

hen laying infertile eggs by fertilising her with agriculture, when the eggs she lays will lead to chicken and further multiplication of life". I have got a full staff of agricultural graduates who have been studying the economic life of the farmer and I believe that none else can be more competent to do both the educative propaganda work and a close examination of the purpose of such loans. If you, as co-operators are prepared to try the experiment with a few societies in each taluk, I shall be glad to offer the services of my staff for the purpose so that our joint work may bring about more satisfactory results.

It is found difficult to get a gathering or a quorum to hold a general body meeting in a society. This is due to the lack of interest on the part of the members in the affairs of the society, which in other words means that the society is not functioning in such a way as to benefit the members. This is a practical proof of the statement I made at the beginning. Therefore, the society must form the organisation of the village for various other purposes which are now found necessary for the villager as a result of the change in his outlook. Whatever is useful of the new ideas and informations for the progress of the villager must be made available at the society centre, such that the villager must be satisfied by the fact that the society is worked entirely for his benefit. If such a feeling is created in the minds of the members, no co-operative society can become unpopular. The practical working aspect of it may come to mean that the society must be almost a rural reconstruction centre of the village. It may have to function as an agricultural improvement society to work up the economic advance of the villager besides attending to health, education, sanitation, medical aid, etc. of the village. The society may be required to go so far as to take up the question of settling disputes of all kinds in the village. In order to effect the joint purchase of the requirements of the village and the co-operative sale of the produce, the society will have to function as a trading body. The society may have to serve the village even as a news agency, since the villager of the present day is found interested even in such affairs as the Sino-Japanese relations. If there should be a separate institution for each one of the above items of work it will make matters very complicated with sometimes conflicting interest that may paralyse work and progress.

THE ORGANISATION FOR ENTOMOLOGICAL RESEARCH IN THE UNITED STATES OF AMERICA

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In this note an attempt is made to give a picture of how entomological research is being carried on by the Bureau of Entomology in the U. S. A. That the importance of research in this direction has

been sufficiently recognised is well certified by the considerable sums spent in the investigation of special problems in the fight against insects. The annual appropriation for the Bureau of Entomology is about (dollars) 20,55,058 which roughly comes to 60 lakhs of rupees. The Bureau of Entomology grew up into the present huge organisation from a very humble beginning; in 1884 it consisted of one chief entomologist with 4 assistants and the total appropriation for the staff was dollars 2000 for the staff and dollars 5000 for the work. Their chief work then was the study of pests on citrus and other fruit trees. Silkworm rearing also formed a part of their activities. Whenever a pest report was received an assistant was sent to the spot to make observations on the spot. But with the organisation of experimental stations in 1888, special investigations were undertaken in the stations among other items of work. The formation in 1889 of the Association of Economic Entomologists and the installation of a new insectary with the then most approved arrangements formed a great advance in the field of Entomological Research.

The Bureau of Entomology made rapid studies both in the activities and organisation under the guidance of Dr. L. O. Howard who, as the chief entomologist, was a dominating figure in the field of Economic Entomology for over 33 years. He retired in 1927 and was succeeded by Dr. Marlatt who is now the chief of the bureau.

Activities. Research activities are chiefly directed towards the solution of economic problems in Entomology. It includes the study of insects injurious to crops and crop products and the development of methods for eradication or control; of insects affecting the health of man and livestock and insects infesting human habitations or injurious to industries of beneficial insects that are of direct utility and others that could be utilized in the control of insect pests. The field work of the Bureau is largely carried on with the help of field laboratories of more or less temporary character where the expert worker is in touch with the centres of activity of the injurious species of insects. The investigations cover control methods of insect, control through the ultimate study of the life of the insect in relation to the farming method. Where favourable, the cultural practices are varied to minimise the insect damage. Insect parasites and other natural enemies of imported insect pests are studied, imported, and established and by this means control of a foreign pest is brought about. Technical, mechanical and chemical methods of control are studied and developed including spraying, fumigation of orchards and trapping methods and other means of mechanical destruction. Plant quarantine and control are efficiently carried out to prevent introduction of new and dangerous insect pests.

