

He exhibited an experiment on the force exerted in the swelling of seeds; a strong iron pipè was filled with peas and water, and a test tube inserted in the top. In 24 hours from the time the peas were put in, a pressure was registered of eight atmospheres, or 120 pounds to the square inch, the highest pressure hitherto recorded by this means.

Dr. MacDougal also discussed malformations in *Arisaema*, and showed specimens of *A. triphyllum* with the spathe double or forked, with the spadix divided and flattened or proliferous, and with two leaves from the same petiole. Also *A. dracontium* with the tapering end of the spathe divided into double hood-like forms. He called attention to the fact that early specimens may be infested with a fungous growth which causes the hood to stand erect.

EDWARD S. BURGESS,  
*Secretary.*

#### DISCUSSION AND CORRESPONDENCE.

##### THE KEELER MEMORIAL.

PROFESSOR KEELER'S sad and sudden death last August came as a great and unexpected shock to his many friends and admirers. Of his work and life it is unnecessary to speak here; it has been sympathetically and ably described by Campbell, by Hale, by Brashear, by Perrine and others. The whole scientific world has united to mourn his loss, both as a colleague and as a friend. But nowhere has his death been more keenly felt than among his many friends and associates whom he formed while connected with the Allegheny Observatory. It was here that he began his scientific career as assistant to Professor Langley, and it was here, as Langley's successor, that he subsequently accomplished much of the work that has rendered his name famous.

It seems therefore particularly fitting that the new Allegheny Observatory, the first plans for which were drawn by Keeler, should contain a memorial to his memory. When the news of his death was received we arranged to have his name placed on the frieze of the new building among the names of other great American astronomers of the past. But some more special tribute is needed to mark our appreciation of his high attainments as a scholar, of his dis-

tinguished services not only to our own observatory, but to the whole scientific world, and last but by no means least to his noble character as a man.

Keeler's last great work, the work upon which he was still engaged when death so suddenly cut him down in the prime of life, was being carried on with the Crossley reflecting telescope, an instrument which for the first time under his able management was being made to demonstrate its possibilities. It is proposed, therefore, to erect the 30-inch reflecting telescope of the new Allegheny Observatory as a peculiarly fitting memorial to his memory; one which he himself would prefer to any monument or statue. The suggestion has met with much favor among his many friends, and a fund is now being raised to carry it into effect.

We desire to make this memorial a general rather than a local tribute to Professor Keeler. A number of voluntary subscriptions have already been promised, and many of his scientific friends and colleagues from other institutions have expressed a desire to contribute. We feel sure that there are many others that only await an opportunity or an invitation to join the movement, and I have therefore written this notice to bring the subject to their attention. Those who wish to subscribe to the fund will kindly send their names and the amount of their subscription to Mr. John A. Brashear, chairman of the Observatory committee, or to the writer. All contributions will be acknowledged from time to time in SCIENCE. If the fund raised exceeds in amount the estimated cost of the memorial telescope, which is \$10,000,\* the balance will be used either to found a general fellowship for the study of astrophysics, 'the Keeler Fellowship,' or for the award of a 'Keeler Medal' for work in the same field, as the majority of the contributors may decide; the award in either case to be made by the Astronomical and Astrophysical Society of America or some other scientific body equally representative of general interests.

We hope all scientific men will join us in this effort to do honor to the name of one who did so much for the advancement of knowledge in

\* It is expected that at least this amount will be subscribed here in Pittsburg and Allegheny alone.

his chosen field of work, who was so broadly sympathetic in his views, and who endeared himself to so many by his personal character and attainments.

F. L. O. WADSWORTH.

ALLEGHENY OBSERVATORY,  
May 1, 1901.

#### THE LARYNX AS AN INSTRUMENT OF MUSIC.

I SEE in the last number (April) of the *American Journal of Science* an excellent paper by Professor Scripture on the 'Nature of Vowels.' After a graphic analysis of these sounds, he criticizes with much acuteness the views of other writers. Of this I have nothing to say, except that I have been greatly interested. But in the last paragraph he concludes that the so-called vocal cords cannot vibrate in the manner of strings nor of tongues of reed-pipes, but must vibrate *compressively* in the manner of *elastic cushions*.

Now I write this to say that somewhat similar views have been expressed by me in my class lectures on comparative physiology for 25 years, although not published until last year in my book on 'Comparative Physiology and Morphology of Animals.'

On p. 210 of that work, speaking of the *larynx as a musical instrument*, after showing that it cannot be likened to a stringed instrument nor to a reed-pipe, I say: "It is strange that no one has thought to liken it to an ordinary *horn*—a stage horn, or better, a *French horn*. In this instrument the sound is modulated exactly as in the larynx, viz., by the *tension* and the *pressing together* of the *lips of the performer*. The edges of the *rima glottidis* ought to be called the *vocal lips*—as indeed they are, and not the *vocal cords*—which they are not in any sense. The analogy between the two instruments is perfect. The performer on the horn presses his lips together tighter, makes them tenser and the opening between them smaller, in proportion as he desires a higher note. He then drives the air between the tense lips so as to set their edges in vibration. This vibration, by alternate partial closing and opening of the aperture, gives rise to *successive jets or pulses of the out driven air*, and this in its turn gives corresponding pulses to the air in

the sounding cavity of the horn. Precisely the same, as we have seen, takes place in the larynx. The only wonder is that so small an instrument as the larynx and the mouth-cavity should be capable of such marvelous effects."

It is true I do not say anything about '*compressive vibrations*,' but I think there can be no doubt that the nature of the vibrations in the two cases is identical.'

JOSEPH LE CONTE.

BERKELEY CAL., April 24, 1901.

#### THE PHOTOGRAPHY OF FOSSILS.

TO THE EDITOR OF SCIENCE: In the current issue of SCIENCE (May 3, 1901), p. 710, report is given of a paper read before the New York Academy of Science by Mr. Gilbert van Ingen, on 'A method of facilitating Photography of Fossils.'

It may be of interest to your readers to know that a patent covering the process there described was issued in December 1899, and a company, the 'Scientific Photograph Company,' under the business management of Roger H. Williams (Address 28 East 28th St., New York) has been formed to execute orders for the preparation of illustrations by this patented process. The results obtained are successful in reproducing the most delicate details of the form of opaque objects of all kinds in which accuracy is demanded. The process eliminates both the interpretation of the artist and the distorting effects of color and uneven reflection of natural surfaces, and is proving of great value as a means of reproducing, in publications, the exact form of fossils and other objects.

HENRY S. WILLIAMS.

YALE UNIVERSITY,  
May 7, 1901.

#### SHORTER ARTICLES.

##### VARIATION IN LIGHT OF EROS.

THE range of variation in the light of Eros, which has been diminishing during the spring, has now become zero. In February, 1901, it was found by European astronomers to amount to 2.0 magn. Observations by Professor O. C. Wendell, with the Harvard Equatorial, showed that the range on March 12, 1901, was 1.13