

high-temperature tar has been partially successful, in that catalysts have now been found by which the tar from vertical retorts can be hydrogenated to produce motor spirit.

(4) The blending of non-caking coals with caking coals is being studied in gas-making plant of the intermittent chamber type.

(5) A process has been worked out by which non-caking coals can be completely gasified in a water-gas plant. If this process can be introduced into commerce, then it will be possible to replace the coke generally used for this purpose and thus conserve the caking coals of the country.

(6) In the search for new products an investigation is in an advanced stage upon the conversion of carbon monoxide and hydrogen into hydrocarbons. This has been worked out in the laboratory, and now a plant is in operation yielding about 10 litres of primary product a day. Lubricating oil has been made from certain fractions of this hydrocarbon product. Fig. 1 shows the actual converter in the centre, and the plant for the removal of organic sulphur from the gases behind it on the left; the condenser is immediately on the right of the converter, and the activated carbon scrubbers on the wall to the right.

(7) Considerable interest is attached to the results which have been obtained upon the burning of coal in the open domestic grate, the investigation of which is financed by funds provided by the Coal Utilisation Council.

(8) As a preliminary study of the combustion of coal in an engine, the effect of coal ash upon engine components is being measured.

University Events

CAMBRIDGE.—Prof. H. R. Dean, master of Trinity Hall and professor of pathology in the University, has been elected vice-chancellor for the academical year 1937-38, beginning in October. He will succeed Mr. G. H. A. Wilson, master of Clare College, whose customary two years of office will then expire. Prof. Dean was educated at Sherborne and New College, Oxford. He went to Cambridge as professor of pathology in 1922, and since then has been a fellow of Trinity Hall, being elected Master in 1929.

Candidates for the Michael Foster studentship in physiology are requested to send their applications, with a statement of the course of research they propose to undertake, to Sir Joseph Barcroft, Physiological Laboratory, by July 7. The student receives the annual value of the fund (about £100), and may be re-elected for a second year.

LONDON.—In recognition of the pre-eminent services rendered, first, by Sir William Beveridge in connexion with the purchase of the Bloomsbury Site and, later, by Lord Macmillan in the raising of the funds necessary to carry out the first part of the building scheme, it has been decided to name two of the halls now completed in the new buildings the "Macmillan Hall" and the "William Beveridge Hall".

OXFORD.—E. S. Duthie has been appointed University demonstrator in pathology for four years from October 1.

Prof. P. Jacobsthal, formerly of the University of Marburg, has been appointed University reader in Celtic archaeology for three years from October 1.

Science News a Century Ago

Snow Harris at the United Service Museum

ACCORDING to the *Nautical Magazine* of 1837, on June 12 and 19 lectures were given by Snow Harris at the United Service Museum on atmospheric electricity and the means of defending buildings and ships from its effects. In his second lecture, Harris "described thunder-clouds as insulated and highly charged surfaces, extending sometimes over an area of 40,000 or 50,000 acres, opposed to the surface of the earth as a conductor, with the air as an intervening insulating medium. The electricity accumulated in the clouds, in order to regain a more equal distribution, passes over the lines where the resistance is weakest, or breaks through the intervening air, discharging itself upon the nearest conductor. The lecturer's plan for conducting lightning from ships was illustrated by the model of a frigate floating in a trough of water, with gunpowder at the royal mast-head, and with a boat astern filled with gunpowder. A metallic ball, charged with lightning, was made to traverse a wire, by which the gunpowder exploded and also that in the boat, but the lightning was conducted into the water without damage to the vessel. A mast without the conductor, in a similar experiment, was shivered to pieces."

On Lightning Conductors for Ships

FIVE days after Snow Harris gave his lecture at the United Service Museum, Martyn Roberts on June 24, 1837, read a paper to the Electrical Society of London entitled "On Lightning Conductors, particularly as applied to Vessels". Roberts had been led to inquire into the causes of the many accidents to ships through lightning and to suggest improvements. "The conductor most in use", he said, "is a chain, each link of which becomes by the action of the saline moisture in the atmosphere highly oxidated . . . and therefore when the vessel is struck by lightning, every joint in this conductor becomes a point at which an explosion may take place."

Roberts's suggestion was that a metallic rope of fine annealed copper wires should be led from a copper point at the masthead, down the mast and then to a back stay, from which it was to be taken outside the ship and there fastened to the copper sheathing. Harris's conductor consisted of a double copper tape led down the mast and connected to copper bolts passing through the ship's bottom timbers. This plan was favourably reported on in 1839 and was soon widely adopted.

Lyell's Forecast of Submarine Telegraphy

WRITING on June 21, 1837, from Copenhagen to his sister Caroline, Lyell referred to Wheatstone's telegraph. "By-the-bye," he wrote, "have you heard of this wonderful invention? It has made a large figure in my waking dreams ever since I first heard of it at Babbage's and I shall be disappointed if it fail to work a mighty change in the 'march of intellect', at least of civilisation." After describing how Wheatstone had experimented with four miles of silk-covered wire in the crypts of King's College, London, and how with four wires and four needles sixty distinct signs could be sent, he went on, "It has been found that by employing small ropes steeped in india-rubber gum, you may isolate the wires much cheaper than by silk and then each wire shall only

cost between £3 and £5 per mile, or for the four wires under £20. Now they had been obliged on the Birmingham and Liverpool railroad to use a very much more expensive telegraph, to give notice of trains coming to tunnels or places where they cross, by means of long iron tubes through which a blast of air is sent which blows a whistle at the end. So when this new rope with the four copper wires is substituted, we shall have not only railway news but all others sent out with the speed of lightning, ciphers being used for private confab. A few days after I left, a tarred rope was to be continued from the end of the four miles of wire, and thrown into the Thames and then carried to the shot tower on the other side, and the rapidity of conveying intelligence through about five miles was to be tried. So perhaps a rope in the sea may carry news from Dublin to Holyhead. . . ."

