

Fish Culture in Sixteenth-century Poland

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REVIEW ARTICLE OF WOJCIECH SZCZYGIELSKI, *Z Dziejów Gospodarki Rybnej w Polsce w XVI-XVIII Wieku* [*The History of Fish Breeding in Poland from the Sixteenth to the Eighteenth Centuries*]. Instytut Historii Kultury Materialnej Polskiej Akademii Nauk, Studia z Dziejów Gospodarstwa Wiejskiego, vol. ix, no. 2, Warsaw, 1969. 68 pp.; *Idem, Gospodarka Stawowa na Ziemiach Potudniowo-Zachodniej Rzeczypospolitej w XVI-XVIII Wieku* [*Fish Breeding in the South-West Regions of Rzeczpospolita, Poland, from the Sixteenth to the Eighteenth Centuries*]. Institute of History, University of Łódź, 1965. 308 pp.

FRANCIS DAY writing in 1880-4 on the *Fishes of Great Britain and Ireland* remarks of the carp that "in some countries, especially those where eating fish forms a portion of the religious creed of the people, this fish is largely cultivated, while a supply is kept in stews, so that when fast or feast days come round it is readily available; they were, likewise, very useful in times when the means of carriage was slow." As an item of diet fish has not received the attention it deserves, for in the period before the Reformation, and indeed long after it, fish was the only animal food permitted on the fasts of the Church. In a pre-refrigeration era those areas remote from sea or even large river fisheries had difficulty in maintaining supplies of fresh fish, and this encouraged the creation of artificial ponds or stews and the development of careful fish breeding and rearing techniques. Two recent publications from Poland by Wojciech Szczygieski discuss in some detail the history of fish culture from the sixteenth to the eighteenth centuries, and this brief review of their content, based upon an English abstract and a letter from the author, provides an opportunity to make some compari-

sons and comment on some general problems of the history of this branch of agriculture.

The History of Fish Breeding in Poland from the Sixteenth to the Eighteenth Centuries contains an English summary (pp. 67-8); this argues that the development of true fish culture as opposed to the management of semi-natural ponds developed vigorously in Poland during the sixteenth century as part of a general expansion of economic activity. This trend seems to have been attendant on a population rise which had the effect of lifting cereal prices and, when associated with devaluation, depressing the real wages of unskilled labour, thus making the investment of capital in the construction of fish ponds an exceedingly profitable venture. The price of fish rose steadily throughout the century in response to an increasing demand. These favourable economic circumstances were fortunately linked with marked improvement in breeding and rearing techniques, and as early as the fifteenth century the value of separate ponds for spawning, nursing, and rearing or fattening was appreciated, an essential preliminary to controlled pisciculture.

The sixteenth century saw the development of a system of fish transference from one pond to another: in particular, fry produced in small spawning ponds could be transferred to larger ponds for rearing to a marketable weight, although the general practice seems to have been to allow some growth in nursery ponds of intermediate size, necessitating three stages of transfer. In this way it was possible to take advantage of a variety of ponds, natural and artificial, including millponds, for the third stage. The total time taken to bring a fish to maturity from spawning to rearing pond seems to have been four or five years, and annual yields were of the order of 40-50 kilograms per hec-

ture, occasionally reaching 65 kg/ha. or, exceptionally, 75 kg/ha. It is instructive to compare these figures with the yields of modern ponds in Israel, whose pond culture practices follow essentially the pattern evolved in Central Europe, modified by technical development and climatic variations; Israeli unfertilized ponds average 400–500 kg/ha., while within fertilized ponds yields of the order of 2,000–3,000 kg/ha. are normal. The abstract makes no specific reference to artificial feeding in Poland, the yield clearly being regarded as a function of soil quality, and this may account for the relatively low efficiency.

Fish culture in Poland was a form of agrarian investment which was closely linked with other aspects of production; ponds were generally sited to take advantage of small patches of waste land, marshy hollows for instance, but in some circumstances it was possible to alternate fish production with grain production on the same land, no doubt using the beds of large shallow ponds which were periodically drained and then cropped; rich yields could thus be obtained. It was inevitable that close links should develop between the techniques of pond construction and supply, and land drainage and improvement: for instance, the mud scoured from the pond beds when they were cleaned constituted a valuable manure which was widely used throughout Poland.

