Botany, Zoology, Chemistry, Agronomy, Horticulture, Animal Husbandry and Dairying including Dairy Chemistry, Dairy Bacteriology and Dairy Technology are reported to be available. The College aims at developing an institution with integrated teaching, research and extension at Bichpuri, which is the new site of the institution. The present staff includes 4 Professors, 30 Assistant Professors and one part-time Lecturer, besides the Principal.

ADMISSION

The strength of the first year class was 41 in 1951 and 142 in 1956-57. During 1957-58, the enrolments for M.Sc. and Ph.D. were 38 and 10 respectively. For the first year class of Intermediate in Agriculture, a pass from the High School stage or equivalent examination has been prescribed by the U.P. Board, while for M.Sc. (Agri.), a pass in B.Sc. (Agri.) degree of the Agra University or its equivalent is necessary.

COURSES OF STUDY AND EXAMINATIONS

The particulars relating to course of study and the papers allotted to the subjects for University Examinations are furnished below for B.Sc. (Agri.) examination.

Part I (under revision by the University)

Paper	I.	Farm management, Field Plot Technique, Agricultural Engineering
Paper	II.	Animal Nutrition, Dairy & Plant Chemistry
Paper	III.	Agricultural Botany
Paper	IV.	Plant Pathology
Paper	V.	Agricultural Zoology and Parasitology, Veterinary Science
Practical	I.	Farm Management and Engineering
Practical	II.	Agricultural Botany
Practical	III.	Plant Pathology
Practical	IV.	Agricultural Zoology and Parasitology, Veterinary Science

Part II

Paper	I.	Crops and Soils
Paper	II.	Dairying and Animal Husbandry
Paper	III.	Agricultural Economics
Paper	IV.	Soils, Fertilizers and Manures
Paper	V.	Horticulture

Paper VI. Entomology
Practical I. Crop Culture
Practical II. Dairying and Animal Husbandry
Practical III. Agricultural Economics
Practical IV. Soils, Fertilizers and Manures
Practical V. Horticulture
Practical VI. Entomology

Note: There is special provision for instruction in Rice Production to students coming from the rice-producing areas such as Assam, Orissa etc.

ALLAHABAD AGRICULTURAL INSTITUTE, ALLAHABAD

The Allahabad Agricultural Institute was founded in 1910 at Allahabad and was sponsored co-operatively by a number of churches and missions. It is now controlled by a Board of Directors. It prepares students for the Intermediate in Agriculture Examination of the U.P. Board of High Schools and Intermediate Education and also trains candidates for the Degree course (B.Sc.) in Agriculture and in Agricultural Engineering of the Allahabad University. Students are also trained for the Indian Dairy Diploma Examination. Women students are prepared for the Intermediate in Science Examination with subjects Home Economics and Home Science of the U.P. Board of High School and Intermediate Education.

The Institute is situated to the west of the south-end of the Jumna bridge, about three and a half miles away from the Allahabad Railway Station (N.R.). The site extends over 600 acres, of which over 400 acres are under cultivation. The building off the institute was completed in 1954 and several others have been added since, for accomodating the Library, Administration, Biology, Agronomy, Horticulture sections, ettc. Hostels have been provided for boy and girl students separately. The staff includes ten Professors, nine Associate Professors, 18 Senior Lecturers and 19 Junior Lecturers for teaching in the degree courses of Agriculture and Agricultural Engineering and the diploma course in dairying.

ADMISSION

The number of students on the rolls in 1959 was 416 in the two courses of Agriculture and Agricultural Engineering. For B.Sc. (Agri.), or B.Sc. Agril. Engineering courses, candidates are required to pass Inter-Agriculture examination, while for B..Sc. Engineering course, candidates for admission should have passed the Board's High School examination or an examination which by regulation is declared equivalent thereto.

COURSES OF STUDY

The following courses are offered at this Institute:

Intermediate in Agriculture: This course which was started in 1925 is designed to prepare students for the degree course in Agriculture as well as to fit them to manage farms or to teach agriculture in lower schools.

B.Sc. in Agriculture: This course is designed to train the students for the various branches of Agriculture, such as Dairying, Care and Management of

Livestock, Horticulture, Agronomy, Agricultural Engineering, Entomology and Agricultural Economics and Farm Management and to prepare students for post-graduate work. This was started in 1932.

B.Sc. in Agricultural Engineering: This course is of three years' duration, with a University examination at the end of the first and third years.

The subjects of study are: (i) Advanced Shop Work Engineering, Drawn and Structural Design ; Mathematics, (ii) Materials of Construction and strength of Materials, Mechanics and Statistics, Agricultural Machinery, and Principles of Electrical Machinery ; Heat Engines, (iii) Farm Management, Soil and Water Conservation including Surveying, and Machine Design and Irrigation and Drainage.

Indian Dairy Diploma: This course prepares students to manage their own or other private dairies or to enter Government dairy service. At the close of the course, an examination is held for those students who have satisfactorily completed the course of instruction and the Indian Dairy Diploma is awarded by the Indian Dairy Research Institute to successful candidates. The course is of two years' duration.

The minimum educational qualification necessary for admission is Matriculation pass or its equivalent.

The following subjects are taught: Principles of Breeding and Feeding ; Sanitation, Hygiene and First Aid Treatment ; Production of clean, safe milk; Manufacture and sale of milk, butter, ice-cream, *dahi*, cream and *ghee* ; Management of the Creamery and Dairy Farm ; Cattle Yard Practice and Stock Judging ; Principles of Co-operative Dairying ; Dairy Chemistry ; Dairy Bacteriology, Dairy and Farm Engineering ; English, and Dairy Book-keeping and Records.

Intermediate in Science with Home Economics: This course, specially designed for women was started in 1943. It prepares them as teachers in Domestic Science, and as social workers, and gives them knowledge about a happy useful life, by employing a scientific approach to the problems of the family. The certificate is given by the Board of High School and Intermediate Board, U.P.

Educational requirement is same as that for Intermediate in Agriculture.

Home Economics Extension: This is a one-year course designed to train young women as Extension workers in Home Economics, so that they are familiar with rural needs and conditions. A diploma is given by the Institute on successful completion of the course.

As for educational requirement, preference is given to those who have passed the Intermediate examination with Home Economics or Home Science.

EXAMINATIONS

In order to encourage regular work, marks for class work are given twice a year, once in October for the period July to October, and again in February for the period November to February. These grades may be based on class recitation or a number of tests. Besides, at the end of each term there is a written (house) examination. Students absenting themselves from house examinations without leave are liable to be detained from promotions or appearing for the final examination.

JAT VEDIC COLLEGE, BARAUT

The Jat Vedic College, Baraut (Dist. Meerut), was founded in 1917 as a Primary School and was developed into a High School in 1919. It was raised to the status of an Intermediate College in 1940. The Agra University granted recognition to this College for teaching up to B.Sc. (Agri.) in 1949 and for B.Sc. in 1950. Since then it has also been awarding B.A. and M.A. degrees as well as training the candidates for M.Sc. (Agri.) in Agricultural Botany and Agricultural Economics.

The College campus has a rural touch, being away from the urban areas. It claims to be one of the few institutions enjoying recognition in three faculties, *viz.*, Arts, Science and Agriculture.

ADMISSION

The rate of admission has ranged from 26 in 1954-55 to 180 in 1959. The Department of Agriculture has an Economist as the Head, one Associate Professor and six Lecturers.

As in other Universities in Uttar Pradesh, only those who have passed the Intermediate examination is Agriculture are eligible for admission to the B.Sc. (Agri.) course. For admission to the Intermediate Agriculture class, a candidate must have passed the High School or equivalent examination with Agriculture or Science subjects or at least with Second Division in Arts subjects.

The course of study is more or less the same as prescribed for other agricultural colleges in Uttar Pradesh.

SRI DURGAJI DEGREE COLLEGE OF AGRICULTURE, CHANDESAR, AZAMGARH

Sri Durgaji Degree College of Agriculture was established in 1958, by a registered body, Sri Durga Vidyalaya. Among the other schools which this body is controlling is the Higher Secondary School, teaching up to Intermediate in Agriculture, which was started in 1946. This College is situated at Chandesar, about five miles from the town of Azamgarh, Uttar Pradesh. The College is affiliated to Gorakhpur University.

Having been started recently the hostel accommodation is only for 40 students though 91 students were on the roll in 1958-59 in the first year class. A dairy farm, a botanical garden, a horticultural garden and orchard, and a workshop for training in Agricultural Engineering are yet to be added. The present staff of the college consists of a Principal, one Lecturer of Agricultural Economics who also functions as the Head of the Department of Agriculture, and five other Lecturers.

ADMISSION

The minimum requirement for admission to the College is a pass in the Intermediate in Agriculture of the U.P. Board or any other examination in Agriculture recognised by the University.

COURSES OF STUDY AND EXAMINATIONS

The subjects taught and the examination papers prescribed are given below:

Part I, Paper I: Crops and Cropping Scheme. Paper II: Internal Morphology, Crop Systematics and Physiology. Paper III: Soils, Plant Chemistry,

Fertilizers and Manures. Paper IV: Agricultural Entomology. Paper V: Plant Pathology including Bacteriology. Paper VI: Animal Husbandry and Veterinary Science. Paper VII: Agric. Economics.

Part II, Paper I: Farm Management, Soil Management and Field Experimentation. Paper II: Farm Machinery. Paper III: Dairying. Paper IV: Horticulture. Paper V: Genetics and Plant Breeding. Paper VI: Dairy Chemistry and Animal Nutrition. Paper VII: Agricultural Extension.

GOVERNMENT AGRICULTURAL COLLEGE, KANPUR

Started as a small school in 1893, mainly for the training of Junior Revenue Officers, this Institution was raised to the status of a College in 1906, converting at the same time the prevalent two-year course into a three-year diploma course in Agriculture. Later, the course was re-organized and divided into a vernacular certificate course for a two-year period and a diploma course extending to four years. In 1925, the College was affiliated to the Board of High School and Intermediate Education, U.P., for the Intermediate Examination in Agriculture. This was followed in 1930, by the affiliation to the Agra University for the B.Sc. (Agri.) degree and in 1943 for the M.Sc. (Agri.) degree. In 1948, facilities were also made available for Ph.D. degree. The vernacular certificate course was discontinued with the affiliation of the College to the University.

There are six teaching sections, besides the Library Section in this College. Separately, there are five research sections of the Agricultural Department also functioning at the College, though their work is not integrated at the college level. The teaching staff consists of five Professors, 15 Assistant Professors, 18 Lecturers and 18 Teaching Assistants. The existing building is an imposing structure constructed in 1911 and houses the research sections also.

ADMISSION

The present strength of this college is 456 in under-graduate classes and 177 in post-graduate courses.

The qualifications for admission, which apply more or less to all colleges in U.P. and fully applicable to all colleges affiliated to Agra University are as given below:

(i) To the I. Ag. course, a pass in the High School Examination or an examination recognised as equivalent thereto by the Board of High School and Intermediate Education, Uttar Pradesh, with either Physics and Chemistry, or General Science, or Agriculture as optional subject or with the diploma examination from the Government Agriculture Schools in Uttar Pradesh ;

(ii) To the B.Sc. (Agri.) course, a pass in the Intermediate examination in Agriculture of the Board of High School and Intermediate Education, Uttar Pradesh, or any other examination in Agriculture recognised by the Agra University as equivalent thereto ;

(iii) To the M.Sc. (Agri.) course, the B.Sc. (Agri.) degree of the Agra University or an equivalent degree of other Universities recognised by the Agra University for the purpose ; and

(iv) To the Ph.D. course, the M.Sc. (Agri.) degree of the Agra University or an equivalent degree of other Universities recognized by the Agra University for the purpose.

COURSES AND EXAMINATIONS

The detailed courses of study for the I. Ag., B.Sc. (Agri.) and M.Sc. (Agri.), and the examinations are according to the syllabus of the Board of High School and Intermediate Education, Uttar Pradesh and the Agra University, respectively.

AMAR SINGH JAT COLLEGE, LAKHAOTI, BULANDSHAHR

Amar Singh Jat College was founded in 1910, at Lakhaoti and was affiliated to Agra University in 1941. The college is now managed by the District Magistrate, Bulandshahr, as the official Administrator.

The College imparts education both in Arts and Agriculture up to the degree standard. The U.P. Government has been giving grants to the College for many years. Research is not obligatory to the teaching staff. The staff includes the Principal, five Heads of Sections, 15 Lecturers, and two Demonstrators. The College farm is about 60 acres in area.

The particulars relating to admission, courses of study and examination are similar to those of other colleges affiliated to Agra University.

COLLEGE OF AGRICULTURE, VARANASI

The Banaras Hindu University established an Agricultural Research Institute in 1931, with facilities for post-graduate work leading to the degree of M.Sc. and D.Sc. In 1945, the Institute was redesignated as College of Agriculture, and facilities were provided for under-graduate education in Agriculture. At the same time, the University continued to admit candidates for post-graduate courses. Thus in 1959-60 there were 198 persons on the rolls studying for B.Sc. (Agri.) in the three-year course, and 60 persons studying for M.Sc. (Agri.) in the two-year course in Agronomy, Agricultural Economics, Plant Physiology, and Plant Pathology. Facilities are also made available to those who desire to pursue research for Ph. D.

The staff consists of one Professor, three Readers, 17 Lecturers and four Instructors.

ADMISSION

Sixty to seventy-five students are admitted annually. The minimum qualification for admission to first year class is a pass in Intermediate in Science. Candidates who have passed the I.Sc. (Agri.) examination (except from Nagpur) are also eligible for admission to the second year B.Sc. (Agri.) degree course of this University. The candidate is required to have obtained 45 per cent marks in the aggregate.

COURSES OF STUDY & EXAMINATIONS

More or less the same as for other Universities in U.P.

BIRLA COLLEGE OF AGRICULTURE, HARINGHATTA, NADIA

The Birla College of Agriculture, formerly known as the West Bengal State

College of Agriculture, has been recently located at Haringhatta in the district of Nadia.

The students' hostels comprising 17 houses, are at present located in Kalyani. It is compulsory that all students live in the College hostel. Although the College has a farm of its own near the College building, the students are also taken to the Central Breeding and Research Farm, Haringhatta for practical training and theoretical instruction in certain subjects.

ADMISSION

Candidates who have passed either the Intermediate examination in Science of an Indian University or any other examination accepted as equivalent by the Calcutta University with Chemistry, Physics and Biology or Chemistry, Physics, Botany and Zoology as subjects, are eligible for admission to the first year class.

Students who have passed the Intermediate examination in Science (Agriculture) of an Indian University or some other examination considered equivalent by the Calcutta University may also be considered for direct admission to the second year class. The number of seats available in the second year class for such direct admission is very limited.

COURSES OF STUDIES

The College provides a course of study extending over a period of three years for the degree of Bachelor of Science (Agriculture). On passing the final examination, the students are required to take six months' practical training in an approved farm.

The three-year course is divided into (*i*) Preliminary, (*ii*) Part I and (*iii*) Part II classes and examinations are held each year in subjects as given below:

Ist Year: Elementary Mensuration & Biometry, Organic Chemistry, Botany, Zoology, Crop Husbandry, Animal Husbandry, Agricultural Economics & Rural Sociology and Rural Extension.

2nd Year: Agricultural Chemistry, Agricultural Botany, Agricultural Zoology, Entomology, Agricultural Engineering, Agronomy, Horticulture, Animal Husbandry and Dairying and Agricultural Economics.

3rd Year: Agricultural Chemistry, Plant & Dairy Chemistry, Agricultural Botany, Genetics & Plant Breeding, Mycology, Bacteriology & Plant Pathology, Agricultural Statistics, Farm Accounts and Farm Management, Agronomy, Horticulture, Animal Husbandry & Veterinary Science and Rural Economics & Agricultural Extension.

UNDER-GRADUATE COURSES IN AGRICULTURAL ENGINEERING

At present facilities are available for training in Agricultural Engineering only at two Institutes in the country: (i) Indian Institute of Technology, Kharagpur, and (ii) Allahabad Agricultural Institute. The former offers a course leading to the B. Tech. in Agri. Engg., while the latter offers the degree of B.Sc. in Agri. Engg. The B. Tech. course in Agricultural Engineering extends over a four-year period after a pass

Since the compilation of this book, a number of new Colleges have been established, bringing the total number to 50. Detailed information about all these is not readily available.

in Inter Science with Physics and Mathematics. The B.Sc. (Agri.) course, on the other hand, is of three-year duration following a pass in Inter Agriculture Examination of Uttar Pradesh. The Indian Institute of Technology, Kharagpur, has recently discontinued the practice of admitting candidates with pass in Inter Agriculture.

The particulars relating to the degree course in Agricultural Engineering of the Allahabad University are furnished under the Allahabad Agricultural Institute.

CHAPTER V

DAIRY EDUCATION

ALTHOUGH Animal Husbandry and Dairying were included in the curricula of all agricultural and veterinary colleges, the training received by the students was not intensive and was only of a general nature. To provide elaborate training and meet the demand for more trained persons in the field of Dairying, the Government of India instituted two courses in 1924, *i.e.*, (i) a two year course leading to the Indian Dairy Diploma, and (ii) a 15-month post-graduate course leading to the diploma of "Associate IDD." The former course was started in 1924 at the then Imperial Dairy Institute and is still continued at the Southern Regional Station of the National Dairy Research Institute, Bangalore, and at the Agricultural Institute, Allahabad.

The training under post-graduate course in Animal Husbandry and Dairying was imparted for three months each at the Cattle Breeding Farm, Karnal, and the I.A.R.I., Pusa, two months at the Central Creamery, Anand, and the remaining period at the Institute of Animal Husbandry and Dairying at Bangalore. In 1948, this was discontinued, when honorary research workers were admitted for conducting research for the degrees of M.Sc. or Ph.D. of Indian Universities.

Degree Course: In 1957, a B.Sc. (Dairying) course running over a $3\frac{1}{2}$-year period was instituted at the National Dairying Research Institute, Karnal. The Anand Agricultural Institute is also organizing a similar course.

DAIRY SCIENCE COLLEGE, KARNAL

This College was established in 1957, as a part of the National Dairying Research Institute. The Institute comprises seven Divisions, of which the Education and Training Wing is one. The Dairy Science College forms a part of that Wing. The College has access to the facilities available in the 1000-acre farm attached to the Institute with a herd of over 1,000 animals, its laboratories, Workshop, Dairy and Library. Residential accommodation is also provided for the students and the staff.

ADMISSION

The number of seats is restricted to about 20 each year, for the present. Out of them, 20 per cent are preserved for candidates from scheduled castes/tribes, if they fulfil the other qualifications. In case no candidates from this category are available, the vacancies are treated as unreserved. Candidates are eligible for admission to the B.Sc. (Dairying) course provided they have passed the Intermediate Science examination of any recognised University or Board with Mathematics, Physics and Chemistry, or have successfully completed the first year examination of any three year degree course with Mathematics, Physics and Chemistry, after passing the Higher Secondary School examination.*

* Amongst others, the following examinations are recognise as being equivalent to the Intermediate examination of an Indian University: The Intermediate Examination of the Board of Secondary Education, Madhya Bharat ; the Intermediate Examination of the Board of High School and Inter-

Candidates having passed the Inter-Science examination or its equivalent, in the Biology group (Chemistry, Physics, Biology), or Inter Science (Agriculture), are also eligible for admission provided they have passed the Mathematics examination of Inter Science standard of a University Board.

The College is a residential institution. For the present, there are no facilities for the accommodation of girl students and consequently, they cannot be admitted.

COURSES OF STUDY AND EXAMINATIONS

The subjects covered in the first, second and final examinations in Dairying are given below:

First Examination in Dairying: Cattle Management, Dairy Engineering I (including Physics), Dairy Farming, Dairy Microbiology I, Dairy Technology I, Mathematics, Dairy Chemistry I, Physical Chemistry, English and Hindi

Second Examination in Dairying: Dairy Accountancy I, Dairy Chemistry II, Dairy Economics & Dairy Development I, Dairy Engineering II, Dairy Microbiology II, and Dairy Technology

Final Examination in Dairying: Dairy Administration, Dairy Accountancy II, Dairy Chemistry III, Dairy Economics & Dairy Development II, Dairy Engineering III, Dairy Microbiology III, and Dairy Technology III

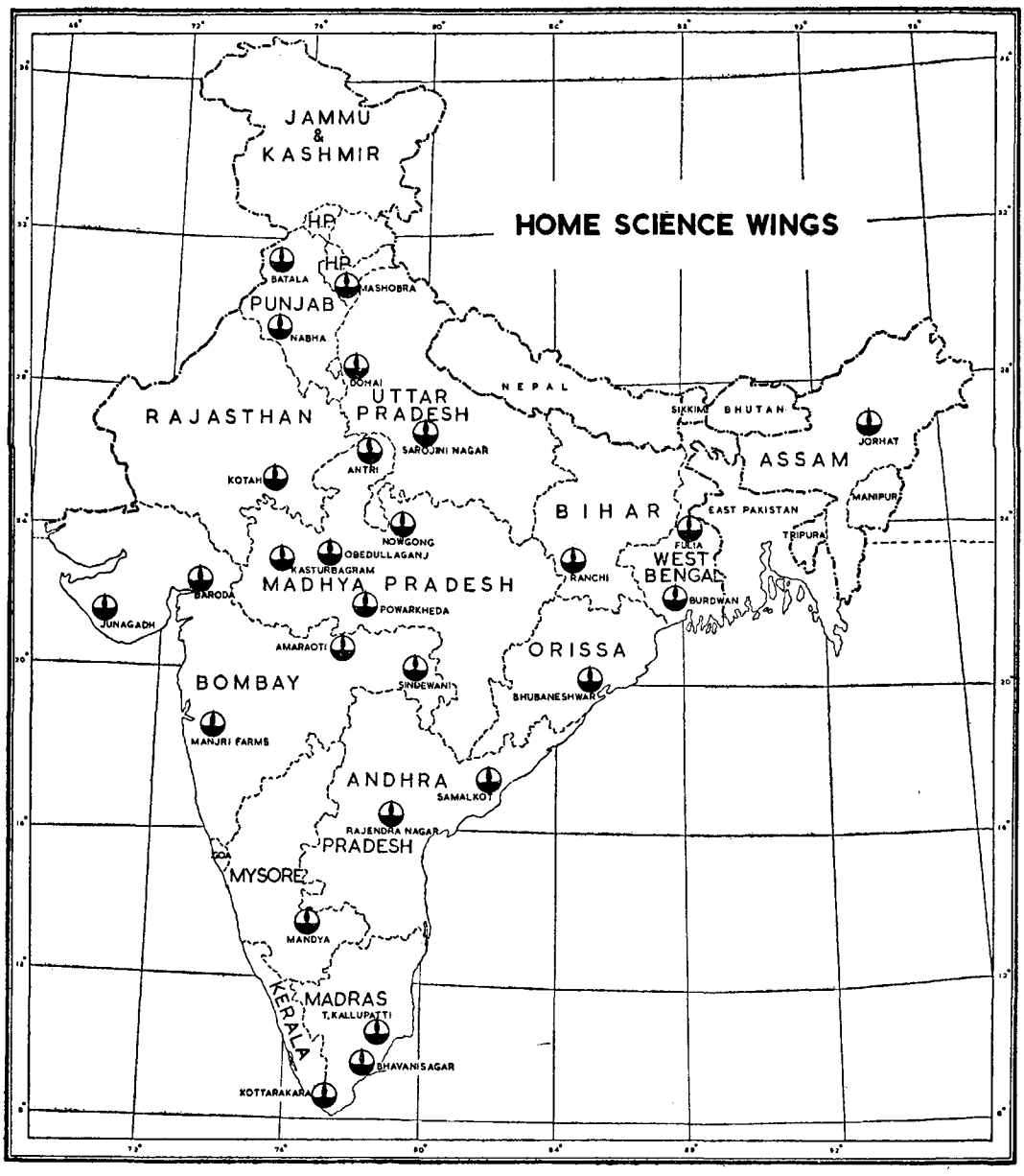
The minimum number of marks required to pass the examination are 50 per cent separately in (i) each written examination, (ii) each practical examination and (iii) oral examination and sessional work taken together. A candidate who fails to obtain this percentage in anyone of the parts is declared to have failed in the subject, as a whole.

