fused group, since there was no hemorrhage, the decrease in hematocrit was primarily due to cessation in new cell production and senescence of red cells present at time of irradiation. If total blood volume remained constant, the red cell mass decrease, as indicated by the hematocrit, would have been about 70% over a 10-day period. Thus a very rough estimate of rat red cell life span by this manner is in excess of 20 days.

It could be argued that larger amounts of lyophilized platelets might be needed to control bleeding. However, the amounts injected were at a level resulting in acute mortality in some animals.

These observations do not apply to frozen platelets and do not prove that lyophilized platelets are of no value in other bleeding states. Since radiation bleeding apparently is due almost exclusively to a simple thrombopenia one can conclude that lyophilized platelets are ineffective in controlling bleeding from uncomplicated thrombocytopenia, whereas fresh platelets are effective in controlling such bleeding.

Summary. The efficiency of fresh *vs.* lyophilized platelet transfusions to control radiation induced hemorrhage were tested in rats by gross observation for bleeding, platelet count, hematocrit, microscopical study of lymph node sections, and susceptibility to bleeding from minor trauma. Hemorrhage occurs in irradiated, untreated rats around the fifth post irradiation day increasing with the progress of platelet fall, which reach a minimum around the tenth day. Fresh and lyophilized platelet transfusions were performed on 5th, 7th and 9th day. Whereas fresh platelet transfusions raised the platelet count to 2-3 times the normal and stopped hemorrhage, lyophilized material had no effect on platelet counts which were not different from irradiated controls and did not show any influence on the bleeding tendency. In the lyophilized platelet transfused rats, the hematocrit dropped more than in the irradiated controls.

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Total Body Water in Growing Domestic Fowl by Antipyrine Dilution Technic. (24482)

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That total body water was nearly a direct proportion of fat-free weight was shown by Light *et al.*(1) to be true for any particular age group but not between ages, in weanling and in grown rats. Annegers(2) studied the relationship among total body water, body fat, and fat-free, dry body weight in normal rats and mice and in starved and dehydrated rats. He showed that body fat did not have an independent effect on total body water when expressed on a fat-free basis. Severe dehydration reduced total body water in adult female rats. Distribution of non-toxic analgesic, antipyrine, in tissues in proportion to their water content was observed by Brodie and Axelrod(3). The volumes of distribution of antipyrine and deuterium oxide were found to agree well in normal subjects. Good agreement has also been obtained when com-

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TABLE I. Total Body Water of Growing White Leghorn Pullets by the Antipyrine Dilution Technic.

Age, wk	No. of birds	Wt, g	mg antipyrine inj.	Plasma H_2O, %	Body water	
					ml	%
1	16	68.7 ± 3.8*	15	95.5 ± .3*	58.5	85.2
2	12	88.1 ± 9.3	15	96.3 ± .5	60.5	68.7
3	17	148.5 ± 20.0	30	96.1 ± .4	99.7	67.1
4	16	221.0 ± 17.9	30	95.8 ± .2	152.3	68.9
6	8	422.8 ± 24.3	60	95.8 ± .4	250.2	59.2
8	16	605.8 ± 34.3	75	95.5 ± .2	399.8	65.9
16	8	1284.0 ± 48.1	150	95.1 ± .5	626.0	48.7
32	6	1619.3 ±227.5	150	94.6 ± .3	890.7	55.0

* Stand. dev.

paring volumes of distribution of antipyrine with total body water estimated by desiccation. The validity of antipyrine measurements was further confirmed when compared to calculations from body specific gravity(4, 5). This method has been applied successfully to cattle(6), swine(7) and calves(8). Weiss(9) used the antipyrine dilution technic to estimate total body water in mature chickens. In the work reported here, the antipyrine dilution technic was extended to include stages of growth of chickens from hatching to maturity.

