

The annexed chart from Prof. Loomis's paper (*Sul. Jour.*, April 1873) shows, in a very striking manner, the correspondence of aurora, magnetic variation, and sun-

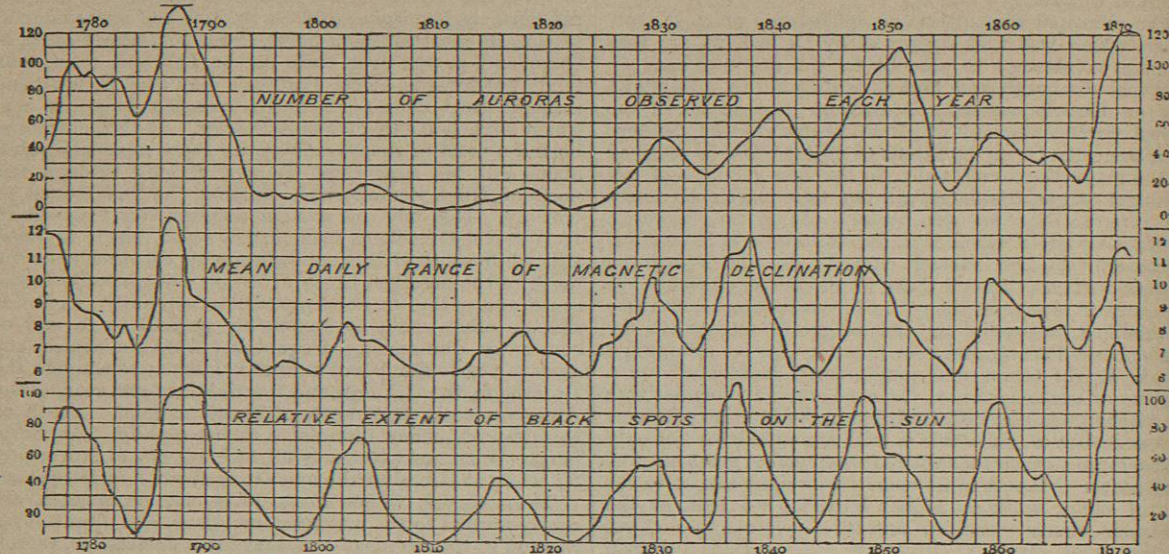


Diagram showing Correspondence of Auroræ, Magnetic Variation, and Sun Spots.

It has frequently been stated that the aurora returned periodically on certain days in the same manner as meteors. On the 3d of February brilliant auroræ occurred in 1750 and 1869, and on the 4th in 1869, 1870, 1871, 1872, 1873, and 1874; on the 13th February in 1575, 1821, 1822, 1865, and 1867; on the 6th March in 1716, 1777, 1843, 1867, and 1868; on the 9th September in 1776, 1827, 1835, 1866, 1868, 1872, and on the 29th in 1828, 1840, 1851, 1852, 1870, and 1872. This conclusion, however, is not supported by systematic investigation. A considerable catalogue of auroræ was divided into decennial periods, and it was found that the maxima of one period rarely coincided with those of others, and that the larger the number of years taken into account the less prominent the maxima appeared,—evident proof that they were only accidental. It may be, however, that if only prominent auroræ had been considered, more periodicity might have been found, or that the periodicity is constant for very short periods only.

Although no daily periodicity can be affirmed, there are two well-marked annual maxima in March and October, of which the latter is the greater, and two minima—the greater in June and the less in January. In this respect the aurora differs from the sporadic meteors, which have a maximum in autumn and a minimum in spring. It also differs from meteors in the hours of its appearance, the former being most frequent before and the latter after midnight.

Although the electric hypothesis is the one generally accepted by scientific men, it is only fair to allude to one that has been recently proposed independently by Dr Zehfuss (*Physikalische Theorie*, Adelman, Frankfurt) and by H. J. H. Groneman of Gröningen (*Astronomische Nachrichten*, No. 2010-2012). According to this view, the light of the aurora is caused by clouds of ferruginous meteoric dust, which is ignited by friction with the atmosphere. Groneman has shown that these might be arranged along the magnetic curves by action of the earth's magnetic force during their descent, and that their in-

fluence might produce the observed magnetic disturbances. The arches may be accounted for by the effects of perspective on columns suddenly terminated at a uniform height by increase of atmospheric density, while the correspondences with iron lines in its spectrum are sufficiently close to favour the idea. Ferruginous particles have been found in the dust of the Polar regions (E. A. Nordenskiöld, *Ast. Nach.*, 1874, § 154), but whether they are derived from stellar space or from volcanic eruption is uncertain. The yearly and eleven-yearly periodicity of auroræ tends to support the theory, but it is a formidable difficulty that, while shooting stars are more frequent in the morning, or on the face of the earth which is directed forwards in its orbit, the reverse is the case with auroræ. Groneman meets this difficulty by supposing that in the first case the velocity may be too great to allow of arrangement by the earth's magnetic force, and that, consequently, only diffused light can be produced. He accounts for its unfrequency in equatorial regions by the weakness of the earth's magnetic force, and the fact that, when it does occur, the columns must be parallel to the earth's surface. Without pronouncing in favour of this hypothesis, it must be admitted that it furnishes a plausible explanation of the phenomenon, although we have no evidence that meteoric dust, even if it exists, would produce the observed spectrum, and, as has been already remarked, the iron coincidences are of little weight.

