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SOSIGENES (*fl.* Rome, middle of first century B.C.), *astronomy*.

Sosigenes helped Julius Caesar with his reform of the calendar. Caesar is said to have made use of Egyptian astronomy, but this may mean only that he discussed astronomy with Greeks from Alexandria. It is, in any case, not certain that Sosigenes was an Alexandrian, and he is not the only person whom Caesar consulted. Plutarch (*Caesar*, 59) simply states, without mentioning any names, that Caesar consulted the best philosophers and mathematicians before producing an improved calendar of his own. Caesar's adoption of the 365-1/4-day solar year may have been one result of Sosigenes' advice, and the statesman's seasonal calendar another. The 365-1/4-day year could even have been borrowed directly from Callippus at the suggestion of Sosigenes. All that Pliny says in this connection, however, is that during Caesar's dictatorship Sosigenes helped him to bring the years back into conformity with the sun (*Naturalis historia* 18.211). He adds (*Naturalis historia* 18.212) that Sosigenes wrote three treatises, including corrections of his own statements.

Sosigenes agreed with Cidenas in giving the greatest elongation of Mercury from the sun as 22° (Pliny, *Naturalis historia* 2.39). It is therefore possible, but far from certain, that he made use of Babylonian astronomical knowledge. Lucan (*Pharsalia* 10.187) implies that Caesar tried to improve upon the seasonal calendar of Eudoxus—"nec meus Eudoxi vincetur fastibus annus" ("and my year shall not be found inferior to the calendar of Eudoxus"). Theodor Mommsen maintains that Caesar ". . . with the help of the Greek mathematician Sosigenes introduced the Italian farmer's year regulated according to the Egyptian calendar of Eudoxus, as well as a rational system of intercalation, into religious and official use." Mommsen here alludes to the calendar in the papyrus *Ars Eudoxi*, but there is no proof of any close connection between the ideas of Sosigenes and the doctrines in the *Ars*.

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On Caesar's alleged use of "Egyptian" sources, see Appian, *Bella civilia* 2.154; Dio Cassius, *Hist. Rom.* 43.26; and Macrobius, *Saturnalia* 1.16.39 and 1.14.3. There are useful discussions regarding Caesar and Eudoxus' seasonal calendar in A. Böckh, *Ueber die vierjährige Sonnenkreise der Alten* (Berlin, 1863), 340–342; F. K. Ginzel, *Handbuch der mathematischen und technischen Chronologie*, II (Leipzig, 1911), 274–277; and Pauly-Wissowa, *Real-Encyclopädie*, 2nd ser., III (Stuttgart, 1927), s.v. Sosigenes (b) 1153–1157—compare Theodor Mommsen, *The History of Rome*, IV (London, 1887), 555. The calendar in the *Ars Eudoxi* is discussed in C. Wachsmuth, *Ioannis Laurentii Lydi Liber de ostentis et calendaria Graeca omnia* (Leipzig, 1897), lxviii–lxix, 299–301.

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SOTO, DOMINGO DE (*b.* Segovia, Spain, 1494 or 1495; *d.* Salamanca, Spain, 15 November 1560), *logic, natural philosophy*.

Born to parents of modest means who gave him the baptismal name of Francisco, Soto received his Latin training at Segovia under Juan de Oteo and Sancho de Villaveses. He continued his education in arts at the newly founded University of Alcalá, where he studied logic and natural philosophy under Thomas of Villanova and earned the baccalaureate in 1516. Shortly thereafter he transferred to the College of Santa Barbara at the University of Paris; his preceptors included Juan de Celaya, under whose tutelage he became acquainted with the terminist physics then current in Paris, where he completed the master's degree in arts. He then began the study of theology, while teaching the arts, and came under the influence of the Scottish nominalist John Major, who was then teaching at the Collège de Montaigu (along with two of Soto's fellow Segovians, Luis and Antonio Coronel), and the Spanish Thomist Francisco de Vitoria, who was lecturing at the Dominican priory of Saint-Jacques.

In 1519, however, Soto's longing for Spain and for his close friend Pedro Fernández de Saavedra prompted his return to Alcalá, where he completed the course in theology under Pedro Ciruelo and immediately (October 1520) occupied the chair of philosophy at the College of San Ildefonso. Here he taught logic, physics, and metaphysics until early in 1524, when internal difficulties in the college led him to resign his post. By this time he had received the licentiate in theology at San Ildefonso. He withdrew temporarily to the Benedictine abbey of Montserrat and was advised there to enter the Dominican order. In the summer of 1524 he became a Dominican novice at the priory of San Pa-

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blo in Burgos, changing his name to Domingo and being professed on 23 July 1525.

Assigned to the priory of San Esteban in Salamanca, Soto taught theology until 1532, a period of service interrupted only by a stay in Burgos during 1528–1529 while supervising the publication of his first work, the *Summulae*. During the academic year 1531–1532 he substituted for his former mentor, Francisco de Vitoria, who held the "prime chair" of theology at the University of Salamanca. The next year Soto was elected to the "vesper chair" of theology at the same university, a post he held for sixteen years. During this period he prepared a second edition of the *Summulae* (1539), a *Dialectica* (1543), and a commentary and questions on the *Physics* of Aristotle (1545). Immediately adopted at both Salamanca and Alcalá, these works went through many editions in Spain and elsewhere.

The works on the *Physics* are particularly important for the history of science, since in his questions on Book VII Soto was the first to apply the expression "uniformly difform" to the motion of falling bodies, thereby indicating that they accelerate uniformly when they fall and thus adumbrating Galileo's law of falling bodies. Soto accounted for the velocity increase in terms of an accidental impetus built up in the body. He assimilated the "calculatory" techniques developed at Merton College, Oxford, in the fourteenth century and the terminist physics perfected at Paris during the early sixteenth century within a Thomistic framework, and thus dealt with most of the physical problems that interested the nominalists and realists of his day. On this account he is sometimes charged with eclecticism, although he tried to work out a position intermediate between those of Duns Scotus and Ockham and more consistent with Aquinas' teaching. Soto had distinctive views on the nature of motion, time and space, infinity, movement through a vacuum, maxima and minima, and the ratios of velocities. He subscribed to the Ptolemaic theory of the universe and generally defended the Scholastic Aristotelian theses of natural philosophy.

Soto was called to the Council of Trent early in 1545, having just completed his questions and commentary on Book VII of the *Physics*; the incomplete texts were printed immediately but did not include the passages of interest to present-day historians of science. He returned from Trent in 1550 and finished both texts, which were published at Salamanca in 1551. (In all, these works went through nine editions, the penultimate appearing at Venice in 1582, when Galileo was beginning his studies at Pisa. Soto's questions on the *Physics* are cited by Galileo in his *Juvenilia*, although not in the context of discussions of falling bodies.) While at Trent, Soto was closely associated with the Spanish ambassador to Venice, Diego Hurtado de Mendoza, who had studied the science of weights under Niccolò Tartaglia; Mendoza's correspondence shows him critical of Soto's physics, probably more because of Mendoza's Averroist and classical leanings than because of any particular attachment, on his part, to Archimedean statics.

Soto held various professorial and administrative positions at Salamanca until his death. He achieved renown in this university city for his extensive knowledge of both philosophy and theology, and is best known for his work in political philosophy, *De iure et iustitia* (1553–1554), in which he developed concepts of natural law and a "translation theory" of the origin of political authority. His competence is attested by a saying current in sixteenth-century Spain: "Qui scit Sotum, scit totum" ("Whoever knows Soto, knows everything").

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