the Court of Session, who was captured at the battle of Philip­haugh in 1645 and executed in 1646.

See the accounts prefixed to the first edition of Spottiswoode's *History of Scotland* and to that published by the Spottiswoode Society in 1851 ; also David Calderwood's *Hist.* *of the Kirk of Scotland* (1842-1849).

**SPOTTISWOODE, WILLIAM** (1825-1883), English mathema­tician and physicist, was bom in London on the 11th of January 1825. His father, Andrew Spottiswoode, who was descended from an ancient Scottish family, represented Colchester in parlia­ment for some years, and in 1831 became junior partner in the firm of Eyre & Spottiswoode, printers. William was educated at Laleham, Eton, Harrow and Balliol College, Oxford. His bent for science showed itself while he was still a schoolboy, and indeed his removal from Eton to Harrow is said to have been occasioned by an accidental explosion which occurred whilst he was performing an experiment for his own amusement. At Harrow he obtained in 1842 a Lyon scholarship, and at Oxford in 1845 a first-class in mathematics, in 1846 the junior and in 1847 the senior university mathematical scholarship. In 1846 he left Oxford to take his father’s place in the business, in which he was engaged until his death. In 1847 he issued five pamphlets entitled *Meditationes analyticae.* This was his first publication of original mathematical work; and from this time scarcely a year passed in which he did not give to the world further mathe­matical researches. In 1856 Spottiswoode travelled in eastern Russia, and in i860 in Croatia and Hungary; of the former expedition he has left an interesting record entitled *A Tarantasse Journey through Eastern Russia in the Autumn of 1856* (London, 1857). In 1870 he was elected president of the London Mathematical Society. In 1871 he began to turn his attention to experimental physics, his earlier researches bearing upon the polarization of light and his later work upon the electrical discharge in rarefied gases. He wrote a popular treatise upon the former subject for the “ Nature ” Series (1874). In 1878 he was elected president of the British Association, and in the same year president of the Royal Society, of which he had been a fellow since 1853. He died in London of typhoid fever on the 27th of June 1883, and was buried in Westminster Abbey.

As a mathematician he occupied himself with many branches of his favourite science, more especially with higher algebra, includ­ing the theory of determinants, with the general calculus of symbols, and with the application of analysis to geometry and mechanics. The following brief review of his mathematical work is quoted from the obituary notice which appeared in the *Proceedings of the Royal Society* (xxxviii. 34) : “ The interesting series of com­munications on the contact of curves and surfaces which are contained in the *Philosophical Transactions* of 1862 and subsequent years would alone account for the high rank he obtained as a mathematician. .. . The mastery which he had obtained over the mathematical symbols was so complete that he never shrank from the use of expressions, however complicated—nay, the more com­plicated they were the more he seemed to revel in them—provided they did not sir against the ruling spirit of all his work—symmetry. To a mind imbued with the love of mathematical symmetry the study of determinants had naturally every attraction. In 1851 Mr Spottiswoode published in the form of a pamphlet an account of some elementary theorems on the subject. This having fallen out of print, permission was sought by the editor of *Crelle* to reproduce it in the pages of that journal. Mr Spottiswoode granted the request and undertook to revise his work.. The subject had, however, been so extensively developed in the interim that it proved necessary not merely to revise it but entirely to rewrite the work, which became a memoir of 116 pages. To this, the first elementary treatise on determinants, much of the rapid development of the subject is due. The effect of the study on Mr Spottiswoode's own methods was most pronounced ; there is scarcely a page of his mathematical writings that does not bristle with determinants.” His papers, numbering over 100, were published principally in the *Philosophical Transactions, Proceedings of the Royal Society, Quarterly Journal of Mathematics, Proceedings of the London Mathematical Society* and *Crelle,* and one or two in the *Comptes rendus* of the Paris Academy ; a list of them, arranged according to the several journals in which they originally appeared, with snort notes upon the less familiar memoirs, is given in *Nature,* xxvii. 599.

