5101

Effect and Mode of Action of Tartrates in the Human Body.

O. B. PRATT AND H. O. SWARTOUT. (Introduced by John F. Kessel.)
From the Research Laboratory, White Memorial Hospital, Los Angeles, Calif.

Though tartrates have long been used in medicine, and grapes and grape products, the chief sources of tartrates are common foods, there is still much difference of opinion as to the effect and mode of action of tartrates in the human body. Among the unsettled questions are: 1. Are tartrates absorbed from the intestine? 2. If absorbed, are they oxidized in the tissues? 3. Are they alkalinizing? 4. If alkalinizing, how is this effect produced? Solis-Cohen and Githens,[1] Blatherwick,[2] Post,[3] and others believe tartrates are alkalinizing, the basis of their belief evidently being the idea of absorption and oxidation. Pickens and Hetler,[4] Wood,[5] Simpson,[6] Rose,[7] and others are on the contrary side of the alkalinizing question. Sollmann,[8] McGuigan[9] and others take a middle ground.

We can not tell whether tartrates are absorbed from the human intestine or not; but if they were absorbed in the case of any of our experimental subjects they were evidently oxidized, for we found no tartrates in the urine after their ingestion in quantities as great as 2 U. S. P. doses in a day's intake.

Rochelle salts, grapes, raisins and grape juice all proved to be definitely alkalinizing. Any of these substances, when added to an acid-forming diet, markedly decreased urinary acidity.

This alkalinizing effect of tartrates would be strong evidence of their absorption and oxidation, were it not for another process that explains this effect. In mixtures of feces and Rochelle salts, incubated at 37.5°C., the tartrate ions were decomposed within 6 to 24 hours. This proved true without exception in 15 cases. Bile and

[1] Solis-Cohen, S., and Githens, T. S., "Pharmacotherapeutics, Materia Medica and Drug Action," 1928, 1175 and 1176.

[2] Blatherwick, N. R., *Arch. Int. Med.*, 1914, xiv, 409.

[3] Post, W. E., *J. Am. Med. Assn.*, 1914, lxii, 592.

[4] Pickens, L. M., and Hetler, R. A., *J. Home Econ.*, 1930, xxii, 44.

[5] Wood, H. C., LaWall, C. H., and others, *The Dispensatory of the United States of America*, 21st ed., 1926, 878.

[6] Simpson, G. E., *J. Pharm. and Exp. Ther.*, 1925, xxv, 459.

[7] Rose, W. C., *J. Pharm. and Exp. Ther.*, 1924, xxiv, 123 and 147.

[8] Sollmann, T., "A Manual of Pharmacology," 1928, 47.

[9] McGuigan, H. A., "A Textbook of Pharmacology and Therapeutics," 1928, 282.

pancreatin seem unable to decompose tartrate ions. Berkefeld filtrates of feces have this ability to a very limited extent, if at all. Carefully controlled tests with *Escherichia coli,* communior and acidi-lactici, however, have shown that all of these organisms can decompose the tartrate ions in Rochelle salts and produce alkali from this compound by this means.

The alkalinizing effect of tartrates, caused by bacterial decomposition of tartrate ions in the lumen of the intestine and the consequent freeing of easily-absorbable sodium and potassium ions, is probably their chief mode of action in cases where catharsis is not produced.

Our work is still in progress, and more detailed reports are in process of preparation.

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A New Synthesis of Aspartic Acid.*

M. S. DUNN AND B. W. SMART.

From the University of California at Los Angeles.

In previous syntheses of aspartic acid the following reactions have been used: The decomposition of acid ammonium malate by heat,[1] the racemization of active aspartic acid[2] and active asparagine,[3] the reaction of maleic or fumaric acid with ammonia,[4] the reduction of oxalacetic ester oxime,[5] the reaction of silver fumarate or potassium acid fumarate with hydroxylamine hydrochloride,[6] the reduction of nitrosuccinic ester,[7] the catalytic reduction and ammonation of oxalacetic acid,[8] and the hydrolysis of the addition compound formed from sodium malonic ester and chloroacetic ester.[9]

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[1] Dessaignes, *Compt. rend.*, 1850, xxx, 324; *Ibid.*, 1850, xxxi, 432. Wolff, *Ann.*, 1850, lxxv, 293.

[2] Michael and Wing, *Ber.*, 1884, xvii, 2984; *Am. Chem. J.*, 1885, vii, 278.

[3] Piutti, *Ber.*, 1886, xix, 1691.

[4] Engel, *Compt. rend.*, 1887, civ, 1805; *Ibid.*, 1888, cvi, 1734; Stadnikoff, *Ber.*, 1910, xliv, 44.

[5] Piutti, *Gaz. Chim. Ital.*, 1887, xvii, 519.

[6] Tanatar, *Ber.*, 1896, xxix, 1477.

[7] Schmidt and Widman, *Ber.*, 1909, xlii, 497.

[8] Knoop and Oesterlin, *Z. physiol. Chem.*, 1925, cxlviii, 294.

[9] Keimatsu and Kato, *J. Pharm. Soc. Japan*, 1929, xlix, 111 and 123.