Although we must confess that the causes of the aurora are very imperfectly explained, we may hope that the rapid progress which the last few years have witnessed in bringing terrestrial magnetism under the domain of cosmical laws may soon be extended to the aurora, and that we shall see in it fresh evidence that the same forces which cause hurricanes in the solar atmosphere thrill sympathetically to the furthest planets of our system in waves, not only of light and heat, but of magnetism and electricity.

The following is a list of the most important papers, treatises, and works on this subject:—*Berlin Mem.* 1710, i. 131; Halley, *Phil. Trans.* 1716, 1719, xxix. 406 xxx. 584; Hearn, *Phil. Trans.*, xxx.

1107; Langworth, Huxham, Hallet, and Callendini, *Phil. Trans.* xxxiv. 132, 150; Mairan, *Traité de l'Aurore Boréale*, 1733, 1754; Weidler, *De Aurora Boreali*, 4to; Wargentin, *Phil. Trans.* 1751, p. 126, 1752, p. 169, 1753, p. 85; Bergmann, *Schw. Abh.*, 200, 251; Wiedeburg, *Ueber die Nordlichter*, 8vo, Jena, 1771; Hüpsch, *Untersuchung des Nordlichts*, 8vo, Cologne, 1778; Van Swinden, *Recueil de Mémoires*, Hague, 1784; Cavallo, *Phil. Trans.* 1781, p. 329; Wilke, "Von den Neuesten Erklärungen des Nordlichts," *Schwed. Mus.*, 8vo, Wismar, 1783; Hey, Wollaston, Hutchinson, Franklin, Pigott, and Cavendish, *Phil. Trans.* 1790, pp. 32, 47, 101; Dalton's *Meteorological Observations*, 1793, pp. 54, 153; Chiminello, "On a Luminous Arch," *Soc. Ital.*, vii. 153; Loomis, "Electrical and Magnetic Relations," *Sill. Jour.* 2d ser., xxxii. 324, xxxiv. 34, Sept. 1870; on "Catalogue, Geog. dist., Sun spots," &c., *ibid.*, 3d ser. v. 245, &c.; B. V. Marsh, "Electrical Theory," *ibid.* 3d ser., xxxi. 311; Oettingen and Vogel on "Spectrum," *Pogg. Ann.*, cxlvi.

284, 569; Galle and Sirks on "Crown," *ibid.*, cxlvi. 133, cxlix. 112; Silbermann, *Comptes Rendus*, lxxvii. 1049, 1120, 1140, 1164; Prof. Fritz, "Geog. Distrib.," *Petermann's Mitt.*, Oct. 1874; Zehfuss, *Physikalische Theorie*, Adelman, Frankfurt; Balfour Stewart, *Phil. Mag.* 4th ser., xxxix. 59; A. S. Davis, *ibid.*, xl. 33; C. Piazzi Smyth, *Ed. Ast. Observations*, xiii. R. 85, *Phil. Mag.*, 4th ser., xlix., Jan. 1875; A. S. Herschel, *Nat.*, iii. 6; Sir W. R. Grove and J. R. Capron, *ibid.*, 28; Webb, Glaisher, &c., "Daylight Auroras," *ibid.*, 104, 126, 348, 510, iv. 209, &c.; Heis, "Auroras at Melbourne," *ibid.*, iv. 213; Prof. C. A. Young, *ibid.*, iv. 345; Kirkwood, "Periodicity," *ibid.*, iv. 505; H. R. Procter, *ibid.*, iii. 7, 346, &c.; P. E. Chase, "On Auroras and Gravitating Currents," *ibid.*, iv. 497; H. A. Newton, "Height," *Sill. Jour.* 2d ser., xxxix. 286, 371; Angström, *Pogg. Ann.* ("Jubelband") and *Nat.*, x. 211; J. R. Capron, "Spectrum," *Phil. Mag.*, 4th ser., xlix., April 1875. (H. R. P.)

