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VISION IN NATURE AND VISION AIDED BY SCIENCE; SCIENCE AND WARFARE[1]

By The Rt. Hon. LORD RAYLEIGH
PRESIDENT OF THE ASSOCIATION

I. VISION, AND ITS ARTIFICIAL AIDS AND SUBSTITUTES

THE last occasion that the British Association met at Cambridge was in 1904, under the presidency of my revered relative, Lord Balfour, who at the time actually held the position of Prime Minister. That a Prime Minister should find it possible to undertake this additional burden brings home to us how much the pace has quickened in national activities, and I may add, anxieties, between that time and this.

Lord Balfour in his introductory remarks recalled the large share which Cambridge had had in the development of physics from the time of Newton down to that of J. J. Thomson and the scientific school centered in the Cavendish Laboratory, "whose physical speculations," he said, "bid fair to render the closing year of the old century and the opening ones of the new as notable as the greatest which have preceded them." It is a great pleasure to me, as I am sure it is to all of you, that my old master is with us here to-night, as he was on that occasion. I can say in his presence that the lapse of time has not failed to justify Lord Balfour's words. What was then an intelligent anticipation is now a historical fact.

I wish I could proceed on an equally cheerful note. The reputation of the scientific school in the Cavendish Laboratory has been more than sustained in the interval under the leadership of one whose friendly pres-

[1] Address of the President of the British Association for the Advancement of Science, Cambridge, August, 1938.

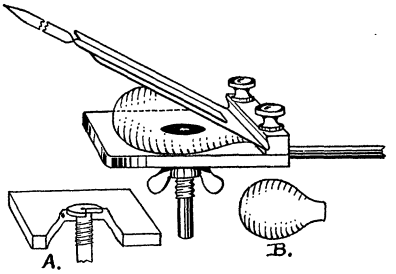

FIG. 1. Bellows recorder.

Fig. 1 is a mechanical drawing of the bellows. Recently we have adopted latex for our balloon material. With this material one can make the balloon any desired shape or size. It is especially desirable to make the balloon smaller in diameter where it passes under the block. Such a shape reduced in size is shown at B in the illustration. At A is a detail drawing of the countersunk depression in the base plate with the brass tube in position. The base plate of the recorder measures 4 cm × 5 cm and is 5 mm thick. It can be made in any shop where tools and a mechanic are available and can be made any desired size. One point indicated in the drawing which might be advantageously changed is the shoulder on the threaded tube which may be made square or, if left round, may be fitted with a tongue which would sink into a corresponding groove in the brass plate. This is to prevent the threaded tube from turning when the wing-nut is tightened, thereby skewing the rubber condom somewhat.

This apparatus has been used in several laboratories, and I have been asked many times to publish a description of it. Dr. Charles Gruber, of Jefferson Medical College, Dr. G. H. Miller, of Iowa City Medical School, and Dr. Fredrick F. Yonkman, of Boston University School of Medicine, have used the bellows and published their results. The bellows was demonstrated at the meeting of the American Society for Experimental Pharmacology and Therapeutics held in Rochester, N. Y., in 1927.

WALTER L. MENDENHALL

"PROPS" FOR COVER GLASSES

A SIMPLE method for "propping up" cover glasses in preparing total mounts of chick embryos, small insects and other specimens requiring raised cover glasses makes use of small bone "curtain rings" which are available in $\frac{1}{2}''$, $\frac{5}{8}''$, $\frac{3}{4}''$ and $\frac{7}{8}''$ diameters, corresponding to standard sizes in round cover glasses.

The bone ring is ground with sandpaper or emery wheel on top and bottom to produce flat adhering surfaces for slide and cover slip. The ground ring is then treated in the same manner as the specimen to be mounted; *i.e.*, washed in distilled water, run through the alcohols, xylol, and impregnated with thin balsam. This procedure is important, especially dehydration, in order that no air or moisture remains in the bony structure to cause "bubbles" or fogging of the balsam after mounting. The rings may be stored in the balsam for later use.

When ready for use, the rings are placed on the slide with sufficient balsam adhering to make a good seal, and then allowed to dry for 24 to 48 hours in a dust-proof cabinet or box. In mounting the specimen, the ring is filled with thick balsam, care being taken to avoid bubbles on the inner and lower periphery of the ring. After placing the specimen in the balsam, more is added until the ring is filled and "heaped" but not overflowing. The cover slip is placed directly over the ring without being pressed down, as the light tension of the cover glass will permit any small bubbles formed to work out and permit some shrinkage of the balsam in drying.

After drying for several days, the ring is "painted" with heavy balsam to form a smooth, even surface finish, and to prevent bubbles of air creeping in as the balsam continues to shrink in drying. An occasional similar application of balsam will make these mounts long-lasting and uniformly neat laboratory slides.

HERTHA M. CORDTS

NEW YORK, N. Y.

BOOKS RECEIVED

BERLAND, L. and F. BERNARD. *Hymenopteres Vespiformes.* Pp. vii + 145. 241 figures. Lechevalier, Paris.

BLUEMEL, C. S. *The Troubled Mind; A Study of Nervous and Mental Diseases.* Pp. ix + 520. Williams and Wilkins. $3.50.

DEBEER, G. R., Editor. *Evolution; Essays on Aspects of Evolutionary Biology Presented to Professor E. S. Goodrich on His Seventieth Birthday.* Pp. viii + 350. Illustrated. Oxford University Press. $5.00.

FRY, WALTER and JOHN R. WHITE. *Big Trees.* Revised edition. Pp. xvi + 126. Illustrated. Stanford University Press. $1.50.

HAAS, ARTHUR E. and IRA M. FREEMAN. *Elementary Survey of Physics; A Non-Mathematical Presentation with a Special Supplement for Pre-Medical Students.* Pp. x + 203. Dutton. $1.90.

HOHAGEN, JORGE. *Boletin del Cuerpo de Ingenieros de Minas del Peru, No. 120; Las Exportaciones Mineras en el Perú, 1937.* Pp. xvii + 396. Imprenta Americana, Lima.

Les Classiques de la Découverte Scientifique: Détermination des Poids Moléculaires; Mémoires de MM. Avogadro, Ampere, and others. Pp. xvi + 165. 7 figures. *La Dissolution; Mémoires de MM. Lavoisier, Gay-Lussac,* and others. Pp. xvi + 148. 7 figures. *Halogènes et Composés Oxygénés du Chlore; Mémoires de Scheele, Berthollet,* and others. Pp. xiv + 147. Illustrated. *Les Métaux Légers; Aluminum, Glucinium, Magnesium, Metaux Alcalins; Mémoires de MM. Henri Sainte-Claire Deville, Héroult,* and others. Pp. xviii + 166. Illustrated. Gauthier-Villars, Éditeur, Paris. 21 fr. each.

Report on the Agricultural Experiment Stations, 1937, U. S. Department of Agriculture. Pp. 226. Superintendent of Documents, Washington. $0.25.