

the required thickness. A contact-lever, delicate level, or electric contact arrangement may be attached to the spherometer in order to indicate the moment of touching more precisely than is possible by the sense of touch. To measure the radius of a sphere—e.g., the curvature of a lens—the spherometer is levelled and read, then placed on the sphere, adjusted until the four points exert equal pressure, and read again. The difference gives the thickness of that portion of the sphere cut off by a plane passing through the three feet; and, since the feet are equidistant, this distance (a) being known gives the value (R) of the radius from the formula $2R = \frac{a^2}{3h} + h$, where h is the thickness of

the lenticular segment. The well spherometer¹ is adapted for measuring small spherical lenses. The true plane on which the instrument stands is perforated by a cylindrical well of known diameter. A plate applied to the lower edge of the well by a spring is adjusted to be parallel to the large plane, and the spherometer screw, being centred over the well, is run down until it touches the plate, and then read. The plate is removed; the lens put in its place; the point—still accurately centred—is brought down; and the screw is read again. The difference between these readings gives the height of the section of the lens above the lower edge of the well. Calling this height h and the radius of the cylindrical well r , the radius R of

the sphere is got by the formula $2R = \frac{r^2}{h} + h$. The spherometer can be applied to test the sphericity of a globe, and may be used on either a convex or a concave surface.

SPHINX, a hybrid creature of Egyptian and Greek art and mythology. In Egypt the sphinxes are colossal images of granite or porphyry, with a human head and breast and the body of a lion (wingless) lying down. The largest and most famous is that of Gizeh, described in vol. vii. p. 772. The head of the sphinx is usually that of a man, but female heads are said to occur occasionally. From Egypt the figure of the sphinx passed to Assyria, where it appears with a bearded male head on cylinders; the female sphinx, lying down and furnished with wings, is first found in the palace of Esarhaddon (7th century B.C.). Sphinxes have been found in Phœnicia, one at least being winged and another bearded. In Asia Minor an ancient female sphinx, but wingless, stands on the sacred road near Miletus. Sphinxes of the usual Greek type (female heads with bodies of winged lions) are represented seated on each side of two doorways in an ancient frieze found by Sir Charles Fellows at Xanthus in Lycia, and now in the British Museum. The same type appears on the early sculptures of the temple at Assus. In the early art of Cyprus—that half-way house between Asia and Greece—sphinxes of this type are not uncommon. On the other hand, on a gem of Phœnician style found at Curium in Cyprus there appear two male (bearded) sphinxes, with the tree of life between them. With regard to Greece proper, in the third tomb on the acropolis of Mycenæ were found six small golden sphinxes; they are beardless, but the sex is doubtful. In the ancient tomb discovered in 1877 at Spata near Athens (which represents a kindred but somewhat later art than the tombs at Mycenæ) were found female winged sphinxes carved in ivory or bone. Sphinxes on glass plates have been found in graves at Camirus in Rhodes and on gold plates in Crimean graves. Sphinxes were represented on the throne of Apollo at Amyclæ; in the best period of Greek art a sphinx was sculptured on the helmet of the statue of Athene in the Parthenon at Athens; and sphinxes carrying off children were sculptured on the front feet of the throne of Zeus at Olympia.

¹ A. M. Meyer, in *American Journal of Science*, 1886, xxxii. p. 61.

In Greek mythology the most famous sphinx was that of Thebes in Bœotia. She is first mentioned by Hesiod (*Theog.*, 326), who calls her the daughter of Orthus and Chimæra. According to Apollonius (iii. 5, 8), she was the daughter of Typhon and Echidna, and had the face of a woman, the feet and tail of a lion, and the wings of a bird. She dwelt on a bald rocky mountain at the south-east corner of the Copaic lake; the name of the mountain was Phicium (now Fagas), which was derived from Phix, the Æolic form of sphinx. The Muses taught her a riddle and the Thebans had to guess it. Whenever they failed she carried one of them off and devoured him. The riddle was this: What is that which is four-footed, three-footed, and two-footed? At last Œdipus guessed correctly that it was man; for the child crawls on hands and feet, the adult walks upright, and the old man supports his steps with a stick. Then the sphinx threw herself down from the mountain.