AURUNGABAD, or AURANGABAD, a city of India, in the native state of Haidarabad, or the Nizam's dominions, situated in 19° 51' N. lat., and 75° 21' E. long., 138 miles from Puna, 207 from Bombay via Puna, and 270 from Haidarabad. It was founded about the year 1620, under the name of Gurka, by Malik Ambar, an Abyssinian, who had risen from the condition of a slave to great influence. Subsequently it became the capital of the Moghul conquests in the south of India. Aurungzebe made it the seat of his government during his viceroyalty of the Deccan, and gave it the name of Aurungabad. It thus grew into the principal city of an extensive province of the same name, stretching westward to the sea, and comprehending nearly the whole of the territory now comprised within the northern division of the presidency of Bombay. Aurungabad long continued to be the capital of the succession of potentates bearing the modern title of Nizam, after those chiefs became independent of Dehli. They abandoned it subsequently, and transferred their capital to Haidarabad, when the town at once began to decline. It is now greatly fallen from its ancient grandeur. The city is but half-peopled, and is half in ruins, presenting everywhere the melancholy appearances of desertion and decay. The population is, however, still considerable, and in the bazar, which is very extensive, various rich commodities, particularly silks and shawls, are exposed for sale. The walls of the town are similar in their construction to those of all the other cities in this quarter of India, being rather low, with round towers.

AURUNGZEBE, one of the greatest of the Moghul emperors of Hindustan, was the third son of Shah Jehan, and was born in October 1618. His original name, Mahomet, was changed by his father, with whom he was a favourite, into Aurungzebe, meaning ornament of the throne, and at a later time he assumed the additional titles of Mohi-eddin, reviver of religion, and Alam-gir, conqueror of the world. At a very early age, and throughout his whole life, he manifested profound religious feeling, perhaps instilled into him in the course of his education under some of the strictest Mahometan doctors. He was employed, while very young, in some of his father's expeditions into the country beyond the Indus, gave promise of considerable military talents, and was appointed to the command of an army directed against the Usbeks. In this campaign he was not completely successful, and soon after was transferred to the army engaged in the Deccan. Here he gained several victories, and in conjunction with the famous general, Meer Jumla, who had deserted from the king of Golconda, he seized and plundered the town of Haidarabad, which belonged to that monarch. His father's express orders prevented Aurungzebe from following up this success, and, not long after, the sudden and alarming illness of Shah Jehan turned his thoughts in another direction. Of Shah Jehan's four sons, the eldest,

Dara, a brave and honourable prince, but disliked by the Mussulmans on account of his liberality of thought, had a natural right to the throne. Accordingly, on the illness of his father, he at once seized the reins of government and established himself at Dehli. The second son, Soojah, governor of Bengal, a dissolute and sensual prince, was dissatisfied, and raised an army to dispute the throne with Dara. The keen eye of Aurungzebe saw in this conjuncture of events a favourable opportunity for realising his own ambitious schemes. His religious exercises and temperate habits gave him, in popular estimation, a great superiority over his brothers, but he was too politic to put forward his claims openly. He made overtures to his younger brother Murad, governor of Guzerat, representing that neither of their elder brothers was worthy of the kingdom, that he himself had no temporal ambition, and desired only to place a fit monarch on the throne, and then to devote himself to religious exercises and make the pilgrimage to Mecca. He therefore proposed to unite his forces to those of Murad, who would thus have no difficulty in making himself master of the empire while the two elder brothers were divided by their own strife. Murad was completely deceived by these crafty representations, and at once accepted the offer. Their united armies then moved northward. Meanwhile Shah Jehan had recovered, and though Dara resigned the crown he had seized, the other brothers professed not to believe in their father's recovery, and still pressed on. Soojah was defeated by Dara's son, but the imperial forces under Jesswunt Singh were completely routed by the united armies of Aurungzebe and Murad. Dara in person took the field against his brothers, but was defeated and compelled to fly. Aurungzebe then, by a clever stroke of policy, seized the person of his father, and threw him into confinement, in which he was kept for the remaining eight years of his life. Murad was soon removed by assassination, and the way being thus cleared, Aurungzebe, with affected reluctance, ascended the throne in August 1658. He quickly freed himself from all other competitors for the imperial power. Dara, who again invaded Guzerat, was defeated and closely pursued, and was given up by the native chief with whom he had taken refuge. He was brought to Dehli, exhibited to the people, and assassinated. Soojah, who had been a second time defeated near Allahabad, was attacked by the imperial forces under Meer Jumla and Mahomet, Aurungzebe's eldest son, who, however, deserted and joined his uncle. Soojah was defeated and fled to Aracan, where he perished; Mahomet was captured, thrown into the fortress of Gwalior, and died after seven years' confinement. No similar contest disturbed Aurungzebe's long reign of forty-six years, which has been celebrated, though with doubtful justice, as the most brilliant period in the history of Hindustan. The empire certainly was wealthy and of enormous extent, for there were successively added to it the rich kingdoms of

Bajapore and Golconda, and the barren province of Assam, but it was internally decaying, and ready to crumble away before the first vigorous assault. Two causes principally had tended to weaken the Moghul power. The one was the intense bigotry and intolerant policy of Aurungzebe, which had alienated the Hindus and roused the fierce animosity of the haughty Rajputs. The other was the rise and rapid growth of the Mahratta power. Under their able leader, Sevaji, these daring freebooters plundered in every direction, nor could all Aurungzebe's efforts avail to subdue them. At the close of the long contests between them, the Moghul power was weaker, the Mahratta stronger than at first. Still the personal ability and influence of the emperor were sufficient to keep his realms intact during his own life. His last years were embittered by remorse, by gloomy forebodings, and by constant suspicion, for he had always been in the habit of employing a system of espionage, and only then experienced its evil effects. He died, on the 21st February 1707, at Ahmadnagar, while engaged on an extensive but unfortunate expedition against the Mahrattas.

