Fig. 2. Effect of poliomyelitis virus on uptake of glycine-2-carbon-14 by monkey kidney tissue culture

It will be seen that infection causes a significant and early depression of the rate of uptake of radioactivity. The partially purified virus described in the section on lactic acid produced the same effect. The other toxic agents tested (thimerosal and diphtheria toxin) both caused more rapid and marked depression of radioactivity uptake than did the virus, the uptake of the tissue after two hours of exposure to thimerosal being only 7 per cent of that of the controls.

In summary, exposure of monkey kidney tissue to high concentrations of Type III poliomyelitis virus leads, within an hour or less, to a stimulation of aerobic glycolysis and to a decrease in the rate of uptake of radioactivity from glycine-2-carbon-14. Two other cytopathogenic substances, thimerosal and diphtheria toxin, exert effects that have some qualitative similarities, as well as differences from those of the virus; but the markedly different quantitative aspects suggest the possibility of a difference in mechanism of action. A more detailed report will be published later.

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Action of the Hypophysis and of Dietary Protein on the Calcifying Tissues

It is well known that protein deficiency causes considerable interference with endochondral calcification in growing rats, the growth of the epiphyseal plate and the formation of calcified trabeculae ceasing, the face of the plate being finally sealed off with bone^{1,2}. Similar changes are seen after hypophysectomy³. In the case of the continually erupting incisor tooth of the rat, protein or amino-acid

deficiency causes very slight changes, chiefly an interference with the calcification of the dentin⁴⁻⁶. Hypophysectomy induces very marked changes in the incisor, the chief defect being caused by the processes of eruption and incremental growth being differently affected. As a result, there is a relative overgrowth of dentin, the pulp cavity becomes smaller and later the formative end of the tooth is thrown into folds. Other degenerative changes also occur^{7,8}.

In recent experiments^{9,10}, young growing rats were put on diets containing 9.3 per cent protein, for from 10 to 117 days. Very marked abnormalities were seen in the epiphyses of the long bones, similar to those described above; they were completely prevented by raising the protein content of the diet to 18.8 per cent. The incisor teeth of the rats on the low-protein diet showed no significant changes in shape or rate of dentin formation or size of the pulp cavity, nor were the effects described by Hunter⁴ and Bavetta *et al.*^{5,6} seen, probably because the dietary conditions were less stringent than in their experiments.

The literature is not clear about the part the hypophysis plays in the changes which occur in bone during protein deficiency. Follis¹ says the question has not "been satisfactorily answered". Frandsen *et al.*² do not think the results in their experiments are due to reduced action of the gland. In view of the striking effects that occur in the teeth after hypophysectomy and the complete absence of such changes in protein deficiency, I conclude that the fundamental actions of the hypophysis and of protein on the hard tissues must be completely unconnected.

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Synthesis of Phosphocreatine by Enzymes from Heart and Skeletal Muscle

THE transfer of phosphate from high-energy phosphate compounds of glycolytic origin (such as phosphoglycerolphosphate and enol-phosphopyruvate) to creatine has been considered possible only through the adenylic nucleotides¹. Direct proof of this has been given so far only for enol-phosphopyruvate². In the case of the acyl-phosphate, examination of thermodynamic data³ shows that a direct transphosphorylation from phosphoglycerolphosphate to creatine is possible and that an equilibrium constant of about 10 might be expected.

In order to test this possibility, a reconstituted system capable of phosphoglycerolphosphate genera-