

figures are also given in the standard works of Westwood and Packard on insects. As W. E. L. is probably a practical man, he will do well to consider the proofs afforded by Mr. Elliot that the "ked," as they call it in Scotland, is anything but the harmless insect which some people imagine it to be.

T. SPENCER COBBOLD

I AM inclined to think your correspondent W. E. L., on the subject of "ticks" (p. 531), may have confounded two quite distinct animal forms under that name. The sheep-tick or louse, as shepherds call it, found at the roots of the wool on sheep, and which I have often formerly had brought to me under one of those names, is an aberrant form of *Hippobosca*, a genus of dipterous insects, the typical species being the well-known forest-fly. An excellent figure of the sheep tick will be found in Curtis's "British Entomology," Pl. 142, under the name of *Melophagus ovinus*.

Ixodes is a genus of the Acaridæ, a group easily distinguished from the true insects by their having eight legs in the adult state. Six British species of *Ixodes* are described by Dr. Leach in vol. xi. of the *Linnean Transactions*. There are probably others not as yet determined. The one best known is the common dog-tick, found in a free state in woods and plantations, and attaching itself not merely to dogs but to hares, &c., and especially to hedgehogs, which often abound with them, the ticks getting their hold as the animals pass through the close grass. After attachment they soon get gorged with blood, their abdomens swelling to an immense size compared with the insignificant appearance of them previous to attachment. But I can remember no instance of an *Ixodes* found on a sheep, though I would not undertake to say they never occur on that animal.

Bath

L. BLOMEFIELD

Helix pomatia, L.

I AGREE with Mr. Gwyn Jeffreys (*NATURE*, p. 511) in considering *Helix pomatia* as indigenous in this country, and not introduced by the Romans. I never found or heard of a single specimen, either living or dead shell, being met with in the neighbourhood of Bath, which the Romans occupied for more than 400 years, though it is found in one or two localities in the adjoining county of Gloucestershire, from whence we have specimens in the museum of the Bath Literary Institution.

Bath

L. BLOMEFIELD

Braces or Waistband?

HAVING worn a Spanish sash for some time many years ago while walking in the Pyrenees, I am decidedly of opinion that the weight of the trousers is supported much more easily and pleasantly by a sash than by braces; these last are narrow, about 2 inches wide, and though custom enables us to wear them without conscious inconvenience, I think any one using them for the first time would find them very unpleasant. The sash worn by the middle and lower class in Aragon is of wool 8 or 9 inches broad, and (if my recollection is correct) about 4½ feet long; when of such width and length it does not need to be drawn tight, but only closely wrapped round the waist and the end tucked in. I should certainly wear one constantly but that I do not wish to have an eccentric appearance. Medical men, I believe, attach great value to the wearing of sashes or bands round the stomach, especially in hot countries. A narrow silken sash which must be drawn tight is, I should suppose, far less pleasant to wear.

N.

SOLAR RADIATION AND GLACIER MOTION

IN the paper on the "Mechanics of Glaciers," which the author had the honour to read before the Geological Society of London in December last, it is stated that, after all allowance is made for work within the glacier due to the potential energy of the weight of the ice-mass, "there remains to be accounted for a secondary differential motion, which has, it appears, not yet received a satisfactory explanation . . . the movement is greater (a) by day than by night, (b) in summer than in winter." The present paper is intended as nothing more than a brief statement of the experimental evidence, upon the

strength of which the explanation offered in the paper referred to has been put forward. I may say *en passant* that this investigation was suggested to me by a statement of Dr. Croll's ("Climate and Time," p. 519) that, "We find that the heat applied to one side of a piece of ice will affect the thermal pile on the opposite side." It occurred to me that the looseness of this statement was quite in keeping with the unphysical notions upon which the writer has built up what he styles his "molecular theory" of glacier motion, and I set to work therefore to investigate its accuracy.

The principal apparatus used consisted of a delicate galvanometer, and a thermopile of a pretty high degree of sensitiveness, made up as it is of eighty-one couples of bismuth and antimony; the measurements were read off numerically by the light reflected on the scale as usual. Suspecting that the fallacy of the statement referred to lay in overlooking the effect of luminous energy, which of course is capable of passing through any transparent body, I made a few preliminary trials with glass and water, not having ice then at hand. A beam of solar radiation, having passed through two inches of distilled cold water + half an inch of glass, was allowed to fall upon a Crookes' radiometer; this made the vanes rotate too fast for their rotations to be counted, even when the instrument was enclosed in a wooden case on all sides except that open to the glass-water screen through which the sunshine passed. A beam of solar light, having been sifted of its dark heat-rays in the same manner as before, was received upon the absorbing face of the thermopile, producing a considerable deflection of the magnet in the galvanometer, even with the feeble sunshine of our recent December days.

The next step was a series of trials with ice itself. In the first instance, trials were made with the plates of ice in contact with the metallic face of the pile, the black (absorbing) face being placed at a distance of 3 inches opposite a large Bunsen flame in a room free from draughts: in this way a constant difference of 36° C. was obtained for the opposite faces of the pile, and maintained for more than half an hour, with the needle of the galvanometer quite stationary. An iron ball 3 inches in diameter, having been heated to dull redness (clearly perceptible in a dark room), was placed opposite the plate of ice (1 inch thick) in contact with the pile, and allowed to cool. It was again heated as before, and placed at a distance of less than an inch from the ice (now less than half an inch thick), and allowed to cool. In both cases the effect observed upon the galvanometer was *absolute nil*, even when, in the second trial, the ice had become so thin by melting as to break under the small force required to hold it against the pile.

In the next series of trials the arrangement was reversed, the ice being placed just in front of the condensing cone attached to the absorbing face of the pile at a distance of 4 inches; the metallic face of the instrument was maintained at a constant temperature by contact with a vessel of cold water, whose temperature was observed frequently, and found to be practically constant. On the distant side of the ice was placed a double board-screen, with air-space and a circular hole to allow the passage of a cylindrical beam of radiation of the same diameter as the condensing cone. The iron ball, heated to dull red heat as before, was placed opposite the hole of the screen, at a distance of 7½ inches from the face of the pile, the intervening ice-plate in this case being 1 inch thick, and the galvanometer having been stationary for half-an-hour before the experiment was made. Under the same conditions the experiment was repeated (1) with ¼-inch plate of ice; (2) with ½-inch of pond-ice + wet half-melted snow; (3) with ⅝-inch of fresh-fallen snow. In all these cases the result of the obscure radiation from the ball upon the galvanometer was *absolute nil*, although, without the interposition of ice or snow, the maximum