Notes.

A CELLULOSE-FILM TRANSFER METHOD IN THE STUDY OF FOSSIL PLANTS.—In 1923 an account of a valuable new method of investigating fossil plants, preserved as flattened incrustations, was given in this Journal by Mr. J. Walton. The essentials of this, which may be spoken of as Walton's Canada balsam transfer method, are briefly these: fastening the surface of rock with the fossil to a glass slide by means of a layer of heated Canada balsam of the right consistence; grinding away superfluous rock, without reaching or injuring the specimen; protecting the glass slide with paraffin wax while leaving the back surface of the rock exposed; placing the preparation thus protected in hydrofluoric acid to dissolve the mineral material of the rock. The result in suitable cases is to leave the organic material of the fossil firmly fastened to the Canada balsam on the slide and to expose to observation the side that had been turned towards the rock. Such preparations, after washing, can be kept dry and examined by reflected light, or be mounted in glycerine jelly under a cover-glass. They cannot be mounted in Canada balsam.

Mr. Walton's transfer method has for some time been employed in my laboratory in connexion with the study of fragmentary remains of Old Red Sandstone plants. Experience of certain of its inherent limitations led my laboratory assistant, Mr. E. Ashby, to work out another technique. This, though arising from Walton's method, is so distinct that it may be spoken of as Ashby's cellulose-film transfer method.

The method employed can be stated briefly by giving the main steps in order.

(a) Treat the surface to be transferred with a solution of cellulose acetate in amyl acetate. Other similar solutions can be used, e.g. the trade preparation 'necol', or a solution of celloidin.

(b) Allow the surface to dry thoroughly and, if necessary, repeat the treatment to obtain a sufficiently strong film.

(c) Grind away any superfluous rock, to lessen the mass to be dissolved.

(d) Place the specimen in hydrofluoric acid in a wax vessel until the cellulose film is freed and clear of mineral matter.

(e) Wash the transfer thoroughly in water.

(f) Dehydrate in 95 per cent. alcohol. (Absolute alcohol must not be used.)

(g) Clear in terpinol, oil of bergamot, &c. (Clove oil must not be used.)

(h) Mount in Canada balsam, applying slight pressure with a clip if necessary.

If a thin piece of rock has plant-remains on both surfaces, both can be treated, and two transfers obtained.

The fossils on the rock may be first macerated with Schulze's macerating fluid, washed thoroughly, and allowed to dry. The process above (a–h) then follows.

Ashby's cellulose-film transfer method gets rid of the troublesome details of technique of Walton's Canada balsam transfer method. There are never air bubbles in the preparation, and the film is not only transparent but level. But perhaps the most important limitation that is completely removed concerns permanent mounting. Since the cellulose film can be cleared and mounted flat in balsam, there is not only increased transparency but the preparation can be examined under high

powers. This was usually impossible in the case of the irregular surface of Canada balsam covered with glycerine jelly.

The value and convenience of the new method have been thoroughly tested in work that is in progress, and it seems desirable to make it known to others engaged in similar investigations. While this account appears over my name I wish to make it quite clear that the conception, working out, and testing of the method have been entirely the work of my colleague, Mr. Ashby.

WILLIAM H. LANG.

Barker Cryptogamic Research Laboratory,
University of Manchester.