

## Animal Tests Justifiable

(Continued from p. 465)

two-thirds of the funds and laboratories one-third. How much money will be available next year depends on NIH's budget, but the most that can be expected is probably about \$12.5 million, said Mr. Tillson.

Would this do the job? No. Extensive renovation and reconstruction are needed to bring animal facilities up to the standards demanded by S 3332. In very rough terms, said Mr. Tillson, the total cost might run perhaps \$20 million a year for five years.

A major reason for substandard laboratory conditions is the drastic shortage of trained animal technicians. Consequently NIH with the Department of Labor has begun a pilot project in California to train people with grammar school educations in this function.

### Laboratories Need Time

Laboratories need a reasonable time—three to five years—in which to comply with standards, said Mr. Tillson. Refusal to allow this would result in immediate crisis.

Why then do humane groups push such legislation? Either they do not believe the problem exists or their sympathies lie so much with the animal, they do not care.

The rationale behind the Rogers bill is to spare animals "avoidable discomfort, pain, fear, stress, trauma and other distresses." But what is avoidable to a member of the Humane Society may not be avoidable to a scientist. In truth, the humane movement, as President Evans admitted in an interview, has "greatly suffered" from a lack of knowledge about research. One of the commendable features of the Rogers bill is that in a few years, it would result in a much better-informed humane movement, said Mr. Evans.

But while scientists educate the animal spokesmen, what happens to human welfare?

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### GEOPHYSICS

## Total Mass of Earth's Atmosphere Calculated

► THE TOTAL WEIGHT of the earth's atmosphere has been calculated accurately by an Italian scientist doing research at the Smithsonian Astrophysical Observatory, Cambridge, Mass.

Its mass in grams is 5.136 followed by 21 zeroes, or 5,136 billion billion grams, Dr. Franco Verniani has computed.

A rough estimate of the total mass of earth's atmosphere can be obtained by multiplying together the average barometric pressure at sea level, the surface area of the earth and the acceleration of gravity.

An accurate calculation, however, is a difficult problem. One complication is the considerable depth of the atmosphere, resulting in gravity being measurably less at higher levels. The varia-

tion in air density with height must, therefore, be known.

Another problem is introduced by differences in the height of earth's land surface—the atmosphere does not everywhere reach down to sea level.

Making suitable allowances for these factors, Dr. Verniani computed the atmospheric mass as 5,136 billion billion grams, with an uncertainty of about a tenth of one percent.

He further found that the lowest 18,700 feet contribute one-half of the total mass, and that the total is close to one-millionth the overall mass of the earth.

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