AUSCHWITZ, or OSWIECIM, a town in Galicia, Austria, on the right bank of the Sola, a tributary of the Weichsel, 33 miles W.S.W. of Cracow. It has a population of upwards of 3800, and carries on a trade in salt. Previous to the first partition of Poland in 1773, it was the seat of a dukedom, which had been united by Sigismund Augustus with the duchy of Zator in 1564.

AUSCULTATION (*auscultare*, to listen), a term in medicine, applied to the method employed by physicians for determining, by the sense of hearing, the condition of certain internal organs. The ancient physicians appear to have practised a kind of auscultation, by which they were able to detect the presence of air or fluids in the cavities of the chest and abdomen. Still no general application of this method of investigation was resorted to, or was indeed possible, till the advance of the study of anatomy led to correct ideas regarding the locality, structure, and uses of the various organs of the body, and to the alterations produced in them by disease. In 1761 Auenbrugger of Vienna introduced the art of percussion in reference more especially to diseases of the chest. This consisted in tapping with the fingers the surface of the body, so as to elicit sounds by which the comparative resonance of the subjacent parts or organs might be estimated. Auenbrugger's method attracted but little attention, till Corvisart, in 1808, demonstrated its great practical importance; and then its employment in the diagnosis of affections of the chest soon became general. Percussion was originally practised in the manner above mentioned (*immediate percussion*), but subsequently the method of *mediate percussion* was introduced by Piorry, and is that now largely adopted. It is accomplished by placing upon the spot to be examined some solid substance named a *pleximeter* (stroke-measurer), upon which the percussion strokes are made either with the fingers or with a small hammer tipped with india-rubber. The pleximeter consists of a thin oval piece of ivory; but one or more fingers of the left hand applied flat upon the part answer equally well, and this is the method which most physicians adopt. Percussion must be regarded as a necessary part of auscultation, particularly in relation to the examination of the chest; for the physician who has made himself acquainted with the normal condition of that part of the body in reference to percussion is thus able to recognise by the ear alterations of resonance produced by disease. But percussion alone, however important in diagnosis, could manifestly convey only limited and imperfect information, for it could never indicate the nature or extent of functional disturbance, or distinguish between different forms of disease, even in

those organs which it had proved to be in an abnormal condition, while in other cases, and notably in many affections of the heart, it could afford no assistance whatever.

In 1819 the distinguished French physician, Laennec, introduced the method of auscultation by means of the stethoscope (*στήθος*, the chest, and *σκοπέω*, to examine), with which his name stands permanently associated. For some time previously, physicians, more especially in the hospitals of Paris, had been in the habit of applying the ear over the region of the heart for the purpose of listening to the sounds of that organ, and it was in the employment of this method that Laennec conceived the idea that these sounds might be better conveyed through the medium of some solid body interposed between his ear and the patient's chest. He accordingly, by way of experiment, rolled up a quire of paper into the form of a cylinder and applied it in the manner just mentioned, when he found, as he states, that he was able to perceive the action of the heart more distinctly than he had ever been able to do by the immediate application of his ear. He thence inferred that not merely the heart's sounds, but also those of other organs of the chest might be brought within reach of the ear by some such instrument, and he, therefore, had constructed the wooden cylinder, or stethoscope, which bears his name. This consisted of a cylindrical piece of wood, about 12 inches long, with a narrow perforation from end to end, the extremity for applying to the chest having a movable piece of conical form fitting into the cylinder, which was withdrawn by the physician while listening to the sounds of respiration, the complete instrument being used for examining the sounds of the voice and those of the heart. This instrument, though rendered portable by being made to screw into two halves, was inconveniently large and heavy, and was subsequently modified by Piorry to the form now generally used of a thin narrow cylinder of about 7 inches long, with an expansion at one end for applying to the chest, and a more or less flattened surface at the other for the ear of the listener. Having ascertained by careful observation the sounds elicited on auscultation of the healthy chest, Laennec studied the modifications of these as produced by disease; and by comparing cases with one another, and especially by investigating the state of the affected parts after death, he was able, in his celebrated *Traité de l'Auscultation médiate*, to lay the foundation for a rational system of diagnosis of the great classes of pulmonary and heart complaints. It does not, however, appear to be the case, as Laennec supposed, that *mediate auscultation* by the stethoscope is superior in an acoustic point of view to *immediate auscultation* by the unaided ear. On the contrary, sounds are heard louder by the latter than by the former method. Nevertheless, the stethoscope possesses special advantages, among the chief of which are that by its use particular areas can be examined and compared with greater accuracy; that it can be applied to all parts of the chest, and that it can be used in all cases where, from the sex or the bodily condition of the patient, the direct application of the ear is inadmissible. On the other hand, *immediate auscultation* is to be preferred in the examination of young children, who are readily frightened by the sight, and still more by the pressure upon them, of the stethoscope.

