

in the same direction as before. The angle through which the crystal has been turned is either $180^\circ + 2A$ or $180^\circ - 2A$, where A is the angle between the faces. The introduction of the fixed mirror by Degen and Lang, and of the horizontal circle with collimators, brought the instrument into its most modern form. Babinet, Malus, Mitscherlich, Haidinger, Von Lang, and others have contributed towards perfecting the instrument. Recently Professor W. H. Miller (*Phil. Mag.*, 1876) has described a new form of goniometer. In the paper quoted some useful details concerning the use of the instrument will be found. For further instructions how to use the goniometer the reader may refer to Phillips's *Mineralogy*, or Groth's *Physikalische Krystallographie*, Abth. iii. The modern goniometer has so much in common with the spectrometer that it is unnecessary to describe it in detail here. See SPECTROSCOPE.

GONSALVO. See GONZALO.

GONZAGA, or GONZUGUE, an old princely family of Italy, which traces its origin to the emperor Lothair, but first came into notice in the 11th century, after the overthrow of the imperial power in Italy, where they for some time disputed the sovereignty of Mantua with the Bonacosse. The long dispute was ended by the murder of Passerino de Bonacossi in 1328, after which the Gonzaga retained possession of Mantua for four centuries. Their claims were in 1354 confirmed to Ludovico I. (1267-1360) by Louis the Bavarian, who nominated him imperial vicar, and gave him also the sovereignty of Reggio and other towns. Petrino, youngest son of Ludovico, founded the countship of Novellara, which became extinct in 1728. The elder branch of the family was continued by Guido and his son Ludovico II., who, on his death in 1382, was succeeded by his brother Francesco. He was followed in 1407 by his son Giovanni Francesco (1394-1444), on whom, for his services in the Italian wars, the emperor Sigismund in 1433 bestowed the title of marquis. Ludovico III. (1414-1478), son of the preceding, surnamed, for what reason is not quite certain, the Turk, retained a body of troops which he granted on hire to neighbouring princes. The younger sons of this Ludovico, Giovanni Francesco and Rudolpho, founded the dukedoms of Gabioneta and Castiglione respectively, which were confiscated in 1692. The elder branch of the family was continued by Frederick I. (1439-1484), whose son, Giovanni Francesco II. (1466-1519), was in 1494 appointed to the supreme command of the united Italian army against Charles VIII. of France, and on the 6th of July of the following year gained the victory of Fornovo, and took prisoner the bastard of Bourbon. His son, Frederick II. (1500-1540), received in 1530 the title of duke from Charles V., and in 1536 the principality of Montferrat. A younger son, Ferdinand, was the founder of the Guastella branch of the family, which became extinct in 1746. Of the succeeding members of the elder branch, the only notable one was Vincenzo I. (1562-1612), to whom the Admirable Crichton was tutor, and by whom he was murdered from jealousy in 1582. This branch became extinct in 1627 through the death of Vincenzo II., sixth successor of Frederick II. The nearest heir was Carlo I., duke of Nevers, who was recognized by the Mantuans, but his claims were contested by Ferdinand II. of Guastella, who had the support of the emperor Ferdinand II. In the war which followed, the duke of Nevers obtained the assistance of Louis XIII. of France, but in 1630 Mantua was captured and pillaged by the imperial troops, and the duke was forced to retire to the States of the Church. In 1631 a treaty was, however, concluded between France and the emperor, by which the duke, on making submission, was re-invested with the duchies of Mantua and Montferrat. Anna, a daughter of Carlo I., became wife of Edward, elector-palatine of the Rhine, and after playing a distinguished part at the French court, died

at Paris in 1684, leaving behind her a volume of interesting *Memoirs* (London and Paris, 1686). Carlo died in 1639, and was succeeded by his grandson Carlo III., who, on his death in 1665, was succeeded by his son Carlo IV. This duke married in 1670 Anna Isabella, eldest daughter of Ferdinand duke of Guastella; and on the death of Ferdinand in 1679, he endeavoured to obtain possession of that duchy, but was compelled to relinquish his claims to Vincenzo, a cousin-german of the deceased duke. He took part on the side of France in the Spanish succession war, and received a French garrison into Mantua. After the defeat of the French he was placed under the ban by the emperor Joseph I., whereupon Victor Amadeus of Savoy conquered Montferrat, and Austria, in agreement with France whom Carlo had offended, took possession of Mantua. On his death without issue in 1708, the dynasty of the Gonzagas of Mantua became extinct.

GONZAGA, THOMAS ANTONIO (1744-1809), "the Portuguese Petrarch," perhaps better known as DIRCEU, was born at Oporto in 1744, and received his early education there and at Bahia, where his father, after having held various judicial appointments, became a member of the supreme court in 1759. Having completed his law studies at the university of Coimbra, which he attended from 1763 to 1768, Gonzaga in the latter year returned to Brazil, and after having acted for some years as juiz de fora or local magistrate at Beja and elsewhere he ultimately was appointed a judge (ouvidor) at Villa-Rica in the province of Minas, where he highly distinguished himself it is said both by his administrative ability and by the many excellences of his private character. He appears before this time to have developed some talent for versification, and his literary tastes soon brought him into intimate association with Claudio Manoel, Alvarenga Peixoto, and other writers of the so-called Minas school; but the love which makes the poet did not, in his own opinion at least, come upon him until he had made the acquaintance (about 1788) of D. Maria Joaquina Dorothea de Seixas, the "Marilia de Dirceu" to whom all his extant poems relate. He had just been nominated a member of the supreme court of Bahia, and was on the eve of his marriage, when discovery was made of the treasonable plot of Minas, and he was arrested on suspicion of having been implicated in it. On merely circumstantial evidence, and that of a very inconclusive kind, he was condemned, 18th April 1792, to banishment for life to Pedras de Angoche, a sentence which was afterwards commuted to one of ten years' exile at Mozambique. Here he made some effort to practise as an advocate, but he never recovered from the wearing-out depression into which he had been thrown by his cruel lot; an attack of nervous fever undermined his health, and after years of an ever-deepening melancholy, which occasionally alternated with fits of acute mania, he died in 1809.

His collection of poems, entitled *Marilia de Dirceu*, consists of two parts. In the first of these, the charms of Marilia and his own happiness in the love he bears to her are his endlessly varied theme. The second, written during his imprisonment, is full of laments over his terrible fate, protestations of his innocence, and many fine expressions of the support and comfort he still finds in the remembrance of his love. Almost everywhere these "lyras" plainly enough betray a conscious imitation of Petrarch or other models; but they also exhibit an imaginative charm, a naturalness and delicacy of feeling, a harmoniousness of diction, and a gracefulness of versification which, in the unanimous opinion of competent critics, entitle them to rank among the best love lyrics in the language. In Brazil their popularity, perhaps aided by feelings of sympathy for their unfortunate author, has from the first been very great. The editions are very numerous, the best probably being that of J. M. P. da Sylva which is accompanied with an historical and biographical introduction (1845). A critical notice, along with selections from the poems of Gonzaga, will be found in Wolf's *Brasil Littéraire* (1863). They have been translated into French by Monglave and Chalas (1825) into Spanish by Vedia, and into Italian by Ruscalla.

