screen being required to shut the blue part of the purple out! Yet this lens gives particularly sharp images, and is a very strong diatom resolver. Now, however, Herr Winkel has revived the American red corrections with Jena glasses. The result is excellent, for brighter, sharper, or, for their apertures, stronger resolving object-glasses will not be found. This red correction is peculiarly suitable, because a peacock-green glass screen turns red into black, and so makes a strongly contrasted image. When the *Podura* was first examined with the 1/7 of 0·85 N.A., for the moment it was difficult to exclude the idea that one of the American red objectives was not on the nose-piece."

The outstanding colour in the fluorite objectives is of the same red tint. In these, of course, the outstanding colour is less, and their definition leaves nothing to be desired.

"Complanat" is a new word coined by Winkel for a new set of Huyghenian eye-pieces which are strictly achromatic and have a perfectly flat field.

Messrs. Angus have also sent us Winkel's new form of screw micrometer. This is based on a suggestion of Koch's. A combination of scale and screw replaces the combination of screw and thread, giving a ready means of obtaining the exact measurement of objects subtending a number of divisions of the scale, the fractional part only of an interval having to be determined by means of the screw. In the instrument real or lateral displacement is measured to 1/500 mm., one turn of the screw travelling over two divisions of the scale, an arrangement which we think will be found inconvenient.

The microscope stand is a beautifully finished specimen of the Continental model; an extension of the horseshoe backwards would make it more stable. The graduation of the scales in the attachable mechanical stage, and its general finish, leave nothing to be desired; the old reputation of the firm for fine metalwork is still kept up.

We have also received from Messrs. Angus a microscope and objectives representing the latest productions of the eminent firm of Reichert, of Vienna, together with a catalogue. As was to be expected, both the optical and mechanical parts are of the highest excellence. In the catalogue the number of fluorite lenses employed in each apochromatic objective is stated. The apochromatic of N.A. 1·30 sent us is a magnificent lens with little trace of colour, and its definition does not break down under a power of 3000.

THE FLORA OF FORMOSA.

PREVIOUS to the acquisition of Formosa by Japan, in 1895, little was known of the vegetation of the mountains of the interior. Many European collectors had visited the island, but none had been able to penetrate the central range, on account of the hostility of the natives. The Japanese soon organised a Botanical Survey, and several botanists have been engaged in the investigation of the flora, the results of their labours having been published from time to time, mostly in English, with Latin descriptions of the novelties, and figures of some of the most remarkable plants. The forerunner was the "Enumeratio Plantarum Formosanarum," by J. Matsumura and B. Hayata, which appeared in 1906. This was followed in 1908 by Hayata's "Flora Montana Formosæ"; and the same author has now issued a bulky and important supplement.[2] As is stated on the title-page, Dr. Hayata worked out his collections at Kew, where he had the opportunity of studying numerous types of genera and species of Eastern plants first described by the Kew botanists.

This work and its predecessors are mainly statistical, descriptive, and pictorial, though publications on the economic botany of the island are not wanting. However, it is possible to extract much that is interesting in the composition of the flora. Taking Dr. Hayata's own figures, the "Enumeratio" comprises 1999 species, belonging to 701 genera and 153 families; and the present supplement brings the numbers up to 2660, 836, and 156 respectively. It should be explained that these figures relate to the flowering plants and ferns and their allies only. In nearly all its features and generic elements the flora of Formosa is essentially Chinese, with a very large number of peculiar species. In all probability the number of species existing is far from exhausted; but the very small generic endemic element is not likely to be much increased by future explorations. Excluding ferns, Forbes and Hemsley's "Enumeration of Chinese Plants" includes representatives of 159 families, so that there are nearly as many in the smaller area as in the large. The same fact comes out in comparing a county flora with that of the whole of England, for example. Although the mountains rise to upwards of 13,000 feet, there is no real alpine flora in Formosa, though many genera are represented that are common to temperate and alpine zones.

Of the Cupuliferæ, the genera Fagus, Alnus, Carpinus, Castanea, Castanopsis, and Quercus are represented, the last-named by thirty-two species. Salix is represented by several species; Populus absent. About five and twenty Coniferæ are recorded, including *Chamaecyparis formosensis*, *Cunninghamia Konishii*, *Juniperus morrisonicola*, *J. formosana*, *Picea morrisonicola*, *Pinus formosana*, *P. taiwanensis*, *Tsuga formosana*, and *Taiwania cryptomerioides*, all of which are supposed to be peculiar to the island. The last is a monotypic genus endemic in Formosa. Nepenthes is not known to occur, nor Pedicularis, whereas in China there are about 150 species of the latter.

Vascular cryptogams are evidently strongly represented, as already there are on record upwards of 300 species of ferns, about twelve species each of Lycopodium and Selaginella, and two species of Equisetum. Orchids number about sixty species, mostly small-flowered and inconspicuous. The foregoing totals are partly compiled from Takiya Kawakami's "A List of Plants of Formosa," published in 1910.

W. BOTTING HEMSLEY.

THE INDIAN SALTPETRE INDUSTRY.[1]

THE production of potassium nitrate in India is probably a very ancient industry, and at the present time, in spite of German competition, the export still amounts to about 20,000 tons per annum. As is well known, the potassium nitrate is extracted by natives from soil collected in the villages, where in all probability it has been formed by bacterial decomposition of the organic matter, with production first of ammonia and subsequently of nitrates. The chemical and bacteriological changes have not yet been studied, but the actual methods of extraction have recently been described by Dr. Leather and Mr. Mukerji in a well-illustrated bulletin issued by the Pusa Research Station.

The soil from which the crude saltpetre is extracted usually contains about 3 to 5 per cent. of pure potassium nitrate, although there may be as little as 1 per cent. or as much as 29 per cent.; chlorides and sulphates are invariably present as well. The soil is scraped together in small quantities and collected by a very low caste called "Nuniah" or "Lunia," who also carry out the extraction process. An earthen chamber, called the "Kuria" or "Kothi," is first made of wet mud and then allowed to dry; the floor of this slopes somewhat from back to front, where a hole is made at the lowest point for the escape of the nitrate liquor. Raised a few inches above the floor, and supported by a few loose bricks, is a false bottom made of bamboos and matting, on which the saltpetre earth is laid with the greatest care and so trodden in that no crevices shall exist. As a rule wood ashes are mixed with the earth beforehand. The filling-in process is stopped when the layer of soil is about 6 to 8 inches in thickness; a small piece of matting is then laid on the top, and water is poured in until about one inch lies on the surface of the soil. Several hours elapse before the water has percolated and begun to flow out from the hole. It usually emerges as a fairly concentrated clear solution, coloured brown by

[1] A delicate test for colour is the raphæ of a Cherryfield Rhomboides, when mounted in balsam, quinidine, or styrax.

[2] Materials for a Flora of Formosa. Supplementary Notes to the Enumeratio Plantarum Formosanarum and Flora Montana Formosæ, based on a Study of the Collections of the Botanical Surveys of the Government of Formosa, principally made at the Herbarium of the Royal Gardens, Kew. Journal of the College of Science, Imperial University of Tokyo, vol. xxx., 1911, pp. 471.

[1] "The Indian Saltpetre Industry." By J. W. Leather and Jatindra Nath Mukerji. Agricultural Research Institute, Pusa. Bulletin No. 24, 1911.