especially in response to the physiological stimulus of light, since the response in an optic fibre is then likely to consist of a brief high-frequency train of impulses.

This ability of single optic nerve fibres to discharge geniculate cells is almost certainly made possible by the fact that the preterminals branch very extensively[6], so that a single fibre may apply a large number of terminals to a cell. This property of the geniculate synapse is in sharp contrast to the spinal motoneuron, which integrates and acts as the final common path for impulses from a wide variety of afferents. This 'straight-through' property of many geniculate cells by no means excludes the possibility of important modifications in the signal taking place at this level, since changes can occur in the pattern of the repetitive discharge which frequently follows a single afferent volley[9].

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Larval and Adult Hæmoglobins of the Cyclostome *Petromyzon planeri*

Systematic investigations of the electrophoretic behaviour of hæmoglobins of various vertebrates have so far been carried out mainly on the higher forms. We have started to investigate the electrophoretic behaviour of hæmoglobin of the cyclostome *Petromyzon planeri* in the adult or in the ammocoetes stage.

Paper electrophoresis did not permit the detection of any consistent differences between adult and larval blood, which by this technique showed the same electrophoretic pattern consisting of a single hæmoglobin band migrating toward the anode. On the other hand, starch-gel electrophoresis provided evidence for the presence of two distinct hæmoglobin bands with different mobility at each stage.

Adult and ammocoetes of *Petromyzon planeri* were collected from the River Sarno near Naples. Blood from 32 adults and 44 ammocoetes has been examined. Blood was collected, by decapitation, in Alsever solution. Erythrocytes were washed repeatedly, and then hæmolysed with distilled water.

Electrophoresis was performed with starch gel using the discontinuous buffer system described by Poulik[1]. Fig. 1 shows the positions of all the hæmoglobin components in the adult and ammocoetes stages. Adult blood has two hæmoglobin bands (I and II). Hæmoglobin I migrates more rapidly and is present in much smaller amounts than II. Larval blood also has two distinct hæmoglobin bands (I′ and II′), which are apparently present in the same concentrations. They migrate more rapidly than the adult ones.

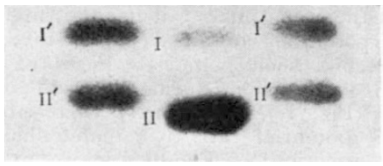

Fig. 1

Apart from the difference in the electrophoretic mobility between adults and larvæ, no other differences were detected among animals of the same stage and in particular no animals with only a single band were found in Nature.

It is conceivable, therefore, that the double-band pattern obtained only by gel electrophoresis might be the result of some kind of degradation of the hæmoglobin molecule due to the supporting medium itself.

Further researches are in progress to clarify this aspect of the problem, bearing in mind what is known for mammalian hæmoglobins[2–4].

Nevertheless we think that the results given above allow the conclusion that in these lower vertebrates the electrophoretic behaviour of hæmoglobin in the larval stage is different from that of the adult stage. Although this may be obviously interpreted as to be due to the presence of some fœtal-like hæmoglobin in the larvæ, it must be noted that unlike the mammalian fœtal hæmoglobin, here the larval hæmoglobin migrates faster than the adult one.

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Respiration and Radiosensitivity of Broad Bean Roots

In the root-tips of the broad bean, *Vicia faba*, potassium cyanide, hydrogen sulphide and cupferron (the ammonium salt of nitrosophenylhydroxylamine) increase the frequency of chromosome aberrations produced by a given dose of X-rays at very low oxygen pressures[1–3]. In the case of cupferron at least, the effect on radiosensitivity seems to be a result of its inhibitory action on the respiration of bean root tips[3]. The fact that oxygen enhances the radiosensitivity of the root-tip chromosomes of *Vicia faba* has been known since the studies of Thoday and Read[4]. When the roots are respiring normally an oxygen effect does not become evident until the concentration of oxygen in the gas phase exceeds 3 per cent, apparently because at lower concentrations oxygen is removed by respiration in the outer cells of the root, so that completely anaerobic conditions prevail in the central parts. When respiration is inhibited, oxygen is able to diffuse into the cells of the whole meristem, even in cases when the oxygen concentration outside the root is very low. That this is the correct explanation of the increased frequency of aberrations obtained in the presence of cupferron is indicated by the fact that cupferron has no marked influence on radiosensitivity in the complete absence of oxygen[3].