GONZALO DE BERCEO, mystic and didactic poet, and one of the earliest names in Castilian literature, was parish priest at Berceo, near San Domingo de la Calzada, in the province of Burgos, and lived, it is believed, during the first sixty years of the 13th century. His works, which are reprinted in the *Poesias Castellanas Anteriores al Siglo XV.* of Sanchez, amount to upwards of 13,000 lines of verse, chiefly in rhymed quatrains. The subjects chosen for treatment are the Lives of San Domingo de Silos, Santa Oria, and San Millan; the Sacrifice of the Mass; the Miracles, Glories, and Pains of the Blessed Virgin; the Signs of the Day of Judgment; and the Martyrdom of San Lorenzo. Apart from the interest which attaches to them in the eyes of the literary and ecclesiastical archaeologist, they have little to attract the modern reader. The monotony of their "sermo pedestris" is but seldom relieved by any touches of poetical genius; in some places, however, as Ticknor remarks, there is a simple-hearted piety that is very attractive, and in others a power in story-telling that is very striking. The poem on the Miracles of the Virgin, which is the largest, is also the most curious; but that upon the Signs of the Last Day is often very solemn, while the Mourning of Mary at the Cross breathes such a childlike spirit of gentle, faithful, credulous devotion as enables one to realize with some vividness many of the best characteristics of the religious life of the time.

See Ticknor, *History of Spanish Literature*; and Carus, *Darstellung der Spanischen Literatur* (1846); also Dunham's *History of Spain and Portugal*, vol. iv. (1832).

GONZALO FERNANDEZ Y AGUILAR (1453-1515), commonly known as Gonsalvo de Cordova, El Gran Capitan ("The Great Captain"), was born at Montilla on the 16th of March 1453, and in his fifteenth year was presented to Queen Isabella at Segovia, where his manly beauty, his graceful manners, and his soldierly accomplishments speedily made him conspicuous in the court. He first saw active military service in Portugal under Alonzo de Cardenas, and gained special praise for his conduct on the battlefield of Albuera in 1479. In the protracted Moorish war begun in 1481, he served with distinction in various capacities, and was finally employed to conduct the peace negotiations with Abdallah. For his efficient services in this business he was rewarded with a pension and a grant out of the conquered territory (1492). When, in consequence of the advance of Charles VIII. into Italy, a Spanish expedition was decided upon in 1495, Gonzalo was selected for the chief command; and although at Seminara near Reggio, through the interference of the friendly Ferdinand of Naples, he lost the battle (it was the only occasion on which he ever was defeated), he gained in reputation both for prudence and for bravery. In spite of his subsequent successes in Lower Calabria, the campaign of this year closed with indecisive results; but in the opening of the following season, he still further increased his fame by his brilliant surprise and capture of Laino, and by his junction with the Neapolitan forces before Atella, after an arduous march through hostile territory. It is most commonly, and with most probability, said to have been on this occasion that he received the honourable title of El Gran Capitan, by which the Spaniards still delight to designate him. The conquest of Calabria having been thus rapidly achieved, he, at the pope's invitation, proceeded to clear Ostia of the French garrison by which it had been held, and shortly afterwards entered Rome itself; where he was greeted by the populace as "deliverer of the city." The object of his expedition, the total expulsion of the French from Neapolitan territory, having been fully attained, he, in August 1498, returned to Spain, where he was received with the utmost enthusiasm by all classes, the king publicly declaring that the reduction of Naples, and the humiliation inflicted on the French,

reflected more lustre on his crown than the conquest of Granada. After having, early in 1500, efficiently cooperated with Tendilla in putting down the Moorish insurrection in the Alpujarras, Gonzalo, in May of the same year, took command of an armada designed to operate on the coast of Sicily and in the Levant, and generally to uphold the influence of Spain. In conjunction with the Venetian admiral he stormed St George in Cephalonia, in January 1501; and soon afterwards returning to Sicily, commenced operations against Frederick in accordance with the treaty concluded between France and Spain for the partition of Naples. The whole of Calabria was occupied in less than a month, with the exception of Tarento, which did not surrender until March 1502. On the outbreak of hostilities between France and Spain in July of the same year, Gonzalo was compelled to fall back upon Barletta, whence, after having sustained a memorable siege of nearly ten months, he sallied in April 1503, and coming upon the French troops at Cerignola, inflicted on them a disastrous defeat, which at once made him master of the city of Naples and of the greater part of the kingdom. A subsequent victory at the bridge of Garigliano (29th December 1503) gave him Gaeta, and terminated the war. For more than three years he continued to act with popularity and efficiency at Naples as Ferdinand's viceroy; but the jealousy and distrust of that somewhat narrow-minded monarch led to his recall in 1507, and to his subsequent retirement from court shortly afterwards. The remainder of his days were passed on his estate at Loja, where, in the midst of preparations for a voyage to Flanders, he was seized with a fever, of which he died, 2d December 1515.

The life of "the great captain" has been rather a favourite subject with literary men, having been treated by Giovinio in his *Vita Illustrum Virorum*, and by Quintana in his *Espanoles Célebres*, as well as by Florian (*Gonsalvo de Cordoue, ou Grenade Reconquise*, 1791), Duponceet (*Histoire de Gonsalve de Cordoue*, 1714), and an anonymous author, sometimes supposed to be Pulgar (*Crónica del Gran Capitan*, 1584). A skilful and judicious use of all these sources has been made by Prescott in his *History of the Reign of Ferdinand and Isabella*, where the purity, generosity, and loyalty of the private character of Gonzalo, as well as the coolness, sobriety, and energy of his military genius, are very fully and vividly illustrated.

GOOD, JOHN MASON (1764-1827), a writer on medical, religious, and classical subjects, was born May 25, 1764, at Epping, Essex, where his father, the Rev. Peter Good, was Independent minister. After receiving his education in the seminary conducted by his father, he was, at about the age of fifteen, apprenticed to a surgeon-apothecary at Gosport. In 1783 he went to London to prosecute his medical studies, and in the autumn of 1784 he commenced practice as a surgeon at Sudbury in Suffolk. Through an obligation rendered to a friend he, in 1792, got into pecuniary embarrassment, and, with a view to surmount his difficulties, he removed in 1793 to London, where he entered into partnership with a surgeon and apothecary who enjoyed an extensive practice. In November of the same year he was admitted a member of the college of surgeons. On account of disagreements with his colleague, the partnership was soon afterwards dissolved, and to increase his income he now devoted more of his attention to literary pursuits. Besides contributing both in prose and poetry to the *Analytical and Critical Reviews*, and the *British and Monthly Magazines*, and other periodicals, he is the author of a large number of works relating chiefly to medical and religious subjects. In 1794 he became a member of the British Pharmaceutical Society, and in that connexion, and especially by the publication of his work, *A History of Medicine*, he did much to effect a greatly needed reform in the profession of the apothecary. In 1820 he took the diploma of M.D. at Marischal College, Aberdeen. He died, January 2, 1827. Dr Good was not only well versed in classical

literature, but was acquainted with the principal European languages, and also with Persian, Arabic, and Hebrew. His prose works display wide erudition and considerable intellectual vigour, and contain much interesting and curious information; but their style is dull and tedious, and they are now very generally forgotten. His poetry never rises above pleasant and well-versed commonplace.

