to a great variety of essential oils, perfume ingredients and perfumes show that it will detect with certainty 5 milligrams (and often as small an amount as 2 milligrams) of diethylphthalate in a 0.1-cc. portion of an essential oil or in a 10-cc. portion of perfume.

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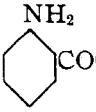
SOME STUDIES ON TASTE AND CHEMICAL CONSTITUTION.

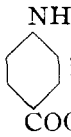
BY THOMAS C. JALESKI.

There is, it seems, no constancy, or very little constancy, in the relation between chemical groups, structure and taste in organic compounds. Also it is apparent that there exists very little relation between physiological action of a substance and taste. If some sort of relation could be established between the above factors, the economic importance would be very great. Taste is an important consideration in the selection of a therapeutic agent.

A few rules have been observed to be important, however, and their application has brought forth some very good results. For instance, it is known that in the aliphatic alcohols increasing the hydroxyl groups augments the sweet taste. For example, glycerin with only three hydroxyl groups is moderately sweet while the hexoses with six hydroxyl groups are true sugars. Sternberg said there are only two groups which can produce a sweet taste. These are the hydroxyl-OH group and the amino-NH_2 group.

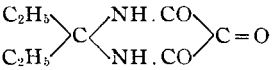
The replacement of an aliphatic group by an aromatic one tends to change the compound from a sweet tasting substance to an intensely bitter one. Butenyl glycerin $CH_3.CH(OH).CH_2(OH)$ is sweet while phenyl glycerin $C_6H_5.CH(OH).CH_2(OH)$ is bitter.

Also the proximity of an amino-NH_2 group and a carboxyl-COOH in the aromatic hydrocarbons affects taste. Anthranilic acid  is sweet while *p*-

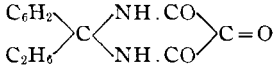
amino benzoic acid  is tasteless. In general, Sternberg says sweetness and bitterness are determined by the position and agreement of the negative groups.

Observations and experiments which I have conducted with the alkyl and alkyl aryl derivatives of baribituric acid show a prevailing tendency of these compounds to have a bitter taste. Neither the size nor kind of the substituted radicals seem to be of any great importance in determining the taste. It also seems to make no difference in which positions substitutions are made.

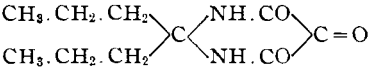
Veronal (diethylbarbituric acid) is a white powder having a faintly bitter taste. It is a very desirable hypnotic.



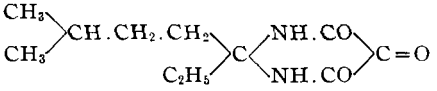
Luminal has a very bitter taste also. The bitter taste here is probably enhanced by the presence of the aryl group.



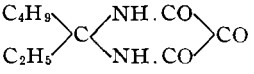
Proponal (dipropylbarbituric acid) resembles Veronal very closely, but is more potent as a soporific and is also more toxic. It also has a bitter taste but one much more intense than that of Veronal.



Isoamylethylbarbituric, which goes under the trade name amytal, is a very effective hypnotic and also possesses a marked bitter taste.



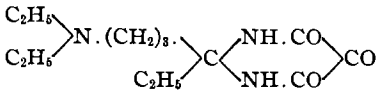
Another very effective hypnotic, and also a bitter tasting substance is *N*-butyl ethyl barbituric acid.



Since the above are more or less key compounds of the series it seems justifiable to consider the bitter taste as a characteristic of the barbituric acid series. From the above discussion it would seem that the bitter taste was correlated with soporific properties. Such is not the case however. Dox and Yoder[1] made several dialkyl barbituric acids with tertiary amino groupings, which had a bitter taste but were not effective as hypnotics at all.

5 ethyl-5γ diethyl amino propyl barbituric acid was made and found to have a bitter taste but no soporific properties.

[1] Dox and Yoder, *J. Amer. Chem. Soc.*, 45, 1757-62 (1923).



Such was the case with the similiar derivatives which they made.

It might be inferred that the rule formulated by Sternberg, stating that the entrance of negative groups reduces the bitter taste, would apply here also. It very likely does. Noctal (Brompropenyl isopropyl barbituric acid) contains bromine in the side chain and has only a very slight bitter taste.

Inspection of the structure of the barbituric acids seems to offer no explanation of the phenomena exhibited. The inference might be made that the ring structure was responsible for the characteristic taste, but on closer inspection this assumption seems untenable. Bitter taste is a characteristic of a great many organic compounds and is not limited to the type of ring structure found in the barbituric acids. Also, as I have stated above, the correlation of soporific properties and taste has no foundation in fact. Efficiency as a hypnotic agent seems to depend on the water lipoid solubility of the compound, and this solubility is often a function of the complexity of the molecule. But water lipoid solubility does not effect the taste as far as we know. The fact, however, that some compounds of the barbituric series, due to the fact that they are not soluble in water or lipoids, are not hypnotics does not prove by any means that they would not be very effective ones were they able to diffuse into the cell. Therefore all members of the barbituric acid series possessing a bitter taste may be potentially hypnotics, but some may not be able to exhibit the property.

Recently W. Straub[1] has found that the bitter taste of alkali metal salts of diethyl barbituric acid is avoided by addition to them of $Na_2.HPO_4$. The two salts are to be mixed in equal proportions.

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TINCTURE OF IODINE ANALYSES.

BY EDWARD S. ROSE.

Very few pharmacists, if any, make Tincture of Iodine U. S. P., since it can be bought for much less than it can be made by them. The large manufacturer uses specially denatured alcohol No. 25 and can sell his product to the pharmacist for about $7.00 a gallon, while the pharmacist who uses tax-paid alcohol knows it would cost approximately $11.00 a gallon, just for the materials.

On several occasions the writer has been told by salesmen that their particular Tincture of Iodine is a superior product and that many tinctures sold in the drug stores were of inferior quality.

While making an auto trip last summer through parts of two mid-western states the writer bought nine bottles of tincture of iodine at drug stores in different towns and cities. In each case one ounce tincture of iodine U. S. P. was asked for. In all cases but one the price was 25 cents. Seven of the tinctures were in glass applicator bottles, one had a dropper and the ninth just a cork stopper. Seven

[1] W. Straub, U. S. 1,488,884 (April 1, 1924).