fuchsin or alum carmine. The activity of the reticulo-endothelial system in the organs studied was assessed by the number of dye-bearing cells and the intensity of the vital staining.

In the group of animals which received 2 mgm. of deoxycorticosterone daily for one week, four showed vital staining appearances similar to those of the controls; the remaining two animals showed reduced activity of the macrophages, especially in the spleen and to a lesser extent in the liver and lymph nodes. In the group which received 2 mgm. of hormone daily for two weeks, five of the animals showed vital staining appearances similar to the controls, and the remaining one animal showed a slight reduction in phagocytic activity; similar results were found in the group which received 5 mgm. of the hormone daily for two weeks.

These preliminary observations show that deoxycorticosterone has little or no effect on the activity of the reticulo-endothelial macrophages and in this respect greatly differs from cortisone. This difference in action between the mineral corticoid and the glucocorticoid is of great interest, and for this reason the effect of adrenocorticotrophic hormone on the reticulo-endothelial system is now being investigated.

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Binocular Vision and Deep-Sea Fish

The human binocular threshold is more than 10 per cent lower than the monocular one. This finding has been explained on a statistical basis by Pirenne[1], who assumed that the two eyes are independent. The extent to which binocular vision lowers the threshold depends on the relation between stimulus and response and on the absolute value of the threshold. The lower the threshold, the greater is the benefit.

An examination of a number of deep-sea fish[2-5] suggests that these animals have binocular vision in order to achieve greater sensitivity. They have eyes which are large and tubular and which often protrude from the head like periscopes. The visual axes are generally parallel. In some cases, the fundi are lined with tapeta. Thus there are several indications that maximum visual sensitivity is the target; the reduction in the threshold afforded by binocularity is in harmony with this design.

But an animal with eyes in front has a smaller visual field than an animal with one eye on each side of the head. Is binocularity in deep-sea fish, therefore, worth the price paid for it in terms of increased vulnerability? The answer may lie in a consideration of the light-intensity range in which they live. A 10 per cent improvement in the threshold would be of small consequence to man, whose environment ranges in intensity over many log units. But a similar small improvement might be highly appreciated in regions in which light is always at a premium. Thus at intensity-levels well above the monocular threshold, monocular views of two widely differing fields may be advantageous as compared with fused binocular views of similar fields because of the increased information afforded by the former system. But, intermediate to the monocular and binocular thresholds, there is a finite intensity-range where fused binocular vision is clearly an advantage: at such intensity-levels, it is better to be able to see a relatively small field than not to see a large one. Assuming that the eyes are independent, binocular vision may double the response near the monocular minimum[6]. Other physical devices, such as a colourless crystalline lens[7], or the presence of a tapetum[8], increase an animal's sensitivity only by a fraction of a log unit. Binocularity in deep-sea fish may rank with such second-order factors, and none the less be of critical survival value.

There is some zoological evidence supporting this view. The explanation usually advanced for the position of an animal's eyes—namely, that the hunter has eyes in front, but the hunted at the sides—does not apply to deep-sea fish[4]. The generalization fails also with other fish, for example, sharks. At least three types of deep-sea fish with tubular eyes do not seem to be predators although their visual axes are parallel. They are *Opisthoproctus*, *Winteria* and *Dolychopteryx*. They have small toothless mouths. Their trunks are trapezoidal and thus unlikely to be capable of the swift movement characteristic of streamlined bodies. They have no photophores with which to attract prey. The correlation between feeding habits and the direction of the visual axes thus does not appear to be as rigid in the sea as it is on land, since there are predator fish with non-parallel axes, and also non-predators with parallel ones.

Maximum light sensitivity may therefore be added to predacity and manipulation[4] as factors associated with binocular vision.

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Euphausiopsin, a New Photosensitive Pigment from the Eyes of Euphausiid Crustaceans

The eyes of euphausiid shrimps contain large quantities of vitamin A [1]. Fisher *et al.*[1] found a particularly high concentration of the vitamin in the eyes of *Euphausia pacifica*. These observations have led to speculation that vitamin A may play a part in euphausiid vision.

Live specimens of *E. pacifica* were dark-adapted in running sea water, and their eyes were removed in dim red light. The whole eyes were macerated with