The following are his principal writings:—*Maria*, an elegiac ode, 1786; *Diseases of Prisons and Poorhouses*, 1795; *History of Medicine*, 1795; *Parish Workhouses*, 1798; *Song of Songs*, translated from the Hebrew, with notes critical and explanatory, 1803; *Triumph of Britain*, an Ode, 1803; *Memoirs of the Life and Writings of Alex. Geddes, LL.D.*, 1803; *The Nature of Things: a Didactic Poem*, translated from the Latin of Titus Lucretius Carus, with the original text and notes philological and explanatory, 1805-7, 2 vols. 4to, which is still of considerable value for its parallel passages and quotations both from European and Asiatic languages; *Oration on the Structure and Physiology of Plants*, 1808; *Essay on Medical Technology*, 1810; *The Book of Job literally translated, &c.*, 1812; *The Study of Medicine*, 1822, 4 vols. 8vo, 3d ed. in 1832, edited by Dr Samuel Cooper; and *The Book of Nature*, 1826, 3 vols. See *Memoirs* by Olinthus Gregory, LL.D., 1828, and a biographical sketch in the *Gentleman's Magazine* for March 1827. His *Thoughts for all Seasons, in Prose and Verse*, was published, with a short biographical sketch, in 1860.

GOOD FRIDAY, the usual English name for the day observed throughout a great part of Christendom as the anniversary of the passion and death of Christ. In the Greek Church it has been or is known as *πάσχα* [σταυρώσιμον], *παρασκευή*, *παρασκευή μεγάλη* or *ἀγία, σωτηρία* or *τὰ σωτήρια*, *ἡμέρα τοῦ σταυροῦ*, while among the Latins the names of most frequent occurrence are Pascha Crucis, Dies Dominicæ Passionis, Parasceve, Feria Sexta Paschæ, Feria Sexta Major in Hierusalem, Dies Absolutionis. It was called Long Friday by the Anglo-Saxons¹ and Danes; in Germany it is sometimes designated Stillter Freitag (compare Greek, *ἄβδομας ἀπρακτος*; Latin, *hebdomas inofficiosa*, *non laboriosa*), but more commonly Charfreitag. The etymology of this last name has been much disputed, but there seems now to be little doubt that it is derived from the Old High German *chara*, meaning suffering or mourning.

The origin of the custom of a yearly commemoration of the crucifixion is involved in some obscurity. It may be regarded as certain, indeed, that among Jewish Christians it almost imperceptibly grew out of the old habit of annually celebrating the Passover on the 14th of Nisan, and of observing the "days of unleavened bread," from the 15th to the 21st of that month. In the Gentile churches, on the other hand, it seems to be well established that originally no yearly cycle of festivals was known at all. The weekly observance of the dies dominica, however, became universal at a very early date; and the practice of giving special prominence to Easter Sunday (the first Sunday after the 14th of Nisan), as well as that of keeping a previous fast of considerable rigour, though of indeterminate duration, had established itself in Egypt and in the Western churches at least by the middle of the 2d century. The accounts which have been transmitted by Eusebius, Socrates, and Epiphanius of the paschal controversies, which began to be agitated about 160 A.D., are obscure on many points—so obscure, indeed, as to suggest doubts whether these historians had altogether comprehended the questions under discussion. So much, however, is clear, that Occidental feeling had even then begun to take great offence at the prevailing Eastern practice. In Asia Minor, Syria, and Mesopotamia, the 14th and 16th of Nisan were specially observed, altogether irrespective of the day of the week, and for this apostolic sanction was urged by Polycarp; but Anicetus of Rome, with great earnestness, though still with deference, pleaded immemorial usage for the custom of observing a

¹ See Johnson's *Collection of Ecclesiastical Laws* (vol. i., anno 957): "Housel ought not to be hallowed on Long Friday, because Christ suffered for us on that day."

Friday and Saturday fast followed by an Easter Sunday feast. As the Western churches gained in influence, the practice of tolerance became increasingly difficult; already in 190 A.D. we find Victor of Rome insisting on the conformity of Polycrates of Ephesus, and proclaiming the contumacious Asiatics to be out of communion (*ἀκοινωνήτους*). To secure uniformity in this matter was one of the objects for which the council of Nice was convened in 325; no canon, however, was framed by the fathers there assembled, but it was recommended in a circular letter that Easter (*πάσχα*) should invariably be observed on a Sunday, and that the passion should, with equal regularity, be commemorated on Friday. Considerable progress towards the compulsory establishment of a uniform paschal usage was made in the years immediately following; thus, by a canon of the council of Antioch (341), the followers of the Oriental use were laid under severe ecclesiastical censures; in the decrees of that of Laodicea (361) the ominous word *αἵρεσις* is heard (*αἵρεσις τῶν τεσσαρες καιδεκατητων*); while in the Theodosian Code (xvi. 5, 9; 6, 6; 10, 24), the Quartodecimans are formally ranked among the other heretics whose error is to be visited with civil pains and penalties.

From the earliest period of its observance, the day was marked by a specially rigorous fast, and also, on the whole, by a tendency to greater simplicity in the public services of the church. Prior to the 4th century there is no evidence of non-celebration of the eucharist on Good Friday; but after that date the prohibition of communion became common. In Spain, indeed, it became customary to close the churches altogether as a sign of mourning; but this practice was condemned by the council of Toledo (633). In the Romish Church the Good Friday ritual at present observed is marked by many special features, most of which can be traced back to a date at least prior to the close of the 8th century (see the *Ordo Romanus* in Muratori's *Liturg. Rom. Vet.*). The altar and officiating clergy are draped in black; this being the only day on which that colour is permitted. Instead of the epistle, sundry passages from Hosea, Habakkuk, Exodus, and the Psalms are read. The gospel for the day consists of the history of the passion as recorded by St John. The reading of this is followed by bidding prayers for the peace and unity of the church, for the pope, the clergy, all ranks and conditions of men, the sovereign, for catechumens, the sick and afflicted, heretics and schismatics, Jews and heathen. Then follows the "adoration of the cross" (a ceremony said to date back to near the time of Helena's "invention of the cross"); the hymn *Pange Lingua* and *Vexilla Regis* are sung, and the reserved host brought out and partaken of by the priest. In many Roman Catholic countries, as, for example, in Spain, it is usual with the faithful to spend much time in the churches in meditation on the "seven last words" of the Saviour; no carriages are driven through the streets; the bells and organs are silent; and in every possible way it is sought to deepen the impression of a profound and universal grief. In the Greek Church also the Good Friday fast is excessively strict; as in the Roman Church, the passion history is read and the cross adored; towards evening a dramatic representation of the entombment takes place, amid open demonstrations of contempt for Judas and the Jews. In Lutheran churches the organ is silent on this day; and altar, font, and pulpit are draped in black, as indeed throughout Holy Week. In the Church of England the history of the passion from the gospel according to John is also read; the collects for the day are based upon the bidding prayers which are found in the *Ordo Romanus*.

