

species: Chenopodiaceæ 94, Papilionaceæ 85, Cruciferae 51, Gramineæ 44, Boraginaceæ 42. Interesting comparisons are drawn between the Transcasian flora and the floras of various other regions, desert and otherwise, with reference to the proportional representation of the families and also of the biological types. The memoir concludes with detailed notes on the structure and biological adaptations of various Transcasian species investigated by the author.

F. C.

THE "AEROSCOPE" KINEMATOGRAPH HAND CAMERA.

AN interesting demonstration of the greatly extended adaptability of kinematographic apparatus was given by Mr. Kasimir Proszynski at a meeting of the Royal Photographic Society on Tuesday, February 18. In introducing the "Aeroscope" hand camera, the lecturer made some general remarks dealing with the problem of flicker, the presence of which, more or less pronounced, has been of considerable trouble to producers of moving pictures. He stated that up to the present time it had been generally understood that the suppression of flicker was in some manner due to the phenomenon of persistence of vision, which, according to the experiments of Helmholtz and other investigators, continues about one-seventh of a second after the light impression has ceased.

Mr. Proszynski considers this idea a mistaken one, and by means of a series of diagrams and demonstrations with the lantern he made out a strong case for his view that flicker is due to the slightly varying lengths of time during which the light from each picture is transmitted to the screen through the openings in the sector shutter. If the opaque portions of the shutter are not all exactly equal, the eye, being extremely sensitive to slight variations of illumination, receives the impression of alternating light and darkness corresponding to the difference between the angular size of the blades of the shutter sectors. From this point of view the flicker should be completely eliminated by using any simple shutter with four, three, or even two wings, the essential feature being that the wings must all be very accurately made of the same size. Various forms were shown in the lantern projector; in practice the three-bladed sector shutter is found most suitable.

Another feature embodied in the "Aeroscope" camera is its adaptability for use without a tripod stand, thereby greatly extending the scope of its usefulness to the portraying of scenes quite inaccessible to the ordinary camera requiring a steady support. The camera is fitted with self-contained mechanism for driving the film, consisting of a small air motor, driven by compressed air stored in four steel reservoirs held in the camera body. These cylinders can be recharged by means of a cycle pump to a pressure of 400 lb. per sq. in. The motor is fitted with a governor for keeping the motion of the mechanism uniform, and a lever control on the exhaust for securing different values of this motion to suit different subjects.

The chances of injurious vibration during the exposure of the film are very neatly minimised by the introduction of a heavy gyrostat wheel in the end of the camera box; this is also driven from the air motor.

A series of beautiful pictures of scenery, including animals and moving water, taken by Mr. Cherry Kearton in North America, was sufficiently convincing as to the efficiency of this novel method of animated picture photography.

C. P. B.

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THE NATIONAL PHYSICAL LABORATORY.

WITH the view of raising funds to complete the additions now in progress at the laboratory, the executive committee of the laboratory last autumn appointed a funds committee, with Sir W. H. White as chairman, and entrusted it with the task of appealing for support to persons interested in their national work.

This work was commenced at Teddington in the year 1901; the great need of an institution such as the laboratory and the importance of its work have been amply demonstrated by its rapid growth. The original buildings comprised Bushy House, granted by the Crown, and an additional building for the engineering department. The wide scope of the work at the present time will be sufficiently indicated by an enumeration of the various buildings, and a brief indication of the purposes for which they are intended.

(1) Bushy House, providing accommodation for administration offices and for divisions dealing with electrical units and standards, general electrical measurements, thermometry, optics, and tide-prediction.

(2) Engineering building, for general engineering research and tests, with additional accommodation for aeronautical investigation, and for the examination of road materials (Road Board Laboratory).

(3) Metallurgy building, for investigations into the properties of metals and alloys.

(4) Electrotechnics building, equipped for researches connected with electricity, and for the testing of alternating- and direct-current instruments of all kinds, as well as of material for electrical purposes; also for photometric work, especially the standardisation of sources of light.

(5) Metrology building, for measurements of length, end gauges, cylindrical gauges, screw gauges, tapes and wires for survey work, &c., the standardisation of weights, and the testing of measures of area and volume, glass vessels, &c.

(6) William Froude National Tank, for experiments on models of ships.

(7) Observatory Department. This section of the work has been housed at Kew Observatory, and includes the testing of thermometers, optical instruments such as telescopes, binoculars, sextants, theodolites, &c., watches, chronometers, and many other types of instruments.

To provide for the research work which is continuously in progress, and occupies perhaps two-thirds of the time of the scientific staff, generous assistance has been afforded by many private individuals, by the City companies, and by all the great technical institutions, some of which have made annual grants for this purpose for many years past.

Some three years ago it was evident that further buildings were needed at Teddington. The accommodation for the metallurgical work was then quite inadequate, while the office and administration rooms were entirely unsuited to their purposes. The library had long overflowed the small room allotted for its use ten years ago. The arrangements for the receipt and dispatch of goods remained much as at the beginning, and it had become increasingly difficult to deal with the apparatus and material sent for test.

Moreover, the optical and thermometric test work at Kew has quite outgrown the opportunities for test at the old observatory, and modern demands require a revision of the methods and appliances available for the work. In addition, a scheme has been approved by the Royal Society and the Government for setting free the observatory for meteorological observations