The story of the sphinx's riddle first occurs in the Greek tragedians. Milchhofer believes that the story was a mere invention of Greek fancy, an attempt to interpret the mysterious figure which Greek art had borrowed from the East. On the other hand, he holds that the destroying nature of the sphinx was much older, and he refers to instances in both Egyptian and Greek art where a sphinx is seen seizing and standing upon a man. And, whereas the Theban legend is but sparingly illustrated in Greek art, the figure of the sphinx appears more commonly on tombs, sculptured either in the round or in relief. From this Milchhofer seems to infer that the sphinx was a symbol of death. The word "sphinx" is Greek, being derived from σφιγγειν, "to draw tight."

See Brugsch, *History of Egypt*, vol. i. pp. 79 sq., 414 sq.; Cesnola, *Cyprus*, pp. 110, 114 sq., 263 sq., and plate xxxvii. No. 15; Schliemann, *Mycenæ*, pp. xiv., 184; and especially Milchhofer, in *Mitth. d. deutsch. archæol. Instit. in Athen*, 1879, p. 46 sq.

SPHYGMOGRAPH. See VASCULAR SYSTEM.

SPICE ISLANDS. See MOLUCCAS.

SPIDER. See ARACHNIDA, vol. ii. p. 290 sq.

SPIKENARD, or **NARD** (Hebrew *nêrd*; Gr. *vâpδος*, from Sanskrit *naladwîtha*, the change from "r" to "l" seeming to indicate that the word came through Persia),² a celebrated perfume which seems to have formed one of the most durable aromatic ingredients in the costly unguents used by the Romans and Eastern nations. The ointment prepared from it ("ointment of pistie nard"³) is mentioned in the New Testament (Mark xiv. 3-5; John xii. 3-5) as being "very costly," a pound of it being valued at more than 300 denarii (over £10). This appears to represent the prices then current for the best quality of nard, since Pliny (*H.N.*, xii. 26) mentions that nard spikes reached as much as 100 denarii per lb, and, although he does not mention the price of nard ointment, he states (xiii. 2) that the "unguentum cinnamominum," a similar preparation, ranged from 25 to 300 denarii according to its quality. Nard ointment also varied considerably in price from its liability to sophistication (Id., xii. 26, 27; xiii. 2). The ingredients of the genuine ointment (*unguentum nardinum sive foliatum*), Pliny tells us (xiii. 2), were Indian nard, juncus (the leaves of *Andropogon Schoenanthus*, L.), costus (the root of *Aptotaxis auriculata*, DC.), amomum (the fruits of *Amomum Cardamomum*, L.), myrrh (the gum-resin of *Balsamodendron Myrrha*, Nees), balm (the oleo-resin of *Balsamodendron Opobalsamum*), omphacium or oleum omphacinum (the oil expressed from unripe olives), and balaninum (derived from *Balanites ægyptiaca*). Dioscorides (i. 75) also remarks that malabathrum (the leaf of *Cinnamomum Tamala*, Nees) was sometimes added. Of these ingredients costus and amomum were most relied upon for increasing the fragrance and the nard for the stimulating and other virtues of the unguent.⁴

² See Fick, in *Orient u. Occident*, iii. p. 364. The Syrians and Arabs simply call it "spike" (*shabâlta, sambul*) or "the Indian spike."

³ The meaning of the word "pistie" is uncertain, some rendering it "genuine," others "liquid," and others taking it for a local name.