GOODRICH, SAMUEL GRISWOLD (1793-1860), an American author better known under the pseudonym of Peter Parley, was the son of a Congregational minister, and was born at Ridgefield, Connecticut, August 19, 1793. In

1814 he commenced business as a publisher in Hartford. He visited Europe in 1823-4, and on his return to America removed to Boston, where from 1828 to 1842 he published an illustrated journal, the *Token*, to which he was a frequent contributor both in prose and verse. A selection from these contributions was published in 1841 under the title *Sketches from a Student's Window*. In the same year he established *Merry's Museum*, which he continued to edit till 1854. In 1827 he commenced, under the name of "Peter Parley," his series of books for the young, which, embracing geography, biography, history, science, and miscellaneous tales, numbered in 1857 as many as 170 volumes, of which about 7,000,000 had been sold, and 300,000 were being sold annually. In 1858 he published *Recollections of a Lifetime*, which contains a list both of the works of which he was the author and of the spurious works published under his name. By his writings and publications he amassed a large fortune. In 1838 he was chosen a member of the senate of Massachusetts, and in 1851 he was appointed consul to Paris, where he remained till 1855, taking advantage of his stay to have several of his works translated into French. After his return to America he published, in 1859, *History of the Animal Kingdom*. He died at New York, May 9, 1860.

GOODSIR, JOHN (1814-1867), anatomist, born at Anstruther, Fife, March 20, 1814, was the son of Dr John Goodsir, and grandson of Dr John Goodsir of Largo. He was educated at the burgh and grammar schools of his native place, and at the university of St Andrews. He served an apprenticeship for a short time to Mr Nasmyth, the eminent dentist, but the higher studies of medicine and surgery were more to his liking, and, under the fascinating impulsion of the lectures of Dr Knox, anatomy, descriptive, surgical, and pathological, became his hobby,—the work of Carus giving the first impetus to his investigations in developmental anatomy. From his mother he had imbibed a love of art, and his sketches and casts and methodical demonstrations were the admiration of his fellow students. In Dr Knox's rooms he made the acquaintance of Edward Forbes, the naturalist, Goodsir also worked under Mr Syme, Professor Christison, Dr John Macintosh, Professor Robert Jameson, Dr Thomas Hope, and Dr Graham. His earliest scientific paper was on the snail,—a novel, elaborate, and highly illustrated treatise. In 1835 he became a licentiate of the Royal College of Surgeons, Edinburgh. After aiding Mr Nasmyth, he joined his father in practice at Anstruther. Three years later he communicated to the British Association a paper on the pulps and sacs of the human teeth, his researches on the whole process of dentition being at this time distinguished by their completeness. He had already commenced the formation of a natural history museum, which attracted many visitors,—the habits of animals, from the polype to the ape, possessing an irresistible charm for him. The results of his studies in natural history were laid before the Society of St Andrews, at the request of whose president, Sir D. Brewster, he furnished an account of *cilia*, reading to the society in 1840 his views on the cephalic termination of the sympathetic nerve. The ichthyolites of the Concerres quarry had not escaped him; and we find him now foreshowing his diversified knowledge in essays on the eye of the cephalopodous mollusks, in descriptions of his dredging expeditions with Edward Forbes, and in his lectures at Capar on the conditions of health. On the nomination of Forbes, he was in 1838 elected to the famous coterie called the "Universal Brotherhood of the Friends of Truth," which comprised artists, scholars, naturalists, and others whose relationship became a potent influence in science. Goodsir was a noble example of the brotherhood, which sought to bind man to man in ties of home and friendship, love and good will. Goodsir and Forbes worked together at marine zoology, but human

anatomy, pathology, and morphology formed Goodsir's chief study. The connexion of these two men was illustrated in a paper read at the British Association in 1840 on *Peloniaia*, and further researches on the British *Ciliograda*. In that year Goodsir became a member of the Wernerian Society, contributing several papers, some jointly with Forbes. Professor Jameson was the president, which may account for the greater part of Goodsir's studies in comparative anatomy from 1840 to 1847 being imparted to its members. In 1841 he joined the Edinburgh Botanical Society, holding the office of secretary from 1842-48, when he was chosen vice-president. In 1840-42 ulcers and abscesses and continued fever, in cases of which he advocated the depletive system, occupied his attention. He had associated himself with the Royal Medical Society in 1833, and was in 1841-42 elected the senior president, at the same time becoming president of the Anatomical and Physiological Societies, to which he submitted his studies on the structure of the liver and kidneys. A member of the Royal Physical Society in 1841, he read his papers on the development of the skeleton in the series of invertebrate animals; in 1849 he was elected president, remaining in office till 1852. His own estimate of his work at this period was represented to the Royal College of Surgeons of Edinburgh on his candidature for the post of conservator of the museum. He stated that he had practised every department of preparation and conservation, that he had considerable experience in modelling in clay, plaster, and wax, and in the use of microscope and pencil, and that his own collection of preparations in human, comparative, and morbid anatomy exceeded 400 examples. He succeeded Macgillivray in April 1841, giving lectures on the subjects illustrated by the museum. Goodsir rested no small part of his reputation on his knowledge of the anatomy of tissues. In his lectures in the theatre of the college in 1842-43 he evidenced the largeness of his observation of cell-life, both physiologically and pathologically, advocating the importance of the cell as a centre of nutrition, and pointing out that the organism is subdivided into a number of departments. Virchow recognized his indebtedness to these discoveries by dedicating his *Cellular Pathologie* to Goodsir, as "one of the earliest and most acute observers of cell-life." In 1843 Goodsir obtained the post of curator in the university of Edinburgh; the following year he was appointed demonstrator of anatomy to Professor Monro, and in 1845 curator of the entire museum. He elucidated about this time much that had been obscure in digestion, in parasitic formation and in the secreting structures. He fully confirmed the supposition that cells are the structures which perform the process of secretion, and that the functions of nutrition and secretion are essentially alike in their nature. His views on the nucleated cell as the great agent in absorption, nutrition, and secretion are established data in the science of physiology. In 1846 Goodsir was elected to the anatomical chair in the university of Edinburgh, his highest ambition being thus satisfied. The same year the Royal Society of London enrolled him as a fellow. All his energies were now devoted to the perfection of the science of anatomy; and his system of teaching was regarded as the best that ever regulated the anatomical department of any British university or medical school.

