viously in the developing cortex. The perikaryon of a cell migrating outward may perhaps establish contact with another cell already in position in the cortex and may then migrate farther while trailing its axon behind, still in contact with the perikaryon or the developing dendritic tree of the cell that had arrived previously. The cell contacts established during histogenetic migration may also be relevant for the formation of particular patterns of synaptic connexions in other parts of the nervous system, as discussed elsewhere[3,4].

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Uptake and Incorporation of Tritiated Thymidine in *in vitro* Culture

The duration of the 'synthesis phase' of deoxyribonucleic acid (DNA) of the mitotic cycle (phase *S* of Howard 1956[1] and Lajtha *et al.* 1954[2]) has been determined for several cell types. As yet no distinction has been made between the uptake of labelled thymidine and its incorporation by the cell into a more complex structure, presumably DNA.

Sagittal slices of the upper tibial epiphysis of the rat, rabbit and guinea pig were cultured *in vitro*, in the presence of tritiated thymidine (0·5–1 μc. tritiated thymidine, specific activity 0·360 c./m.mol., to 5–6 ml. medium), in an attempt to elucidate the growth pattern of the epiphyseal growth cartilage and the articular cartilage. The explants were fixed in 10 per cent formalin at *p*H 7·4–7·6. Some were embedded in butyl and isobutyl methacrylate and sectioned without decalcification; others were first decalcified with 10 per cent formic acid for 12 hr. before being embedded in paraffin wax. Sections 4–7μ thick were cut, the embedding medium removed, and autoradiographs made according to the Pelc stripping film technique[3], and exposed for 3–6 weeks. Grain counts were made on cells in the proliferative zone (flattened cells) of the epiphyseal growth cartilage.

If the tissue was sectioned without previous decalcification, the grain counts attained nearly the maximum value after ½ hr. in culture. By 1 hr. the maximum value was found; this persisted for the duration of the experiment (Fig. 1).

On the other hand, if the tissue was first decalcified with formic acid, maximum counts were only attained on explants that had been cultured for 6–9 hr. (Fig. 2, rat). Similar results were obtained by giving the tritiated thymidine to rats *in vivo*.

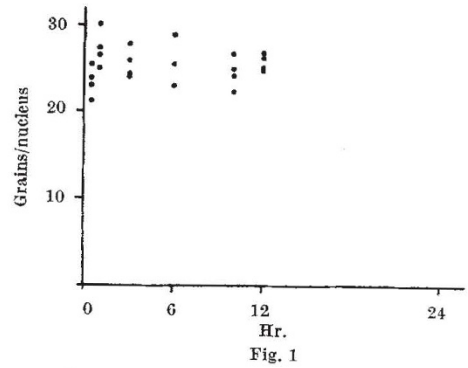

Fig. 1

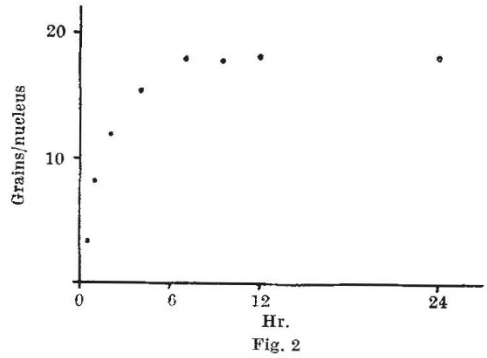

Fig. 2

These results suggest that a maximum load of tritiated thymidine is taken into the cell nucleus very rapidly. In fact, this occurs so rapidly, in less than 1 hr., that a carrier mechanism might have to be invoked to explain it. But once in the nucleus, it takes a finite time for the tritium-labelled substance to be incorporated into a large and more complex molecule capable of resisting removal by 10 per cent formic acid. This process of incorporation would appear to take between 6 and 9 hr. to be completed in the cells of the proliferative zone of the epiphyseal growth cartilage.

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BIOLOGY

Fluctuations in Marine Populations in Icelandic Waters

It is well known that populations of many animals living at high latitudes are subject to considerable fluctuations. Fairly regular periodic variations are reported in a number of cases. The 10-yr. cycle of the rock ptarmigan in Iceland reported by Gudmundsson[1] furnishes a striking example. The cause of this cycle is unknown.

Marine populations are also subject to large fluctuations but there are few reports on regular or periodic variations. This may in many cases be due to lack of observations.

There are available fairly reliable data on the catching of cod in the waters south-west of Iceland since 1900. In particular, there is available a set of data of a rather uniform quality for the winter