A candidate who fails in one subject obtaining not less than 40 per cent of marks in that subject but obtaining 50 per cent of the aggregate of all the subjects, is permitted to appear for examination in that subject at the next examination, on payment of admission fees as prescribed for the whole examination. If successful at that examination, he is deemed to have passed the examination.

At the end of the third year course, every student is required to undergo a course of practical training in an approved dairy for six months to the satisfaction of the Principal of the College in which he has studied. This training is to be in addition to the three months training required to be undergone after each of the first and second year courses.

The Division of Dairy Education and Training at Karnal is responsible for organising and co-ordinating all teaching work in dairying sponsored by the Institute, *viz.*, (i) the two year diploma course given at the Southern Regional Station, (ii) the B.Sc. (Dairying) course of the Punjab University conducted at Karnal, (iii) regular short course at the Southern Regional Station and also (iv) the training of occasional State and private candidates who seek facilities for specialised training.

mediate Education, U.P., Allahabad; the Intermediate Examination of the Central Board of Secondary Education, Ajmer, and the Pre-Engineering Examination conducted by the Pre-Engineering Board, Delhi.


HOME SCIENCE WINGS
JAMMU & KASHMIR
HP
HP
BATALA
MASHOBRA
PUNJAB
NABHA
DOHAI
UTTAR PRADESH
RAJASTHAN
NEPAL
SIKKIM
BHUTAN
JORHAT
ASSAM
SAROJINI NAGAR
ANTRI
KOTAH
MANIPUR
BIHAR
EAST PAKISTAN
NOWGONG
TRIPURA
FULIA
OBEDULLAGANJ
KASTURBAGRAM
RANCHI
WEST BENGAL
MADHYA PRADESH
BARODA
BURDWAN
POWARKHEDA
JUNAGADH
AMARAOTI
ORISSA
BOMBAY
SINDEWANI
BHUBANESHWAR
MANJRI FARMS
ANDHRA
SAMALKOT
RAJENDRA NAGAR
PRADESH
GOA
MYSORE
MANDYA
KERALA
MADRAS
T. KALLUPATTI
BHAVANISAGAR
KOTTARAKARA

CHAPTER VI

HOME SCIENCE COLLEGES IN INDIA

Home Science may be interpreted as the application of many sciences and arts in an effort to make homes healthier and happier. It requires knowledge of physics, chemistry, biology, physiology, economics, bacteriology, sociology, psychology, and fine arts. With this basic knowledge, the students are trained in the science of food and nutrition, clothing, housing, health, family planning and child development, home beautification and human relationship. Home Science forms an integral part of the agriculture and community development programme. Its importance can hardly be ignored in a predominantly agricultural country like India, where women share most of the work on the farm.

Today, Home Science* or Home Economics, as it is called has found an important place in the curricula of our educational institutions from the nursery school stage to the University level. Several colleges and Universities offer Home Science subject both in the undergraduate and post-graduate programmes. Many new colleges have been started during the last five to six years for teaching Home Science. Some of these colleges are entirely devoted to the teaching of Home Science, such as the Lady Irwin College of Delhi University, the Faculty of Home Science of Baroda University, the Institute of Home Science of Mysore University, the Biharilal College of Home Science of Calcutta Univerity, the M.H. College of Home Science of Jabalpur University and the Shri Avinashilingam Home Science College of Madras University. Others are usually Arts and Science colleges, but have included Home Science in their programmes as an optional subject. (A list of the colleges teaching Home Science is given in Appendix VIII).

There is no uniform curriculum for Home Science in any of the College programmes. The contents and scope of the Home Science curriculum offered by these institutions vary from a few courses of two years' duration, to a variety of courses covering four-year or three-year programme leading to a Bachelor's Degree either in Arts or in Science. Home Science in some colleges is taught as one of the optional subjects, while in others, it is offered in place of a group of optional subjects at the Intermediate and Degree levels.

In general, the Home Science courses at the undergraduate level are built around some basic Sciences and Arts. The subjects such as Nutrition, Clothing, Home Management, Child Care and Development and Family Relationship form the core of the Home Science subjects.

In some Universities, the colleges of Home Science are attached to the Faculties of Sciences while in others to the Faculties of Arts. Only in the University of Baroda and Jabalpur, the colleges of Home Science enjoy the faculty status.

---

* Home Science is known by various names—Home Economics (In the USA and Canada), Home Science, Household Arts or Science, Domestic Science and Home-crafts. In order to avoid confusion in the nomenclature, the Home Science Association of India adopted the term 'Home Science' in 1952.

With the introduction of the Community Development Projects and the consequent need for a large number of trained women graduates, some Universities are now planning to include courses like ' Agriculture related to Home Science ', ' Rural Development',' Community Development ' at the undergraduate and post-graduate levels. The Osmania, the Punjab, Madras and Baroda Universities have already made some progress in this direction.

Only recently the Universities of Delhi, Baroda, Madras and Mysore have instituted post-graduate courses in Home Science leading to a Master's degree.

In addition to these college courses, Home Science is offered also in the Teachers Training Colleges at the Bachelor of Teaching level (B.T. or B.Ed.) and in the newly established rural institutes for higher education. Some colleges offer Home Science not as a University programme but as a Diploma programme.

The details of courses and training in Home Science offered in some of the colleges in the country are given in the following pages.

Colleges Devoted to Teaching Home Science only

THE LADY IRWIN COLLEGE, NEW DELHI

The Lady Irwin College for Women was established in New Delhi in 1932, by the All India Women's Conference with the object of providing adequate training and facilities for women to become (i) efficient teachers of Domestic Science in girls' institutions, (ii) capable wives and mothers and (iii) useful members of society.

It was the first Institution in our country to recognize the necessity for scientific and professional instruction in Home Science under Indian conditions to be offered to young women. The College started with provision to offer a two-year Diploma course in Home Science after Matriculation and a one-year Teacher's Training Diploma following the two-year Home Science Diploma and a two-year Needle-work Diploma.

The College was affiliated in 1950 to the University of Delhi to offer a full-fledged B.Sc. Degree course in Home Science. In 1952, the B. Ed. course was opened and in 1958, the M.Sc. course in Nutrition was started. It draws students not only from all over India, but from other Asian and African countries also.

The College has very well equipped Library and laboratories for Chemistry, Physics, Biology, Bacteriology, Cookery, Laundry, Needle-work and Nutrition.

There are 36 members on its staff. Some of them have had higher training in London, Australia and the U.S.A.

So far, the college has produced 412 graduates i.e., 285 in B.Sc. and 127 in B.Ed. The College has sent out 900 fully qualified teachers with the Diploma Training.

The present strength of the College in all classes is 500 including 18 in B.Ed. and 12 in M.Sc. Out of this, 375 are day students and 125 residents. There is a good hostel for the resident students where the average monthly expenditure for board and lodging is Rs. 50/- per month approximately. The College also offers some scholarships and freeships.

THE FACULTY OF HOME SCIENCE, M.S. UNIVERSITY OF BARODA

The Faculty of Home Science of M.S. University of Baroda was established on the 3rd July, 1950. The Government of Baroda realising the need for a type of

education suited more particularly to women created a Women's Educational Trust Fund for the purpose and offered to transfer the fund to the University on condition that a Home Science College for women be established utilising the fund. Smt. Hansabai Mehta, the then Vice-Chancellor accepted the offer and started the Faculty.

COURSES OFFERED

The Faculty offers a four-year course leading to B.Sc. Home Science degree and also a two-year post-graduate course leading to the M.Sc. degree in Child Development and Nutrition.

The Faculty is housed in a spacious building and includes the departments of Child Development and Family Relation, Economics of Household and Home Management, Food and Nutrition, Home Science Education and Extension and Clothing and Textiles.

There are excellent hostel facilities attached to the Faculty. A cafetaria, Nursery School, Home-Management House and Library are also provided.

Including the Dean of the College, there are 24 staff members.

SHRI AVINASHILINGAM HOME SCIENCE COLLEGE, COIMBATORE

Shri Avinashilingam Home Science College for Women, was started in 1957 under the auspices of the Shri Avinashilingam Education Trust, at Coimbatore.

The College is affiliated to the Madras University and offers Home Science for Pre-University, B.Sc. and M.Sc. (Home Management) programmes.

The objectives of the College are to train women for their roles as wives, mothers and citizens and as income earners on the basis of the highest traditions in Indian culture in the context of modern advancements of science.

The College follows the ideals preached and lived by Shri Ramakrishna, Swami Vivekananda, Sharda Devi and Mahatma Gandhi.

The College is located on the same campus as the Forest College and the State Agricultural College. It has a full-fledged Nursery School, a Multipurpose Home Science High School and a Mukhya Sevika Training Unit (under the auspices of the Community Development Ministry). A beautiful temple dedicated to Shri Ramakrishna situated in the centre, commands the whole campus.

The College has well equipped laboratories for Chemistry, Physics, Biology, Bacteriology, Physiology, Hygiene, Foods, Nutrition, Clothing, Laundry and Home Management.

An excellent hostel is attached to the College for the resident students.

The present strength of the College is 221. With the officiating Principal, there are 28 members of staff.

The College plans to introduce Agriculture and Home Science Extension as elective subjects from June, 1960.

THE M.H. COLLEGE OF HOME SCIENCE FOR WOMEN, JABALPUR

The M.H. College for Home Science, was established in 1954 and is affiliated to the University of Jabalpur. The courses offered by the College are the B.Sc. Home Science and Diploma in Arts and Crafts. The College has good facilities of laboratory and library. It is administered by the Government of Madhya Pradesh.

RAJASTHAN MAHILA VIDYALAYA

The Rajasthan Mahila Vidyalaya, was founded as an educational institution for women in 1918. It was affiliated to the University of Rajasthan in 1958, for offering the Home Science Degree course in B.A. with Home Science as a special subject.

The objectives of the college are to provide education for ideal Indian womanhood, help women and girls to manage and make homes beautiful and pleasant, and also help women to find avenues for financial assistance and economic independence where necessary.

This institution was started at a time when people in those parts did not know much about, and were even opposed to women's education. Overcoming severe criticisms and hardships, the institution has passed through many trying situations and has now received recognition for its spirit of service to the community.

Till 1945, the Vidyalaya had classes only up to VIII standard. In 1948, it was raised to high school standard and in 1950, up to the grade of Intermediate College, and given affiliation for B.A in 1954. In 1956, the Needle-work Diploma was added. In 1957, the Multipurpose High School was founded and two years later the B.Sc. Home Science classes were started. The Institute has now been converted into a Home Science College.

In addition to the Higher Secondary School section, there are primary and pre-primary sections. The College has laboratories for Physics, Chemistry, and Biology, Nutrition and Home Management.

INSTITUTE OF HOME SCIENCE MAHARANI'S COLLEGE FOR WOMEN, BANGALORE

Institute of Home Science, Maharani's College for Women was established in the year 1951, and is affiliated to the Mysore University. The Institution has very well equipped laboratories. A hostel is also attached to the college for the resident students. There are about 492 students enrolled for Home Science. Including the Principal, there are eleven members of staff. The college awards freeships and scholarships to deserving candidates.

ALLAHABAD AGRICULTURAL INSTITUTE, ALLAHABAD

The Allahabad Agricultural Institute was established in 1910 as an Associated College of the University of Allahabad. It offers B.Sc. Degree in Agriculture and Agricultural Engineering courses and Home Science of the Intermediate level of the Board of Intermediate Education U.P.

The objectives of the College are to foster such attitude regarding careers in Agriculture and Home Economics as to render worthy contribution to the educational and social life of rural India.

It is a co-educational institution, with a separate Home Science Department and a women's hostel attached to it.

The present student enrolment in the Home Science Department is 20, with four members of staff. This is the only institution in the country where Home Science is attached to an agricultural college.

Other Colleges Offering Home Science

ST. THERESA'S COLLEGE FOR WOMEN, KERALA

This College is one of the oldest colleges for women in Kerala State and was founded by Carmalite Sisters of St. Theresa's congregation, Ernakulum in 1925. It was affiliated to the University of Madras till 1957 and is now affiliated to the University of Kerala.

The objectives of the College are higher education of the women of India to enable them to play their part efficiently in the home, community and State. St. Theresa's High School and Nursery School are also on the same campus. The College has well equipped laboratories for various sciences. Home Science was started in 1958. It has a hostel and a library attached to it.

The present enrolment is approximately 1600. The College also offers a post-graduate Diploma in Social Service.

COLLEGE FOR WOMEN, TRIVANDRUM

This College was established in 1897. It is now affiliated to the Kerala University and offers the courses for the Pre-university and three year B.A. and B.Sc. degrees. It is administered by the Government of Kerala.

Home Science was started as an optional subject for the B.Sc. in 1958-59 and the first group of students will appear for the examination in 1961.

The objective of the College is to give higher education to the women mainly belonging to the State of Kerala and the purpose of training is well explained in the motto of the College ' For the Home and the Country.'

The College has laboratories for Physics, Chemistry and Zoology. The Home Science laboratories are under construction.

There is a big library attached to the College with over 30,000 books.

There is a hostel attached to the College. The present strength of the College is 1285 out of which 299 are residing in the hostel.

C. M. S. COLLEGE, KOTTAYAM, KERALA

This institution was founded as a School in 1816 and developed into an Intermediate College in 1892. Now it is affiliated to the Univerity of Kerala offering Pre-university course and B.Sc. courses in Physics, Chemistry, Zoology, Botany and Home Science, B.A. in History and English and M.A. course in English and Literature.

B.Sc. (Home Science) was introduced in June, 1959. It is a co-educational College with a Women's Hall attached to the College where Home Science is taught. The College has laboratories for all the sciences.

S. N. COLLEGE FOR WOMEN, QUILON, KERALA

This College is affiliated to the Kerala University and started the Home Science subject only in 1958. The College is meant for women only and offers P.U.C., B.A., and B.Sc. courses.

THE WOMEN'S CHRISTIAN COLLEGE, MADRAS

The Women's Christian College was established in 1915 in the city of Madras

and affiliated to the University of Madras. It offers B.A. and B.Sc. Degree courses. Along with the Queen Mary's College, this was the first college in India to offer Home Science as a B.Sc. course. This is the first college also to offer M.Sc. course in Institution Management.

The object of the College is to educate women with aesthetic sense so that they can keep their houses economically as well as artistically.

The College has a nursery school financed by the alumni of the College in the city. The College has its own hostel and has well equipped laboratories for all the sciences.

THE QUEEN MARY'S COLLEGE, MADRAS

The Queen Mary's College for Women was established in 1917 in the city of Madras by the State Government and is affiliated to the University of Madras. Along with Women's Christian College, this was the first to offer B.Sc. Home Science Degree course, which was started in 1942. It is an Arts and Science College offering a variety of subjects at the Pre-University, B.Sc., B.A. and post-graduate level. It has a fine library with 26,008 volumes and well equipped laboratories in Science and Home Science subjects. The College has an excellent hostel attached to it. The total enrolment is 827 among whom 180 are residents.

S. I. E. T. WOMEN'S COLLEGE, MADRAS

The S.I.E.T. College for Women was established in 1955 in the city of Madras under the auspices of the South Indian Education Trust. It is affiliated to the University of Madras and offers Pre-university, B.A. and B.Sc. courses including B.Sc. Home Science.

There are 750 students on roll among whom 300 are in the hostels attached to the College. The average monthly expenditure per student for board and lodging etc. is Rs. 90.

The College has all the necessary laboratories and a library.

The Ethiraj College for Women in Madras city and the Fatma college in Madurai, affiliated to the University of Madras also offer Home Science at the Pre-university level.

MOUNT CARMEL COLLEGE, BANGALORE

Mt. Carmel College for women was established in June 1948, and is affiliated to the University of Mysore. It offers the Pre-university, B.A. and B.Sc. (including Home Science) courses.

The College has got a well equipped laboratory and a library with more than 10,000 volumes. Home Science was started in 1958 and is receiving special attention. The present enrolment is 660 with accommodation for 84 resident students.

MAHARANI'S COLLEGE FOR WOMEN, MYSORE CITY

This College was started in 1919 and is affiliated to the University of Mysore. The College offers Pre-university, B.A. and B.Sc. degree courses in Arts and Sciences. The objective of the College is to train lady students in Arts and Sciences up to the degree level. The present strength is nearly 1,000. Home Science was introduced at the B.A. degree level in 1957-58. There are 78 students who have offered Home

Science in the Pre-University and B.A. classes. The first batch will appear for B.A. examination in 1962. The College proposes to build a separate block for Home Science.

GOVERNMENT COLLEGE FOR WOMEN, PATIALA

This College was established in 1950, and is affiliated to the Punjab University offering courses for F.A. and B.A. with Home Science as an elective subject.

The objective of the College is to prepare students up to the graduate standard.

This is the first college in the Punjab State to start Home Science in 1955 for Inter classes and in 1956 for B.A. classes.

The College has laboratories for Cookery, Laundry, Needle-work and Science. It has a hostel attached to it. So far, 11 students have graduated in Home Science. The present strength of the college is 49.

LADY AMRITA BAI DURGA COLLEGE, NAGPUR

The Lady Amrita Bai Durga College for Women, Nagpur offers Home Science for B.A. degree.

PADMAVATI COLLEGE, VENKETESHWARA UNIVERSITY

Padmavati College of Shri Venketeshwara University offers Home Science for the Pre-University course.

ISABELLA THOBURN COLLEGE, LUCKNOW

Isabella Thoburn College, the first women's college in India was founded by Miss Isabella Thoburn in Lucknow in 1870. When the Lucknow University was established in 1921, Isabella Thoburn College became the Women's College of the Lucknow University. It offers courses for B.A. and B.Sc., and it also offers Bachelor of Science (Pass) in Euthenics. Euthenics is a science applied to living conditions, including the study of means to improve man's physical and mental life. The B.Sc. course includes the subjects: (a) General English, (b) Chemistry applied to Home and Community, (c) The Family, (d) Living Science and (e) Euthenics.

Home Science in Teachers' Training Colleges

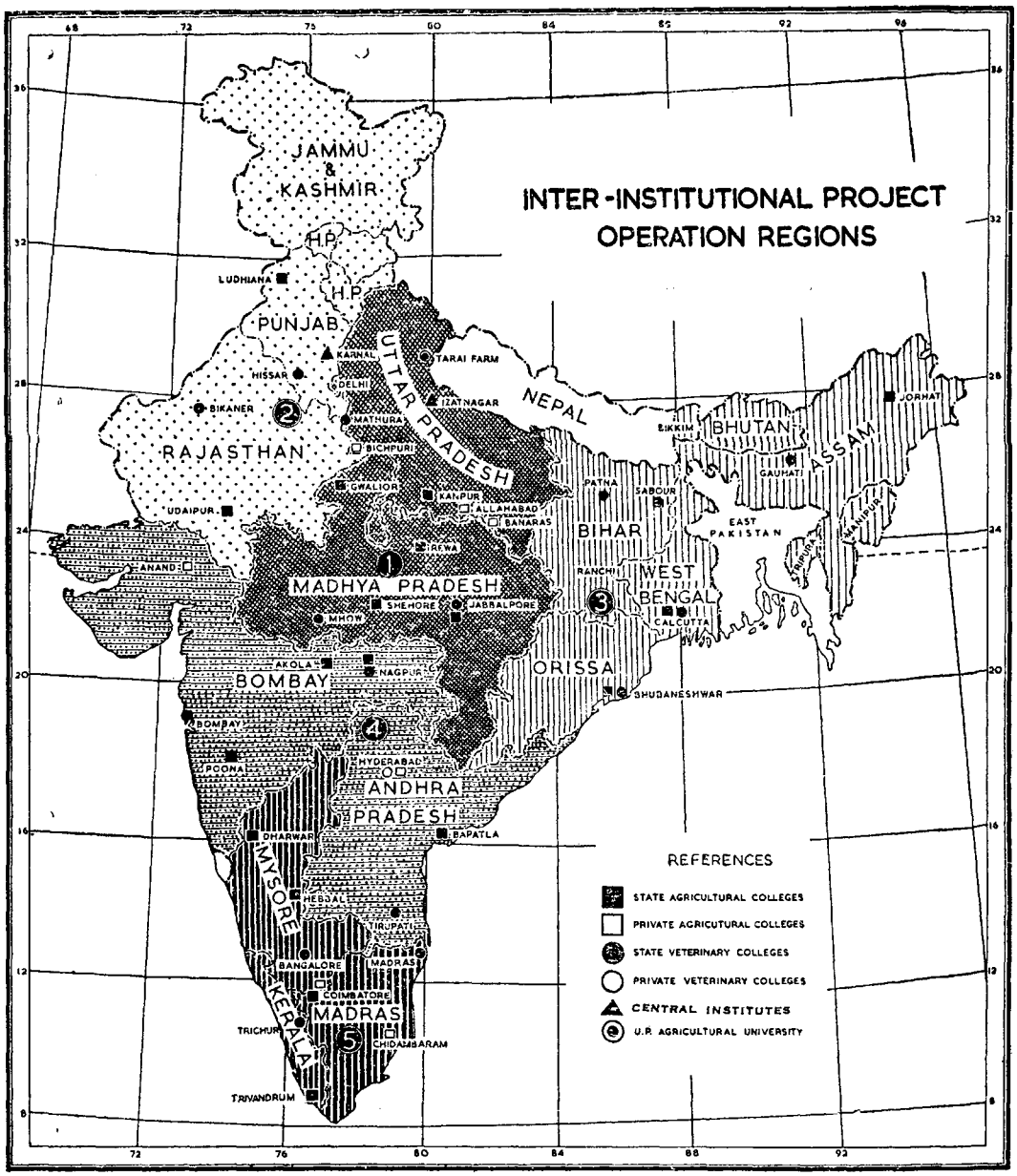
Lady Willingdon Training College in Madras: This was established under the auspices of the Government of Madras for women teachers in 1922, to offer Home Science for the B.T. course and is affiliated to the University of Madras.

