

result of these it appears in the period July to October, which is usually taken as the flood period, the discharge of 1913 is between 50 and 60 per cent. below the average. In early times the effect of such a flood would have been disastrous, but the recent raising of the Aswan Dam, the reservoir being filled to its full capacity for the first time this year, and the construction or strengthening of the four barrages on the Nile, have removed the possibility of extensive loss and enabled the deficiency, due to the late arrival of the flood, to be tided over.

There is no need to point out the importance to Egypt of a knowledge of the causes of the Nile flood, and of the value of a prediction which could be given with fair accuracy a month beforehand. The flood of this year having been so exceptional, there is every possibility that useful clues may be obtained to its detailed causes, and to further this object I should be glad to have copies of any meteorological observations made in Central and South Africa, and the South Atlantic in this and previous years.

H. E. HURST.

Meteorological Office, Survey Department,  
Giza (Mudiria), Egypt.

#### Pianoforte Touch.

I do not think that Prof. Bryan will find any difficulty in sounding a single note of the same loudness a sufficient number of times for the test suggested, if he eliminates, as I did, those which are perceptibly louder or softer than the average; and the task for the listener is a very different one from sipping blind-fold coffee and tea, where the two different tastes persist for a long time, and soon become hopelessly superposed. Certainly the problem as to whether a difference is caused by the nature of the blow given to the strings cannot be solved by playing a succession of notes, instead of a single one, for such a succession at once introduces a number of other factors.

The instrument which I used was an Erard grand of the latest type. Such an instrument, owing to the fact that the hammer strikes the string twice for each blow on the keys, is specifically favourable for producing differences which might be impossible in other cases.

SPENCER PICKERING.

MR. PICKERING tells us that in his latest Erard piano "the hammer strikes the string twice for each blow on the keys." If this is really the case the statement will go a long way towards clearing up the theoretical difficulties which have arisen in the attempt to explain the possible production of variations of tone quality by differences of touch. It is very difficult to obtain any definite information regarding the action of pianoforte hammers. Both Helmholtz's and Kaufmann's theories are inadequate, and an investigation recently started with one of my pupils seems to show that the action is much more complex than is usually supposed. But inquiries in other directions have merely elicited the dogmatic statement that the whole object of the check action is to prevent the hammer striking the string twice. In my Collard horizontal piano of 1892 the arrangement of the check action is distinctly favourable to a multiple impact, for when the action is removed and the hammer projected into the air it certainly rebounds considerably. Granting such an action to take place, we are no longer thrown back on the vibrating-shaft theory as the only possible explanation. The extent to which such effects are or are not noticed must necessarily be a matter of personal opinion, although I hope shortly to repeat the experiment described by Mr. Pickering when I can obtain a music-roll cut with the necessary repetitions.

G. H. BRYAN.

#### Alfred Russel Wallace Memorials.

MAY we appeal through these columns to men of science, both here and abroad, to contribute to a fund which we are raising for the purpose of placing a suitable memorial to the late Dr. Alfred Russel Wallace in Westminster Abbey? We should like also to be able to offer to the Royal Society a posthumous portrait of the late distinguished naturalist, and Mr. J. Seymour Lucas, R.A., has consented to execute this work. It is further contemplated that a statue or bust should be offered to the trustees of the British Museum (Natural History) if the necessary fund is subscribed. In view of the great services to the cause of science rendered by Darwin's contemporary and colleague, the duty of handing down to posterity a memorial worthy of the man and his work obviously devolves upon those of the present generation who have in so many diverse ways benefited both by his teaching and by his example. The whole sum asked for to enable us to carry out all the objects which we have in view is comparatively modest, viz. 1100*l.*, and we hope that this amount will be reached. The preliminary list of subscribers is sufficiently weighty to convince us that in undertaking the organisation of this movement we have not only the sympathy of the scientific world, but also the approbation of leaders of thought and of culture in other spheres of activity. Thirty fellows of the Royal Society, including the present and past presidents, have already given their adherence, and among those representative of other interests will be found the names of Mr. Arthur Balfour, Lord Haldane, Dr. Warren, the president of Magdalen, and the Dean of Westminster. We have only to add that permission to place the memorial, which it is proposed should be in the form of a medallion with a suitable inscription, in Westminster Abbey, has been cordially given by the Dean and Chapter.

We shall be willing to receive and acknowledge subscriptions, but it will be most convenient if these are sent directly to the manager, Union of London and Smith's Bank, Holborn Circus, E.C., in the form of cheques made payable to the "Alfred Russel Wallace Memorial Fund."

RAPHAEL MELDOLA,

6 Brunswick Square, W.C.

EDWARD B. POULTON,

Wykeham House, Oxford.

JAMES MARCHANT,

(Secretary), 42 Great Russell Street, W.C.

THE family of the late Dr. Alfred Russel Wallace having invited me to arrange and edit a volume of letters and reminiscences, they would be thankful if those of your readers who have letters of reminiscences would kindly send them to me for this purpose. The letters would be safely and promptly returned.

Will provincial American, Colonial, and foreign newspapers kindly republish this letter?

JAMES MARCHANT.

Lochnagar, Edenbridge, Kent.

#### Distance of the Visible Horizon.

ABOUT forty years ago I learnt a formula which I have used ever since. It was  $7x=4y^2$ ;  $x$ =height of observer in feet,  $y$ =distance of horizon in miles. I do not now know where I found this formula, but it will be seen, if a few examples are worked out, that it agrees very closely with that given in your issue of November 20. At 1000 ft., for instance, the distances are 42 and 41.9 miles respectively.

R. LANGTON COLE.

Sutton, Surrey, November 30.