The Bureau of Entomology has the largest organisation in the world for investigation and research on insect pests. On January

1929 it was actively engaged on 76 major projects, in the investigation of at least 500 insects known to be injurious to agriculture. The entomological activity of the Bureau are classified under the following groups:— Investigations on (1) Deciduous fruit insect. (2) Cereal and forage insect. (3) Insects affecting cotton. (4) Forest and shade tree insect. (5) Truck crop insects, (6) Bee culture. (7) Stored product insects. (8) Tropical, sub-tropical and ornamental plant insects. (9) Insects affecting the health of man and animals. (10) Insects. (11) Bioclimatic studies. (12) Insect morphology. (13) Insect morphology studies. (14) The exchange of useful insects and (15) Insect pest survey.

Organisation:—The employees of the Bureau of Entomology are nearly all in the classified civil services; the total classified personnel on March 1930 amounted to 575 in addition to the temporary unclassified field employees. Field stations are established whenever there is a necessity and are changed from time to time. There is usually one entomologist with a few assistants to attend to each unit of work in a field laboratory. Each local station is organised to conduct work on definite, concrete problems. Each division has its own full organisation with its own particular sub-station established, where the work is needed, the stations of one division being independent of those of another. There are altogether over 600 fields stations. All the administrative and scientific research work of the Bureau is under the direction and supervision of the chief of the Bureau and he is assisted by associate chiefs.

Just to give some idea of the nature of the organisation a list is presented showing the personnel under the Deciduous Fruit insect investigation with their salaries. Each of the 15 divisions more or less carry a similar personnel.

Deciduous fruits insect investigation :— Salary

	No.		per annum.
(1) Entomologist in charge	1	dollars	4000
Associate	1	"	3000
(2) Orchard insecticides section			
Entomologist	1	"	3600
Asst. Entomologists	2	"	5000
(3) Orchard insect survey			
Entomologist	1	"	3200
(4) Apple insect section			
I. Field laboratory, Bentonville.			
Entomologist.	1	"	4000
" Junior	1	"	2000
II. Field laboratory, Vincennes			
Entomologist.	1	"	4800
" Assistant	1	"	2600

III. <i>Field laboratory, Sligo</i>			
Entomologist	1	"	4600
Associate	1	"	3200
IV. <i>Field laboratory, Urichita</i>			
Entomologist.	1	"	3400
V. <i>Field laboratory, Yakima</i>			
Entomologist	1	"	4600
Assistant	1	"	3400
(5) <i>Grape insects section.</i>			
I. <i>Field laboratory, Ohio</i>			
Entomologist.	1	"	3400
(6) <i>Nut insect section</i>			
I. <i>Field laboratory, Albany</i>			
Entomologist.	1	"	3400
II. <i>Field laboratory, Georgia</i>	1	"	2900
III. <i>Field laboratory, French creek</i>	1	"	3400
(7) <i>Blue berry magot section.</i>			
I. <i>Field laboratory Cherryfield.</i>	1	"	2600
(8) <i>Japanese and Asiatic beetle section.</i>			
I. <i>Principal Entomologist.</i>	1	"	5600
II. <i>Insecticides investigating</i>			
Entomologist	1	"	3700
III. <i>Biological investigating</i>	1	"	3400
IV. <i>Parasite investigating</i>	1	"	4600
V. <i>Foreign parasite investigating</i>	1	"	3600
(9) <i>Plant disinfection investigation.</i>			
I. <i>Field laboratory, Moorstown</i>	1	"	3800
(10) <i>Peach insect investigation section.</i>			
Entomologist.	1	"	4200

I feel it may not be out of place here to mention that the recent postings of Entomology research assistants to circles, to undertake definite problems pertaining to their own tracts, marks a definite advance in the expansion of entomological research. It is hoped that the direction and supervision of administration and scientific research work will be vested in the hands of the Chief Entomologist just as is being done by the Bureau; the circle officers may not be in a position to give undivided attention to the progress of work, if the direction and supervision are transferred to them.

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