The Domestic Science Training College in Hyderabad: This College was established under the auspices of the Government of Andhra Pradesh in 1951 with the objective to get lady students trained in Domestic Science.

St. Joseph's Training College for Women, Guntur: This College was established in the year 1946 and is affiliated to the Andhra University. The College offers Home Science in the methods of teaching.

Home Science in Rural Institutes

In the three year Diploma course in Rural Service offered by the Rural Institutes of Higher Education sponsored by the Ministry of Education, Home Science is offered as a special subject by the Shivaji Education Society and Gandhigram.


INTER-INSTITUTIONAL PROJECT
OPERATION REGIONS
JAMMU & KASHMIR
H.P.
H.P.
PUNJAB
UTTAR PRADESH
TARAI FARM
NEPAL
RAJASTHAN
BHUTAN
ASSAM
BIHAR
EAST PAKISTAN
MADHYA PRADESH
WEST BENGAL
ORISSA
BOMBAY
ANDHRA PRADESH
MYSORE
KERALA
MADRAS
LUDHIANA
KARNAL
HISSAR
DELHI
BIKANER
MATHURA
IZATNAGAR
BICHPURI
GWALIOR
KANPUR
ALLAHABAD
BANARAS
UDAIPUR
REWA
PATNA
SABOUR
RANCHI
CALCUTTA
JORHAT
GAUHATI
SIKKIM
ANAND
SHEHORE
JABBALPORE
MHOW
AKOLA
NAGPUR
BHUBANESHWAR
BOMBAY
POONA
HYDERABAD
DHARWAR
BAPATLA
HEBBAL
TIRUPATI
BANGALORE
MADRAS
COIMBATORE
TRICHUR
CHIDAMBARAM
TRIVANDRUM
REFERENCES
STATE AGRICULTURAL COLLEGES
PRIVATE AGRICUTURAL COLLEGES
STATE VETERINARY COLLEGES
PRIVATE VETERINARY COLLEGES
CENTRAL INSTITUTES
U.P. AGRICULTURAL UNIVERSITY

CHAPTER VII

SISTERHOOD ARRANGEMENTS WITH LAND-GRANT UNIVERSITIES IN THE U.S.A.

The constitution of a Joint Indo-American Team on Agricultural Education and Research in 1954, is an important landmark in the sphere of agricultural education in the country. This was followed by another major event—an agreement with five Land-Grant Universities of the U.S.A. under the Indo-U.S. Technical Co-operation Programme to foster the development of Agricultural Education, Research and Extension programmes in the country. The five Universities were Illinois, Ohio, Missouri, Kansas and Tennessee and the aim of the contract programme was stated to be, (i) to improve the administrative, professional and physical features of Agricultural and Veterinary colleges, (ii) to co-ordinate teaching, Research and Extension work of the participating institutions, and (iii) to increase the number and capabilities of college graduates who would contribute to increased food production and better utilization of agricultural products in India.

According to this agreement, the country was divided into five regions, each being assigned to one of the Land-Grant Colleges for the operation of the contract. The contract provided for the posting of American technicians in various specialised fields, sending of Indians as participants to various Universities in the U.S.A. for higher training and supply of laboratory and field equipment, library books and journals to strengthen the facilities in Indian institutions and thus developing and improving the standard of the colleges in this country.

The area of operation of each co-operating Land-Grant College is as given below:

	Land-Grant College	*States*
Region I	University of Illinois	U.P. and M.P.
Region II	University of Ohio	Panjab and Rajasthan
Region III	University of Missouri	Bengal, Orissa, Bihar and Assam
Region IV	University of Kansas	Bombay and Andhra Pradesh
Region V	University of Tennessee	Mysore, Madras and Kerala

Under the Agreement, 46 technicians were assigned to the various institutions in India, a total of 240 participants were to receive advanced training in the U.S.A. and a total provision of $ 2,293,400 was made for supply of equipment and books. As against these, 23 technicians had returned to the U.S.A. after completing their assignment period in India and 23 were working in India (January 1960). As regards participants, 103 had returned to India after completion of their training, and 82 were undergoing training in January, 1960, while 55 were expected to leave for U.S.A. in the following six months. The value of equipment obtained till January, 1960 was $ 1,000,000 but equipment lists to the extent of $ 2,100,000 were finalized.

Under a separate Agreement with the TCM, the assistance provided on a de-

monstrational basis for planning, building, organizing, developing and day-to-day operations of the Agricultural University of Uttar Pradesh, comprised supply of laboratory equipment and books of the value of $3,00,000 placing six American staff members for teaching and advisory work, deputing four members of the staff to the U.S.A. for advanced training and sending five short-term consultants to the U.S.A. Of these, two American staff members had arrived in India by the beginning of 1960 and one has already returned after completion of his assignment period.

CHAPTER VIII

RURAL INSTITUTES

The Rural Institutes, at the moment, eleven in number in India, mark a new venture in the development of education in the country. They were first established in 1956, by the Education Ministry of the Government of India to provide higher education after the secondary stage to the rural youth in rural environments, and rural settings which would be in consonance with their felt needs. The programme was designed to train and motivate the rural talent for careers in the development programme of the country.

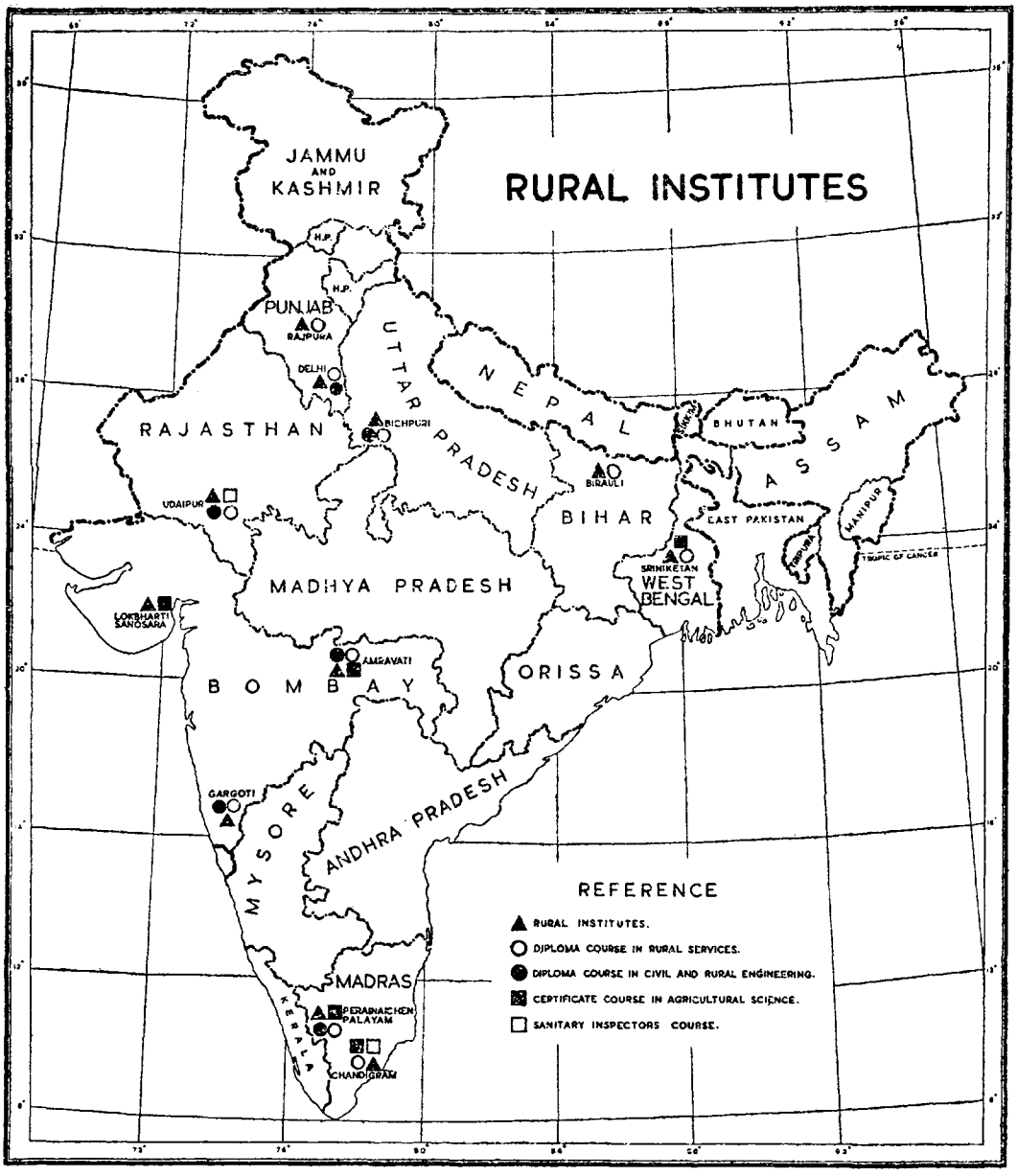
The need for such institutions of higher learning arose because of the complete urbanization of the existing Universities, total absence of educational facilities in rural areas, a constant drift of rural people to cities in quest of higher education and living, leaving the villages depleted of resources in talent, and the general apathy of the so-called ' educated proletariat ' coming out of Universities for service in rural areas, and their aversion to simple natural life in villages. The advent of the era of independence and the new Constitution of free India guaranteeing equal opportunity to all brought the educationists and leaders of political thought face to face with this urgent challenge.

The University Commission which gave the first serious thought to this problem warned that India must decide, "whether to aim at a widely distributed population making villages prosperous, interesting and culturally rich places with a wide range of opportunity and adventure.....or whether to run vast centralized industries, with all labour taking direction either from the State or from the private corporations." They recommended the establishment of Rural Universities i.e., a ring of small resident undergraduate colleges with specialized and University facilities at the centre.*

In 1953, the Ministry of Education appointed a team of experts to study the working of the Danish Folk High Schools and Colleges in Denmark to find out how much India could benefit from the experience of other countries. On the receipt of its report, a committee on Rural Higher Education was appointed " to undertake a comprehensive survey and appraisal of promising ideas, institutions and experiments, in the field of higher education in rural areas and to recommend possible patterns of education so as to evolve a sound and reasonably uniform system suited to the needs and resources of the country.

This committee was concerned to find a " deep gulf in the country between culture and work, between humanities and technology and between practical and the ideal ". Education, they said, should equip the rural youth " to grapple with the real problems of rural life " and that the students should not confine themselves to the study of abstract theories for the sake of the degree ". " This approach,"

* A reference is also invited to the portion relating to Rural Institutes on pages 57 to 60 of the *Report of the Joint Indo-American Team on Agricultural Research and Education*, 1955, published by the I.C.A.R.


RURAL INSTITUTES
JAMMU AND KASHMIR
H.P.
PUNJAB
RAJPURA
DELHI
RAJASTHAN
UTTAR PRADESH
NEPAL
BICHPURI
BIRAULI
BHUTAN
ASSAM
UDAIPUR
BIHAR
EAST PAKISTAN
MANIPUR
TRIPURA
TROPIC OF CANCER
SRINIKETAN
WEST BENGAL
MADHYA PRADESH
LOKBHARTI SANOSARA
AMRAVATI
BOMBAY
ORISSA
GARGOTI
MYSORE
ANDHRA PRADESH
MADRAS
KERALA
PERIYAKULAM
CHANDIGARH
REFERENCE
RURAL INSTITUTES.
DIPLOMA COURSE IN RURAL SERVICES.
DIPLOMA COURSE IN CIVIL AND RURAL ENGINEERING.
CERTIFICATE COURSE IN AGRICULTURAL SCIENCE.
SANITARY INSPECTORS COURSE.

it was stated, " did not in any way under-rate the high values of the life which must remain one of the chief concerns of the higher education, but it implied that the mind must find nourishment for its healthy growth from many different sources, including productive work and realistic social experience." They further desired through this education full development of individuality in the context of a democratic set up so that the rural youth may be able to take " full advantage of the energy released through ' stir and confidence ' created among the people by the Five-Year Plans ".

This trend of thought pointed to a clear direction. Firstly, that the higher education should be taken to the door of the rural people, and secondly, the education should be designed to work as a ' capstone of democratic public education ' and bring about a functional integration of knowledge based not primarily on the subjcet matter, but on the ultimate development of mental habits, attitudes and personality. This co-ordination, co-relation and articulation of educational efforts at all levels and in all spheres in the " spirit of democratic co-operation will help to bring together into wholeness the total educational experiences of the students ".

The Rural Institutes were started, therefore, with this ideology, and the curriculum and courses were fashioned to provide an integral whole knowledge blended with research and extension activities. These institutes are to " discover rural talents, pattern their aptitudes and inclinations, and guide them to proper destination." Their achievements are to be assessed in terms of their success in providing the community a general base on which it plans its future aspiration. In an entirely agricultural district, it shall take the shape of an extensive agricultural farm centre with complete leadership in various aspects of agricultural life. In a craft district, it can lay greater stress on the village industries to develop the art, taste and methodology in production.

At present, the rural institutes concentrate on development in four directions, agricultural, technical, sanitation and general education. In the last direction, it has started a three-year Diploma Course equivalent to a B.A. of a University in duration as well as in academic standard, but with emphasis on the application of theoretical knowledge gained in the classroom to rural situations outside. To develop the faculty of observation, examination and expression, research has been made an integral part of the curriculum.

BROAD AIMS

Nothing touches the village community more than agriculture. The main occupation of the people is agriculture and it shall remain the towering economy of the people for a long time to come. No village uplift is possible unless the village farmer is educated to bring himself up to the level of his contemporaries in other countries in the newer skills and newer ideas. There are many problems to which he has to find a solution. The most important factor, however, is the introduction of improved and mechanised system of tilling the land. This has placed demand on the farmer for new skills, new techniques, and new scientific knowledge which should be provided in the rural institutes and other agricultural institutions. The rural community has to be prepared for the new life and new ventures. This can be done through education of the right type. The rural institutes which were specifically

started to provide a well-rounded education to the rural people had to take into consideration this crying need. Since the immediate need is to produce better farmers and better citizens, the usual four objectives of agricultural education *i.e.* self-realization, human relationship, economic efficiency and civic responsibility have been kept in view in designing the curriculum.

The agricultural education in the Rural Institutes is designed to give the student a better command of the fundamental processes in Agriculture, Health, Citizenship, Home Membership, Vocational Efficiency and Ethical character. Emphasis has been placed on the practical work in the farm, and dissemination of the knowledge gained in the Rural Institutes to the rural people outside the campus through extension activities. The rural institutes, accordingly, aim at producing agricultural students who should take delight in farming or its management, or fill positions in the development programmes of the Government. The curriculum has been designed to present an integrated educational programme which includes Humanities, Co-operation, Forestry, Animal Husbandry, Dairying, Public Health and Rural Economics and Extension, with Agriculture of the applied nature as the base. Care is taken that the students, after completing the course, are able to produce agricultural products, market them efficiently, select and purchase suitable farm equipment and co-operate intelligently in economic activities, and are also able to conserve soil and other natural resources. The duration of this course is two years after passing Matriculation with science subjects.

THE SCHEME OF STUDY

A student seeking admission to the course of study and examination for the Certificate Course in Agricultural Science in Rural Institutes has to satisfy the following conditions:

(*a*) He must have passed

Matriculation or High School Certificate examination of a recognised University or Board with Physics and Chemistry as its subjects,

or

Post-Basic examination recognised as equivalent to matric by the State Government with Science and English as optional subjects..

(*b*) He must have completed a continuous course of two years in a Rural Institute or in various institutes without break.

EXAMINATIONS

The students have to take two kinds of examinations to qualify for the Certificate, one internal, in the subjects of Public Health, Village Industries and Humanities conducted by the Rural Institutes themselves after the end of one year ; and the other, external in the remaining subjects conducted by the Board of Examinations of the National Council for Rural Higher Education at the end of two years.

The Final examination (External) is held in April or on the dates fixed by a Board of Examinations, constituted by the National Council for the purpose.

Each candidate has to submit application on a prescribed form together with fee to the Board of Examination through the Director/Deputy Director of the Rural

Institutes with the following certificates:

(*a*) that he bears a good moral character;

(*b*) that he has attended not less than 75% of the total hours for practical and field work;

(*c*) that he has successfully passed the Internal Examination conducted by the Rural Institute; and

(*d*) that he has made satisfactory progress during his study in the Rural Institute.

The medium of examination is either English or the language of the region where the Rural Institute is located, except where the language of the subject is the medium of examination.

The papers are set in English, but the Superintendents of the Centres are authorised to translate them into regional languages, if required.

Each written paper is of three hours' duration.

SUBJECTS FOR INTERNAL AND EXTERNAL EXAMINATIONS

Internal examination	*Marks*
(*a*) Public Health—one paper	100
(*b*) Village Industries—one paper	100
(*c*) Humanities—two papers	200

External examination	*No. of papers*	*Theory*	*Practical*	*Total*
(*i*) Agriculture	2	200	200	400
(*ii*) Animal Husbandry and Dairying	2	180	120	300
(*iii*) Rural Economics and Co-operation	2	150	50	200
(*iv*) Horticulture & Forestry	1	75	75	150
(*v*) Agricultural Extension	1	100	50	150
	8	705	495	1,200

SUBJECTS FOR INTERNAL EXAMINATION

		Theory	*Practical*	*Total*
Public Health				
(Marks not to be counted in the final examination for purpose of giving class)		50	50	100
Humanities				
Paper I	Civics and Administration	75	25	100
Paper II	Languages	100	—	100
	Total	175	25	200
Village Industries				
Paper I (marks not to be counted in the final examination)		50	50	100

SUBJECTS FOR EXTERNAL EXAMINATION

Agriculture

Paper I		*Theory*	*Practical*	*Total*
Soil and Soil Management	Part I	50	50	100
Crop production tillage implements	Part II	50	50	100
	Total	100	100	200
Paper II				
Plant Protection	Part I	50	50	100
Farm Accounts	Part II	20	20	40
Survey, Irrigation and Drainage	Part III	30	30	60
	Total	100	100	200

Students are required to answer specified questions from each part. In practicals also, a number of questions are put from each part.

Animal Husbandry & Dairying

Paper I	Animal Husbandry	100	50	150
Paper II	(A) Veterinary Science	30	20	
	(B) Dairying	50	50	150
	Total	180	120	300

Rural Economics and Co-operation

Paper I	Rural Economics & Agricultural Legislation	75	25	100
Paper II	Co-operation	75	25	100
	Total	150	50	200

Horticulture & Forestry

Paper I	(A) Horticulture	50	50	
	(B) Forestry	25	25	150

Agricultural Extension

Paper I		100	50	150

The marks in Internal Examination are not counted in making gradations, but each student has to pass these examinations to qualify for the External Examination. The fact of their passing in these subjects is mentioned in the Diploma/Certificate.

LOCATION OF RURAL INSTITUTES

Since Rural Institutes are experimental institutions, this course has so far been started only at the first five Rural Institutes mentioned below:

1. Rural Institute, Amravati
2. Rural Institute, Sriniketan
3. Ramakrishna Mission Vidyalaya, Ramakrishna Vidyalaya P.O., Coimbatore, Distt. Madras
4. Lok Bharati Sanosara, Gohilwad (Saurashtra) Gujarat
5. Gandhigram Rural Institute, Gandhigram P.O., Madurai, Madras
6. Jamia Rural Institute, Jamia Nagar, New Delhi
7. Vidya Bhavan Rural Institute, Udaipur, Rajasthan
8. Rural Institute of Higher Studies, Sundernagar, Birouli, P.O. Dighara, District Darbhanga, Bihar
9. Balwant Vidyapeeth Rural Institute, Bichpuri, Agra
10. Mouni Vidyapeeth Rural Institute, Gargoti, Kolhapur
11. Kasturba Rural Institute, Rajpura, Distt. Patiala

CHAPTER IX

EXTENSION TRAINING CENTRES

TRAINING FOR GRAM SEVAKS

With the inception of the National Extension Service and Community Development programmes in the country, the Village Level Worker or the *Gram Sevak* has become the chief instrument for bringing the latest improvements in Agriculture, Animal Husbandry and other media of rural uplift to the villagers and inducing them to adopt these practices so as to improve the standard of living in the villages. Though a multi-purpose extension worker, with the emphasis being laid on agricultural improvement, the *Gram Sevak* has become, first and foremost an agricultural extension agent.

The pre-service training programme of Village Level Workers, was initiated in 1952 with the establishment of five Training-cum-Development Projects and subsequently, 43 Extension Training Centres in different States. The course comprised six months' training in extension methods in Agriculture, Animal Husbandry, Public Health, Adult Education, etc. It was soon realised that this short training needed considerable re-inforcement in basic agricultural sciences. Consequently, with the establishment of Basic Agricultural Schools in 1953 and 1954, the training period was raised to 1½ years in which one year of basic agricultural course was followed by six months' training in Extension methods and other related subjects, such as, Co-operation, Public Health, etc.

The above pattern of training was followed till the end of the first-Plan period. By the end of March, 1956, about 13,000 Village Level Workers had been trained in 43 Extension Training Centres and 50 Basic Agricultural Schools. Some of these had received training for 18 months, while others had only undergone a course of six months' duration or even less in Extension Training Centres established earlier.

To meet the needs of the National Extension Service Blocks to be established during the Second-Plan period, it was proposed to establish 15 additional Extension Training Centres and 41 Basic agricultural schools. Actually, however, 13 Extension training centres and 36 Basic agricultural schools were established, bringing the total to 56 Extension Training Centres and 86 Basic Agricultural Schools in all.

With the proposal to stagger the allotment of Blocks to the third-Plan period in order to cover the entire country by October, 1963, and in accordance with the experience gained so far, a decision was taken towards the close of 1958, to introduce a two-year integrated course for Village Level Workers, replacing the separate one-year basic Agriculture and six months' Extension courses. The establishment of these integrated institutions has been proceeding actively in most States.

ADMISSION

The minimum educational qualifiation for admision to the Extension Training Institutions is a pass in the High School or equivalent examination, relaxable only in

the cases of candidates belonging to the backward classes and ex-service men. A selection board selects the candidates on the basis of written tests, endurance tests and *viva-voce*. Aptitude for work as *Gram Sevak*, physical fitness and sincerity of purpose are specified as the criteria for selection.