Captain Graah's Expedition to Greenland

In the *Athenæum* of June 24, 1837, is a review of the "Narrative of an Expedition to the East Coast of Greenland by Captain W. A. Graah, of the Danish Royal Navy". Captain Graah had proceeded to Greenland at the command of the King of Denmark. He arrived off the coast in May 1828, spent ten months examining the coast towards Cape Farewell and in 1829-30 proceeded to explore the eastern side of Greenland in boats. "The expedition of Captain Graah", said the *Athenæum*, "appears to set at rest for ever the question which it was designed to elucidate. That able officer explored the east coast of Greenland as far north as the latitude of Iceland; he sojourned on it a year and a half; and yet he discovered no vestiges whatever of ancient Icelandic civilization. He found there no iron, no bell metal, no stones with inscriptions or other relics, such as are found on the western coast; and he was assured by the natives, who are well acquainted with the interior of their firths, that they never saw nor heard of ruins in their country."

Autopsy on William IV

THE *London Medical Gazette* of June 24, 1837, contains the following account of the post-mortem examination on William IV, who died on June 20, aged seventy-one years. "On opening the body the heart was perceived to be enlarged and flabby, with a few shreds of soft lymph gluing the surfaces of the pericardium together. The right side was comparatively healthy, but the left side showed very extensive disease of both sets of valves; those of the aorta were ossified, presenting an obstruction to the passage of blood into that vessel, which was rough on its internal surface, but without dilatation. The mitral valves were also ossified, and suffered the blood to regurgitate. The tendency to bony degeneration extended to the respiratory organs, the larynx, trachea, and even the bronchi, being ossified. The left lung was greatly gorged, and the pleuræ on this side firmly united by thick adhesions of ancient date. In the right cavity of the chest were some 12 or 14 ounces of serous fluid, probably poured out during the few days immediately preceding dissolution. The liver was enlarged and granulated; there was also slight granular disease of one kidney. To the medical reader it will be obvious that the deficiency in the general circulation and the overloaded state of the lungs are clearly explained by the dilatation without hypertrophy of the left ventricle, the obstruction of the aortic and patulous condition of the mitral valves."

Societies and Academies

Dublin

Royal Dublin Society, April 20.

D. A. WEBB: Spectrographic analysis of marine invertebrates, with special reference to the chemical composition of their environment. Quantitative data for the occurrence of 25 elements in a variety of forms are presented, and considered in relation to the concentration in which the same elements are found in sea water. Li, B, Sr, Al and Ag can frequently be detected in organisms, but not in concentrations significantly higher than in the environment. Si, Cu, Fe, Co, Ni, V, Cr, Zn, Cd, Sn and F, can be accumulated by some species from food or water in which they are scanty or undetectable. Pb, Ba and Mn, are intermediate. Previous work on the subject is discussed, with more than a hundred references.

J. CARROLL: Potato eelworm investigations. Recent research on the potato root eelworm, *H. schachtii*, has demonstrated conclusively that the eelworm can by itself give rise to 'potato sickness' in its most severe form. It has also been established that healthy crops of potatoes can be produced on eelworm-infected soil whenever the plants make a fair amount of growth before normal hatching of eelworm eggs in the soil commences. Experiments are designed to test the usefulness of trap-cropping with potatoes for the purpose of reducing the eelworm population of the soil.

C. S. RONAYNE: A curious lightning photograph. An exposure of about two minutes with an aperture $f/6.3$ at about 11.30 p.m. B.S.T. in the month of July recorded two flashes. One was completely solarized, and appeared on the print as a thin black line, with the exception of the lower end which was white. Another neighbouring flash was not reversed and appeared white and of appreciable width. This flash showed a thin black edge and black branches. It would seem that the effect must be due to double reversal of the photographic image.

Paris

Academy of Sciences, May 3 (*C.R.*, 204, 1285-1374).

RICHARD FOSSE and ROGER DE LARAMBERGUE: The synthesis of cyanamide by the oxidation of glucose and ammonia. Cyanamide is produced by the oxidation of glucose in ammonia solution by potassium permanganate.

CHARLES ACHARD, AUGUSTIN BOUTARIC and MME. MADELEINE ROY: The optical activity of sera and their proteins separated by the acetone method in the cold. The rotations produced by sera or by the proteins separated from the sera are practically identical. From this it is concluded that the extraction by the acetone method causes no change in the proteins.

GEORGES CLAUDE: The search for aeroplanes lost at sea. Suggests the use of dyes in special containers giving a coloured area visible for about six hours.

SERGE BERNSTEIN: Quadrature formulæ with non-negative coefficients and equidistant abscissæ.

JEAN BAPTISTE SENDERENS: Researches on benzoyl chloride. Aromatic ketones.

LAUGE KOCH: The question of the Caledonian chain in northern Greenland.