after one trial of this *spectral* music, to take refuge in the awful solitudes described by Dante:—

" —— dove *il Sol tace.*"

Trinity College, Cambridge SEDLEY TAYLOR

Solar Spots Visible to the Naked Eye

OWING to the smoke and clouds which generally obscure the sky at Glasgow, opportunities to observe the phenomena of the heavens are very rare.

When gazing at the sun this morning (February 16th), I observed on its disc a dark line on the upper half of the disc. In order to convince myself that it was not a delusion, I directed a small pocket telescope (magnifying power about six times linear) and observed several spots. The principal one, as near as I could guess, was 5′ long by 1′ broad.

I would be glad to hear the extent of it from any one of your correspondents, who has measured it, as it must have been of enormous dimensions.

Argyle Street, Glasgow ROBERT M'CLURE

[The dimensions of this spot have been taken by M. Tremischini, who communicated his observations to the French Academy of Sciences at the meeting on the 14th inst., as will be seen from our report of the proceedings further on.—ED.]

Flight of Birds

IN reply to J. H.'s query respecting the flight of the albatross mentioned in a paper of mine on the flight of birds, read at the November meeting of the Norfolk and Norwich Naturalists' Society, I beg to assure him that no bird is able to fly without flapping its wings.

The birds observed by your correspondent's brother were performing one of the most beautiful feats of "wingmanship"—a feat which can only be indulged in, to any extent, by birds possessed of a superabundance of wing-power. The albatross is the great master of this style of flight. Having by repeated flappings of the wings raised itself into the air, and acquired a certain degree of velocity, it brings its body and outstretched wings to such an angle that the pressure of the breeze against its surface is sufficient, or nearly so, to neutralise the force of gravity; it can then "sail" on as long as the momentum lasts. It has been known to sail in this way, with the wings and body perfectly motionless, for more than an hour (though this is an unusually long time), and when the momentum becomes exhausted, a few strokes of the wing are sufficient to restore it. From its frequent indulgence in this sailing flight, the albatross may be said seldom to flap its wings, but certainly cannot be said *never* to do so.

Inserting this explanation may be what J. H. requires.

Norwich, February 7 T. SOUTHWELL

Relations of the State to Scientific Research

As an old worker in science, and as one who, had Nature not been unkind, might have been eminent, I desire to say a few words on the relations of the State to Scientific Research, a matter likely, I understand, to be the subject of a "Commission."

I take it for granted that it is a natural and proper function of the State to assist and develop labours, the results of which are of national importance, though their market value cannot be satisfactorily ascertained at the time they are being carried on, and therefore they can seldom be immediately remunerative. Of the seed sown to-day, the nation will reap in years to come, long after the sower is dead and gone. It is only right that the nation should help in the sowing. To continue, as of old, merely to reap where others have sown, may seem good in the sight of temporising politicians; but it will not seem so when there comes to be a scanty harvest by reason of the sowers having been feeble and few. It was bad political philosophy when the rulers of the great city overlooked the poor wise man.

But what I wish more particularly to deal with now, is the manner in which the State can best perform this acknowledged duty. In what way can Government most beneficially interfere with the spontaneous energy of original scientific labourers? And this I confess is a matter of no little difficulty. Let us suppose that a certain large sum of money should be set aside, in order to enable a large body of elect men to prosecute original inquiries undisturbed by the bark of the wolf at the door; in other words, let us suppose that Government pays directly for simple scientific investigation. In that case, such elect men will either have to work by the piece, being paid for and by their results when they have brought them forward, or they will have to receive a salary, —to be paid beforehand for work which they will be expected to do. The former plan is, in the first place, impracticable, for the simple reason that the value of the work cannot be satisfactorily gauged,—in the second place it would be most pernicious, and inevitably bring about a deluge of delusions. It would be a gigantic system of prize essays, and we all know that nothing but lies and nonsense proceed out of the mouths of prize essays.

The second plan flies in the face of a fundamental law of human nature. Suppose a hundred men to receive each, say, seven hundred a year, paid quarterly, in order that they may devote themselves to original research. How much of the divine afflatus would list to come into the minds of ninety and nine of them? The morning after they had received their quarter's salary, they would take up their apparatus and sit down by the side of the pool waiting till the waters should be stirred. But the stirring would never come. They would always be paulo-post-futurists; they would ever be writing title-pages of books that would never be seen. They would become admirable critics, keenly sensitive of the follies and errors of the pushing, squabbling, busy, outside mob of unpaid workers; but they, the ninety and nine, would not produce. As they grew old they would ask permission to retain their salaries while they went to live in a land in "which it always seemed afternoon." And when they, the first batch, died, those who succeeded them would boldly declare, as I am told the Fellows of the old Universities do, that they were paid not for the work of which their ability gave promise, but as a reward for having shown themselves worthy of filling the posts. The one man who would do any work at all would be the man who would find the greatest difficulty of getting into the guild, and he, most probably, would only get in by accident after all.

There may be a little exaggeration in the above. As an old man I am prone to be garrulous; but of this I feel above all things assured, that in all the higher functions of the scientific man, in all work that is not mechanical, help from Government or from elsewhere must be given—not directly and in exchange for actual scientific work, but indirectly for some other tasks that do not demand original thought—and given in such a way that active private research may comfortably be carried on at the same time.

In the good old times when the ties which bound together State and Church were not such ticklish ties as now, they used to reward abstract unremunerative learning indirectly by bestowing on it the rich offices of religion. Greek and philosophy took the bishoprics which rightly belonged to piety.

It is possible for science to copy the indirectness and yet to avoid the injustice of this old method; to retain the good while rejecting the evil of such a method of payment *not* by results. How such a plan may be carried out, I will venture with your permission, Sir, to trace in a succeeding letter.

IN SICCO

NOTES

IN the last number of the *Revue des Cours Scientifiques*, M. Alglave again announces further subscriptions to the Sars Fund amounting to 40*l.*, half this sum being a prize awarded by the Zoological Society of Paris in recognition of Sars's works.

M. STAS has been elected director of the Classe des Sciences in the Royal Academy of Belgium.

A DEPUTATION consisting of Earl Fortescue, the Right Hon. C. B. Adderley, Dr. Farr, and others, had an interview with Mr. Shaw-Lefevre at the Board of Trade on Saturday to recommend the legalisation of metric weights and measures in the Post Office, and the legal substitution of metric weights for the troy weight which the Standard Commissioners propose to abolish.

ALL who are interested in the science of ethnology in this country, and their number is daily on the increase, will be glad to learn that the Council of the Royal College of Surgeons are in treaty with Dr. Nicolucci of Nola di Sora, for the purchase of his fine collection of Italian and Greek skulls. This collection, comprising 165 specimens of ancient and modern crania, upon which the celebrated Italian ethnologist's well-known researches into the history of the races of Southern Europe have been mainly founded, will prove a valuable acquisition to the already extensive series in the Hunterian Museum.