

labels in the same attitude as when they fed on the fresh privet leaves with which they were provided. In the course of two or three days, the labels—particularly those of strawboard—were so mutilated and diminished in size as to be useless, and they had to be removed and replaced by others protected by glass. The insects were not observed to eat their sloughs; the nibbling of the antennae of individuals in an akinetic condition seems to be a common habit of those in captivity.

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The Museum,  
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Dec. 30.

<sup>1</sup> NATURE, 138, 1058 (1936).

<sup>2</sup> NATURE, 138, 886 (1936).

#### Adjustable Resonators and Orchestration

THE major difficulty in adopting Prof. Osborne's idea<sup>1</sup> of adjustable resonators in orchestral instruments is that it is not easy to make a change of pitch in an instrument without a change of quality. The same is true, to a less extent, of the voice. The wood-wind have resonators the length of which is

adjusted to vary the pitch, but there is a consequent difference in timbre between the upper and lower notes of their registers, notably in the clarinet. To preserve the same quality while the pitch varies would involve a complicated system of levers to alter the bore of the—presumably flexible—tube, which would render the execution of rapid passages impossible. On keyboard instruments, with one or more vibrators to each note, another difficulty would arise. Adjustments of the resonator would react on the vibrator, whether string, reed or edge tone, to such an extent as to cause considerable changes of the intensity, or even complete stoppage of the sound.

Sounds received by membranes loaded on one side—to imitate the ear-drum and associated ossicles—have been analysed by Waetzmann<sup>2</sup>. His object was to find how much distortion was introduced by this asymmetric loading of the receiver, and he was thus able to explain the formation of 'subjective' combination tones in the ear.

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Dec. 22.

<sup>1</sup> NATURE 138, 1059 (1936).

<sup>2</sup> Z. Phys 1, 271 and 416 (1920).

#### Points from Foregoing Letters.

By growing sunflower plants which have already developed their lower leaves in nutritive solutions containing radioactive phosphorus, Prof. G. Hevesy, K. Linderstrøm-Lang and C. Olsen find that, as in the case of the maize plant, a considerable migration of phosphorus atoms takes place from the lower to the upper leaves during the subsequent growth. The bulk of the phosphorus is present as inorganic phosphate, and probably moves about in the plant, but none of it escapes when cut leaves are placed in a nutritive solution. Germinating maize and pea seeds take up the labelled (radioactive) phosphorus in the germ but not in the endosperm, showing that there is no phosphorus exchange between the two.

Prof. Irvine Masson reports a number of new interrelated facts in the organic and inorganic chemistry of iodine, including the one-stage formation of aromatic iodonium salts, the direct replacement of aromatic hydrogen by the iodoso-group by a new substituting reagent, and the principles controlling the reactions between iodine, its pentoxide and its sesquioxide and a coloured suboxide, especially in sulphuric acid media.

Tables showing the influence of temperature and catalysts upon the position (*ortho*-, *meta*-, *para*-) taken by bromine and other halogen atoms when they are substituted in the benzene molecule are given by Prof. J. P. Wibaut and M. van Loon.

Some measurements of the conductivity of mixed solutions of bi-bivalent salts are described by E. A. O'Connor. These are considered to favour the complete dissociation theory, although the measurements are not in agreement with the results to be expected from Onsager's equation.

Dr. F. P. Bowden and T. P. Hughes give examples showing that polishing takes place when the melting point of the polishing material is higher than that of the solid to be polished. The relative hardness, as normally measured at room temperature, is comparatively unimportant. This agrees with the

observations that the high temperatures developed during friction are sufficient to cause surface flow. Such high temperatures have been observed at the sliding contact of two different metals acting as a thermocouple.

Using as criteria of 'organisms' the presence of a limiting surface, low speed of transmission, slow rate of increase, and lack of crystallinity, Prof. H. H. Dixon classifies viruses as autocatalysts and not as organisms.

Structural changes in the chromosomes of the pollen grains of the hyacinth and of *Tradescantia* are described by Miss M. Upcott. These changes are apparently due to breaks and rejoins between the chromosomes and lead to the formation of bridges connecting the two daughter nuclei during certain phases of the division process (anaphase and metaphase).

Several new properties of the "hexlet" and propositions concerning four mutually touching circles and five mutually touching spheres are described by Prof. F. Soddy.

The growth-promoting effects upon oat and pea seedlings of certain synthetic organic compounds (thionaphthene- $\beta$ -acetic acid, coumaryl-*l*-acetic acid) are briefly described by E. M. Crook, Dr. W. Davies and Miss N. E. Smith. There are indications that the pea and oat tests of these compounds are not strictly comparable.

Favourable results in the treatment of night-blindness by intramuscular injection of carotene or vitamin A are reported by Drs. E. M. Josephson and M. Freiburger.

According to Prof. J. L. Synge, if thin tunnels of matter are removed from a continuous medium to permit the free passage of a light-pulse or particle, the difficulties recently raised by Dr. L. Silberstein, regarding the physical interpretation of Einstein's geodesic principles inside matter, disappear.