examined, which possesses the larval shell (prodissoconch) only, without any fringing growth (dissoconch), has seven gill filaments on this side. In this spat the anterior adductor already shows reduction and, with the increase in size of the posterior adductor, the ratio between the two is already 3 : 2 in favour of the latter.

During the first eighteen hours after settlement, the spat retains the 'eyespots' which are so characteristic of the fully-developed larva, and such 'eyed' spat usually have eight gill filaments on the left side with a suggestion of the ninth. The 'eyespots' disappear within twenty-four hours of settlement, and at forty-eight hours a fringe (dissoconch) has been added to the larval shell. The spat at about forty-eight hours after settlement measures about 0·35 mm. and possesses ten gill filaments on the left side, while still showing distinct vestiges of the foot and velum. The fate of these larval organs in the American oyster (*Ostrea virginica*) has been described by Stafford[3], but we have no information concerning their fate in *Ostrea edulis*. The eleventh, twelfth and thirteenth gill filaments appear on the left side before the spat is ninety hours old, and such spat usually show the anterior adductor reduced to a few fibres at the edge of the shell, or absent altogether. The posterior adductor has increased in size and its point of attachment has moved ventrally until it lies almost outside the prodissoconch attached to the dissoconch, the definitive shell of the adult. Such ninety hours old spat may be 0·6 mm. in diameter, that is, with a shell twice the diameter of that of the larva. The foot and velum are completely absorbed and there are 13 gill filaments on the left and 7 on the right. The smallest spat described by Yonge[2] had 20 filaments on the left and 13 on the right and its shell measured 1·2 mm. It is probable that it had been attached for five or six days.

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Light and Breeding Seasons

IT has recently been shown by Marshall and Bowden[1] that not only duration but also intensity of illumination can affect the onset of a breeding season, and that ultra-violet as well as visible light is effective. These discoveries have an important bearing on seasonal phenomena in the tropics.

On the equator itself the length of day is always the same, and in the equatorial regions the seasonal change is small. (As my brother, Mr. S. J. Baker, points out, the difference in minutes between the longest and shortest day in the tropics may be found by multiplying the latitude in degrees by 7·2. The result is always correct within two minutes between 20° N. and 20° S.) Despite a constant or almost constant length of day, not very many equatorial birds are known to breed all the year round. One may suppose that the control is by intensity of illumination (visible and ultra-violet).

It is an interesting fact that, of those species of birds in Ceylon the breeding seasons of which are known, no fewer than eleven definitely have two breeding seasons annually, and at least sixteen other species probably behave in the same way. The length of day, of course, only rises to a maximum and sinks to a minimum once annually, but the intensity of illumination probably has two maxima in the year, at about the times when the sun passes overhead. Although these are often times of heavy rainfall, yet the mornings and early afternoons tend to be sunny. In South America in nearly the same latitude as Ceylon, it has been shown that there are two periods of maximum intensity of ultra-violet light in the year, in May and October (Chavarria and Gomezvega[2]). Similarly, Harrisson and I[3] have shown that in the tropics of the southern hemisphere the amount of ultra-violet light sinks to a low figure when the sun is near the Tropic of Cancer.

Those birds of Ceylon which have two breeding seasons commonly breed at about the times when one must suppose that the intensity of illumination is near its maxima. To take only one example, the Ceylon blackbird, *Turdus merula kinnisii*, breeds in March–April and again in September[4].

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Feb. 5.

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Extent of the Ranikot Sea

WITH reference to my preliminary note[1] on the results of work by Mr. Pinfold and myself on the Eocene beds of the Punjab Salt Range, we have now determined the fact that, of the six sections of the local Eocene, the lower three (Dhak Pass Beds, Khairabad Limestone and Patala Shales) are all of Upper Ranikot age ; the Patala Shales representing later Ranikot elements than have yet been found elsewhere. The three upper sections (Nammal Shales, Sakesar Limestone and Bhadrar Beds) are of Lower to Middle Laki age, the unconformity between Ranikot and Laki being rather less on the Salt Range than elsewhere. Our paper on this subject, giving full palæontological details, will appear in due course as the first part of vol. 24 (N.S.) of the *Palaeontologia Indica*.

We have meanwhile studied the Eocene rocks of Waziristan, and the Kohat and Attock Districts, in order to determine the further extensions of these beds to the north and north-west. I also examined the late Sir Henry Hayden's collections from the Cretaceous and Eocene beds of Kampa Dzong in Tibet, due north of Calcutta. Certain of these beds were referred to the Danian by Prof. H. Douvillé in 1916 ; but Dr. G. de P. Cotter, of the Geological Survey of India, afterwards argued that they more probably belong to the Laki. I found that they are really of Upper Ranikot age, their foraminiferal fauna agreeing in closest detail with that of the Khairabad Limestone of the Punjab Salt Range.

It has thus become obvious that the Ranikot Sea, once thought to have been limited to a small area in western Sind, not only reached northwards as far as the Tirah, but also extended thence to the east over the whole length of the Himalayas, as far, at least, as the longitude of Calcutta. The peculiarly rich and characteristic Ranikot foraminiferal fauna