The whole subject of auscultation has been greatly elaborated since the time of Laennec, and while some of his opinions have been found to require modification, continued investigation only serves more clearly to demonstrate the value of this method of diagnosis, and to elicit fresh and more accurate results from its employment. Although much remains to be done in the way of the correct interpretation of the phenomena observed in auscultation, yet the facts already established are among the most important

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acquisitions in the whole domain of practical medicine. The numerous diseases affecting the lungs can now be recognised and discriminated from each other with a precision which, but for auscultation and the stethoscope, would have been altogether unattainable, a point which bears most intimately upon the treatment of this great and common class of ailments. The same holds good in the case of the heart, whose varied and often complex forms of disease can, by auscultation, be identified with striking accuracy. But in addition to these its main uses, auscultation is found to render great assistance in the investigation of many obscure internal affections, such as aneurisms and certain diseases of the œsophagus and stomach. To the accoucheur the stethoscope yields valuable aid in the detection of some forms of uterine tumours, and especially in the diagnosis of pregnancy,—the auscultatory evidence afforded at a particular stage by the sounds of the fetal heart being by far the most reliable of the many signs of that condition. (J. O. A.)

AUSONIUS, DECIMUS MAGNUS, a Roman poet of the 4th century, was the son of an eminent physician, and born at Burdigala (*Bordeaux*) about 310 A.D. His education was conducted with unusual care, either because his genius was very promising, or because the scheme of his nativity, which had been cast by his maternal grandfather, was found to promise great fame and advancement. He made extraordinary progress in classical learning; and, after completing his studies at Toulouse, he practised for a time at the bar in his native place. At the age of thirty he became a teacher of grammar, and soon afterwards was promoted to the professorship of rhetoric. In this office he acquired so great a reputation that he was appointed preceptor to Gratian, the Emperor Valentinian's son. The rewards and honours conferred on him for the faithful discharge of his duties, prove the truth of Juvenal's maxim—that when Fortune pleases she can raise a man from the humble rank of rhetorician to the dignity of consul. He was appointed consul by the Emperor Gratian in the year 379, after having filled other important offices; for besides the dignity of questor, to which he had been nominated by Valentinian, he was made præfect of Latium, of Libya, and of Gaul, after that prince's death. His speech, returning thanks to Gratian on his promotion to the consulship, is a good specimen of high-flown rhetorical flattery. The time of his death is uncertain, but he was alive in 388, and probably survived till about 394. From references in his works he appears to have been a convert to Christianity.

Of his prose writings, there are extant the *Actio ad Gratianum*, the *Periocha* (or summaries) in *Iliadem et Odysseam*, and one or two of the *Epistolæ*. The principal pieces in verse are the *Epigrammata*, some of which are extremely felicitous; the *Parentalia* and *Commemoratio Professorum Burdigalensium*, which give interesting details concerning his relations and literary friends; the *Epistolæ*; and, finally, the *Idyllia*, a collection of twenty small poems, the most famous of which are the *Cento Nuptialis*, an obscene selection of lines from Virgil, and the *Mosella*, a descriptive poem on the river Moselle, containing some good passages. Ausonius was rather a man of letters than a poet; his wide reading supplied him with materials for verse, but his works exhibit no traces of a true poetic spirit; even his versification, though ingenious, is frequently defective. The best editions of his works are those of Tollius (Amsterdam, 1669), and Souchay (Paris, 1730), and the Bipontine (1785). The *Mosella* has been edited separately by Böcking (1828, 1842).

AUSPICIA. See AUGURS.

AUSSIG, AUSSYENAD, or LABEM, a town of Austria, in Bohemia, situated in a mountainous district, at the confluence of the Elbe and the Elbe. It carries on a large manufacture of woollen wares, linen, paper, &c. Its chemical works alone give employment to 500 operatives, and about 600 boats are annually built in its yards. Besides a considerable trade in grain, fruit, mineral-waters, and

wood, there is a large export of coal from the neighbouring mines. Aussig, once strongly fortified, was destroyed by the Hussites in 1426, burned down in 1583, and captured by the Swedes in 1639. Population, 10,933.

