

## THE CENTRAL BOARD OF IRRIGATION IN INDIA

THE *Annual Report* (Technical) of the Central Board of Irrigation, India, 1937-38, is a highly instructive publication, giving in outline, the various lines of investigation in connection with irrigation problems that are being tackled at the different hydraulic laboratories in India. The *Report* shows that no new research station has been opened during the course of the year under review. The existing stations are:—

1. *Central Research Station at Poona.*
2. *Punjab Research Station at Lahore.*
3. *Bombay Research Station at Poona.*
4. *United Provinces Research Station at Lucknow.*
5. *Sind Research Station at Karachi.*

The work carried out by these Research Stations cover a wide range of subjects and the discussions provided by the periodic meetings of the workers in these fields are both refreshing and instructive. The interchange of ideas between scientists and engineers which the meetings of the Central Board of Irrigation promote, has got one great advantage, in that they give to the scientists a practical outlook and to the engineers a scientific bent of mind.

In going through the various *Annual Reports* of the Central Board for the last few years of its existence, one is struck by the fact that more and more attempts are being made to tackle problems of flood and river control by means of scale model works. The *Central Station* at Poona has been carrying out these experiments for the last few years. In the year under review experiments in river models have also been instituted by the *Punjab Irrigation Research Institute at Mallikpur River Model Station*. These models were two of a series of experiments carried out in connection with the Haveli Project. The river models specially for alluvial rivers are in the early stage of their development and it will require careful and patient study by scientists and engineers to make them yield useful quantitative information for future guidance. The construction, manipulation and interpretation of two dimensional models such as that of a weir section for scour downstream or for position of the standing wave are comparatively simple and have been more or less standardised. The experimental results can be safely interpreted as their

peculiarities and limitations are well known. For such three dimensional models as those of falls for bed and side scour, the construction, manipulation and interpretation are more difficult, though with the accumulation of more data, the interpretation of these results are becoming easier and reliable. But for river models the main difficulty is the correct reproduction of the movement of silt both on the bed and in suspension. For Northern India rivers, this difficulty is not so acute as the silts here are more or less incoherent sand and their quantities are not very great. But rivers in Bengal, Bihar, Assam and Orissa bring in huge quantities of silt and their qualities, specially those of the rivers that fall in the Gangetic Delta are colloidal. If this fundamental difference between the silt carried by the two systems of rivers in India, those of Northern India and those of the Gangetic Delta is realised, then it will become easy for the scientists and the engineers who deal with models and utilise their results to practical ends, to understand that the results derived from experiments on Northern India rivers will not apply directly to the rivers in the Deltaic regions. This difficulty is already being felt by engineers in Sind who have, up till now, tried to apply Lacey to a system of canals that carry quite an appreciable proportion of very fine colloidal clay in the bed and in suspension. In Sind a number of canals designed on Lacey had silted up badly and this was only to be expected as Lacey is supposed to hold good for canals which carry incoherent alluvial sands on the bed. Thus the application of any theory or equation derived for Northern India river conditions to the deltaic rivers of Bengal, Madras or Sind is bound to lead to costly failures. Similarly, the experience gained from the working of scale models of rivers of Northern India will not be directly applicable to rivers in Bengal or Madras.

**Central Research Station, Poona.**—This station has in its programme a long list of model experiments mostly in river training. The summaries show only one experiment on silt exclusion and another on falls. Among the river models there is mention of a model of the River Ganges at Hardinge Bridge. The informations supplied in the summaries are too meagre to enable the reader to form any clear idea about the

details of these experiments. One wonders if the effect of colloidal silt which is so prevalent in the river Ganges has been taken account of in the model.

Punjab Irrigation Research Institute, Lahore.—The Institute deals with almost all aspects of irrigation, from river training to reclamation of alkali soils by molasses. The poor results obtained with molasses in the Punjab as compared with the very satisfactory results obtained in the United Provinces make one wonder if the two types of alkali soils were the same in both the Provinces. It appears that an extensive series of model experiments on tube wells had been carried out in the Institute. The results, although indicated only briefly, appear to be highly instructive.

Bombay Research Station, Poona.—This Station has been mainly busy with waterlogging and drainage problems in the sugarcane areas of the Deccan Canals. Experiments on reclamation have also been carried out.

United Provinces Research Station at Lucknow.—This Station has now got a small flume for carrying out experiments in two dimensional models such as scour below falls. A number of models on different scales had been experimented upon. The silting of Sarda Canals Main Line and the control of silt entry at the head by means of regulation had been the subject of another investigation at this Station. The methods

of sampling suspended silt from the river and the canal adopted in this experiment do not appear to be satisfactory. The authors are requested to see that these samples are representative and reliable.

Sind Research Station at Karachi.—It appears that this Station has increased its activities in the direction of model experiments mainly on falls and scour below falls. They are more or less on the standard lines as carried out in other stations. Lacey's Silt Theory received some attention here also but as was pointed out before, it did not lead to any useful conclusion.

In the agenda for the eighth meeting of the Research Committee of the Central Board of Irrigation held in Simla from the 5th to the 9th July 1939, there are a number of interesting items discussed.

One of these was the establishment of a Central Research Station for Irrigation. The arguments that had been advanced for or against the establishment of such a Station were many. But one point seems to have been missed by most of the speakers that irrigation and river conditions are different in different parts of India and as had been pointed out before the results obtained in Northern Indian conditions will, in most cases, not be directly applicable to deltaic conditions in Bengal or Madras. Under these circumstances it appears regional Research Stations will be more suited to Indian conditions than a Central one.

## OBITUARIES

### P. V. MAYURANATHAN (1893-1939)

MR. P. V. MAYURANATHAN, who died of heart failure on December 1, 1939, was born on March 4, 1893 not far from Palghat, where he was educated till he passed his Intermediate examination. He then entered Presidency College, Madras, where he studied botany under Prof. Fyson, taking his B.A. degree in 1918. After teaching for a time in the Venkatagiri Raja's School, Nellore, he joined the staff of the Government Museum, Madras, in August 1920, taking charge of the Botanical, Geological, Anthropological and Economic Sections, the Anthropological Section being separated later under its own Curator.

In view of the multifarious duties imposed upon its Curator, it is not surprising that the Botanical Section had come to be badly

in need of reorganisation. The first necessity was the building up of a reserve herbarium collection on which to draw for exhibition purposes, work on which he entered with enthusiasm and continued till his death. Special attention was naturally paid to local plants, resulting in his preparing in conjunction with Mr. Barnes, of the Madras Christian College, *The Flowering Plants of Madras City and its Immediate Neighbourhood*, published as a Madras Museum Bulletin in 1929.

Owing to the difficulty of dealing with succulent plants from herbarium specimens only, a collection of living specimens of the Indian species of *Caralluma* was made and an account of them was published by Mr. Mayuranathan and myself in 1931. This led him to attempt a similar study of the succulent Euphorbias of India on