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WAR DEPARTMENT  
UNITED STATES ENGINEER OFFICE  
MANHATTAN DISTRICT  
OAK RIDGE, TENNESSEE

IN REPLY  
REFER TO

712300

14 January 1944

Subject: Meeting on the "Metabolism of Fluorides", 6 January 1944  
at the Hotel Pennsylvania, New York, New York.

MEMORANDUM to Safety Section Files.

1. At this conference, sponsored by the Office of Scientific Research and Development, outstanding authorities in the field of "Fluoride Metabolism" presented papers covering various phases of the subject.
2. The opening statement indicated that knowledge of fluorides was confined to the last ten to fifty years. The action of fluorine on soft tissues is unknown but tests indicate fluorine is stored in the bones and teeth. It was stated that animal tests were of doubtful value. The conference was intended to bring together the best thought on the subject.
3. Dr. Armstrong told of the testing methods reported in the literature and stated that reliable quantitative methods had only been developed lately.
4. Dr. Benning described a qualitative glass etching test. Pyrex was slowly etched and soft glass more rapidly in concentrations of 1 to 20 p.p.m. of HF in air, 10 to 20 p.p.m. were definitely irritating in breathing and 1 p.p.m. will detectably etch glass in 2 hours and 500 p.p.m. in one minute. Etching is not a sure test of the presence of toxic concentrations.
5. Results of tests in which a subject was given known amounts of NaF and CaF and the total daily input and total daily excretion were graphically presented. The figures indicated a relationship between input, retention and excretion.
6. X-ray pictures of the teeth of people exposed to HF were compared to those in which no exposure occurred. Definite evidence was present according to the speaker, of a greater density of teeth and bone when HF exposure existed. The question as to the value of these pictures was raised and discussed. The X-ray of the mouth was suggested as a substitute for the X-ray of the pelvis.

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*Serge Volving*  
Name (ADC) - Organization  
*6-2-94*  
Date

DECLASSIFICATION AUTHORIZED

*MALCOLM THEISEN, ANALYSIS*  
Name (ADD) - Organization  
*6-2-94*  
Date

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7. Some safety features in handling HF were given as follows: Ceilings should be lofty. Adequate ventilation should be provided. A cotton handkerchief in the mouth with mouth breathing was suggested as a "homespun method" of protection. Respirators (chemical cartridge types) are suitable for emergency or short exposures only. Supplied air types of respirators are suitable for longer exposures. Protective clothing includes neoprene suits and rubber gloves.

8. The prevention and treatment of HF burns was discussed. Magnesium oxide and glycerine, zinc oxide, and zinc sulfate pastes were suggested as being useful for their protective value. Low concentration of HF may cause painful nuisance burns. The use of calcium gluconate (3 percent solution) injected in an affected area, relieves pain quickly. Thorough washing with water is the common method of treatment. An alternate treatment is to use Ammonia to "soak out" or neutralize the HF. In applying the ammonia treatment the skin should be rubbed away until a stinging is felt, then thoroughly wash with water. It was suggested that the skin should not be the site of chemical reactions and some difference of opinion existed regarding this treatment. A newer treatment was described in which 90 to 95 percent ethyl alcohol mixed with crushed ice is placed on the skin surface.

9. A paper was presented regarding the incidence of dental caries in relation to the fluorine content of the drinking water. Tests are being planned in which fluorine is to be introduced in municipal water supplies. The evidence seemed to indicate that teeth are definitely improved when some fluorine is present.

10. The fluorine content of food was the subject of another paper. Tea has the highest normal content.

11. The use of fluorine compounds applied directly to the external surface of teeth at definite intervals is under test and results are being tabulated.

12. A maximum safe or permissible limit should be set but at the moment additional research is needed before a limit can be established.

13. Historical accounts of experiences were cited with HF but, because of the lack of reliable test methods, any figures given must be discounted.

14. The meeting was semi-private but none of the materials presented were confidential.

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