pyronine ; in this case, there is a good correspondence between methyl green staining and the number of silver grains in the emulsion.

Labelling of deoxyribonucleic acid could thus be observed in morula as well as in blastula cells of the lethal hybrids. Moreover, 24 hr. after development stopped, tritium-labelled thymidine was still incorporated into deoxyribonucleic acid, a fact which suggests that the block in development is not due to the arrest of deoxyribonucleic acid synthesis. Such a conclusion has already been reached by Løvtrup and Gregg[6], for the similar *Rana pipiens* ♀ × *Rana sylvatica* ♂ combination, on the basis of biochemical measurements of deoxyribonucleic acid synthesis.

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[1] Moore, B. C., *Anat. Rec.*, **134**, 610 (1959).
[2] Lison, L., *Histochimie et Cytochimie animales*, 29 (Gauthier-Villars, Paris, 1953).
[3] Ficq, A., *Arch. Biol.*, **66**, 509 (1955).
[4] Barth, L. G., and Barth-Jaeger, L., *J. Embryol. Exp. Morph.*, **7**, 210 (1959).
[5] Brachet, J., *Arch. Biol.*, **65**, 1 (1954).
[6] Gregg, J. R., and Løvtrup, S., *Exp. Cell. Res.*, **19**, 621 (1960).

Chloride-secreting Cells in the Gills of European Eels

In a recent communication Parry, Holliday and Blaxter[1] reopened the question of the chloride-secreting cells of the gills of fish and, in agreement with Bevelander's[2] arguments, they brought new indirect evidence against Keys and Willmer's theory[3] and Copeland's[4] conclusions.

Eels provide an excellent material for direct investigation of this point : Keys[5] demonstrated that branchial chloride is excreted by animals adapted to sea-water ; whether chloride absorption occurs is doubtful[6]. Moreover, silver eels migrate from fresh water to the sea and this behaviour should be related to a change in osmo-regulative capacities.

Gills of yellow and silver eels, adapted to fresh and sea-water, have been studied with Leschke's histochemical test for chloride. Although Leschke's method lacks specificity and is reproducible only within rather wide limits (cf. Lison[7]), a comparison of results obtained with identical tests in standard conditions from different animals can give reliable information.

The acidophil cells of yellow eels living both in fresh and in sea-water gave a positive chloride test, although slight and somewhat variable. With silver eels, the chloride test was strongly positive (Fig. 1) for animals adapted to sea-water, but clearly negative for those maintained in fresh water (Fig. 2).

These results confirm Keys and Willmer's theory and Copeland's data (on *Fundulus*) of the role of the acidophil cells of the gills of some fishes in chloride secretion, and demonstrate a different osmo-regulation between yellow and silver eels.

Yellow eels appear to be more euryaline and capable of secreting and absorbing chloride through the gills, but this conclusion should be confirmed by physiological experiments on eels of a definite stage of development. Silver eels seem to be able to secrete but not to absorb chloride by the gills.

These differences in osmotic function between yellow and silver eels explain the migration of silver

Fig. 1. Longitudinal section of gill filament of a silver eel adapted to sea-water. The acidophil cells at the base of lamellæ show a positive test for chloride, with Leschke's method. (× 300)

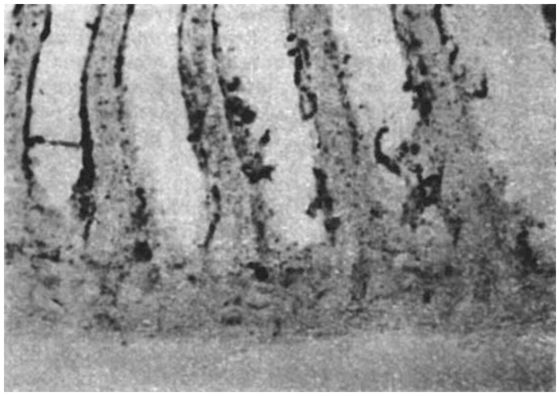

Fig. 2. Longitudinal section of gill filament of a silver eel adapted to fresh water. Leschke's test is negative. (× 300)

eels from fresh water to the sea more clearly than the 'demineralization' theory postulated by Fontaine[8].

Silver eels can also survive in fresh water ; the salt balance in this environment is likely to be maintained by the larger amount of water swallowed. Indirect evidence of this fact comes from Defrise's[9] experiments, which show that, in fresh water, (silver?) eels produce more than ten times as much urine as sea-adapted eels.

A full account of this research is in the press[10].

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[1] Parry, G., Holliday, F. G. T., and Blaxter, J. M. S., *Nature*, **183**, 1248 (1959).
[2] Bevelander, G., *J. Morph.*, **57**, 335 (1935) ; **59**, 215 (1936).
[3] Keys, A., and Willmer, E. N., *J. Physiol.*, **76**, 368 (1932).
[4] Copeland, D. E., *J. Morph.*, **82**, 201 (1948) ; **87**, 369 (1950).
[5] Keys, A., *Z. f. vergl. Physiol.*, **15**, 364 (1931).
[6] Krogh, A., *Osmotic Regulation in Aquatic Animals* (Cambridge Univ. Press, 1939).
[7] Lison, L., *Histochimie et cytochimie animale* (Gauthier-Villars, Paris, 1953).
[8] Fontaine, M., *et al.*, *Bull. Mus. Nat. Hist. Natur., Paris*, **15**, 373 (1943) ; *J. de Physiol.*, **42**, 287 (1950).
[9] Defrise, A., *Arch. Ital. Anat. e Embr.*, **33**, 692 (1934).
[10] Colombo, G., *Arch. Ocean. e Limn.*, **12** (in the press).