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It is to Heincke that credit is due for first applying to the study of the herring all those principles and methods which have gradually been discovered and found of value for the study of mankind.

The term "race" (family or tribe) is taken by Heincke to mean a number of individuals living together under the same external conditions, together propagating their kind, and standing therefore in more or less close relation to each other. The idea of a race is based upon that of an ideal type. All the separate individuals diverge from this type, both as regards each single quality and also, in each case to the combination of all the qualities appertaining to the type. The very idea of a type presupposes a certain degree of variation in the individuals and in their features, the type being the average or mean of all the different individual varying features.

Heincke's method is therefore to examine the individuals with regard to all, or a large number of qualities, and to find an arithmetical expression for a combination of these. In this way, the individuals of one and the same race will naturally group themselves about the same type (the mean of the race), and individuals of different races be separated, owing to the grouping of their qualities about different means. (*Metode der kombinierten Merkmale.*)

Working on this basis, Heincke has examined the variation of a great number of features in thousands of herring from different localities. Of the features in question some are constant, i.e. independent of the age and growth of the fish; to these belong the number of vertebrae, of keel scales, and of fin rays. By far the greater number of features which Heincke has examined have, however, been found to vary with age and growth. As Heincke himself points out, only a part of the investigations made can therefore be regarded as sufficiently exact and adequate. On the basis of all his investigations, Heincke has drawn up a system, the features of which we may notice as follows, taking especially into consideration the characters, which Heincke himself regards as the constant ones, i.e., number of vertebrae and number of keel scales:—

1. Northern ocean herring; spawn near the coasts in winter or spring, but move during summer in the open sea.

(a) Iceland herring of large size, mostly over 300 mm., when at maturity, number of vertebrae large, averaging over 5.7; number of keeled scales behind ventral fin (k_1) small, averaging under 14; tail tolerably long, head short and broad.

(b) Spring herring of Norway, large in size, at maturity over 300 mm., number of vertebrae very large, averaging over 57.5, single examples up to 60; number of tail vertebrae large, average 14.5 and more; average number of keeled scales under 14.5.

2. Coast herring; these are always winter spawning; they live in the immediate neighbourhood of the coast, spawning in brackish or estuary waters, differing greatly in different waters.

3. Ocean herring of the North Sea banks; inhabiting the open waters, from the coasts of England and Scotland across the whole North Sea. In summer and autumn they move to seek spawning grounds on the sandy and stony banks, which rise from the depths of the sea, and some distance from land. These have all a medium number of vertebrae (56.5 to 55.5); a large number of keel scales behind the ventral fins (15 to 14), these scales being highly developed. They have a broad skull. The southern bank herring have an extraordinary number of keel scales, 15 on an average to 17 and 20 in individual cases.

4. Autumn or sea-herring of the Baltic; size 250 mm., but towards Ruegen and Gotland bank growing less to 220 and 210 mm. Number of vertebrae small, 56.0 on an average, number of vertebrae to first hæmal arch 25.0 and more; number of keeled scales moderate 14.0 to 14.5.