⁴ The use of alabaster vessels for preserving these fragrant unguents

The exact botanical source of the true or Indian nard was long a matter of uncertainty, the descriptions given by ancient authors being somewhat vague. Theophrastus (*De Odor.*, 28) classes nard amongst roots, and states that it came from India (*Hist. Plant.*, ix. 7, 2), had a biting and hot taste, and resembled iris root in perfuming the air near it (*De Odor.*, 12, 56). He also remarks (*l.c.*, 42) that the ointment was one of the most durable of perfumes. Pliny (*H.N.*, xii. 26, 27) gives a somewhat confused account, from which it appears that both "spike" and leaf were in use, although it is not clear whether the spike (*spica*) consisted of the flower-head or the fibrous lower portion of the stem. The only definite statement he makes concerning it is that the "sincere" nard is known by its red colour, sweet smell, and especially taste, "for it drieth the tongue and leaveth a pleasant relish behind it." Dioscorides (i. 6) states that the true nard came from India and was collected on mountains beside which the river Ganges flowed. He describes it as blackish with short spikes, smelling something like cyperus. Linnæus, Blane, Hatchett, and other writers have supposed that spikenard was an Indian grass of the genus *Andropogon* (*A. Nardus*, L.); but Sir W. Jones (*As. Res.*, ii. 416, iv. 97) has given convincing reasons for identifying it with *Nardostachys Jatamansi*, a plant of the Valerian order, the fibrous root-stocks or "spikes" of which are still collected in the mountains of Bhotan and Nepal. Further evidence is afforded by Lambert (*Illustr. of the Genus Cinchona*, App., p. 177), who found the root under the name of "spikenard" in one of the oldest chemist's shops in London, also by Dymock (*Mat. Med. W. India*, 2d ed., p. 347), who states that the principal use of the drug at the present time is for making hair washes and ointments, the popular opinion being that it promotes the growth and blackness of the hair. The name of "spike" applied to the Indian nard appears to be derived from its resemblance in shape to a spike or ear of bearded corn. The root is crowned by the bases of several stems, each about 2 inches or more in length and as thick as the finger. To these the fibrous tissue of former leaves adheres and gives them a peculiar bristly appearance. It is this portion that is chiefly collected.

Other and inferior varieties of nard are mentioned by Dioscorides and subsequent writers. Celtic nard, obtained from the Ligurian Alps and Istria, consisted of the roots of plants also belonging to the Valerian order (*Valeriana celtica* and *V. salicina*). This was exported to the East and thence to Egypt, and was used in the preparation of baths. Mountain nard was collected in Cilicia and Syria, and is supposed to have consisted of the root of *Valeriana tuberosa*. The false nard of Dauphiné, used in later times, and still employed as a charm in Switzerland, is the root-stock of *Allium Victoralis*. It presents a singular resemblance to the spikes of Indian nard, but is devoid of fragrance. It is remarkable that all the nards belong to the natural order *Valerianaceæ*, the odour of valerian being considered disagreeable at the present day; that of *Nardostachys Jatamansi* is intermediate between valerian and patchouli, although more agreeable than either.

The name "spikenard" has also been applied in later times to several plants. The spikenard of the United States is *Aralia racemosa*, and another species of the same genus, *A. nudicaulis*, is known as "false spikenard." In the West Indies *Hyptis suaveolens* is called "spikenard," and in Great Britain the name "ploughman's spikenard" is given to *Inula Conyza*. (E. M. H.)

SPINACH. See HORTICULTURE, vol. xii. pp. 285, 288.
SPINAL CORD. See PHYSIOLOGY, vol. xix. p. 34 sq.
For the diseases affecting the spinal cord, see ATAXY

was customary at a very early period. Theophrastus (c. 314 B.C.) states that vessels of lead and alabaster were best for the purpose, on account of their density and coolness, and their power of resisting the penetration of the ointment into their substance. Pliny also recommends alabaster for ointment vases. For small quantities onyx vessels seem to have been used (Horace, *Carm. iv.*, 12, ll. 10, 17).

¹ The plant figured by Sir W. Jones is *Valeriana Hardwickii* (probably the inferior Gangetic nard of Dioscorides and the ozænitis of Pliny); the true plant is figured by Royle and Lambert.

(LOCOMOTOR), PARALYSIS, PATHOLOGY (vol. xviii. p. 392), and SURGERY.

