chamber and establishing a provisional military government. Salmeron went into exile and remained abroad till 1881, when he was recalled by Sagasta. In 1886 he was elected to the Cortes as Progressive deputy for Madrid, and unsuccessfully endeavoured to combine the jarring republican factions into a party of practical moderate views. On the 18th of April 1907 he was shot at, but not wounded, in the streets of Barcelona by a member of the more extreme Republican party. He died at Pau on the 21st of September 1908.

SALMON, GEORGE (1819-1904), British mathematician and divine, was born in Dublin on the 25th of September 1819 and educated at Trinity College in that city. Having become senior moderator in mathematics and a fellow of Trinity, he took holy orders, and was appointed regius professor of divinity in Dublin University in 1866, a position which he retained until 1888, when he was chosen provost of Trinity College. He was provost until his death on the 22nd of January 1904. As a mathematician Salmon was a fellow of the Royal Society, and was president of the mathematical and physical section of the British Association in 1878. He was a D.C.L. of Oxford and an LL.D. of Cambridge.

His published mathematical works include: *Analytic Geometry of Three Dimensions* (1862), *Treatise on Conic Sections* (4th ed., 1863) and *Treatise on the Higher Plane Curves* (2nd ed., 1873); these books are of the highest value, and have been translated into several languages. As a theologian he wrote *Historical Introduction to the Study of the New Testament* (1885), *The Infallibility of the Church* (1888), *Non-Miraculous Christianity* (1881) and *The Reign of Law* (1873).

SALMON and SALMONIDAE.@@1 The Salmonidae are an im­portant family of fishes belonging to the Malacopterygian Teleosteans, characterized as follows: Margin of the upper jaw formed by the premaxillaries and the maxillaries—supra- occipital in contact with the frontals, but frequently overlapped by the parietals, which may meet in a sagittal suture; opercular bones all well developed. Ribs sessile, parapophyses very short or absent; epineurals, sometimes also epipleurals, present. Post-temporal forked, the upper branch attached to the epiotic, the lower to the opisthotic; postclavicle, as usual, applied to the inner side of the clavicle. A small adipose dorsal fin. Air-bladder usually present, large. Oviducts rudimentary or absent, the ova falling into the cavity of the abdomen before extrusion.

The Salmonidae are very closely related to the Clupeidae, or herring family, from which they are principally distinguished by the position of the postclavicle and by the presence of a rayless fin on the back, at a considerable distance from the true or rayed dorsal fin; this so-called adipose fin is an easy recognition-mark of this family, so far as British waters are concerned, for, if it is present in several other families, these have no reprc- sentatives in the area occupied by the fresh-water salmonids, with the exception of the North American Siluridae and Percop- sidae, which are readily distinguished by the pungent spine or spines which precede the rays of the first dorsal fin. The imper­fect condition of the oviducts, quite exceptional among fishes, owing to which the large ripe eggs may be easily squeezed out of the abdomen, is a feature of great practical importance, since it renders artificial impregnation particularly easy, and to it is due the fact that the species of *Salmo* have always occupied the first place in the annals of fish-culture.

The Salmonidae inhabit mostly the temperate and arctic zones of the northern hemisphere, and this is the case with all fresh­water forms, with one exception, *Retropinnα,* a smelt-like fish from the coasts and rivers of New Zealand. A few deep-sea forms (*Argentina, Microstoma, Nansenia, Bathylagus)* are known from the Arctic ocean, the Mediterranean and the Antarctic ocean, down to 2000 fathoms. The question has been discussed whether the salmonids, so many of which live in the sea, but resort to rivers for breeding purposes, were originally marine or fresh-water. The balance of opinion is in favour of the former hypothesis, which is supported by the fact that the overwhelming majority of the members of the suborder of which the salmonids form part permanently inhabit the sea. The clupeids,

for instance, which are their nearest allies, are certainly of marine origin, as proved by their abundance in Cretaceous seas, yet a few, like the shads, ascend rivers to spawn, in the same way as the salmon does, without this ever having been adduced as evidence in favour of a fresh-water origin of the genus *Clupea* to which they belong.