Human myology was his strong point; no one had laboured harder at the dissecting-table; and he strongly emphasized the necessity of practice as a means of research. He believed that anatomy, physiology, and pathology could never be properly advanced without daily consideration and treatment of disease. In 1848 he became a fellow of the Royal College of Surgeons, and in the same year he joined the Highland and Agricultural Society, acting as chairman of the veterinary department, and advising on

strictly agricultural matters. In 1847 he delivered a series of systematic lectures on the comparative anatomy of the invertebrata; and, about this period, as member of an æsthetic club, he wrote papers on the natural principles of beauty, the æsthetics of the ugly, of smell, the approbation or disapprobation of sounds, and other refinements. Owing to the failing health of Professor Jameson, Goodsir was induced to deliver the course of lectures on natural history during the summer of 1853. It was mainly zoological, and included the psychological conditions of man as compared with the brute, and the highest exercise of the human faculties—perception, logic, and science. These lectures are among the *memorabilia* of the university; but the infinite amount of thought and exertion which they cost broke the health of the lecturer. Goodsir, nevertheless, persisted in work till 1853, when the necessity for rest urged itself with painful force. A sojourn on the Continent, though it refreshed, could not rid him of incipient paralysis, the common penalty for overtaxing powers. The death of Forbes in 1854 was a sore trial to Goodsir, and though other friends were numerous, the firm attachment of this man could not be replaced. Goodsir persevered in his labours, writing in 1855 on organic electricity, in 1856 on morphological subjects, and afterwards on the structure of organized forms,—his speculations in the latter domain giving birth to his theory of a triangle as the mathematical figure upon which nature had built up both the organic and inorganic worlds. The fundamental principle of form he conceived to exist within the province of crystallography, and to be discernible by a close study of the laws of that science. As he believed that every cell had a parent cell, or “a mother,” so he argued there was an umbilicus or centre in everything. He regarded man as simply a conglomerate of cells, rising up, maturing, and decaying. He saw in the growth and form and finished structure of man a tetrahedron,—man, a physical being and a form divine, but a crystal in his structural entity and arrangement. Goodsir hoped to complete the triangle theory of formation and law as the greatest of his works. In his lectures on the skull and brain he held the doctrine that symmetry of brain had more to do with the higher faculties than bulk or form. Goodsir was still working out these higher studies when death ended his labours. He expired at Wardie, near Edinburgh, on the 6th of March 1867, in the same cottage in which his friend Edward Forbes died. Goodsir's anatomical lectures are remarkable for their solid basis of fact; and no one in Britain took so wide a field for survey, or marshalled so many facts for anatomical tabulation and synthesis.

See *Anatomical Memoirs of John Goodsir, F.R.S.*, edited by W. Turner, M.B., with Memoir by H. Lonsdale, M.D., Edinb. 1868, 2 vols., in which Goodsir's lectures, addresses, and writings are epitomized; *Proceedings of the Roy. Soc. of Lond.*, vol. iv., 1868; *Transactions of the Botanical Soc. Edin.*, 1868, vol. ix. (T. N.)

GOODWIN, THOMAS (1600–1679), a prominent English divine of the later Puritan period, was born at Rollesby, Norfolk, on the 5th of October 1600, and a little before the completion of his thirteenth year was enrolled a student of Christ's College, Cambridge, where in 1616 he proceeded to the degree of B.A. In 1619 he removed to St Catherine's Hall, and there in 1620 he was chosen fellow. In 1625 he was licensed a preacher of the university; and three years afterwards he became lecturer of Trinity Church, to the vicarage of which he was presented by the king in 1632. Harassed by the interferences of his bishop, who was a zealous adherent of Laud, he resigned all his preferments and left the university in 1634. He then seems to have lived for some time in London, where in 1638 he married the daughter of an alderman; but, in the following year, he found it expedient to withdraw to Holland, and for some time was pastor of a small congregation of

English merchants and refugees at Arnheim. Returning to London soon after Laud's impeachment by the Long Parliament, he ministered for some years to an Independent congregation in the parish of St Dunstan's-in-the-East, and rapidly rose to considerable éminence as a preacher; in 1643 he was chosen a member of the Westminster Assembly, and at once identified himself with the Congregational party, generally referred to in contemporary documents as “the dissenting brethren.” He frequently preached by appointment before the Commons, and in January 1650 his talents and learning were rewarded by the House with the presidency of Magdalen College, Oxford, a post which he held until the period of the Restoration. He rose into high favour with the Protector, and ultimately became somewhat prominent among his more intimate advisers. From 1660 until his death, which occurred on the 23d of February 1679, he lived in London, and devoted himself exclusively to theological study and to the pastoral charge of a small congregation which his piety and intellectual abilities had attached to him.

The works published by Goodwin during his lifetime consist chiefly of sermons printed by order of the House of Commons; but he was also associated with Nye and others in the preparation of the *Apologetical Narration* (1643). His collected writings, which include expositions of considerable portions of the Epistle to the Ephesians and of the Apocalypse, were published in five folio volumes between 1681 and 1704, and have recently been reprinted in twelve 8vo volumes (Edin. 1861–66). Characterized by great yet one-sided reading, remarkable at once for the depth and for the narrowness of their observation and spiritual experience, often admirably thorough in their workmanship, yet in style prolix to a degree that, by modern readers at least, is sometimes found to be almost intolerable,—they fairly exemplify both the merits and the defects of the special school of religious thought to which they belong. Calamy's estimate of Goodwin's qualities may be quoted as both friendly and just. “He was a considerable scholar and an eminent divine, and had a very happy faculty in descanting upon Scripture so as to bring forth surprising remarks, which yet generally tended to illustration.” A memoir, derived from his own papers, by his son is prefixed to the fifth volume of his collected works; as a “patriarch and Atlas of Independency” he is also noticed by Wood in the *Athenæ Ozonienses*. A somewhat amusing sketch, from Addison's point of view, of the Puritan president of Magdalen's is to be met with in No. 494 of the *Spectator*.

GOOJERAT. See GUJARAT.

GOOLE, a market town and river-port of England, West Riding of Yorkshire, is situated on the right bank of the Ouse, 25 miles W. of Hull, on the Hull and Doncaster Railway, and at the eastern terminus of the Wakefield, Pontefract, and Goole branch of the Lancashire and Yorkshire Railway. About a mile north of Goole the Ouse is crossed by a railway swing bridge, worked by hydraulic power. Until it was made a bonding port in 1829, Goole was an obscure hamlet; but since the erection shortly afterwards of commodious docks, it has steadily advanced in prosperity. The harbour, 250 feet long and 200 wide, communicates by gates with the wet docks, which consist of the ship dock 700 feet by 200, with a depth of 18 feet, the railway dock 600 feet by 200, and the steamship dock 900 feet by 150. The town is well built, and possesses a fine modern parish church in the Perpendicular style, a Roman Catholic chapel in the Early English style, a neat custom-house, a market hall, a handsome courthouse, a union poorhouse, public, free, and national schools, and extensive warehouses for grain and other goods. The number of British ships that entered the port in 1877 was 1686, with a tonnage of 298,150; of foreign ships 62, with a tonnage of 16,399. The number of British ships that cleared was 2642, with a tonnage of 342,727; of foreign ships 64, with a tonnage of 17,038. There is regular steam communication with London and the principal Continental ports. The chief exports are coal, woollen goods, and machinery; and the chief imports, butter, fruit, indigo, logwood, timber, and wool. The

industries include the manufacture of alum, sugar, ropes, and agricultural instruments, and iron-founding. Shipbuilding is also carried on, and there is a large dry dock, and a patent slip for repairing vessels. The population in 1871 was 7680.

