crystals in round bars. In each case the two fractured halves are shown, one placed with the broad and the other with the narrow side facing the camera.

A word must be said about the crystallography of aluminium. Hull was the first to investigate the structure of aluminium crystals in a finely crystalline aggregate by X-ray analysis, and he concluded that the pattern thus obtained corresponds to a face-centred cubic lattice, *i.e.* the grouping of the atoms is such that there is one at each corner of the cube, and one in the centre of each face, making a total of fourteen in all. This corresponds, as Colonel Belaiew has recently pointed out, to an octahedron situated within a cube. Sir William Bragg and Dr. Müller have kindly examined our single crystals, and find that they conform to the same pattern. They belong, therefore, to the cubic system, and must have properties consistent with those of that group which possesses the highest degree of symmetry both external and internal. Investigations of the crystals in this system indicate that as regards certain properties they are isotropic, while as regards others they are anisotropic. In the former category come the properties of conducting light, heat, electricity, and expansion. In the latter are grouped elasticity, cohesion, and conduction of sound. In such cases, however, the properties are closely related to the symmetry, since the maximum and minimum values have been found to coincide with the axes of symmetry.

Accordingly, the variations in the tensile properties of the testpieces which have been described are due to differences of cohesion in different planes which do not all contain the same number of atoms. Although the single crystals obtained in the sheet and bars were formed in the same shaped testpieces in both categories, it was obvious that their original orientation

relative to the axis of the testpiece varied considerably. Indeed, it may not have been precisely the same in any two of the cases tested. The shape of the test-piece alters when stress is applied, since slip and deformation take place only on certain planes, and the changes in shape observed correspond to the attempt of the crystal to accommodate itself to the stress. Such changes were much greater in some tests than in others.

It is not possible within the limits of this article to discuss the two questions, (1) why abnormally large crystals form on heating after a small deformation, and gradually decrease in size as the deformation increases; and (2), to take the extreme case, why, after a particular degree of deformation, it is possible to form a single crystal from an aggregate of several millions. Those interested in the matter may be referred to the author's original publications with Miss Elam.¹ It may, however, be stated that the conditions for the production of a single crystal in a testpiece consisting of the usual aggregate of small crystals are considered by us to be, that every crystal in the complex must be strained a certain amount, and that one of them is strained rather more than the rest. This particular crystal may be regarded as being in the condition of critical strain, and ultimately all the other crystals align themselves upon it after sufficient heating. When this condition is realised, the testpiece consists of a single crystal. We have taken up the experimental investigation of the deformation of the testpiece by X-ray analysis, and are hoping that the result of this will show what it is that happens when a testpiece is strained to the critical amount and subsequently heated.

¹ Journal of the Institute of Metals, No. 2, 1920, pp. 83-131. Proceedings of the Royal Society, V. 100a, pp. 329-353. Journal of the Iron and Steel Institute, No. 1, 1923.

The Royal Asiatic Society.

By F. F. PARGITER.

THE Royal Asiatic Society of Great Britain and Ireland was founded in London on March 15, 1823, by the distinguished Sanskrit scholar, Henry Thomas Colebrooke, supported by others interested in Oriental matters, to investigate (as he announced) the history, civil polity, institutions, customs, languages, literature, and science, ancient and modern, of all countries in Asia. This removed the reproach that, while similar societies had been formed at Calcutta, Bombay, Madras, Paris, and elsewhere, Great Britain had done nothing. The charter was granted on August 11, 1824, and under it the Society is governed by a council of twenty-five members, including the president, director, vice-presidents, and other officers, elected annually at general meetings.

The Society was well supported by the East India Company and many eminent men, and prospered and developed its activities. It appointed a "Committee of Correspondence," which embarked on far-spread measures to receive and communicate information about Asiatic matters. From the copious donations that it received it began a library and a museum. To utilise the Oriental MSS. collected in English libraries it established the "Oriental Translation

Committee and Fund" in 1828, to publish translations of approved works in Oriental languages, and this was liberally supported, and published thirty volumes in the next four years. The scheme included measures to benefit Asia and Europe materially; hence, when trade with India and China was thrown open in 1833-34, the Society formed a "Committee of Agriculture and Commerce" in 1836, and this collected valuable information about coffee, sugar, opium, and other important commercial products and their improvement. The Society published three quarto volumes of "Transactions," containing papers read before it, in 1827, 1830, and 1833, and began an annual "Journal" in 8vo form in 1834.

The early enthusiasm, however, gradually declined; the membership fell and the financial position caused anxiety. Then came the time of the Cuneiform discoveries by Major (afterwards Sir) Henry Rawlinson, who found the great Behistun and other inscriptions in Persia, eclipsing those reported by earlier travellers. He communicated them to the Society in 1838, solved the problem of their decipherment in 1844, and announced his results in 1846. These were received by the public with much incredulity, but the Society

gave him its cordial support and set apart certain volumes of the *Journal* for their publication. Opinion turned after a time, and the Society became the centre of a great literary movement. His work, however, never reached completion in those volumes, because excavations by Botta, Layard, and others at Nineveh and Babylon brought out overwhelming material; new duties trenched on his time, and other scholars finished what he had so well begun.

