A solution containing 12400 rabbit units was fractionated and the resulting precipitate was found to contain 650 R.U. The assay of the filtrate showed it contained 11700 R.U. This is a total recovery of 99.6%. In working with small quantities of concentrated solutions, small unavoidable losses are incurred in the various procedures. For example, a solution containing 3100 R.U. gave 2 fractions with 2740 and 10 R.U. The recovery in this case was 88.7%.

The simple method for the bioassay of renin, suggested in this paper, will make it possible to give data concerning yield and degree of purity for each step of the various chemical procedures involved in the preparation of renin.

## 13125

## Distribution of Body Weight in the Organs and Tissues of the Rabbit.*

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In the study of the distribution of radioactive isotopes in rabbits, it is usually convenient to prepare for the counting procedures, 1 or 2 g or less of the various tissues. From this sample, the percentage of the isotope dose per gram of tissue may be calculated. However, to account for all of the isotope dose, it becomes necessary to know the total amount of muscle, brain, bone and other tissues in the experimental animal. Such data are not available in the literature.

*Procedure.* The animals were adult, male, New Zealand albino rabbits in good health which had been for several months on our stock ration of oats, alfalfa and lettuce supplemented by chow.

Immediately upon sacrifice, the skin was removed from the body. Considerable subcutaneous fat adhered to the skin and was not separated from it.

The viscera weight included the usual viscera, the salivary glands, larynx, perirenal fat and also the weight of blood removed in the blood volume determinations.

All the adhering soft tissues were removed from the skeleton. As

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each bone was cleaned, it was placed in tap water. When all the bones were prepared, they were dried with blotting paper and weighed together. The weight of the muscle was obtained by difference.

The fresh bones were dried overnight at 105°C, the fat removed by alcohol extraction, and the extracted bones dried on a steam bath. The remaining organic matter was removed by boiling in 3% KOH solution in ethylene glycol, followed by washing in boiling water. The inorganic residue was dried overnight at 105°C.

*Discussion.* The brain weight expressed as a percentage of the body weight was remarkably constant (about 0.3%) (Table I). The bone percentage was fairly constant. The other tissues (see also Table III) showed some variability but in no case did the average deviation exceed 6%. These data provide the desired basis for the calculation of the distribution of radioactive isotopes in the rabbit.

The distribution of bone constituents for the entire skeleton (Table II) gives a somewhat different picture than is usually obtained from analyses of femur or humerus. The average values expressed on the wet bone weight basis are as follows: water, 38%; fat, 9%; other organic matter, 20%, and ash, 33%. The organic to inorganic ratio is not much different from femur analyses, but the water content is high. This may have been an artifact contributed by the method of storing the bones.

TABLE I.
Percentages of Blood, Skin and Fur, Viscera, Bone, Brain and Muscle in the Rabbit. Data are given as percentage of intact body weight.

| Rabbit No. | Rabbit wt, g | Blood Vol.,* % | Skin and Fur, % | Viscera, % | Wet Bone, % | Brain, % | Muscle, % | Recovery, % |
|---|---|---|---|---|---|---|---|---|
| 1 | 3420 | | 13.3 | 22.0 | 8.2 | 0.32 | 56.3 | 99.8 |
| 2 | 3440 | 7.4 | | | | | | |
| 3 | 2935 | | 13.9 | 27.1 | 8.4 | 0.32 | 50.4 | 99.8 |
| 4 | 3160 | | 13.3 | 25.5 | 7.8 | 0.32 | 53.2 | 99.8 |
| 5 | 3050 | 6.8 | 13.2 | 27.8 | 8.6 | 0.33 | 50.4 | 100.0 |
| 6 | 3615 | 6.9 | 14.9 | 24.0 | 7.5 | 0.30 | 53.5 | 99.9 |
| 7 | 2630 | 8.2 | | | | | | |
| 8 | 3560 | 6.1 | 13.1 | 26.1 | 8.5 | 0.30 | 52.3 | 100.0 |
| 9 | 3590 | 6.3 | | | | | | |
| 10 | 3045 | | 14.5 | 26.5 | 7.7 | 0.30 | 50.5 | 99.2 |
| 11 | 2655 | | 15.0 | 26.8 | 7.2 | 0.34 | 51.0 | 100.0 |
| 12 | 2630 | | 11.9 | 29.8 | 8.6 | 0.37 | 49.4 | 99.7 |
| 13 | 2445 | | 11.2 | 26.9 | 8.1 | | 53.2 | 99.4 |
| Avg | 3090 | 7.0 | 13.4 | 26.2 | 8.0 | 0.32 | 52.0 | |
| Avg deviation | | 0.6 | 0.9 | 1.5 | 0.4 | 0.02 | 1.7 | |

*The blood volume figures are not a part of the "Recovery" column.