SPINEL. See MINERALOGY, vol. xvi. p. 386, and RUBY.
SPINELLO ARETINO (c. 1330-c. 1410), painter, the son of a Florentine named Luca, who had taken refuge in Arezzo in 1310 when exiled with the rest of the Ghibelline party, was born at Arezzo about 1330. Spinello was a pupil of Jacopo di Casentino, a follower of Giotto, and his own style was a sort of link between the school of Giotto and that of Siena. In the early part of his life he worked in Florence as an assistant to his master Jacopo while painting frescos in the church of the Carmine and in Sta Maria Novella. Between 1360 and 1384 he was occupied in painting many frescos in and near Arezzo, almost all of which have now perished.² After the sack of Arezzo in 1384 Spinello returned to Florence, and in 1387-88 with some assistants covered the walls and vault of the sacristy of S. Miniato near Florence with a series of frescos, the chief of which represent scenes from the life of St Benedict. These still exist, though in a sadly restored condition; they are very Giotto-like in composition, but have some of the Siena decorative brilliance of colour. In 1391-92 Spinello was painting six frescos, which still remain on the south wall of the Pisan Campo Santo, representing miracles of St Potitus and St Ephesus. For these he received 270 gold florins. Among his later works the chief are the very fine series of frescos painted in 1407-8 on the walls and vault of a chapel in the municipal buildings of Siena; these also have suffered much from repainting, but still are the finest of Spinello's existing frescos. Sixteen of these represent the war of Frederick Barbarossa against the republic of Venice. Spinello died at Arezzo about 1410.

Spinello's frescos are all strong and highly decorative works, drawn with much spirit, and are very superior in style to his panel pictures, many of which appear to be mere *bottega* productions. The academy of Florence possesses a panel of the Madonna and Saints, which is chiefly interesting for its signature—"Hoc opus pinxit Spinellus Luce Artio D. I. A. 1391." The easel pictures which are to be found in the various galleries of Europe give little or no notion of Spinello's power as a painter.

SPINET. See PIANOFORTE, vol. xix. p. 67 sq.

SPINNING. See YARN.

SPINOLA, AMBROGIO SPINOLA, MARCHESE DI (c. 1571-1630), a celebrated general, belonged to a noble and wealthy Italian family, and was born at Genoa about 1571. After the siege of Ostend had languished for more than two years under the direction of the archduke Albert, Spinola, who, though not a soldier by profession, had seen something of campaigning during a season or two, came upon the scene as a condottiere and received charge of the works. He entered upon his task in October 1603, and his courage and vigour were rewarded by the surrender of the place on 20th September 1604. During the next five years, until the conclusion of the armistice of 1609, he frequently encountered Maurice of Orange, but on the whole with undecisive results. In 1620 he was sent by Spain into the Palatinate of the Rhine, and took many places; in the following year, on the renewal of the war with Holland, he returned to the scenes of his earlier campaigns, where his principal exploits were the capture of Jülich in February 1622 and of Breda after a ten months' siege in June 1625. His health now began to give way; and his spirits are said to have been further depressed by Philip's disregard of his pecuniary claims. He died at Castel-Nuovo di Scrvia on 25th September 1630.

SPINOZA, BARUCH (1632-1677), or, as he afterwards signed himself, Benedict de Spinoza, philosopher, was born at Amsterdam on 24th November 1632. His parents be-

² The fine fresco of an Apocalyptic scene which still exists in Sta Maria degli Angeli at Arezzo belongs to about 1400.

