growth in *Tilletia*, *Ustilago*, and *Urocystis*. The synopsis of the Ustilagineæ in relation to their supporting plants and the place of their spore formation will be very useful to students, as will also the counter-synopsis of the supporting plants, and the Ustilagineæ occurring on them. The details of the germination of spores, direction and character of the promycelia, the effects of moisture, light, &c., measurements of threads and spores, all combine to render this a useful contribution to the literature of the Smuts, although not containing any startling discoveries. It is just what it professes to be, the record of observations on the germination of the spores of several of the Ustilagines under artificial cultivation, as a supplement to Tulasne's memoir in which this history of development was deficient. It would have been an advantage had this "Contribution" made its appearance in the trade as a separate publication with a London publisher, at a fixed price, so that all persons interested in the subject in this country might have obtained copies, and recommended the work to their mycological, horticultural, and agricultural friends. M. C. C.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.*]

The Philippine Islands

ENCLOSED you will find:—1. A list of Earthquakes on the Philippine Islands from January to March 1872. As communication is very bad here, and meteorological observations are seldom made and noted down, I may say that most of the earthquakes do not come to our knowledge at all. I believe I do not say too much in expressing my opinion that there may be, at least, one earthquake every day at some one spot in this Archipelago. 2. Description of a Typhoon, which I witnessed at Cebu.

EARTHQUAKES ON THE PHILIPPINE ISLANDS

Since my last communication to the list of earthquakes to your journal (Feb. 5, 1872) I have noted the following:—

1872

Jan. 27, Zambales in Luzon, E.-W., many and strong shocks.
Feb. 7, Camarines on Luzon, twice.
Mar. 5, Manila, weak, 9 A.M. } These two were
6, Province Laguna in Luzon, 9 A.M. } perhaps on the same day, and a mistake has been made in the letter which announced the second.
22, Manila, several very strong shocks.
,, Province Batangas in Luzon.

TYPHOON AT CEBU

April 4, I witnessed a Typhoon in the harbour of Cebu, Philippine Islands, on board H.M.S. *Nassau*, Captain Chimmo. The following gives a short description of it, hoping that the officers of that ship will publish a detailed account of this interesting storm:—

		Barometer	
8h	A.M.	29·96	Strong N.W. winds, heavy rains.
2h	P.M.	29·82	
3h30m	,,	29·74	
6h	,,	29·54	Wind, N.W. (4 to 8) rain.
7h	,,	29·40	Wind and rain ceasing, till
8h	,,	29·30	some heavy squalls from N.W., followed by perfect calm.
8h15m	,,	29·28	Lowest marking of the barometer, till most furious squall from S.E. (11) with heavy rains and lightning. This furious storm lasted about ten minutes, and then, varying from S.E. to S.W. (hardest from S.) diminished slightly; barometer rising rapidly.
10h	,,	29·76	Wind steadier, squalls less frequent, and heavy rain ceased.
12h	,,	29·86	Wind steady from S.S.E. (5) dying away till daylight.

About eighteen vessels were thrown on shore, more or less damaged, many houses unroofed, and native huts blown away throughout the island Cebu, and several lives lost. At Horlo in Panay the storm did a great deal of damage too; at Manila it was not observed at all. It is said that there must have been at the same time a storm at Sargoon. Typhoons are very rare as far south as Cebu, and are said not to have been observed for twenty years. This storm proves to be a real typhoon, according to the variation of the wind and the calm betwen it, showing that the centre passed Cuba.

Manila, April 15 ADOLF BERNHARD MEYER

The Conservation of Energy not a Fact, but a Heresy of Science

PERMIT me a few words in reply to Mr. Brooke's strictures in your journal (No. 137) upon my article on "The Heresies of Science" in the *London Quarterly Review* of July last.

Mr. Brooke asserts that in the article "two widely different principles are oddly linked together as heretical dogmas, the doctrine of Evolution and the Conservation of Energy." Now, so far from these doctrines being oddly linked together as heresies, they are not linked at all. It is not the doctrine of Evolution, but the hypothesis of Natural Selection that I affirm to be one of the great heresies of modern science. Evolution is dealt with only so far as is found necessary to prove that the theory of Natural Selection is false. The two heresies named are connected in the article because I found so many physicists employing them to overthrow some of the best established truths in philosophy. Of this Mr. Brooke is perfectly aware, since he expresses regret that "the principle of the Conservation of Energy has by some been misapplied in a fruitless endeavour to supersede the necessity of a creative intelligence."

"The Conservation of Energy a Fact, not a Heresy of Science," is the title of Mr. Brooke's paper. To this assertion I need only oppose some of his own admissions. He complains that the proposition—viz., "that the amount of energy in the world is unchangeable, the sum of the actual or kinetic and potential energies being a constant quantity—has been by some writers rather overstrained." "It may," he adds, "be taken as a postulate, and is probably true, but it is a proposition that is equally incapable of proof or of disproof, because the amount of potential energy in a body can be determined only by its development into actual energy, and cannot therefore be predicated."

Are then our judgments respecting that which Mr. Brooke asserts to be a fact of science only probably true? Surely there is contradiction here. I take it that science is knowledge, and that consequently judgments not accompanied by a conviction of certainty, but merely possessing a higher or lower degree of probability, are altogether outside the sphere of science. As Mr. Brooke accepts the doctrine of the Conservation of Energy as a truth of science, it is not competent for him to maintain that the proposition—viz., "that the amount of energy in the world is unchangeable, the sum of the actual or kinetic and potential energies being a constant quantity"—is equally incapable of proof or disproof, unless he can show that it expresses one of those primary convictions of the mind which constitute the very starting points of human thought. Let Mr. Brooke do this, and there is an end to all discussion on the subject. By one of the laws of thought a proposition which can neither be proved nor disproved, but by other propositions not more evident or more certain, must, by all rational minds, be accepted as true. In this region doubt becomes suicidal by self-contradiction. It is easy to show that the proposition which constitutes the scientific expression of the doctrine of the Conservation of Energy is not the symbol of a primary synthetical judgment. It is really nothing but a truism rendering to the scientific inquirer no higher service than the statement that "every effect must have a cause." In all such cases we grant the truth of the proposition when we grant the definition of either of its related terms. "That everything which begins to be has been produced, immediately or mediately by the power of an intelligent being," is the only philosophic expression of the great law of causation. Stated thus it becomes the appropriate symbol of a primary and necessary synthetical judgment of which every sane mind is conscious. No less a thinker than the late Sir John Herschel held that the doctrine of the Conservation of Energy is a mere truism. It is so as the result of the introduction of what he terms the unfortunate phrase "potential energy."

Mr. Brooke says that "energy is the power of doing work." He does not tell us what he means by work. If he means motion in any of its modes, then he confounds what he holds to