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12. I thank A. Robertson for loan of time-lapse photographic equipment, J. Sak for translating the Krinskii paper, and many colleagues for thought-provoking discussion. M. Andrews (British Broadcasting Corp.) kindly released color movies made for *Horizon*. Support came from the National Science Foundation, the Sloane Foundation, and the Otho S. A. Sprague Memorial Foundation. This report was written while enjoying the hospitality of the MRC Laboratory of Molecular Biology, Cambridge, England.

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Giant Amphipod from the Abyssal Pacific Ocean

Abstract. *A baited camera has recorded a lysianassid amphipod that is twice as large as the largest amphipod previously recorded. The locality for this mobile omnivore is the sterile bottom of the eastern North Pacific Ocean, at a depth of 5304 meters.*

In the deep sea, many of the megafaunal taxa are either so rare or so wary that it is unlikely they will be recorded by conventional photographic surveys or captured by ordinary trawls or grabs. As a result, our understanding of the deep-sea fauna may harbor significant biases. New techniques are likely to reveal unsuspected aspects of the deep-sea benthos. This was demonstrated by the discovery of a giant amphipod in some photographs taken by a free-vehicle bottom camera known to its users as the monster camera.

The monster camera, as used in the lowering discussed here, consists of a weighted can of bait with a camera suspended above it. A strobe light is fastened to a long arm extending out to the side of the camera, and floats and beacon extend above the camera. The camera has a capacity of 100 feet of 35-mm film and can take pictures at intervals of 5, 10, and 15 minutes. When a clock release operates, or a magnesium link dissolves away, the camera returns to the surface and leaves the weighted bait can on the bottom (*1*).

On free-vehicle mission 515 of the Marine Life Research Group of the Scripps Institution of Oceanography, 29–30 November 1968, the monster camera was employed 780 miles east-northeast of Oahu in the northeastern Pacific Ocean (23°54.5′N, 144°04.9′ W). The depth to the red clay bottom was 5304 m. Because of depth, remoteness from land, and the low productivity of the surface waters, this portion of the abyss is one of the least productive regions in the world's oceans (*2*). The camera run lasted 20 hours, with exposures every 10 minutes. The bait (assorted dead fish) was held in a 19-liter (5-gallon) bait can whose top was 235 mm square.

The first animals to be attracted to the bait were natantian decapod crustaceans, which appeared 1 hour after bottom contact. Fish appeared after approximately 4 hours. The first large amphipod arrived after 5 hours, and one or more amphipods were recorded intermittently for the next 11 hours. By then the bait can had been emptied and presumably had lost much of its attractiveness.

As many as three amphipods appeared in a single exposure. Judged by the different sizes, at least five individuals visited the bait. These swam and walked about the can, nestled into (and fed on?) bait that had been dislodged from it, or even went completely into the can when it was nearly empty. With the bait can used for scale, some of the amphipods were measured. The largest was 282 mm long, twice as long as any amphipod previously recorded. The prior record belongs to *Alicella gigantea* Chevreux (*3*), from the eastern North Atlantic Ocean at a depth of 5285 m, which attained only 140 mm.

A few other large gammarid Amphipoda have been recorded from bathypelagic or abyssal locations; for example, *Eurythenes gryllus* (Lichtenstein) (family Lysianassidae), taken in the North and South Atlantic and Pacific oceans from the surface to 6500 m, reaches 90 mm (*3, 4*). Most other large amphipods are considerably smaller; for example, *Parargissa galatheae* J. L. Barnard (family Hyperiopsidae), 42 and 50 mm long, from the eastern tropical Pacific and Indian oceans at 3750 and 4360 m (*4*), and the bathypelagic or abyssopelagic *Hirondellea gigas* (Birstein and Vinogradov) (family Lysianassidae), 32 mm, in the Kurile-Kamchatka Trench at 6000 to 6400 m (*5*) and, 20 to 25 mm, from a trawl in the Philippine Trench down to 10,190 m (*6*).

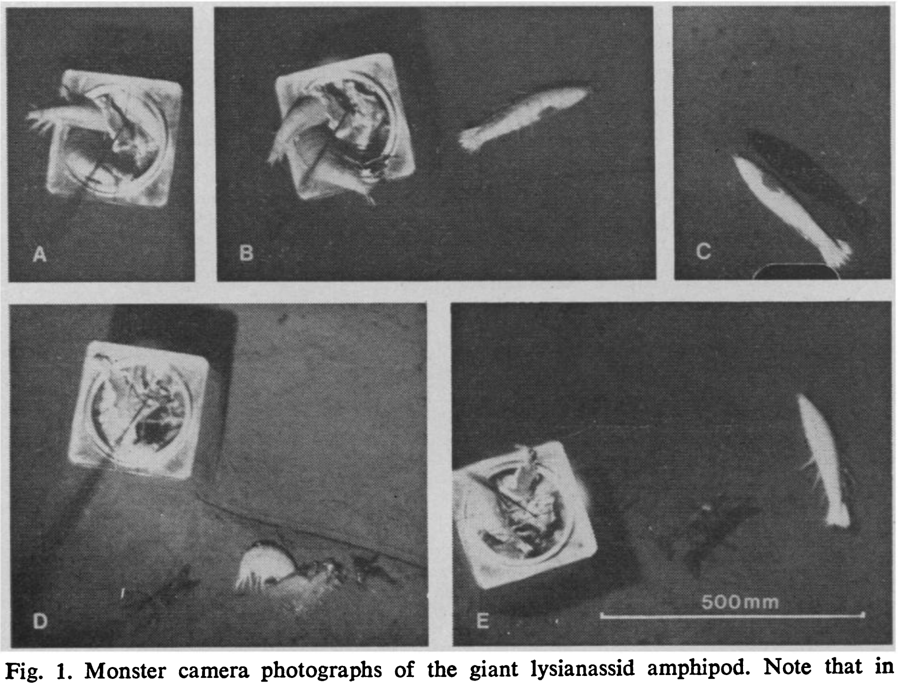

Fig. 1. Monster camera photographs of the giant lysianassid amphipod. Note that in (B) there are two individuals in the bait can.

