
This paper deals principally with the problems of dark adaptation raised by the necessity of reading illuminated instruments and charts by men engaged in night operations, whether by sea, air or land. The lighting of aeroplane instrument boards by red light is described and the results stated to be favourable. In July, 1941, red lighting was introduced also on ships of the Royal Canadian Navy with equally good results and has been extended to the Royal Navy. The use of red goggles for 30 minutes before going on watch is important to reduce the time required to adapt to deck conditions. Various tests for dark adaptation are discussed and results obtained with the Hecht-Shlaer R.C.N. adaptometer described and tabulated. A description of the instrument and of the testing unit at Halifax, N.S. is given. 6,285 men were tested, and 1'6 per cent. of these were found to have defective dark adaptation. In order to check the accuracy of the method tests were repeated on groups of men daily for 6 to 8 days. The results were found to show only a standard deviation of 0'06 to 0'17 and therefore to be of value. It is to be noted, however, that in this as in most other tests for night vision the sensitivity of a small constant area of the retina only is measured. If the test is intended as an indication of a man's suitability for night operations it would seem desirable to design something which would measure the extent of the dark adapted field of vision rather than the sensitivity of one point in it.

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Circumcorneal injection and corneal vascularisation have been investigated using a special camera which takes highly magnified photographs of any desired quadrant of the eye. Examination of these photographs, rather than of the eye itself, provides the data on which judgment of normality or abnormality has been based. A study of 198 men in the R.C.A.F., begun in May, 1942, using this method, showed that one only among them had what the authors considered to be normal eyes. Seventy men whose eyes
showed "proliferation of the vessels of the limbic plexus and penetration of the cornea with twigs, streamers and loops" were chosen to test the effect of riboflavin on such corneal vascularisation. Other symptoms which have been suggested by Kruse to be associated with riboflavin deficiency were also taken into account. Enquiries were made concerning tiredness, aching, or watering of eyes, sandy sensation under lids, dizziness, headaches, reading intolerance and decreased visual acuity.

The 70 men were divided into three groups. The first group of 28 men received 9.9 mg. riboflavin each day for two months. Photographs showed a marked or moderate decrease in vascularisation in 20 cases. None got worse. Twenty-one men received 9.9 mg. riboflavin each day for one month. Here again the photographs showed that 6 showed marked or moderate decrease in vascularisation. One man got worse. Of 21 men treated with capsules containing no riboflavin none showed more than faint improvement and 6 grew worse. Symptoms, apart from corneal vascularisation, also improved markedly under treatment with riboflavin, but not without.

This short summary of Tisdall, McCrery and Pearce's paper is sufficient to show either that the R.C.A.F. is in a very unbalanced nutritional state, or that photographs, like statistics, can prove anything. Of the two hypotheses the reviewer prefers the latter and would urge readers of this paper to bear it in mind while examining the photographs reproduced. Photographs 4, 5, and 6 of one normal and of two eyes showing very early stages of arboflavinosis are difficult to assess by anyone unfamiliar with this photographic technique, but the corneae of all would pass as normal here if slit-lamp appearance is similar to photographic appearance. Photographs 7, 8, and 9 are of the same eye. This eye showed a "penetration of the cornea with twigs, streamers and loops" and photographs 7 and 8 give two pictures of the same quadrant before riboflavin treatment. Photograph 9 is the same eye and same quadrant after riboflavin. In all three photographs that part of the conjunctiva that is in focus is markedly engorged and by tracing out individual capillaries at the limbus, which in Fig. 9 is also largely out of focus, very little difference can be found between these three photographs.

The reviewer admits that inability to detect the difference may be due to poor reproduction of the photographs themselves. But if we accept unquestioningly the data in this paper the population of Canada—as a group of civilians also showed these signs—appears to be very much worse off than the population of Britain. Here very few cases of arboflavinosis have been described, although it has been carefully looked for. The authors consider that it may be glare that is largely responsible for the susceptibility of the R.C.A.F.
to ariboflavinosis. Now, although riboflavin itself is light sensitive, the compounds of riboflavin, flavin adenin dinucleotide and flavoproteins, which occur in animal tissues, are not destroyed by light and no connection between snow blindness and riboflavin has been demonstrated as far as the reviewer knows. The symptoms which were used as ancillary evidence for ariboflavinosis can also result from errors of refraction or need not be of ocular origin, e.g., dizziness and headache, or alternatively can be symptoms of photophobia with which the photographs are also consistent. It is noteworthy that the authors state that the changes in vascularity took place gradually over the two months of treatment. This is unlike the rapid effect of large doses of riboflavin in more advanced ariboflavinosis, where decrease in vascularity begins immediately.

The authors state that further work is in progress. The results will be awaited with interest as the reviewer feels that tongue and skin signs of ariboflavinosis and slit-lamp examination of the cornea are necessary before the presence of this very widespread malnutrition in Canada can be accepted as proved.

A, PIRRIÉ.


(3) Kull reports that in the normal rabbit eye, prostigmin, like eserine, induces a fall in tension after a transitory rise. In glaucoma patients, prostigmin lowers the tension, sometimes even in patients in whom pilocarpine was ineffective. The best results were obtained in chronic simple glaucoma. Drops of 3 per cent. solution are well tolerated; exceptionally, 5 per cent. can be borne without irritation.

ARNOLD SORSBY.


(4) Goldmann and Hagen report on the use of X-rays for the measurement of the actual length of the living eye by the procedure described by Rushton (Trans. Ophthal. Soc. U.K., Vol. LVIII, Pt. 1, p. 136, 1938). They confirm Rushton's findings and give measurements of 18 eyes by an apparatus slightly modified from the original. They also discuss mathematical computation of the total refraction of the eye.

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