LETTERS TO THE EDITOR.

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Magnetic Strain in Bismuth.

YOUR report of the meeting of the Royal Society of Edinburgh, held on May 16 (NATURE, June 22, p. 192), states that Dr. C. G. Knott has obtained a slight indication that there is a change of form in bismuth when strongly magnetised.

In the *Phil. Trans.*, vol. clxxix. (1888) A, p. 216, I described an experiment in which a rod of bismuth was found to exhibit an elongation of about 1·5 ten-millionths of its length in a magnetic field of 840 C.G.S. units. As to the reality of this effect and the fact that it was due solely to magnetism, there was no doubt whatever.

Since the publication of my paper I have repeated the experiment with another sample of bismuth obtained from Messrs. Johnson and Matthey; but though the field was brought up to nearly 1500 units, there was never the smallest indication of any magnetic change of length. An elongation one-tenth as great as that observed in the former case would have been easily perceptible.

After this experience I should hesitate to attach importance to any such observations unless the bismuth employed had been proved by analysis to be free from traces of magnetisable metals.

SHELFORD BIDWELL.

MY experiments were made with a bismuth *tube*, the notion being that, as in like experiments with nickel tubes, any existing strain would be much more easily detected by means of secondary volume changes than by means of the direct elongation measurements which Mr. Bidwell so successfully carried out. Mr. Bidwell's warning as to the necessity of having the material pure is well-timed. So far I have taken no special precautions in this direction; but in the improved form in which I purpose repeating the experiment, and from which I hope to get some really decisive result, this question of freedom from traces of strongly magnetic metals must of course be carefully considered.

C. G. KNOTT.

Gooseberry Saw-fly.

I SHALL be obliged if any reader of NATURE who has happened to pay attention to the gooseberry saw-fly will let me know whether my experience agrees with that of observers in other parts of the country. In Yorkshire the larvæ were so abundant in 1893, 1894 and 1895, that the bushes were in many places stripped of their leaves every summer. In 1896, there was a marked diminution, and many of the larvæ contained ichneumons. In 1897, 1898 and 1899, they have been so scarce that I have had difficulty in getting specimens for anatomical study.

L. C. MIALL.

The Yorkshire College, Leeds, June 29.

School Laboratory Plans.

REFERRING to Mr. Richardson's letter (p. 199), our laboratory, now approaching completion, will afford, as regards chemistry in a room 30 by 26 feet, accommodation for twenty-seven boys, including one 18-foot bench for general purposes, and two draught cupboards. We have one 21-foot wall bench and two 18-foot double central benches in parallel, and one 10-foot wall bench at right angles. I believe a novel feature to be the demonstrator's platform placed on the top of and slung across the central benches, provided with a revolving chair and a table, and approached by steps. The whole sacrifices two working places only. The demonstrator has sixteen boys in front of him, five parallel with him, and six behind him, at a maximum distance of fifteen feet. His commanding position should save considerable time usually spent in running about. A large mirror might further aid matters. The central benches alone have reagent shelves.

A. E. MUNBY.

Felsted School, Essex.

ILLUSTRATIONS OF MIMICRY AND COMMON WARNING COLOURS IN BUTTERFLIES.

AN interesting, though brief, paper entitled "Natural Selection in the Lepidoptera" was read by Mr. Mark L. Sykes before the Manchester Microscopical Society on November 4, 1897, and published in the *Transactions* for the year (p. 54). The chief interest of the paper consists, as the author points out, in the eight excellent plates by which it is accompanied. These plates contain a very large number of figures reproduced by a photo-mechanical process from the insects themselves. The author has evidently had at his disposal a very large and complete collection, and having selected a number of very fine illustrations he thus makes them available for all other naturalists.

At the opening of his paper the writer expresses some doubt as to whether the subject is a suitable one for a Microscopical Society; but on this question there need be no hesitation. The microscope is an instrument of the most varied uses, and is necessary in the investigation of this subject among others, for without its aid we cannot ascertain the depth to which mimetic resemblance penetrates into the structure of organisms. The interpretation of these resemblances as due to natural selection implies that they are confined to visible effects, and therefore the microscope should reveal an underlying difference beneath the superficial similarity. Hence a paper which, by describing this fascinating subject, and abundantly illustrating it, directs attention to a promising field for microscopic inquiry, is in every way suitable for the audience before which it was read, and the Manchester Society is to be congratulated upon the broad view it has taken of its subject and responsibilities. The present writer has already commenced the study of mimetic resemblance from this point of view, and has found that the methods by which the transparency which is necessary for the likeness attained in a group of Lepidoptera from South America differ in the most marked degree, although the superficial resemblance is of a very high order (*Journ. Linn. Soc.*, vol. xxvi., 1898, pp. 596–602; plates 42, 43, 44).

The great interest of Mr. Sykes' paper is the abundant illustration which it provides for the two different classes of resemblance often confused together under the name of "Mimicry." A few words on the history of the recognition and suggested explanation of these two classes may be useful, inasmuch as great confusion still exists upon the subject. The theory of mimicry was first suggested by H. W. Bates in his important paper published in the *Transactions* of the Linnean Society for 1862 (vol. xxiii.). He here suggested the idea of a conspicuous, abundant, and specially defended species, serving as the model towards which other comparatively rare and defenceless species are brought by natural selection. His illustrations were taken from the fauna of tropical America, and the explanation was suggested to him by the study of his collection after his return home from his prolonged visit to the Amazon Valley. The theory is of special interest, as it was probably the first great result of the theory of natural selection after its appearance in the *Journal* of the Linnean Society in 1858, and in the "Origin of Species" in 1859. Bates' generalisation was extended by A. R. Wallace to the tropical East (*Trans. Linn. Soc.*, 1866, vol. xxv.), and by Roland Trimen to Africa (*Trans. Linn. Soc.*, 1870, vol. xxxi.). In the first-named paper Bates expressly pointed out that his explanation did not cover all cases of mimetic resemblance, but that there were a very large number of species abundant in individuals, and presumably specially defended, which nevertheless "mimic" each other. Furthermore, this kind of resemblance is as close and detailed as that which the Batesian theory of mimicry sought to explain. For such