The information provided by the English summary on post-sixteenth century conditions is unfortunately most perfunctory, but during the seventeenth century there appears to have been a marked recession in fish production, a recession which was no doubt linked with the general agricultural depression of the late seventeenth and early eighteenth centuries, although this is not specifically stated in the abstract. The art of fish culture was, however, preserved on some large estates, and in the improved climate of the late eighteenth century a revival took place. There are strong indications that fish culture was at all periods particularly associated with the large estates, whose owners possessed a reserve of capital and could enlist

the help of semi-servile labour in pond construction. The system developed most strongly in south-west Poland, in the valleys of the Warta and Prosna around Kalisz and Sieradz, around Łowicz, in the valley of the Vistula between Kraków and Sandomierz, and around Oświęcim and Zator.

The second study by Dr Szczygielski entitled *Fish-Breeding in South-Western Poland from the Sixteenth to the Eighteenth Centuries: A Study of Agricultural Progress*, is much more detailed, but unfortunately contains no English summary. In comparison with the paper discussed above it examines more specific problems, amongst others the organization of breeding, the techniques of fish-pond construction, the transporting and marketing of the fish, and the organization of the fish farms. As might be expected these developments were not confined to Poland. A highly developed fish culture was also found during the sixteenth century in Czechoslovakia, and comparable techniques were probably widespread throughout the whole of Europe from the sixteenth century onwards.

The English material on fish culture affords a number of contrasts and parallels with regard to techniques, the relationship to general economic trends, and agricultural practices. Perhaps the most fundamental problem raised by this Polish work concerns the date of the introduction of the technique of fish transfer from spawning ponds to rearing ponds. Quite clearly this method was known by the early eighteenth century for Mortimer, writing in 1721, noted that "A pond of an acre of land, if 'tis a feeding and not a breeding pond, will every year feed well two hundred carps of three years old," and in another context the same author, when discussing the draining of ponds, states that "if 'tis a breeding pond you must take out the smaller (fish) to store other ponds." Unfortunately the medieval material is rather ambiguous on this point, for while both early fourteenth and mid-fifteenth century sources from the English Midlands make it clear that multiple pond complexes existed and that small fish

were being deliberately preserved for restocking it is not certain that fry were being produced carefully in spawning ponds. The transfer of both 'bremettes' and single live fish over substantial distances may perhaps be taken to suggest that the careful selection of fish was occurring, but too much must not be read into such slender evidence.

The development of fish culture in the English Midlands during the Middle Ages was dependent partially upon location, and the distance from sea and river fisheries, partially upon the general economic factors of the period, and partially upon social factors, such as the emergence of a wealthy class of freeholders. In this last respect the work done by the reviewer may well be atypical, and as in Poland the larger landowners may have been more deeply involved in fish culture than has been suggested. At this stage little can be said concerning the fortunes of pisciculture during the successive booms and slumps of the post-medieval period, but there is certainly evidence for the maintenance of fish culture throughout the sixteenth and seventeenth centuries. Similarly, the relationship between pisciculture and agricultural practice is hard to determine; writers of the seventeenth and eighteenth centuries point out the virtues of pond mud which is described as "a singular compasse for land" and good for "wheat land, or your garden, or to better any other barren ground that yeeldes no profit" and there are late sixteenth-century references to pond mud being scoured out to use as manure. It is hard to believe that this is not an ancient and widespread practice, especially as the regular scouring of ponds would seem to be attested by a survey of the lands of the Bishop of Worcester as early as 1299. Gervase Markham writing in 1614 on the *Pleasures of Princes* describes, in addition to the feeding of

fish with garbage and "the bloode of sheepe, calves, hogges and such like," the turving of the bottoms of spawning ponds. A logical extension of this latter practice would be the cultivation of the bed of a large pond, and one example is known to the author, at Wormleighton (Warwickshire), where the bed of a large pond has undoubtedly been ploughed, although this may of course have been subsequent to draining. Day mentions that it is possible to rotate crops of vegetables and fish, in which case three ponds are needed.

These two publications, by revealing the character and extent of former fish culture in Poland, emphasize the work yet to be done in this well-documented country. One of the crucial problems would seem to be the date at which the breme was replaced by the carp as the common pond fish. Dr Szczygielski states that the qualities of the carp as a food fish were first noticed in Poland during the fifteenth century. Both breme and carp in fact have qualities which make them suitable for cultivation: they are gregarious, they frequent sluggish water, grow rapidly, and have substantial powers of reproduction and resistance to live transport conditions. In England there is no mention of the carp in any of the medieval material the author has examined, the breme being dominant, and Day indicates that the earliest reference to the carp seems to be in 1496. By the seventeenth century, however, the normal pond fish was the carp, though it is not clear why; possibly it was somewhat more adaptable than the breme, and was regarded as better eating. The answer may well be a question of taste, but the possibility of a close link between the adoption of the carp and the development of new techniques of controlled breeding in both Poland and England seems very likely and would repay further investigation.