Materials and methods. Females of the White Leghorn breed at Cornell University were used. They were fed a commercial ration appropriate to their age and housed in batteries at temperatures within their required zones. Birds of 1, 2, 3, 4, 6, 8, 16 and 32 weeks of age were studied. They were deprived of food for 18-24 hours before determinations were made. An appropriate amount, depending upon size of the bird, of a 15% antipyrine solution was injected intravenously. Blood samples were taken with heparinized syringes at 5, 10, 20 and 30 minutes after injection (in some cases 45 minutes). The problem of obtaining 4 samples was met by injecting a large number of chicks and collecting only one sample from each at a certain time after injection. As the birds grew older, 2 blood samples were taken from one bird. With mature hens all the blood samples could be taken from the same bird. A protein-free plasma filtrate was prepared. Antipyrine was determined essentially as described by Weiss (9). Plasma water was determined by desiccation of plasma to constant weight at 105°C.

Results. The results obtained for total body water by the antipyrine dilution technic are presented in Table I. In the 1-week-old chick, total body water was found to be 85.2% of the body weight; this percentage dropped rapidly to begin with and decreased to 55.0 in the mature bird. Plasma water content had a very narrow range from 95.5% in the 1-week-old to 94.6% in the mature hen. The estimation of total body water by desiccation(10) is also shown.

Discussion. With the exception of the 1, 6 and 16-week-old birds the direct method and antipyrine method agree fairly closely, although it does appear that antipyrine underestimates total body water. There was considerable variability found in the total body water in the one-week-old chick. This was probably due to differing amounts of yolk present in the birds used. The results obtained for the 32-week-old birds are in agreement with those published by Weiss(9). In conjunction with other published results (1,10) it was found in chickens that the relationship between total body water and fat-free body weight, which holds for any particular age group, does not hold between ages.

Conclusion. Total body water was estimated by the antipyrine dilution technic. There was considerable variation between the ages studied. In comparison with the direct method it appeared that in chickens the antipyrine technic underestimates body water, the range being from 85.2% for a one-week-old chick to 55% for the 32-week-old bird.

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Origin of the *Trans* Fatty Acids in Human Tissue.* (24483)

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We have previously reported(1,2) that *trans* fatty acids were deposited in the tissue of female rats which had been fed *trans* fatty acids and that these acids did not seem to pass through the placenta, as the progeny from these rats did not contain *trans* fatty acids unless they had been allowed to suckle the maternal milk. Since rat and human placentae may differ in ability to transfer nutrients, it is not possible to conclude from these results whether the human baby receives *trans* fatty acids *via* the placenta. In the present study samples of fat from human placental, maternal, fetal, and baby tissue were examined for the presence of *trans* fatty acids to determine whether those in human tissues originate(3) solely from dietary fat.

Methods. The placenta was washed free of superficial blood with cold water, the umbilical cord removed; the placenta was cut into small pieces, ground in Waring Blendor in the presence of ethanol, and allowed to remain in contact with solvent for 12 hours. The remaining lipid was removed by successive extractions with acetone, petroleum ether (Skellysolve F) and ethyl ether. Extracts were combined, dried over sodium sulfate and freed from solvent. Since these lipids contained a large amount of unsaponifiable material which interfered with absorption at 10.36 μ in the infrared region, analyses for *trans* fatty acids were carried out on the methyl esters. The combined lipids were saponified with 4% alcoholic potassium hydroxide at room temperature. We found that *trans* isomers are not formed under these conditions. The unsaponifiable material was removed in a separatory funnel by shaking with Skellysolve F, the soaps were acidified with hydrochloric acid, fatty acids removed by extraction with Skellysolve F, free from solvent, and the methyl esters prepared from residue by esterification with cold methanol saturated with hydrogen chloride gas. All extractions were done quantitatively and solvents were removed by use of a Rinco rotating evaporator. Lipids from samples of maternal, baby and fetal tissue were extracted by use of Soxhlet apparatus and after drying, the solvent (acetone followed by Skellysolve F) was removed as described above. The % *trans* double bond was determined at 10.36 μ by use of Beckman IR2A spectrophotometer and the Jackson and Callen baseline method(4). All analyses were done in carbon disulfide solution at 5% concentration. Methyl esters were compared with methyl elaidate standard and all other samples with a trielaidin standard.

Results. Methyl esters obtained from placental lipids contained little or no *trans* double bonds. In 3 samples a slight absorption

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