theory of the Origin of Species, it is not a theory of the origin of variations. He starts from the observed fact that variations occur and are transmitted; he supposes that by natural selection individuals favoured by suitable variations are preserved, and that in such a fashion the divergence which leads to the origin of species has come about; he also supposes that by sexual selection, or preferential mating, the differences between male and female have been brought about. “ Courage, pugnacity, perse­verance, strength and size of body, weapons of all kinds, musical organs, both vocal and instrumental, bright colours, stripes and marks, and ornamental appendages, have all been indirectly gained by the one sex or the other, through the influence of love and jealousy, through the appreciation of the beautiful in sound, colour or form, and through the exertion of a choice; and these powers of the mind manifestly depend on the development of the cerebral system ’’ (*Descent of Man,* ii. p. 402). The characters to be accounted for are confined to one sex and are in close relation with the breeding season and breeding habits. In those cases where they differ from the females, the males are the most active in courtship, and the best armed, and are rendered the most attractive in various ways. They fight with their rivals for the possession of the female, or display their attractions before her, and either by conquest or by being preferred have an advantage over less favoured males. Darwin was in some doubt as to how far it could be shown that such favoured individuals had a chance of leaving more progeny, except in cases where males were polygamous or much more numerous than females, but he suggested that on the whole the more vigorous female would be the the first to breed and to choose the more attractive males, or be captured by the stronger males. A. R. Wallace was unable to accept the theory of sexual selection except in the most limited way, and in particular laid great stress on the want of evidence, to which Darwin himself has called attention, that females prefer more highly ornamented males. He thought that natural selection was sufficient to explain sexual differences such as the possession of weapons, scents and call-notes. With regard to colour and pattern, he regarded these as natural outcrops of specialized structure, better displayed in more vigorous animals, and therefore likely to increase under natural selection. The inconspicuous patterns and dull colours of females he believed to depend on natural selection, and to be associated with the greater need for females to be inconspicuous whilst engaged in their duties to their young. More recent writers have shown that in a large number of cases brilliant colours and patterns are in themselves really protective (see Colours of Animals), so that the facts left to be explained by the theory of sexual selection are still further restricted.

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SEXBY, EDWARD (d. 1658), English soldier, “leveller” and conspirator, was a private soldier in Cromwell’s regiment of horse when first heard of about 1643. He opposed the proposal to disband the army in 1647; and as one of the “ agitators ” he resisted all attempts to come to an arrangement with Charles I.,

and advocated extreme democratic doctrines. He rose to the rank of colonel, but was deprived of his commission in 1651. When Cromwell assumed the title of lord protector, Sexby became one of his most violent opponents, and in 1655 tried to bring together the levellers and the royalists in a combination to overturn the government. Compelled to fly from England, he intrigued with the Spanish government with a view to restor­ing Charles II., as the only feasible plan for destroying Cromwell; and he was concerned in several plots to assassinate the pro­tector. About 1657 he wrote the celebrated apology for tyran­nicide entitled “ Killing No Murder,” under the pseudonym William Allen, which was printed in Holland and distributed in England. In July 1657 he was arrested in disguise in England, whither he had come to attempt Cromwell’s assassination, and he died in the Tower of London on the 13th of January 1658.

SEXPARTITE VAULT, in architecture, a name given to the single bay of a vault, which, in addition to the transverse and diagonal ribs, has been divided by a second transverse rib, forming six compartments. The principal examples are those in the Abbaye-aux-Hommes and Abbaye-aux-Dames at Caen (which were probably the earliest examples of a construction now looked upon as transitional), Notre Dame, Paris, and the cathedrals of Bourges, Laon, Noyon, Senlis and Sens; from the latter cathedral the sexpartite vault was brought by William of Sens to Canterbury, and it is afterwards found at Lincoln and in St Faith’s Chapel, Westminster Abbey.

SEXTANT, an instrument for measuring angles on the celestial sphere. The name (indicating that the instrument is furnished with a graduated arc equal to a sixth part of a circle) is now only used to designate an instrument employing reflection to measure an angle; but originally it was introduced by Tycho Brahe, who constructed several sextants with two sights, one on a fixed, the other on a movable radius, which the observer pointed to the two objects of which the angular distance was to be measured.

The imperfections of the astrolabe and cross-staff for taking altitudes (see Navigation) were so evident that the idea of employing reflection to remove them occurred independently to several minds. R. Hooke contrived two reflecting instruments. The first, described in his *Posthumous Works* (p. 503), had only one mirror, which reflected the light from one object into a telescope which is pointed directly at the other. Hooke’s second plan employed two single reflections, whereby an eye placed at the side of a quadrant could at the same time see the images formed in two telescopes, the axes of which were radii of the quadrant and which were pointed at the two objects to be measured. This plan is described in Hooke’s *Animadversions to the Machina Coelestis of Heυelius,* published in 1674, while the first one seems to have been communicated to the Royal Society in 1666. Newton also studied this subject, but nothing was known about his ideas till 1742, when a description in his own handwriting of an instrument devised by him was found among Halley’s papers and printed in the *Philosophical Trans­actions* (No. 465). It consists of a sector of brass, the arc of which, though only equal to one-eighth part of a circle, is divided into 90°. A telescope is fixed along a radius of the sector, the object-glass being close to the centre and having outside it a plane mirror inclined 45° to the axis of the telescope, and inter­cepting half the light which would otherwise fall on the object glass. One object is seen through the telescope, while a movable radius, carrying a second mirror close to the first, is turned round the centre until the second object by double reflection is seen in the telescope to coincide with the first. But before Newton’s plan was published the sextant in its present form had come into practical use. On May 13, 1731, John Hadley described an “octant,” employing double reflection, and a fortnight later he exhibited the instrument.@@1 On the 2oth of May Halley stated to the Royal Society that Newton had invented an instrument founded

@@@1 Hadley described two different constructions: in one the telescope was fixed along a radius as in Newton’s form, in the other it was placed in the way afterwards universally adopted ; an octant of the first construction was made in the summer of 1730, according to a statement made to the Royal Society by Hadley’s brother George on Feb. 7, 1734.