

remarkable discoveries in science during the last decade." This object he attains. His style is clear and straightforward, and, without being "sensational," he knows how to present facts and principles in a way that is likely to arrest attention and awaken curiosity. Among the subjects dealt with are the formation of dew, the colour of water, dust and fogs, lightning, sun-spots, after-glows, the enumeration of organisms in air, micro-organisms in water, and characteristics of deep-sea fishes. The first edition was issued about two years ago. In the present edition the author has added a few notes to bring the facts up to date.

#### LETTERS TO THE EDITOR.

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#### County Councils and Technical Education.

YOUR article of April 30 (vol. xliii. p. 602) is scarcely fair to the London County Council.

When you allege that the Council "have 'grabbed' a fund, ear-marked for educational purposes," you assume the question at issue. The only way in which the fund in question is "ear-marked" for educational purposes is by a clause in the Act which gives each Council a discretionary power to apply the fund either to those purposes or to other purposes, as they choose.

London, which, as proved by Mr. Goschen, is exceptionally rated, has come badly off in the general scramble for Imperial doles which are devoted to the alleviation of rates; and if the representatives of London ratepayers treat this additional dole out of the beer and spirit duties as a make-up for their comparatively small share of other doles, they are doing not only what the law allows, but what equity justifies.

I believe, however, that amongst those who voted against the plan proposed by the Committee of the Council there are many who would not be unwilling to see the money devoted to education, if any well-considered and reasonable plan were proposed for this purpose.

But there are several questions which have to be answered before this can be done properly.

What do the promoters of "technical education" mean by that term? It is not to be the teaching of the elementary school; it is not to be the training of the workshop; but between these two extremes all is uncertain. The counties say, "instruction in the elements of farming"; the London County Council Committee says, "Polytechnics"; the statute says, "whatever the authorities at South Kensington define it to be." Educational reformers generally, so far as I can judge, mean by it all or any forms of secondary education, *i.e.* of the education which carries forward the work of the elementary school, and brings the pupil nearer to the business of life. But we need to be a good deal more precise before we establish a precedent and a practice.

Then, again, is it wise for the London County Council, which has work enough on its hands in looking after the physical condition of this great City, to take upon itself a task for which it is in no way fitted, and which was not contemplated when it was elected? Is it wise to muddle administration by first intrusting one part of education to one elective body—*viz.* the School Board—and then intrusting another part of it to a different elective body chosen for a different purpose?

Whilst such questions as these remain unanswered, the London Council exercises a wise discretion in not committing itself to any scheme for appropriating this fund, the offspring of a legislative fluke, to any special and permanent object.

You speak, as persons in general speak, of the London County Council as one amongst other County Councils. The name County Council is a misnomer which leads to constant errors. The London County Council has little or nothing in common with the bodies which have taken the place of the old magistracy in most districts. It is really the chief Town Council of the largest city or aggregation of cities in the world, and the rules and reasoning which, under the ill-drawn and ill-digested Local Government Act, are applied to both, are often singularly in-

appropriate. Calling London a county is the parent of endless mistakes; and to abuse the London Council because it is not acting in the same way as the Councils of counties seem disposed to act is no less confused than unfair.

T. H. FARRER.

May 5.

#### The Alpine Flora.

I HAD not intended to continue the discussion on this subject, but Prof. Henslow's last letter calls for a few remarks. My argument, summed up, is as follows:—

(1) Alpine plants as a class show certain characters, *e.g.* dwarfing and compact growth.

(2) These characters are advantageous to them, or are correlated with such as are advantageous.

(3) Although dwarfing, &c., may be produced as the direct result of environment (*e.g.* poor soil), there is normal variability in respect to size, time of maturing, &c.

(4) When in cultivation those plants are selected which show a natural tendency to dwarfing, &c., it is found that the character is inherited; and in this way, dwarfed, early-maturing, and other peculiar races can be produced.

(5) On the other hand, when plants have been dwarfed from growing in poor soil, or otherwise as the result of environment acting directly upon them, there *appears* to be no evidence to show that the peculiarity is inherited.

(6) Supposing natural selection to be the only factor, it is fully competent, working on the normal variability, to produce the results observed, *so far as they are hereditary*. At least, so it seems to me.

To illustrate the point, take *Mertensia* again. In Colorado, *M. sibirica* grows in ravines, &c., by creeks; it could not possibly grow in the same way above timber-line, with its tall stems and abundant foliage. Yet it gains much advantage in the creek-bottoms from its height and rank growth; if it were a dwarf, it would be almost or altogether smothered. Above timber-line, on the Sangre de Cristo Range, I found the dwarf species, *M. lanceolata*. Thus we have two species frequenting different situations in the same district: each is fitted for its station; either, removed to the station of the other, could not exist. In Arctic regions, *M. sibirica* has produced a dwarf variety called *drummondii*, which is, I suppose, a first step towards the establishment of a dwarf Arctic species.

Prof. Henslow asks why, if natural selection eliminates tall plants on Alpine summits, it does not also do so lower down? I am not at all clear that it does not, in some cases. For example, why is it that plants growing on exposed sea-shores have a tendency to lie upon the ground or otherwise to evade the violence of the winds? But when a plant is growing among others, it has to compete with them in raising itself into conspicuousness, and any slight disadvantage from exposure to the winds would be more than compensated by the advantage of being able to spread its flowers and foliage in the sunlight and attract insects.

The only plant of any size I found above timber-line on the Sangre de Cristo Range was *Cnicus erioccephalus*, a wonderful great thistle, with bright chrome-yellow flowers, which are visited by humble-bees. But this plant is very prickly and woolly, and its heads are nodding; it is, though it seems paradoxical to say so, a gigantic dwarf.

The splendid *Primula parryi* shows its crimson flowers by creeks at very high altitudes in Colorado; an allied but *very small* species lives above timber-line in the same districts, called *P. angustifolia*. These are true species; *angustifolia* is not starved or frozen *parryi*. Now *P. parryi* is coming into cultivation, it would be interesting to see whether it could be modified by environment in the direction of *angustifolia*, and how far such modification would be inherited.

There are other matters one might discuss, but I think I have already written enough. I merely ask, will Prof. Henslow give a case in which the direct effect of environment *has* produced inherited dwarfing? Will he also show that natural selection cannot produce a dwarfed variety, or that artificial selection has not?

T. D. A. COCKERELL.

3 Fairfax Road, Bedford Park, Chiswick, W., April 27.

MR. THISELTON-DYER, in his interesting letter in NATURE (p. 581), does not mention one of the striking characteristics of the Alpine flora—the remarkable brilliancy of the flowers, as compared with those borne by the same or similar species in