GOOSANDER. See MERGANSER.

GOOSE (Anglo-Saxon, *Gōs*), the general English name for a considerable number of birds; belonging to the Family *Anatidæ* of modern ornithologists, which are mostly larger than Ducks and less than Swans. Technically the word Goose is reserved for the female, the male being called Gander (Anglo-Saxon, *Gandra*).

The most important species of Goose, and the type of the genus *Anser*, is undoubtedly that which is the origin of our well-known domestic race, the *Anser ferus* or *A. cinereus* of most naturalists, commonly called in English the Grey or Grey Lag Goose, a bird of exceedingly wide range in the Old World, apparently breeding where suitable localities are to be found in most European countries from Lapland to Spain and Bulgaria. Eastwards it extends to China, but does not seem to be known in Japan. It is the only species indigenous to the British Islands, and in former days bred abundantly in the English Fen-country, where the young were caught in large numbers and kept in a more or less reclaimed condition with the vast flocks of tame-bred Geese that at one time formed so valuable a property to the dwellers in and around the Fens. It is impossible to determine when the wild Grey Lag Goose ceased from breeding in England, but it certainly did so towards the end of the last century, for Daniell mentions (*Rural Sports*, iii. p. 242) his having obtained two broods in one season. In Scotland this Goose continues to breed sparingly in several parts of the Highlands and in certain of the Hebrides, the nests being generally placed in long heather, and the eggs seldom exceeding five or six in number. It is most likely the birds reared here that are from time to time obtained in England, for at the present day the Grey Lag Goose, though once so numerous, is, and for many years has been, the rarest species of those that habitually resort to the British Islands. The domestication of this species, as Mr Darwin remarks (*Animals and Plants under Domestication*, i. p. 287), is doubtless of very ancient date, and yet scarcely any other animal that has been tamed for so long a period, and bred so largely in captivity, has varied so little. It has increased greatly in size and fecundity, but almost the only change in plumage is that tame Geese lose the browner and darker tints of the wild bird, and are invariably more or less marked with white—being often indeed wholly of that colour.¹ The most generally recognized breeds of domestic Geese are those to which the distinctive names of Emden and Toulouse are applied; but a singular breed, said to have come from Sebastopol, was introduced into Western Europe about the year 1856. In this the scapulars are elongated, curled, and spirally twisted, having their shaft

¹ The meaning and derivation of this word *Lag* had long been a puzzle until Prof. Skeat suggested (*Ibis*, 1870, p. 301) that it signified late, last, or slow, as in *laggard*, a loiterer, *lagman*, the last man, *lagteeth*, the posterior molar or “wisdom” teeth (as the last to appear), and *lagclock*, a clock that is behind time. Thus the Grey Lag Goose is the Grey Goose which in England when the name was given was not migratory but lagged behind the other wild species at the season when they betook themselves to their northern breeding-quarters. In connexion with this word, however, must be noticed the curious fact mentioned by the late Mr Rowley (*Orn. Miscell.*, iii. p. 213), that to this day the flocks of tame Geese in Lincolnshire are urged on by their drivers with the cry of “Lag'em, Lag'em.”

² From the times of the Romans white Geese have been held in great estimation, and hence, doubtless, they have been preferred as breeding stock, but the practice of plucking Geese alive, continued for so many centuries, has not improbably also helped to perpetuate this variation, for it is well known to many bird-keepers that a white feather is often produced in place of one of the natural colour that has been pulled out.

transparent, and so thin that it often splits into fine filaments, which, remaining free for an inch or more, often coalesce again.³

The other British species of typical Geese are the Bean-Goose (*A. segetum*), the Pink-footed (*A. brachyrhynchus*), and the White-fronted (*A. albifrons*). On the continent of Europe, but not yet recognized as occurring in Britain, is a small form of the last (*A. erythropus*) which is known to breed in Lapland. All these, for the sake of discrimination, may be divided into two groups—(1) those having the “nail” at the tip of the bill white, or of a very pale flesh colour, and (2) those in which this “nail” is black. To the former belong the Grey Lag Goose, as well as *A. albifrons* and *A. erythropus*, and to the latter the other two. *A. albifrons* and *A. erythropus*, which hardly differ but in size,—the last being not much bigger than a Mallard (*Anas boschas*),—may be readily distinguished from the Grey Lag Goose by their bright orange bill and legs, and their mouse-coloured upper wing-coverts, to say nothing of their very conspicuous white face, and the broad black bars which cross the belly, though the two last characters are occasionally observable to some extent in the Grey Lag Goose, which has the bill and legs flesh-coloured, and the upper wing-coverts of a bluish-grey. Of the second group, with the black “nail,” *A. segetum* has the bill long, black at the base and orange in the middle; the feet are also orange, and the upper wing-coverts mouse-coloured, as in *A. albifrons* and *A. erythropus*, while *A. brachyrhynchus* has the bill short, bright pink in the middle, and the feet also pink, the upper wing-coverts being nearly of the same bluish-grey as in the Grey Lag Goose. Eastern Asia possesses in *A. grandis* a third species of this group, which chiefly differs from *A. segetum* in its larger size. In North America there is only one species of typical Goose, and that belongs to the white-“nailed” group. It very nearly resembles *A. albifrons*, but is larger, and has been described as distinct under the name of *A. gambeli*. Central Asia and India possess in the Bar-headed Goose (*A. indicus*) a bird easily distinguished from any of the foregoing by the character implied by its English name; but it is certainly somewhat abnormal, and, indeed, under the name of *Eulabia*, has been separated from the genus *Anser*, which has no other member indigenous to the Indian Region, nor any at all to the Ethiopian, Australian, or Neotropical Regions.