SUBJECTS TAUGHT

The integrated course for Village Level Workers covers instruction in theory, practical and Extension in ten subjects.

Though the duration of the integrated course is two years, the trainees are to be sent out to villages for job training as apprentice Village Level Workers for two and a half months, after completing 21 months' training in the training centre. Besides, the trainees are required to pay periodical visits to villages during 21 months of the institutional training period for seasonal activities and study tours for a total of 118 days.

The following Table gives a picture of the subjects taught and the number of periods (each of 45 minutes) allotted for theory and practical instruction.

	No. of periods for theory and tests	No. of periods for practical instruction
Agriculture I—Soil Management and Agricultural Engineering	210	120
Agriculture II—Crop Husbandry	210	120
Horticulture and Plant Protection	280	170
Animal Husbandry	270	140
Co-operation	130	75
Panchayats	130	75
Public Health	180	110
Social Education	140	82
General—including Extension Principles and Programme Planning	110	60
Minor Engineering Works	60	40
Rural Industries	100	100

ASSESSMENT

The assessment of the trainees is based on the periodical tests and the final examinations (written and practical) including *viva-voce* in various subjects, and on the performance of the trainees in the job training period. The periodical tests and final examination have equal importance and carry the same number of marks. Marks are also allotted for discipline, leadership and initiative on the basis of monthly observation reports submitted by all the instructors. The minimum pass marks are 40 per cent in the written and 50 per cent in the practical examinations in each subject and 45 per cent in the aggregate.

As in September, 1959, a total of 36,557 Village Level Workers were trained while 6,104 were under training. At the same time 80 Extension Training Centres were functioning in the country, besides 8 which were offering only 6 months' course. One Training Centre was also functioning in NEFA.

TRAINING GRAM-SEVIKAS

In 1954, a decision was taken to introduce *Gram Sevikas* in the Community Development Blocks. The training programme for *Gram Sevikas* started in 1955. The Centres of training were the 27 Home Science Wings which were mostly attached to Extension Training Centres in the different States. As on December, 1959, 1300 were trained and 1100 were under training.

The present policy is to post two *Gram Sevikas* per block, which means that there should be 10,000 *Gram Sevikas* available by 1963. Admissions to Home Science Wing are, therefore, being increased from 20 to 40 with the consequent expansion of existing facilities and establishment of 42 new Training Centres and Home Science Wings by the end of 1963.

The *Gram Sevika* is the woman Multipurpose Village Level Worker in the Block. Her sphere of activity lies not only in the homes, but also extends to the farms, the schools and the Community Centres in the rural areas. It is her duty to create a desire in the rural women to have better and healthier homes and improve the standards of living of families.

ADMISSION

Candidates seeking admission for the course which extends to a year, must have preferably passed the Secondary School Leaving Certificate examination; should be between 18 to 35 years of age, with village background and good health.

SUBJECTS TAUGHT

The subjects included in the training course are: Agriculture and allied subjects, Health and Sanitation, Mother and Child Care, Food and Nutrition, Home Management, Clothing, Crafts, Co-operation, Extension Philosophy and Techniques, Office Procedures and Records.

The time table includes Kitchen Gardening—at least half an hour daily and village work for at least three hours, on alternate days in a week.

EXAMINATIONS

Two examinations are required to be conducted, one half-yearly and the other annually. The latter, which is the final examination may consist of three written papers in the subjects of Food and Nutrition, Health and Sanitation, Clothing, Home Management and Extension Philosophy and Techniques and two practical examinations, one each in Food and Nutrition and Clothing.

TWO YEARS' COURSE IN HOME SCIENCE

The Institute of Agriculture, Anand, has organised a two years' course in Home Science with the aim of equipping farmers' daughters with practical knowledge essential for the promotion of better habits in diet, housing, child care, crafts and

cultural activities. The admission is open to girls who have passed Primary School Leaving Certificate examination. In the first year, the final examination includes the following five papers: (*i*) Food and Nutrition, (*ii*) Home Management and Home Furnishing, (*iii*) Mother and Child care, (*iv*) Language and Co-operation and (*iv*) Agriculture.

In the second year, there are six papers on Food and Nutrition, Home Management and Home Furnishing, Mother and Child Care, Language and Co-operation, Health and Sanitation, Home Science Extension, and Office Procedures.

The practical examinations in both years are conducted in: (*i*) Food and Nutrition, (*ii*) Clothing and Crafts, (*iii*) Child Development, (*iv*) Home Management, (*v*) Agriculture (only in the first year), and (*vi*) Arts and Music.

TRAINING INSTRUCTORS

At the early stages, the Instructors in Extension Training Centres "had to be employed without any previous training or background in rural extension work." The need for having well-qualified instructors and Principals for the integrated institutions is now well recognised. To fulfil this objective, the Extension Training Centre, Nilokheri, Punjab, was converted into Extension Teachers' Training Centre to train about 200 Instructors by the end of Second Plan. Starting of more institutions on regional basis was also contemplated. To accelerate the training programme of Instructors, short duration seminars (workshop type) were also organized as a short-term arrangement so as to train maximum number of Instructors during 1959.

REFRESHER COURSES

A special scheme for refresher training of Instructors of Extension Training Institutes and Extension officers in Agriculture, was conceived in 1958. Unless the teaching staff of these training centres are continuously given refresher training in their respective subjects, *viz.*, Agriculture, Animal Husbandry, Co-operation, Public Health, Adult and Social Education, etc. they can not keep themselves abreast of the latest developments in their fields. For this purpose, six agricultural colleges and six veterinary colleges were selected and 21 courses were organised in 1958-59, (Seven in Agriculture, 11 in Animal Husbandry, one in Co-operation and two in Home Science) and 460 Instructors and Extension Officers were trained. By the end of 1963, about 5,000 Extension Officers in Agriculture and 300 Instructors would be in position. Refresher training of all these is proposed to be covered during the third-Plan Period. Similarly, arrangements have been proposed for refresher training in Animal Husbandry, Co-operation, Social Education, etc.

For Village Level Workers also, refresher training is proposed to be organised separately at many centres in the States, besides at Nilokheri.

The refresher training of Instructors of Extension Training Institutes and Extension Officers in agriculture envisages one month's training, of which three weeks are to be devoted to institutional programme and one week to 'study tour.'

CHAPTER X

VOCATIONAL AGRICULTURAL SCHOOLS

The aim of vocational education in Agriculture is to train persons who have just started or who are preparing to take up farming for proficiency in the line. The student of the vocational school is presumed to have a farm-background and also some farm-experience. To instil the scientific principles of farming in his mind and to teach him the essential skills needed by a modern good farmer, are the objectives of vocational agricultural schools.

The development of vocational agricultural schools have an important bearing on Extension work. With the increasing tempo of agricultural extension work, expansion of vocational agricultural education becomes essential, as by the latter means, we produce a band of trained farmers who will be the most active allies of the agricultural extension staff to disseminate by actual examples all that the Extension stands for.

MANJRI-TYPE SCHOOLS

In India, different types of vocational training in Agriculture have been tried, but those which are now in successful operation in Bombay and known by the name of Manjri Schools, are of topical interest. The First Joint Indo-American Team considered this type of schools as a decidedly worthwhile experiment in rural education.

The original Manjri school was started by the Government of Bombay in Manjri, Poona District, Bombay State, in 1947, with a view to providing opportunities to farmers to have their sons trained in scientific agriculture.

COURSES OF STUDY

The course of study covers a period of two years. Instruction is provided in vernacular languages. In the beginning, the subjects taught were Agriculture, Animal Husbandry, Dairying and Veterinary Science, Horticulture, Co-operation, Marketing and Agrarian Legislation, Village Industries and Methods of Extension. Later on, subjects like Public Health and Civics, Village Administration and Revenue, Forestry and Hindi were added so that students may also become more useful to the community in which they live. In order to obtain a comprehensive knowledge of Agriculture and Animal Husbandry, pupils have to perform all operations on the farm, in the dairy and in the poultry yard. The emphasis is on practical exercises. They are encouraged to participate freely in discussions on various subjects and to maintain records of their observations. They visit villages in the vicinity of the school and demonstrate improved methods of agriculture to farmers.

ADMISSION

The minimum standard required for admission is a Certificate of VII Vernacular Standard. A candidate who has passed the Secondary School Certificate examination with Agriculture as optional subject, is directly admitted to the Second

year class. Preference is given to sons of farmers. However, sons of landless labourers and those of backward and scheduled communities are also admitted. The age limit is from 16 to 30 years. In order to enable people with low income to take advantage of the school, a stipend of Rs. 20/- *per mensem* is granted to each student. No tuition fees are charged and lodging is free. Students are provided with uniforms and free medical service. They prepare their own food and manage the mess under guidance of school authorities.

The applications for admission to school are invited by advertisement in April. The applications are to be accompanied with a certificate together with the marks secured in the last examination passed, and revenue records showing survey numbers of land possessed by the parents or guardians of the candidates. The candidates are selected by a Selection Committee.

EXAMINATIONS

Examinations are conducted at the end of the Second Term each year. The subjects taught each year are given below:

First Year

Agriculture and Animal Husbandry, Horticulture, Co-operation, Civics, and Village Industries;

Second Year

Agriculture and Animal Husbandry, Public Health, Co-operation, Marketing and Agricultural Legislation, Village Administration and Revenue Matters, Agricultural Extension and Village Industries.

Students failing in one subject only in the First year are allowed to keep terms for the Second year. Such students are declared to have passed the final examination only when they pass the remaining subjects of the First year. Students failing in the final examination are allowed to reappear on payment of a fee of Rs. 25/- each.

The examinations for the First year class are conducted by the school authorities and that of the Second year by a Board of Examiners.

The successful candidates at the final examination are awarded a certificate by the Department of Agriculture.

The Manjri-type school has become very popular with the farming public and the Government of Bombay has decided to establish at least one such school in every district. At present, there are 23 schools and by the end of the Second Five-Year Plan, the number would increase to 28. By the end of the Third Five-Year Plan, every district in the State will have a Manjri type school. A list of such schools which are now in operation and which would be opened in future, is given in Appendix IX.

AGRICULTURAL SCHOOLS

A number of agricultural schools have been established in Uttar Pradesh. These Government agricultural schools are located at Bulandshahr, Gorakhpur and Chirgaon (Jhansi). The minimum qualification for admission in these Agricultural Schools is a pass in High School and the minimum and maximum age limits are 16 and 21 years, respectively. The Schools are residential institutions.

The course of training extends over two years. The subjects included in the

training course are Agriculture, Horticulture, Farm Engineering, Animal Husbandry and Dairying including Veterinary Science, Elementary Science, Rural Economics and Co-operation, Panchayat, Rural Industry, Rural Sanitation and Public Health, Extension and Social Education and Villagers' Participation. The medium of instruction is Hindi. Special emphasis is given to practical work. The final examination is conducted by the Agriculture Department through an Examination Committee with the Director of Agriculture as its President. The successful candidates are awarded a Diploma in Agriculture and Extension.

These Schools also give the following financial awards:

1. Five merit scholarships in the First and the Second year classes of the value of Rs. 10/- per month for first position, Rs. 8/- per month for 2nd position and Rs. 6/- per month each for the third, fourth and fifth positions in the order of merit.
2. Indigent stipends of Rs. 10/- per month each to 16 per cent, and Rs. 5/- per month each to 17 per cent of the total number of students on roll on 31st July.
3. Remission of tuition fees to a maximum of 25 per cent of the students on roll, excluding the recipients of scholarships or stipends.
4. *Prizes*

	First Year Class	*Second Year Class*
(*i*) General merit		
(a) First position	Rs. 20/-	Rs. 30/-
(b) Second position	Rs. 15/-	Rs. 20/-
(*ii*) First position in all the eleven principal subjects.	Rs. 10/- per subject	Rs. 15/- per subject

(*v*) Stipend of Rs. 30/- per month to all the students. In lieu of the same, they have to sign an agreement bond to serve the State Government at least for a period of three years.

The Agricultural Schools have their own farm, garden, dairy, science laboratory and a library. Medical facilities have been provided for the students.

To ensure practical training, the students are given individual plots to cultivate. The produce of their plots is retained by the students for their own use.

All the successful candidates are absorbed in the Agriculture Department or in the Planning and other Development Departments.

Besides the three Government Agricultural Schools, the following private institutions have also been recognised for the Agriculture and Extension Diploma course.

(*i*) Agricultural School, Rajghat, Varanasi
(*ii*) Agricultural School, Gurukul Kangri, Hardwar, District Saharanpur
(*iii*) Agricultural School (Jat College), Muzaffarnagar
(*iv*) Munshi Land Institute, Sarojininagar, Lucknow
(*v*) Town Inter College, Ballia
(*vi*) Rajput Shiksha Shivir, Dhaulana, Meerut
(*vii*) Rural Agricultural Institute, Bisawar, Mathura

The following statement shows the number of candidates admitted in these institutions in first and second year classes.

Name of the Agricultural School	*Number of candidates*	
	First Year	*Second Year*
1. Government Agricultural School, Bulandshahr	84	85
2. Government Agricultural School, Gorakhpur	73	80
3. Government Agricultural School, Chirgaon (Jhansi)	66	68
4. Agricultural School, Rajghat, Varanasi	42	45
5. Agricultural School, Gurukul Kangri, Hardwar, District Saharanpur	83	79
6. Agricultural School, (Jat College), Muzaffarnagar	82	73
7. Munshi Land Institute, Sarojininagar, Lucknow	105	85
8. Town Inter College, Ballia	77	—
9. Rural Agricultural Institute, Bisawar, Mathura	63	—
10. Rajput Shiksha Shivir, Dhaulana, Meerut	81	—

AGRICULTURAL TRAINING CENTRE FOR THE BLIND

A great majority of blind persons in this country are stated to belong to rural areas. The Royal Commonwealth Society for the Blind, which has carried on a number of experiments in the training of the blind in several countries, chiefly in East Africa, has agreed to assist the National Association for the Blind, which is a leading voluntary organisation in India, in establishing an Agricultural Training Centre for the Blind at Phansa Village, about 107 miles from Bombay on the Western Railway in Thana District. Lands extending to about 220 acres have been purchased with the aid of a donation of Rs. 2 lakh from the Tata Trust. The Centre is known as The 'Tata Agricultural and Rural Training Centre for the Blind. It aims to develop a 'Teachers' Training Centre for supplying trained teachers to other centres.

ADMISSION

For getting admission to the Centre the candidate or his guardian should possess land and/or livestock ; should have an opportunity to cultivate commonly owned land or husband cattle ; and should also be able to understand Hindi.

Landless blind labourers will also be considered if they have employment opportunities.

COURSES OF STUDY

The course will include practical training in Agriculture, Horticulture, Poultry, Animal Husbandry, Rural Crafts and Trades, and also in personal grooming, cleanliness, elementary domestic science and indoor and outdoor cane travel. The training in sowing, reaping, etc., will be planned to meet the needs of each individual or groups of individuals as far as possible. Each blind trainee will, however, be given a separate plot of about half an acre to cultivate on his own. The programme of training is expected to last for one year in the case of those whose aptitude is good. In other cases, it may take longer depending on the capacity of the individual. In the final stages of training, any close friend or member of the trainee's family, should visit the Centre for about two months, so that he may be instructed how to help the trainee and obtain maximum co-operation from him.

It is through this training that the Centre hopes to ultimately resettle the blind

in their own familiar rural surroundings and to give them an opportunity to live healthy and wholesome lives.

JUNIOR HIGH SCHOOLS OR SENIOR BASIC SCHOOLS

Basic Education envisaged by Mahatma Gandhi was built on the conviction that education, if it is to draw out to the full the latent capacities of the child, has to be through a craft. It is also required to be based on the life-activities of the community which it is meant to serve and the environment for which it is preparing the child. In this country where the environment of the vast majority of the children is rural and the life of the community agricultural, it is obvious that education for the vast majority of children must be based on agriculture and rural environment. In Uttar Pradesh, the Senior Basic Schools were oriented in 1954, by introducing subjects like Agriculture, Wood-craft, Tailoring, Metal-craft, Spinning and Weaving, Leather-craft and House-craft (for girls only). The aim of introducing Agriculture and other crafts as subjects in these Schools was as under:

(i) Development of well integrated personality through Agriculture/Craft
(ii) Making education productive
(iii) Realization of dignity of work
(iv) The School is to be the centre of community life and spearhead of progress
(v) Training in citizenship for a democratic society
(vi) Training leadership and self-government through Youth Organizations

The Scheme was launched in the State, in the year 1954. But prior to the actual launching of the scheme, a State-wide effort was made to procure land for the Senior Basic Schools well in advance. The result was highly encouraging and to begin with, some 21,000 acres of land were donated by the public and the village *panchayats*. The ceiling of land fixed for each school was between five to ten acres.

Thus agriculture was started in some 3,000 Senior Basic Schools of the State mostly in rural areas.

Some 3,000 teachers (under-graduates, graduates and post-graduates) were selected and posted to these Schools after subjecting them to a three months' refresher course in Practical Agriculture and Elementary Pedagogics. Most of these teachers had agricultural qualifications and the rest were ordinary Arts graduates or under-graduates.

The State Government sanctioned a non-recurring lump sum of Rs. 30,00,000 out of which grants for water-lifting devices, bullocks, construction of wells, fencing, starting of community centres, establishment of museums etc. were sanctioned.

Efforts made to enlist public co-operation included the creation of a fund known as the ' Chief Minister's Education Fund '. A large sum of Rs. 32,00,000 was thus collected. Out of this, a portion was spent on the purchase of agricultural implements like spades, *khurpies*, *kudals*, hand-hoes, rakes, etc.

A good portion of the land that was received as gift from the public was either fallow land or was of an inferior type or was *usar* (alkaline) land. Through a gradual process of reclamation, the cost of which was met out of the Chief Minister's Education Fund, considerable improvement was effected.

Training of Teachers: Most of the teachers employed had no knowledge of the principles and practice of teaching. As such, a scheme for their training was drawn

up and eight training centres were started in the State for the purpose.

Extension Teachers: Besides the teaching of Agriculture in Senior Basic classes, the agricultural teacher is required to maintain the account of school farm, demonstrate improved farm practices, develop the school as a community centre, organize 'Yuwak Mangal Dals' and to take up extension work in the village in which the school is situated. As such he has been designated as Extension Teacher.

The Extension Teacher is also required to attend Block staff meetings and to organize campaigns like *rabi* and *kharif*, etc., in the school area in co-operation with the Block authorities.

COURSES OF STUDY

The Senior Basic School (Junior High School) curriculum was recast as a result of orientation of these schools towards the basic pattern with effect from 1954. The main feature of this curriculum is that (i) Agriculture as basic craft has been made a compulsory subject and (ii) full emphasis has been laid on Practical Agriculture. Besides the above, Extension Service, Rural Sanitation and Environmental Hygiene, Animal husbandry and Dairying, Co-operation, Rotation of Crops, Crop Protection and Community work are included in the curriculum.

The Senior Basic School Examination (Junior High School) is held every year under the guidance of the Registrar, Departmental Examinations, U.P., in each district. The Registrar is responsible for setting of question papers and their printing and despatch to the various centres in the district. The Examiners are appointed by the District Advisory Committee of which the District Inspector of Schools is the Chairman. The District Advisory Committee is responsible for the preparation and publication of results. Candidates are examined in both theoretical and practical Agriculture. The total number of scholars offering Agriculture in the Senior Basic Classes in the year 1958-59 was 2,40,587.

Land and farm produce under the Senior Basic Schools

(i)	Total land procured	21,122 acres
(ii)	Total land under cultivation	13,335 acres
(iii)	Total land reclaimed during 1958-59	1,260 acres
(iv)	Total produce in terms of money	9,05,000 Rupees

Recurring amount: The State Government's recurring budget allotment for the scheme is about Rs. 51,00,000.

Supervisory Staff: The Supervisory staff at the district level is known as Extension Guide. There is one Extension Guide for every ten agriculturally oriented schools. He is at least B.Sc. (Agri.). He visits the schools under his charge twice a month and offers technical help and co-operation to the Extension teacher.

At the regional level, there are Supervisors of Agriculture, who are M.Sc. (Agri.), and hold gazetted status. They maintain liaison between the Extension Guide on one side and the Headquarters office on the other. At the Headquarters level there is one Class I Officer assisted by a Class II Officer and a Superintendent of Agriculture (Gazetted). They have to look to both office and field work.

CHAPTER XI

AGRICULTURAL EDUCATION IN MULTIPURPOSE SCHOOLS

In 1955, a new type of institution—the Multipurpose or Diversified Secondary School was initiated in the country. The main aim of this scheme was to provide in the Secondary School agricultural, commercial and other practical courses which may help the students in taking up vocational pursuits.

The decision by the Government of India to encourage the growth of the Diversified School and to place much importance on a scheme designed for the practical education of the rural boy reflect vision and stable thinking.

In 1952, the Government of India appointed the Secondary Education Commission " to examine the prevailing system of Secondary Education in the country and suggest measures for its reorganization and improvement."

The Commission found many defects in the then prevailing secondary system and made important suggestions for its improvement. A few of these are quoted here:

" The Secondary Education, which would be the end of all formal education for the majority of citizens, must assume the responsibility of providing the necessary training for this purpose."

" In the past, our education had been so academic and so divorced from practical work that educated classes have, generally speaking, failed to make any major contribution to the development of this country's national wealth.... diversification of courses should be introduced at the secondary stage so that a large number of students may take up agricultural, commercial and other practical courses which will train them....either to take up vocational pursuits or for further training."

Considering that over 75 per cent of the population is employed in agriculture, the Commission further said:

".....we recommend that all States shoud provide much greater opportunities for agricultural education in rural schools so that more students may take it and adopt it as a vocation."

Much emphasis has been placed on the report of the Secondary Education Commission in as much as their recommendations have generally been accepted by the States and are now being implemented in many schools. By 1958, about 1,329 schools had been converted to the multipurpose pattern. Of these, 255 schools offer Agriculture.

The seven streams which give diversity to this Higher Secondary School include, Agriculture, Commerce, Fine Arts, Home Science, Humanities, Science, and Technology. Humanities and Science are more generally found than the other more practical subjects, although most schools have one or two of the other five streams.

THE AGRICULTURAL STREAM

Agriculture is usually prescribed for 9th, 10th and 11th year classes but in at least two States, four years of multipurpose work is provided for. As is fitting and

logical, Agriculture is largely confined to the rural schools although boys of urban families are often found enrolled in the course.

