Our scientists would do well to rid themselves of the mania for control and power to produce.

The present science departments have been modelled on the revenue-collecting departments with their graded array of heads, deputies, and assistants in descending order with great differences in emoluments. This difference in emoluments is often interpreted as connoting parallel differences in research talent which is wrong. We have not yet learned to appreciate and give the proper position to scientific talent.

In the past, the scientific services in the country lost many useful and devoted votaries because of the allurements held out by administrative positions carrying higher status and better emoluments. Science departments should learn to appreciate and hunt for research talent wherever found. In the future set up there should be no need for a researcher to give up his line of work and get lost in administrative nullity to improve his position. Scientific talents need to be paid on a par with administrative ability and within the science department itself the differences between pay scales should be lessened. I have very intimate knowledge of one agricultural researcher who had to give up higher emoluments in a different line of work and at a different place to enable him to produce tangible results. In this case, the individual lost but the country gained immensely.

T. S. VENKATRAMAN.

THE ASIAN REGIONAL COMMISSION OF THE INTERNATIONAL METEOROLOGICAL ORGANISATION

IT is a matter for genuine gratification that the Capital city of Free India is becoming the venue for the meetings of many International Conferences. In the first Asian Regional Commission of the International Meteorological Organisation which held its session at New Delhi from the 10th to the 20th November 1948, India played a leading part. 13 Member States including the U.S.S.R. as well as observers of the U.K., the U.S.A. and the I.C.A.O. took part in the proceedings.

The Prime Minister of India who opened the session on the 10th November, rightly stressed the importance of international co-operation in Meteorology as follows :—

".....So it is a good thing that we take advantage of all these opportunities for international co-operation, not only because it is good in their particular field of activity but because they affect the larger field of human relations in the world and make people realise that after all the world is being carried on today by a great measure of international co-operation. In this context the communications system becomes more and more international and so many other branches of Science can only progress internationally.

Therefore, I welcome all the delegates who have come here and I hope that your labours will bear fruit in this particular branch of Science which is so important for human welfare as well as in the larger field of human relations."

The Director-General of the Indian Meteorological Service was elected as President and the Chiefs of the U.S.S.R. and the Netherland East Indies Weather Services were elected as the two Vice-Presidents.

The Commission appointed *ad hoc* sub-committees to go into the following very important problems of Synoptic Meteorology in the Asian Region,—

1. Net-work of surface, upper air, radio-electric, etc., observatories.
2. Tele-communications and Broadcasts.
3. Codes and Units.
4. Marine Meteorology.
5. Use of Counting Machines for Meteorological purposes.

These sub-committees some of which were presided over by members of the Indian Meteorological Service concluded their valuable work during the session and produced workable solutions of the many problems raised and agreed plans for observational net-work, inter-regional and national meteorological broadcasts, procedure relating to codes and units, etc. The Conference held 18 plenary sessions to discuss the 25 items on the agenda and passed 45 resolutions and recommendations.

The labours of the Commission have paved the way for increased co-ordination and co-operation in the field of Meteorology. It is essential that we should have the maximum co-operation and understanding with our neighbour countries for the successful prediction of weather for the

benefit of the Indian farmer, aviator, engineer and the public at large.

Apart from the problems of organisation, procedure, communication, etc., referred to above, the Commission also considered some of the important research aspects of pure and applied Meteorology. In the field of Agricultural Meteorology the Indian workers under the Director of Agricultural Meteorology at Poona have played a leading role and it is pleasing to note that the Indian Crop-Weather Scheme has been adapted for international use by the Commission. A permanent Sub-Committee on Agricultural Meteorology, with the Director of Agricultural Meteorology, Poona (India), as Chairman, has been constituted for the Asian Region for developing and co-ordinating the work on this subject in the various countries of Asia.

Another permanent Sub-Committee on Hydrology, a subject of such vast importance for India where many multi-purpose irrigation schemes are under way, was also constituted.

It is obvious that these meetings at Delhi have been very fruitful and we congratulate both the Government of India and its Meteorological Department for the important role they have played in furthering the cause of Meteorology in the service of the Asian Region.

THE MICROMANIPULATOR

DR. S. L. SCHOUTEN

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EARLY in February 1948, I had the pleasure of giving to Prof. M. Sreenivasaya during his stay in my Laboratory, a comprehensive demonstration of the Micromanipulator technique and its applications to problems in bacteriology and cellular physiology. On this occasion he suggested that I should contribute a note on this subject to *Current Science*; the following article has been written in response to his kind request.

The introduction of the gelatine medium by Robert Koch, represents one of the epochal landmarks in the development of bacteriological technique and has been responsible for the phenomenal advances in microbiological research during the past sixty years. This we certainly owe to the simplicity, ease and elegance of what has now come to be known as "plating method". The clarity of the medium facilitates the unmistakable location of microbes and the development of colonies as a result of their growth. No wonder that the method has remained unchallenged and is universally employed as a routine in bacteriological research.

Many workers, however, unwilling to confine themselves to routine investigation, observed that this method had certain serious limitations. When plating river water, we may be justified in assuming that by vigorous stirring of the molten nutrient medium, the individual cells would be completely separated, and the resulting colonies developed in the petri-dish, would represent integrally pure cultures. In the case of slimy material, however, *e.g.*, pus, blood, fæces, filthy ditch water, this assumption would not be justified. In such samples the cells adhere together, so that it is usually extremely difficult to separate them by stirring. We encounter the same difficulty with dermatomycoses. Even after pulverising with quartz powder one finds the cells adhering together in great numbers.

The investigator is often confronted with a mixture of different bacilli, from which he is obliged to isolate and examine one of them in pure culture. The "plating method" does not give him any reliable result; none of the colonies in the plate would be representative of the species he is seeking. This difficulty is experienced by all workers. Plating—I might say—is a blind method. An unknown quantity of unknown species is plated, but you never know which of them develop, neither the way of developing (only think of the lag-time!) nor the antagonistic influence of the different associates. From bacilli, found in fæces, it is often found that only one per cent. of them develop.

The inherent drawbacks which characterise gelatine or agar-agar affect the development of certain organisms, *e.g.*, nitrifying bacteria, but such organisms are fortunately few and occur only rarely. But what is of real importance is described in the next para.

The basis of all biological work consists in the integrity of the individual. In problems of heredity, in determining vari-