by Rice, Johnston and Evering [THIS JOURNAL, **54,** 3529 (1932)] in which water vapor served as a carrier gas, and the decomposition products were allowed to pass over cold lead mirrors. It was found that the products readily removed the mirrors when the temperature of the furnace was above 475° and that removals could be observed when the mirrors were as far as 10 cm. from the furnace.

These facts indicate very strongly that methyl radicals are formed when azomethane decomposes thermally. Ramsperger found that from 275 to 330° the products of the decomposition were independent of temperature. It is not absolutely certain that the products at 475° would be the same as those at 330°, but it is probable that they would be so if no explosion of the gas occurred. No explosions were observed to have taken place in the experiments here reported.

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SOME FURTHER REMARKS ON THE USE OF THE MAGNETO-OPTIC METHOD

Sir:

Allison and Murphy [THIS JOURNAL, **52,** 3769 (1930)] presented their very important work on the magneto-optic apparatus. Since that time several other papers have come from their laboratory giving further data on the use of this apparatus. Their results have been so astounding that many chemists, physicists and other scientists have been a little hesitant in accepting this work and have also failed to see its wide application and use in the field of science, especially in the field of chemistry and biochemistry. Due to this feeling of skepticism, and to our interest in the method, we decided to apply it in the study of the localization of some metals in the organs and tissues of animals.

We believe, therefore, that the experience which we have had in the application of this method to the analysis of solutions of uranium nitrate will be of general interest.

Following the procedure of Bishop and Dollins [THIS JOURNAL, **54,** 4585 (1932)] we determined the concentration at which the characteristic minimum of the most abundant isotope of uranium appeared on progressive concentrations and that at which it disappeared on progressive dilutions. In a total of 126 analyses, many of which were checked by two different observers, readings could be repeated within 3 mm., corresponding to 0.02 division of the magneto-optic scale, and the results as obtained lead us to believe that the method is accurate by very careful manipulation to within ±10%. However, one must observe all the precautions outlined in the literature descriptive of the method and a trained observer is essential. For such an observer this is indeed a comparatively easy method of analysis.

We were interested in the application of this method to uranium because we wished to study the distribution in the blood, urine and various organs of a foreign material injected into the blood of animals. This we were able to do with satisfaction and we believe that we have given the method a fair and thorough test, as all the 126 samples of which analyses were made were unknowns to the observer. We are also of the opinion that it can be used advantageously by chemists and biological chemists, as well as by physicists, especially if dealing with very small quantities. The details of this work will be published in full in the *American Journal of Physiology.*

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THE VESICANT ACTION OF HALOGENATED SULFIDES

Sir:

Dawson, in an article entitled, "Reactions of Certain Halogen Substituted Aryl, Alkyl and Di-alkyl Sulfides with Benzylamine. I" [THIS JOURNAL, **55,** 2070 (1933)], discusses the mechanism of vesicant action of halogenated sulfides and states, "The data obtained from these reactions may be regarded as further substantiating the condensation theory of vesicant action, but they entirely eliminate thiazane formation as an important factor and appear to demand a new limitation, that of a reactive halogen on the beta carbon atom."

In 1928 I published an article [*ibid.*, **50,** 2446 (1928)] dealing with the synthesis of β-chloroethyl and γ-chloropropyl *methyl* sulfides. The vesicant action of these compounds was studied and the following conclusion was drawn: "It is quite apparent that *only when the halogen is in the β position with respect to the sulfur atom will the resulting compound possess vesicant properties.*" This conclusion was confirmed in a study I made of the vesicant action of the analogous β-chloroethyl and γ-chloropropyl *phenyl* sulfides [Kirner and Richter, *ibid.*, **51,** 3413 (1929)] and also, later, by Gilman and Hewlett [*ibid.*, **52,** 2141 (1930)] in a study of the vesicant action of β-chloroethyl and γ-chloropropyl *furfuryl* sulfides.

In connection with the synthesis of β- (and γ)-chloropropyl *ethyl* sulfides, Dawson used a modification of the method I described for the above-mentioned methyl sulfides and gave a reference to my work, but he apparently overlooked the conclusions which were drawn in this paper regarding the vesicant action of these compounds.