

The following ingredients are used: 65 parts creosote and 35 parts water with 1.2 parts oleic acid, 0.8 parts casein and 0.36 parts sodium hydroxide as the emulsifying agent. The agent is dissolved in water and the two fluids are mixed in a jet similar to that of a cream-making machine. An emulsion prepared in this way should be stable and can be transported in drums or kegs. Before use it should be diluted with water to a suitable consistency for spraying so that the creosote content does not fall below 25 per cent.

(2) An organic copper salt is dissolved in creosote or tar distillate of the type indicated in (1) above, the solution then being made up into an emulsion with water, by the use of a special type of emulsifying agent. The copper salt should be one of an organic fatty acid of high molecular weight (such as, for example, copper oleate). The organic copper salt should be added in the proportion of 16 per cent of the weight of the creosote, and the whole should be emulsified with water. When sprayed on the bags it should be applied as 20 per cent emulsion. This will leave 0.5-1.0 per cent of metallic copper, estimated on the normal weight of the fabric when conditioned under ordinary atmospheric conditions.

Care should be taken to coat thoroughly any seams visible on the face of the pile and to work the emulsion well into the seams. The spraying should be done with a paint spray or horticultural spray, and the stirrup-pump recommended for A.R.P. fire protection may be used if no other spray is available. Care is needed to avoid fire risk during application as when handling creosote in the ordinary way. As creosote may cause permanent stains, suitable measures should be taken to protect the surface of buildings against which the bags are placed whilst spraying is in progress.

In order to obtain the best possible penetration into the revetment the preservatives should not be applied immediately after a heavy rain. They will be far more effective if the pile is given a reasonable time for drying after rain.

It will be desirable to repeat the treatment, and this should be done at intervals not exceeding three months.

UNIVERSITY EVENTS

DURHAM.—The honorary degree of D.C.L. has been conferred on Sir Charles Peers, chief inspector of ancient monuments and architect in charge of the Durham Castle restoration scheme since 1933. The honorary degree of M.Sc. has been conferred on Mr. C. A. Linge, clerk of works for the scheme.

LONDON.—Owing to the war, and the absence of the University from London, the following honorary degrees among others have been conferred *in absentia*: D.Sc. on Prof. Niels Bohr and Sir Robert Robinson; D.Sc. (Economics) on Mr. R. G. Hawtrey and Mr. Simon Marks.

OXFORD.—R. S. G. Rutherford, Wadham College, has been appointed a research officer in the Institute for Research in Agricultural Economics as from October 1.

Dr. S. N. Chakravarti, St. Catherine's Society, has been granted the degree of D.Sc. for his work in synthetic organic chemistry.

SCIENCE NEWS A CENTURY AGO

Fecundation and Development of Plants

At a meeting of the Ashmolean Society, at Oxford, on November 19, 1839, Prof. Daubeny explained the new views with respect to the fecundation and the development of plants, which had been brought forward by Brown, Mirbel, Schlieden and other botanists of the day. When Linnæus, he said, had established the doctrine of the sexuality of plants he left to his successors two branches of inquiry in a manner untouched, namely, first, in what precise method do the stamens operate upon the pistils when they cause fecundation to take place; and secondly, to what extent can we trace an analogy between the mode of fecundation and development in the case of flowering plants where sexes exist, and in that of cryptogamous ones, where they are not discoverable. The first of these points had been elucidated by the researches of Brown, A. Brongniart and Ehrenberg, while the analogy subsisting between flowering and cryptogamous plants had been investigated by Mirbel in France and Schlieden in Germany. The former observed new cells originating out of those already existing in the case of *Marchantia*; while the latter appears to have shown that a process the same in kind takes place within the pollen tubes emitted from flowering plants at the very time they reach the ovary and impregnate it, as well as the cells of the plant in the subsequent stages of its growth. From Schlieden's researches it would seem to follow that the embryo exists in the pollen, and not in the ovary; the office of the latter organ being merely that of furnishing to the young individual a receptacle and nourishment. This, however, was disputed by Mirbel.

