

taining both elements can be done without difficulty.

The mechanical tests differ little from those given by arsenic without oxygen, and the same applies to the electrical resistivity. The oxygen, which occurs in pure copper as cuprous oxide, combines, when more than 1 per cent. of arsenic is present, to form a slaty-grey compound which is a reaction product of cuprous oxide and arsenic. The softening temperature of copper is raised by arsenic whether oxygen is present or not. Arsenic is without effect on the tendency of copper to become brittle through heating in hydrogen.

F. C. T.

### University and Educational Intelligence.

**BRISTOL.**—Four scholarships are offered by the Society of Merchant Venturers to matriculated candidates of not less than 17 years of age. The scholarships provide free tuition; one is open to pupils in any secondary school; three are restricted to pupils of secondary schools situated in the counties of Gloucestershire, Somerset, and Wiltshire. A War Memorial scholarship is also offered, with a preference to a candidate needing pecuniary help who is the son of a former student who lost his life while serving with H.M. Forces during the War. Further particulars can be obtained from the Registrar of the Merchant Venturers' Technical College.

**CAMBRIDGE.**—Mr. H. E. Tunnicliffe, Gonville and Caius College, has been appointed University demonstrator in physiology.

**OXFORD.**—The Halley Lecture for 1927 will be delivered on Friday, May 20, at 5 P.M., in the University Museum, by Lieut.-Colonel F. J. M. Stratton, of Gonville and Caius College, Cambridge, on the subject of "Modern Eclipse Problems."

**DR. WILLIAM THOMAS**, lecturer in chemistry in the University of Aberdeen, has been appointed principal of the Denbighshire Technical Institute, Wrexham, North Wales.

**PROF. H. H. TURNER**, Savilian professor of astronomy in the University of Oxford, will deliver a lecture at Birkbeck College, London, on May 25, on "The Total Eclipse of the Sun." The lecture is one of the special lectures arranged for teachers by the London County Council.

COURSES of free public lectures have been arranged by the Armourers and Brasiers' Company as follows: "Special Steels and their application in Engineering," by Dr. W. H. Hatfield (at the Sir John Cass Technical Institute, on May 17 and 31 and June 14, at 6.30), and "Oxidation, Corrosion, and Passivity of Metals," by Mr. U. R. Evans (at the Royal School of Mines, on May 18 and 25 and June 1, at 5.30). No tickets will be necessary. The Armourers and Brasiers' Company has founded senior industrial bursaries of £170 per annum and junior industrial bursaries of £50 per annum, the former to assist young men who have obtained honours at the final examination at the University of London for the degree of B.Sc. (Eng.), (mining) or (metallurgy), to enable them to prosecute further studies, and the latter to enable youths who have shown promise in their preliminary studies in subjects relating to engineering or metallurgy to continue those studies.

### Calendar of Discovery and Invention.

**May 16, 1888.**—Whereas in the phonograph Edison made his sound records by causing the engraving tool to rise and fall, Emile Berliner in his gramophone employed a tool moving from side to side in a spiral groove cut in a disc. Berliner's original gramophone was first publicly exhibited in the Franklin Institute, on May 16, 1888, and it is now in the National Museum, Washington, D.C.

**May 17, 1823.**—Jacob Perkins was one of the pioneers of the use of high-pressure steam in engines, and he was also the first to put into practice heating by steam, the British patent for which is dated May 17, 1823.

**May 18, 1825.**—In the minutes of the Royal Society of Arts for May 18, 1825, is a report on Sturgeon's apparatus for exhibiting the principles of electro-magnetism. It was then resolved to award Sturgeon the Silver Medal and thirty guineas on condition of his leaving a complete apparatus and description thereof with the Society for the use of the public and relinquishing all pretensions to a patent. Included in this apparatus was the first electro-magnet, a horse shoe of soft iron made from a round bar about  $\frac{1}{2}$  in. in diameter wound over with about eighteen turns of copper wire. Though this historic gift has been lost, the transactions of the Society contain an illustration of it, and by means of this Prof. Fleming had a replica made which he presented to the Science Museum, South Kensington.

**May 19, 1766.**—When Euler left Berlin for St. Petersburg, D'Alembert suggested to Frederick the Great that his place in the Academy of Sciences should be filled by Lagrange. To this Frederick agreed, and on May 19, 1766, D'Alembert wrote to the King, "Je me tiens trop heureux d'avoir pu réussir dans cette négociation, et procurer à Votre Majesté et à son Académie, un si excellent sujet. Cet événement répand dans mon âme une satisfaction dont je n'ai pas joui depuis longtemps, et je suis sûr que mon estomac s'en ressentira."

**May 19, 1919.**—The first to attempt the direct flight from America to Europe for the £10,000 prize offered by Lord Northcliffe were Hawker and Grieve, who on May 19, 1919, set out from St. Johns, Newfoundland, in a Sopwith biplane driven by a Rolls-Royce engine. They had flown about 1100 miles in 14½ hours when the cooling water arrangements of the engine failed. It being impossible to complete the journey, search was made for a ship and the aeroplane brought down in the water close to her, both pilots being rescued and brought to England.

**May 20, 1859.**—Through information regarding the work of James Young on the distillation of oil, efforts were made to bore for oil in the United States. The first, however, to sink such a well, and thus become the founder of the great petroleum industry of America, was Colonel Drake, who on May 20, 1859, with four companions, began drilling in the woods of Pennsylvania, and after three months' strenuous work obtained oil from the rock on Aug. 27, 1859, for the first time.

**May 21, 1797.**—"Wherever the steam-mill resounds with the hum of industry, whether grinding flour on his native Schuylkill or cutting logs in Oregon, there do you find a monument to the memory of Oliver Evans." This tribute recalls the inventor who worked out the modern system of flour milling and was one of the first to use high-pressure steam. Among his patents was that of May 21, 1797, for a steam-driven carriage. He afterwards made a crude steam-driven vehicle and also a steam dredger.

E. C. S.