

and practicable; and its adoption is an important reform, which is deserving of hearty support and encouragement.

LETTERS TO THE EDITOR.

Phalansterium digitatum Stein.

THERE is no published evidence that the infusorial colony here referred to has been seen by any observer except its German discoverer. It is stated not to occur in English waters; and this uncommon animalcule had not been taken in America, until the writer recently found it in considerable profusion, attached to the leaflets of *Myriophyllum* from a millpond near this city. The colonies and the enclosed zooids differ from their German relatives in no essential character, the only perceptible divergence being in the somewhat smaller size of the American Infusorium.

The tubular colonies, which take an irregular digit-like form, and branch somewhat dichotomously, are in great part built up of granular digestive rejectamenta remarkable for their coarseness. The distal extremity of each tubule is slightly inflated, each zooid sitting singly in the hollow thus formed, except after having undergone the reproductive process, when two or more may be present, the flagellum alone extending beyond the aperture.

The conical collar, embracing the flagellum for some distance above its point of origin, is often thickened by an outward flow of the body-sarcode; but whether a regular circulation takes place in the collar substance could not be determined.

Although the zooids are apparently entirely free from all connection with the walls of the zoocytium, they have the power of suddenly darting back into the tubules for a distance equal to two or three times their length. They seem to exercise this accomplishment at pleasure, but especially when any unwelcome object comes in contact with the flagellum. I have seen a large animalcule glide across the front of a colony, and each zooid in regular succession, as its flagellum was touched, shoot back into the tube, remaining there some minutes before cautiously reapproaching the aperture.

I have several times witnessed the reproductive process, and have verified the statement that it takes place by transverse fission. An interesting fact in this connection is, that the only other species of the genus reproduces itself by dividing longitudinally, a method directly the opposite of that which obtains with the present form.

The two posteriorly located contractile vesicles pulsate at intervals of about thirty seconds.

DR. ALFRED C. STOKES.

Trenton, N.J.

Solar constant.

I enclose a translation of a portion of a letter to me from Dr. Josef Pernter of the Austrian meteorological service. Dr. Pernter writes:—

"Speaking of radiation, I remember to have read several times in *SCIENCE*, under the 'letters to the editor,' various things concerning the solar constant,—lately, a letter from John LeConte, but which, like former communications, appears to make the subject a little unclear.

"The solar constant is a quantity of heat, and the number which is the expression for the solar constant must mean calories. If, for example, Violle says the solar constant is 2.54, then it must be 2.54 calories. But since the solar radiation is a summation, during time, extending over space, the duration and the surface certainly come into the question. The minute has been taken as the unit of time, and the square centimetre as the unit of space.

"That the solar constant is 2.54 calories, means, therefore, that

the sun's rays bring to the outside of our atmosphere, in each minute, 2.54 heat-units upon each square centimetre. What becomes of these heat-units, or calories, does not belong at all to the conception of the solar constant.

"The new solar constant of Langley, 2.84, signifies, consequently, that the amount of heat furnished per minute per square centimetre by solar radiation is 2.84 calories. But this number, 2.84 calories, must be comprehended. Lately the term 'calore' has been used in two significations,—the large calore, or the amount of heat that raises one kilogram of water 1°; and the small calore, or the amount of heat which raises a gram of water 1°. The latter, or small calore, is applied to the solar constant. Expressed in large calories, the solar constant of Langley would not be 2.84, but .00284 calories; that is, 1,000 times smaller.

"After these explanations, one can immediately say how many great or small calories fall upon the square metre per minute from the solar radiation; viz., 10,000 times as many as on the square centimetre."

FRANK WALDO.

Deutsche seewarte, Hamburg, Germany,
Sept. 16, 1883.

Dissemination of *Phlox*.

I have had for some time past, on my table, some capsules of *Phlox Drummondii*, which is so commonly cultivated in gardens. The capsules were picked while still green, and had dried gradually. Several times I have been puzzled at finding small seeds and parts of the capsule of a plant on the table, and could not think where they came from; but, a day or so since, I heard a sharp pop, and, looking up, saw that one of the capsules had burst, and sent the seed several feet away. Since then it has often occurred. This is an evident means for the dissemination of the seed. The most of the capsules I have examined have perfected only one seed, instead of three; and the sudden opening of the capsules have sent the seeds flying far and wide.

JOS. F. JAMES.

Cincinnati, O.

The Iroquois institutions and language.

The very courteous and complimentary manner in which my work on the Iroquois book of rites has been noticed in a recent number of this journal has made me reluctant to take exception to any portion of the review. On further consideration, however, I must beg to be allowed, in the interests of both science and history, to refer to one or two of the remarks of my friendly critic. He expresses the opinion that 'the sceptical reader' may be inclined to regard the portion of the work which relates to 'the league and its founders' rather as 'classic historical romance' than as history; and this on the sole ground (as I understand his suggestion) that the Iroquois cannot be supposed to have been capable, five hundred years ago, of the intellectual efforts implied in this narrative. This suggestion, it will be seen, opens up the entire question of the comparative mental capacity of civilized and uncivilized, or rather unlettered, races.

The question is one altogether too large to be fully discussed in this place. But as regards the particular subject now referred to, I may remark that the existence of the league itself, with all its judicious and statesmanlike regulations, is a fact of which there can be no possible question. Any one can see this remarkable constitution in full and vigorous operation among the three thousand Iroquois on their Canadian reservation. There is ample evidence to show that this league existed in its present form when the people who maintained it first became known to European explorers. It is clear, therefore, that whatever intellectual power was needed for its formation was possessed by the Iroquois before they acquired any tincture of foreign civilization.

But why should their capacity for forming such a government be questioned? The Iroquois tribes, when