

and their relation to appendicitis, and C. C. Macklin with the macrophages of the lung alveoli. C. M. Fraser discussed the ecology of the butter clam, F. C. Gilliatt the bionomics of the tortracid moth *Eulia mariana* (a new orchard pest which has developed in Nova Scotia), while S. Hadwen dealt with colour changes in animals, Miss H. I. Battle with the development of structural anomalies in the four-bearded rockling due to unfavourable temperatures and salinities during early stages, and J. M. D. Scott with pregnancy anaemia in rats.

Monseigneur Camille Roy, of Laval University, Quebec, was elected president, and Prof. A. S. Eve, of McGill University, vice-president, for 1928-29.

Kiln-Seasoning of Timber.

THE natural seasoning of timber by allowing it to remain stacked or otherwise for a varying period of time was well understood in Great Britain, and seasoned timber, especially for the better class of work, was in common use. During the progress of the War the stocks of seasoned timber were utilised, and kiln-seasoning, where seasoned material was indispensable, as, for example, for aircraft work, came to be relied on more and more. Experiments were also inaugurated in other parts of the British Empire with the object of endeavouring to place upon the market kiln-seasoned wood of some of the broad-leaved soft-wooded species from the tropical and sub-tropical forests which had previously been unmarketable. Kiln-seasoning thus began to assume an important position, where timber was in question, in commercial centres. So much so that repeated inquiries for advice have been addressed to the Director of the newly established Forest Products Research Laboratory at Princes Risborough. With the view of making public the research work being carried out in this direction, a report entitled "The Principles of Kiln-Seasoning of Timber" (*Special Report No. 2*) is being prepared, of which Part I, "Types of Commercial Kilns in Use," by Mr. S. T. C. Stillwell, has been issued.

In an introduction the troubles attendant on drying timber are discussed. A correct appreciation of these difficulties is necessary in order to estimate the value of the use of the kiln method. "If we consider a board of green timber," says the writer, "which is allowed to dry freely, the surface layers quickly lose their free moisture; this is followed by evaporation from the cell walls, and a corresponding shrinkage then takes place in the surface structure. In the meantime, though there is a tendency on the part of the moisture in the centre portion of the board to move towards the surface layers as soon as these become drier, the amount of moisture so moving is much smaller than the amount evaporated from the surface. It is inevitable, therefore, that the surface layers will tend to shrink before the centre portion is ready to do so, and, as a result, tension is set up in these layers." Regulation of the rate of drying from the surface is therefore essential and requires to be under control. This control involves the regulation of humidity, temperature, and the circulation of air, and that the latter should be changed regularly and frequently in the kiln.

Before dealing with the types of kilns, kiln treatment is briefly discussed. It may be mentioned that almost invariably the timber placed in the kiln is first warmed up by a circulation of saturated or nearly saturated air, driven through it by various devices, to a temperature slightly higher than that at which drying is to commence. This is said to be

doubly advantageous since it both warms the timber in the centre, thus afterwards assisting in the transference of moisture from the centre to the surface, and also relieves any existing stresses in the surface layers.

Five different types of kiln are fully described and clearly illustrated in the report, these kilns being known as (1) natural circulation ventilated kiln, (2) tunnel or progressive kiln, (3) water-spray kiln, (4) external fan kiln, and (5) internal fan kiln. For their varied features and uses the report should be consulted.

The writer concludes with some brief notes upon lay-out, equipment, and kiln staff. A subsequent Part II. is promised, dealing with the field of kiln instruments, which is said to be both wide and important. Mr. Stillwell emphasises the importance of employing a good man, with scientific and engineering training, to supervise the seasoning operation. "Practically," he says, and the point is worth stressing, "all the prejudice which at present exists against kiln-seasoned timber can be attributed to the short-sighted policy of many commercial firms in putting their kiln plant in charge of men of little education and no experience as kiln operators."

The important work upon which this report is based can be safely recommended to all those in the British Empire who deal with timber in its many aspects.

Flowering Plant Hybrids.

THE Masters Lectures for 1927, delivered by Dr. C. H. Ostenfeld of Copenhagen on "The Present State of Knowledge on Hybrids between Species of Flowering Plants," have been published in the *Journal of the Royal Horticultural Society*, vol. 53, Part 1. Dr. Ostenfeld reviews past and present concepts of species, but finds it no more possible now than it was forty years ago to formulate a definition of a 'species' which possesses at the same time practical advantages and scientific accuracy. Any definitions which embody such modern concepts as 'microspecies,' 'ecospecies,' or 'genospecies' are for practical purpose useless. On the other hand, a practical definition which satisfies all minds and all ideas must necessarily possess a somewhat vague connotation.

In spite of the lack of a definition which is at once apt and generally applicable, species in Nature are rather well-defined, a characteristic which their ability to hybridise fails to modify. This is explained either by the sterility of the hybrids themselves, or by the ease of back-crossing with one or other of the parents as against 'selfing.' Any external sign of hybridity is thus quickly effaced.

Dr. Ostenfeld discusses some of the most recent work on the formation by hybridisation of new types which fail to segregate and are thus wholly or partially stable. Related species with the same number of chromosomes usually produce fertile hybrids, while sterile hybrids are usually produced when the parents have different chromosome numbers. The Japanese botanist Kihara has, however, succeeded in obtaining fertile hybrids in a cross between two species of *Triticum* with different chromosome numbers. The offspring with chromosome numbers the same as either of the parents were most fertile, while those with the intermediate number were very much less so. Thus a selective process goes on, resulting in the disappearance of intermediate forms.

The Danish geneticist, Winge, has advanced a theory that a new stable type could be produced by hybridisation of two species, if the chromosomes of