TABLE II.
Distribution of Weight Between the Various Components of Rabbit Bone.

| Rabbit No. | Wet wt, g | Dry wt, g | Fat, g | Total organic material, g | Ash, g |
|---|---|---|---|---|---|
| 1 | 279 | 182 | 28.0 | 86.0 | 96.0 |
| 3 | 248 | 148 | 19.1 | 65.5 | 82.8 |
| 4 | 246 | 156 | 24.0 | 73.5 | 82.5 |
| 5 | 251 | 156 | 24.3 | 77.8 | 77.9 |
| 6 | 270 | 172 | 32.0 | 79.4 | 92.8 |
| 8 | 302 | 176 | 32.0 | 91.2 | 84.6 |
| 11 | 190 | 119 | 14.5 | 56.5 | 62.5 |
| 12 | 225 | 138 | 17.0 | 61.7 | 76.3 |
| 13 | 198 | 120 | 17.5 | 56.0 | 64.0 |
| Avg | 245 | 152 | 23.2 | 71.9 | 79.8 |
| Avg deviation | 27 | 18 | 5.4 | 10.7 | 8.7 |

TABLE III.
Weights of Certain Organs in the Rabbit.*

| Rabbit body wt, kg | Kidney, g | Spleen, g | Adrenal, g | Heart, g | Lung, g | Submaxillary salivary gland, g | Liver, g | Thyroid, g |
|---|---|---|---|---|---|---|---|---|
| 2.90 | 23 | 0.6 | 0.50 | 11.2 | 12 | 1.4 | 120 | |
| 3.12 | 20 | 1.5 | 0.45 | 10.0 | 32 | 1.5 | | 0.35 |
| 2.40 | 20 | 1.2 | 0.20 | 9.0 | 18 | 2.4 | 150 | 0.20 |
| 2.67 | 20 | 1.0 | 0.45 | 8.8 | 16 | 1.6 | 75 | 0.30 |
| 3.40 | 24 | | | 9.4 | 25 | 1.8 | 112 | 0.35 |
| 3.00 | 21 | 2.7 | 0.50 | 9.1 | 13 | 1.6 | 106 | 0.25 |
| 3.35 | 25 | 2.0 | 1.15 | 9.3 | 15 | 1.9 | 84 | 0.55 |
| 2.88 | 18 | 2.2 | 0.75 | 7.6 | 12 | 1.4 | 84 | 0.40 |
| 3.20 | 21 | 1.8 | 0.60 | 15.8 | 27 | 1.8 | 133 | 0.50 |
| 3.55 | 24 | | 0.45 | 10.8 | 19 | 1.4 | 117 | 0.35 |
| 3.00 | 16 | 1.4 | 0.40 | 7.5 | 14 | 1.3 | 146 | 0.20 |
| 2.81 | 22 | 1.4 | 0.55 | 10.6 | 14 | 1.3 | 137 | 0.71 |
| 2.45 | 18 | 1.7 | 0.45 | 7.1 | 14 | 1.0 | 97 | 0.60 |
| 2.25 | 13 | 1.0 | 0.73 | 5.8 | 12 | 1.0 | 66 | 0.55 |
| 2.64 | 20 | 1.6 | 0.35 | 8.3 | 11 | 1.2 | 116 | 0.24 |
| 2.72 | 22 | 1.2 | 0.35 | 7.2 | 24 | 1.1 | 107 | 0.42 |
| 2.75 | 17 | 2.0 | | 8.8 | 22 | 1.9 | 108 | 0.50 |
| 2.03 | 24 | 1.2 | 0.25 | 8.6 | 15 | 1.5 | 98 | 0.55 |
| 2.82 | 11 | 2.5 | 0.50 | 10.5 | 12 | 1.2 | 88 | 0.30 |
| 2.71 | 25 | 0.7 | 0.50 | 8.3 | 20 | 1.5 | 89 | 0.30 |
| 3.35 | 24 | 1.5 | 0.30 | 7.6 | 16 | 1.6 | 98 | 0.22 |
| 3.27 | 24 | 3.5 | 0.47 | 10.6 | 21 | 1.3 | 97 | 0.50 |
| 3.51 | 26 | 0.9 | 0.40 | 13.1 | 37 | 1.7 | 120 | 0.55 |
| 2.94 | 17 | 1.5 | 0.35 | 8.2 | 18 | 1.8 | 102 | 0.35 |
| 3.50 | 20 | 2.4 | 0.45 | 9.2 | 22 | 1.8 | 114 | 0.45 |
| 2.66 | 24 | 2.2 | 0.40 | 6.0 | 12 | 1.3 | 83 | 0.50 |
| 2.84 | 18 | 2.5 | 0.85 | 8.2 | 13 | 0.8 | 108 | 0.10 |
| 2.99 | 23 | 2.4 | 0.25 | 7.6 | 18 | 1.4 | 91 | 0.25 |
| 3.02 | 20 | 1.5 | 0.20 | 8.4 | 17 | 1.4 | 122 | 0.20 |
| 2.90 | 21 | 2.4 | 0.35 | 8.3 | 15 | 1.2 | 103 | 0.35 |
| 2.98 | 19 | 1.7 | 0.26 | 7.2 | 11 | 1.0 | 91 | 0.50 |
| Avg 2.92 | 21 | 1.7 | 0.46 | 9.0 | 18 | 1.5 | 105 | 0.39 |
| Avg deviation 0.28 | 3 | 0.5 | 0.14 | 1.4 | 5 | 0.3 | 16 | 0.12 |