**SPOTTSYLVΑΝΙΑ, a** county of Virginia, U.S.A., so called after Alexander Spotswood *(q.v.),* lieutenant governor of Virginia in 1710-1722, who owned extensive estates and mines therein. It is bounded on the N. by the Rapidan and Rappahannock rivers and on the S. by the North Anna. It is celebrated as containing several of the most famous battlefields of the Civil War—Fredericksburg, Chancellorsville, the Wilderness, and particularly that of Spottsylvania Court House, where the armies of Grant and Lee contended for nearly two weeks (May 8-21, 1864). The battles of Chancellorsville, Wilderness and Spottsylvania are described in the article Wilderness.

SPOUSE, (O. Fr. *espous,* mod. *époux, espouse, épouse,* Lat. *sponsus, sponsa,* a betrothed or promised man or woman, from *spondere,* to promise), a husband or wife, properly one promised or betrothed to another in marriage.

**SPRAT, THOMAS (**1635-1713), English divine, was bom at Beaminster, Dorsetshire, and educated at Wadham College, Oxford, where he held a fellowship (1657-1670). Having taken orders he became a prebendary of Lincoln in 1660. In the pre­ceding year he had gained a reputation by his poem *To the Happie Memory of the most Renowned Prince Oliver, Lord Protector* (London, 1659), and he was afterwards well known as a wit, preacher and man of letters. His chief prose works are the *Observations upon Monsieur de Sorbier's Voyage into England* (London, 1665), a satirical reply to the strictures on Englishmen in Samuel de Sorbière’s book of that name, and a *History of* the Royal Society of London (London, 1667), which Sprat had helped to found. In 1669 he became canon of Westminster, and in 1670 rector of Uffington, Lincolnshire. He was chaplain to Charles II. in 1676, curate and lecturer at St Margaret’s, West­minster, in 1679, canon of Windsor in 1681, dean of Westminster in 1683 and bishop of Rochester in 1684. He was a member of James II.’s ecclesiastical commission, and in 1688 he read the Declaration of Indulgence to empty benches in Westminster Abbey. Although he opposed the motion of 1689 declaring the throne vacant, he assisted at the coronation of William and Mary. As dean of Westminster he directed Wren’s restoration of the abbey. He died on the 20th of May 1713.

SPRAT, a marine fish *(Clupea spratlus),* named "garvie ” in Scotland, one of the smallest species of the genus *Clupea* or herrings, rarely exceeds 5 in. in length, and occurs in large shoals on the Atlantic coasts of Europe. Sprats are very often con­founded with young herrings, which they much resemble, but can always be distinguished by the following characters: they do not possess any teeth on the palate (vomer), like herrings; their gill-covers are smooth, without the radiating striae which are found in the shad and the pilchard; the anal fin consists of from seventeen to twenty rays, and the lateral line of forty-seven or forty-eight scales. The ventral fins are slightly anterior to the origin of the dorsal fin; and the spine consists of from forty- seven to forty-nine vertebrae. The sprat spawns in the open sea from February to May and is only occasionally captured in the ripe condition. Its eggs are buoyant and pelagic and easily recognized. The sprat is one of the more important food-fishes on account of the immense numbers which are caught when the shoals approach the coasts. They are somewhat capricious, however, as regards the place and time of their appearance, the latter falling chiefly in the first half of winter. They are caught with the seine or with the bag-net in the tideway. Large quantities are consumed fresh, but many are pickled or smoked and others prepared like anchovies. Frequently the captures are so large that the fish can be used as manure only.

**SPRATT, THOMAS ABEL BRIMAGE** (1811-1883), English vice-admiral, hydrographer and geologist, was bom at East Teignmouth on the 11th of May 1811. He was the eldest son of Commander James Spratt, R.N., and entered the navy in 1827. He was attached to the surveying branch, and was engaged almost continuously until 1863 in surveying the Mediterranean. As commander of the “ Spitfire ” he rendered distinguished service in the Black Sea during the Crimean War, and was appointed C.B. in 1855. At an earlier date he was associated with Edward Forbes, then naturalist to the “ Beacon,” and during the years 1841-1843 they made observations on the bathymetrical distribution of marine life. To Forbes he was specially indebted for his interest in natural history and geology,