

XXIII.—*On the Natural Term of Life and of its chief Periods in the Hippopotamus* (*Hippopotamus amphibius*, Linn.).

By Prof. OWEN, C.B., F.R.S., F.Z.S.

IT may be interesting to note, in relation to the longevity of wild mammals (a constant in the determination of which it is difficult to get facts), that the hippopotamus the capture of which, shortly after birth, is noted in the 'Annals & Magazine of Natural History' for June 1850 as having occurred in August 1849, died at the Zoological Gardens in March 1878. The conditions under which this animal lived to the age of twenty-eight years and eight or nine months, were such as to support an inference that it died of old age, and that the natural term of life of *Hippopotamus amphibius* may be set down at thirty years or thereabouts.

No special morbid appearance was discovered to suggest that death from old age had been anticipated. The worn state of the teeth was that of a vegetable feeder at the close of natural life. It may be thought that some allowance should be made for the artificial conditions under which this male hippopotamus lived; yet its health and vigour were such as to enable him to procreate.

The first offspring was a male, which was born February 22, 1871; it died on the 23rd of the same month*.

The father had attained a size in 1854 indicative of the procreative period; but the exercise of the faculty was delayed both by the later acquisition of the female and the state of their abode.

Mr. Bartlett informs me:—"I believe the reason she did not breed sooner was the fault of the construction of the water-tank. I had the tank made to slope gradually at the side; and this form of tank enabled the animals to copulate, whereas the sudden drop of 2 feet was unsuited to the purpose"†.

The pregnant state of the female was suggested by "a considerable change in her habits and appearance." The coitus had been noted as on June 29, 1870, giving a period of gestation of 7 months 22 days, = 237 days.

The periods of gestation of the *Hippopotamus amphibius* determined at the Zoological Gardens of Amsterdam are from 7 months and 21 days to 7 months 25 days.

The second offspring of the same parents at the London

* 'Proceedings of the Zoological Society,' March 1871, "Notes on the Birth of a Hippopotamus in the Society's Gardens," by A. D. Bartlett, Superintendent.

† Letter, July 17, 1879.

Zoological Gardens was born January 7, 1872*, and was begotten May 27, 1871. It was a female, and died on the 10th January, 1872; the gestation was 227 days, being 10 days shorter than in the case of the male offspring.

On November 5, 1872, the Secretary reports "the birth of a third hippopotamus (*Hippopotamus amphibius*), which had taken place that day in the Society's Gardens at 7 A.M. The period of gestation in the present instance had been eight calendar months less four days, according to the keeper's observations" †.

The coitus here is noted as on March 9, 1872‡. The offspring was a male; and the gestation was five days longer than in the case of the first male, and fifteen days longer than in the case of the female offspring.

Since this birth the mother has ceased to breed; she is four years younger than the male. The female hippopotamus in the menagerie at Amsterdam produced young as soon as she was full-grown.

The term of growth of the hippopotamus appears to be about five years; it extended, in the instance of the male born in midsummer 1849, as to length, to the year 1854; but the well-fed animal gained in bulk during some following years. The procreative period, commencing probably in 1854, was continued up to the year 1872, and perhaps a few years later, say to 1875, when the animal had attained the age of 26 years; this would leave a period of four years for old age.

An approximate conclusion as to the natural term of life in mammals may be made upon knowledge of the duration of one of the well-marked periods of existence. These are three, viz. the "preprocreative," the "procreative," and the "post-procreative" periods. In the human subject the first is modified to a small extent by latitude and climate. Taking an average as at 18 years, the procreative period may be set down as at three times that extent, carrying on the life-term to 72 years. If the postprocreative equals the preprocreative, life will extend to 90 years.

If the first period of life be characterized by the acquisition of full growth, then a man might survive as long after the procreative period, ending say at 75 in the male, as he had lived to acquire maturity and complete ossification, say at 30 years, and so reach the rare term of 105 years.

* See "Notes on the Visceral Anatomy of the Hippopotamus," by J. W. Clark, F.R.S., Proc. Zool. Soc. 1872, p. 185.

† Report on the additions to the Society's Menagerie, by the Secretary, Proc. Zool. Soc. 1872, p. 795.

‡ Ibid. p. 819.

The ascertained relative duration of the three periods above defined in the artiodactyle mammals most nearly approaching the *Hippopotamus amphibius* in size, supports the conclusion here endeavoured to be drawn from what could be ascertained of these periods in the captive male in the Gardens of the Zoological Society of London, viz. that the duration of its life under these circumstances must be that, or nearly that, of the individuals of the species in their native land and wild state, which may accordingly be set down at or about 30 years.

It is but due to the responsible officers in charge of the exotic animals in that noble establishment, to bear grateful testimony to their successful treatment, and to their exact observations and records of phenomena essential to the advancement of the science of Natural History.

British Museum, July 20, 1879.

XXIV.—*On some new and rare British Spiders, with Characters of a new Genus.* By the Rev. O. P. CAMBRIDGE, M.A., C.M.Z.S., &c.

[Plate XII.]

SINCE my last communication on British Spiders (Ann. & Mag. Nat. Hist. Feb. 1878, ser. 5, vol. i. p. 105, pl. xi.) I have been enabled, through my own researches and the kind assistance of several friends and relatives, to add thirty-nine species to the list of those then known to Great Britain and Ireland. Fifteen out of the thirty-nine appear still to be undescribed; twelve others have not hitherto been recorded as British, though known on the continent of Europe; and the twelve remaining species have lately been described, either as new to science or to Britain, in Part I. of "The Spiders of Dorset," published in the 'Transactions of the Dorset Natural-History and Antiquarian Field Club' for 1879. The fifteen new species, above referred to, are described in the following pages; and several of them are figured in the accompanying Plate. A list is also appended of those spiders not before recorded as British, and of the others mentioned above as described and recorded in "The Spiders of Dorset."

Several of the species included in the total (484) of British spiders recorded up to the time of the publication of my last communication (February 1878) have since been ascertained to be synonymous with others previously known. The number now considered to be British, so far as they are known up



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