MOTTLED ENAMEL OF DECIDUOUS TEETH

MOTTLED enamel,[1] which we now know to be caused by the poisonous action of fluorine which is present in the water supply of the afflicted persons in the concentration of 1 part per million or above, has been considered primarily a defect of the second or permanent set of teeth. In 1916 McKay[2] said, "Mottled enamel in my experience has never been found upon the temporary teeth." Later, in 1932,[3] McKay modified this statement somewhat to say that "the temporary teeth have been found to be affected very rarely and then only the molars and *very slightly*."

The writers have personally examined the teeth of thousands of children in Arizona to determine the incidence of mottled enamel and in 1931[1] stated that "deciduous teeth more rarely show mottling, mottling being chiefly a defect of the permanent teeth, although a few cases on the temporary molars of Indian children have been observed." The explanation given for the almost complete absence of mottled enamel on temporary teeth was that in all probability fluorine in sufficient concentration did not pass through the maternal placenta, and hence the deciduous teeth, which were formed and largely calcified before birth, were spared.

It is the purpose of this note to report the occurrence of severe mottled enamel upon all the deciduous teeth of children in a community recently visited by the authors. The first cases noted were those of two sisters, aged 5 and 7, respectively. The condition of the temporary teeth was too severe to be considered typical of mottled enamel. The teeth did not show chalky white areas characteristic of mottled enamel, because most of the enamel was gone. The premolars were ground off almost down to the gum line. The parents of these girls had repeatedly sought dental advice, but the condition had completely baffled the dental profession. A Wassermann test had shown the absence of venereal infection. Analysis of the private well water supply of this family showed a fluorine content of 12.0 parts per million, as determined by the Foster method of analysis, by means of which 1 part per million has been established as toxic level.[4]

Subsequently, other cases of the same severe type of mottled enamel on the temporary teeth have been observed in the same general district. In each case, analysis of the water supply has revealed an extremely high fluorine content (from 12 to 16 parts per million). The fluorine concentration of the water in this district is higher than any reported heretofore.

In spite of the fact that deciduous teeth are largely calcified before birth and have a relatively short period of both prenatal and postnatal development, it would appear that use of water containing excessively high concentrations of fluorine during the period of their formation produces mottled enamel of an extremely severe type on the temporary teeth.

It is interesting to note also that mottled enamel of the permanent teeth has been observed in persons who had not used this high-fluorine-water for drinking, but had used it for cooking and other household purposes only.

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[2] F. S. McKay and E. V. Black, *Dental Cosmos*, 58: 132, 1916.
[3] F. S. McKay, *Jour. Am. Dent. Assoc.*, 17: 15, 1932.
[4] H. V. Smith. Unpublished data. University of Arizona. *Jour. Ind. and Eng. Chem., Anal. Ed.*, 1935.

THE DISINHIBITION OF EXPERIMENTAL EXTINCTION IN THE WHITE RAT

THE phenomenon of the disinhibition of experimental extinction, described by Pavlov for the salivary reflex, is an important characteristic of behavior because it throws light on the conditions which control behavior. The terms inhibition (as exemplified in experimental extinction) and disinhibition refer primarily to the respective non-appearance and appearance of behavior under certain well-defined conditions. Just what the physiological processes concerned may be is still undetermined. It may well be that the phenomena described by Pavlov are quite different physiologically from the other inhibitory phenomena studied by physiologists. Leaving this question aside, however, it is still important to verify Pavlov's findings with the salivary reflex by experiments on such a laboratory animal as the white rat using overt bodily activity of the locomotor type.

The present note reports two experiments. In the first experiment, 4 normal untrained white rats of about 3 months of age were conditioned to a light. This response was then extinguished by withholding reinforcement; after which a buzzer was sounded at medium intensity at the moment when the light should have been presented. When the light was used one minute later, disinhibition was assumed if the rat now responded to the light. The second experiment was conducted with three other normal untrained white rats. In this case the rats were first conditioned to the sound of the buzzer; the response was then extinguished; and the effect of the light as a disinhibiting stimulus was then tested. The buzzer and the light were the same in the two experiments.

The apparatus used was developed in the Clark Laboratory some two years ago as a modification of