review—a small flume in which experiments on model of the Sarda Barrage at Banbassa and the Deoha Barrage at Duni was conducted to devise the form of protection for down stream scour

Problems of seepage loss from canals and experiments to devise means to stop it are also being tried here

It is interesting to note that Mr Lacey's theory of flow in alluvial channels has been adopted for future work in the United Provinces This is perhaps the first time that Mr Lacey's theory has been given official recognition This experiment of replacing Kennedy Diagrams by Lacey Diagrams will be watched with interest

Sind

Here researches on irrigation problems are carried out by the Development and Research Division A number of model experiments on different hydraulic structures appears to have been carried out systematically and more or less on conventional lines

Here again Lacey Theory is being put to the practical test Data from seven regime sites were analysed with a view to see how the equations derived therefrom agreed with those of Lacey's Certain relationships between different hydraulic constants obtained from these channels have been worked out by the method of least square Agreement in certain cases is quite good Determination of seepage loss from the bed of the canals is also being carried out here and treatment with sodium carbonate is also being tried

From the *Report* it is apparent that the irrigation engineers are becoming conscious of the fact that problems of irrigation should be tackled exactly on the same lines as any other scientific problem and not on empirical lines as was the case previously In this respect Punjab appears to have gone ahead of every other province Here the whole irrigation research is conducted by a band of scientists who must be working in close co operation with engineers as is evident from their publication on Design of Weirs on Sand Foundations' This is indeed the right spirit where the scientists should be left free to develop the technique and arrangements of the experiments, the interpretation of the results to be done conjointly with the engineers

A comparison of the two *Annual Reports*—the first one and this one will show how irrigation research has developed On the hydraulic side, model experiments in flumes have become the usual thing experiments on river models are coming to the front and practical irrigation problems such as seepage losses from canals movements of silt in canal and their control at the head works are being recognised as being amenable to scientific treatment Indications are evident that irrigation engineers are coming to recognise the help that they can derive from scientists and are not reluctant to utilise it

It is a pity that this spirit of scientific research in irrigation problems has touched only a few provinces Other provinces such as Bengal and Madras where scientific investigations on purely academic lines are so intensively pursued should not lag behind It is hoped that irrigation engineers in these provinces will lose no time in attracting some of these scientific workers to irrigation problems on whose proper solution depends much of the prosperity and wealth of the country that they serve

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The Conference of Medical Research Workers in India.

THE Fifteenth Conference of Medical Research Workers in India was opened by His Excellency the Viceroy at the Imperial Secretariat New Delhi on 29th November 1937 In his address His Excellency briefly reviewed some of the outstanding health problems of India making particular mention of those connected with malaria tuberculosis cholera maternal mortality and nutrition and stressed the importance of medical research from the point of view of the health and happiness of the people In recalling that Indian medical research workers were the inheritors of a most distinguished tradition His Excellency emphasised the necessity for maintaining the work at its previous high level and expressed the hope that research into the many problems of health existing in India would commend itself to private munificence

After His Excellency withdrew Major General F W C Bradfield, Director General, Indian Medical Service, in the course of his address referred to a number of important events that had taken place during the year The establishment of the Central Board of Health, he said was an event of great significance as that body would provide an opportunity for periodical consultations between the Central and Provincial Governments and Indian States in the framing of common policies regarding public health and for the interchange of information the result of varying experience

As regards research work the contributions made by Indian research workers in regard to the elucidation of the cholera problem had received the commendations of the Office Internationale d Hygiene Publique As regards the danger of the importation of yellow fever into India the Government were taking a strong stand and as a result of Notification dated September 1936 the entry into India of æroplanes and of individuals from infected and suspected yellow fever areas is now under strict control Further protective measures which were being taken at the Karachi Airport were nearing completion

India sent a strong delegation to Java to the Rural Hygiene Conference organised by the League of Nations for the Far Eastern Countries Many of the recommendations made by this Conference were considered by the Research

Workers Conference and suitable action was suggested

The Conference conducted its business by referring all the major heads of research to separate advisory committees These committees considered in detail research work carried out during the year and proposals for the following year and then made specific recommendations to the Conference, which in its turn recommended them for the consideration of the Scientific Advisory Board of the Indian Research Fund Association

