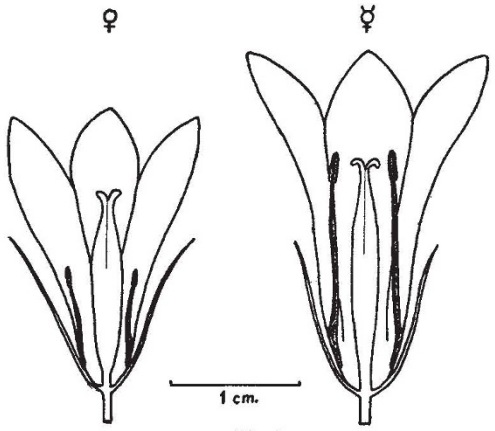

Fig. 1

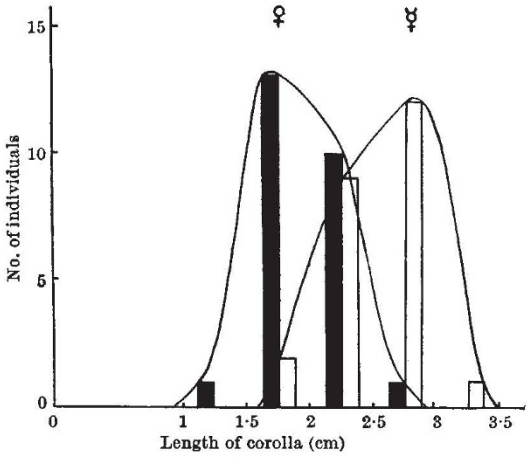

Fig. 2

shows the measurements of corolla length for 25 individuals of each sex.

So far as we are aware, this is the first time that gynodiœcy has been reported for members of the family Gentianaceae. (New Zealand gentians are not close congeners of northern hemisphere species. They belong to a natural group, possibly a distinct genus, found in New Zealand, Tasmania, Australia and South America.) Investigation of possible heterœcy in other members of the family is warranted, since most Floras describe the perfect flower as a family characteristic in the Gentianaceae.

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[1] Burrows, C. J., *Trans. Roy. Soc. N.Z.*, **88**, 1, 29 (1960).

The observations of Burrows and Hobbs (preceding communication) direct attention again to one of the peculiarities of the New Zealand flora. As far back as 1880, Thomson[1] had observed that "species, genera and families which are characterized by hermaphrodite flowers in other parts are frequently unisexual here". Later work has brought to light a number of examples of gynodiœcy and other sex forms in New Zealand plants that were unknown to Thomson. In December 1961 I noted another in *Ranunculus*, a genus in which gynodiœcism had not hitherto been reported. A large colony of *R. limosella* F. Muell. ex Kirk consisting of many thousands of plants occupying several acres of the dried-up bed of Lake Forsyth on the Banks Peninsula was inspected and a pad of the lake mud was removed to observe the plants in detail. Some of the flowers in this sample were without stamens, and observations over the next few days on freshly opened flowers established that some purely female plants were present with the normal hermaphrodite form. A week later, the site was revisited with Dr. E. J. Godley and a search was made for female plants. None was found until the site of the original sample was rediscovered. At this point there was a small colony of female plants. It is evident that the proportion of female plants in the Lake Forsyth population as a whole was extremely small. A search for female plants in other localities established their presence over a wide area in Canterbury so that gynodiœcism appears to be a normal feature of this species.

According to Parsons[2], the proportion of diœcism in the South Australian flora is significantly greater than in European floras. This he attributed to climatic factors. Comparison with New Zealand, which has a widely different climate and a high incidence of sex forms, does not suggest that climate is of major importance. It is more probable that the important factors are biological and concerned with the pollinating organisms. In Australia brilliantly coloured flowers are abundant and are associated with a high frequency of bird pollination and a numerous fauna of large Lepidoptera. The few brilliantly coloured flowers in New Zealand are bird pollinated, while the majority are small, white or pale yellow in hue and adapted for pollination by flies and beetles; large Lepidoptera are scarce. One factor in common between Australia and New Zealand is the absence of any native large colonial Hymenoptera. Colonial bees in the northern hemisphere are a major factor in effecting cross-pollination, and many floral mechanisms in hermaphrodite plants help to ensure that outbreeding takes place. In the absence of colonial bees, the advantages of outbreeding can be obtained to various degrees by partial or complete separation of stamens and pistils. Conditions in Australia may be expected to favour the evolution of such sexual forms, while in New Zealand the small number of species of bird pollinators and of large Lepidoptera should tend to shift the balance even more in their favour.

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[1] Thomson, G. M., *Trans. N.Z. Inst.*, **13**, 241 (1880).
[2] Parsons, P. A., *Nature*, **181**, 1673 (1958).

Free Sugars in Spores of *Pithomyces chartarum*

Very few analyses of free sugars have been reported in fungal spores. Owens *et al.*[1] found 9·3 per cent hot-water soluble carbohydrate in conidia of *Neurospora sitophila* but only 0·06 per cent free sugars, principally glucose. Other authors[2,3] have found higher amounts of free sugars in fungi. Sussman and Lingappa[4] found 10 per cent trehalose in ascospores of *Neurospora tetrasperma*, while other fungi[5] and yeasts[6] also contain trehalose, often as the main carbohydrate reserve. The conidia of *Neurospora sitophila*, however, apparently contain none[1]. Irani and Ganapathi[2] found free glucose, ribose and a trace of galactose in the mycelium of *Penicillium chrysogenum*. This report gives results of a study of the free sugars in the spores of *Pithomyces chartarum* (Berk. and Curt.) M. B. Ellis.

Spores were collected from rye-corn cultures[7] after drying at 40° for several days. Extraction of sugars from the spores by the usual method with hot 80 per cent (v/v) ethanol was found to be unsatisfactory. Despite thorough desalting, all paper chromatograms streaked badly. Extracts were therefore prepared by disrupting a suspension of spores (1 g in 5 ml. water) in a Hughes press[8]. After centrifuging the resulting homogenate,