

derivative was converted to the free vitamin by dissolving in water and warming for 10 minutes in an evacuated flask. It was dried in a vacuum desiccator over barium oxide. Without further purification this slightly yellow product melted at 189.5°. The melting point of the pure substance is 192°C. The acidity and the amount of iodine reduced by these preparations were within 3% of the theoretical.

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Purgative Effect of Some Aliphatic Alcohols.

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In connection with a pharmacological study of the first 18 primary alcohols of the aliphatic series made in this laboratory in collaboration with Professor E. Emmet Reid of the Laboratory for Organic Chemistry, Johns Hopkins University, an investigation was also made of the higher members of the series, most of which are solids, to ascertain whether any of these exert a laxative or purgative action. The reason for such an inquiry was the finding by Macht and Barba-Gose, while studying the pharmacology of the oil of the *Ruvettus pretiosus* fish, that the active principle responsible for its laxative effect was the acetate of a hexadecyl or cetyl alcohol.¹ Because of the small amount of material available and the insolubility of these higher alcohols in water and physiological saline, the writers employed a new method.² Briefly, it consists of the introduction through a "stomach tube" of an emulsion of finely divided animal charcoal into the stomachs of full-grown white rats, previously fed on a standard dry diet composed of wheat (25 gm.), ground maize (25 gm.), rolled oats (28½ gm.), flaxseed meal (10 gm.) casein or whole milk, dried (10 gm.), sodium chloride (1 gm.), and calcium carbonate (0.5 gm.). An hour after the introduction of such an emulsion, the animal is quickly killed and the entire gastrointestinal tract is excised and stretched out on the operating table. The distance traversed by the black emulsion in a

¹ Macht and Barba-Gose, *PROC. SOC. EXP. BIOL. AND MED.*, 1931, **28**, 772.

² Macht and Barba-Gose, *J. Am. Pharm. Assn.*, 1931, **20**, 558.

given time, easily ascertained by examination of the intestines, is measured in centimeters. Series of such experiments with a normal emulsion give consistent readings which are expressed in percentages of the total length of the intestinal tract. Other emulsions, similarly prepared, but in which 1% of the respective alcohols had been incorporated, are given other rats in the same way; and the distance traversed by the emulsion in one hour is also ascertained in each instance. In this way emulsions of all the alcohols studied were prepared and their passage through the intestinal canal of rats was compared with that of controls and also with that of emulsions containing olive oil, mineral oil and other well-known laxative drugs. The results obtained with the aliphatic alcohols are expressed in Table I.

TABLE I.

Charcoal Emulsion	No. Experiments	Aver. Distance Traversed Hour % of total length of intestine
Normal	30	55
American mineral oil	5	56
Russian " "	5	56
Tetradecyl	10	65
Pentadecyl	10	64
Hexadecyl	15	69
Heptadecyl	10	63
Octodecyl	10	64

All the primary alcohols containing from 13 to 18 carbon atoms exhibited more or less laxative action. Hexadecyl or cetyl alcohol was the most effective in this respect. The action of the alcohol itself, however, was not as powerful as that of the ester, cetyl acetate, studied in the research on *Ruvettus* oil. This investigation brings to light a new property of some of the higher alcohols. It is well known that the old drug manna, which is a laxative, contains mannitol, a polyhydric alcohol, but it has not been known hitherto that the simple monohydric alcohols of the fatty acid series also produce a laxative effect. It is interesting to observe, furthermore, that when ordinary mineral oils were studied on rats by the method described above, no special laxative action was noted, thus confirming the generally accepted view that such mineral oils relieve constipation in human beings by virtue of their lubricating effect.