But the New World possesses by far the greatest wealth of Anserine forms. Beside others, presently to be mentioned, its northern portions are the home of all the species of Snow-Geese belonging to the genus *Chen*. It is true that two of these are reported as having appeared, and that not unfrequently, in Europe and Asia; but they possibly have been but stragglers from America. The first of these is *C. hyperboreus*, the Snow-Goose proper, a bird of large size, and when adult of a pure white, except the primaries, which are black. This has long been deemed a visitor to the Old World, and sometimes in considerable numbers, but the later discovery of a smaller form, *C. albatas*, scarcely

³ Want of space forbids our entering on the breeding of tame Geese, which was formerly so largely practised in some English counties, especially Norfolk and Lincoln. It was no uncommon thing for a man to keep a stock of a thousand, each of which might be reckoned to rear on an average seven Goslings. The flocks were regularly taken to pasture and water, just as sheep are, and the man who tended them was called the Gooseherd, corrupted into Gozzerd. The birds were plucked five times in the year, and in autumn the flocks were driven to London or other large markets. They travelled at the rate of about a mile an hour, and would get over nearly ten miles in the day. For further particulars the reader may be referred to Pennant's *British Zoology*; Montagu's *Ornithological Dictionary*; Latham's *General History of Birds*; and Rowley's *Ornithological Miscellany* (iii. pp. 206–215), where some account also may be found of the Goose-fattening at Strasburg, which, since the reconquest of Alsace, has been transferred to the south of France.

differing except in size, throws some doubt on the older records, especially since examples which have recently been obtained in the British Islands undoubtedly belong to this lesser bird, and it would be satisfactory to have the occurrence in the Old World of the true *C. hyperboreus* placed on a surer footing. So nearly allied to the species last named as to have been often confounded with it, is the Blue-winged Goose, *C. caerulescens*, which is said never to attain a snowy plumage. Then we have a very small species, long ago described as distinct by Hearne, the Arctic traveller, but until 1861 discredited by ornithologists. Its distinctness has now been fully recognized, and it has received, somewhat unjustly, the name of *C. rossii*. Its face is adorned with numerous papillae, whence it has been removed by Mr Elliot to a separate genus, *Exanthemops*, and for the same reason it has, for more than a century, been known to the European residents in the fur countries as the "Horned Wavy"—the last word being a rendering of a native name, *Wawa*, which signifies Goose. Finally, there appears to belong to this section, though it has been frequently referred to another (*Chloephaga*), and has also been made the type of a distinct genus (*Philacte*), the beautiful Painted Goose, *C. canagica*, which is almost peculiar to the Aleutian Islands, though straying to the continent in winter, and may be recognized by the white edging of its remiges.

The southern portions of the New World are inhabited by about half a dozen species of Geese, akin to the foregoing, but separated as the genus *Chloephaga*. The most noticeable of them are the Rock or Kelp Goose, *C. antarctica*, and the Upland Goose, *C. magellanica*. In both of these the sexes are totally unlike in colour, the male being nearly white, while the female is of a mottled brown, but in others a greater similarity obtains.¹ Very nearly allied to the birds of this group, if indeed that can be justifiably separated, comes one which belongs to the northern hemisphere, and is common to the Old World as well as the New. It contains the Geese which have received the common names of Bernacles or Brents,² and the scientific appellations of *Bernicla* and *Branta*—for the use of either of which much may be said by nomenclaturists. All the species of this section are distinguished by their general dark sooty colour, relieved in some by white of greater or less purity, and by way of distinction from the members of the genus *Anser*, which are known as Grey Geese, are frequently called by fowlers Black Geese. Of these, the best known both in Europe and North America is the Brent-Goose—the *Anas bernicla* of Linnæus, and the *B. torquata* of many modern writers—a truly marine bird, seldom (in Europe at least) quitting salt-water, and coming southward in vast flocks towards autumn, frequenting bays and estuaries on our coasts, where it lives chiefly on sea-grass (*Zostera maritima*). It is known to breed in Spitsbergen and in Greenland. A form which is by some ornithologists deemed a good species, and called by them *B. nigricans*, occurs chiefly on the Pacific coast of North America. In it the black of the neck, which in the common Brent terminates just above the breast, extends over most of the lower parts. The true Bernacle-Goose,³ the *B. leucopsis* of most authors, is but a casual visitor to

¹ See Selater and Salvin, *Proc. Zool. Society*, 1876, pp. 361-369.

² The etymology of these two words is exceedingly obscure, and no useful purpose could be attained by discussing it here, especially as any disquisition upon it must needs be long. Suffice it to say that the ordinary spelling Bernacle seems to be wrong, if we may judge from the analogy of the French *Bernache*. In both words the *e* should be sounded as *a*.

³ The old fable, perhaps still believed by the uneducated in some parts of the world, of Bernacle-Geese being produced from the Bernacles (*Lepidida*) that grow on timber exposed to salt-water, is not more absurd than many that in darker ages had a great hold of the popular mind, and far less contemptible than the conceited spirit in which many modern zoologists and botanists often treat it. They

North America, but is said to breed in Iceland; and occasionally in Norway. Its usual *incumbula*, however, still form one of the puzzles of the ornithologist, and the difficulty is not lessened by the fact that it will breed freely in semi-captivity, while the Brent-Goose will not. From the latter the Bernacle-Goose is easily distinguished by its larger size and white cheeks. Hutchins's Goose (*B. Hutchinsi*) seems to be its true representative in the New World. In this the face is dark, but a white crescentic or triangular patch extends from the throat on either side upwards behind the eye. Almost exactly similar in coloration to the last, but greatly superior in size, and possessing 18 rectrices, while all the foregoing have but 16, is the common wild Goose of America, *B. canadensis*, which, for some two centuries or more, has been introduced into Europe, where it propagates so freely that it has been included by nearly all the ornithologists of this quarter of the globe, as a member of its fauna. An allied form, by some deemed a species, is *B. leucoparva*, which ranges over the western part of North America, and, though having 18 rectrices, is distinguished by a white collar round the lower part of the neck. The most diverse species of this group of Geese are the beautiful *B. ruficollis*, a native of North-eastern Asia, which occasionally strays to Western Europe, and has been obtained more than once in Britain, and that which is peculiar to the Hawaiian archipelago, *B. sandvicensis*.

The largest living Goose is that called the Chinese, Guinea, or Swan-Goose, *Cygnopsis cygnoides*, and it seems to be the stock whence the domestic Geese of several Eastern countries have sprung. It may not infrequently be seen in English farmyards, and it is found to cross readily with our common tame Goose, the offspring being fertile, and Blyth has said that these crosses are very abundant in India. The true home of the species is in Eastern Siberia or Mongolia. It is distinguished by its upright bearing, which has been well rendered by Bewick's excellent figure. The Ganders of the reclaimed form are distinguished by the knob at the base of the bill, but the evidence of many observers shows that this is not found in the wild race. Of this bird there is a perfectly white breed.

We have next to mention a very curious form, *Cereopsis nove-hollandia*, which is peculiar to Australia, and appears to be a more terrestrial type of Goose than any other now existing. Its short, decurved bill and green cere give it a very peculiar expression, and its almost uniform grey plumage, bearing rounded black spots, is also remarkable. It bears captivity well, breeding in confinement, and may be seen in many parks and gardens. It appears to have been formerly very abundant in many parts of Australia, from which it has of late been exterminated. Some of its peculiarities seem to have been still more exaggerated in a bird that is wholly extinct, the *Cremiornis calcitrans* of New Zealand, the remains of which were described in full by Professor Owen in 1873 (*Trans. Zool. Society*, ix. p. 253). Among the first portions of this singular bird that were found were the *tibia*, presenting an extraordinary development of the *patella*, which, united with the shank-bone, gave rise to the generic name applied. For some time the affinity of the owner of this wonderful structure was in doubt, but all hesitation was dispelled by the discovery of a nearly perfect skeleton, now in the British Museum, which proved the bird to be a Goose, of great size, and unable, from the shortness of its wings, to fly.

should remember that the doctrine of spontaneous generation has still many adherents, and that seems to be hardly less extravagant than the notion of birds growing from "worms," as they were then called. The mistake of our forefathers is of course evident, but that is no reason for deriding their innocent ignorance as some of our contemporaries are fond of doing.

