passed in the 13th century into the possession of the kings of France, to whom it remained constantly faithful. The English failed to capture it during all the course of the Hundred Years’ War. After the Reformation the town became the metropolis of Protestantism in France and the seat of a theological seminary, illustrated by many distinguished names. The school of Saumur, as opposed to that of Sedan, represented the more liberal side of French Protestantism (Cameron, Amyraut, &c. ). In 1623 the fortifications were dismantled ; and the revocation of the edict of Nantes reduced the population from 25,000 to 6000.

SAUNDERSON, Nicholas (1682-1739), mathema­tician, was born at Thurlstone, Yorkshire, in January 1682. When about a year old he lost his sight through small­pox ; but this did not prevent him from acquiring, by the help of kind friends, a good knowledge of Latin and Greek, and pursuing with assiduity and success the study of mathematics. In his twenty-fifth year he commenced lecturing in Cambridge on the principles of the Newtonian philosophy, and, though he was not a member of any of the colleges, the university authorities placed no impedi­ment in his way. In November 1711 he was selected to succeed Whiston, the Lucasian professor of mathematics in Cambridge, after having had the degree of master of arts conferred upon him to render him eligible for the appointment. He was created doctor of laws in 1728 by command of George IL, and in 1736 was admitted a member of the Royal Society. He died of scurvy on the 19th of April 1739.

Saunderson possessed the friendship of many of the eminent mathematicians of the time, such as Newton, Halley, De Moivre, Cotes, and for the first of these he entertained a profound veneration. Whether from an inflexible love of truth, or from a motive less exalted, he was accustomed to speak his sentiments regarding persons very freely, and friends as well as enemies were criticized without reserve. As is frequently the case with the blind, his senses of hearing and touch were extraordinarily acute, and he could carry on mentally long and intricate arithmetical or algebraical cal­culations. He devised for his own use a palpable arithmetic, an account of which is given in his elaborate *Elements of Algebra* (2 vols. 4 to, Cambridge, 1740), which he did not live to publish. Of his other writings, prepared for the use of his pupils, the only one which has been published is *The Method of Fluxions* (1 vol. 8vo, London, 1756). At the end of this treatise there is given, in Latin, an explanation of the principal propositions of Sir Isaac Newton’s philosophy.

SAURIANS. See Reptiles.

SAURIN, Jacques (1677-1730), one of the group of great French preachers of the 17th century (see France, vol. ix. p. 662), was born at Nîmes on January 6th 1677, studied at Geneva, settled in London in 1701 as one of the pastors of the Walloon church, and died at The Hague, on December 30, 1730, whither he had gone to defend himself before the synod against a trumped-up charge of heterodoxy. Besides collections of *Sermons,* on miscellaneous texts, he wrote *Discours sur les événements les plus mémorables du Vieux et du Nouveau Testament* (Amsterdam, 1720-28), a work which, as continued by Beausobre and Roques, became popular under the name of *Sawiris Bible.*

SAUROPSIDA. This name was introduced by Huxley in his *Introduction to the Classification of Animals,* 1869, to designate a province of the *Vertebrata* formed by the union of the *Aves* with the *Reptilia.* In his *Elements of Comparative Anatomy,* 1864, he had used the term “Sauroids” for the same province. The five divisions of the *Vertebrata—Pisces, Amphibia, Reptilia, Aves,* and *Mammalia*—are all distinctly definable, but their relations to one another differ considerably in degree. The *Amphibia* are more similar to the *Pisces* than to any of the other divisions, and the *Aves* are closely allied to the *Reptilia,* and thus three provinces—*Ichthyopsida, Sauropsida,* and *Mammalia—*are formed.

The characters which distinguish the *Sauropsida,* that is, which are common to birds and reptiles, and not found combined in the other classes, have been thus summarized by Huxley :—no

branchiae at any period of existence ; a well-developed amnion and allantois present in the embryo ; a mandible composed of many bones and articulated to the skull by a quadrate bone ; nucleated blood-corpuscles ; no separate parasphenoid bone in the skull; and a single occipital condyle. In addition to these principal characters, others exist which are found in all birds and reptiles, but are not exclusively confined to them. The oviduct is always a Mullerian duct separate from the ovary and opening from the body cavity. The adult kidney is a metanephros with separate ureter ; the mesonephros and mesonephric duct become in the adult male, the efferent duct of the testis. The intestine and the repro­ductive and urinary ducts open into a common cloaca. There is usually an exoskeleton in the form of scales ; in the birds the scales take the form of feathers. There are two aortic arches in reptiles, in birds only one,—the right. The heart is usually trilocular, becoming quadrilocular in crocodiles and birds. In all the eggs are meroblastic and large, possessing a large quantity of yolk ; in all the egg is provided in the oviduct with a layer of albumen and outside this with a horny or calcareous shell. In a few cases the egg is hatched in the oviduct, but in these cases there is no intimate connexion between the embryo and the walls of the duct. Fertilization takes place internally, occurring at the upper end of the oviduct previously to the deposition of the albuminous layer and egg shell.

Comparative anatomy clearly shows that birds are reptiles which have become specialized in adaptation to the function of flight. This conclusion has been con­firmed in the most surprisingly complete manner by the discovery of fossil forms intermediate between birds and reptiles. Two points of specialization in addition to the transformation of the fore limbs into wings are conspicuous in birds,—the reduction of the tail and the absence of teeth. *Archaeopteryx* is a flying feathered animal with a long reptilian tail. In the Rocky Mountain region numerous toothed birds have been recently discovered, and have been studied and described in a masterly fashion by Prof. O. C. Marsh. These forms belong to the Mesozoic period. For further details see Reptiles and Birds.

SAUSSURE, Horace Benedict de (1740-1799), one of Switzerland’s most celebrated physicists, was born in Geneva on February 17, 1740. @@1 His youth was passed at his father’s farm, where he early acquired a love for the study of nature. Following the example of his father and of his uncle Charles Bonnet, with whom he was associated in a research on the leaves of plants, he devoted himself at first to botany. Thus he was led to make the acquaintance of Haller, who was not long in discerning and appreciating his rare powers as an observer. In 1762, when only twenty-two years of age, Saussure was elected to the chair of philosophy at Geneva, where, along with another professor, he taught logic and physics alter­nately. But his natural leanings were all towards the study of external nature; and he took advantage of all available opportunities of travelling to thoroughly explore the mountains, valleys, and lakes of his native land, and to visit those of foreign countries, with the view of widen­ing and deepening his conception of the constitution of the world. The Society of Arts of Geneva was founded by Saussure in 1772, and in 1774, at the invitation of the Government, he elaborated a plan for the reform of the system of teaching in his native town; but this was too radical in its nature to be adopted. In 1786 he resigned his professorship to his friend and fellow-worker Pictet. While honouring his country by his devotion to laborious scientific investigations, he exhibited his patriotism by

@@@1 His father, Nicolas de Saussure (1709-90), an agriculturist of unusually liberal opinions and wide sympathies, when a young man had applied himself to literary pursuits, and especially to the study of writings bearing on farming. He resided all his life at his farm of Conches, on the Arve, near Geneva. As a member of the council of Two Hundred he took part in public affairs. Most of his writings were of a practical character, bearing on the growth and diseases of grain and other farm produce. His last work, *On Fire, the Principle of Fecundity in Plants and of Fertility in the Earth,* published in 1782, was more speculative in its nature.