Cholera

The Cholera enquiry, which has been in progress for about four years, constitutes a combined study by several research laboratories in India, including the Central Research Institute Kasauli, the All India Institute of Hygiene and Public Health and the School of Tropical Medicine at Calcutta, the King Institute, Guindy and the Pasteur Institute, Shillong During the year a great deal of fresh knowledge has been gained about the cholera vibrio and considerable progress made in connection with its identification and differentiation from other related organisms Side by side with the laboratory studies an extensive field study has been in progress on the epidemiology of cholera in Bengal which is recognised as an endemic home of the disease. In addition, a statistical study of cholera mortality figures has differentiated the endemic from the non-endemic areas in that province in the hope that the application of the new methods of study, which laboratory research has suggested, might elucidate some of the hitherto unknown factors concerned in the periodic spread of this disease

Tuberculosis

Research into the problems of tuberculosis has been in progress in Bengal for some years under the auspices of the Indian Research Fund Association During the year tuberculosis in relation to industry was studied in one of the large Calcutta jute mills, with a labour force of about 5,000

A study of the contacts of tuberculosis patients, particularly children, has brought out the interesting fact that tuberculosis constitutes a cause of sickness and mortality among children to an extent hitherto unsuspected

Finally, an inquiry into the incidence of the disease among the hill tribes near Kalimpong in Darjeeling District revealed the fact that tuberculosis was spreading fairly rapidly amongst these primitive people

Nutrition.

The nutrition researches carried out at Coonoor during the past twenty years have gained world wide recognition During the past two years this work has been extended in many new directions Surveys of diets and the state of nutrition have already been carried out in certain parts of Madras Presidency, Mysore State and Kashmir and similar investigations have been planned for the coming year in Delhi Province the United Provinces, Madras City, the Central Provinces and Orissa The results of these surveys should provide a practical basis for the adjustment of local agricultural policy to nutritive requirements a point which was stressed both by Sir John Russell and by Dr N C Wright in their recent reports

The addition of skimmed milk to the diet of growing children has been shown to be of great value but to feed a child with 8 ounces of skimmed milk a day costs about 12 annas a month which is a large sum in relation to the income of many millions of people in this country The benefit of skimmed milk appears to be mainly due to its calcium content The administration of calcium on the other hand has been estimated to cost only about an anna per month per child and this it is considered should not be beyond the means of a large part of the population

Clinical tests carried out in the Madras Ophthalmic Hospital in association with the nutritional laboratories at Coonoor point to the conclusion that red palm oil is as effective as cod liver oil in the treatment of eye conditions caused by deficiency of vitamin A in the diet The price of red palm oil is very much less than that of cod liver oil and the corollary would seem to be that the cultivation in India of the red palm should be taken up in order that cheap supplies of this important protective oil should be made available

Another research which promises very useful results relates to the formulation of objective standards for the assessment of malnutrition A standard based on the measurements of the arm chest and hip has been introduced in America Indices based on Indian data are now being evolved and these should prove useful particularly to school medical officers and other workers engaged in the task of estimating the degree of malnutrition among Indian children

Maternal Mortality

Research into the problems of maternal mortality has been approached from two standpoints (i) that of making surveys in urban and rural areas for determining the causes of maternal deaths and (ii) that of detailed study by laboratory and field investigations of the primary causes of the large numbers of deaths due to child birth which these surveys disclose With these ends in view a survey has been completed in Calcutta two others are in progress in Bombay City and in a rural area in Bihar while it has also been suggested that the rural Health Units, which have been established in different parts of India, should be utilised for similar surveys in relation to rural conditions

The Calcutta inquiry which has been completed has brought out the fact that anæmia associated with pregnancy and eclampsia are important causes of mortality and an investigation into the factors responsible for anæmia in pregnant women was started in July 1937 Another inquiry relating to anæmia amongst women employed in the tea plantations of Assam has been in progress during the year These inquiries have been recommended for continuance Other inquiries which have been recommended, are an investigation relating to eclampsia and a study of the bacteriology of the genital tract which is of importance in relation to the question of sepsis during child birth

