stimulating hormone indicated by uptake of phosphorus-32 are not difficult to explain in view of our preliminary studies on the rate of disappearance of thyroid iodine-131. The uptake of iodine-131 in sialoadenectomized mice is maximal at 6–8 hr. and the iodine-131 disappears from the thyroid quite slowly or not at all in the 24–48 hr. interval, indicating reduced titre of thyroid-stimulating hormone.

The increased sensitivity of thyroid-stimulating hormone (Table 3) suggests that some regulating mechanism is impaired when salivary glands are removed from the mouse. Whether the effects produced are due to a hormonal or enzymatic regulator presumably present in salivary glands is not yet known.

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Effect of Vitamin D on the Phosphorus Content of Rachitic Rat Cartilage

Earlier investigations[1] in these Laboratories had indicated that vitamin D influenced carbohydrate metabolism in calcifying cartilage of the albino rat. Since carbohydrate and phosphorus metabolism are closely interlinked, the present investigation was undertaken with the view of determining the influence of vitamin D on the phosphorus content of rachitic rat cartilage.

Healthy albino rats four weeks old were distributed in seven groups; the first six groups contained ten rats in each, while the last one contained twenty animals. All the animals were fed a modified rachitogenic diet[2] for twenty-one days. At the end of this period, animals in group I were killed, their tibial epiphyseal cartilages quickly removed and placed individually in tubes and dried at 90° C. Animals in groups II–VII were fed a single dose of vitamin D (4,000 I.U.). Exactly 24 hr. after vitamin D administration, rats in group II were killed and their tibial cartilages removed and dried. The animals in the remaining groups were killed at intervals of 24 hr. The dried cartilage of each rat was weighed and its total phosphorus content determined colorimetrically after wet ashing. The results are presented in Table 1.

It will be seen that the administration of vitamin D caused a gradual increase in the total phosphorus content of the cartilage. At 96 hr. after vitamin D administration, the phosphorus content of the cartilage was maximum, being about twice that contained in the cartilage of the untreated rachitic animal.

It is not clear at this stage why the phosphorus content of cartilage decreases after 96 hr. It may be mentioned, however, that this fall coincides with

Table 1. Total Phosphorus in Cartilage from Rachitic Rats and Rats given Vitamin D

Group No.	Hr. after vitamin D	No. of observations	μgm. phosphorus/ mgm. dry cartilage
I	0	10	9·78 ± 1·72
II	24	10	11·00 ± 1·15
III	48	10	14·13 ± 1·71
IV	72	10	13·14 ± 1·49
V	96	10	20·94 ± 2·37
VI	120	10	17·21 ± 2·38
VII	144	20	12·21 ± 1·41

(*a*) the maximum increase in calcifying capacity *in vitro* shown by the cartilage of the animals treated with vitamin D, and (*b*) the commencement of calcification *in vivo*, both of which have been demonstrated by Dikshit and Patwardhan[3] to occur at 96 hr. after administration of vitamin D.

The results reported here indicate that the phosphorus content of rachitic cartilage increases due to the influence of vitamin D preparatory to the onset of calcification. Further work is in progress to determine the effect of vitamin D on the various phosphorus compounds in the healing cartilage.

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Dominant Lethality induced by X-Rays in Haploid and Diploid *Saccharomyces cerevisiae*

In a previous paper[1], evidence was presented for the presence of dominant lethals in X-irradiated haploid yeast cells. Diploid yeast zygotes formed by the conjugation of one irradiated and one unirradiated haploid cell were found to exhibit signs of radiation damage, including swelling, delay in division and death. The damage responsible for inactivation of these half-irradiated zygotes was defined operationally as dominant lethal damage. The present communication describes a continuation of these experiments in which diploid cells homozygous for mating type were employed along with the two haploid cultures previously used. These diploid cells will conjugate with haploid or diploid cells of opposite mating type when placed in direct contact, thus permitting a similar determination of the frequency of dominant lethals in diploid cells. This was of interest because previous studies of the survival of X-irradiated yeast cells of higher ploidy[2] suggested that the frequency of this type of damage might increase with increasing ploidy.

The diploid cells arose spontaneously in the haploid cultures and were isolated with a micromanipulator. The amounts of deoxyribonucleic acid, ribonucleic acid and dry weight per cell for the haploid and diploid cultures were all approximately in the ratio 1 : 2, confirming the expected ploidy of these cultures[3]. The cells used in the experiments were harvested from 24-hr. streak cultures on yeast extract – dextrose agar plates (½ per cent yeast extract, 1 per cent dextrose), suspended in