longed to the community of Jewish emigrants from Portugal and Spain who, fleeing from Catholic persecution in the Peninsula, had sought refuge in the nearly emancipated Netherlands. The name, variously written De Spinoza, D'Espinoza, and Despinoza, probably points to the province of Leon as the previous home of the family; there are no fewer than five townships so called in the neighbourhood of Burgos. Of the philosopher's parents nothing is known. His father is said to have been a tradesman in fair circumstances, and the house is still shown upon the Burgwal where his son Baruch was born; two sisters, Rebekah and Miriam, formed the remainder of the family. Spinoza received his first training under the senior rabbi, Saul Levi Morteira, whose most promising pupil he soon became. Under Morteira he became familiar with the Talmud and, what was probably more important for his own development, with the philosophical writings of Ibn Ezra and Maimonides, Levi ben Gerson, Chasdai Creskas, and other representatives of Jewish mediæval thought, who aim at combining the traditional theology with ideas got from Aristotle and his Neoplatonic commentators. Latin, still the universal language of learning, formed no part of Jewish education; and Spinoza, after learning the elements from a German master, resorted for further instruction to a physician named Franz van den Ende, who eked out an income by taking pupils. Van den Ende appears to have been distinctly a man of parts, though of a somewhat indiscreet and erratic character. He was eventually hanged in Paris as a conspirator in 1674. His enthusiasm for the natural sciences may have been the only ground for the reputation he had acquired of instilling atheistic notions into the minds of his pupils along with the Latin which he taught them. But it is quite possible that his scientific studies had bred in him, as in many others at that time, a materialistic, or at least a naturalistic, turn of mind; indeed we should expect as much in a man of Van den Ende's somewhat rebellious temperament. We do not know whether his influence was brought to bear in this sense upon Spinoza; but it has been suggested that the writings of Bruno, whose spirit of enthusiastic naturalism and fervid revolt against the church would be especially dear to a man of Van den Ende's leanings, may have been put into the pupil's hand by the master. Latin, at all events, Spinoza learned from Van den Ende to use with correctness, freedom, and force, though his language does not, of course, conform to classical canons. The only romance of Spinoza's life is connected with Van den Ende's household. The physician had an only daughter, Clara Maria by name, who, besides being a proficient in music, understood Latin, it is said, so perfectly that she was able to teach her father's pupils in his absence. Spinoza, the story goes, fell in love with his fair instructress; but a fellow-student, called Kerkering, supplanted him in his mistress's affections by the help of a valuable necklace of pearls which he presented to the young lady. Chronology unfortunately forbids us to accept this little episode as true. Recent investigation has proved that, while the marriage with Kerkering, or rather Kerckkrink, is a fact, it did not take place till 1671, in which year the bride, as appears by the register, was twenty-seven years of age. She cannot, therefore, have been more than eleven or twelve in 1656, the year in which Spinoza left Amsterdam; and as Kerckkrink was seven years younger than Spinoza, they cannot well have been simultaneous pupils of Van den Ende and simultaneous suitors for his daughter's hand. But, though the details of the story thus fall to pieces, it is still possible that in the five years which followed his retirement from Amsterdam Spinoza, who was living within easy distance and paid visits to the city from time to time, may have kept up his connexion with Van den

Ende, and that the attachment may have dated from this later period. This would at least be some explanation for the existence of the story; for Colerus expressly says that Spinoza "often confessed that he meant to marry her." But beyond possibility we cannot go in the matter. There is no mention of the Van den Endes in Spinoza's correspondence; and in the whole tenor of his life and character there is nothing on which to fasten the probability of a romantic attachment.

The mastery of Latin which he acquired from Van den Ende opened up to Spinoza the whole world of modern philosophy and science, both represented at that time by the writings of Descartes. He read him greedily, says Colerus, and afterwards often declared that he had all his philosophical knowledge from him. The impulse towards natural science which he had received from Van den Ende would be strengthened by the reading of Descartes; he gave over divinity, we are told, to devote himself entirely to these new studies. His inward break with Jewish orthodoxy dated, no doubt, farther back,—from his acquaintance with the philosophical theologians and commentators of the Middle Ages; but these new interests combined to estrange him still further from the traditions of the synagogue. He was seldom seen at its services,—soon not at all. The jealousy of the heads of the synagogue was easily roused. An attempt seems to have been made to draw from him his real opinions on certain prominent points of divinity. Two so-called friends endeavoured, on the plea of doubts of their own, to lead him into a theological discussion; and, some of Spinoza's expressions being repeated to the Jewish authorities, he was summoned to give an account of himself. Anxious to retain so promising an adherent, and probably desirous at the same time to avoid public scandal, the chiefs of the community offered him a yearly pension of 1000 florins if he would outwardly conform and appear now and then in the synagogue. But such deliberate hypocrisy was abhorrent to Spinoza's nature. Threats were equally unavailing, and accordingly on the 27th of July 1656 Spinoza was solemnly cut off from the commonwealth of Israel. The curses pronounced against him may be read in most of the biographies. While negotiations were still pending, he had been set upon one evening by a fanatical ruffian, who thought to expedite matters with the dagger. Warned by this that Amsterdam was hardly a safe place of residence for him any longer, Spinoza had already left the city before the sentence of excommunication was pronounced. He did not go far, but took up his abode with a friend who lived some miles out on the Old Church road. His host belonged to the Collegiants or Rhijnsburgers, a religious society which had sprung up among the proscribed Arminians of Holland. The pure morality and simple-minded piety of this community seem early to have attracted Spinoza, and to have won his unfeigned respect. Several of his friends were Collegiants, or belonged to the similarly-minded community of the Mennonites, in which the Collegiants were afterwards merged. In this quiet retreat Spinoza spent nearly five years. He drew up a protest against the decree of excommunication, but otherwise it left him unmoved. From this time forward he disused his Hebrew name of Baruch, adopting instead the Latin equivalent, Benedictus. Like every Jew, Spinoza had learned a handicraft; he was a grinder of lenses for optical instruments, and was thus enabled to earn an income sufficient for his modest wants. His skill, indeed, was such that lenses of his making were much sought after, and those found in his cabinet after his death fetched a high price. It was as an optician that he was first brought into connexion with Huygens and Leibnitz; and an optical *Treatise on the Rainbow*, written by him and long supposed to be lost, has been recently