Notwithstanding the interest of these revelations, the Society's condition remained anxious, for local societies in the East appropriated much local inquiry; its efforts to aid commerce became exhausted, and it developed more towards learned research, while Oriental studies attracted little public interest. The committees of correspondence, of Oriental translation, and of agriculture and commerce gradually fell into neglect, and a later effort to revive them had but transient success. The East India Company had generously subsidised the Society, and the loss of its patronage on its abolition in 1858 caused discouragement. The Government after some vacillation continued the subsidy, yet the Society's fortunes still continued low. It changed its abode in 1869, and through want of room made over its museum to the India Office.

The tide turned, however, when Mr. Vaux became secretary in 1877 and devoted himself to the Society's welfare, and more interest in Oriental studies began to be manifested then among the educated. The late Prof. Rhys Davids became secretary from 1887 to 1905 and edited the *Journal*, and enhanced the improvement. The Society's course since then has been one of steady expansion and influence, and its *Journal* has risen to acknowledged excellence with a wide and attractive range of subjects. The membership consists of those "resident" within fifty miles from Charing Cross and "non-residents," and also thirty honorary members elected from among eminent foreign scholars.

To reward British erudition the "Gold Medal Fund" was inaugurated in memory of Queen Victoria's Jubilee, and the medal was awarded in 1897 to Prof. Cowell, and since then triennially. Two other funds were established in 1903, the "Public Schools' Gold Medal Fund" and the "Prize Publications Fund." Under the former a prize medal has been awarded yearly on an essay on some Oriental subject in competi-

tion among the boys of the public schools. A new "Oriental Translation Fund" was started privately in 1891 and transferred to the Society afterwards, and it began a "Monograph Fund" in 1902. By these three funds many treatises have been issued, and the proceeds of the sale of published books provide the means of printing fresh works. Thus the Society encourages Oriental research, honours Oriental learning, and makes the results public, free of expense to the authors. Another fund, the Forlong Fund, is managed by the Society for the benefit of students at the School of Oriental Languages.

The Society is now established at 74 Grosvenor Street, London, W., and completed its hundredth year on March 15 last. It has issued a centenary volume, displaying its history and the achievements of its members in research, and will celebrate the event by a reunion of Orientalists and festivities on July 17-20. It has a very large and comprehensive library of about 30,000 volumes, important collections of MSS. in many Oriental languages, portraits and busts of eminent members, and valuable objects of antiquity and art. Its most outstanding figures have been its three directors, H. T. Colebrooke (1823-37), Prof. H. H. Wilson (1837-60), and Sir H. Rawlinson (1862-95), and its late president, Lord Reay (1893-1921).

The *Journal* abounds with articles elucidating all the subjects mentioned in the inaugural discourse regarding all the countries of Asia and those in Africa into which Mohammedanism overflowed, and India has occupied as much attention as all the other countries combined. Archaeology has been a leading subject, especially since exploration has brought ancient inscriptions and other material to light from Asia Minor to Further India, and the old texts have become available for study. The Society's representations have largely contributed to archaeological enterprise in India. Ancient remains have been examined, inscriptions deciphered, coins read, language and literature investigated, and religion studied. The researches have been so varied, that it is impossible to speak of them here except in general terms. They have not only amplified what was known of the ancient world, but have also reconstructed kingdoms and history that had vanished, disclosed much of the course of civilisation and religion through Asia, and revealed unknown languages that have perished.

Obituary.

PROF. JOHN CHIENE.

JOHN CHIENE, late professor of surgery in the University of Edinburgh, to which chair he had succeeded on the death of James Spence in 1882, and held for twenty-eight years, died on May 29 at the age of eighty. Chiene does not claim a record in this *journal* on account of original scientific work—for scientific inquiry was not much in his line—but he was deeply impressed with the importance of it, and, though not himself an experimenter, he set up in the University the first teaching laboratory of bacteriology and surgical pathology in the United Kingdom. To quote the words of his pupil Sir Harold Stiles, who now

occupies the chair once held by Syme and Lister, "Chiene set the example, in the academic teaching of surgery, of cultivating the subject as a science so that its art might be better taught and promoted. . . . He spared neither time nor money to encourage research by his assistants."

Chiene may be said to have belonged to the school of anatomical surgeons; but he had been Syme's house-surgeon and John Goodsir's demonstrator, and from both of these distinguished men he inherited the habit of scientific thought and logical expression. He was a very successful lecturer on operative and systematic surgery in the extra-mural school, and in this way