Evidence of cross-bedding, which is inseparable from this type of rock, would be easily lost, since the greywethers are secondarily silicified or "concretionary." From conversation with the late Prof. Rupert Jones, than whom I knew no keener observer, I gathered that he firmly believed in the rootlet and stem structure of these perforations (see *Geol. Mag.*, 1901, pp. 54-59 and 115-125). Another recorded instance of enclosed rootlets is given by Wm. Carruthers (*Geol. Mag.*, 1885, p. 361), who found in a weathered sarsen stone from Abury a root with rootlets, which he doubtfully ascribes to a palm, and in the position of growth.

It would be interesting to discover any positive evidence of cross-bedding in these white Tertiary sandstones. The Bagshot sands, by the way, both in Surrey and Kent, are often strikingly and steeply cross-bedded, and this, from a study of our dune rock in Victoria, points to aeolian formation rather than to marine current action. FREDK. CHAPMAN.

National Museum, Melbourne,
June 15.

Barometric Pressure in High Latitudes.

I AM much obliged to Mr. L. C. W. Bonacina (NATURE, July 21, p. 100) for pointing out a clerical error in my statement concerning the winter and summer Arctic pressures. The correction gives greater emphasis to my contentions.

My point is that in the Arctic regions, even during the winter when the sun's light does not reach the area to any extent, the pressure is low, indicating a sufficiently warm stratosphere able more than to counterbalance the effect of the cold lower troposphere.

The lower troposphere over the polar areas is undoubtedly very cold, and this cold air often flows outwards from the poles for some distance. I am not aware that my views on this point are in conflict in any way with those of Dr. G. C. Simpson, Prof. Mohn, or Prof. Bjerknes, except on very minor points. What I have attempted to explain is not why these northerly Arctic winds exist, but rather why they do not blow from the poles to the equator. The real difficulty, to my mind, is to account for the westerly poleward winds of middle latitudes.

Mr. Bonacina says "there must, on the average, be a relatively high surface pressure about the poles." But all the charts show a relatively low pressure. However, an outflow of cold air from the poles will occur if the density of the *lower* troposphere decreases with sufficient rapidity as we move towards lower latitudes; and this is what actually often occurs, for the temperature rises as we move from the poles.

R. M. DEELEY.

Tintagil, Kew Gardens Road,
Kew, Surrey,
July 20.

Phototropic Compounds of Mercury.

IN NATURE of June 9, p. 775, Messrs. Venkataramaiah and Rao describe "A New Phototropic Compound of Mercury" of the composition $Hg\begin{matrix}/HS\\ \backslash CNS\end{matrix}$, which they regard as "the most phototropic compound as yet known"; or that this compound shows appreciable change in colour on exposure to light in less time than that required by any other known phototropic compound. In 1917, while working in the College of Science, Calcutta, in an attempt to prepare $(SHgI)_2$, described by Ray (Trans. Chem. Soc., 111, 109), without using any organic compound, I obtained $2HgS.HgI_2$, which showed phototropy to a remarkable degree. The orange yellow powder turned black very quickly on exposure to sunlight, but only gradually in diffused daylight. On keeping the black powder in the dark, the reverse change took place. At room temperature, it took several hours to recover, but at higher temperatures the change of colour was quicker; at about 85° C., for example, only a few seconds. Both varieties had the same chemical composition. This substance was exhibited before the Indian Science Convention of that year, and a preliminary note was published in the Report of the Indian Association for the Cultivation of Science, 1917. Since then I have found that phototropy is exhibited more or less by all the complex sulphides of mercury of the general formula $HgS.HgX_2$ or $2HgS.HgX_2$, where X is a halogen or a monovalent acid radicle, including CNS, of which $2HgS.HgI_2$ is the most sensitive.

The sensitiveness to light depends to some extent, as might be expected, on the nature and area of the surface exposed. I have found that paper coated with an emulsion of $2HgS.HgI_2$ in gelatin is much more sensitive to light than the powder. In fact, it turns black more quickly on exposure to light than the ordinary gelatino-chloride paper used in photography. But it is very curious that in this case the reverse change of colour does not take place on keeping in the dark or heating. Evidently the gelatin somehow prevents the reversal. A detailed report on these inorganic phototropic compounds will be published in due course. M. L. DEY.

Central Chemical Laboratory
Kirkee, India, July 5.

Melanism in the Lepidoptera and its Possible Induction.

BELIEVING that light can be thrown on some of the problems of evolution by an experimental investigation of the development of melanism in lepidoptera, we have been studying the influence of the food plants growing in critical areas, and also of inorganic substances likely to occur in or on the plants of such regions, on races of moths imported from non-melanic districts. Our cultures have been reared at two centres; some at Birtley (Durham), an area producing a very large number of melanic species, and others at Hexham (Northumberland), where melanism is much less prevalent, although not absent. The work is not finished, but certain facts seem worth publishing at once, particularly in view of the recent controversy as to the value of Kammerer's experiments.

We began with Kentish races of *Tephrosia crepuscularia* Hb., and Kent and Hampshire strains of *T. bistortata* Goeze, rearing them on hawthorn gathered by the roadside at Birtley, and in the third generation of *T. crepuscularia*, a species in which we have proved melanism to be a Mendelian dominant, obtained one black female in a brood of 23 insects. *T. bistortata*, on the other hand, showed no change in the fourth generation, at which stage the eggs from one pairing were sent to Hexham and others reared at Birtley, where in the next (fifth) generation one black female was obtained from about 90 pupæ. The eggs at Hexham, cousins to those at Birtley, were divided into four batches, the larvæ in one case being fed on local hawthorn and in the others on hawthorn impregnated with a metallic salt. In each culture one or two black moths appeared, the broods averaging two dozen in number.