Malaria

The Indian Research Fund Association maintains the Malaria Survey of India an institution concerned with the study of the problems of malaria in India and with the training of workers in malarial research and prevention The Malaria Survey also conducts every year a course of training which is attended by medical officers from all parts of India In addition it has organised and directed the antimalarial campaign in Delhi This work has within the last year produced excellent results giving promise of considerable reduction if not complete elimination of the disease in and around Old and New Delhi

The researches carried out by the Malaria Survey of India included an investigation in Kutch into the bionomics of *A culicifacies* and *A stephensi* in relation to the transmission of malaria, an intensive study of the bionomics of the local malaria carrying mosquitoes in Delhi, a large scale experiment to determine the value of insecticidal sprays in the control of malaria and a study of the feeding habits of malaria carrying anophelines

Blackwater fever is a disease which has hitherto eluded research both in regard to causation and methods of treatment Very interesting work in this direction has been in progress at the All India Institute of Hygiene and Public Health and a new line of treatment is reported to have given encouraging results

The need for making cheap quinine treatment available to the people has been repeatedly emphasised by the Research Workers Conference for some years and on this occasion the Conference noted with satisfaction the action taken recently by the Indian Research Fund Association to institute an enquiry into the cultivation of chinchona in India with this end in view

A large number of minor enquiries of which it is not possible to give details in the course of this very brief note came under discussion at the Conference Many of these are being conducted at university and college laboratories in different parts of India The I R F A has always been willing to recognise the importance of associating research work with institutions and colleges concerned with the training of medical students and medical post graduates The large number of enquiries which the Association has financed during the past years at the Calcutta School of Tropical Medicine at the All India Institute of Hygiene and at various universities is evidence of the Association's policy in this direction.

His Highness the Maharaja's Observatory, Trivandrum.*

HIS HIGHNESS THE MAHARAJA'S Observatory, Trivandrum was founded in 1837 during the illustrious reign of His Gracious Highness Sri Swati Thirunal Maharaja of Travancore a great patron of Science and Arts The Observatory is one of the oldest in India and its first astronomer was Mr John Caldecott, who was, prior to his appointment as Director of the Observatory, the commercial agent of the Government of Travancore at Alleppey The present site was chosen as the best available in the town of Trivandrum being 200 feet above sea level and commanding a good view of the horizon

Mr Caldecott's original proposal was to establish an Astronomical Observatory and he got down for this purpose a few astronomical instruments but when the institution started work in 1837 greater attention seems to have been paid to meteorological observations Mr Caldecott published three issues of an astronomical ephemeris adapted to the Meridian of Trivandrum After the death of Mr Caldecott Mr John Allan Broun who till 1849 was the Director of the Magnetic Observatory Makerstoun Southern Scotland was appointed Director of the Observatory and he took charge of the institution in 1852 Finding that there was good scope for work on Terrestrial magnetism in Trivandrum he started a scheme of investigations on magnetism and meteorology As a result of his observations Mr Broun showed that the Sun and the Moon exerted an influence on the direction of the magnetic needle and that a lunar diurnal variation existed for this influence Near the equator the influence in December was the opposite of what it was in June He also showed that the lunar action was reversed at sun rise and was much greater during the daytime than at night whether the moon was above or below the horizon Mr Broun also deduced that the day to day changes in the horizontal force of the earth's magnetism was simultaneous all over the world Some of these changes he attributed to the moon while the others had periodical changes once in 26 days on account of the influence of the Sun He also inferred that the greater magnetic disturbances were due to actions proceeding from certain meridians of the Sun

Mr Broun showed that the apparent simultaneity of the changes of mean barometric pressure over a great part of the globe, had a period of 26 days He started systematic observations of the clouds at different altitudes He also found certain relations between atmospheric motions and the directions of the lines of equal barometric pressure

It is a noteworthy fact that Mr Broun also established an Observatory on the top of Agustia peak at a height of 6,200 feet above the sea level

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* The centenary of the foundation of H H The Maharaja's Observatory was celebrated in a fitting manner on the 23rd December 1937 A brief history of this great institution is given here. A more detailed account can be obtained from the Centenary Volume which is now in the press —*Editor*.]