discovered and reprinted by Dr Van Vloten. He was also fond of drawing as an amusement in his leisure hours; and Colerus had seen a sketch-book full of such drawings representing persons of Spinoza's acquaintance, one of them being a likeness of himself in the character of Masaniello.

The five years which followed the excommunication must have been devoted to concentrated thought and study. Before their conclusion Spinoza had parted company from Descartes, and the leading positions of his own system were already clearly determined in his mind. A number of the younger men in Amsterdam—many of them students of medicine or medical practitioners—had also come to regard him as their intellectual leader. A kind of philosophical club had been formed, including among its members Simon de Vries, John Bresser, Louis Meyer, and others who appear in Spinoza's correspondence. Originally meeting in all probability for more thoroughgoing study of the Cartesian philosophy, they looked naturally to Spinoza for guidance, and by-and-by we find him communicating systematic drafts of his own views to the little band of friends and students. The manuscript was read out and discussed at their meetings, and any points remaining obscure were referred to Spinoza for further explanation. An interesting specimen of such difficulties, propounded by Simon de Vries and resolved by Spinoza in accordance with his own principles, is preserved for us in Spinoza's correspondence. This Simon de Vries was a youth of generous impulses and of much promise. Being in good circumstances, he was anxious to show his gratitude to Spinoza by a gift of 2000 florins, which the philosopher half-jestingly excused himself from accepting. De Vries died young, and would fain have left his fortune to Spinoza; but the latter refused to stand in the way of his brother, the natural heir, to whom the property was accordingly left, with the condition that he should pay to Spinoza an annuity sufficient for his maintenance. The heir offered to fix the amount at 500 florins, but Spinoza accepted only 300, a sum which was regularly paid till his death. The written communications of his own doctrine referred to above belong to a period after Spinoza had removed from the neighbourhood of Amsterdam; but it has been conjectured that the *Short Treatise on God, on Man, and his Wellbeing*, which represents his thoughts in their earliest systematic form, was left by him as a parting legacy to this group of friends. It is at least certain, from a reference in Spinoza's first letter to Oldenburg, that such a systematic exposition was in existence before September 1661.¹ There are two dialogues somewhat loosely incorporated with the work which probably belong to a still earlier period. The short appendix, in which the attempt is made to present the chief points of the argument in geometrical form, is a forerunner of the *Ethics*, and was probably written somewhat later than the rest of the book. The term "Nature" is put more into the foreground in the *Treatise*, a point which might be urged as evidence of Bruno's influence,—the dialogues, moreover, being specially concerned to establish the unity, infinity, and self-containedness of Nature²; but

¹ Various manuscript copies were apparently made of the treatise in question, but it was not printed, and dropped entirely out of knowledge till 1852, when Edward Böhm of Halle lighted upon an abstract of it attached to a copy of Colerus's *Life*, and shortly afterwards upon a Dutch MS. purporting to be a translation of the treatise from the Latin original. This was published in 1862 by Van Vloten with a re-translation into Latin. Since then a superior Dutch translation has been discovered, which has been edited by Professor Schaarschmidt and translated into German. Another German version with introduction and notes has been published by Sigwart based on a comparison of the two Dutch MSS.

