

Hughes described the various degrading effects on sounds by the chamber in which they are emitted or reproduced. The final test is always a subjective one, and owing to the short memory of the ear it is necessary for comparisons between the original performance and the reproduction to be direct. This is difficult, and the method Dr. Hughes advocated was to use two separate chambers with a microphone in each to represent the listener, and to compare their outputs subjectively at the remote end of a very good quality amplifier.

Dr. Hughes explained that each letter has its own requirements in the matter of frequency range for good reproduction of speech, but he stressed the point that the final test is always an aural one in the tests conducted by the Apparatus Approval Committee of the Central Council for School Broadcasting, where non-technical audiences vote subjectively on the quality of reproduction on a scale attained entirely by experience. In the discussion which followed, doubts were expressed as to the validity of subjective tests, but Dr. Hughes stated that a completely new panel had, in duplicate tests, returned votes which were within 1-2 per cent in agreement with the regular panel.

#### Michelia Timbers for Aircraft

A SERIES of leaflets has recently been issued from the Forest Research Institute, Dehra Dun, on utilization matters. No. 17 deals with the species of *Michelia* of which the *champaca* (champ) is the most important, being fairly common in Assam and cultivated all over India for its fragrant flowers. Its true habitat is in the Eastern Himalaya, Sikkim and Assam. There are four other species of the genus in India, but they are less abundant. The timber of the five species is very similar in weight and strength and is only slightly heavier than spruce (being about 33 lb. per cubic foot as against 30 lb. for spruce) and compares very favourably with spruce in strength.

*Michelia* timber seasons without difficulty or degradation; it is straight grained and very easy to work both by hand and machine tools. It can, it is said, be finished to a beautiful smooth surface and is a pliant wood to handle; also it can be peeled on a rotary lathe and sliced on a slicing machine to produce excellent veneers for plywood. It is not surprising, therefore, that this timber should prove very suitable as a substitute for Sitka spruce in the manufacture of aircraft. It is stated that though supplies are limited, if the wood of these species is reserved for aircraft construction in India alone, available supplies would go some way to supplying the needs of the industry. This takes one back to a century ago when the same remarks were being made in Malabar and Tenasserim in connexion with the teak demands of the Bombay Dockyard and the Admiralty in Great Britain.

#### Indian Woods for Battery Separators

LEAFLET No. 14 of the Utilisation Section, Forest Research Institute, Dehra Dun, deals with investigations into woods for battery separators. The battery separator is a thin sheet made of wood, ebonite or glass interposed between the positive and negative plates of an acid storage battery in order to prevent the plates from touching each other during handling or use, while at the same time allowing the ionic

exchange to take place in the electrolyte. When wood is used its essential characteristics must be good permeability, freedom from volatile acids, low percentage of tannins and resinous matter, sufficient mechanical strength and resistance to chemical action of the electrolyte. The most commonly used timber has been the American *Chamaecyparis lawsoniana* or the Port Orford cedar. The Indian Forest Research Institute has been investigating the suitability of Indian timber for the purpose for some time past. The research work has shown that the following are suitable for use as battery separators: *Adina cordifolia* (*haldu*), *Cupressus torulosa* (cypress), *Michelia champaca* (champ or champak), and *Talauma phello-carpa*. The leaflet describes some of the tests carried out. As regards the *Michelia* it is more likely to be earmarked for aeroplane construction than battery separators, unless the wastage from the former can be utilized for the latter.

#### Horticultural Science

SEVERAL papers upon scientific aspects of gardening have appeared in recent numbers of the *Journal of the Royal Horticultural Society* (vol. 67). Dr. B. A. Keen expounds his doubts of the value of hoeing except for the destruction of weeds (Part 10; Oct. 1942). This conception must now express the ideas of many workers who have considered the mechanism of water movement in soil. The experiments quoted are upon an agricultural scale, but should also have direct reference to horticulture. M. Mather publishes further work upon the effect of the moon on germination and seedling growth (Part 8; Aug. 1942). He again finds no consistent lunar influence, but can explain all the differences recorded for tomato and maize by the effects of temperature and light. The moon is not known to exert a great influence upon these two factors. Other experiments on growth of tomatoes are those of Dr. M. A. H. Tincker (Part 8), who finds that extracts of the vitamins in yeast do not improve growth or enhance the vitamin B<sub>1</sub> content of the plant.

Air Vice-Marshal A. E. Borton records (Part 10) satisfactory control of the Rhododendron bug *Stephanitis rhododendri* by spraying with an atomized pyrethrum wash. 'Die-back' disease of apricots makes cultivation of this crop difficult in Great Britain. H. Denham and H. Wormald show (Part 8) that the trouble is caused by the brown rot fungus *Monilia cinerea* (*Sclerotinia laxa*). It can be controlled by the removal of shoots with wilted flowers or leaves, or dead twigs. Spraying with copper carbonate washes is also mentioned.

#### Rubber Economy in Typewriter Cylinders

ACCORDING to an article by A. R. Kemp (*Bell Lab. Rec.*, 20, No. 12; August 1942) savings in the rubber used for typewriter cylinders are now possible as a result of experiments recently carried on in the Bell System Chemical Laboratories. These cylinders consist of an arbor of steel or wood over which is slipped a sleeve of rubber. The rubber is vulcanized on the arbor, and then ground to the proper size and to roughen its surface so as to grip the paper firmly. With extensive use, the cylinders become hard and glazed, and no longer hold the paper securely. They have then been returned to the factory to have the old rubber removed and new rubber put in its place. It has been estimated that