planetary perturbations soon smear out any record of the original direction or distance of fall toward the sun. Even if we could observe all comets within 10 or 20 astronomical units of the sun, the key to their origin would lie in recognizing the new ones that preserve some record of the initial conditions.

THORNTON PAGE
Department of Astronomy, Wesleyan University, Middletown, Connecticut

Exposures in Lunar Photography

If the errors in *Outer Space Photography for the Amateur*, reviewed by Charles H. Smiley in a recent issue of *Science* [**133**, 271 (1961)], are typified by the example given in the review, they must be "few and . . . unimportant" indeed.

It is well known among astronomers that the full moon is about nine times as bright as the first and last quarters. But since the quarter moon is only half illuminated, the surface brightness of the full moon is only about four and a half times that of the quarters. Thus, the book's suggestion that the exposure for the quarter moon be four times that for the full moon is substantially correct, and the reviewer's "correction," giving the factor of nine, is wrong.

However, to paraphrase the reviewer, if a professional overexposes his first moon photograph, he can make corrections on his second try.

ANDREW T. YOUNG
Harvard College Observatory, Cambridge, Massachusetts

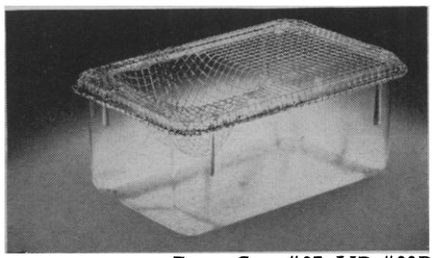
I shall leave my statement as it is, with the factor nine. Young's arithmetic is satisfactory, as far as it goes, but some judgment is needed in addition. The full moon, flat-lighted, is low in contrast; most astronomers expose and develop to increase the contrast. If one is to develop to a high gamma and yet have a reasonable maximum density, one will choose an exposure on the low side, down one or two stops from that indicated by Young's arithmetical solution.

For the moon at either quarter, the situation is different. Then the interesting lunar area is that near the terminator, where the natural contrast is high. One may reasonably choose to expose for the partly illuminated areas and develop for less than full contrast. One might also take into account the fact that the surface brightness of the moon at first quarter is about 20 percent greater than at third quarter.

Modern black-and-white negative materials provide such a generous latitude that the amateur does not need

A Mousellany of Animal Care Developments

They Said It Couldn't Be Done



Econo-Cage #27, LID #22D

The new Polycarbonate Econo-Cage #27 is clear, autoclavable and unbreakable.

To operate most efficiently animal colonies must use cages which withstand the rough and tumble of mechanized washing systems and the high temperatures at which these systems and autoclaves operate. Because colonies must be inspected quickly, cages should afford maximum visibility. Until now the cages were either transparent or durable, but none had both characteristics.

The new Polycarbonate combines the optical and thermal properties of glass with an *impact resistance unmatched by any other clear material.* A good example of the degree of impact resistance was furnished by a doubting Thomas who could not break the cage by dropping it out of a fourth floor window. Polycarbonate retains this remarkable strength from 275° F. to −40° F. It is the first clear plastic which can be autoclaved repeatedly.

This new material, a linear aromatic polyester of carbonic acid, has a very low absorption level. Odor producing gases are not absorbed, resistance to most acids and basics is very good.

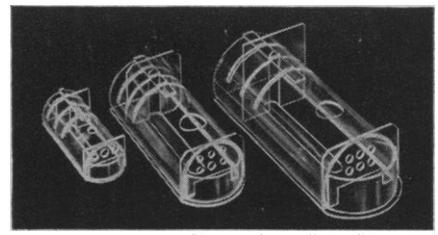
The cage is constructed to N I H Spec. EG-84. For housing mice, the cage is 11½″ x 7½″ x 5″ deep. The cages nest for easy storage.

This is one of the "20 Series" of Econo-Cages, which includes cages of fibre glass, acrylonitrile-styrene-copolymer, polypropylene and polycarbonate. These are all 11½″ x 7½″ x 5″ deep. There are four lid styles which are interchangeable on all "20 Series" cages. Write for complete information on this series.

Working With Restraint

Two new pieces of animal restraining equipment are now available from the Econo-Cage Division of Maryland Plastics, Inc. A small restrainer for mice weighing from 10 to 40 grams (Econo-Cage #88), and a large unit for rats and hamsters weighing from 250 to 600 grams (Econo-Cage #91), are new additions which supplement Econo-Cage #90 for 150 to 300 gram rats and hamsters.

These clear acrylic plastic units afford rapid and safe immobilization of animals, easy access and maximum visibility of animals in restraint. Econo-restrainers prevent unanesthetized animals from attacking tubes, cannulae, and other fixtures; provide extended housing during nutritional studies; restrain animals during administration of intravenous, intraperitoneal, intramuscular, and subcutaneous injections; and are useful for administering intravenous fluid drips and anaesthetic.



Econo-Cage #88, #90, #91

All three sizes have an adjustable tailgate which fits into any of three slots to vary cage length, confine the animal, and serve as a cage door. Openings at the top, bottom, and tail provide easy access to any part of the animal (the bottom slot also permits drainage of animal waste). A hopper permanently attached to the front of the unit includes a trough for granular feeds and a water tube inlet.

The small restrainer, Econo-Cage #88, can be varied from 2″ to 3½″ in length and is 1¼″ wide. The medium restrainer, Econo-Cage #90, can be varied from 4½″ to 6″ in length and is 2½″ wide. The large restrainer, Econo-Cage #91, can be varied from 5″ to 7″ in length and is 3″ wide. All these units can be cleaned chemically or with hot water, they are not autoclavable.

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- c a g e

ECONO-CAGE DIVISION
MARYLAND PLASTICS, INC.
9 East 37th Street,
New York 16, N. Y.

to worry about overexposing or underexposing by a factor of two. With color, it is different; the arithmetician's solution may not be satisfactory for either the sun-lit or the earth-lit portion of a thin crescent moon.

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Ladd Observatory, Brown University, Providence, Rhode Island

Inquiry into Racial Differences

I agree with the ideas expressed in the letter by Leon S. Mickler on "Racial differences" [*Science* **133**, 202 (1961)].

The proposition that all races are genetically equal in mental abilities has become a part of conventional wisdom, but, in my opinion, none of the supporting evidence meets requirements for proof. It is also unproven that racial differences in mental abilities and achievement have a genetic basis, but it seems to me that the weight of evidence is strongly in favor of this conclusion. The lack of culture-free tests of abilities, problems of sampling and control, and the fact that racial groups are not pure are all barriers to proof. There are methods of studying the problem that have not been tested, and the question could be answered with reasonable certainty, although the procedures would be tedious and costly. We should support inquiry and debate of this question for two reasons. First, science should continue as the free pursuit of knowledge; we should make no rules which stop people from thinking. Second, additional information on racial differences may be required in order for society to work intelligently toward removing the causes of racial problems.

I agree with Mickler that new information on the genetic basis of mental abilities should not threaten the legal or moral rights of any race. It is possible, however, to hold to the principle that each individual be appraised on his aptitudes and behavioral standards without regard to race and, at the same time, to face the possibility that the random mixing of races in schools and housing as a means of achieving desegregation is neither scientifically sound nor morally right. It may well be, if civilization survives and racial bias disappears and each individual is free to move ahead according to his aptitudes and drives, that, although individuals of every race will achieve excellence in every field, there will continue to be important racial differences in interests, aptitudes, and kind of achievement.

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