No remains older than Miocene (*Osmerus, Prothymallus, Thaumaturus)* are certainly referable to this family, the various Cretaceous forms originally referred to it, such as *Osmeroides* and *Pachyrhizodus,* being now placed with the *Elopidae.* There is probably no other group of fishes to which so much attention has been paid as to the Salmonidae, and the species have been unduly multiplied by some writers. Perhaps not more than 80 should be regarded as valid, but some of them fall into a number of local forms which are distinguished as varieties or subspecies by some authors, whilst others would assign them full specific rank. These differences of opinion prevail whether we deal with *Salmo* proper or with *Coregonus.*

*Classification.—The* recent genera may be arranged in five groups: The first, which includes *Salmo, Brachymystax, Stenodus, Coregonus, Phylogephyra* and *Thymallus,* has 8 to 20 branchiostegal rays, 9 **to** 13 rays in the ventral fin, the pyloric appendages **more** or less numerous (17 to 200) and breeding takes place in fresh water. The second group, with the single genus *Argentina,* is, like the following, marine, and is characterized by 6 branchiostegal rays, 11 to 14 ventral rays, the stomach caecal, with pyloric appendages in moderate numbers (12 to 20). The third group, genera *Osmerus, Thaleichthys, Mαllotus, Plecoglossus, Hypomesus,* has 6 to 10 branchiostegal rays, **6** to 8 ventral rays, the stomach caecal, with pyloric appendages few (2 to 11) or rather numerous. The fourth group, genera *Microstoma, Nαnseniα, Bathylagus,* deep-sea forms with the branchiostegal rays reduced to 3 or 4, ventral rays 8 to 10, the stomach caecal and pyloric appendages absent; whilst the fifth group, with the genera *Retropinna* and *Salanx,* is distinguished from the preceding in having no air-bladder, branchiostegal rays 3 to 6, ventral rays 6 or 7, stomach siphonal and pyloric appendages absent.

The genus *Salmo,* the most important from the economical and sporting points of view, is characterized by small smooth scales, which at certain seasons may become embedded in the slimy skin, a moderately high dorsal fin with 10 to 12 well-developed rays, and a large mouth provided with strong teeth, which are present not only in the jaws and on the palate, but also on the tongue; the maxillary or posterior bone of the upper jaw extends to below or beyond the eye. Young specimens (see Parr) are marked with dark vertical bars on the sides (parr-marks), which in some trout are retained throughout life, and have the caudal fin more or less deeply forked or marginate, the form of the fin changing with the age and sexual development of the fish. Adult males have the jaws more produced in front than females, and both snout and chin may become curved and hooked. As pointed out by A. Günther, who was the first to make a profound study of the members of this genus, and especially of the British forms, there is probably no other group of fishes which offers so many difficulties to the ichthyologist with regard to the distinction of species, as well as to certain points in their life-history, the almost infinite variations which they undergo being dependent on age, sex and sexual development, food and the properties of the water. The difficulties in their study have rather been increased by the excessive multiplication of so-called specific forms. Opinions also vary as to the importance to be attached to the characters which serve to group the principal species into natural divisions. Whilst A. Günther admitted two genera, *Salmo* and *Oncorhynchus,* D. S. Jordan and B. W. Evermann go so far as to recognize five, *Oncorhynchus, Salmo, Hucho, Cristivomer* and *Salvelinus.* The latter arrangement is certainly the more logical, the difference between the first genus and the second being of rather less importance than that between the second and the third. However, considering the slightness of the distinctive characters on which these divisions are based, and the complete passage which obtains between them, the writer of this article thinks it best to maintain the genus *Salmo* in the wide sense, whilst retaining the divisions as subordinate divisions or sub-genera, with the following definitions:—

*Oncorhynchus* (Pacific salmon).—Vomer flat, toothed along the shaft, at least in the young; anal fin with 12 to 17 well-developed rays.

*Salmo* (true salmon and trout.—Vomer flat, toothed along the shaft, at least in the young; anal fin with 8 to 12 well-developed rays.

*Sαlυelinus* (char).—Vomer boat-shaped, the shaft strongly de- pressed behind the head, which alone is toothed, the teeth forming an isolated fascicle; anal fin with 8 to 10 well-developed rays.

*Hucho* (huehens).—Vomer as in the preceding, but teeth forming a single arched transverse series continuous with the palatine teeth; anal fin with 8 to 10 well-developed rays.

The salmon itself (*Salmo salar),* the type of the family, is a large fish, attaining a length of 4 or 5 ft., and living partly in the

@@@1 The Latin name *salmo* possibly means literally “ the leaper,” from *satire,* to leap, jump.