

wave-front is no longer received through the aperture.

The third image mentioned above could be cut off by inserting an opaque screen near the farther end of the heated plate and adjusting it so that its edge protrudes a little beyond the surface of the plate. This shows that the image is due to the ordinary refraction of rays directly entering the edge of the heated layer at the farther end of the plate. The main features of the path of such rays may be deduced from the experimental observations described in the previous paragraph. The terminus of the reflected part of the cusped wave-front corresponds to certain limiting rays entering the region at the farther end of the plate. Rays which are able to enter the edge of the heated layer at a closer distance to the plate than these limiting rays proceed a longer distance before emerging from the heated stratum and also suffer a larger deviation. These rays give rise to the erect third image; in fact, the second refracted wave-front, obtained by drawing the surfaces orthogonal to these rays, meets the termination of the refracted part of the wave-front so as to form a second cusp.

Till now we have dealt mainly with the case when the distant object is of negligible angular dimensions. When an object of finite angular dimensions is used, the point on the image which corresponds to any particular point on the object is to be determined as before for each setting of the eye. In this case there will

be a distortion of the images because the position of the limiting layer as well as the inclinations of the cusped wave-fronts corresponding to any particular point on the object varies with the position of the object-point. Figure 2 shows the photographs taken using as the object a small model of a bird made of glass. This was placed near the focal point of the collimating lens. The sequence of photographs show the variation in the appearance of the phenomena as the eye is moved away from the plane of the plate. The appearance of a third erect image in addition to the usual reflected image may be discerned in the last two photographs of the sequence. It is worthy of note that a third erect image adjoining the inverted image which is the principal feature of the mirage has actually been noticed by various observers in mirages as seen in a large scale in the open air. It was noticed, for example, by Hiller in his study of mirages of the inferior type produced by a long vertical wall which had been warmed by the sun's rays. Hiller's photograph showing this effect is reproduced in Pernter's treatise already mentioned and also elsewhere. The third erect image is a conspicuous feature in Vince's drawings of ships at sea exhibiting the phenomenon of the superior mirage. It may safely be presumed that the explanation of its appearance is analogous to that of the effect noticed in the laboratory experiments and illustrated in Figs. 2 and 3 above.

COMMONWEALTH EDUCATION CONFERENCE

THE report of the Commonwealth Education Conference, presented at the final session at Oxford on July 28, 1959, adds an important chapter to the history of Commonwealth endeavour and co-operation.

The Conference has helped to carry a step forward the scholarship scheme originated by Canada and approved last year at Montreal. As a result not only will the scheme come into force in the year 1960-61 but the target of 1,000 scholarships may well be exceeded. Of these United Kingdom has offered to provide 500 and Canada 250. In the main the Commonwealth Scholarships will be for post-graduate study or research. A limited number of awards will be made to senior scholars of established reputation and achievement and called Commonwealth Visiting Fellowships.

The report points out that over the first five years Commonwealth Governments will spend at least £10,000,000 in addition to their present expenditure, on education.

One of the major problems to be solved is about the acute shortage of trained teachers. While the long-term problem of Teacher Training needs must be solved by the respective countries themselves, the report shows that a number of practical suggestions have been made at the Conference to meet the immediate needs.

On the supply of teachers the report estimates that 500 teachers are wanted immediately for training institutions, well over 1,000 a year for secondary schools, and 200 a year for technical schools. Universities also need staff, often in highly specialized subjects. In this respect the attention of Governments is being drawn to the need for satisfactory arrangements for the reception and welfare of the scholars and teachers on which much of the success of the plan will depend.

The report suggests that funds are to be allocated for teaching English as a second language, and a group of Commonwealth experts will shortly consider the problems involved in teaching this subject.