Complementary Red and Green D, but they and their dilution depend upon the paper and the spectacles being used. The kind of spectacles we have are of cardboard with celluloid eyes costing four shillings a dozen, so the outlay even for a large class is not serious. Having found the right strength of ink, use the green first, as the red has a tendency to run along the wet green lines if they are used in the reverse order.

It improves the general appearance and ease of interpretation of the diagrams if the near edges are made at least twice as wide as those at the back (the others very roughly in proportion) and if the parts needing special emphasis are cross-hatched. By the latter means parts are given a solidity which, however, is translucent and so the relation of internal structures to the parts in front and behind them is easily appreciated.

These wall-diagrams are perfectly satisfactory even when viewed from a fair distance or from the side. Their only disadvantage compared with the ordinary kind is that the lecturer cannot successfully *point* to any part (except the nearest point when they are drawn coincident) as the apparent position varies with the view-point. This, however, is more than compensated for by the ease with which the shape is seen and can be described and, anyhow, the parts can easily be lettered.

To anyone familiar with perspective drawing technique the production of these wall-diagrams is not difficult unless there are many curved surfaces to be represented. These can only be reproduced by drawing their lines of curvature, the projection of which is a laborious task. In many instances, however, such a task can be avoided by substituting polyhedral surfaces for the curved ones. I have, for example, made a pair of diagrams to show the invagination of the optic vesicle to explain the reason for the appearance of the choroid fissure, the relation of the retinal and pigment layers, etc., with this modification, and it is quite satisfactory.

In the above account I hope I have omitted no important detail of the method, but, if any reader has any question to ask, I shall be happy to try to answer it.

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Shadows of the Retinal Blood-Vessels seen by Monochromatic Light

IT is well known that the shadows of the retinal blood-vessels may be seen if a pinhole is held in front of the eyes near to the anterior focus and moved from side to side. They are also sometimes seen in a microscope field, though they disappear if the eye is held still and comfortably adapted. During some observations with a monochromator, I noticed that the patterns could easily be seen in the field when blue light was used, but that they could not be seen at all with green light. Further experiments, with about ten observers, showed that most people could see the patterns easily with light of λ 4078 and λ 4358 (violet and blue), much less easily with light of λ 4916 (blue-green) and not at all in the range λ 5000–λ 6000 (green and yellow). They could be seen again in the red, but not nearly so easily as in the blue and violet. By removing the prism and substituting a plane mirror, so as to retain the same geometrical arrangement, I found that they could be seen with white light. Dilution of the blue with a little green made the patterns much less clear.

On examining the pinhole effect with monochromatic light, I found that the patterns could be seen by any colour if the pinhole was moved rapidly, but only by blue light if it was moved very slowly. The effect depends on so many factors that it is not possible to give any quantitative data, but the minimum speed for green appeared to be about five times as great as that for blue light. The patterns were more easily seen with strong light than with weak, up to the limit of comfortable illumination.

It is usual to explain the fact that these patterns are not seen in ordinary vision by assuming that the eye has some compensatory mechanism for ignoring them. Thus the receptors on which the shadows normally fall may become hypersensitive, so that they give a full response when stimulated by the small amount of light passing through the vessels. They are seen in the pinhole experiment because the retina is illuminated by fairly narrow pencils of light. When the pinhole is moved, the direction of illumination changes and the shadow moves from one set of receptors to another so rapidly that the compensation is defeated. In the microscope field the effect is produced by flickering of the eye when it is not comfortably adapted. In seeking to apply this explanation to the experiments with monochromatic light, we may note that the effect is supposed to depend on the rate at which the adaptation is able to take place. Our results could be explained if either, (*a*) for blue light a given movement of the pinhole produces a greater movement of the shadows than for other parts of the spectrum, or (*b*) for blue light the adaptation is more rapid. At first sight, supposition (*a*) appeared very attractive. If the reception action takes place mainly as the light is absorbed in the visual purple, we should expect that the reception of the blue and red would take place mainly at a greater depth than reception of the blue and green (owing to the strong absorption in the green). This would mean that for a given change in the direction of illumination the shadows would move farther for blue than for green. This explanation had to be abandoned because direct experiments show that there is no difference in the depth of the different receptors[1]. On the other hand, if explanation (*b*) is correct, we should expect to find effects of a corresponding nature in experiments on fatigue. I can find no evidence of such results, though there is no definite negative evidence.

According to Roaf's theory of colour-vision, blue light stimulates the rods rather than the cones, and this might suggest a reason for a different rate of adaptation to changing illumination. It would not explain the difference between red and green found in the experiments with the monochromator. This difference, which was small, may have been due to some subsidiary effect, especially since it could not be found in the pinhole experiment.

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[1] Koster, *Archiv Opthalmologie*, **41**, 1. In view of the fact that Koster's results were in conflict with earlier work, I have repeated some of his observations and confirmed his conclusions.