

The dimensions, in inches, of the specimens represented in text-figs. 123 & 124 are as follows :—

	<i>B. sondaicus.</i>	<i>B. s. lowi.</i>
Length of horn on outer curve	25	21 $\frac{1}{2}$
Basal girth of ditto	11 $\frac{1}{4}$	12 $\frac{1}{2}$
Maximum span of horns	28	23 $\frac{1}{2}$
Tip-to-tip interval of ditto	16	13
Length from intercornual ridge of skull to tip of nasals	16	13 $\frac{1}{2}$
Minimum width of skull between base of horn-core and orbit	9	7 $\frac{1}{2}$

These differences fully justify the right of the Bornean Bantin to racial distinction, and as none of the comparatively few synonyms of *Bos sondaicus* appears referable to that race, I propose that it should be known as *B. sondaicus lowi*; the skull and horns represented in text-fig. 124 (B. M. No. 87.2.10.4) being the type.

It may be added that both the Burmese Bantin or Tsaine, for which I proposed the name of *B. s. birmanicus* in the Society's 'Proceedings' for 1898, p. 277, and the Siamese Bantin, for which I have suggested the name of *B. s. porteri*, Ibid. 1909, p. 669, have horns of the general type of those of the typical race, although those of the Siamese race are more heavily wrinkled at the base than any Javan horns in the British Museum.

Information is still required as to whether the Bantin occurs in Sumatra.

56. Notes on the Breeding of the "Millions" Fish (*Girardinus pæciloides*). By EDWARD G. BOULENGER, F.Z.S., Curator of Reptiles.

[Received October 18, 1912: Read October 29, 1912.]

The little fish *Girardinus pæciloides*, popularly known as "Millions" in Barbados on account of the enormous numbers frequenting all the shallow pools in that island, is said to be of great practical value on account of its devouring mosquitoes; the absence of malaria, which is so prevalent in the neighbouring islands, is believed to be due, as first pointed out by Mr. C. Kenrick Gibbons, to the presence of this fish, for the insect conveying the malarial disease breeds only in shallow pools, where these fish abound and, it is well to add, have no competitors, *G. pæciloides* being the only freshwater fish inhabiting Barbados. For this reason, the Society arranged with the Colonial Office to keep a large stock and to supply specimens to various tropical stations in the British Empire. The fishes have bred on numerous occasions in small aquariums in the Reptile and Tortoise Houses,

and I have thus been able to observe certain facts in relation to their breeding habits, to one of which in particular I wish to draw attention, namely that in some cases the male breeds before the assumption of its secondary sexual characters. Before dealing with this matter it is necessary to mention briefly the sexual differences, which are very marked. Females, which may measure up to 25 mm. in length, are simply of a dull olive-grey in colour, usually with a dark patch above the anal fin, while the males, which do not attain quite so large a size, are most conspicuously ornamented with red, blue, violet and yellow, with a dark ocellar spot situated in the middle of the body, in front of or beneath the dorsal fin, and another at the base of the caudal fin, these spots appearing at least fourteen days before the brilliant hues. Males are to be further distinguished from females by the position and prolongation of their anal fin, which is transformed into an intromittent pairing organ.

The male is remarkably active, and is perpetually courting the female, going through all kinds of antics in front of her, and as breeding goes on all through the year, at least in captivity, the latter is in an almost permanently pregnant condition, and within a fortnight of having brought forth a brood (such a period representing the duration of the gestation, at a temperature of over 70°), once more brings a generation into the world. It should be borne in mind, however, that a single impregnation is sufficient for the fertilization of several broods, the embryos of the second and third generations being already in an advanced condition when the first young are born. Each brood comprises from five to as many as twenty-five fish.

The young fishes grow rapidly: about 4 mm. long at birth, they double that length in a fortnight or so, when their sex can be determined by the shape and position of the anal fin; it is not, however, until at least six weeks after birth that the males become adorned with the brilliant colours which characterise the adult, this period again varying according to the temperature of the water.

The first brood, containing a male which bred before the assumption of its secondary sexual characters, was produced on March 11th of this year, and numbered eleven. As is almost invariably the case, a number of weaklings died within a few days of their birth, and eight fish remained at the end of a fortnight, when I found the sexes to be equally divided, which is remarkable, for as a rule females outnumber males by about three to one. On May 7th, six young ones were born of this brood, and at the time none of the males had developed their adult coloration, the only markings distinguishing them from the females being the spots beneath the dorsal fin and at the base of the caudal, and it was in fact not until six days later that one of these acquired its full sexual livery. The others followed suit on May 17th and 18th. These broods were kept at an average temperature of 80°.

In another case, a brood of fourteen fishes, born on June 5th,

and of which only seven survived, two males and five females, reproduced their species on September 29th and 30th, the adult coloration of the males appearing only on October 7th and 16th. When we consider the fact that these fishes, owing to the warmer tanks being already occupied, were kept at the low average temperature of 65°, we must conclude that, like their growth, the period of gestation must have been slow, and that the male undoubtedly bred at least a month before acquiring its full secondary sexual characters.

A parallel case is well known in the male Salmon, which occasionally becomes sexually mature in the parr condition, while the Wrass (*Coris julis*) and the Dragonet (*Callionymus lyra*) have been observed by Mr. E. W. Holt also to become sexually mature prior to having fully developed their adult characters. In the two latter cases, however, the question is one of degree only, the characteristic male livery not being entirely absent, as in *Girardinus*.

EXHIBITIONS AND NOTICES.

October 29, 1912.

Prof. E. A. MINCHIN, M.A., F.R.S., Vice-President,
in the Chair.

The SECRETARY read the following report on the Additions that had been made to the Society's Menagerie during the months of May, June, July, August, and September 1912.

MAY.

The registered additions to the Society's Menagerie during the month of May were 448 in number. Of these, 207 were acquired by presentation, 60 by purchase, 43 were received on deposit, 72 in exchange, and 66 were born in the Gardens.

The number of departures during the same period, by death and removals, was 203.

Amongst the additions special attention may be directed to :—

A large collection of Mammals and Birds from Nepal, including 1 Indian Rhinoceros (*Rhinoceros unicornis*), 1 Kiang (*Equus kiang*), 2 Barasingha Deer (*Cervus duvaucelli*), 2 Sambur Deer (*Cervus aristotelis*), 3 Hog-Deer (*Cervus porcinus*), 2 Monaul Pheasants (*Lophophorus impeyanus*), 2 Cheer Pheasants (*Catreus wallichii*), and 2 Wedge-tailed Fruit-Pigeons (*Sphenocercus sphenurus*); presented on May 21st by H.M. THE KING.

A pair of European Bison (*Bison bonasus*), from Russia, presented by H.G. the Duke of Bedford, K.G., on May 15th.



Lydekker, Richard. 1912. "The Bornean Bantin." *Proceedings of the Zoological Society of London* 1912, 906–908.

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