As in any new educational venture, the educators concerned with this work in India are quite often hesitant in the expression of purposes and philosophy. However, the objectives must be well defined if the curriculum, syllabus, organization, teaching, and public support are to result in functional accomplishments. It is satisfying that the more recent trends of thinking by Indian educators interested in agricultural education have resulted in quite generally accepted objectives, which may be listed as under:

(i) To provide the boy a terminal education and with the occupational competency that will fit him to return to the village farming operations;
(ii) To provide him with a practical and diverse training which will serve as a foundation to advanced training in an agricultural college;
(iii) To give him a training which will broaden his knowledge and appreciation of community life so that he might assume the responsibilities of village citizenship.

These purposes can all be met through the means of a carefully formulated course, effectively taught, in the three or four years of secondary training. Moreover, when such a high quality of teaching is done that the first purpose of occupational competency is accomplished, then it becomes likely that the other two purposes have been accomplished. This first purpose of secondary agricultural education is important enough to justify further comment.

OCCUPATIONAL COMPETENCY

It is impossible to ignore the fact that the Secondary school will be the end of formal education for an increasing number of young people. Due largely to compulsory education at the lower levels, enrolments are increasing at the secondary levels at an astounding rate each year. This increase in enrollment is reflected in the increasing numbers and increasing percentages of those who pass out of the multipurpose or higher secondary schools and who either cannot afford to go to college, or have not the ability to do college-level work. Agricultural education on the secondary level must, therefore, provide such training as will prepare the Matriculate to return to the village and the farm with abilities above those of the preceding generation.

For this education to be worthwhile and effective, the training must be carried on to a ' doing level ' as it is commonly called. It is another way of stating that it must be vocational training, and that it must provide occupational competency. Without practice and participation that can give the student the learning and skill to do the job, theory alone is ineffective and incomplete. Learning the theory, and learning to do by doing, must go together.

It is worthy of note that there is an increasingly strong trend toward a philosophy which incorporates these aims, and that attempts are being made to so organize and conduct Secondary School of Agriculture as to meet the purposes stated above.

The scheme of education which has resulted in the multipurpose school is a progressive step toward a balanced education, and toward meeting the needs of a developing democracy. It should be interesting to see how one of the streams of this

secondary school, by its organization, needs, and procedures, is attempting to fulfil its responsibility for the progress of the country.

CURRICULUM AND SYLLABUS

A typical curriculum for a three-year training period in multipurpose agricultural schools would include the following subjects:

Languages: The regional language, and/or Hindi, and English ; Social Studies ; General Science—usually including Mathematics ; One craft such as Spinning, Workshop, Modelling, etc.; Agriculture.

This list is not fixed, and it may vary from State to State. Neither does it give an accurate picture of the heavy load carried by the student.

Unfortunately, for the purposes of learning thoroughly, Agriculture has an extremely wide range of subject matter. Much of the subject matter is basic to the later study of crops and animals. A wide range of crops and animals are indigenous or distinctive to the many States. These factors cause nearly all the States to try to cover a great amount of subject matter in their required syllabi. The teacher, in turn, finds it practically impossible to cover the entire field and do an effective job of teaching. A complete and detailed State Prospectus covering the agricultural courses is not given here, but a list of general headings will incidate what the student can expect.

A. Agricultural Biology and Chemistry

(Some require Agricultural Physics)

1. Morphology of vegetative plant organs
2. Plantation Campaigns
3. Crop Pests and Diseases
4. Locust and Rat Campaigns
5. Fertilizers—Nitrogenous and others
6. Soil Salts

B. General Agriculture including Soil Management and Crop Culture

1. Soils—all phases
2. Rainfall and Climatology
3. Soil Management—cultural processes
4. Irrigation
5. Field and Garden Crops plus Culture and Classification
6. Fruit Crops
7. Preparation of Fruits and Vegetables

C. Farm Management including Animal Husbandry and Dairying

1. General information, parts of an animal, etc. (All Animals including poultry)
2. Feeding
3. Breeds
4. Diseases
5. Dairy milk
6. Management including records

It must be remembered that at the conclusion of the multipurpose stream the student must pass the external examination in both theory and practice of all phases of the above list of topics.

NEED FOR MORE TEACHERS

Some difficulty has been experienced in finding enough teachers to fulfil the needs of this multipurpose stream. The difficulty will persist for some time.

A majority of the teachers have their B.Sc. in Agriculture but with little professional training in teaching methods. A few do hold the Bachelor of Teaching Diploma (B.T.) and a few have an L.T. (Licentiate in Teaching). In a few cases, schools have had to employ teachers who are acquainted with only farm or farm management work, and do not possess teaching experience. Those who have had training in teaching methods for agricultural teachers are neglibigle in number, although this deficiency is being partially overcome through attendance at teacher seminars or workshops, usually organized by co-ordinators of the Secondary Education Extension service now attached to many training colleges throughout India.

Some of the teachers find difficulty in attaining the high level of teaching skill required of this vocational-bias course. Even those with agricultural college training are seldom able to demonstrate to students the many agricultural skills they are required to teach. This weakness will be gradually overcome if the experience of other countries is any indication. All have overcome many of these problems during the initial years of vocational agriculture at the secondary levels. There will be improvement as a result of in-service training, more practical courses in the agricultural colleges, and increase in teacher training courses designed specifically for agricultural teachers, and improved salary and living conditions. These things will be essential for the development of teachers both in the class-room and on the school farm.

PROGRAMME FOR STUDENTS

The typical secondary school requires the student to attend four to nine periods of Agriculture per week depending on the proportion of time given to practical activities, and on his load of other subjects. He is an extremely busy student during the 220 days or more of his yearly schooling. He is a boy of 13 to 18 years of age and is usually the son of a villager or land owner. He would like to go on to agricultural college but realizes that this may not be possible. He is prepared to go into farming. Some 13 types of farming including dozens of occupations within these await his increased abilities.

The opportunities and demand for the Indian student who will go on to college are numerous. More than 50 different professional and industrial occupations needing agricultural training are available to him. A partial list will serve to illustrate this statement.

Agricultural Education.

Secondary school teaching
Agricultural College Lecturer
Agricultural Extension Worker
Village Level Worker

Agricultural Research

Production
New methods
Processing
Pathology

Conservation

Soil
Water
Forest
Range

Agricultural Communications

Farm reporting
Farm fairs and exhibits
Farm publications

Agricultural Business

Banking and Credit
Farm Management
Land appraisal
Marketing

Agricultural Industry

Agricultural Engineering
Agricultural Chemistry
Fertilizers
Insecticides and Herbicides

Agricultural Services

Inspection and Regulation
Technicians and Consultants
Veterinarians.

It is doubtful if greater occupational opportunities await a properly trained young man than those found in the field of agriculture.

FACILITIES AND FINANCING

The agricultural facilities needed for training vary a good deal among the multipurpose schools. It is somewhat difficult to give an accurate picture of existing conditions. One government or private school may try to maintain a department with one acre of land, little financial support, and equipment limited to a few hand tools. Another may have 200 acres of land, adequate running-expense funds and equipment. It might be mentioned that the educational value of either the one or the two hundred acres of land may be subject to doubt. Ten to fifty acres are considered good. State Departments of Instruction prefer that the land be donated.

Other facilities and equipment may include the following:

(i) A class-room providing a laboratory with necessary teaching aids such as samples, models, charts and library books;
(ii) Adequate water supply, usually by electric pump and tube well;
(iii) Farm buildings which may include animal shelters, store and equipment sheds, and quarters for farm servants;
(iv) One or two pairs of bullocks with yokes;
(v) Livestocks according to needs to fit the community. It usually includes poultry, dairy, and perhaps sheep;
(vi) Land implements such as plough, carts, clod crusher, spray equipment, forage cutter, and the many hand tools in local use. These should supply the needs of a class of perhaps 20 boys.

Such an optimum situation entails a capital or non-recurring expense of Rs. 30,000 to Rs. 40,000 which would include the cost of the land. It is justified if the teaching programme produces the desired student accomplishments. Learning

'to a doing level' is not possible without the practical aids which will give experience to the student.

The annual recurring costs of such a department might total Rs. 3,000 to Rs. 4,000 although income taken from the land and livestock, which must be returned to government funds, lessens this expenditure.

It must be understood that only a few schools have, as yet, reached this high standard of State or private-organization support as indicated above. Many of the agricultural streams, most of which have started functioning from 1957, have very little besides the class-room and a small school farm. The increase of facilities and consequent improvement of any one school department must, and will be, gradual.

STUDENT EVALUATION

Each State Department of Instruction develops the syllabus or course of study which must be covered. It also frames final examinations, often referred to as the external or public examinations. It is the result of an educational policy developed over many decades, and is sometimes condemned by administrators and teachers in the practical fields as handicapping teacher's initiative and a suitable selection of subject matter. Many States are seeking to get rid of this criticism by allowing internal assessment of the student to make up 20 per cent to 25 per cent of the final marks. It is being recognised that formal examinations do not give a complete picture of student accomplishment, and that skills and techniques can be judged only by continuous observation of the everyday performance of the student.

CHAPTER XII

INDIAN COUNCIL OF AGRICULTURAL RESEARCH LIBRARY

Library is both an asset and a vital need to an Institution. There is a unanimity of opinion in India that the scope for improvement of libraries in our agricultural and veterinary colleges is great. At the present stage of rapid expansion in agricultural and veterinary education, the need for equipping these institutions with libraries designed with all modern aids to render services of varied character to the students and the staff, is unquestionable. The following note prepared by the Librarian of the ICAR Library may, therefore, be found to be of interest to all those connected with our agricultural and veterinary institutions.

On the recommendations of the Royal Commission on Agriculture in India, the Government of India founded the Indian Council of Agricultural Research in May, 1929. The main object of this Council, since its inception, has been to aid and co-ordinate the agricultural research carried on in the various parts of the country. For this object, need for a well-equipped research and reference library was felt and in August 1930, the Indian Council of Agricultural Research Library was started primarily for the officers of the Council and those engaged in research work in Agriculture and allied subjects.

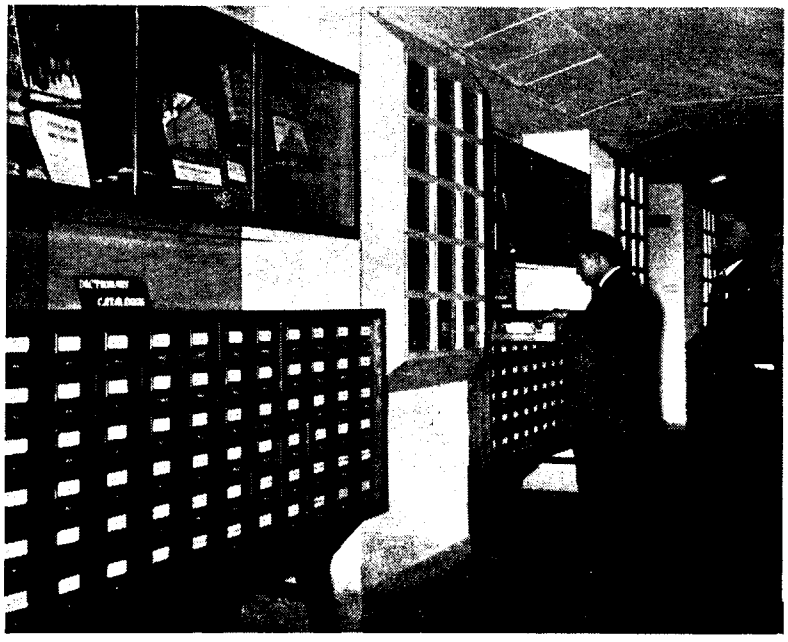
During the past 29 years, the library has developed considerably. With the establishment of the Indian Council of Agricultural Education, its activities have very much extended.

Growth and Development: As a result of the Agricultural Library Survey conducted by Dr. R.R. Shaw and the recommendations made in the Report on Library and Bibliographical Services for Agricultural Teaching and Research in India, several new services have been initiated by the library. It has been called upon to assume the responsibility of developing the library and bibliographical services in all the agricultural and veterniary colleges and research institutions in the country. A brief description of the layout, collection and arrangement, classification, catalogue, equipment, organisation and services of the ICAR library is given below.

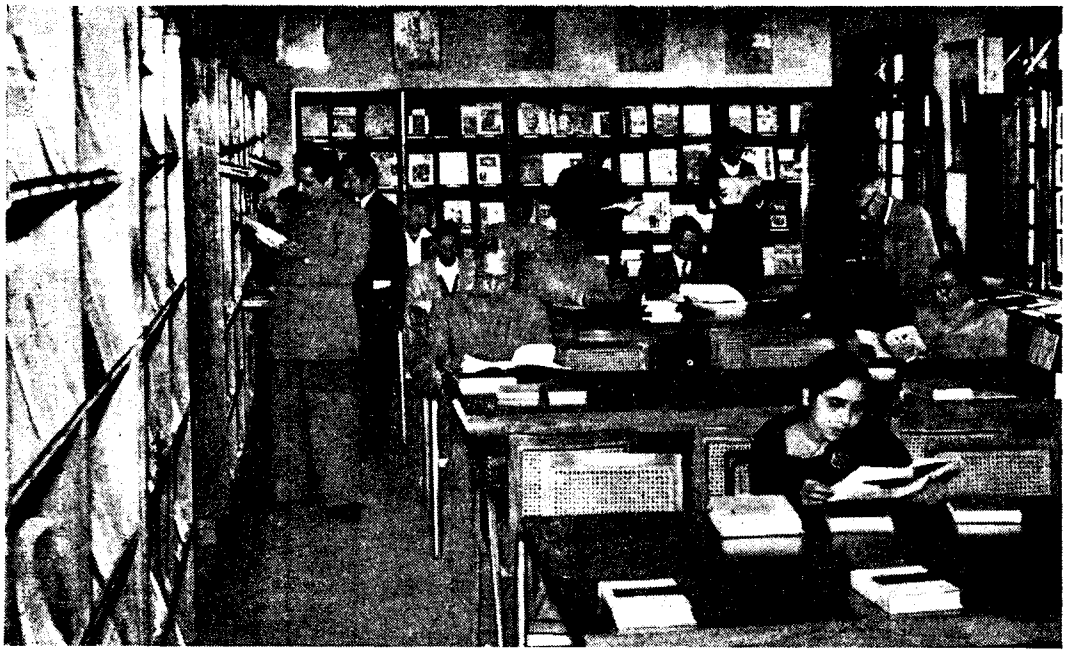
Location and Layout: The Indian Council of Agricultural Research Library is housed in the Krishi Bhawan, New Delhi.

As one enters the library, one will find on one's right, a counter table for loan transactions and maintaining the visitors' register, and one shelf for keeping visitors' belongings which are not allowed inside the Library. On the left are two catalogue cabinets each with a display case above it. These cases contain publications of the I.C.A.R. and the Commodity Committees. On both sides of the passage, transparency cabinets displaying coloured pictures, on agricultural and allied subjects are fixed. On the right of this central passage is a hall of the dimension of 121 ft. × 17.6 ft., nicely furnished with stacks of Books. On the left is a spacious reading room tastefully furnised to accommodate 40 readers at a time.

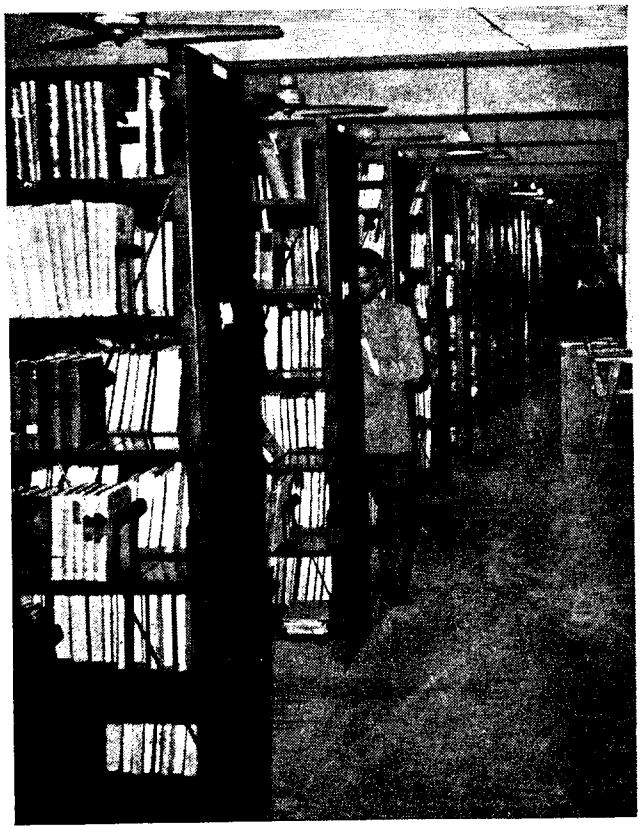
The long hall on the right side has a row of stacks made of steel. There are 18 large two faced steel stacks; each face has four bays and each bay has six shelves.



THE LIBRARY OF THE INDIAN COUNCIL OF AGRICULTURAL RESEARCH. A SCIENTIFIC SYSTEM OF INDEXING HELPS IN SPOTTING THE BOOKS QUICKLY



READING ROOM OF THE LIBRARY OF THE INDIAN COUNCIL OF AGRICULTURAL RESEARCH



I.C.A.R. Library—Books Arranged on Open Shelfs Provide Easy Reference

There are also four smaller single faced stacks. Each one of these has three bays of four shelves each. On one side of the stack room,there is a wooden almirah with sliding doors which houses extra copies of the books etc., published by the Council and the Commodity Commitees and also other costly books.

At the other end of the central passage, there is the desk for information, references and bibliographic services. The Assistant Librarian sits here to assist the readers.

Reading Room: Towards the left of the central passage of the library, is the finely got-up reading room. This hall is 55 ft. 5 in. long and 17 ft. 2½ in. wide and can accommodate 40 readers at one time. Five large reader tables provide comfort to the readers.

Along the walls of the reading room periodicals display racks are fixed. There is an attached toilet room at one end of the reading room. Beautiful paintings of the dainty Himalayan peaks and gorgeous flowering trees complete the setting of the reading room.

Collection: The collection of literature comprises books, periodicals, official publications, reports, pamphlets, reprints, trade catalogues, etc., and reference books in the form of bibliographies, indices and abstracting periodicals, dictionaries, directories, encyclopaedias, guide books, handbooks, tables, maps, atlases, etc.

The stack room houses books including reference books, bulletins, reports and bound volumes of periodicals. The reading room displays about 450 select periodicals. The display racks are so designed as to contain the back issues of the periodicals on display, on the shelf placed behind it. Indian periodicals and foreign periodicals are displayed separately. In each of these sections, the periodicals are grouped under broad subject groups.

Catalogue: There are two large catalogue cabinets each with 78 drawers. One of these is the Dictionary Catalogue holding cards prepared up to 1957. A shelf list with cards in Decimal and Universal Decimal Classification sequence completes this section. A classified catalogue has been started from January, 1958.

Previously, classification of publications was done according to the Decimal Classification. During the past ten years, there has been a change over to the U.D.C. System as the Decimal Classification system has been found inadequate for scientific research and technical libraries.

Classification Clinic: Classification is a difficult and complicated work in specialised libraries. It is very important for obtaining maximum efficiency in retrieving of the research literature in books, bulletins, reports and articles in periodicals. Some of the agricultural college libraries are classifying their books by Decimal Classification ; some are following Colon Classification and are consulting the Council's Library for the class numbers for specialised subjects and others are using U.D.C. System, after using D.C. System for some years.

Whatever may be the defects in each system, it is obvious that a remedy is necessary. As a preliminary step, the Council's Library is initiating a classification clinic. This will pool together all the problems in classification received each month, examine difficulties and advise remedies and suitable guidance for dealing with the problems in classification under a consistent principle.

Organisation and Services. The library, besides serving the needs of the staff of

the Council, is also intended to provide library-advisory and bibliographical services for agricultural teachers and research workers in India. The services provided by the library are described below.

BOOK LENDING SERVICE. All the books and publications except reference books are available on loan. Unbound issues of periodicals, single bulletins and the like, publications of poor physical make-up, are issued generally for consultation at the library reading room only. The loaning of publications is on ticket system. Books lost or injured are to be replaced or paid for by the borrower.

INTER-LIBRARY LOAN SERVICE. Loan service of the library is not limited to the collection of the library itself. The library has machinery for tapping a wider field by Inter-Library Loan-Service. This enables the officers to get on loan publications available elsewhere in Delhi and from other places inside the country. This, however, requires utmost co-operation of the borrowers as the libraries are apt to feel reluctant to continue lending if their books are not returned in time. The books borrowed from other libraries are, therefore, generally issued for reading in the library itself. To reciprocate such services of other libraries, the Council's Library also sends on Inter-Library loan publications to other libraries in Delhi.

CIRCULATION SERVICE. Selected scientific and other periodicals are circulated to the Vice-President, Commissioners, Advisers and Secretaries of the Council. Generally, it is expected that the circulated items will be returned to the library after two days. Every year, the circulation work is reviewed to enable alterations in the items required. Special publications are circulated to other officers also for information.

ENQUIRIES AND READY REFERENCE SERVICE. The library handles every day a number of ready reference inquiries on telephone, by person and on files. These include such questions as the availability of a particular book or periodical, the details for a particular periodical for subscription, specific data *viz.*, total production of wheat or rice over a few years, area sown under a crop over a few years, the exact spellings of a plant or insect name in Latin, the vernacular names of particular plants, etc. These enquiries are answered, in some cases by directing the inquirer to the source or by working with the reference books and answering them by telephone, or by noting on the files.

BIBLIOGRAPHY AND LONG RANGE REFERENCE SERVICE. The library receives a number of enquiries which involve search of literature before they are answered. These are received either in person or on files and are answered by the Librarian or the Assistant Librarian by providing guidance to the officers with regard to all the possible sources where the reply can be found, or by preparing short notes and sending them to the person concerned, on the file.

The Council's Library functions as the main reference and research library for the Advisers, Commissioners and other technical officers of the Council and the Ministry of Food and Agriculture and for all other Ministries and Departments of the Government of India, on subjects relating to Agriculture and Animal Husbandry.

ASSISTANCE IN PUBLICATION PROGRAMME. The Council has initiated during recent years a huge publication programme covering a series of agricultural text books, scientific monographs, bulletins, leaflets, etc. The library is providing reference service to assist the authors. Further, there are a number of periodicals

such as *Indian Journal of Agricultural Science, Indian Journal of Veterinary Science and Animal Husbandry, Indian Farming, Indian Horticulture*, etc., regularly published by the Council. The Library provides asistance to the editorial staff in charge of these publications, in their routine work.