In correlation with this loss of power may also be noted the dwindling of the keel of the sternum. Generally, however, its osteological characters point to an affinity to *Cereopsis*, as was noticed by Dr Hector (*Trans. New Zeal. Institute*, vi. pp. 76-84), who first determined its Anserine character.

Birds of the genera *Chenalopez* (the Egyptian and Orinoco Geese), *Plectropterus*, *Sarcidiornis*, *Chlamydochen*, and some others, are commonly called Geese. To the writer it seems uncertain whether they should be grouped with the *Anserinae*. The males of all appear to have that curious enlargement at the junction of the bronchial tubes and the trachea which is so characteristic of the Ducks or *Anatinae*. As much may be said for the genus *Nettionus*, but want of space precludes further consideration of the subject here.

(A. N.)

GOOSEBERRY, *Ribes grossularia*, a well-known fruit-bush of northern and central Europe, usually placed in the same genus of the natural order to which it gives name as the closely allied currants, but by some made the type of a small sub-genus, *Grossularia*, the members of which differ from the true currants chiefly in their spinous stems, and in their flowers growing on short footstalks, solitary, or two or three together, instead of in racemes.

The wild gooseberry is a small, straggling bush, nearly resembling the cultivated plant,—the branches being thickly set with sharp spines, standing out singly or in diverging tufts of two or three from the bases of the short spurs or lateral leaf shoots, on which the bell-shaped flowers are produced, singly or in pairs, from the groups of rounded, deeply-crenated 3 or 5-lobed leaves. The fruit is smaller than in the garden kinds, but is often of good flavour; it is generally hairy, but in one variety smooth, constituting the *R. uva-crispa* of writers; the colour is usually green, but plants are occasionally met with having deep purple berries. The gooseberry is indigenous to the central parts of Europe and western Asia, growing naturally in alpine thickets and rocky woods in the lower country, from France eastward, perhaps as far as the Himalaya. In Britain it is often found in copses and hedgerows and about old ruins, but has been so long a plant of cultivation that it is difficult to decide upon its claim to a place in the native flora of the island. Common as it is now on some of the lower slopes of the Alps of Piedmont and Savoy, it is uncertain whether the Romans were acquainted with the gooseberry, though it may possibly be alluded to in a vague passage of Pliny: the hot summers of Italy, in ancient times as at present, would be unfavourable to its cultivation. Abundant in Germany and France, it does not appear to have been much grown there in the Middle Ages, though the wild fruit was held in some esteem medicinally for the cooling properties of its acid juice in fevers; while the old English name, *Fea-berry*, still surviving in some provincial dialects, indicates that it was similarly valued in Britain, where it was planted in gardens at a comparatively early period. Turner describes the gooseberry in his *Herball*, written about the middle of the 16th century, and a few years later it is mentioned in one of Tusser's quaint rhymes as an ordinary object of garden culture. Improved varieties were probably first raised by the skilful gardeners of Holland, whose name for the fruit, *Kruisbezie*, may have been easily corrupted into the present English vernacular word.¹ Towards the end of the last century the gooseberry became a favourite object of cottage-horticulture, especially in Lancashire, where the working cotton-spinners have raised numerous varieties from seed, their efforts having been chiefly directed to increasing the size of the fruit.

¹ The Scotch *grossart*, originally *grosel*, evidently from the French *groselle*, may have the same ultimate origin; the usual derivation from *grossus*, a green fig, seems far-fetched. The rough wild fruit is called by the Germans *krausbeere*.

Of the many hundred sorts enumerated in recent horticultural works, few perhaps equal in flavour some of the older denizens of the fruit-garden, such as the "old rough red" and "hairy amber." The climate of the British Islands seems peculiarly adapted to bring the gooseberry to perfection, and it may be grown successfully even in the most northern parts of Scotland; indeed, the flavour of the fruit is said to improve with increasing latitude. In Norway even, the bush flourishes, in gardens on the west coast, nearly up to the Arctic circle, and it is found wild as far north as 63°. The dry summers of the French and German plains are less suited to it, though it is grown in some hilly districts with tolerable success. The gooseberry in the south of England will grow well in cool situations, and may be sometimes seen in gardens near London flourishing under the partial shade of apple trees; but in the north it needs full exposure to the sun to bring the fruit to perfection. It will succeed in almost any soil, but prefers a rich loam or black alluvium, and, though naturally a plant of rather dry places, will do well in moist land, if drained.

The varieties are most easily propagated by cuttings planted in the autumn, which root rapidly, and in a few years form good fruit-bearing bushes. Much difference of opinion prevails regarding the mode of pruning this valuable shrub; it is probable that in different situations they may require varying treatment. The fruit being borne on the lateral spurs, and on the shoots of the last year, it is the usual practice to shorten the side branches in the winter, before the buds begin to expand; some reduce the longer leading shoots at the same time, while others prefer to nip off the ends of these in the summer while they are still succulent. When large fruit is desired, plenty of manure should be supplied to the roots, and the greater portion of the berries picked off while still small. Burdige states that the gooseberry may be with advantage grafted or budded on stocks of some other species of *Ribes*, *R. aureum*, the ornamental golden currant of the flower garden, answering well for the purpose. The giant goose berries of the Lancashire "fanciers" are obtained by the careful culture of varieties specially raised with this object, the growth being encouraged by abundant manuring, and the removal of all but a very few berries from each plant. Single-gooseberries of nearly 2 ounces in weight have been occasionally exhibited; but the produce of such fanciful horticulture is generally insipid. The bushes at times suffer much from the ravages of the caterpillar of the gooseberry or magpie moth, *Abraxas grossulariata*, which often strip the branches of leaves in the early summer, if not destroyed before the mischief is accomplished. The most effectual way of getting rid of this pretty but destructive insect is to look over each bush carefully, and pick off the larvæ by hand; when larger they may be shaken off by striking the branches, but by that time the harm is generally done—the eggs are laid on the leaves of the previous season. Equally annoying in some years is the smaller larva of the V-moth, *Haliastur vanaria*, which often appears in great numbers, and is not so readily removed. The gooseberry is sometimes attacked by the grub of a fly, *Nematus ribesii*, of which several broods appear in the course of the spring and summer, and are very destructive. The grubs bury themselves in the ground to pass into the pupal state; the first brood of flies, hatched just as the bushes are coming into leaf in the spring, lay their eggs on the lower side of the leaves, where the small greenish larvæ soon after emerge. For the destruction of the first broods it has been recommended to syringe the bushes with tar-water; perhaps a very weak solution of carbolic acid might prove more effective. The powdered root of white hellebore is said to destroy both this grub and the caterpillars