

In connection with that portion touching upon the Meridian Circle, Professor Keeler states that during the year ending last September, and upon 106 nights, 6000 observations were made with the Meridian Circle.

Now the question I would submit, and upon which I would request information, does Professor Keeler wish it understood that 6000 star places were observed in that time, or are these numbers of observations made up of the determination of the right ascension, declination, nadir point, collimation, level and azimuth, each individual determination of these quantities to be counted as one observation?

The above figures give as a nightly average 57 observations, and from my experience four or five observations per hour—I mean a complete determination in both right ascension and declination, when one is not working with an assistant and not in zone work—is about the limit.

When it is taken into consideration that one observer sets his circle, reads four microscopes, observes nine or eleven transits, makes two or more bisections in zenith distance, and records all these, reads his level at least once every hour, observes his collimation twice in an evening's work, an average of 57 observations per night is almost, if not quite, unrivaled.

But, as I said before, perhaps what Professor Keeler wished to convey by the word 'observations' is not what I have construed it, a complete determination of the two coördinates of the star place, but may contain two, three or four quantities, which he calls observations.

GEO. A. HILL.

NAVAL OBSERVATORY, WASHINGTON, D. C.

NOTE ON THE FOREGOING LETTER BY PROFESSOR HILL.

IN the part of my report to which Professor Hill refers in his letter, one observation means one complete determination of both coördinates of a star. A complete observation of the nadir (zenith) point and level is also, in accordance with the usual custom, counted as one observation. Collimation and flexure determinations and *mire* readings have not been included.

A reference to our records for the year covered by my report shows that the average number of stars, completely observed in both coörd-

inates during this period by Professor Tucker, was fifty per night. With an assistant reading the microscopes the average number was sixty-two per night of from four to five working hours. The observations, as shown by their probable errors on complete reduction, are of the highest order of precision.

Doubtless this is quick work, but I believe that it is by no means of unprecedented rapidity. It is moreover obvious that a comparison of the work of different instruments, on the basis of such figures as those given by Professor Hill, may be quite misleading, since the rapidity with which observations can be made depends largely on the character of the work which is being done. With a full list like that of Mr. Tucker's during the past year, the stars culminate more rapidly than they can be observed, so that the list has to be gone over several times. The rate of observation then depends upon the observer's quickness and skill. With a list which contains many gaps, stars have to be waited for, and the rate depends upon the list alone.

JAMES E. KEELER.

DARK LIGHTNING.

TO THE EDITOR OF SCIENCE: My attention was drawn to Mr. Clayden's work by an article in *Nature* in which reference was made to a communication in one of the photographic journals. The note in the *Philosophical Magazine* I had somehow overlooked.

Mr. Clayden in his letter states that he was unable to obtain any results with the calcium light or with sunlight, and suggests that there may exist some difference between light from such a source and a source whose excitement is electrical, and that it is not safe to assume that the time factor is the only one, until the image of some non-electrical source has been reversed. I cannot see much difference between the calcium light and the arc, for in both we are dealing with an incandescent solid. To settle the matter definitely I have repeated the experiment with the revolving disc, using a calcium light, and obtained perfect reversed images of the slit on the first trial. Mr. Clayden's failure to get reversal with sources other than the spark was due, I imagine, to a too long exposure. The duration must be something less than $1/15000$

sec. The exact point at which the reversing action begins can be easily determined by the revolving disc, and will be investigated shortly by one of our students.

R. W. WOOD.

SCIENCE IN THE DAILY PRESS.

TO THE EDITOR OF SCIENCE: In view of the appearance of several articles in the daily press relating to the case of the rapid calculator, Arthur Griffith, and purporting to be written by us, we beg to say that we have written no such article and have seen neither copy nor proof of any such article. We have given to reporters, when asked to do so, the principal facts reported before the Psychological Association. The published accounts have varying degrees of accuracy, a few of them being substantially correct. We are impelled to make this disavowal, for the reason that in some instances we are represented as making claims in regard to the case which we have never made. Persons interested are referred to the Proceedings of the Psychological Association and to the fuller statement of results presently to appear.

E. H. LINDLEY,
WM. L. BRYAN.

UNIVERSITY OF INDIANA, Jan. 4, 1900.

'NEWSPAPER SCIENCE.'

TO THE EDITOR OF SCIENCE: Some weeks ago in SCIENCE, and more recently in *The Psychological Review*, Professor J. H. Hyslop condemned in rather sweeping terms what he called 'newspaper science.' He was incited to do so by the publication of an erroneous and annoying report about himself. But while his irritation was certainly justified, his utterances were a trifle indiscriminate. And it is due both to the daily press, which he thus censures, and to the readers of your pages that attention be called to this fact.

It is true that certain papers indulge in untruthful and sensational stories about scientific men and scientific discoveries. But there are others that do not. To classify these two kinds of newspapers together betrays a lack of careful observation, or a wrong use of the logical faculty; perhaps both. Such a proceeding is

hardly worthy of a man who pretends to a strictly scientific method in his ordinary work.

The fact is that, though they are only too scarce, one can easily find both newspapers and newspaper men who possess as keen a perception of the eternal beauty of truth, and are animated by as lively a sense of responsibility to the public, as the average professional scientist. A wider recognition of this fact is needed, not merely in the interests of justice, but in those of science also.

Now the number of persons who read technical reports and periodicals—astronomical, electrical, engineering, medical, psychological, and so on—is only about one-hundredth, or only a thousandth, as great as those who see only the daily papers. The vast majority of people could not understand this literature, anyhow. It needs interpretation and adaptation to popular comprehension. The daily paper, therefore, forms a highly important medium of communication between the original investigator and the general public; and, for better or for worse, it will always perform that function. If, then, men who are themselves engaged in scientific researches of value to mankind, or are identified with institutions devoted to the deposit of scientific collections, would abstain from aiding papers that are notoriously reckless, and encourage by word and definite favors those which treat scientific matters intelligently, conscientiously and accurately, they would promote the diffusion of knowledge to a far greater degree than is now possible, and check the very abuses of which Professor Hyslop complains. Not merely in their comments, but also in their active policy, professional scientists can do much to reform 'newspaper science' if they will.

AMATEUR.

NEW YORK, January 5, 1900.

BOTANICAL NOTES.

A NEW SOUTHERN FLORA.

PROFESSOR TRACY has prepared a little book under the title of 'Flora of the Southern United States' for use with Bergen's 'Elements of Botany' (Ginn & Company), which is intended to be used as an elementary manual for field work in systematic botany in the public schools.