hydrogen-ion concentration and the flora of a soil is mediate, and not immediate. Hoagland has shown that barley will withstand a very much greater hydrogen-ion concentration in a water-culture solution than it will tolerate in a soil. Also, it is known that plants which are usually very susceptible to acidity will thrive in certain soils of California and Sweden the pH of which is between 4 and 5, and that those plants growing in those soils show no response to liming. The inference is that the effect of the hydrogen-ion concentration of the soil on plants is indirect, and that there is some ulterior factor the fluctuations of which are commonly, but not invariably, accompanied by fluctuations of hydrogen-ion concentration. In the search for that ulterior factor it has been fairly well demonstrated that in many soils certain polyvalent ions (chiefly aluminium ions) are the primary cause of the effect of acid soils upon plants. It is clear that in mineral soils variations in the aluminium-ion concentration will roughly correspond with variations in the hydrogen-ion concentration.

I am not aware that any explanation has been advanced to account for the fact stated above, that in some soils a high hydrogen-ion concentration is not accompanied by that effect on plants which usually accompanies such hydrogen-ion concentration in soils. The fact alone seems to preclude any possibility of the effect in question being directly and immediately due to the hydrogen-ion, and if it is due to the aluminium-ion it remains to be shown that a high hydrogen-ion concentration in a soil may sometimes exist without a corresponding concentration of aluminium-ion. That may occur in the presence of much organic matter, for it is well known that in the presence of almost any hydroxy-organic compound aluminium (and ferric) ions are "masked." Presumably the aluminium, in such circumstances, becomes part of a complex electro-negative ion—certainly it does not behave chemically like the aluminium-ion.

So far as I can ascertain, the Californian and Swedish soils that have a high hydrogen-ion concentration which is without detriment to plant growth are all peat soils, and it seems likely that the absence of "sourness" in the presence of acidity may be due to the effect of certain organic compounds upon aluminium salts. This possibility is being investigated here and it seems to offer a solution of some other soil-plant problems.

The accumulation of such valuable data as that given by Dr. Atkins is, as that writer says, necessarily slow. Even at the risk of making it slower it seems important to remember that the ultimate interpretation of such data is likely to be possible only in the light of detailed knowledge of the soils concerned. The relation of hydrogen-ion concentration to plant growth is a relatively simple problem: the relation of the hydrogen-ion concentration of the soil to plant growth is a very complex problem.

NORMAN M. COMBER.

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September 17.

The "Proletarianisation of Science" in Russia.

LIKE the majority of people in this country, where the news we receive about what is going on in Russia is often misleading, I know little about the working of the "proletarianisation of science" on which Dr. Boris Sokoloff writes in *NATURE* of September 1. But the omission by Dr. Sokoloff of any account of the constructive elements of this "proletarianisation," with one of which I have

recently become acquainted, suggests that he is more concerned with spreading propaganda against "Bolshevism" than with giving an outline of all the features, good and bad, of the attitude of Bolshevism to science.

The particular constructive element to which I refer is the effort of the Soviet Government to bring the fundamental conclusions of scientific thought within the reach of the "proletariat" with the deliberate purpose of shaping the mental outlook of the masses, and especially of the rising generation, in such a way that the standard of values in everyday affairs will be based on a naturalistic interpretation of man's environment and of his relations to it. In pursuance of this end the Soviet Government has already issued a whole series of elementary text-books ("Estestvenno-Nauchnaya Biblioteka"), which aim at explaining the scientific position in terms intelligible to the "proletariat," many of whom have learned to read only since the advent of Bolshevism. They are written by scientific men who have remained in Russia, and who, like most of our own men of science during the war, have temporarily suspended their "free" researches in order to take part in work directed to particular ends considered by the State to be more immediately important under the existing emergency. The series includes such subjects as "How Man Arose," "Human and Animal Evolution," "The Origin of the World," "What Chemistry and Physics Teach Us," "Popular Astronomy," "Brain and Spirit," "Outline of the History of Geological Knowledge" (by Prof. A. P. Pavlov), etc., as well as translations of Geikie's "Physical Geography" and other books.

It would be difficult to imagine the present Government of any of the nations of Western or Central Europe, evincing such a faith in science, as able to bring about the "change of heart" on which alone a new society could be founded, that in the midst of all the horrors of blockade, invasion, and civil war its publishing department would issue broadcast to the "proletariat" a whole library of introductions to scientific thought.

H. LYSTER JAMESON.

Bees and Scarlet-runner Beans.

I HAVE been much interested by Mr. Harford J. Lowe's letters upon this subject in *NATURE* (August 12, 1920, and July 28 and August 11, 1921), and have been led by them to observe the runner beans in my own garden, which lies fourteen miles to the north-west of London. My experience differs somewhat from Mr. Lowe's, and may be worth recording. Although I searched diligently through the whole summer, I did not, until September 1, find a single open flower that had not been pierced through the base of the corolla by the humble-bees in the way described. During the drought there was never more than an occasional pod, although the plants were strong and the flowers very abundant. But after the rain which fell on August 17 pods at once began to form freely, and there has been a plentiful and continuous crop ever since. I then examined the withered petals clinging to the young pods, and found that these also had always been pierced at the base.

It is clear, therefore, that the evil practice of the humble-bees does not necessarily lead to barrenness, and may possibly not do any harm at all. The drought is indicated as the direct or indirect cause of the initial failure of the crop. Now, in mid-September, the humble-bees do not come out so early, and in the morning I have found a very small proportion of uninjured flowers which were being visited by the honey-bees through the legitimate entrance.

H. B. HEYWOOD.