Conception of the Steam Hammer

In his "Autobiography", James Nasmyth, when speaking of the iron ship *Great Britain*, which it was at first intended to drive by paddles, said that Mr. Francis Humphries, finding great difficulty in obtaining tenders for the large wrought iron shaft, approached Nasmyth. "In this dilemma," said Nasmyth, "he wrote a letter to me. . . . This letter immediately set me a-thinking. How was it that the existing hammers were incapable of forging a wrought-iron shaft of thirty inches diameter? Simply because of their want of compass, of range and fall, as well as of their want of power of blow. A few moments' rapid thought satisfied me that it was by our rigidly adhering to the old traditional form of a smith's hand hammer—of which the forge and tilt hammer, although driven by water or steam power, were mere enlarged modifications. . . . The obvious remedy was to contrive some method by which a ponderous block of iron should be lifted to a sufficient height above the object on which it was desired to strike a blow and then to let the block fall down upon the forging, guiding it in its descent by such simple means as should give the required precision in the percussion action of the falling mass. . . . I then rapidly sketched out my Steam Hammer, having it all clearly before me in my mind's eye. In little more than half an hour after receiving Mr. Humphries's letter narrating his unlooked-for difficulty, I had the whole contrivance, in all its executant details, before me in a page of my Scheme Book. . . . The date of this first drawing was the 24th November, 1839."

The Fossil Fishes of the Yorkshire Coalfields

ON November 20, 1839, the naturalist William Crawford Williamson (1816-95) contributed to the Geological Society a paper "On the Fossil Fishes of the Yorkshire and Lancashire Coal Fields". Within the previous four years the Coal Measures of these counties had assumed a zoological importance which hitherto they had not been supposed to possess. In Lancashire ichthyolites had been lately found to pervade the whole of the series from the Ardwick limestone to the millstone grit, and in Yorkshire they had also been found in abundance. These remains, except in the case of the Ardwick limestone, always occurred in highly bituminous shale and were most abundant where plants were least numerous. The fishes were found chiefly in the roof of the coal, rarely in the seam itself, and not often in its floor. The author made some observations on the manner in which ichthyolites were associated with other fossils in the Coal Measures. At Burdichouse they occurred in the midst of fresh-water shells and Cypris; at Coalbrook Dale with marine Testacea; at Middleton, near Leeds, with Lingula; and at the top of the series in Lancashire and Derbyshire with Mytili and Melanæ. When he read this paper, Williamson was a medical student; in 1851 he became first professor of natural history, anatomy and physiology at Owens College, Manchester. He was Wollaston medallist in 1890.

Roman Causeway

"SOME works for improving the channel of the Scheldt", according to the *Gentleman's Magazine* of November, 1839, "have occasioned several extensive cuttings across the old Roman causeway called La Chaussé de Brabant de Brunehaut, which connects in a straight line the towns of Bavay and Tournay. These cuttings took place on the spot described in the Itinerary of Antoninus as the Pons Scaldis. In the course of the works there have been discovered on various points remains of constructions, and large quantities of material which indicate the site of a town or large village; and it appears that in this locality several bridges have been thrown over the Scheldt. This discovery shows that the point given by antiquaries as Pons Scaldis was not merely a bridge over the Scheldt, but a Roman station which was probably fortified."

Royal Botanic Society

THE issue of the *Gentleman's Magazine* of November 1839 contains the following information: "A charter of incorporation has just been granted to this Society, for the promotion of botany in all its branches, and its application to medicine, arts, and manufactures, and also for the formation of extensive botanical and ornamental gardens within the vicinity of the metropolis'. The Charter appoints the Duke of Richmond as the first president, Mr. Marjoribanks the first treasurer, and the Duke of Norfolk, the Earl of Albemarle, Mr. Rushbrook, Philip Barnes and James de Carle Sowerby Esqs. the first councillors. The organization is similar to that of other scientific societies, and meetings for the discussion of scientific subjects will be held periodically. The anniversary meeting is assigned by the charter for the first of January. Steps are in active progress for the completion of the gardens in Regent's Park, in which exhibitions will be held in the approaching season."

APPOINTMENTS VACANT

APPLICATIONS are invited for the following appointments on or before the dates mentioned:

LECTURER in the Mining Department—The Principal, Technical College, Sunderland (November 25).

SGR-LIBRARIAN of the University of Cape Town—The Secretary, Office of the High Commissioner for the Union of South Africa, Trafalgar Square, W.C.2 (December 31).

REPORTS AND OTHER PUBLICATIONS

(not included in the monthly Books Supplement)

Great Britain and Ireland

The British Academy. Presidential Address, 12 July 1939, by Sir David Ross. (From the *Proceedings of the British Academy*, Vol. 25.) Pp. 8. (London: Oxford University Press.) 6d. net. [2510]

Borough of Falmouth Public Library. Descriptive Catalogue of the Paintings and Engravings in the Maritime and General Art Collections. Pp. 23. (Falmouth: Public Library.) 2d. [2510]

Other Countries

Commonwealth of Australia: Council for Scientific and Industrial Research. Bulletin No. 129: Investigations on Chilled Beef. Part 2: Cooling and Storage in the Meatworks. By W. J. Scott and Dr. J. R. Vickery. Pp. 63. (Melbourne: Government Printer.) [2310]

