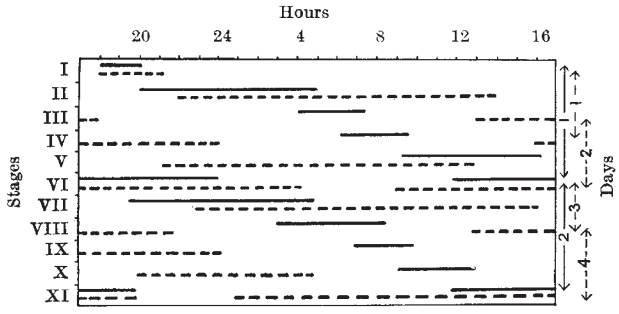

Fig. 1. Duration of embryonic development in the sardine: ———, in December at 18° C.; – – – –, in March at 13° C.

The first occasion was in December and the second in March. These dates were selected because at the place chosen the water temperature is then uniform from surface to bottom: in December it was 18° and in March 13° C. Thus the temperature conditions were as constant as in a laboratory experiment. We made use of the eleven embryonic stages of Ahlstrom, since the development of the two species is similar. Our results are shown diagrammatically in Fig. 1. Hatching takes place after stage XI. It will be seen from Fig. 1 that at 18° C. the duration of embryonic development is nearly two days, and at 13° C. about three and a half days. It is also clear that spawning takes place in the evening.

We have some evidence, deduced from studies of planktonic ova, of the occurrence of spawning at a definite time of day in yet other species of fish, especially pelagic ones, but the data are as yet incomplete. A full account of the work on the sardine will be published in *Acta Adriatica*, volume 7.

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Swimming of Fishes

The 'load carried' by a nursehound *Scyllium catulus* is approximately 5 per cent in this fish, and fishes closely related to it; only 95 per cent of the weight of the fish (in air) is supported by the water. In most teleosts (with swim-bladders), such as the conger, the load carried is about 0·01, or practically the whole of the weight is supported by the water[1].

A large nursehound lends itself to the simple experiment of hanging additional weights on to it and ascertaining how much additional weight it can carry. This was done recently in one of the large outside tanks at the Marine Biological Association at Plymouth, when it was found that a large nursehound could carry an additional weight amounting to practically 25 per cent of its weight in air, while a teleost was practically incapable of carrying anything.

Thus a nursehound has an enormous reserve of carrying power, while most teleosts (with swim-bladders) have practically none.

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Nomenclature in Microscopy

Some confusing terms are used nowadays in microscopy. One repeatedly sees and hears the expression 'light-microscopy' used with the intention of excluding phase-contrast and dark-ground, as though these methods did not involve the use of light. One also notices the expression 'phase-contrast illumination', which is used despite the fact that the essential part of the method occurs at or near the upper focal plane of the objective.

We need a universally recognized word for what is sometimes called 'ordinary' microscopy. The word 'ordinary' is not very suitable, because other methods are coming into wide favour. It might be convenient to speak of 'direct' microscopy in all cases in which (1) there is only one illuminating cone, arranged symmetrically about the optical axis, and (2) the direct and diffracted light are not treated differently. Direct microscopy would be in contrast with 'oblique', 'dark-ground' and 'interference' microscopy.

In 'oblique' microscopy the direct rays are sent through the optical system in such a way that their course is not symmetrical about the optical axis.

In 'dark ground' microscopy the direct rays are either so directed as to miss the lenses of the objective by passing externally to them (external dark-ground), or else they are stopped within or just above the objective (internal dark-ground). What is here called internal dark-ground is commonly called 'central dark-ground'; but the term is not fortunate, for an annular stop is preferable to a central one. ('Dark-ground' seems preferable to 'dark-field', because it is only the background, not the whole field of view, that is dark.)

'Interference' microscopy is also of two main kinds. In one, which may be called 'double-beam interference', two coherent sets of rays are used for illumination. In the other, a single (hollow) illuminating cone is used, and the second set of rays, with which the direct rays will be caused to interfere, originates at the object. This is 'single-beam interference', but the name 'phase-contrast' is (unfortunately) firmly established.

It would be a convenience to limit the expression 'light-microscopy' to cases in which visible light is the illuminant. If one did not state or suggest the contrary, it could be assumed that the illuminant was light. Thus, the unqualified expression 'dark-ground microscopy' would mean dark-ground microscopy with visible light. The various terms suggested in the preceding paragraphs would be (potentially) as applicable to infra-red, ultra-violet and electron-microscopy as to light-microscopy.

It would be consistent to restrict the term 'photomicrograph' to micrographs made with visible light, and thus to speak always of infra-red, ultra-violet and electron 'micrographs'. The expression 'electron photomicrograph', which one sometimes sees in scientific papers, is objectionable.

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