DOCUMENTATION SERVICE. There are about 600 research institutes, stations, laboratories and farms, engaged in work on Agriculture and Animal Husbandry in India and a number of technical officers and research workers are engaged in research and advisory work in these institutions. It is necessary to keep them informed of what is being done and published in India. To cope up with this need the council's library has initiated the publications of two documentation lists. These are:

1. Documentation of Agriculture (the Bulletin of current reference on Agriculture in India).
2. Documentation of Animal Husbandry (the Bulletin of current reference on Animal Husbandry in India);

Each of these is a classified list of references in Indian periodicals. These lists are distributed to the stations referred to above. A project for publishing an Abstracting periodical is under way.

RESEARCH ASSISTANCE. Research scholars working at the I.A.R.I., University of Delhi and at other Universities in India very often seek the asistance of the library, either during their work or at the time of writing their thesis for reference and bibliographical services. Such requests require the formal sanction of the Secretary of the Council, after which all possible research assistance is provided to the scholars.

The following services are extended to agricultural and veterinary colleges and the professors and teachers working in those institutions.

ASSISTANCE FOR BOOK SELECTION. The Council's Library prepares and circulates to college libraries select biblio-graphies of important books on different aspects of Agriculture and Animal Husbandry. This is to enable each library to check the titles in stock with them as well as new ones to keep up-to-date the book collections in their library.

ADVISORY SERVICES. The Council's Library provides advisory service to college libraries. Council's Librarian inspects the colleges and advises them on the location, layout, equipment, functions, services, organisation and personnel for the college libraries.

CIRCULAR LETTERS. In order to provide help to the college libraries, discuss and solve difficulties encountered in their routine work as well as in developing their services, the Council has initiated a series of Library Circular Letters. These letters are intended to take one by one, all the aspects of library work and describe the important points for successfully and efficiently conducting the library work. These letters also provide a forum for discussing the problems of classification, cataloguing, referencing, etc. and assist in developing team spirit among the librarians for working together to build up a co-ordinated and integrated library and bibliographical service for the benefit of agricultural education and research in the country.

BOOK INSURANCE SCHEME. The Council's Library has initiated a scheme known as Book Insurance Scheme, with the object of assisting the college libraries to provide facilities to student population in agricultural and veterinary colleges for liberal access to books for consultation, study at the library and loan.

TRAINING AND CONSULTATION SERVICE. Librarians of agricultural and veterinary colleges are provided special training and guidance by the library. Librarians of other libraries frequently visit this library for short periods of about a week and consult the Librarian on their problems for guidance. Short Refresher courses are also organised for the benefit of college librarians. One such course was completed in October 1959.

PHOTOSTAT AND MICROFILM SERVICES. The Council is to instal shortly Photostat and Microfilm Units to meet the growing demand for these in the monograph and other publication activities of the Council and also to provide service to the research enquiries from outside.

APPENDICES

APPENDIX I

RECOMMENDATIONS OF THE FIRST SEMINAR ON TEACHING METHODS IN AGRICULTURAL AND VETERINARY SCIENCES

Objectives and Methods of Teaching: Bearing in mind that the methods of teaching have a direct relation to the purpose of teaching, it is proposed that the purpose of teaching should be, in addition to covering the subject matter, to stimulate a spirit of inquiry and creative capacity in the student so as to enable him to think for himself and act accordingly.

The following recommendations on the methods of teaching are made in keeping with this basic purpose.

Lecture Method

(*a*) Lectures have a very useful place in the educative process. However, the student should be supplied with mimeographed lecture material not in detail, but rather in the form of outlines covering the main points.

(*b*) Dictation of notes will in this way be unnecessary; it should be avoided.

(*c*) Factual information in lectures is not usually well remembered. It is therefore, preferable to supply such factual information in the mimeographed notes or in assigned readings.

(*d*) Lectures should be used to introduce the subjects to the student to stimulate interest in the subject and to give him an idea of the correct approach to the study of the subject.

(*e*) Problem exercises designed by the teacher should be worked out by the students as a way of learning fundamental principles.

(*f*) Questions from the students should be encouraged during lecture hours to help them clear their doubts.

(*g*) At the end of each lecture-topic, questions based on the topic may be designed by the teacher and given to the students for answering. This should be made compulsory. The answers received should be corrected by the teacher and be kept in the library for reference. The questions should be so drawn that the student is forced to analyse and correlate the facts rather than merely collect information from various references.

(*h*) Use should be made of specialists in subjects to supplement the planned teaching programme with a view to strengthening it.

Discussion as a Method of Teaching

Realising that lecturing is a slow process of teaching, it is recommended that lectures should be supplemented by discussions encouraged during the lecture. Questions by students during lecture hours may be taken advantage of by the teacher for developing lively discussion. Besides, planned discussions may be arranged so that a fuller understanding of the topic is achieved by the student. It is further

recommended that at least 20 per cent of the total teaching time allotted to a subject (theory and practicals) may be devoted to discussion.

It is desirable, wherever possible, that planned discussions take place in classes of not more than 30 students. Such discussions may take place either during lecture periods or during practicals. Spontaneous discussions may be developed by the teacher from questions asked by the students also. The teacher may start discussions by asking questions when he feels that certain students are not following his ideas.

In respect of planned discussions, the following alternative techniques are suggested:

(*a*) The class may be given a specific topic by the teachers and after a suitable interval for study the students hold discussion among themselves on the topic with the teacher acting as moderator and advisor.

(*b*) A student may be asked to lecture for about 15 minutes in the class on a specific topic which may be followed by a discussion on similar lines as above.

(*c*) Special sessions may be held with sufficient notice to the students, for questions by the students on any topic to that date in the course.

It is suggested that a record of these discussions be maintained by the teacher.

The Practicals as a Method of Teaching

The importance of the practical work on a subject is that it is the student's connecting link between his class-work and its practical application in the field. The following recommendations arise from this principle.

(*a*) Laboratory exercises should be so designed that they induce the student to pay as much attention to the fundamental principles as to the technique of the experiment.

(*b*) The practical utility laboratory or field exercise to be conducted should be explained to the students by the teacher before commencing the practical.

(*c*) The teacher should inform the students of the results to be achieved and principles to be studied in the practical, and allow the student to work it out for himself so that at the end of the practical the student has a feeling of accomplishing something on his own.

(*d*) The teacher's role should be to guide the student in this analysis.

(*e*) The professor should exercise a close watch on the designing and conduct of the practicals. Preferably he should take a few practicals himself regularly.

The aforesaid recommendations can be implemented without involving any extra expense or changes in curriculla or syllabi.

In order to ensure the effective utilization of the teaching methods the qualifications for appointment to teaching positions and for promotions should be based upon teaching competence as well as technical competence in a subject. Therefore, the principal and the professor concerned should be closely associated in the selection of the personnel. It is equally necessary to suggest that frequent transfers of the teaching staff should be avoided.

It is recognised that there are other methods of teaching not discussed here

and that no single method is in itself complete ; each serves a particular purpose. It is urged that teachers try all different methods and observe and report the results for the benefit of others. A combination of many methods is undoubtedly necessary to the achievement of maximum effectiveness in the teaching of the highly varied courses of agricultural and veterinary sciences.

TEACHING AIDS

The existing simple teaching aids are not being utilized effectively. Over-emphasis on specialised teaching equipments, such as, sound projectors, tape recorders should be guarded against as the simple teaching aids could be used to the best advantage. With a little expenditure, a number of aids could be improvised. However, it is essential to provide additional funds to institutions to provide a minimum of specialised equipment so as to modernise teaching in agriculture and veterinary colleges.

Having regard to the above the following recommendations are made.

Part A

1. The institutions should take stock of the existing teaching aids such as black-boards, bulletin boards, graphs, charts, posters, maps, specimens, models, and ensure that they are utilized effectively. Holidays and beginnings of sessions could be utilized to familiarise the teachers in understanding the role of teaching aids in education.

In case any institution does not have any of these simple teaching aids, steps should be taken to provide them.

2. Special efforts should be made by instructors to produce new illustrative and visual aids, taking advantage of interested and talented students. Teachers should be given sufficient free time for this purpose.

3. Teachers should be given every encouragement for perfection in the use of teaching aids by

(*a*) holding staff seminars;

(*b*) arranging lectures by experts in educational methods etc.,

(*c*) giving them opportunities to visit other institutions to enable them to exchange views and ideas.

4. Conscious effort should be made to use the library as a teaching aid. To make its use more effective, adequate number of textbooks and important reference books should be provided. Bulletins, pamphlets, and other publications should be properly classified and attention of the teacher drawn to this.

5. Use of museums should be made as freely as possible as an aid to teaching. Where museums do not exist, arrangements for establishing them should be made. Where museums do exist, they should be improved.

Part B

1. A central exhibition on teaching aids, should be organised under the auspices of the Indian Council of Agricultural Education. It is suggested that colleges be asked to enter in a competition and attractive prizes offered for winner institutions.

A set of selected teaching exhibits may be circulated to all the institutions.

2. The *Journal of the Indian Council of Agricultural Education* should devote a section to teaching aids.

3. All agricultural educational institutions should register as members, of Central Film Library set up by the Indian Council of Agricultural Research. The Film Library should also stock films which can serve as aids to agricultural teaching and suggestions from institutions for the procurement should receive due consideration.

Part C

Every institution should have:

(*i*) a good still projector to show 2 × 2 inches slides, film strips,
(*ii*) a good beaded screen,
(*iii*) a 16 mm. sound movie projector,
(*iv*) two cameras—one for 35 mm. film and the other for 6 × 6 cm. film of reflex type to enable the teachers to produce for themselves slides, film strips, enlarged photographs, etc.
(*v*) a tape recorder,
(*vi*) at least one room for projecting pictures,
(*vii*) an artist-cum-photographer.

STUDIES AND TOURS

Properly selected and organised field study and tours have been recognised to be one of the most effective and efficient methods of teaching the practical application of scientific studies in agricultural and veterinary colleges. Such study should be encouraged and expanded.

I. Every college of Agriculture and Veterinary Science should have as the need may be:

(*a*) crop and horticulture farms;
(*b*) livestock farm consisting of (*i*) Dairy Unit, (*ii*) Sheep and Goat Units, (*iii*) Poultry Unit and (*iv*) Piggery, if required and
(*c*) an ambulatory clinic.

Within the State, special trips to Government and private owned farms should be made for the study on specific subject(s) for which transport facilities should be provided by the institution or management. Community Project and National Extension Service Blocks within the area should also be included.

II. Senior students of the agriculture and veterinary colleges should be given facilities to visit important organisations or projects outside the State for which such facilities do not exist in the State.

III. 1. Field study should be extended to all branches of learning of major items of regional importance, *e.g.*, Major Crops, Breeds of Livestock and Poultry, Diseases, Dairy Farms, Animal Hygiene, etc.

2. Preparation for field study:

(*a*) This should be entrusted to the professors concerned and should be programmed in such a way as to conform to the theoretical background already covered. However, opportunities should be taken advantage

of as and when they arise for demonstrating practical aspects of important problems.

(*b*) The aim of field study should, as far as possible, be intensive and not extensive.

(*c*) Time spent at each station, project or organisation should be in relation to its importance.

(*d*) After the general survey of the station, project or organisation, groups of students should be assigned to study special aspects of the project or organisation as the case may be, for further discussion. For this purpose, a carefully designed set of questions should be prepared by the teacher prior to the field trip and given to the students.

3. *Teacher student ratio when on tour*

Adequate number of staff should accompany the students while on tour. It is recommended that the teacher student ratio should be not less than 1 :20.

4. *Post tour analysis and record*

On conclusion of the the tour the Professor(s)-in-charge should ensure that every student has understood all the important items that were seen, through discussion and report, and such study should be integrated in the general pattern of learning. The marks awarded for such field study and tour work must be taken into account along with the grades received throughout the year, for considering the merit of the student to receive his final pass or degree.

STUDENT TEACHER RELATIONSHIP

A proper student teacher relationship is one of the important factors contributing to the success of a teaching programme. The objective is to develop mutual respect, the student and the teacher treating each other as individuals having certain rights and responsibilities. A student should be treated in such a way that he feels at home in the presence of his teacher and feels confident that he can meet him always as a friend, philosopher and guide. To achieve this, all measures should be taken to bring the teacher and the student closer together in our agricultural and veterinary colleges, so that this may lead to better training and better adjustment to his environment and career. To this end, the following recommendations which directly or indirectly relate to the student teacher relationship are made.

1. While there are Students' Unions and Staff Councils working separately in several colleges, there is at present no overall organization to bring the student representatives and teacher representatives together to enable a free discussion of the difficulties and problems of the students as they arise. It is, therefore, recommended that in each college there should be a 'Student-Teacher Council' consisting of student representatives drawn from the various student organisations and teacher representatives, with the Principal or the Head of the institution as the *Ex-Officio* President. It is suggested that such a Council should meet regularly and periodically at least once in a month and that the proceedings be as informal as possible, to enable the students to speak out their minds and that remedies are found on the spot as far as possible. As a result of such deliberations, anything that would lead to a feeling of victimization in the mind of a student should be particularly avoided.

2. In some agricultural and veterinary colleges, there is an Advisor-Ward System

in which every teacher is allotted a small number of students under his charge and he guides the progress of each individual student throughout his stay in the college in all personal and other problems. This system may be adopted in all agricultural and veterinary colleges. Wherever possible, the student should be assigned to an Advisor with whom he has some common interest.

It is suggested that the Advisor may maintain a personal record of each student with regard to the period prior to his enrolment and throughout his stay in the college. This background information will help the advisor in guiding the student.

The data for the confidential use of the advisor may include information on his personal background, economic status, personal interests, hobbies and games activities, etc., and health and physical condition. Much of the basic data will ordinarily be available from the office of the Principal.

A copy of the suggested proforma is appended (Appendix X).

3. It is found that while the concept of an agricultural and veterinary college is that of a residential campus, there are some colleges where a significant percentage of students are residing outside the campus for want of sufficient accommodation in the hostel ; and in all colleges without exception, a proportion of teachers are not provided with any residential accommodation in the college campus, and in some other colleges there is no residence at all provided for any teacher, including the Warden of the hostel and the Principal. This situation is not conducive to closer contact between the students and the teachers. This defect should be remedied as early as possible.

It is further recommended that residence for teachers may be allotted rent free or at nominal rents, as this will compensate to some extent for the extra hours spent by the teachers on the welfare of the students and such facilities or amenities may also incidentally prevent the flight of personnel from the agricultural and veterinary colleges.

4. In recent years, there has been considerable increase in admissions to the agricultural and veterinary colleges, to meet the developmental needs of the country. However, there has not been proportionate increase in the teaching staff, thus adversely affecting the student-teacher ratio and incidentally the student-teacher relationship also. This defect may be remedied as early as possible and that particularly in the case of practical and laboratory classes, an approximate student teacher ratio of 12:1 be maintained.

5. It is recommended on the basis of success met with in the American Universities, that each year there should be an Orientation Week in every college soon after enrolment, during which period the freshmen are brought into social contact with the teachers and advisors with whom they would be associated during the year, through informal group meetings and socials. During this week, the students should also be acquainted with the traditions of the college, their objectives and goals, rules and regulations, the details of the several student organisations, the general facilities in the college, libraries, locations of buildings and departments, etc. This is primarily meant to introduce friendliness between the students and the teachers from the start and also to facilitate the students feeling at home from the very commencement.

6. The Heads of Sections or the Senior Professors concerned should assume responsibility of orienting inexperienced or new teachers when they are appointed on the staff. They should particularly guide them with regard to the proper student-teacher relationship.

7. Recognising the value of student clubs, such as literary clubs, debating societies, dramatic clubs and other clubs as horticultural clubs, poultry clubs and other interest groups, athletic associations, music, fine arts and photographic clubs, etc., as agencies in the improvement of student-teacher relationship, the members of staff should be encouraged to participate in the activities of these clubs. Frequent excursions and picnics with the students, apart from the educational tours are also desirable.

8. The teachers should be divested of minor, routine administrative and accounts work, and their teaching and research load should be so adjusted that they have time to maintain closer contact with the students. It is suggested that every teacher should have some definite hours suited to the students assigned for student-contact, wherever feasible.

9. It is observed that in both agricultural and veterinary colleges the students at present are confined to their class-rooms for unduly long hours working in some cases even up to 40 hours in a week spread over 6 days. This, together with the time required for preparation and study by the students, leaves very little or no time for personal contact between the teacher and the student outside the class-room. One of the ways by which this pressure on the student during working days can be minimised, is to explore possible ways of decreasing the number of holidays during the academic year. Nevertheless, the holidays that come in-between the working days during the year can be utilised by the teachers for contacting the students either in the hostels or in their own homes, particularly since the agricultural and veterinary colleges are generally residential. Moreover, even within the existing teaching hours, it is possible for the teacher to improve his contact with his students by organising his teaching methods in such a way, particularly during practical classes, that through discussions, suitable aids of teaching and other improved teaching methods, he is able to come into contact with individual students.

10. It is observed that there are instances of teachers who have established their reputation not only for teaching but also for cordial relationship with the students being transferred from their posts for administrative convenience. Such transfers, as far as possible, may be avoided in the interest of student-teacher relationship without prejudice to the prospects of promotion.

11. It is imperative that every teacher should try to make himself accessible to his students as much as possible, and to encourage a healthy freedom of expression on the part of the students by a friendly response to his questions and doubts, not only with regard to the subject which he is teaching, but also in other probems of the students.

In conclusion, it may be stated that these recommendations are no substitute for a good teacher, who has the proper sympathy and interest of the student at heart. This will mean that the proper student-teacher relationship begins with the selection of the teacher himself. Every effort should, therefore be made to select the proper teacher at the time a vacancy is filled.

TEST, EXAMINATIONS AND EVALUATION OF STUDENTS' WORK

1. Periodical class tests should be more widely recognised as effective teaching aids and should be considered as of equal importance in grading the students as the examinations conducted by the Universities. The marks obtained in such tests should be given due credit as a part of the University examination.

2. The periodical class tests should be so designed as to encourage the student to make use of the library facilities at the college to the maximum extent.
3. The tests may be conducted at convenient intervals. It is recommended that there should be at least one test, both written and practical, in a month, in each subject. These tests should be conducted by the lecturers actually handling the classes.
4. Only teachers who are actually handling the subject in the colleges should be Internal Examiners for the subject in the college concerned.
5. External Examiners and paper setters should be teachers of recognised Universities, who are actually handling the subject or have done so within the past five years.
6. It is felt that in order to attract students of higher calibre to the agricultural and veterinary colleges, the pay and prospects of the agricultural and veterinary graduates should be substantially improved.

TEACHER EVALUATION AND IMPROVEMENT

Teacher evaluation requires to be done on a clear understanding of the objectives and principles. The objective of teaching is not merely the transmission of knowledge but the building up of knowledge and understanding in the student. The teacher is the most active participant in the transmission of knowledge, stimulating the learning process and creating love and interest in the subject. A qualified teacher is the foremost requisite for good teaching. But equally important is the love of the subject and student, to promote understanding, sharpen his critical faculties and create a genuine love for the subject. These are some of the important objectives which should animate the teacher.

In working towards such objectives, the organisation and set up of our teaching institutions, the recruitment and service regulations are all important. It is not proposed nor is it necessary to detail all these features but it is a fact that any method devised to evaluate the teacher has to be based on all the aforesaid factors. It may be recognised that the development of understanding in the students will depend on the training and equipment of the students as much as those in the teacher. The value of a teacher tied down to a rigid and overloaded syllabus cannot be the same as of one who has to follow a flexible syllabus with wide choice of subjects and with less teaching loads. Under a system of examination where memorisation is given a premium, the problems of the teacher get aggravated. These are *inter alia* some of the important considerations that influence the adoption of a standard evaluation method.

The evaluation of a teacher begins with his recruitment to the teaching profession. The desire to grow professionally being not a uniform quality, measures have to be devised to spot out and encourage those who keep their knowledge trim, are pains-taking, are animated by a spirit of love and devotion to the subject, and place the interests of the students above everything else. Any method that could foster these qualities will help in uplifting the standard of teaching and, therefore, the quantity and quality of learning.

Teacher evaluation has to be based on the need to provide a motivating force rather than to serve as an authoritative, coercive measure to be dreaded by the teacher ; any matter that is not likely to appeal to the teacher class as a whole may, therefore, hinder rather than promote the interests of teaching.

Methods of Evaluation

After a detailed consideration of all the possible methods of teacher evaluation, the Seminar expressed the opinion that the teacher evaluation through examination results would be an unsafe standard, mainly because of the type of students that the agricultural and veterinary colleges are able to attract at present and the difficulties of current syllabi and examination systems.

Among all methods of teacher evaluation the one that has been used most extensively in the U.S.A. is the 'Rating Scale' Card which is a pro-forma containing certain questions to which the students have to answer anonymously. Experience of use of similar rating cards for short periods in some of the colleges of agriculture indicates that with such modification as are felt necessary, these rating cards would be a useful instrument to the teacher to assess his own teaching performance through the eyes of the students. The attached specimen rating card (Appendix XI) in use in the U.S.A. may be employed with advantage by those who voluntarily desire this method for self improvement.

Alumni opinion has been suggested in some quarters as a means of teacher evaluation. The Seminar did not consider this as a useful method.

The scrutiny of lecture notes is yet another method that was discussed. In view of the fact that the printing of lecture notes is under active consideration, the Seminar did not consider it necessary to commend this method for teacher evaluation.

Another method for teaching improvement and self evaluation would be by eliciting the opinion of the associates of the Faculty who might be invited to attend the classes and offer their suggestions. The view was expressed that this method may be useful and commended to the teacher for voluntary adoption.

An evaluation of the efforts by the teacher towards the highest standard of efficiency and usefulness would obviously be desirable but the Seminar considered that in view of the difficulties in adopting a standard method of evaluation in this respect, no practicable suggestions were possible.

A suggestion for an objective self assessment of teaching which may be helpful to the teacher would be the use of, on demand, tape records. Opportunities for tape recording may be given to teachers who may desire to make such records for self improvement by playing them back.

The Seminar is of the view that no evaluation methods can be of any use if rigid standards of evaluation are not adopted at the time of selection or posting of personnel for teaching. The Seminar noted that in a few centres there is only a single cadre for services in all fields of agricultural activities, education, research and extension, and this enables unrestricted transfer of personnel from one branch to the other, to the detriment to the teaching efficiency and interests of the students. Such unrestricted transfers should be avoided as far as possible without detriment to the future prospects of the incumbent. To promote teaching efficiency, the Seminar recommends that the minimum qualifications for appointment should be:

(*a*) Basic Degree or Diploma in Agriculture and Veterinary or allied pure Science subjects when permissible at the professional stage;

(*b*) Experience in the line of teaching, if possible;

(*c*) Post-Graduate Research experience in the subject for teachers at higher levels.

The Seminar recommends that these minimum requisite qualifications together with the aptitude for teaching should be the governing principles in the appointment of teachers.

