Letters

Pre-1962 Creatine Sought

We are seeking help in finding 50 grams of Eastman (Distillation Products Company) creatine, catalog No. 951, purchased prior to 1962. We have been informed that the source of creatine sold by Eastman has changed, and we find a different physiological response from that formerly found in rats fed creatine. Eastman has been unable to locate a supply of the earlier product for us.

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"Sea-Grant" Colleges

Though I am in complete agreement with Spilhaus (4 Sept., p. 993) that our efforts to study the oceans and their tidal tributaries must be more adequately supported and staffed as well as properly organized, it is difficult to find significant merit in his "sea-grant college" notion. One cannot argue against the generally excellent record of the "land-grant college system." Its accomplishments have been great. However, it was developed under conditions which do not exist today. Land-grant colleges were developed to promote and encourage education and its practical by-products at a time when there were few institutions of higher learning of any sort. From them, the great government-supported system of higher education arose.

Now, however, there is no need to encourage establishment of institutions interested in the sea. On the contrary, there are many institutions, including some land-grant colleges, which are actively interested in oceanography or marine science. Many of these institutions have teaching and research faculties, laboratories, field and laboratory equipment, and administrative units, in being and functional, which could and should be augmented and made more effective. Recent studies of marine research capabilities conducted for the Atlantic States Marine Fisheries Commission indicate that many of the numerous coastal states have programs of marine research and teaching and that their efforts are growing. These programs involve a great many people and projects. Making more effective use of these ready-made state-supported and independent marine laboratories would enable the United States to increase the assault on the oceans without the necessity of building whole new seaside laboratories, faculties, and equipment pools. I wish, therefore, to urge strongly against the inevitable dilution of effort that would accompany establishment of a whole new marine research and teaching system as embodied in the "sea-grant college" notion.

It is heartening to observe revival of interest in oceanography in the nation's news media after a comparative lull of several years, but I sincerely hope that this revival will not prompt another bandwagon leap by institutions whose locations, faculties, and facilities make them more suitable for terrestrial- or space-oriented work.

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Snailpower

In "Ecological design of irrigation canals for snail control" (18 Sept., p. 1324), Jobin and Ippen declare it "amusing, if irrelevant" to calculate the maximum power of a snail, finding it to be a mere 5.2 erg, which they belittle by noting that "the output of 2.5 million snails would be equivalent to 1 horsepower."

This is not amusing to a snail or irrelevant to man. The relative power of small creatures is well known. When the creatures are abundant and prolific, their power can be plaguing or even disastrous to man. Instead of belittling the snail by comparing its horsepower with that of the horse, it would be more in point to compare their power relative to their size.

The standard laboratory draft horse weighs 600 kg, or 500,000 times as much as the snail. If nearly equal specific gravities for the two creatures are assumed, the linear scale factor (L) is the cube root of the weight ratio (M), or about 80. The dimension of power being $M \times L \times t^{-1}$, its scale factor is 500,000 times 80, or 40×10^6. The measured snailpower was 0.40×10^{-6}; if this is multiplied by the power scale factor, it appears at first that a horse with power comparable to that of a snail must be able to produce 16 hp. Upon further analysis, it appears that the horse must produce this power while submerged!

Let's not bewail the lowly snail
At several ergs retrorse,
But rather hail that for his scale
He matches man or horse.
If each is first complete immersed,
Test Jobin, dunked, or Ippen,
One-third his weight athwart his pate;
Assuredly he'd be slippin'!

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Exams: The Undergraduate Mind at White Heat

LaFave's letter (9 Oct., p. 171) in favor of using essay tests instead of multiple-choice tests struck a responsive chord. I wish to offer the observations of William A. Kepner, longtime professor of invertebrate zoology at the University of Virginia, as shedding light on this subject. When asked why his final examinations usually consisted of one "fact" question and one "essay" question designed to explore relationships not even mentioned in class, he remarked that the only time an undergraduate's mind works at white heat is during an examination, and that he considered it much more important to insert a concept than to extract a fact at such a time.

I took several of these highly original and confidence-shattering tests. You had to study facts. You never knew which of a whole semester's collection he would call for in question 1. The reward for this toil was the magnificent opportunity, in question 2, of seeing some of these facts from a new point of view—of considering connections between things previously kept in separate compartments in the mind. These challenging examinations never bored anyone. They are the only ones in 7 years of college attendance that I still remember 30 years later. I am grateful to Professor Kepner to this day.

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