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 paddlewheels, 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."