

lamb of smaller size, the ram behaves only as grade (V) or (VI). Also, if a Welsh Mountain ewe with her rump cleared of wool is mated to a heavy Border Leicester ram, the latter will probably show no sexual interest.

This work is being carried out in the Animal Research Station, Cambridge, while on study leave from the Fouad I University of Egypt. Detailed results will be published elsewhere. I wish to thank Dr. John Hammond for his advice and encouragement and Dr. Arthur Walton for criticism.

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<sup>1</sup> Ring, J. R., *Endocrin.*, **37**, 237 (1945).

<sup>2</sup> Asdell, S. A., de Alba, G. H., and Roberts, J. S., *J. Anim. Sci.*, **4**, 277 (1945).

<sup>3</sup> Cole, H. H., Hart, G. H., and Miller, R. F., *Endocrin.*, **38**, 6 (1945).

<sup>4</sup> Walton, A., *Proc. Soc. Study of Fertility*, **1**, 40 (1950).

<sup>5</sup> Beach, F. A., "Recent Prog. in Hor. Res.", **1**, 27 (1947).

### A Sanskrit Work on Angling of the Early Twelfth Century

BASHFORD DEAN'S "Bibliography of Fishes" records an anonymous work entitled "Dit Boecxken leert hoe men mach voghelen vanghen metten handen. Ende hoe men mach visschen vangen metten handen. Ende oeck andersing. Ende oeck tot wat tyden vanden iare dat een yeghelyck visch tsynen besten is. Hier eyndet een boecxken dat seer profitliëck is voor allen visschers, ende vogheleers" and published at Antwerp in 1492 as the earliest known work on angling. In 1872, Alfred Denison, as editor, published "A literal translation into English of the earliest known book on fowling and fishing, written originally in Flemish and printed at Antwerp in the year 1492". The editors of Dean's "Bibliography of Fishes" have supplied the following useful information concerning another earlier book on angling: "This Flemish tract appears to have priority over the 'Boke of St. Albans', as far as fishing is concerned; that is, as a printed book. There are a number of early German versions, appearing under the title of 'Büchlin' or 'Fischbüchlin', published between 1552 and 1700. One of these is included in the Fischbach of Gregory Mangolt, published at Zurich in 1598. Three other editions are known: one in 4°, without place or date, having an identical title; the other, slightly changed in verbiage, in 1583 without place; and the third in 1584."

In the fourteenth edition of the *Encyclopædia Britannica* (1, p. 932) more light is thrown on the "Boke of St. Albans", a part of the second edition of which was published in 1496. The manuscript is stated to be of the earlier part of the fifteenth century. There are, however, possibilities of still older manuscripts of this work.

The publication of the Sanskrit manuscript of "Mānasollāsa" by King Sōmēśvara, son of King Vikramāditya VI of the later Chālukyas, in the Gaekwad's Oriental Series (Publication No. XXVIII, Baroda, 1925), has brought to light a chapter on angling which gives details, almost modern in practice, about this pleasant pastime. "Mānasollāsa" is an encyclopædic work and was composed in A.D. 1127. The kingdom of Sōmēśvara comprised practically the whole of the Deccan plateau and included the Godavari, Nerbada, Tapti and Kistna river systems.

It included the Maratti, Tamil and Telugu peoples and stretched from the east to the west coast of India.

The chapter on angling is entitled "Matsyavinōda", the pastime of angling. As many as thirty-seven species of Indian sporting fishes are mentioned. These are divided into marine, freshwater and anadromous kinds. They are then further divided into scaly and scaleless varieties, and each group is still further divided into large, medium and small according to size. From the etymological meanings of the fish names and other particulars given in the work about each kind, it has been possible to determine with a fair degree of certainty thirty-three out of thirty-seven species. The fishing tackle is dealt with under the three main components, namely, line, rod and hook. Various types of fibres for making a line are suggested, and their relative merits discussed. A solid bamboo shoot or a branch of a mangrove tree are suggested as suitable material for making a rod; types of suitable iron hooks are described.

For different groups of fishes different prescriptions are given for preparing ground baits, and methods of feeding various species are separately described. Sōmēśvara also gives hints on the actual fishing technique and refers to details of ground bait, tackle, float, bait, casting the line, fish bite, striking a fish and playing a fish.

By studying inscriptions of irrigation tanks in southern India, it has been possible to give an evolutionary sequence of fishing in such tanks. There are inscriptions of the fifth and sixth centuries A.D., showing that irrigation tanks were maintained from the revenue derived from paddy cultivation. In an inscription of the middle of the tenth century, there is mention of a fisherman, but he is assigned the work of supplying wood for the repairs of boats used for the desilting of tanks, and is paid for his labour in paddy. A Tamil inscription of A.D. 1112 mentions revenue derived from fishing for the maintenance of the tank, which shows that the art of pond culture and angling had already progressed fairly far. King Sōmēśvara composed his "Mānasollāsa" in 1127. In all the inscriptions of the thirteenth to the sixteenth century, one finds that fishery revenue from irrigation tanks was sufficient for their maintenance. From this historical narrative, the art of sport fishing can definitely be assigned in southern India to the middle of the tenth century.

The work referred to here shows that the art of angling was developed in ancient India to a very high standard, for the methods described therein are quite in line with those used by anglers in India to-day. The gipsies of Europe, who use Mongolian, Hindi and other fragments of Asiatic languages, to-day practise the same methods as those described by King Sōmēśvara, and it is likely that they wandered from India to Europe and spread the art of angling there. The so-called 'Thomas Detective float', a peacock feather type of float, is described in "Matsyavinōda" and is not an innovation of the nineteenth century. Full details of this work, with an atlas of fishes referred to therein, will appear in the *Journal of the Royal Asiatic Society of Bengal* in due course.

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