duced by adding mannitol to the purer extracts (*ibid.*, vol. 23, p. 61 ; 1929). Mannose itself and related alcohols cannot replace mannitol ; it appears that the organism uses the alcohol as a specific source of food supply.

Working on the relation of bios to yeast, A. M. Copping (*ibid.*, vol. 23, p. 1050 ; 1929) has found that the necessity for bios depends on the yeast and the medium used. Those which grow in a synthetic medium without the addition of a factor such as is supplied by an autoclaved extract of yeast, produce a stimulant for other yeasts. Bios is required by yeasts which only ferment and do not respire in its absence ; added bios then stimulates both respiration and fermentation.

Narayanan has separated a yeast bios from vitamin B_2 in yeast extract, since the former is not precipitated by lead acetate in the hydrolysed extract (*ibid.*, vol. 24, p. 6 ; 1930). The bios is not adsorbed on norite charcoal, but is soluble in strong alcohol ; it is precipitated by phosphotungstic acid but not by silver or platinic chloride. By a series of fractionations a highly active concentrate was obtained. The material contained nitrogen but no phosphorus : most tests for nitrogenous compounds were negative, but a positive Pauly reaction was obtained. It is stable to nitrous acid but destroyed by hydrogen peroxide. Narayanan also tested a large number of pure substances, such as nucleic acid, purines, nicotinic acid, betaine, lipoids, and various bases and amino acids for bios activity, but all were found to be inactive.

Henry Briggs, 1561–1631.

HENRY BRIGGS died three hundred years ago, on Jan. 26, 1631. He is famous for his important works on logarithms. Napier's first publication of the invention of logarithms, in 1614, had come on the world, as Lord Moulton said, "as a bolt from the blue," breaking in upon human thought abruptly without borrowing from other workers or following known lines of thought. Twenty years of persistent effort had been expended by Napier before he arrived at his great discovery, but within far less time than that after its publication the new method of computation was in use in England, France, Germany, and Italy, and its almost immediate adoption for astronomical and other calculations was mainly due to Briggs.

Well over fifty years of age when he heard of Napier's work, Briggs made two visits to Scotland to see Napier, and the remainder of his life was almost entirely devoted to the compilation of his three works, "Logarithmorum Chilias Prima", 1617 ; "Arithmetica Logarithmica", 1624 ; and "Trigonometria Britannica", 1633. The first of these contained the logarithms of the first thousand natural numbers calculated to eight decimal places ; in the second, he gave the logarithms of 30,000 natural numbers to fourteen places of decimals ; while the third work, completed after his death by his friend Gellibrand, contained tables of logarithms of sines and tangents carried to the hundredth part of a degree and a table of natural tangents, sines, and secants. The labours involved in these works have placed Briggs among the most industrious of men and the benefactors of mankind.

Had Briggs never heard of Napier's invention and had he not taken a leading part in spreading abroad a knowledge of logarithms, he would still be remembered as one of the outstanding British mathematicians of his day, for he was the first to hold the Gresham professorship of geometry in London and the Savilian professorship of geometry at Oxford. In a city rich in scientific associations the name of Sir Thomas Gresham (1519–1579) will always be connected with the foundation of the Royal Exchange and of Gresham College, from the latter of which, in other circumstances, might well have sprung a great university of London. A visitor to-day leaving St. Helen's Church—the Westminster Abbey of the City—where Gresham is buried, passes into a busy centre of finance and commerce. Three hundred years ago it was not so, for just opposite the church stood the entrance gates to Gresham's mansion, which, by a will made in 1575, he bequeathed to the Mayor and citizens of London for the use of seven professors, who were to read daily lectures on astronomy, music, geometry, law, physic, rhetoric, and divinity. Confirmed by an Act of Parliament, on the decease of Lady Ann Gresham the bequest became available, and in 1596 the chair of astronomy was bestowed upon Edward Brerewood (1565–1613), of Brasenose College, Oxford, while Briggs was appointed to the chair of geometry.

Briggs was then thirty-five years of age. Born at Warleywood, near Halifax, Yorkshire, in 1561, he attended a grammar school in the district, and in 1577 entered St. John's College, Cambridge. He became a scholar in 1579, took the degree of B.A. in 1582, that of M.A. in 1585, and was elected a fellow in 1588. In 1592 he was made examiner and lecturer in mathematics, and for a time held the lectureship in physics founded by Linacre.

Removing to London in 1596, like the other Gresham professors, he occupied "commodious and comfortable" apartments in Gresham's house, and, with his colleagues, began delivering those lectures which were given, we are told, "to the great delight of many, both learned and lovers of learning". Some idea of Gresham's house, with its reading hall, its observatory, its galleries, its colonnade, and its great quadrangle, can be obtained from the sketch in Ward's "Lives of the Professors of Gresham College". For more than a century and a half it sheltered the professors and for half a century it was the home of the Royal Society, but to-day nothing of it remains. The Royal Society removed its headquarters to Crane Court, at the other end of the City, in 1710 ; the interest in the lectures diminished, the buildings became dilapidated, and in 1767 "for the poor sum of 500£ per annum the trustees agreed to demolish the College and to part with all the land [the property really of the public] for the very unphilosophical purposes of an Excise-office".

