

at a point 7° south of west, and in about 7 seconds of time attained a culminating altitude of 55° at a point 19° north of west. Two large trees interlaced prevented me from seeing the head of the meteor till shortly before its culmination, but the light given out by it soon after its first appearance was equal to that of the full moon, and at culmination it much surpassed the light of a full moon in a cloudless sky. The ball seemed to be of a most dazzling bluish-grey colour, and it had a diameter of at least three-quarters of a degree. The disk presented a nebulous appearance with radiations within it as from a centre, but was well defined, except on its lower edge. The glare was almost too much for eyesight, and although the night was very frosty, calm, and clear, all the stars in the west became invisible. I turned to look again very shortly after, and at 5 seconds from culmination found the meteor had become a small yellow ball only one-twelfth of a degree in diameter, and was dropping ruddy sparks. It then disappeared at an altitude of 23° towards a point about 51° north of west. My impression was that this meteor was at no great distance from this place in any part of its course (lat. $51^{\circ} 20' N.$, long. $3m. os. E.$). I noted the positions relatively to trees and tall shrubs, and measured them exactly with a theodolite this morning. To-day I hear that the fire-ball was seen to fall by a man in Chestnut Street, a hamlet on the Maidstone road, and then appeared quite close to him. The direction of fall accords fairly well with my own observation, and would make it descend about two and one-third miles from me. At culmination I should say it seemed very much nearer to me, considering especially its great apparent size at that time. I heard not the slightest noise either of rushing or bursting.

A. FREEMAN.

Murston Rectory, Sittingbourne, Kent, December 15.

ON Sunday, the 14th inst., about 9h. 45m. p.m., I was entering my house by the back door, when the whole place was so brilliantly illuminated that I momentarily supposed there had been a flash of lightning. That erroneous impression was at once removed by the continuance of the light. Wheeling round, I saw a splendid meteor of the fire-ball type, descending obliquely through the sky. Though the Monday newspapers reported serious fog in London on the previous day, yet the night sky at Loughton was perfectly clear; and it was easy to see that the meteor in its descent was passing a little to the right of the constellation Gemini, in a direction nearly, but not quite, parallel to a line joining Castor and Pollux. The head, which was downwards, was a large oval mass of light. The tail was not a mere thread of silvery radiance, like those of November 1866; it seemed broad, irregular on the edges, and sending out sparks. The fire-ball had not descended far when it vanished among a shower of sparks, which also very speedily disappeared. I heard no rushing sound during its course, and no noise of an explosion when it came to its end.

As the time available for observation extended to only a few seconds, it is possible that there may be some error of detail in the foregoing statements. I shall not, therefore, call them observations, but mental impressions of what took place.

ROBERT HUNTER.

Forest Retreat, Staples Road, Loughton, Essex,
December 16.

Attractive Characters in Fungi.

IN the communications which have recently appeared in your journal on this subject, it has been taken for granted that, in the development of *spores* into *mycelium*, the former must necessarily pass through the body of an animal host. We have no scientific evidence of this. I am inclined to think that the theory is a remnant of the old superstition that toadstools are the result of the excrement of toads, and that we must seek for more natural processes of fertilization if we are to solve the mystery. Unbelief is sometimes the nearest road to a right faith. Scepticism is often the gate to truth. It is at least desirable that those who are investigating the subject should approach it unfettered by a theory which is yet destitute of proof, and should direct their researches to ground which is not littered with what may be only the fragments of an exploded superstition. My own observations tend to convince me that germination of the spore and development of the mycelium are alike dependent upon conditions of soil, modified by atmospheric

influences, fertilizing agents, &c., &c.. It may be added that the solution of the problem is rendered more difficult by the apparently inexplicable fact in Nature, so strikingly exemplified in the field of mycology,

"that of fifty seeds
She often brings but one to bear."

The countless millions of spores which never reproduce their kind must be transmuted into other conditions of being, to form part of the "living whole" of the universe, in which nothing can be lost.

J. S.

Glamis, December 5.

Some Habits of the Spider.

IT would be strange indeed, if, as your correspondents infer, there is no record of the gyrating habit of a species of geometric spider so common as even to be well known to Londoners who have a garden. It may be that Kingsley referred to this species, but his "Water Babies" is not found in scientific libraries. It occurred to me, last September, whilst amusing myself, by making some of these spiders gyrate, by blowing on or gently touching them, that the instinct, in this kind, is in a decadent state; it does not appear well suited to a heavy-bodied, sharp-legged species like this one, and is certainly much less perfect than in other species possessing a similar habit.

Some years ago, when describing the habits of some Argentine spiders, I mentioned a species of *Pholcus*, abundant in La Plata, with legs of extraordinary length, in colour and general appearance something like a crane-fly, but double the size of that insect. When approached or disturbed in any way, it gathers its feet in the centre of the web, and swings itself round and round with the rapidity of a whirligig, so that it appears like a very slight mist on the web, and offers no point for an enemy to strike at. Here the correspondence between structure and habits is very perfect; the slinness and great length of the legs causing the creature, at the moment the swift revolutions begin, to seem to disappear from sight; and, owing to the string-like form of the legs, the fatigue experienced is probably very much less than the action would cause in a stout short-legged spider like the English species. At all events, it can revolve for fifteen or twenty seconds at a stretch; and, if the cause of alarm continues, it will perform the action no less than three times before quitting the web. The English spider exhausts itself in a few seconds.

Those of your readers who are interested in the habits of spiders will find the paper referred to in the *Gentleman's Magazine* for 1884. Some of my observations contained therein, I find, have been served up—after a fashion, and (of course) without acknowledgment—in a spider article in the current number of *Longmans' Magazine*.

W. H. HUDSON.

"Nowhere can Mathematics be learned as at Cambridge."

THESE words are ascribed to Dr. Hopkinson in his speech at the Royal Society on behalf of the medallists; and as they are calculated to sustain a belief which, Heaven knows, is already widely enough prevalent among even tolerably well-informed people in England—the belief, namely, that no one but a Cambridge Wrangler is worth thinking of as a teacher of mathematics—perhaps you will allow me to enter a protest.

In the department of applied mathematics, thanks to the work of Thomson, Tait, and Clerk Maxwell, Cambridge is supreme, and so far Dr. Hopkinson is right. The weakness of the Cambridge system has always been on the side of geometry; and I am sure that those who studied this subject under Hamilton, Salmon, and Townsend (to go no farther back), will agree with me in saying so. It is a weakness apparent in almost every work emanating from Cambridge. What would the subject of conic sections, for example, be, if Salmon had not shown how it should be treated? The answer is easily supplied by some of the Cambridge works on the subject which are still in extensive circulation in England. As a result of the belief which Dr. Hopkinson seeks to strengthen, the schools and Colleges throughout the whole country are becoming dominated by Cambridge methods exclusively, all appointments in them being virtually filled with Wranglers and no others; and hence we shall have, in time, a dead-level of sameness of method and thought which will partake of whatever shortcomings may characterize the Mathematical Tripos. Is this result desirable?

GEORGE M. MINCHIN.

R.I.E. College, Cooper's Hill, December 11.