There is little doubt that the amphipods photographed by the monster camera belong in the family Lysianassidae. Although most detailed diagnostic features are not visible, the stout peduncle of the first antenna, the compact body, and the smooth cuticle and lanceolate uropods (Fig. 1, C, B, and D, respectively) are satisfactory evidence (*7*). No doubt many undescribed Lysianassidae still remain in the deep sea, which makes closer identification impossible. However, this species apparently lacks the strongly ridged dorsal surface of the common bathyal and abyssal *Eurythenes gryllus* [figure 132a in (*7*)] and has some features, such as the shape of the basis of the last pereiopod, the dorsal surface of the urosome and pleon, and the telson (visible in Fig. 1, D, B, and E, respectively), similar to those of *Alicella gigantea* (*3*).

Evidence of the habits of these large amphipods is scanty. In general, Lysianassidae are ubiquitous, strongly swimming carnivores or omnivores. *Eurythenes gryllus* has diffuse eyes (*3*, *4*) occupying a large part of the side of the head. The adults are red in color (*5*) and have oily bodies. These features suggest a bathypelagic life, although "mineral particles" have been found in the gut (*4*), and specimens have been collected from such diverse sources as benthic fish traps and the stomach (*3*) of a sea bird (the fulmar, *Fulmarus glacialis*), which indicate that this species may feed from the surface of the sea (probably at night) to the abyssal bottom on occasion. *Alicella gigantea* has large eyes (*3*), and our species probably has extensive ocular areas (see Fig. 1C); both have whitish or light-colored bodies like obligate benthic species. It is likely that both swim extensively but spend more time on the bottom than *Eurythenes gryllus*.

These large Lysianassidae appear to be versatile omnivores and scavengers, swimming through a great depth range and having adaptations for reduced specific gravity (for example, the oily body of *Eurythenes gryllus*) and photoreception in the photic zone, but retaining features, such as the compact bodies, relatively short simple pereiopods, antennae, and uropods, necessary for opportunistic scavenging and carnivory on the bottom. The features of *Eurythenes gryllus* indicate that its primary habitat is the bathyal region of the water; *Alicella* and our species probably spend much of their time on or near the bottom but venture occasionally into the photic zone.

Chevreux (*3*) commented on the difficulty or impossibility of obtaining large deep-sea Lysianassidae by trawling or dredging. His specimens of *Eurythenes gryllus* and *Alicella gigantea* were taken from large fish traps containing smaller traps, so in many ways his method of collection was similar to our bait can method. The apparent alacrity with which these scarce, mobile creatures approach the bait suggests that trapping of the attracted animals may be a potent technique for obtaining otherwise uncatchable organisms in the deep sea.

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Ovulation in Hamster: Induction by β Subunit of Ovine Interstitial Cell Stimulating Hormone

Abstract. *As little as 5 micrograms of interstitial cell stimulating hormone (ICSH) or 20 micrograms of ICSH-β is effective for the induction of ovulation in 100 percent of hamsters treated at 0500 hours on day 4 after lordosis, whereas as much as 800 micrograms of ICSH-α is ineffective. Both ICSH and ICSH-β are also effective for induction of ovulation in hypophysectomized animals. Thus, the ovulation-inducing activity of the ICSH molecule resides in its β subunit.*

Pituitary interstitial cell stimulating hormone [ICSH or luteinizing hormone (LH)] induces ovulation in the rat (*1*) and hamster (*2*). Highly purified ICSH isolated from sheep pituitary glands (*3*) is composed of two chemically dissimilar subunits (*4, 5*), and the primary structures of both subunits (ICSH-α and ICSH-β) have recently been elucidated (*6*). We now report the ovulation-inducing activity of ICSH, ICSH-α, and ICSH-β in both normal and hypophysectomized hamsters.

Mature female golden hamsters (*Mes-*

Table 1. Induction of ovulation in the intact hamster by a single intraperitoneal injection of ovine-ICSH or its subunits at proestrous stage at 0500 on day 4 after lordosis. Animals were examined for the number of ruptured follicles and newly ovulated tubal eggs 17 hours later. The hormone was administered in 0.2 ml of water; S.E., standard error.

Single dose (μg/hamster)	Animals			Ruptured follicles (Mean ± S.E.)	Tubal eggs (Mean ± S.E.)
	Treated (No.)	With ruptured follicles (%)	With tubal eggs (%)		
		ICSH			
1.25	9	0	0	0	0
2.5	9	6 (67)	5 (56)	3.1 ± 1.0	2.6 ± 1.0
5.0	9	9 (100)	9 (100)	8.0 ± 0.8	8.0 ± 0.8
		ICSH-α			
8.0	9	0	0	0	0
80.0	10	0	0	0	0
800.0	9	0	0	0	0
		ICSH-β			
2.5	9	0	0	0	0
5.0	9	1 (11)	1 (11)	0.4 ± 0.4	0.2 ± 0.2
10.0	13	9 (69)	9 (69)	5.9 ± 1.1	4.6 ± 1.0
20.0	10	10 (100)	10 (100)	8.7 ± 0.8	8.7 ± 0.8
40.0	5	5 (100)	5 (100)	9.6 ± 0.5	9.6 ± 0.5
		Prolactin			
800.0	7	0	0	0	0
		H_2O			
0.0	8	0	0	0	0