AUSTEN, JANE, one of the most distinguished modern British novelists, was born December 16, 1775, at the parsonage of Steventon, in Hampshire, of which place her father was for many years rector. Her life was singularly tranquil and void of incident, so that but few facts are known concerning her from which an idea of her character can be formed. She was tall and attractive in person, and of an extremely kind and gentle disposition. Under her father's care she received a sound education, though she had few of the modern accomplishments. She had a fair acquaintance with English literature, her favourite authors being Richardson, Johnson, Cowper, and Crabbe; she knew French well and Italian slightly, had some taste for music, and was noted for her skill in needlework. She was a particular favourite with all her younger relatives, especially on account of her wonderful power of extemporising long and circumstantial narratives. At a very early age she seems to have begun to exercise her faculty for composition, and wrote several short tales and fragments of larger works, some of which have been found among her papers. These first essays are written in a remarkably pure and vigorous style, and are not unworthy of her later reputation. In 1796 her first large work, *Pride and Prejudice*, was begun and completed in about ten months; *Sense and Sensibility* and *Northanger Abbey* were written soon after, during 1797 and 1798. Many years elapsed before these works were published, for the first attempts to introduce them to the public were badly received. *Pride and Prejudice* was summarily rejected by Mr Cadell; *Northanger Abbey* was sold for £10 to a Bath publisher, but was never printed, and, many years after, was bought back by the author. From 1801 to 1805 the Austen family resided in Bath, they then removed to Southampton, and finally, in 1809, settled at Chawton. There Miss Austen, who for some years had written nothing, resumed her pen, and began to prepare for publication her early novels. *Sense and Sensibility* was published in 1811, *Pride and Prejudice* in 1813, *Mansfield Park* in 1814, *Emma* in 1816. These four were anonymous. *Northanger Abbey* and *Persuasion* appeared together under Miss Austen's name in 1818, after her death. Early in 1816 her health had begun to give way; her strength gradually declined, and on the 18th July 1817, she died at Winchester, whither she had removed for change of air and scenery. She was buried in the cathedral of that town.

Miss Austen's works at the time of their appearance were on the whole well received, and brought her considerable reputation,—more, indeed, than she had herself anticipated; but their full merits were not then so generally recognised as they have since been. The novels most popular at that time belonged to the class of which Mrs Radcliffe's *Udolpho*, Godwin's *St Leon* or *Caleb Williams*, and Lewis's *Monk* are the best known representatives. Against this style of fiction Miss Austen from the first set her face; she had a remarkably keen sense of humour, and the ludicrous aspect of these thrilling incidents, mysterious situations, and unnatural characters, presented itself very strongly to her mind. *Northanger Abbey*, one of her earliest productions, is a clever and well-sustained parody on romances of this type. She did not, however, confine herself to mere negative criticism, but resolved to show that the interest of readers could be roused and sustained by a story absolutely free from the whole machinery of romance and exaggerated sentiment, but presenting an accurately-drawn picture of quiet, natural life. This task she accomplished with complete success; she was the first

to introduce the novel of domestic life, and her writings are still the best specimens of that class of fiction. It could hardly be expected that such works would become immediately popular; the characters, the motives of action, and the plot itself were too ordinary, one may say too commonplace, to appeal strongly to the sympathies of the general mass of readers. Her colours were not showy enough to strike the vulgar eye. It is probable, indeed, that her admirers will always be few in number; for not only does it require a somewhat cultivated taste to appreciate the rare skill with which the scanty materials of her tales are handled, but the author's experience of life was so limited that her works are entirely wanting in certain elements—such as depth of feeling and breadth of sympathy—which are indispensable before a work of fiction can exercise any considerable influence on the public mind.

The framework in nearly all Miss Austen's novels is the same, taken as they are from ordinary English middle-class life; her characters are in no way distinguished by any remarkable qualities, they are such persons as one would readily expect to meet in every-day life; the plot is exceedingly simple, and the incidents, never rising above the level of the most common-place occurrences, flow naturally from the characters of the actors. In the hands of most writers such materials would infallibly become monotonous and tiresome; but from any danger of this Miss Austen is completely freed by her wonderful power of exciting interest in the "involvements and feelings of ordinary life," and the skill with which, by a series of imperceptible but effective touches, she discriminates her characters, rounds them off, and makes them stand out from the canvas real and living personages. Her gallery of portraits is certainly small, and the same character appears over and over again, but each figure is so distinctly drawn, and has such marked individuality, that one is never struck with a sense of repetition. A warm admirer of her works, Archbishop Whately, has compared them to the carefully-executed pictures of the Dutch school; perhaps the analogy of miniature painting, suggested by the author herself, is more happy and expressive.

Miss Austen's life has been written by her nephew, Rev. J. Austen-Leigh (1870, 2d ed., 1871), who has also published some extracts from her papers, including a short tale, *Lady Susan*, written in the form of letters; a fragment of a larger work called *The Watsons*; the first draft of a chapter in *Persuasion*, and the beginning of a novel, on which she was engaged at the time of her death.

AUSTERLITZ, a small town of Moravia, 12 miles E.S.E. of Brünn, containing a magnificent palace belonging to the prince of Kaunitz-Rietberg, and a beautiful church. It has been rendered memorable by the great victory obtained in its vicinity, on the 2d December 1805, by the French under Napoleon, over the united forces of Austria and Russia under their emperors. Population, 3450.

