

character very slowly. Brewster himself uses language about Thomas Young and the undulatory theory which recalls the fact that though a statesman had a great share in it, it was not the State that drummed the greatest philosopher since Newton out of the ranks of science. Something more of regard for the *genus humanum*, the statesman's care, and a little less attention to the *ingenio superavit*, the examiner's business, seem necessary to give science its true position.

Least I should be thought merely to be indulging in the prevalent habit of "grousing," let me briefly explain. The exponents of science in this country have allowed the issues of the inevitable conflict of studies in science to be dictated everywhere from the examination point of view. That calamity—for it is nothing short of it—is more largely responsible for the apathy of the State towards science than is generally acknowledged.

So far has our control by examination extended that it is not too much to say that, for the general, our education has become the art of passing examinations without having to think, and the educational profession is, in practice, the only human occupation for which a general education is not required.

The difficulty is a real one, but it must be faced; we must find something better to offer, as our idea of education inspired by the study of nature, than 30 per cent. of what is set out in the examination papers put before an individual student in one or other of the alternative courses controlled by men of science. Specialists are, of course, the *corps d'élite* of the army of science, but they ought to be persuaded not to use the nursery as their battleground. That is our business, and we can do it if we will.

NAPIER SHAW.

### The Daylight Saving Scheme.

I SHALL be glad if you will allow me to deal with the objections raised to the daylight saving scheme in NATURE of April 27. I have had to content myself with identifying these by the numbers of your paragraphs.

(1) Though people engaged in the trades you mention may not receive the same benefits from the operation of a Daylight Saving Act as in the case of the rest of the population, those at least who are interested in gardening and in any form of athletics would benefit from an extra hour of daylight at the end of their day, and all would effect a saving in artificial light. I have also dealt with this question in my reply to your objection (6). From the fact that these trades regulate their times more by the sun than by the clock, it must at least be granted that they would take no harm from the Act.

(2) If, as seems probable, the daylight saving principle is universally adopted in Europe, there is no reason why there should be any more chaos than at present. It was not proposed to interfere with Greenwich mean time, and that would remain as the universal standard just as it is to-day. Such difficulties as would arise in this respect are only of such a nature as could be got over.

(3) Those places which get twilight all night would not suffer by an alteration of the clock, even though they might not reap any special benefit. A large majority of the population of Great Britain lives in the southern half of the kingdom.

(4) The reason that the proposed date of altering clock time back to Greenwich mean time was fixed for the third week in September was that at the end of the year the atmosphere in the early morning is usually warmer than that which we experience in March and the beginning of April, frosts being practically unknown in September.

(5) I sincerely hope that the intelligence and resource of the gentlemen responsible for these matters are not

of such a low order as to be unable to deal with such questions as may arise.

(6) I think that your approximate calculation of the additional darkness which the early-morning workers would experience has failed to take into account the fact that it is light about three-quarters of an hour before sunrise. Very few of those starting work at 6 a.m. would require to use artificial light to rise by. Certainly in September there would be some additional use of light in the morning.

(7) Granting that there would be some additional use of fuel in the morning, you fail to notice that there would be a corresponding saving in the evening.

(8) Nobody appreciates the value of the scientific method more than I do. Might I suggest that the daylight saving scheme is less a question of absolute science than of social and political science? Your principal argument is that it is the scientific men who should decide as to whether or not the provisions of the measure should be adopted, and that they as a body have not expressed their support. The real reason of this is that it is not a question that interests them as a whole in their scientific capacities. All scientific men are interested in time measurement, but they are principally interested in the actual lengths of the units of time, viz., of minutes and hours. Those who have special interest in the relation of clock time to solar time are practically confined to the astronomers, meteorologists, and navigators. Of the five astronomers who have taken up the subject, three were in favour of the Bill. They were the late Sir Robert Ball, Prof. Rambaut, and Prof. Turner. On the other hand, Sir William Christie and the late Sir David Gill opposed the Bill. To anyone who carefully reads the evidence given by these latter gentlemen before the Parliamentary Committee of 1908, it is quite clear that their opposition was based, not on scientific grounds, but merely on grounds of social expediency, and their replies to the questions of the Committee are largely filled with discussions of the habits of shopkeepers, clerks, factory hands, etc., on which subjects scientific eminence is scarcely necessary in order to make one expert. As a matter of fact, Sir William Christie, in replying to the question, "The idea of the Bill is not altogether so unreasonable as it might on the face of it appear?" replied, "No, my view is rather that it does not obtain the greatest convenience. That is really my argument here," etc.

I should scarcely imagine that the rejection of a private Bill by Parliament would be accepted by men of science as a final test of the social value of the measure; however, this is what you suggest to them. In your section No. 7 you make a suggestion as to the reason of our customary time-table. I think really that our time-table has developed to suit the winter light conditions, as such a one is the only single unaltered time-table which is reasonably workable throughout the year.

H. W. M. WILLETT.

Sloane Square, London, S.W., May 2.

[We deal elsewhere in this issue with the main points of Mr. Willett's letter.—EDITOR.]

### Avoiding Zeppelins.

A LITTLE knowledge of spherical perspective would materially reduce the loss of life due to Zeppelins. There is no danger from a bomb dropped by one of these vessels unless the latter is approaching the zenith, and will reach there in a few seconds. If the Zeppelin appears inclined—that is, unless one end appears exactly over the other—there is no danger. This is easily seen at a glance, but a plumb-line formed by a stone attached to a string will show this with certainty. The Zeppelin will always pass on the side