

produce fruit."¹ Perhaps therefore *Voandzeia* may have to be expunged from the list of cleistogamic plants, while on the other hand *Krascheninikowia*, according to a thoughtful criticism of Mr. Darwin's book in the *Journal of Botany*, must be restored to it.

It may also be noted that according to Bentham *Martinsia* was a genus founded on a cleistogamic state of *Clitoria glycinoides*; *Cologania* also should possibly be added to the list since Zuccarini's *Martia mexicana* appears to be an apetalous condition of some species of the genus.

Although the habit of producing cleistogamic flowers is pretty widely diffused amongst flowering plants it is locally concentrated in particular groups. This is particularly true in the case, as Mr. Darwin has pointed out, of *Malpighiaceæ* and *Acanthaceæ*, and amongst *Leguminosæ* in the *Glycinææ*. The genus *Viola* is remarkable in this respect; it is rich in cleistogamic species except in the section *Melanium*, to which *V. tricolor* belongs. In this species, besides conspicuous flowers adapted for self-fertilisation, smaller and less conspicuous flowers adapted for self-fertilisation are produced. These are not closed, but, as Mr. Darwin points out, "they approach in nature cleistogamic flowers," and though they differ in being produced on distinct plants they are perhaps destined to be as completely modified as the self-fertilising flowers of other sections of the genus.

The question as to the causes predisposing to the production of cleistogamic flowers is one of very great interest. In the first place Mr. Darwin points out that the larger proportion of known cases belong to plants with irregular flowers, that is, to plants whose flowers have been adapted for insect cross-fertilisation. Cleistogamy in this light is a resource to fall back upon when the elaborate adaptations for making insects do their work fail, as they seem to do more or less in *Viola*. It is a remarkable contrast that in heterostyled flowers, which are absolutely dependent upon insects for their legitimate fertilisation, irregular flowers are extremely exceptional, the adaptation, as far as it goes, being so complete that anything further in that direction is superfluous.

Four cleistogamic genera are normally wind-fertilised, and this shows that the cause alluded to above must be a subordinate one. Mr. Darwin urges with much force as the most potent agency, the unfavourable influence of climatic changes. From the time of Linnæus, it has been observed that exotic plants may be fertile, though their flowers have never attained proper expansion, that is to say, for the nonce they have become cleistogamic and self-fertile. The same thing occurs on a large scale with *Funcus bufonius*, in Russia, which in some districts never bears perfect flowers, while in Liguria, *Viola odorata* never bears cleistogamic ones. It is perhaps, however, doubtful whether winter-flowering plants are absolutely sterile, since the well-known *Chimonanthus*, whose name records its habit, is known to fruit, though sparingly, in this country. The evidence is, however, strong enough to render it highly probable that plants which are normally cross-fertilised, are driven into the abasement of cleistogamy when their geographical limits are extended beyond the limits not favourable to their receiving visits from appropriate insects, or to their properly expanding their flowers.

Here our comments must cease, content for our part if they attract a few more readers to a most fascinating research.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

Elements of Articulate Speech

As a corollary to the interesting observation with the phonograph recorded by Prof. Fleeming Jenkin and Mr. Ewing in the last number of NATURE, will you allow me to point out that every capital letter of the Greek alphabet except Γ and Π is actually (either as written or when turned through an angle of 90°) a reversible or a reduplicate symbol.

With regard to gamma, although the capital is not, the small letter (γ) is reversible; and as to Π (or R, which is another ancient Greek form of it), many facts seem to show that by itself it does not as a rule represent a complete part of articulate speech; witness its frequent reduplication in Greek, the aspirate so often employed with it both in Greek and Latin, and the way in which it is frequently omitted, as if of no importance, from Latin words ordinarily spelt with it. The French or Italian pronunciation of this letter amounts to a reduplication in the English ear, while the English pronunciation of it amounts to its omission altogether in the ear of a Frenchman, an Italian, or a Scotchman.

In the Roman alphabet F, G, L, P, and R, are the exceptions; much might be said about each of these, but I will content myself by saying that L is obviously only an apparent exception, as it is easily derived from A. W. H. CORFIELD
10, Bolton Row, Mayfair, March 30

Phonoidoscopic Representation of Vowels and Diphthongs

I HAVE just obtained the two following results with the phoneidoscope¹ :—

1. If a vowel be steadily sung on a single note, a constant colour-figure is produced; but if the vowel be spoken in the ordinary conversational tone, a change of figure occurs before the sound ceases. The slurring alteration of pitch which takes place in pronouncing a single vowel is thus rendered perceptible by the eye.

2. When a diphthong is slowly intoned, two distinct figures successively present themselves, which are found on trial to be those corresponding to its constituent vowel-sounds. The two-fold nature asserted in the word "diphthong" receives by this experiment a visible illustration. SEDLEY TAYLOR

Trinity College, Cambridge, April 1

The Southern Drought

YOU ask in last week's NATURE (p. 436) for information respecting the drought in the southern hemisphere. A few days ago I received letters from Samoa and the Gilbert Islands telling me of its severity there. Droughts are of frequent occurrence in the Gilbert Islands, but my correspondent (a native of Samoa) tells me they have had an extraordinary one there, which commenced in 1876, and which continued up to the date of his letter—December 4, 1877. He says many of the people have died from starvation in consequence.

A letter from a missionary who has been forty years in Samoa contains the following :—"We have had the greatest drought I have ever known." The Samoan Islands are wonderfully fertile, and even during what is called the dry season it is rarely that more than a fortnight passes without rain. The atmosphere is always full of moisture, and there are very heavy dews at night, so that the vegetation never gets burnt up, except the drought be very extraordinary. Now, however, my correspondents speak of scarcity of food in those most fertile islands.

Blackheath, March 29

S. J. WHITMEE

[Can our correspondent favour us with the date of the last drought or series of droughts?—ED.]

¹ *Journal. Lin. Soc., Bot. xi. p. 295.*

¹ See NATURE, vol. xvii. p. 426, note 2.