AUSTIN, JOHN, one of the ablest English writers on jurisprudence, was born on the 3d March 1790. At an early age he entered the army, and passed five years in military service. He then retired, applied himself to the study of law, and was called to the bar in 1814. His powers, though admirably adapted for grasping the fundamental principles of law, were not of a nature to render him successful in legal practice. His health, too, was delicate, and in 1825 he resigned active employment at the bar. In the following year, however, he was appointed to the chair of jurisprudence in the newly-founded London university. He immediately crossed over to Germany to prepare himself for his new duties, and at Bonn became acquainted with some of the most eminent German jurists. His lectures were at first attended by a number and a class of students quite beyond his anticipations. Among his

hearers were such men as Lord Romilly, Sir G. C. Lewis, and J. S. Mill. From Mill's notes some of the lectures were afterwards published, and he has given an admirable account of Austin in his *Dissertations* (vol. iii.) But it soon became apparent that there would be no steady demand for training in the science of law, which, though useful, was not of immediate utility in practice. Under these circumstances Austin, who was almost too conscientious in regard to his own work, thought it right to resign the chair in 1832. An attempt to institute lectures at the Inner Temple also failed, and, as his health was delicate, he retired to Boulogne, where he remained for nearly two years. In 1837 he acted as royal commissioner in Malta, and discharged the duties of that office most efficiently. The next ten years were spent in travelling on the Continent, as the state of his health hardly permitted him to reside in England. The Revolution of 1848 drove him from Paris, and on his return to England he settled at Weybridge, in Surrey, where he remained till his death in December 1859. Austin wrote one or two pamphlets, but the chief work he published was his *Province of Jurisprudence Determined* (1832), a treatise on the relation between ethics and law, which gives a clear analysis of the notion of obligation, and an admirable statement of utilitarianism, the ethical theory adopted by the author. After his death, his widow, Mrs Sarah Austin, published his *Lectures on Jurisprudence; or, The Philosophy of Positive Law*. These, combined with the *Province*, have been edited, under the same title, by Mr R. Campbell, and reached in 1875 a fifth edition.

AUSTIN, SARAH TAYLOR, translator and miscellaneous writer, was born in 1793. She was one of the Taylor family of Norwich, several of whose members had distinguished themselves in the fields of literature and science. She was the youngest child of her family, received a liberal and solid education at home, chiefly from her mother, and had the advantage, too, of enjoying in her father's house much intellectual society. She grew up a beautiful and cultivated woman, and in 1820 became the wife of John Austin, noticed above. They settled in London, and among the familiar visitors of their house were Bentham, the Mills (father and son), the Grotes, Romilly, Buller, Sydney Smith, and other eminent men. She accompanied her husband in 1827 to Bonn, where they spent some months, and made acquaintance with Niebuhr, Schlegel, Arndt, and other distinguished Germans. She afterwards lived some years in Germany and France, and was left a widow in December 1859. Mrs Austin is best known as a singularly skilful translator of German and French works. In 1832 appeared her version of the *Travels of Prince Puckler Muskau*. This was followed by *Characteristics of Goethe* from the German of Falk, *History of the Reformation in Germany* and *History of the Popes* from the German of Ranke, and Dr Carove's *Story without an End*. She contributed "Travelling Letters" and critical and obituary notices to the *Athenæum*, edited the *Memoir of Sydney Smith* and her daughter Lady Duff Gordon's *Letters from Egypt*, and for some years of her widowhood was occupied in arranging for publication her husband's *Lectures on Jurisprudence*. She was also author of *Germany from 1760 to 1814*, *National Education*, and *Letters on Girls' Schools*. Mrs Austin died at Weybridge in Surrey, 8th August 1867.

AUSTRALASIA, one of the six great geographical divisions of the globe, is situated, as its name indicates, south of Asia, between the equator and 50° S. lat., and 110° and 180° E. long. It comprises the island-continents of New Guinea, Australia, Tasmania, and New Zealand, and the conterminous archipelagoes of New Britannia, Solomon Islands, New Hebrides, Loyalty Islands, and New Caledonia which will be treated of under special headings.

A U S T R A L I A

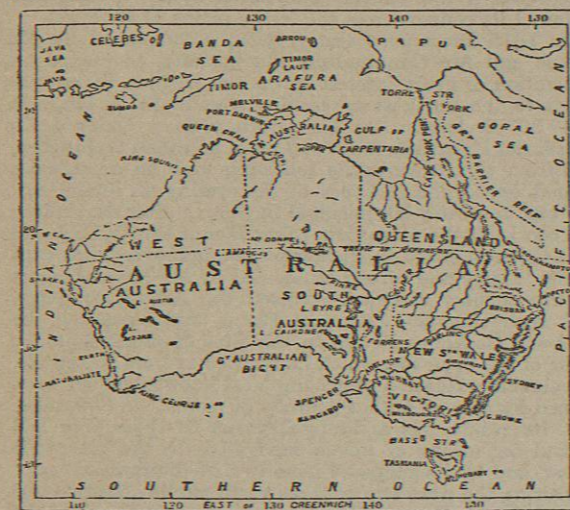
AUSTRALIA or NEW HOLLAND, the largest island-continent of Australasia, is situated within 10° 47' and 39° 11' S. lat., and 113° and 153° 30' E. long. It measures 2500 miles in length from west to east, by 1950 miles in breadth from north to south, and contains an area of about 3,000,000 square miles—nearly the same as that of the United States of America, exclusive of Alaska. It is surrounded on the west by the Indian Ocean, and on the east by the South Pacific. In the north it is separated

narrow strait. Its shores are hitherto but little known, since, after one voyage and another, that route has been deserted, and seldom is the country visited, unless when sailors are driven there by storms. The *Australis Terra* begins at one or two degrees from the equator, and is ascertained by some to be of so great an extent, that if it were thoroughly explored it would be regarded as a fifth part of the world."