Indian Forest Records (New Series). Botany, Vol. 1, No. 5: Recently Introduced or Otherwise Imperfectly Known Plants from the Upper Gangetic Plain. By Mukat Behari Raizada. Pp. vi+223-236. 12 annas; 1s. Entomology, Vol. 5, No. 3: New Species and Biology of *Coccotyptes* and *Thamnurgides* (Scolytidae, Col.). By C. F. C. Beeson. Pp. ii+279-303. 10 annas; 1s. (Delhi: Manager of Publications.) [2310]

Ministry of Agriculture, Egypt: Technical and Scientific Service. Bulletin No. 186: The Pomegranate Fruit Butterfly *Virachola livia* Klug; Morphology, Life-History and Control. By Dr. A. D. Hanna. Pp. ii+54+40 plates. P.T. 10. Bulletin No. 196: Further Tonnage Tests of Imported Sugar Cane Varieties. By Arthur H. Rosenfeld. Pp. 10+2 plates. Mills. 15. Bulletin No. 203: Manurial Requirements of Sugar Cane in Egypt. 3: Further Rate of Nitrogen Experiments. By Arthur H. Rosenfeld. Pp. ii+24+5 plates. Mills. 35. Bulletin No. 209: Some Mealy Bugs of Egypt and Experiments on their Control by means of Chemicals. By M. Deshir and M. Hosny. Pp. 16. P.T. 2. Bulletin No. 216: Some Notes on the Potato Tuber Moth (*Phthorimaea operculella*, Zell.). By Rizk Attia and Bishara Mattar. Pp. ii+136. P.T. 10. Bulletin No. 223: Study and Control of Antirrhinum Rust. By Dr. Amin Fikry. Pp. ii+16+21 plates. P.T. 4. Bulletin No. 226: Pneumococcus in Camels. By Dr. Hussein Kamel. Pp. 12+4 plates. P.T. 2. Bulletin No. 235: The Cottons of Egypt. By H. A. Hancock. Pp. 24. P.T. 2. (Cairo: Government Press.) [2410]

Egyptian Government: Ministry of Public Works. Annual Report for the Year 1932-33. English Version. Part 1. Pp. 214. P.T. 50. Part 2. Pp. 438+12 plates. P.T. 100. (Cairo: Government Press.) [2410]

U.S. Department of the Interior: Office of Education. Bulletin 1939, Misc. No. 3: Education in the United States of America. Pp. 55. 15 cents. Leaflet No. 52: Know Your Modern Elementary School. By Helen K. Mackintosh. (Know Your School Series.) Pp. iii+22. 5 cents. Vocational Division Bulletin No. 198 (Business Education Series No. 11): Conference Topics for the Retail Grocery Business, Rewritten and revised by Kenneth B. Haas and B. Frank Kyker. Pp. iii+133. 20 cents. (Washington, D.C.: Government Printing Office.) [2410]

Proceedings of the United States National Museum. Vol. 87, No. 3069: A Generic Revision of the Staphylinid Beetles of the Tribe Paederini. By Richard E. Blackwelder. Pp. 93-126. (Washington, D.C.: Government Printing Office.) [2410]

Memoirs of the Entomological Society of Washington. No. 1: The North American Bees of the Genus *Osmia* (Hymenoptera: Apoidea). By Grace A. Sandhouse. Pp. iv+167 (11 plates). (Washington, D.C.: Entomological Society of Washington.) [2410]

U.S. Department of Commerce: National Bureau of Standards. Research Paper RP. 1221: Rate of Oxidation of Steels as determined from Interference Colors of Oxide Films. By Dunlap J. McAdam, Jr. and Glenn W. Geil. Pp. 63+124. (Washington, D.C.: Government Printing Office.) 10 cents. [2410]

National Advisory Committee for Aeronautics. Report No. 670: Tensile Elastic Properties of 18:8 Chromium-Nickel Steel as affected by Plastic Deformation. By D. J. McAdam, Jr. and R. W. Mebs. Pp. ii+42. (Washington, D.C.: Government Printing Office.) 15 cents. [2410]

New Zealand. Thirteenth Annual Report of the Department of Scientific and Industrial Research. Pp. 131. (Wellington: Government Printer.) 2s. 9d. [2510]

Report upon the Mining Industry of Malaya. By Sir Lewis Leigh Fermor. Pp. xv+240. (Kuala Lumpur: Government Press.) 2.50 dollars; 6s. [2610]

Royal Observatory, Hong Kong. Magnetic Results, 1938. Prepared under the direction of C. W. Jeffries. Pp. 51+2 plates. (Hong Kong: Government Printers.) 1 dollar. [2710]