After this, lectures were given in the Royal Exchange until 1843, when a special building was erected, and this in 1913 was replaced by the handsome Gresham College in Gresham Street, where the present Gresham professors continue the work which was inaugurated more than three centuries ago by Briggs and his fellow-workers.

In 1620, Briggs removed to Oxford as Savilian professor of geometry, at the invitation of Sir Henry Savile (1549–1622). Savile himself had already read thirteen lectures upon the first eight propositions of Euclid's "Elements", and Briggs began his own lectures with the ninth proposition. His teaching, however, was of secondary importance to his compilation of logarithmic tables, and it was largely due to the leisure he enjoyed at Oxford that he was able to accomplish so much. "A contemner of riches, and contented with his own station; preferring a studious retirement to all the splendid circumstances of life", his close habits of study did not prevent him gaining the good opinion of his contemporaries, one of whom, William Oughtred, called him "the Mirror of the Age". Briggs's long and useful life came to an end when he was nearly seventy years of age, and he was buried beside Savile in the chapel of Merton College, "a plain Stone being laid over him, with his Name only inscribed on it".

Obituary.

DR. J. W. EVANS, C.B.E., F.R.S.

BY the unexpected death of John William Evans on Nov. 16 last, geological science has lost an indefatigable worker and writer, and many geologists a valued teacher, colleague, or friend. Born in 1857 and educated at University College School and College, he took the LL.B. of the University of London and he was called to the Bar in 1878. He turned, however, to science and joined the Royal College of Science, where he studied under Judd and Cole, and was one of a brilliant group of students that included Holland, Wells, Davies, and Lanchester. He was awarded the Murchison Medal and joined the staff as demonstrator in 1889. He published his first paper in 1891, on the Old Red Sandstone of Caithness, a subject pursued again in later years, when he made important discoveries in the Devonian Rocks of southern England and made contributions to the classification of the rocks.

In 1891–92 Evans was geologist to an expedition to the Upper Paraguay and other rivers in an almost unknown area in Brazil, later publishing a paper on the geology of Matto Grosso. He returned to South America as leader of an expedition to north-east Bolivia in 1901–2, and wrote descriptions of the area for the *Geographical Journal*, as well as geological papers.

Meanwhile Evans had been appointed geologist to the State of Kathiawar, where he made important collections, afterwards described by himself or his students. Then, in 1894, he passed to Mysore, becoming chief geologist and chief inspector of mines, etc. In 1901 he received the Lyell award from the Geological Society, and about the same time took the D.Sc. of the University of London for a thesis on the geology of India.

In 1904 Evans became special assistant in geology at the Imperial Institute, serving on the Colonial Survey Committee and Mineral Council of the Institute, posts which not only gave him the opportunity of acquiring a wide knowledge of the mineral resources of the Empire, but also a close interest in the personnel and work of the surveys. This interest was enhanced by his appointment, later, as Colonial Office representative on the Imperial Mineral Resources Bureau, and here his legal knowledge was of much use in connexion with the improvement of mining codes in the Dependencies.

From this time onward, Evans took much interest in mineralogy and crystallography, publishing papers on projections, classification, and nomenclature, on methods of investigation, and on the properties of certain minerals. Much of this work was summed up in his own book on the determination of minerals under the microscope, and in his joint work on crystallography. He was treasurer of the Mineralogical Society from 1918 until 1924, and afterwards foreign secretary until his death. His teaching work was at the Birkbeck College from 1906 until 1920 and, as lecturer in petrology, at the Imperial College from 1912 until 1927. He was an inspiring teacher, and many of the students beginning research under his supervision have become leading geological surveyors or investigators.

Dr. Evans was a devoted adherent to the Geologists' Association, often leading excursions or contributing to the proceedings. He was president in 1913–14, and dealt in his addresses with the wearing down of the rocks, a subject which his mathematical ability enabled him to treat in a fashion unusual and provocative of new work. He was president of Section C (Geology) of the British Association at Bournemouth in 1919.

The great War revealed a new side in Dr. Evans's character. His experience as a volunteer qualified him for a commission, and with the rank of lieut.-colonel he was put in charge of a section of the northern defences of London. He also served on the tribunal, was made a Justice of the Peace, and received the Volunteer Decoration.

After being elected a fellow of the Royal Society, gazetted a C.B.E., and awarded its Murchison Medal by the Geological Society, Evans served in the presidency of the Geological Society during 1924–1926. Again he broke new ground and devoted his first address to the consideration of areas of tension in the earth-crust, and the second to areas of compression. About this time he became interested in the Wegener hypothesis, led a discussion on it at the British Association, and revised Skerl's translation of Wegener's book.

Although petrology and mineralogy, and especi-