It was in 1606 that Torres, with a ship commissioned by the Spanish Government of Peru, parted from his companion Quiros (after their discovery of Espiritu Santo and the New Hebrides), and sailed from east to west through the strait which bears his name; while in the same year the peninsula of Cape York was touched at by a vessel called the "Duyfhen" or "Dove" from the Dutch colony of Bantam in Java, but this was understood at the time to form a part of the neighbouring island of New Guinea. The Dutch continued their attempts to explore the unknown land, sending out in 1616 the ship "Endracht," commanded by Dirk Hartog, which sailed along the west coast of Australia from lat. 26° 30' to 23° S. This expedition left on an islet near Shark's Bay a record of its visit engraved on a tin plate, which was found there in 1801. The "Pera" and "Arnhem," Dutch vessels from Amboyna, in 1618 explored the Gulf of Carpentaria, giving to its westward peninsula, on the side opposite to Cape York, the name of Arnhem Land. The name of Carpentaria was also bestowed on this vast gulf in compliment to Peter Carpenter, then governor of the Dutch East India Company. In 1627 the "Guldene Zeepard," carrying Peter Nuyts to the embassy in Japan, sailed along the south coast from Cape Leeuwin, and sighted the whole shore of the Great Bight. But alike on the northern and southern seaboard, the aspect of New Holland, as it was then called, presented an uninviting appearance.

An important era of discovery began with Tasman's voyage of 1642. He, too, sailed from Batavia; but, first crossing the Indian Ocean to the Mauritius, he descended to the 44th parallel of S. lat., recrossing that ocean to the east. By taking this latter course he reached the island which now bears his name, but which he called Van Diemen's Land, after the Dutch governor of Batavia. In 1644 Tasman made another attempt, when he explored the north-west coast of Australia, from Arnhem Land to the 22d degree of latitude, approaching the locality of Dirk Hartog's discoveries of 1616. He seems to have landed at Cape Ford, near Victoria River, also in Roebuck Bay, and again near Dampier's Archipelago. But the hostile attitude of the natives, whom he denounced as a malicious and miserable race of savages, prevented his seeing much of the new country; and for half a century after this no fresh discoveries were made.

The English made their first appearance on the Australian coast in 1688, when the north-western shores were visited by the famous buccaneer Captain William Dampier, who spent five weeks ashore near Roebuck Bay. A few years later (1697) the Dutch organised another expedition under Vlamingh, who, first touching at Swan River on the west coast, sailed northward to Shark's Bay, where Hartog had been in 1616. Dampier, two years later, visited the same place, not now as a roving adventurer, but with a commission from the English Admiralty to pursue his Australian researches. This enterprising navigator, in the narrative of his voyages, gives an account of the trees, birds, and reptiles he observed, and of his encounters with the natives. But he found nothing to invite a long stay. There was



Sketch Map of Australia.

from New Guinea by Torres Strait, which is 80 miles broad, and from the Eastern Archipelago by Arafura Sea; while on the south Bass Strait, 140 miles wide, separates it from Tasmania. The neighbouring colony of New Zealand lies 1200 miles opposite its south-east coast.

Owing to its position at the antipodes of the civilised world, Australia has been longer a *terra incognita* than any other region of the same extent. Its first discovery is involved in considerable doubt, from confusion of the names which were applied by the earlier navigators and geographers to the Australasian coasts.

The ancients were somehow impressed with the idea of a *Terra Australis* which was one day to be revealed. The Phœnician mariners had pushed through the outlet of the Red Sea to eastern Africa, the Persian Gulf, and the coasts of India and Sumatra. But the geographer Ptolemy, in the 2d century, still conceived the Indian Ocean to be an inland sea, bounded on the south by an unknown land, which connected the *Chersonesus Aurea* (Malay Peninsula) with the promontory of *Prasum* in eastern Africa. This erroneous notion prevailed in mediæval Europe, although some travellers like Marco Polo heard rumours in China of large insular countries to the south-east.

The investigations of Mr R. H. Major make it appear probable that the Australian mainland was known as "Great Java" to the Portuguese early in the 16th century; and the following passage in the *Descriptionis Ptolemaice Augmentum* of Cornelius Wytfliet, printed at Louvain in 1598, is perhaps the first distinct account that occurs of the country:—"The *Australis Terra* is the most southern of all lands and is separated from New Guinea by a