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## Simultaneous Excretion of Coproporphyrin I and III in a Case of Chronic Porphyria.

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In the urine and stool of normal individuals there is a small amount of coproporphyrin I present. In many pathological conditions, however, the amount excreted is considerably increased.[1, 4] and in some conditions, notably lead poisoning, coproporphyrin III is excreted rather than the normal coproporphyrin I. Although it is probable that both types of porphyrins are produced in various diseases, the predominance of one type has made the isolation of both types difficult. In the case described below both coproporphyrin I and coproporphyrin III could be isolated from the feces of a woman suffering from chronic porphyria. Thus, the simultaneous formation of these 2 isomers is established.

The patient in whom this condition occurred was found in the psychiatric ward of the Strong Memorial Hospital. Since exogenous causes, such as lead and drugs, could be excluded, the condition is one of chronic porphyria. The patient was not anemic, did not suffer from abdominal colic and was not photosensitive; there was no evidence of abdominal bleeding. The patient was placed on a meat-free diet and the stool and urine collected. Because of the mental condition of the patient, collections were difficult to make.

The stool contained relatively large amounts of coproporphyrin, small amounts of a coproporphyrin ester and deuteroporphyrin and somewhat larger amounts of protoporphyrin. Only in the case of the coproporphyrin fraction was sufficient material present for identification. The porphyrin was methylated to the methyl ester and the product recrystallized from chloroform-methyl alcohol. After 3 recrystallizations crystals nearly uniform in appearance separated rapidly from the solvent. These melted indefinitely at 192°C. Further recrystallization raised the melting point to 194°C. and finally to 210-212°C. This behavior suggested a mixture of coproporphyrin I and III. The crystals were fractionated, therefore, by treating with cold methyl alcohol which dissolves coproporphyrin III methyl ester much more readily than it does coproporphyrin I

[1] Dobriner, K., *J. Biol. Chem.*, 1936, **113**, 1.

methyl ester. In this way 2 fractions, (A) methyl alcohol insoluble and (B) methyl alcohol soluble, were obtained.

A. *Methyl Alcohol Insoluble Fraction.* After 2 recrystallizations from chloroform-methyl alcohol crystals melting at 221-224°C. were obtained. Further recrystallizations, after each of which the crystals were washed with cold methyl alcohol, raised the melting point to 235-236°C. and finally to 238-239°C.

B. *Methyl Alcohol Soluble Fraction.* After 2 recrystallizations from chloroform-methyl alcohol the melting point was found to be 160-168°C. Two further recrystallizations in which crystallization took place with difficulty, as is characteristic of coproporphyrin III methyl ester, yielded a preparation with a double melting point, 135/170-175°.

The crystals of fraction A agree with the characteristics of coproporphyrin I methyl ester, m.p. 252°C., while fraction B is coproporphyrin III methyl ester, m.p. 142/172°C.

From the urine of this patient a very small amount of ether insoluble porphyrin (uroporphyrin) and a larger amount of ether soluble, chloroform insoluble porphyrin (coproporphyrin) could be isolated. The amounts present were too small for complete identification but the behavior of the ester of the coproporphyrin was suggestive of coproporphyrin III.

This appears to be the first instance in which simultaneous excretion of coproporphyrin I and III has been established. That both types of porphyrins may be excreted simultaneously has been shown by various investigators. Waldenström[2] isolated coproporphyrin I from the feces and uroporphyrin III from the urine of the same patient suffering from acute porphyria. In a case of lead poisoning, Watson[3] has presented some evidence that coproporphyrin I is present in the stool while coproporphyrin III is excreted in the urine. Watson[4] believes, also, that in normal urine there may be very small amounts of coproporphyrin III which have not been detected because of the extremely small amount of porphyrin, predominantly coproporphyrin I, which is present; his proof is admittedly incomplete. The uroporphyrin isolated from the famous case of Petry has recently been reexamined by Hans Fischer[5] with the result that it could be separated into uroporphyrin I and III.

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2 Waldenström, J. *Z. Physiol. Chem.*, 1936, **239**, III.

3 Watson, C. J., *J. Clin. Inv.*, 1936, **15**, 456.

4 Watson, C. J., *J. Clin. Inv.*, 1936, **15**, 327.

5 Fischer, H., and Libowitzky, H., *Z. Physiol. Chem.*, 1936, **241**, 220.