terminals, not merely the strengthening of existing but silent synapses. If so, it implies that the mammalian central nervous system, at least early in life, has some powers of rapid regeneration.

This work was supported by a grant to C. B. from the Medical Research Council. J. A. M. holds a research training studentship from the Wellcome Trust. We thank Dr R. C. Van Sluyters for help and discussions, and R. D. Loewenbein, J. S. Dormer and R. M. Cummings for technical help.

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Received May 22, 1974.

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Intercellular gap junctions in pigment epithelium cells during retinal specification in *Xenopus laevis*

DURING embryonic development the cells of the retina acquire positional information which predisposes the future optic axons to connect with specific loci in the optic tectum. In *Xenopus* embryos the eye becomes irreversibly polarised along the naso-temporal and dorso-ventral axes by stage 32[1], after which it is insensitive to any specifying influence previously exercised by the tissues surrounding the eye[2].

In a recent electron microscope study[3] of the developing *Xenopus* retina we described the fine structure of the developing retina between stages 26 and 36. We noted then, the presence of intercellular gap junctions which occurred throughout the retina up to stage 30/31. Beyond stage 32 these junctions could only be found at the periphery of the retina where stem cells contribute new cells to the growing retina[4]. Hence the disappearance of these gap junctions from the central portion of the developing retina appears to be correlated with the time of retinal specification.

We have recently re-examined our data on the developing *Xenopus* eye and noted a significant feature which we failed to report in our original paper. Namely, that cells of the embryonic pigment epithelium, as well as cells of the neural retina, establish gap junctions with one another throughout the eye prior to stage 30/31. We also observed gap junctions between retina and pigment epithelium (Fig. 1). After stage 32 these gap junctions disappear from the centre of the eye but persist for some time in the periphery.

Many results support the view that the flow of molecules through cell junctions may be important in the control of cellular growth and differentiation[5]. In our previous paper we suggested that the disappearance of gap junctions from the central part of the eye and the time of retinal determination might be causally related. Our present observations on the distribution of gap junctions between developing retina and pigment epithelium prior to stage 32 suggests that not

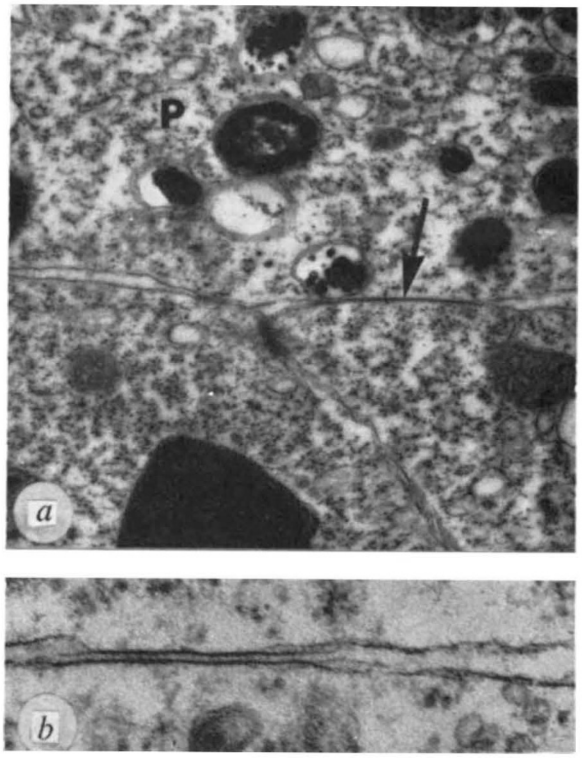

Fig. 1 *a*, The arrow indicates an intercellular junction between a germinal pigment epithelial cell (P) and a retinal cell at stage 26. (×24,000); *b*, A similar junction at higher power illustrating the characteristic narrow gap of 3–9 nm. (×94,000).

only the retina, but also the pigment epithelium, may be subject to the specifying influence of the surround through intercellular channels. This is particularly interesting in view of recent indications that pigment epithelium cells from the centre of the eye of an adult newt may pass on positional information to a new regenerating retina[6].

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Received April 4; revised June 14, 1974.

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Specificity of regenerating optic fibres for left and right optic tecta in goldfish

RECENT studies[1] on the regeneration and development of the visual nervous system of inframammalian vertebrates have concentrated on the topographic patterning of retinotectal connections, neglecting the problem of what specifies the pathways of large tracts. Embryologically the eye is an outgrowth from the ipsilateral side of the brain, but during development the optic nerve fibres cross the midline and terminate on