

was distinctly less than that of the control rats even though the food consumption was the same. The addition of glycine or of gelatin to the diet containing 3% sodium benzoate resulted in growth equal to that of rats on the basal diet. These results, based upon the consumption of equal amounts of food of the same calorific value, are in agreement with our earlier experiments in which similar diets were fed *ad libitum*.

4301

Apparatus for the Quantitative Testing of Air and Bone Transmitted Speech.

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The usual test for the relative acuity of hearing air and bone transmitted sound is made with a series of tuning forks—the air vibrations coming from the prongs and the bone vibrations through application of the stem to the head of the examined individual. It is well known that the greatest disability of the deafened individual is found in his inability to hear conversations. The sounds from the fork are relatively pure tones while the voice sounds are complicated combinations of tones. For this reason the fork tests are a poor criterion of the sensitivity for speech. An air telephone with its large diaphragm and efficient production of air vibrations of large amplitude and little force necessarily shows an entirely different type of response to that elicited through a bone telephone which develops small amplitudes of considerable force. A quantitative method of producing voice sounds has been developed by the Western Electric Co. in the phonograph audiometer with its electromagnetic pick-up. This instrument may also be employed with a bone telephone provided the energy is stepped up with a 2 stage audio-amplifier. It is also possible to test both the air and the bone acuity with the same receiver under the same mechanical conditions. This quite eliminates the physical peculiarities of the receiver itself and makes a direct comparison possible. The air acuity is determined by holding the receiver by its mushroom stem against a resonant surface and the person examined writes the numbers heard which become progressively fainter and fainter. Next the record is changed and the bone telephone is held against the forehead in a

similar manner. Again the numbers are written by the observer. If it is thought desirable to test the enhancement to bone acuity which is brought about by occlusion of the external canals, the ears are closed with plastocene and the test repeated the third time.

The advantage of employing a single receiver to accomplish both purposes is obvious. Further the test is sufficiently interesting to help rivet the attention on the problem; eliminates the personal equation of the examiner; and is both rapid and satisfactory. A demonstration of the apparatus was made to prove the surprisingly good quality of reproduction both through air and through bone vibrations.

4302

Effect of Amylase on Formation of Hexose-phosphate by Muscle Extract.

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The mechanism by which the pancreatic factor¹ inhibits the formation of hexose-phosphate² and therefore glycolysis in muscle extract has been shown by Case and McCullagh³ to be a direct action on the starch or glycogen used as the source of carbohydrate. Hydrolysis of these carbohydrates before the esterification of their mono-saccharid derivatives with phosphate seems a necessary assumption. Complete inhibition is difficult to explain since always there remains a residue of carbohydrate with but slight reducing value. We are, however, able to confirm these observations and find also that muscle amylase added in sufficient quantities produces marked inhibition of glycolysis.

We report here a study of the action of pancreatic diastase on the formation of hexose-phosphate by muscle extract, undertaken with a view to establishing a possible rôle of amylase in muscle extract glycolysis. If hydrolysis of starch or glycogen is a necessary step before its esterification with phosphate, it should be possible to increase the rate of esterification by accelerating the hydrolysis of the carbohydrate, unless muscle extract contains an optimum amount

¹ Winfield, G., and Hopkins, F. G., *J. Physiol.*, 1915, 1, 5.

² Ronzoni, E., *PROC. SOC. EXP. BIOL. AND MED.*, 1927, **xxv**, 178.

³ Case, E. M., and McCullagh, D. R., *Biochem. J.*, 1928, **xxii**, 1060.