The provision of an adequate motivating force is the pre-requisite for improvement in the teacher. Inequalities of opportunities and absence of any suitable rewards which the teacher could aspire to, serve to limit the chance for full development of the teacher's talents and performance. The creation of a few selection posts on a higher cadre to which teachers of outstanding ability could aspire, regardless of seniority and purely on grounds of merit and usefulness, is, therefore, recommended.

APPENDIX II

RECOMMENDATIONS OF THE SECOND SEMINAR ON TEACHING METHODS IN AGRICULTURAL AND VETERINARY SCIENCES

STUDENT COUNSELLING

There is a strong need for counselling to help students to make intelligent decisions regarding their educational, psychological, social and economic problems.

Counselling to acquaint new students with the college, its staff and facilities, its traditions and its rules and regulations should be provided by means of orientation periods at the beginning of each academic year.

The colleges have a continuing responsibility in providing guidance to students on the following types of problems:

(*i*) The selection of elective courses of study where the curriculum provides for electives;

(*ii*) Academic difficulties;

(*iii*) Choice of vocation and placement;

(*iv*) Selection of institution for post-graduate studies; and

(*v*) Personal, social and financial problems.

The tutorial system now in use at many of the colleges is useful in providing much of the counselling needed by students. However, since the tutorial system at times includes junior staff members who are not sufficiently experienced to give adequate counsel on many important problems of students, it is recommended that each college should form a committee which would have the responsibility of reviewing and developing the counselling service of the college. Members of this Committee might also serve as a Panel of Counsellors to advise students on problems on which the tutors are not competent to give guidance.

It is recognised that adequate counselling on many of the problems faced by college students requires special training and experience not ordinarily found in the regular teaching staff of agriculture and veterinary colleges. It is, therefore, recommended that each college give consideration to the appointment of specialised personnel for counselling work.

FINANCIAL AID

It was agreed that the financial aid to the deserving and needy students, on merit and poverty basis, is very essential to attract a greater number of students of higher calibre, although the major factor to attract the students to the agricultural and veterinary colleges would be the scales of pay and prospects, after the completion of the courses. As an outcome of the detailed discussions by the various groups, separately and in the plenary session, the following recommendations were adopted.

1. As far as possible, the number of scholarships, stipends and concessions in tuition fees granted by the Governments, Universities and other agencies to the deserving and needy students should be increased ; however, no merit scholarships should be awarded to students securing less than 50 per cent marks. The value of such

scholarships and other aids should be fairly high. Besides the above mentioned sources of scholarships, the local bodies, alumni associations, marketing committees, Rockefeller and Ford Foundations, and trusts like Tata and other private firms and persons who have funds available for such purposes should be approached for granting handsome scholarships tenable in agricultural and veterinary colleges.

2. Assistantships for the post-graduate students be created subject-wise, at least one in each subject and awarded purely on merit.

3. Revolving loan funds should be created in each college and money should be secured from the State Governments, Universities, Co-operative Societies, Rockefeller Foundation and such other sources. Part of the fines collected from students should be credited to the Student Loan Fund. They may be advanced to deserving students, who should be required to repay these loans within a reasonable period of their securing gainful employment. Each college will frame rules as necessary for grant and recovery of such loans.

4. Where facilities exist, part-time jobs on suitable remuneration basis may be made available to needy students by engaging them in the library, cafeteria, dairy, poultry, agricultural farm, research projects, etc.

CLASS SCHEDULES

It is recognised that continuous class work without a break is not the best method of learning or the best time used by the students. It is like-wise recognised that teachers who do research work keep abreast in their field of science and are there fore, better able to keep their students up-to-date.

It is, therefore, recommended that:

(*i*) As far as possible, students should not be allowed to take a course load that requires more than 36 hours of class work per week ;

(*ii*) The out-side class assignments be made to encourage independent study and library use ;

(*iii*) The students should have some voice in and responsibility for their own education and be allowed some electives, wherever possible, to broaden their education ;

(*iv*) Teachers have at least two hours time for preparation, paper grading and other college services for each one hour they are in class; and

(*v*) Teachers be encouraged to carry on research in their major field and that their teaching load be reduced accordingly.

IN-SERVICE TRAINING OF TEACHERS IN TEACHING METHODS

It is recognised that there exists a definite need for training the teachers of agricultural and veterinary colleges in the methods of teaching. The three ways to organise this training programme are as follows:

1. (*a*) A central agency may organise such a course for a duration of six weeks during the holidays at the Central Research Institutes where suitable facilities exist. These should be organised in co-operation with specialists of the Central Institute of Education and other similar training institutions in the States.

(*b*) Such training seminars may be conducted on regional basis.

(*c*) In the various colleges, teacher entrants and others should receive a short course of training in general methods and principles of education. This course should be given by education experts from training colleges and those who have already undergone such a training at a central institute.

It is desirable that this training in teaching should be organised simultaneously with 'training in subject-matter'.

2. The exchange of teachers between Indian colleges and foreign universities should be encouraged and the staff deputed for the purpose should continue in their posts at least for three years after their return. Besides, the T.C.M. and other programmes, deputation by State Governments may also be encouraged. Participants going for training in different subject-matters, may also be required to undergo a short course on teaching methods.

3. The Indian Council of Agricultural Education should take the responsibility of improving the quality of teaching in various colleges and should adopt necessary measures to maintain standards of agricultural and veterinary education as early as possible.

4. Selected books on teaching methods in agriculture and veterinary education should be made available to teachers.

EFFECTIVE USE OF LIBRARY

In view of the growing importance of libraries in our intensive programme of agricultural and veterinary education, the Seminar feels that the implementation of the useful suggestions made by Dr. Ralph Shaw has already been unduly delayed, and recommends with special emphasis the following for immediate adoption.

1. The library should be centrally located and so housed as to have ample scope for future expansion.

2. The Librarian and Assistant Librarian(s) should preferably be Science graduates with recognised Degree or Diploma in Librarianship. To ensure efficient all-time service, they should be employed on the same pay scales as for Assistant Professors and Lecturers respectively.

3. The library should function on the open-shelf system with proper vigilance against losses.

4. Text-books and such other costly publications as are frequently required by students should be stocked in sufficient numbers, say in the ratio of one copy to every ten users. Non-technical books of general knowledge should also be included.

5. To encourage the library habit among students, reading assignments be made and to assist them in this task, the working hours of the library should be extended beyond the regluar teaching hours. Such extended hours may be from 8 A.M. to 10 P.M. in one session or in suitably interrupted sessions.

6. The librarians be included among the participants selected for training in specialised fields under the Inter-Institutional Programme.

IN-SERVICE TRAINING OF TEACHERS IN SUBJECT-MATTER

Recognising the in-service training of teachers in subject-matter to keep them up-to-date in their respective fields, the Seminar makes the following recommendations.

1. Teachers should be encouraged to attend meetings of scientific and professional societies in their subject-matter fields, and funds provided to meet the necessary travel expenses incurred.
2. Refresher courses be organised on a regional basis, the same to be scheduled during vacation periods so that teachers may find it convenient to attend.
3. Staff Seminars be arranged in all colleges as a means for promoting free and full discussion and inter-change of information which may be useful to teachers in their work.
4. Teachers should be encouraged to conduct original research in their respective fields, and their teaching assignments be adjusted as necessary to allow time for such research.
5. Provision should be made for study leave and other types of leaves so that teachers may engage in short-term research projects or study for higher degrees than the minimum prescribed for the post.
6. The extent to which individual teachers take advantage of the opportunities provided for professional improvement, should be taken into consideration when promotions and salary increases are recommended.
7. Specialists should be invited to the colleges to deliver lectures in their specialised fields.

ORGANISATION OF COMMITTEES ON REGIONAL BASIS FOR SURVEY OF THE IMPLEMENTATION OF THE TEACHING SEMINARS

It is recommended, that Sub-Committees of professional men with power to co-opt be appointed by the Regional Advisory Committee.

Each Sub-committee will report to its parent Committee the extent to which the recommendations have been adopted. The Sub-committee will also report as to which of the recommendations could not be implemented and the remedial measures that can be instituted in this connection. The report of the Sub-committees will be placed before the respective Regional Advisory Committees.

EXAMINATION AS A TEACHING AID

The University Education Commission and the Joint Indo-American Team on Agricultural Research and Education have been very critical of the examination system. Here are given a few excerpts from their recommendations.

" An unsound examination system continues to lower the standards of instruction to the detriment of a quickly expanding system of education. In our visits to the universities, we heard from teachers and students alike the endless tale of how examinations have become an aid and end of education, how all instruction is subordinated to them, how they kill all initiative in the teacher and the student, how capricious, invalid, unreliable and inadequate they are, and how they tend to corrupt the moral standards of University life."

(University Education Commission)

" It has subjected teaching to the examination, made it almost impossible to provide true education and to develop wider interests and has created temptations of cheating, corruption and favouritism. The obsession to secure, as it were, a ticket in

lottery of job securing has over-shadowed the educational purpose which good examination can serve."

(University Education Commission)

" In most countries, it is recognised that there is a high degree of correlation between the relative autonomy of colleges and universities and their efficiency and prestige." (Joint Indo-American Team on Agricultural Research & Education)

It is very clear from these statements that as long as the present system of examination is in vogue, its usefulness as a teaching tool will remain very limited. The following recommendations are, therefore, made.

1. The maximum usefulness of examination as a teaching tool will be possible only when the university departments of studies and colleges are given full autonomy in the matter of examination and syllabus. Full autonomy should, therefore, be recognised as a very desirable goal. When the stage is reached, the function of the university will be to see to the maintanance of proper standards. The role of the affiliating Universities will be similar to those of the Accreditation Boards in the U.S.A.
2. Full autonomy should be reached through stages. Progressive internal appraisal along with external examinations should be a feature of all university examinations. At least 25 per cent of the total marks should be assigned to periodical asessments and term examinations, etc. The universities and colleges which have gone beyond this should continue to experiment with increasing weightage to internal examinations till the goal of full autonomy is achieved.
3. Certain university departments of studies and colleges should be selected for experiment in complete autonomy under proper supervision and guidance.

In view of the importance of the subject, it is recommended that a committee on examinations be appointed by the I.C.A.E. to draw a programme for progressive decentralisation of examination and evolution of full autonomy.

This Committee should also report on (i) attendance requirements of students for appearing at an examination (ii) marks requirements for a pass and division placement (iii) the advisability of doing away with the classification and (iv) reduction in the number of holidays with a view to increasing the number of working days.

ACCOMMODATION FACILITIES FOR TEACHING AND RESEARCH

Adequate accommodation facilities for research and recreation form an indispensable adjunct in any teaching and research institution. In view of the large number of details which are required to be considerd in this context, it was resolved that two separate committees, one for agriculture colleges and the other for veterinary colleges, may be constituted by the I.C.A.E. to decide upon the detailed requirements of colleges. The recommendations of the Seminar may be taken as a basis for this purpose.

IMPORTANCE OF RESEARCH IN TEACHING PROGRAMMES

The Seminar strongly feels the necessity of research work to be undertaken by the teacher which would keep him fully equipped with recent developments in his field. The types of problems to be investigated should be generally of applied nature

relating to the subject of the teacher concerned keeping in view the State research programmes.

For better assessment of such programmes, a Research Council should be set up in the college consisting of the Principal and Heads of the college departments. Such programmes which require co-ordinated efforts of different specialists should be jointly handled by such specialists under the guidance of the Principal.

Teaching and research should be integrated at the college departmental level. When this action is implemented, naturally, many of the teachers would be engaged in active research and many of the research workers in active teaching.

SHOULD TEACHING AND RESEARCH SECTION OF A COLLEGE FARM BE AN EARNING SECTION?

Since the aim of agricultural and veterinary colleges is teaching and research, the emphasis on farms attached to them should also be the same. The main objective of the college farm is not to make profit. Any profit that accrues is incidental. The success of these farms may be assessed by scientific improvements, performance and efficiency rather than in terms of financial returns.

The energy and attention of the college staff should not be diverted from their main function of education and research to operating a commercial farm. To acquaint the students with commercial farms, it is desirable to select a few successful farms in the neighbourhood of the college.

INTRODUCTION OF 'ELECTIVE' OR 'OPTIONAL' SYSTEM FOR AGRICULTURE AND VETERINARY EDUCATION

The Seminar is of the opinion that there is some scope for the introduction of ' Elective ' or ' Optional ' system at the under-graduate level. This may be tried wherever feasible by re-adjustment of syllabi.

It is further suggested that a small committee be appointed by the Indian Council of Agricultural Education to go into this question and recommend suitable syllabi.

STUDENT-TEACHER RATIO

In recent years, there has been great demand of agicultural and veterinary graduates in various departments and institutions. This has resulted in considerable increase in the enrolment of students in colleges. But there has not been proportionate increase in the teaching staff. Hence, it is feared that the standard of teaching is bound to be affected. This fact was partially realised in the teaching Seminar held at Trivandrum, in 1957 when it was recommended that the student-teacher ratio in practical classes be fixed at 12 : 1.

In view of the experience gained since then in various institutes, the matter was reconsidered in the Seminar from different angles and the following recommendations were made:

(i) No limit should be fixed for the number of students in theory classes for under-graduate Courses but as far as possible it should not be unwieldy. In practical classes, the ratio should be 15 to 20 students per demonstrator besides the Teacher-in-charge.

(ii) The guidance of research should be entrusted to senior members of the

staff and not more than four students should be under the guidance of one teacher.

(iii) The number of students in tutorial classes should not exceed 15 per teacher.

(iv) While on educational tour, a batch of every 20 students or a fraction thereof above 20, be entrusted to the care of one teacher.

(v) The contact hours with students should be so devised that they get sufficient leisure hours. As far as possible, the load of teaching should not exceed 36 hours per week. In addition, 4 hours should be reserved for library assignment.

This can be done by (i) reducing the number of holidays and (ii) careful preparation of class notes both for theory and practical classes avoiding overlapping.

"SELECTED METHODS OF TEACHING" AND "FLEXIBILITY VERSUS RIGIDITY OF CURRICULA"

The papers contributed on 'Selected methods of teaching' and 'Flexibility versus rigidity of curricula' are very important and require thorough and careful study by each and every teacher in agricultural and veterinary college. Sufficient number of copies of the two papers should be got prepared for distribution to the colleges. The Principals of the colleges will report in due course on the results of measures adopted to the Sub-committee of the Regional Advisory Committee on implementation of Seminar Recommendations which will further be considered at a Seminar on Teaching Methods.

APPENDIX III

Suggested Departmental Organization and Allocation of Subjects

College of Agriculture, University of Agriculture, U.P.

	Animal Husbandry	Agronomy	Horticulture and Forestry	Agricultural Economics and Rural Sociology	Entomology	Plant Pathology	Remarks
First year	Introduction to Animal Science	Field Crops	Elementary Horticulture	Elements of Agricultural Economics			1. See School of Basic Sciences and Humanities for other Courses. 2. A Course in Elements of Agricultural Engineering should be available for First Year students, to be taught in the College of Agricultural Engineering and Technology when organised.
Second year	Elements of Animal Nutrition, Dairy manufacturing, Livestock production	Soils (Principles)	Farm Forestry, Plant Propagation	Farm Management, Marketing Farm-products	Elements of Entomology		1. Courses in Metal and Wood working and in Applied Agricultural Engineering would be taught in the College of Agricultural Engineering and Technology.

Third year	Livestock Breeds and Management, Artificial insemination, Advanced Animal Nutrition, Animal Genetics, Dairy Chemistry, Dairy Bacteriology, Meat processing	Weed control, Plant breeding & genetics, Plant nutrition, Morphology & systematics, Forage and fodder crops, Poisonous plants, Cereal crops, Soil Management	Orchard management, Fruit and Vegetable Preservation, Vegetable production, Horticultural seed production	Rural Sociology, Advanced farm management, Agricultural Credit and financing, Co-operatives, Grain marketing, Marketing horticultural crops	Fundamentals of insect control, Insect Bionomics	Introduction to Plant Pathology	1. Courses in Animal Pathology and Hygiene, Physiology of Domestic Animals and food sanitation are taught in the College of Veterinary Science. 2. Extension methods and vocational education are taught in Departments of the School of Basic Sciences and Humanities
Fourth and subsequent years	Poultry production, Sheep and Goat production, Swine production, Dairy production, Dairy plant management, Hatchery management	Soil physics, Soil fertility and fertilizers, Crop ecology, Soil survey, Classification and Analysis	Ornamental gardening, Nursery management, Floriculture	Marketing Livestock and Livestock Products, Agricultural Prices and Statistics, Agricultural Policies and Land Economics, Advanced Sociology and Rural Social Problems	Apiculture, Insects of crops, Insects affecting animals and man	Diseases of field crops, Diseases of Horticultural Crops, Forest Pathology	

Note: Actual courses of study or curricula are matters which belong to the faculty. Although originally a four-year course of study after passing the Intermediate Examination was envisaged, the present system is to offer a three-year course to which the allocation of subjects as given above has to be adjusted.

APPENDIX IV

Suggested Departmental Organisation and Allocation of Subjects

College of Veterinary Science

	Anatomy and Histology	Pathology and Hygiene	Veterinary Clinical Medicine	Physiology and Pharmacology	Remarks
First Year	Gross Anatomy, Histology and Embryology	Elements of Animal hygiene		Physiology of Domestic Animals	1. Deficiencies in Pre-Veterinary Training could be made up in School of Basic Sciences and Humanities. 2. The elements of feeding, nutrition and introduction to Animal Science are available in other colleges. 3. Biochemistry is available in the School of Basic Sciences and Humanities.
Second Year		Veterinary Immunology and Bacteriology, Veterinary Parasitology, General pathology	General Surgery	Pharmacology	1. Breeds of livestock and livestock management, advanced nutrition and genetics and artificial insemination and production courses are available in the College of Agriculture.
Third Year		Special Pathology, Food Sanitation	Special Surgery, Diseases of small animals, Clinical and Laboratory Practice, Breeding problems and Obstetrics	Pharmacology	1. A course in Poisonous Plants is available in the College of Agriculture.
Fourth and subsequent years		Diseases of Poultry, Public Health and Food Inspection	Diseases of large animals, Radiology, Clinical and Laboratory Practice, Veterinary Jurisprudence and Ethics, Seminar		

APPENDIX V

Suggested Departmental Organisation and Allocation of Subjects

School of Basic Sciences and Humanities

	Chemistry	Language and Literature	Mathematics and Physics	Zoology and Bacteriology	Botany	Communications	History and Pol. Science	Psychology and Sociology	Economics and Business	Education
First year	General Chemistry Inorganic Chemistry and Qualitative Analysis	English Hindi	Algebra Trigonometry Solid Geometry	Elements of Zoology and Bacteriology	General Botany				Elements of Accounting Elements of Economics	
Second year	Organic Chemistry Quantitative Analysis		General Physics Analytical Geometry	Plant and Animal Genetics Comparative Vertebrate Anatomy.		Speech	World History World Political Systems	Introductory Sociology Introductory Psychology	Elements of Marketing	
Third year	Bio-Chemistry, Physical Chemistry	Introduction to Poetry, Drama & Fiction	Advanced Algebra	General Microbiology		Agricultural Journalism *Extension Organization and Methods	National Government Contemporary History	Introduction to social work The Psychology of Learning	Elements of Statistics Principles of Business Law	Nature of Teaching Principles of Secondary Education
Fourth and subsequent years		World Literature Indian Literature				Scientific and Business Writing Advanced Agricultural Journalism *Advanced Extension Methods	State Government	Social problems and Contemporary society		**Teaching of Vocational Agriculture **Teaching of vocational Home Science

Remarks: The Dean of Student Welfare is responsible for physical training. It is suggested that the Head of this Department should have a joint appointment in the office of the Dean, and that appropriate courses be worked out to keep pace with the need.

* Courses in Extension would be developed and taught in co-operation with the Directorate of Extension.

** Courses for the preparation of teachers of Vocational Agriculture would be developed and taught in cooperation with the Dean of Agriculture, under the advice of a Joint Committee of the College of Agriculture and the Department of Education. A similar arrangement would be made with the College of Home Science.

