return to its original configuration). In other words, we cannot suppose energy to be conserved unless we connect the new forces by some fixed laws with known and already determinate physical agents, and we must be content to regard the system as non-conservative until the necessary physical connection is assigned and introduced which will account for the free forces that we have observed, and will allow us to comprehend their action under the known laws of inanimate natural agency. This way of dealing with the work of "external forces" on a system which the new science of energy has devised, and shown to be the only one which in these cases can be generally employed, has perhaps contributed (but only by the unavoidable abstruseness and abstractness which belong to the new science itself) to invest with something of the appearance of a "phantom" and with an air of mystery, the character of force, and the laws of its operation as they have been universally studied in mechanics. But rightly regarded according to the simple principles of philosophical consistency and progress, which the new science of energy recognises in its probable extensions, there can be no doubt that it will really tend to establish more clearly than before the familiar notions of mechanics, and to open out fields of application of the time-honoured laws of motion and of force in unforeseen directions, in which their certainty and truth will continue to be felt as surely and to be described as simply now and hereafter, as they were in the days of Galileo and of Newton.

Newcastle-on-Tyne

A. S. HERSCHEL

Faraday's "Experimental Researches"

MR. SILVANUS P. THOMPSON, of Bristol, has made, in NATURE (vol. xvii. p. 304) an inexplicable attack upon my issue of Faraday's "Experimental Researches in Electricity," 3 vols. 8vo. 1839-55, unwarranted by logic or facts.

Mr. Thompson ordered my issue, which is advertised as "a perfect copy" of Faraday's work, through a Bristol bookseller, to whom it was charged at the trade price of 36s. Mr. Thompson declined to ratify his purchase, and there the matter should have ended, as I would readily have cancelled the transaction with his agent.

Mr. Thompson says that I profess to supply a perfect copy of Faraday's "Experimental Researches," implying that my professions are deceitful. I am at a loss to understand his meaning, because the fact is that I can and do supply perfect copies.

The history of the book is as follows:—Faraday's "Experimental Researches," 3 vols., appeared in 1839-55, in 3 vols. 8vo, with plates, and in course of time two of the volumes fell out of print, which raised the market value of occasional copies to seven and eight guineas. Availing myself of the opportunity of buying from Mrs. Faraday the copyright and existing stock, I completed, by facsimile reprint, a small number of copies, as is plainly stated on the title-pages of vols 1 and 2. I alone possess the right to reprint the whole or a portion of the work.

It was at Mrs. Faraday's express wish that only such a reprint has been executed, and I was further advised to that course by eminent Fellows of the Royal Society. Mr. Thompson's innuendo of wilful deception is an infamous slander unworthy of a man of science.

I consider I deserve the thanks of all purchasers of Faraday's "Researches" for having invested my capital in the long dormant copyright of this work, and having thus put it in the power of students to obtain "perfect copies" at a moderate price.

Messrs. Taylor and Francis, the printers of the former edition, executed for me the reprint of the first two volumes (the stock of the original third volume not having been exhausted.) The original dates were preserved to show that no alterations had been made, and to preclude the notion, which Mrs. Faraday desired to avoid, that she had sanctioned a veritable new edition.

After this explanation I do not doubt that Mr. Thompson will see he has deceived himself, and I expect that he will apologise for his ill-advised attack upon my genuine and authorised re-issue, and admit that it is indeed a perfect copy of Faraday's great work.

BERNARD QUARITCH

Singing in the Ears

THIS consists of two or more continuous or alternating tones originating within the ear, very faint and sounding like a teakettle just beginning to boil, or a distant orchestra tuning. It is heard when there is undue pressure of the circulation in the head, as after long mental application, or upon hanging the head downwards. To my ear these tones bear constant musical relations to each other, and as the phenomenon bears directly on

the theory of the mechanism of audition, its verification is a matter of importance.

Will the readers of NATURE who can observe it write me what are the intervals of pitch (i.e. thirds, fourths, octaves, fifths, &c.) between the different tones heard together or alternating?

XENOS CLARK

916, Washington Street, San Francisco, Cal.

Meteor

ABOUT 12.47 A.M. (Irish time) on Monday the 18th inst., I observed a brilliant meteor when looking north from the south side of Dublin. It resembled a bluish white ball with an apparent diameter of about one-fifth that of the moon, which was shining brightly at the time, and left behind it a continuous yellowish luminous train. When first sighted it appeared at an angular distance of about 15° from the polar star, and appeared to be in the constellation of the Dragon, about midway between the brilliant star of the constellation of Lyra and the polar star, somewhat below the line joining these constellations.

Its path was apparently a line about 5° from the vertical, and inclined from west towards east, and I lost sight of it when at an angle of 10° with the horizon by intervening buildings. Its brilliancy surpassed that of the moon, which at the time was bright enough to allow of distinguishing printed characters. It did not burst while in sight, and I heard no report.

Royal College of Science, Dublin

H. HATFIELD

Eucalyptus

I have only just observed Dr. Calmy's letter in your impression of the 7th inst. (p. 283). The febrile attacks to which I alluded in NATURE (vol. xvii. p. 10) were sufficiently serious to incapacitate shepherds and stockmen for anything like continuous work for two or three weeks, and on some days the men were quite prostrated. The mosquito of which I spoke as not being banished by the presence of Eucalyptus is that species of Culex whose larval state is passed in water (the larvae may even be seen in rain-water collected in decayed parts of trees), and I cannot call to mind a single place from which these pests were absent, trees being present. No doubt they may be carried many miles by the wind from their place of birth; but the real question is whether any species of gum so drains the land as to banish both mosquito and malaria by drying wet soil. If so, how is it that we find in Australia swamps which have existed for apparently an indefinite time, and do not look in the least likely to dry up, though the "blue" gum grows all round them, where the mosquito is rampant and malarious fever not by any means rare? I entirely agree with Dr. Calmy that the mosquito may be a "real danger to the rash traveller." One not acclimatised would suffer agonies among the mangrove swamps of Moreton Bay. I have had my own hands so paralysed by the poison that I could not close them without difficulty; and a new arrival, whom I took there on a duck-shooting expedition, was almost blinded, and became seriously ill for some days, though he was exposed to the attacks of the insects only a few hours. Whatever may be the case in Algeria or the Campagna, no one familiar with Australia will give the gum-trees there credit for having banished swamps, malaria, or mosquitos. Is not the Newfoundland mosquito of the pine forests to which Dr. Calmy alludes bred in water?

ARTHUR NICOLS

February 20

Telephone Experiments

THE following experiments with the ordinary small portable telephone may interest your readers.

Experiment 1. Connect a small strip of zinc by a thin covered wire to one of the binding screws of the instrument, and connect in the same way to the other binding screw a plate of metal with a rough edge; a saw does well. Place the end of the piece of zinc in the mouth, or hold it between moist fingers. Take a shilling between the fingers of the other hand and pass it along the teeth of the saw. The sound is clearly heard in the telephone. If instead of a shilling, a sovereign or a penny be used, the result is much the same, but if a piece of zinc be substituted, the sound in the telephone, if not lost, becomes very feeble.

Experiment 2. With the apparatus as before, let a number of persons, taking hand in hand, form a chain. At one end of this chain the zinc is held, and at the other the shilling. When the saw is rubbed the sound is heard in the telephone so long as the hands are held, but on leaving go anywhere in the chain the telephone becomes silent. This experiment is successful with