on the contralateral side from the stimulated ear. Having set the electrode in this region and obtained records showing the usual frequency correlations, we hardened the brain with the electrode *in situ* and sectioned in order to locate more exactly the position of the exposed electrode tip. This was found to be in the region corresponding to the position of the lateral lemniscus.[1]

From the above animal, using head phones, we were able to hear tones up to 3000 d. v. per second although at too low an intensity for photographing on the oscillograph.

The authors present these data without intending to commit themselves as to their meaning. They offer a more accurate and reliable check on some of the previously published experiments.

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A New Colorimetric Method for the Determination of Soluble Fluorides.

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Soluble fluorides in neutral solution react with Fe^{+++} to give a complex which does not develop a color with the various reagents for iron. Guyot,[1] Greef[2] and Treadwell and Köhl[3] have developed a colorimetric titration method for fluoride based on this fact. Our efforts have been directed towards the application of this principle as a method for the determination of fluorides colorimetrically. We have used thiocyanate, salicylic acid, 8-hydroxy quinoline, and acetylacetone as reagents for the development of color with the excess iron added to a fluoride solution. We have found acetylacetone to be the superior reagent because the others either give colors which are not stable to light, or the amount of fading induced by varying concentrations of fluoride is erratic. Our present method of procedure is as follows: The solution containing the fluoride is rendered just acid to phenolphthalin and diluted to 100 cc. To each of two 25 cc. volumetric flasks is added 1 cc. of a freshly prepared solution of $FeCl_3$ containing 0.3 mg. Fe/cc. and 1 cc. of a

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[1] Davis, H., and Saul, L. J., *Science*, 1931, **74**, 205.

[1] Guyot, *Comptes Rendus*, 1870, **71**, 274; 1871, **78**, 273.

[2] Greef, *Ber.*, 1913, **46**, 2511.

[3] Treadwell and Köhl, *Helv. Chem. Acta.*, 1925, **8**, 500.

0.05% solution of acetylacetone in water. The contents of the flasks are mixed and the red color of ferric acetylacetone develops. To one of the flasks is added 10 cc. of the fluoride solution. (If this aliquot assays over 0.3 mg. fluoride the assay is incorrect and must be repeated with a smaller aliquot; if less than 0.01 mg. a larger aliquot is taken.) The flasks are diluted to volume and the contents mixed. The color of the contents of the flask to which the fluoride was added fades as a consequence of the action of the F^-. The solution containing the fluoride is placed in the right cup of the colorimeter, while the solution containing no fluoride is placed in the left cup and set at 20 mm. A Bausch and Lomb No. 3610 blue color filter is placed in the eyepiece of the colorimeter and a ground glass and 500 watt mazda lamp is placed in front of the mirror. Twenty readings are averaged. This procedure is repeated on the same size aliquot plus a known quantity of fluoride (0.1 mg. F). By plotting colorimeter readings against concentration of fluoride, a straight line was obtained with amounts of fluoride up to 0.40 mg. and agreed with the following empirical formula:

$$F = \frac{0.1\,D\,(X-20)}{Y-X}$$

Where F represents mg. fluoride in the total solution, X is the reading of unknown, Y is the reading of unknown plus 0.1 mg. F and D represents the ratio of the total volume of the solution to the volume of the aliquot. The slope of the line mentioned above is altered by the pH of the solution and by the presence of such electrolytes as Na_2SO_4. We have as yet not been able to buffer the solution or to control the other factors. Due to these facts fluoride cannot be estimated by a comparison of the fading caused by an unknown quantity fluoride against a standard, and we have used the method described above as the only one applicable. The method has been found to give good checks even in the presence of 0.1 g. Na_2SO_4, 0.04 g. NaCl, 0.1 g. $NaNO_3$ and 5 cc. saturated silicic acid, and it has been applied successfully to the analysis for fluoride in solutions of NaF prepared from SiF_4 distillates. Further work is in progress in which it is planned to apply the method to the analysis for fluoride in biological material.