Society and other leading learned societies in this matter. The British Science Guild has kindly granted the committee permission to use its address.

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The Pea-Crab

(*Pinnotheres pisum*).

THERE is an apparent discrepancy between Dr. J. H. Orton's interesting description of the pea-crab in NATURE of December 23, p. 533, and that given by Dr. W. T. Calman, whom he quotes. Dr. Orton attributes the impunity with which the male crab and the male-like female sustain the nip of a bivalve to their "extraordinarily strong carapace" (p. 534). On the other hand, Dr. Calman, discussing whether the Pinnotherid crabs should be reckoned commensals or parasites, observes that they "show one of the characteristics of parasites in being to some extent degenerate in their structure. The carapace and the rest of the exo-skeleton, no longer needed for protection, have become soft and membranous" ("Life of the Crustacea," p. 217).

Does not Dr. Calman's suggestion tend to confound racial degeneracy (such as environment has imposed upon Crustacea and fishes inhabiting subterranean waters, or such as has been induced by habit of life on certain parasitic species of Hemiptera) with modification of growth and adaptation of functional activity in individuals approaching parturition? If the female crab does not, after moulting within the bivalve, renew the hard carapace which protected her in obtaining entrance, the diversion of nutriment to her swelling spermothecæ can scarcely be accounted degeneracy. Rather it suggests analogy to the extreme case of *Termes bellicosus*, the so-called white ant, which is neither parasitic nor, presumably, racially degenerate, but the queen-mother of which is perennially and unintermittently parturient, with the result that, according to Smeatham, her abdomen "grows to such an enormous size that an old queen will have it increased so as to be fifteen hundred or two thousand times the bulk of the rest of her body," and twenty or thirty times the bulk of one of her worker offspring.

Dr. Orton having carried research into the pea-crab's life-history a stage further than Dr. Calman, it is to be hoped that he will soon be able to announce a complete solution. HERBERT MAXWELL.

Monreith.

The Mechanics of Solidity.

IN connection with the correspondence on this subject in NATURE, attention may be directed to the attempts made by C. Benedicks (*Zeit. f. anorg. Chem.*, vol. xlvii., p. 455, 1905; *Ann. d. Physik*, vol. xlii., p. 153, 1913) to relate the hardness (H) to the other physical properties of the substance. He suggested that H is inversely proportional to the atomic volume (V) and to the coefficient of expansion (α), and therefore $HV\alpha$ is constant for different elements. This result includes the relation given by Mr. J. Innes (NATURE, November 18). Benedicks also proposed a new formula for the characteristic frequency (ν) of an element of atomic weight A in the solid state. He assumed that the frequency is proportional to $\sqrt{(H/A)}$, and hence to $\sqrt{(1/V\alpha A)}$. If the further assumption be made that the frequency so determined is identical with the frequency given by one or other of the formulæ summarised by Mr. V. T. Saunders (NATURE, December 23), other relations between the physical constants may be obtained. For example, according to the Sutherland-Lindemann formula ν is proportional to $\sqrt{(T_s/AV^{\frac{2}{3}})}$, where T_s is the melting point on the Absolute scale. Combining this with the previous result, we find $\alpha V^{\frac{2}{3}}T_s$=a constant, a relation given by Pictet in 1879.

I cannot altogether agree with Mr. Saunders (NATURE, December 23, p. 534) in his omission to consider the hardness in relation to other physical constants mentioned on the ground that it is a surface effect and not a bulk effect. Although the conditions at the surface differ from those in the interior of the solid, those conditions are determined by forces of the same general character in each case. In the case of a liquid a large number of relations between surface tension or intrinsic pressure and other physical and chemical constants have been given, and Laplace's theory points the way towards the co-ordination of these results. Reference may be made to the book by Willows and Hatschek on "Surface Tension and Surface Energy" (Churchill), in which this matter is discussed, and the conclusion that *solids* ought to possess surface tension and intrinsic pressure is emphasised. Mr. Saunders, if he is to be consistent, should omit reference to the melting point as well as to the hardness value, since a pure crystalline solid melts on the surface only, and the melting point is the temperature at which the solid can exist in equilibrium in contact with its own liquid under a specified pressure.

Mr. Saunders is no doubt correct in maintaining that further attempts to relate mechanical and other physical constants of solids must be based on modern theories of the structure of the atom.

H. S. ALLEN.

The University, Edinburgh.

The Meteorology of the Antarctic.

IN the preface to my book on Antarctic meteorology I wrote, "I was recalled to my work in India when the *Terra Nova* returned to the Antarctic in January, 1912," and the reviewer in NATURE of December 23 (p. 528) has very naturally concluded that this meant that I was recalled officially by the Government of India. It is, therefore, only fair that I should state the facts. I was granted three years' leave by the Government of India, which would have been sufficient if Capt. Scott's original plan of staying only one year in the Antarctic had been carried out. When, however, it was clear that the expedition would remain two years, I told Capt. Scott that I would stay the second year and write to India asking for my leave to be prolonged. When the *Terra Nova* arrived in January, 1912, she brought me a letter from Mr. Field telling me that Dr. Walker had gone to England seriously ill, and that he himself was so unwell that he did not see how he could carry on. In these circumstances I felt it was my duty to my colleagues in India to return at once.

I think most people will understand how in such circumstances I came to write that I was "recalled" to India, but it was an unfortunate expression, and would not have been used if I had realised the inference which would be drawn from it.

G. C. SIMPSON.

Meteorological Office, London, December 27.