continuity ") and in independent sequences (the "test of agreement with other records ") are often more important criteria of reality than is the height of the intensity itself. The former test, at least, should never be neglected; it has led me to relegate to my fourth class as merely "possible," several periods, such as those near 11, 17, and 24 years, indicated by high intensities in the whole sequence, but failing in either the first or the second half.

Ultimately, of my fifteen intensities between 5 and 40 years, I have treated only nine (at 5·100,  $5\cdot671$ ,  $5\cdot960$ ,  $8\cdot050$ ,  $9\cdot750$ ,  $12\cdot840$ ,  $15\cdot225$ ,  $19\cdot900$ , and  $35\cdot500$  years respectively) as certainly or probably due to real periodicities, because they show in all cases perfect or fair continuity and in most an agreement with other records. The smallest of these fifteen intensities ( $21\cdot72$  at  $7\cdot417$  years) in fact equals not 3a but  $3\cdot683a$ . If with this revised figure, the probabilities are calculated in the way suggested by Dr. Walker, the odds that at least nine of the fifteen intensities are not due to luck work out at more than 2000 to I, while the odds in favour of seven at least are 14,000 to I.

This remarkable result, which seems to establish beyond all reasonable doubt the reign of periodicities in wheat prices, is not affected by the fact that of the fifteen intensities only four are so high that any one of the four, if it occurred alone and had to be judged by height alone, would have odds of more than 20 to 1 in its favour. Each intensity does not occur alone. Every period, moreover, to which I attach importance rests on more evidence than mere height in my periodogram.

With reference to the last paragraph but one of Dr. Walker's note, on the relation of my synthetic curve and the rainfall, I should like to emphasise the point made in my paper (pp. 449-450) that the synthetic curve as now drawn represents only a first approximation of the roughest possible character; the correlation co-efficient of 0.38 between it and the rainfall from 1850 to 1921 is sufficient to demonstrate some connexion between the wheat price cycles and the rainfall, but is in no sense to be treated as a measure of the degree of connexion. In constructing the syn-thetic curve, for instance, the periodicities have all been treated as of equal importance; inspection shows that weighting according to the intensities would almost certainly give a better fit and so a higher co-efficient of correlation. In many other ways a more accurate determination of the cycles is required. How high a correlation might ultimately be obtained as the result of this, it is impossible now to say, but it might easily prove to be very high indeed. Unfortunately, I have no resources for carrying my own investigations further for the present; I can only hope that others may be better placed. W. H. BEVERIDGE.

## One Possible Cause for Atmospheric Electric Phenomena,—A Query.

MAY I ask Sir Arthur Schuster or Dr. Chree or some other authority whether there is any serious objection to an idea like the following :

The sun being radio-active emits not only gamma rays, which ionise the atmosphere, but also alpha and beta particles. The alpha particles will be stopped by the upper layers of atmosphere, charging them positively, while the beta particles will be more penetrating, and might even reach the ground, charging it negatively; though I admit that thirty inches of mercury is a serious obstruction. But, as Arrhenius showed, the beta particles would be

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magnetically inveigled towards the poles, where they might descend with down currents: whereas the alpha particles—most numerous near the tropics would be sustained by up currents; and thereafter the separated charges would reunite with familiar dielectric disruption. OLIVER LODGE.

Normanton, Lake, Salisbury, Sept. 29.

## School Instruction in Botany.

In the article on "School Instruction in Botany" in NATURE of September 2, p. 329, the report on the botany gardens of the James Allen's Girls' School, recently published by the Board of Education, was reviewed. As I am not only the author of the report but also the initiator and organiser of the botany gardens at Dulwich, I shall be glad if space can be afforded me to reply to the following comment at the end of the article: "No mention is made in the Report of the utilisation of the botany gardens for the observation of animal life." The omission is due to the fact that the report was written in 1915 (see prefatory note) when some of the "gardens," which are now of great help in studying animal life,

For example, in 1915 the oak trees in the new wood were only from three to four years old and looked somewhat like sticks, as shown in Plate 10. Since 1915 the trees have grown so much that blackbirds, hedge sparrows, and a thrush have built nests, laid their eggs and in all cases but one reared their young in our wood. Advantage of this has been taken and many girls have visited the nests. During outdoor lessons, girls have learned to recognise birds which frequent the school garden, and have become familiar with their calls and songs.

In the spring term the awakening of the numerous frogs which hibernate in the school pond is eagerly awaited. For a short period the pond is densely populated by hundreds of croaking frogs. Later, the development of the tadpoles through all the stages is watched with the keenest interest by girls of all ages. Observation of animal life in the pond includes the study of the life-histories of china mark moths, dragon flies, newts, great water beetles, water boatmen, and water snails. On one occasion last term many girls watched the various stages in the emergence of a china mark moth from its chrysalis.

In these and in other ways the botany gardens at the James Allen's Girls' School are utilised for the observation of animal life. LILIAN J. CLARKE. James Allen's Girls' School,

East Dulwich Grove, S.E.22, September 28.

## Transcription of Russian Names.

IN his further letter (NATURE, July 15, p. 78) Lord Gleichen refers to the Royal Geographical Society's System (II.) for the transcription of foreign alphabets into English. A copy of this system has just reached us and impresses us with its completeness and utility, especially for rendering place-names into English.

With regard to the transcription of Russian names we agree with Lord Gleichen that French, German, and hybrid transcriptions are unsatisfactory, but we would advocate, with Prof. Brauner, an international system, and for this purpose the Czech transcriptions have much to recommend them.

In the first place, the Serbian alphabet contains fewer letters than the Russian, and is thus inadequate to allow of accurate transcription from Russian by