² The fact that Spinoza nowhere mentions Bruno would not imply, according to the literary habits of those days, that he was not acquainted with his speculations and even indebted to them. There is no mention,

the two opposed Cartesian attributes, thought and extension, and the absolutely infinite substance whose attributes they are—substance constituted by infinite attributes—appear here as in the *Ethics*. The latter notion—of substance—is said to correspond exactly to "the essence of the only glorious and blessed God." The earlier differs from the later exposition in allowing an objective causal relation between thought and extension, for which there is substituted in the *Ethics* the idea of a thoroughgoing parallelism.

Early in 1661 Spinoza's host removed to Rhijnsburg near Leyden, the headquarters of the Collegiant brotherhood, and Spinoza removed with him. The house where they lived at Rhijnsburg is still standing, and the road bears the name of Spinoza Lane. Very soon after his settlement in his new quarters he was sought out by Henry Oldenburg, the first secretary of the Royal Society.³ Oldenburg became Spinoza's most regular correspondent,—a third of the letters preserved to us are to or from him; and it appears from his first letter that their talk on this occasion was "on God, on infinite extension and thought, on the difference and the agreement of these attributes, on the nature of the union of the human soul with the body, as well as concerning the principles of the Cartesian and Baconian philosophies." Spinoza must therefore have unbosomed himself pretty freely to his visitor on the main points of his system. Oldenburg, however, was a man of no speculative capacity, and, to judge from his subsequent correspondence, must have quite failed to grasp the real import and scope of the thoughts communicated to him. From one of Oldenburg's early letters we learn that the treatise *De Intellectus Emendatione* was probably Spinoza's first occupation at Rhijnsburg. The nature of the work also bears out the supposition that it was first undertaken. It is, in a manner, Spinoza's "organon,"—the doctrine of method which he would substitute for the corresponding doctrines of Bacon and Descartes, as alone consonant with the thoughts which were shaping themselves or had shaped themselves in his mind. It is a theory of philosophical truth and error, involving an account of the course of philosophical inquiry and of the supreme object of knowledge. It was apparently intended by the author as an analytical introduction to the constructive exposition of his system, which he presently essayed in the *Ethics*. But he must have found as he proceeded that the two treatises would cover to a large extent the same ground, the account of the true method merging almost inevitably in a state-

for example, of Hobbes throughout Spinoza's political writing, and only one casual reference to him in a letter, although the obligation of the Dutch to the English thinker lies on the surface. Accordingly full weight must be allowed to the internal evidence brought forward by Sigwart and others to prove Spinoza's acquaintance with Bruno's writings. But in regard to this question, and in regard to the elaborate researches directed to prove that the main determinations of Spinoza's thought are anticipated in the mediæval philosophers of his own race, it must be said that these investigations are of comparatively little vital interest. Doubtless Spinoza's thought was coloured by his Hebraic origin and his Hebraic studies; from these sources, above all, he may have brought with him to the study of the dualistically expressed philosophy of Descartes the need, and the profound conviction, of unity. But the main strain of Spinoza's thought is sufficiently explained by reference to the Cartesian philosophy itself, the intellectual *milieu* of the time. Descartes's metaphysics can be shown to lead us to the very threshold of Spinoza's system; not only the general form, but the very terminology—substance, attributes, and modes—lay waiting to be appropriated by an independent student.

³ Henry Oldenburg (c. 1626-1678) was a native of Bremen, but had settled in England in the time of the Commonwealth. Though hardly a scientific man himself, he had a genuine interest in science, and must have possessed social gifts. He was the friend of Boyle, and acquainted with most of the leaders of science in England as well as with many on the Continent. He delighted to keep himself in this way *au courant* with the latest developments, and lost no opportunity of establishing relations with men of scientific reputation. It was probably at the suggestion of Huygens that he bent his steps towards Spinoza's lodging.