APPENDIX VI

General Information about Agricultural Colleges

Name of the College	Year of establishment	University	Courses of study	Entrance requirements	Duration of the course	Farm area	Scholarships	Hostel facilities	Remarks
1	2	3	4	5	6	7	8	9	10
Agricultural College, Baptala, Andhra Pradesh	1945	Andhra	B.Sc. (Agri.) M.Sc. (Agri.)	I.Sc.	3 years 2 years	450 acres	38 scholarships	180 seats	
College of Agriculture, Hyderabad, Andhra Pradesh	1946	Osmania	B.Sc. (Agri.) M. Sc. (Agri.)	I. Sc. or pre-professional B.Sc. (Agri.)	3 years 2 years	—	Several	1000 seats	This is under the control of the University and not under the Agric. Deptt.
Assam Agricultural College, Jorhat, Assam (for men only)	1948	Gauhati	B.Sc. (Agri.)	I.Sc. (Agri.) or Inter Sc. or Matric	3 years 4 years	120 acres	Several scholarships worth Rs. 3575 per month	105 seats	—
Ranchi Agricultural College, Kanke, Ranchi, Bihar	1955	Bihar	B.Sc. (Agri.) M.Sc. (Agri.)	I.Sc. B.Sc. (Agri.)	3 years 2 years	360 acres	Various scholarships worth Rs. 19,400/-	270 seats	—
Bihar Agricultural College, Sabour, Bihar (for men only)	1908	Bihar	B.Sc. (Agri.) M.Sc. (Agri.)	I.Sc. B.Sc. (Agri.)	3 years 2 years	600 acres	Merit, poverty and other scholarships	350 seats	Degree course started in 1945
B.A. College of Agriculture, Anand, Gujerat State	1947	Sardar Vallabh Bhai Vidyapeeth	B.Sc. (Agri.) M.Sc. (Agri.) Ph. D.	S.S.L.C. or Matric B.Sc. (Agri.) M.Sc.(Agri.)	4 years 2 years	850 acres	10 scholarships of Rs. 20/- and 4 of Rs. 40/- for backward classes	600 seats	Some research is being done through a private institution

General Information about Agricultural Colleges—(*Contd.*)

1	2	3	4	5	6	7	8	9	10
Agricultural College, Vellayani, Kerala	1955	Kerala	B.Sc. (Agri.)	Pre-Professional	3 years	About 250 acres	2 stipends of Rs.180/- p.a. and 9 stipends of Rs. 150/- p.a. for scheduled castes	216 seats	Being a new institution, it is not located close to the main Research centres in Kerala
M.B. College of Agriculture, Gwalior ,M.P.	1950	Vikram	B.Sc. (Agri.) M.Sc. (Agri.)	Matric	4 years 2 years	—	8 merit scholarships worth Rs. 2,000/-, 20 conditional stipends worth Rs. 5,000/-	80 seats	—
College of Agriculture, Jabalpur, M.P.	1955	Jabalpur	B.Sc. (Agri.) M.Sc. (Agri.)	S.S.C.E. B.Sc. (Agri.)	4 years 2 years	640 acres	24 scholarships and other concessions	200 seats	—
Agricultural College, Rewa, M.P.	1952	Saugar	B.Sc. (Agri.) M.Sc. (Agri.)	High school pass B.Sc. (Agri.)	4 years 2 years	85 acres	—	—	— —
R.A. Kidwai Agricultural Institute, Sehore, M.P.	1955	Vikram	B.Sc. (Agri.) M.Sc. (Agri.)	Matric B.Sc. (Agri.)	4 years 2 years	—	More than 50 per cent students receive scholarships	122 seats	—
Agricultural College, Annamalai University, Chidambaram, Madras State	1958	Annamalai	B.Sc. (Agri.) M.Sc. (Agri.)	Pre-University	4 years	Over 200 acres	Only for scheduled castes	Residential	Private College
Agricultural College and Research Institute, Coimbatore-3, Madras	1908	Madras	B.Sc. (Agri.) M.Sc. (Agri.) Ph. D.	Pre-Professional B.Sc. (Agri.) M.Sc. (Agri.)	3 years 2 years	650 acres	—	—	—
College of Agriculture, Akola, Maharashtra State	1955	Nagpur	B.Sc. (Agri.) M.Sc. (Agri.) Ph. D.	S.S.C.E. B.Sc. (Agri.) M.Sc. (Agri.)	4 years 2 years	—	Five scholarships of Rs. 30/- and five of Rs. 35/- and three freeships in each class	45 seats	Private College. Research is the function of the State Agricultural Deptt.
College of Agriculture, Nagpur, Maharashtra State	1906	Nagpur	B.Sc. (Agri.) M.Sc. (Agri.) Ph. D.	S.S.C.E. B.Sc. (Agri.) M.Sc.	4 years 2 years	A farm of 250 acres	Prizes and stipends	200 seats	—

General Information about Agricultural College—(*Contd.*)

1	2	3	4	5	6	7	8	9	10
Government Agricultural College, Parbhani, Maharashtra State	1956	Marathwada	B.Sc. (Agri.)	I.Sc.	3 years	400 acres	24 scholarships	50 seats	—
College of Agriculture, Poona, Maharashtra State	1908	Poona	B.Sc. (Agri.) M.Sc. (Agri.)	Matric or S.S.L.C. B.Sc. (Agri.)	4 years 2 years	—	Several	312 seats	—
College of Agriculture, Dharwar, Mysore	1947	Karnatak	B.Sc. (Agri.) M.Sc. (Agri.) Ph.D.	S.S.L.C. B.Sc. (Agri.)	4 years 2 years	—	4 Merit Scholarships of Rs. 20/- each and 4 for backward classes	120 seats	—
Agricultural College, Hebbal, Mysore	1946	Mysore	B.Sc. (Agri.)	Pre-University	4 years	186 acres	2 merit scholarships per class and some others	Yes	Some research work is done by staff
Utkal Krishi Mahavidyalaya, Bhubaneshwar, Orissa	1954	Utkal	B.Sc. (Agri.)	Matric	4 years	300 acres	—	120 seats	Provision for research is under contemplation
Khalsa College Agriculture Deptt, Amritsar, Punjab	1923	Punjab	B.Sc. (Agri.)	Matric	4 years	Farm of 460 acres of which student farm is of 60 acres	scholarships of Rs. 10/-to 15/- P.M. from the Distt. Board —	120 seats	Private College
Government Agricultural College and Research Institute, Ludhiana (Pb.)	1941	Panjab	B.Sc. (Agri.) M.Sc. (Agri.)	Matric B.Sc. (Agri.)	4 years 2 years	A farm is attached and more land is being acquired	—	Yes	—

General Information about Agricultural Colleges—(*Contd.*)

1	2	3	4	5	6	7	8	9	10
Dayanand College, Ajmer, Rajasthan	1955	Rajasthan	B.Sc. (Agri.)	High School Exam. or I.Sc.	4 years 5 years	—	—	—	—
Govt. College of Agriculture, Jobner, Rajasthan	1947	Rajasthan	B.Sc. (Agri.)	Higher Secondary Exam. or I.Sc. Exam.	5 years 3 years	—	7 scholarships of Rs. 30/-, 12 of Rs. 50/- and one of Rs. 30/-	75 seats	—
Rajasthan College of Agriculture, Udaipur, Rajasthan	1955	Rajasthan	B.Sc. (Agri.)	High School Exam.	4 years	234 acres	Merit-cum-need scholarships available but number not fixed	250 seats	—
B.R. College, Agra, U.P.	1885	Agra	B.Sc. (Agri.) M.Sc. (Agri.) Ph.D.	S.S.L.C. or Matric or B.Sc. (Agri.)	4 years 2 years	483 acres	Scholarships worth Rs. 5,000/-	500 seats	Private College. Research is function of the State Agricultural Deptt
Allahabad Agricultural Institute, Allahabad, U.P.	1910	Allahabad	B.Sc. (Agri.) B.Sc. (Agri.) Engg.), I.D.D.	Inter Agri. Exam. or S.S.L.C. or Matric for I.Sc. (Agri.)	2 years 4 years	600 acres (400 under cultivation)	—	279 seats for men & accomodation for all women	Private College
Jat Vedic College, Baraut, U.P.	1949	Agra	B.Sc. (Agri.) M.Sc. (Agri.)	S.S.L.C. or Matric, B.Sc. (Agri.)	4 years 2 years	—	—	—	Private College
Agricultural College, Chandesar, U.P.	1958	Gorakhpur	B.Sc. (Agri.)	Inter. Agri.	2 years	—	—	40 seats	—

General Information about Agricultural Colleges—(*Contd.*)

1	2	3	4	5	6	7	8	9	10
Government Agricultural College, Kanpur, U.P.	1906	Agra	B.Sc. (Agri.) M.Sc.(Agri.) Ph.D.	High School Exam. or Inter Agri., B. Sc. (Agri.) M.Sc. (Agri.)	4 years 3 years 2 years	Instructional farm of 30 acres and dairy farm of 230 acres	Several	373 seats	—
A.S. Jat College, Lakhati, Uttar Pradesh	1941	Agra	B.Sc. (Agri.) M.Sc.(Agri.) Ph.D.	High School Exam. or Inter (Agri.) B.Sc. (Agri.) M.Sc.(Agri.)	4 years 3 years 2 years	Instructional farm of 60 acres	Fee concession and scholarships available	235 seats	—
College of Agriculture, Banaras Hindu University, Varanasi, U.P.	1931	Banaras	B.Sc. (Agri.) M.Sc. (Agri.), Ph.D.		4 years	234 acres	Merit-cum-need scholarships available but number not fixed	250 seats	—
Birla College of Agriculture Haringhatta, Distt. Nadia, W. Bengal	1958	Calcutta	B.Sc. (Agri.)	I.Sc.	3 years	10 per-cent students get scholarship of Rs. 40 per month on merit basis, 10 per cent get free studentships	Hostel at Kalyani	—	—

Note: Since the Compilation of this book, a number of new Colleges have been established bringing the total number to 50. Detailed information about all these is not readily available.

APPENDIX VII

General Information about Veterinary Colleges

Name of the College/Institute	Year of esta-blish-ment	Affiliating university	Courses of studies	Entrance requirement	Duration of the course	Farm area	Scholarships	Hostel facilities
1	2	3	4	5	6	7	8	9
University College of Veterinary Science and Animal Husbandry, Hyderabad, Andhra Pradesh	1946	Osmania	B.V. Sc.	I.Sc. (Medical group)	4 years	Dairy and livestock farm	25 stipends	1000 seats
Andhra Veterinary College, Tirupathi, Andhra Pradesh	1955	Sri Venkates-wara Uni-versity Tirupathi	B.V. Sc. & A.H.	Inter. Arts or Science	.. ..	.. ..	.. ..	.. ..
Assam Veterinary College, Gauhati, Assam (For men only)	1948	Gauhati	B.V. Sc. & A.H.	Matriculation	4 years	..	20 stipends of Rs. 30/- each on merit basis	152 seats
Bihar Veterinary College, Patna, Bihar	1930	Bihar	B.V. Sc. & A.H.	I. Sc.	4 years	Cattle breeding and dairy farm	Scholarships of Rs. 60/- to Scheduled Caste students	600 seats
Veterinary College, Trichur, Kerala	1955	Travancore	B.V. Sc.	Inter with Biology & Chemistry	4 years	Arrangement with Distt. Livestock and Poultry farm	More than 50 per cent students get scholarships	Separate hostels for men & women
Madhya Pradesh Veterinary College, Jabalpur, Madhya Pradesh	1948	Jabalpur	B.V. Sc.	Matriculation or H.S.C. Exam.	..	Farm and workshop	..	200 seats
College of Veterinary Science and Animal Husbandry-cum-livestock Research Institute, Mhow, M.P.	1955	Agra	B.V. Sc. & A.H.	I. Sc. (Medical group) or Intermediate in Agriculture	4 years	Dairy and Poultry Farm	20 scholarships of Rs. 40/- each	For all students

General Information about Veterinary Colleges—(*Contd.*)

1	2	3	4	5	6	7	8	9
Madras Veterinary College, Vepery, Madras	1903	Madras	Ph. D. & P.G.	..	..	Hospital and 3 livestock and poultry farms	14 scholarships for Harijans and 21 for others	3 hostels
Veterinary College, Nagpur, Maharashtra	1958	Nagpur	B.V. Sc.	Pre-professional (Medical group)	4 years	Poultry & Cattle farms	Rs. 40/- per student	100 seats
Bombay Veterinary College, Parel, Bombay	1886	Bombay	B. Sc. (Vet)	I.Sc. (Medical group)	4 years	..	60 scholarships of Rs. 40/- each	244 seats
Veterinary College, Hebbal, Bangalore, Mysore	1958	Mysore	B.V. Sc.	I. Sc. (Medical group)	4 years	Farm attached	Several	60 seats
Orissa College of Veterinary Science & Animal Husbandry Bhubaneshwar, Orissa	1955	Utkal	B.V. Sc. & A.H.	I. Sc.	4 years	..	14 scholarships and 32 stipends	81 seats
Punjab College of Veterinary Science and Animal Husbandry, Hissar, Punjab	1946	Punjab	B.V. Sc.	I. Sc. (Medical group)	4 years	Arrangement with Govt. livestock farm with an area of 40,000 acres	One scholarship of Rs. 30/- p.m.	386 seats
Rajasthan College of Veterinary Science & Animal Husbandry, Bikaner, Rajasthan	1954	Rajasthan	B.V. Sc. & A.H.	I.Sc. (Medical group)	4 years	..	114 stipends worth Rs. 1,367/- p.m.	160 seats
U.P. College of Veterinary Science & Animal Husbandry, Mathura, U.P.	1947	Agra	B.V. Sc. & M.V. Sc.	I. Sc. (Medical group) or Intermediate in Agriculture B.V. Sc.	4 years	Farm of 784 acres	8 merit scholarships and 812 stipends	404 seats
Bengal Veterinary College, Calcutta—27, West Bengal	1893	Calcutta	B.V. Sc.	I. Sc. (Medical group)	..	Dairy and Poultry Farm	Several scholarships and stipends from various sources	180 seats

APPENDIX VIII

Institutions Officering Home Science

UNIVERSITIES OFFERING HOME SCIENCE

1. Delhi University, Delhi
2. M.S. University of Baroda, Baroda
3. Lucknow University, Lucknow
4. Allahabad University, Allahabad
5. Banaras Hindu University, Banaras
6. Punjab University, Chandigarh
7. Rajasthan University, Jaipur
8. Madras University, Madras
9. Mysore University, Mysore
10. Kerala University, Trivandrum
11. Shri Venkateshwara University, Triupathi
12. Jabalpur University, Jabalpur
13. Nagpur University, Nagpur
14. Gujarat University, Ahmedabad
15. Aligarh University, Aligarh
16. Kashmir University, Srinagar
17. S.N.D.T Women's University, Bombay
18. Calcutta University, Calcutta

HOME SCIENCE COLLEGES OFFERING DEGREES

1. College of Home Science, S.N.D.T. University, Queen Road, Bombay
2. Faculty of Home Science, M.S. University, Baroda
3. Institute of Home Science, Maharani's College, Bangalore, Mysore
4. Viharilal College of Home Science, Calcutta University
5. Lady Irwin College, Sikandra Road, New Delhi, Delhi University
6. M.H. College of Home Science, Jabalpur (M.P.), University of Jabalpur
7. Shri Avinashilingam Home Science College, Coimbatore-2, Madras University

HOME SCIENCE INSTITUTIONS OFFERING DIPLOMA

1. The Allahabad Agricultural Institute, Allahabad (Intermediate and Extension)
2. Domestic Science Teachers Training College, Hyderabad (Andhra Pradesh) (Teacher's Training Diploma)

ARTS AND SCIENCE COLLEGES WHERE HOME SCIENCE IS OFFERED AS A SUBJECT ONLY FOR THE DEGREE

1. Women's College, Allahabad University, Allahabad

2. Women's Christian College, Chetpat, Madras-31
3. Queen Mary's College, Mylapore, Madras-1
4. Lady Amrita Bai Durga College for Women, Nagpur
5. Government College for Women, Patiala
6. Women's College, Banaras Hindu University, Varanasi
7. S.I.E.T. College, 34-A, Mount Road, Madras-2
8. Isabella Thoburn College, Lucknow (U.P.)
9. Shri Padmavati College for Women, Shri Venkateshwara University, Tirupathi
10. Women's College, Aligarh University, Aligarh, U.P
11. Maharani's College, Mysore
12. S.N. College, Quilon, Kerala
13. St. Theresa Convent, Ernakulam (Madras)
14. Government Women's College, Trivandrum
15. Rajasthan Mahila Vidyalaya, Udaipur (Rajasthan)
16. Women's College, Ranchi, Patna University

COLLEGES OFFERING HOME SCIENCE UP TO INTERMEDIATE LEVEL

1. Dayal Bagh College, Dayalbagh, Agra University
2. Savitri Girls' College, Ajmer
3. Sophia Girls' College, Ajmer
4. St. Agne College, Bangalore (Mysore State)
5. St. Carmel Convent, Bangalore, Mysore Women's University
6. Government College, Kapurthala, Punjab

TEACHERS TRAINING COLLEGES OFFERING HOME SCIENCE FOR BACHELOR'S DEGREE IN TEACHING

1. Lady Willingdon Training College, Triplicane, Madras-5
2. St. Christopher's Training College, Vepery, Madras-5
3. St. Joseph's Training College, Guntur (Andhra Pradesh)
4. Banaras Hindu University, Banaras
5. Faculty of Home Science, M.S. University, Baroda
6. Lady Irwin College, New Delhi

COLLEGES OFFERING MASTER'S DEGREE IN HOME SCIENCE

1. Women's Christian College, Madras (Institution Management)
2. Faculty of Home Science, M.S. University, Baroda (Child Development and Nutrition)
3. Lady Irwin College, New Delhi (Nutrition)
4. Shri Avinashilingam Home Science College, Coimbatore (Home Management)

APPENDIX IX

MANJRI-TYPE AGRICULTURAL SCHOOLS

Location	*Taluka*	*District*	*Year of starting*	*Annual admission capacity*
Manjri	Haveli	Poona	1947	75
Puntamba	Kopergaon	Ahmednagar	1947	50
Borgaon	Satara	N. Satara	1947	50
Dhulia	Dhulia	W. Khandesh	1947	50
Kosbad	Thana	Thana	1947	50
Anand	Anand	Kaira	1947	50
Dohad	Dohad	Panchmahals	1947	50
Sholapur	Sholapur	Sholapur	1948	50
Malegaon	Malegaon	Nasik	1948	50
Parbhani	Parbhani	Parbhani	1948	50
Kohlapur	Karvir	Kohlapur	1949	50
Mirjola	Ratnagiri	Ratnagiri	1949	50
Manavdar	Manavdar	Sorath	1949	50
Baroda	Baroda	Baroda	1950	50
Jagudan	Mehsana	Mehsana	1950	50
Vandhya	Bhuj	Kutch	1951	50
Aliabad	Jamnagar	Halar	1955	50
				875
		SECOND PLAN PERIOD		
Dhari	Dhari	Amreli	1956	50
Charodi	Ahmedabad	Ahmedabad	1957	50
Sanosara	Sanosara	Gohilwad	1957	50
Kolad	Roha	Kolaba	1958	50
Digraj	Miraj	S. Satara	1958	50
Amrawati	Amrawati	Amrawati	1958	50
Mominabad	Mominabad	Bhir	1959	50
Latur	Latur	Osmanabad	1959	50
Gangzari	Gondia	Bhandara	1959	50
Yeotmal	Surendranagar	Zalwad	1959	50
				500
		THIRD PLAN PERIOD		
(to be decided)	(to be decided)	Akola	1961	50
-do-	-do-	Broach	1961	50
-do-	-do-	Wardha	1962	50
-do-	-do-	Sabarkantha	1962	50
-do-	-do-	Banaskantha	1963	50
-do-	-do-	Chanda	1963	50
Jalgaon	Jalgaon	E. Khandesh	1963	50
Badnapur	Jalna	Aurangabad	1963	50
Parbhani	Parbhani	Parbhani	1963	50
Baldhana	Buldhana	Buldhana	1963	50
Tharsa	Nagpur	Nagpur	1963	50
Surat	Surat	Surat	1963	50
Morvi	Morvi	Madhya Saurashtra	1963	50
				650
		Grand Total:		2025

APPENDIX X

Suggested Proforma for

PERSONAL DATA CONFIDENTIAL

(To be furnished by the Student)

Space for Photograph

A. *General*

Name.....Date of joining.....
Permanent address.....
Age.....Date of Birth.....
Place of birth.....
Name of father or guardian.....
Father's or guardian's occupation.....
Father's or guardian's income or economic status .....
Occupation of elder brothers and sisters

1.

2.

3.

(The above information is for the purpose of understanding the social and economic status and the composition of the family).

B. *Educational*

School and College attended

1.

2.

3.

Highest general education and examination passed .....

Marks obtained at each appearance .....

Distinctions obtained such as prizes, merit scholarships etc. in school or college:

1.

2.

3.

C. *Personal and Social*

In what extra-curricular activities have you taken part, (including games and sports), mention distinctions obtained, if any.

1.

2.

3.

Were you a scout or a N.C.C. cadet?.....

Are you married?.....

If so, have you any children.....

What are your hobbies ?.....

What are your objectives in taking up this course?

D. *Physical and Health condition*

(In standard form)

E. *Progress of student*

(Space for Adviser to incorporate periodically)

APPENDIX XI

FORM OF RATING SCALE FOR TEACHERS

Print instructor's name here.....Deptt.....

Course No.....

Please rate your instructor as to each of the 16 qualities named below. It is necessary in each case only to place a check mark (√) on the accompanying line at that point which seems to you to be right. In rating him, try to compare him with all other instructors you have had.

The higher ratings are made by placing the check mark at the *left* end of the line ; the lower, by placing it at the *right*. These stages and also the middle ones, are clearly described by the words printed just below the line. The check mark may in any given case be placed *either* directly *above* the words or *along the line between them* as you deem proper.

Please make this rating conscientiously and individually. Your instructor will receive only the final summary of the results from the class as a whole. He will use them for self-improvement in teaching.

1. Preparation for class meeting	Class meetings very carefully planned	Usually some preparation; often seems inadequate	Little or no preparation apparent
2. Interest and enthusiasm in his subject	very enthusiastic and interested	Seems only mildly interested	Subject seems irksome to him
3. Organization of course	Course well-organized; parts clearly related	Some organization, but not always clear	Little or no organization
4. Scholarship	Knowledge of subject—broad and accurate	Knowledge, apparently deficient at times	Knowledge, very plainly deficient
5. Ability to express himself	Words, some with easy meaning, always clear	Some hesitation for words, meaning at times not clear	Much hesitation for words, meaning often not clear
6. Feeling between instructor and students	Feeling of goodwill prevails strongly	Neither goodwill nor antagonism seems to prevail	Instructor tends to antagonize class

7. Thinking demanded of students	Work demands much sound, original thinking	Thinking and memorization required about equally	Thinking discouraged; much memorization demanded
8. Assignments	Assignments clear, reasonable and carefully given	Rather indefinite and often hurriedly given	Very indefinite, usually hurriedly given
9. Leading discussion and questioning	Questions, thought provoking, discussions lively and worthwhile	Questions usually call for facts or lead to rambling discussion	Few questions or none put to class
10. Sense of proportion	Stresses important topics; disregards trivial details	Occasionally stresses details, neglecting important topic	Often neglects important topics, for unimportant details
11. Enunciation	Speaks very clearly and distinctly	Words sometimes indistinct and not easy to hear	Words very indistinct; often impossible to hear
12. Self-Confidence	Sure of himself; meets difficulties with poise	Fairly self-confident; occasionally disconcerted	Hesitant, timid, uncertain
13. Tolerance and liberality	Welcomes differences of opinion	Sometimes impatient when student opposes his views	Easily aroused to temper by opposition
14. Personal apperance	Well-groomed; clothes neat, clean, in good taste	Usually rather untidy and careless as to appearance	Slovenly; clothes and person untidy
15. Personal peculiarities	Manner pleasing; free from annoying mannerisms	Objectionable mannerisms not serious or humorous	Constantly exhibits annoying mannerisms
16. In summary how would you rate this instructor in comparison with all teachers whom you have had ?	Excellent — above Average	Average — below average	Unsatisfactory

Please do not sign your name or make any other mark which might serve to identify you. Place this sheet in envelope, seal and give it to instructor. He will forward it to the Council on teaching without opening it.

LIST OF REFERENCES

Randhawa, M.S., 1958. *Agricultural Research in India—Institutes and Organisations*, Indian Council of Agricultural Research, New Delhi.

Report of the Joint Indo-American Team on Agricultural Research and Education, 1955, Indian Council of Agricultural Research, New Delhi.

Report of the Second Joint Indo-American Team on Agricultural Education, Research and Extension, 1960, Indian Council of Agricultural Research, New Delhi.

Report of the University Education Commission, 1949, Manager of Publications, Delhi.

Stevenson, K.A.P., 1958. *Proceedings of the Third Session of Indian Council of Agricultural Education*, Uttar Pradesh Agricultural University—page 147.

Report of the Secondary Education Commission, 1953. Ministry of Education, Government of India.

Vaidyanathan, P.P.I. and Naik, K.C. 1958. *Agricultural Institutions in the United States of America*, Government Press, Madras.