XV. NOTE ON THE SULPHURIC ACID TEST FOR LIVER OILS.

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(*Received January 15th, 1923.*)

The well-known test for liver oils, which consists in the production of a blue or purple coloration on agitating a solution of the oil in carbon disulphide or chloroform with a drop of concentrated sulphuric acid has generally been attributed to the presence in such oils of cholesterol and lipochromes. Recently, however, Drummond and Watson [1922] have drawn attention to the parallelism occurring in a long series of oils between the production of this coloration and the presence of vitamin A, and they conclude that the substance, to which the formation of the coloured compound is due, is neither cholesterol nor, probably, a member of the lipochrome pigments. The general resemblance between this test and that of Pettenkofer for bile acids or Mylius's modification, in which the sugar is replaced by a solution of furfuraldehyde, suggested to us that the reaction might be of the same type as in these latter, namely, a condensation between two compounds under the influence of sulphuric acid. Cholesterol might thus be involved in the reaction though not of itself capable of giving the test, while the second substance, which must also be present in the oil, might be a derivative of furfuraldehyde or other compound of similarly reactive nature. Such a reaction occurs in Neuberg and Rauchwerger's [1904] test for cholesterol in which δ-methylfurfuraldehyde, formed from rhamnose, is employed, a red coloration being produced under the influence of concentrated sulphuric acid.

The purple coloration given by liver oils can, we find, be closely simulated by adding a drop of concentrated sulphuric acid to a light petroleum solution containing both cholesterol and furfuraldehyde or ω-hydroxymethylfurfuraldehyde. Chloroform may also be used as a solvent but unless the solutions are carefully dried, several drops of sulphuric acid will be required to produce the coloration. Further, the addition of furfuraldehyde to such oils as butter, which of themselves give only a faint coloration, causes the production of a very intense purple colour on adding the sulphuric acid.

So far all attempts to obtain furfuraldehyde, or some compound which could replace it in this reaction, from coal fish oil by distillation with steam or under reduced pressure and in other ways have been unsuccessful.

The reaction provides a delicate test for cholesterol, a faint purple colour being slowly given by 0·1 mg. in 5 cc. light petroleum containing excess of furfuraldehyde, while with 0·5 mg. cholesterol the coloration is immediate and pronounced.

Since these experiments were carried out a paper by G. S. Whitby [1923] has come to our notice, in which somewhat similar tests for cholesterol using formaldehyde are described and in view of this we do not propose to continue the work from this aspect.

REFERENCES.

Drummond and Watson (1922). *Analyst*, **47**, 341.
Neuberg and Rauchwerger (1904). *Chem. Centr.* **2**, 1434.
Whitby (1923). *Biochem. J.* **17**, 5.