*The distribution of radioactive arsenic in these tissues is given in a report by Ariel, I., DuPont, O., and Warren, S. L., *J. Syph. Gonn.*, in press.

*Summary.* Ten adult, male, New Zealand albino rabbits were used to determine the percentages of body weight of blood, skin and fur, viscera, bone, brain and muscle. The brain weight is a constant percentage of body weight, the bone weight fairly constant and the other tissues vary within 6%.

## 13126

## Transitory Diminution of Blood Pyruvate *in vitro*.

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In freshly drawn blood with or without added pyruvate, there occurs first a rapid fall in pyruvate content followed by a later rise.[1, 2] These changes are abolished by the addition of iodoacetate.[2]

In order to determine whether serum or blood cells are responsible for the fall in pyruvate content, freshly drawn human blood was defibrinated with glass beads and the serum was separated by centrifugation. The pyruvate content was determined by Lu's method[3] modified by the use of tungstic acid protein precipitation. Blood cells suspended in saline caused a rapid change in added pyruvate while the serum had no effect (Table I).

The rate and extent of this reaction varied with the blood cell suspensions of different subjects. It was not affected by anaerobiosis with carbon monoxide or nitrogen.

TABLE I.

Protocol: Blood was defibrinated and the serum separated. Red cells were washed once in 0.85% NaCl and resuspended in Ringer-$PO_4$ Buffer (0.02 M, pH 7.3) to 50% hematocrit. Both serum and cells after pyruvate addition kept at 37.5° in water bath with constant slow shaking.

| | Pyruvate added, μg/ml | Theoretical content, μg/ml | Pyruvate found, μg/ml (Time after addition of pyruvate) 1 min. | 10 min. | 30 min. | 120 min. | 300 min. |
|---|---|---|---|---|---|---|---|
| Serum | 83.4 | 84.1 | 84.2 | 83.9 | 84.0 | | 84.0 |
| Cells | 21.6 | 22.3 | 12.7 | 8.2 | 7.8 | 23.3 | |

1 Wilkins, R. W., Weiss, S., and Taylor, F. H. L., PROC. SOC. EXP. BIOL. AND MED., 1938, **38**, 296.

2 Bueding, E., and Wortis, H., *J. Biol. Chem.*, 1940, **133**, 585.

3 Lu, G. D., *Biochem. J.*, 1939, **33**, 249.