eating, nor during the time immediately following feeding (sometimes as long as 30 min).

This curious rearing response of *G. sargassicola* to a sudden decrease in light intensity appears to be a unique case of a shadow response among members of the phylum Platyhelminthes. (For a discussion of recent work on shadow responses see ref. 7.)

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The Marine Cladoceran *Penilia avirostris* Dana in the American Waters of the Pacific Ocean

The marine cladoceran *Penilia avirostris* Dana has been recognized as the only species of the genus[1–3], and to this species belong the many specimens collected on April 11, 1953, at Bingham Station No. 70, at 04° 42′ S., 81° 22′ W., near the Peruvian coast.

P. avirostris reproduces parthenogenetically by eggs laid into the brood pouch and developed there into free-swimming young. Then males and fertile females appear in the population and the latter bear one or two resting eggs, which have been generally assumed to develop as a result of the sexual reproduction. Our specimens were parthenogenetic individuals bearing in the brood pouches 2–8 young; no males and no females with resting eggs were seen.

P. avirostris shows a sporadic and discontinuous distribution and has been found mainly in the coastal waters of tropical oceans, in the northern and southern areas of the warm temperate region, as well as in the Mediterranean and Black Seas[3–5]. In a previous paper[5], I have pointed out the lack of records along all the American coasts of the Pacific Ocean. The recent occurrence in Peruvian waters breaks down such a discontinuity, and it is rather surprising since the nearest recorded positions are all located in the western Pacific.

In some localities, where *P. avirostris* produces resting eggs, a regular and seasonal occurrence has been observed; however, its presence all the year round in the plankton of the inshore waters off Freetown (Sierra Leone)[6] and at Algiers[7] could confirm the hypothesis[4] by which, in some areas, it could reproduce by parthenogenesis only.

The appearance in new and unusual localities may be due to the production of resting eggs which, not yet sunk, have been caught up in wind-driven spray[4], but its distribution could also be connected with the circulation of the water masses[8]. The appearance in the North Sea[9] was rather surprising as the nearest record seemed to be located in the Mediterranean; but *P. avirostris* has since been found in Portuguese waters[10]. The new record, although the cladoceran might be endemic in the tropical waters of the eastern Pacific or arrived there by the Panama Canal, is particularly interesting as the recorded position is located in the northern area of the Peru Coastal Current where upwelling is a conspicuous feature; moreover, seasonal changes turn south, along the coast, part of the Equatorial countercurrent.

P. avirostris lives in swarms along the coasts, in sounds and bays; nevertheless the few records offshore[8] and the present one suggest that it can be considered an indicator in biological oceanography, as distribution and establishment of the cladoceran in a certain area require different conditions from ecological and biological points of view.

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A Case of Negative Allometry in *Austropotamobius* Gill Growth

The relative filamental surface area of the common British crayfish shows a tendency to decrease with increase in body size[1]. This seems to contradict the principle of similitude which states that the surface area of an animal is proportional to the square of its linear dimensions, whereas the volume (and the weight, for approximation) is proportional to the cube. Growth rates are known to differ in different organs of the same animal, and Huxley[2] found quite empirically that organ to body relationship is better expressed by the equation:

$$G = bW^{\alpha}$$

where G is the size of organ examined (in dimension or weight units), W is the size of whole body (in dimension or weight units) and b and α are constants.

The total wet gill weight, G, of *Austropotamobius pallipes* (Lereboullet) was plotted logarithmically against the logarithm of the wet body-weight, W, for a range of 2–51·7 g. The results are presented in Fig. 1. The straight line follows the equation, $G = (0{\cdot}1769)\ W^{0{\cdot}931}$.

The findings suggest that the branchial tissue grows at a slightly slower rate than the entire body, the difference

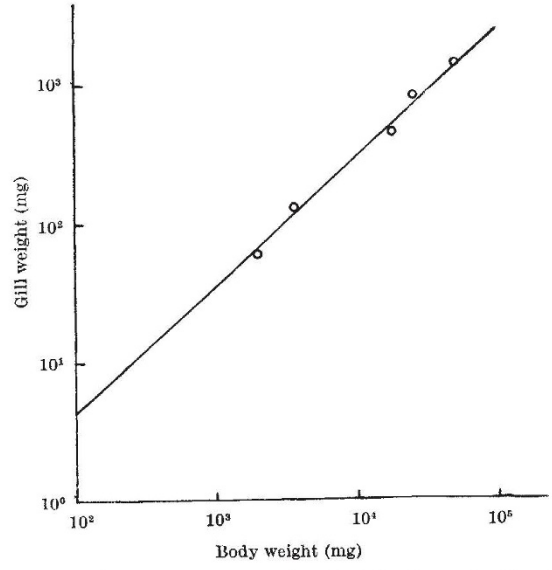

Fig. 1. Relative growth curve of wet gill weight in *Austropotamobius*