bidity assumes very low values in both heated- and raw-milk serums (Table 2).

Additional evidence of the validity of this theory of the cause of the decrease in the *p*H of milk by pasteurization was obtained from experiments with artificial mixtures of monocalcium and dicalcium phosphates. A mixture of these two salts, at about the same concentration in which they occur in milk (*5*), was prepared, and its *p*H was adjusted to a value approaching that of milk by adding small amounts of carbonate solution. When this mixture was heated at the pasteurization temperature of milk, its *p*H decreased, and generally the mixture behaved like milk in this respect. These facts indicate definitely that the decrease in the *p*H of milk effected by the pasteurization treatment is due to the new equilibrium established between monocalcium phosphate and dicalcium phosphate through a reaction that takes place between dicalcium phosphate and carbonic acid.

The work of Muller and Knöffel (*6*) has shown that carbonic acid at higher temperatures reacts to a certain extent with secondary and tertiary calcium phosphates with the production of primary calcium phosphate. This can also be deduced from the result obtained by Windish and Dietrich quoted by Mellor (*7*).

We have found that the lowering of the *p*H of milk effected by heat treatment and the resulting increased stability of the phosphates of the serum can be used as a test for differentiating heated milk from raw milk in their mixtures. Details of this work, as well as other possibilities now being explored, for using the change of the stability of phosphates in other biological fluids, will be reported later elsewhere.

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Communications

Effect of X-irradiation on the Adrenal Cortical Steroid Excretion in Urine

Abundant indirect evidence (*1–4*) supports the prevalent idea that adrenal cortical activity is altered following the stress of x-irradiation. The following preliminary results of the determination of the adrenal cortical steroids in the urine of pigs after lethal x-irradiation give more direct evidence (*5*).

Two castrated, male Chester-White pigs each weighing approximately 22 lb were given 1000 and 750 r, respectively, of total body x-irradiation. The factors were 1000 kv, 3.0 ma, Pb parabolic, 35-in. target-skin distance, and output 8.9 and 9.25 r/min, respectively.

Table 1. Total neutral adrenal cortical steroids in urine of pigs given lethal total body x-irradiation.

Day	Pig No. 1, 1000 r, mg/24 hr	Pig No. 2, 750 r, mg/24 hr
−2		1.1
−1	0.9	0.7
0	.9	.5
1+*	1.7	2.4
2+	1.4	0.7
3+	0.4	1.1
4+	.3	1.8
5+	Animal expired	0.8
6+		1.0
7+		Animal expired

* Irradiated on this day; 24-hr urine collection was begun immediately following irradiation.

Control and post-irradiation 24-hr urine collections were obtained. The urine was stored at 5°C without preservatives. The total neutral C_{21} adrenal steroids were determined by the method of Burton, Keutmann, and Waterhouse (*6*) with the modification that they were quantitated by the method of Mader and Buck (*7*).

Table 1 shows the marked increase in the urinary excretion of adrenal cortical steroids in these animals after lethal total body x-irradiation. It is to be noted that the increase was most marked in the first 24-hr period following exposure of the animals to the radiation.

The data are conclusive only in that they supply direct evidence of acutely altered adrenal cortical activity following lethal total body x-irradiation.

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