(ii) preference for glucose as substrate without the addition of hexokinase, (iii) sensitivity to glyceraldehyde inhibition, (iv) inefficiency of phosphorylation, (v) the Pasteur effect without the Meyerhof cycle.

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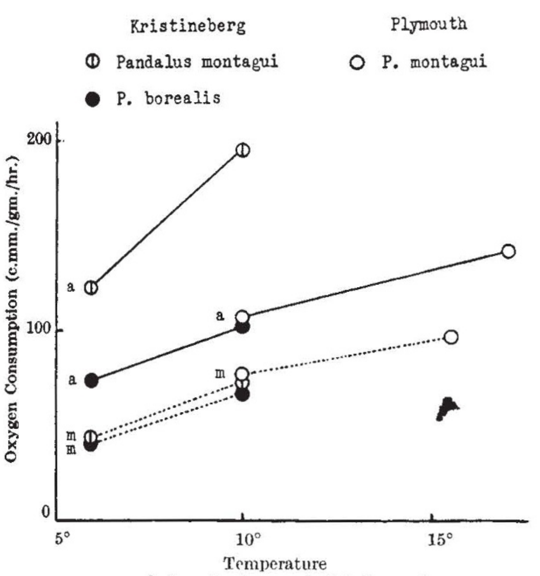
Rate of Tissue Metabolism of Marine Cold-blooded Animals in Different Latitudes

IN previous communications to NATURE[1] the activities and metabolism of arctic and English marine invertebrates were compared. It was shown that English species consume more oxygen, at the temperatures at which they live, than nearly related arctic species at the lower temperatures of their habitats. Since the locomotory activities of the English species are apparently no greater than those of their arctic cousins, the hypothesis was proposed that the greater oxygen consumption of the former is due to a greater non-locomotory metabolism. We have now tested this hypothesis for prawns living in the two waters by measuring the oxygen consumption of thin isolated muscles as well as that of the whole animals. The dorsal extensor muscles of the abdomen were used.



a, whole animals; *m*, isolated muscles.
Fig. 1.

Fig. 1 shows that *Pandalus borealis* from the cold water at Kristineberg[1] and *P. montagui* from Plymouth fully bear out the hypothesis. The oxygen consumption values for the whole animals fall on a single curve rising with temperature, and those for the muscles fall on another single curve parallel to the first. At every temperature the excess oxygen consumption of the whole animals over that of the muscles is the same.

But for *Pandalus montagui* from Kristineberg the situation is not so clear. Fig. 1 shows that while the oxygen consumption of its isolated muscles is almost identical with that of the muscles of *P. borealis*, the oxygen requirements of whole animals of the former species are almost double those of the latter. This suggests greater activity. Indeed the oxygen consumption of whole animals of *P. montagui* at the low temperatures of Kristineberg is seen to be as great as, or greater than, that of the same species at the higher temperatures of Plymouth.

In other ways, too, *Pandalus montagui* from Kristineberg behaves as a different physiological variety from the same species at Plymouth. The heart and scaphognathite rates at Kristineberg and at Plymouth show differences parallel to the oxygen consumptions of the whole animals in the two localities. Moreover, the Kristineberg variety will not survive an aquarium temperature above 11°, whereas the Plymouth form can be kept alive at 17°.

These results will be published in the *Proceedings of the Zoological Society*.

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Effect of Ultra-centrifuging on the Egg of *Ascaris megalocephala*

EGGS of *Ascaris megalocephala* (= *equorum*) var. *monovalens*, like those of *Ascaris suum*[1], may develop mormally after being subjected in the uncleaved condition to great centrifugal forces over long periods.

However, cytological examination of eggs which have been kept in the air turbine ultra-centrifuge at 150,000 times gravity until after control eggs have undergone several cleavages, shows that the nucleus has divided, but no cleavage of the cytoplasm has occurred. If one cleavage has been suppressed, there are four centrosomes and four chromosomes in the egg cell at the next metaphase (Fig. 1). In most of such cases the chromosomes are undiminished, but frequently diminution has occurred (Fig. 2). Such tetrapolar mitoses usually result in four cells, in all of which chromatin diminution has taken place before the next division is completed. Very rarely, the cleavage planes are so oriented that one of the resulting cells contains most of the material from the animal pole of the egg; chromatin diminution may take place in this daughter cell but not in the others. If two cleavages have been suppressed, there are eight centrosomes and four nuclei (eight chromosomes) in the egg cell. When such eggs are in metaphase, all the chromosomes have undergone diminution. In a few late prophases, however, all the chromosomes appear to be undiminished.

It seems clear that Boveri's explanation[2] of chromosome diminution, although valid in its reliance on cytoplasmic rather than nuclear control, is inadequate for the observations reported here. The mere presence of an inert material which either prevents (or causes) diminution can not account for the fact that it may take place in eggs when cleavage has been suppressed, although nuclear divisions and, presumably, other changes have occurred. It is these other changes which take place independently of cleavage but ordinarily correlated with it, to which attention must be turned in seeking an