When one considers the ease with which uric acid may be oxidized to allantoin *in vitro*, and the further fact that a similar transformation occurs in the organism of lower animals, it is logical to look for at least some oxidation of this character in the human organism.

## Summary.

When the diet of a normal man was supplemented by 900 cc. of water per day the average daily output of allantoin (Wiechowski's method) was 0.0135 gram for a period of thirteen days. Upon increasing the water intake to 3450 cc. per day for a period of five days, the average daily allantoin excretion was increased to 0.0173 gram. This constitutes an approximate 20% increase. The daily value for a five-day final period on the original 900 cc. water ingestion was 0.0122 gram.

The increase in the allantoin output accompanying water-drinking may indicate that the oxidative mechanism of the organism has been stimulated through the introduction of the large volume of water into the body and that purine material which would ordinarily have been excreted in some less highly oxidized form has been oxidized to allantoin and excreted in this form. This interpretation is strengthened by the finding in this laboratory of a decreased uric acid output after the water ingestion of the subject (man) had been considerably increased.

In view of the fact that the above interpretation is contrary to the current views regarding purine metabolism in the human organism, the authors make the interpretation tentatively until further experiments may be completed.

URBANA, ILL.

# A NEW APPARATUS FOR VACUUM SUBLIMATION.[1]

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Received February 9, 1912.

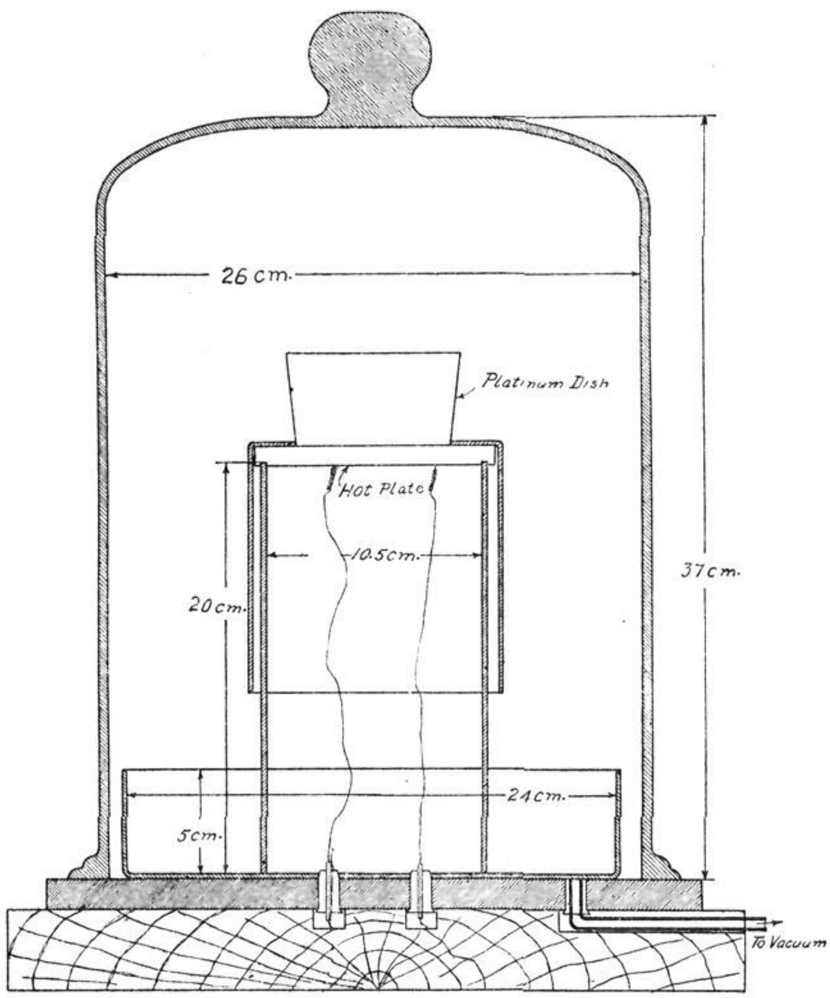
An examination of the literature shows surprisingly few descriptions of apparatus for sublimation *in vacuo*. The apparatus of Kempf[2] is probably the best of the common forms. It is easily broken, however, since one of the ground joints becomes heated, both by radiation and by the condensation of the sublimed material. Moreover, it is not suitable for working with large quantities of material.

The need arising to sublime large quantities of certain organic compounds, the apparatus described here was devised. Its construction can be readily seen by referring to the sketch. The bell jar is a large one (26 cm. diameter) and the joint between it and the glass plate is well ground, so that it will readily hold a vacuum with a very thin coating of

[1] Published by permission of the Director of the Bureau of Standards.

[2] Richard Kempf, "Praktische Studien über Vakuum-sublimation," *J. prakt. Chem.*, **78**, 201–59.

stopcock grease. Since this joint is never heated and none of the sublimed material comes in contact with it, no contamination is to be feared. A large, shallow crystallizing dish, that will just sit inside the bell-jar, rests on the glass base plate, and on it rests a glass cylinder, 10.5 cm. in diameter and 20 cm. high, cut from a large piece of tubing. This glass cylinder serves as a support for the electrical heating element, which is of the type ordinarily used in electrically heated hot plates, with an iron top and an enamel bottom. The top of the cylinder is loosely ground into the enamel bottom of the hot plate. The glass cylinder also serves




to keep the sublimed material from coming in contact with the lead wires or with the top of the rubber stoppers. The wires carrying the current are led in through the bottom as shown, the rubber stoppers being pushed in far enough to pass through the holes in the crystallizing dish, thus holding the latter in position. It is best to have the wires in two parts with connectors near the top, to facilitate the removal of the heating element. The substance to be sublimed is placed in a flat bottomed platinum dish or in a crystallizing dish resting directly on the hot plate. A deep crystallizing dish, with a hole cut out through the bottom to receive the platinum dish, is placed, upturned, over the top, as shown, to prevent the sublimed substance coming in contact with the iron hot plate. The bell jar is evacuated through the bottom, the crystallizing dish not being drilled in this case. The whole is mounted on a wooden base, cut out to allow the electrical leads and vacuum connection to pass through.

The advantages of this form of apparatus can be readily seen. It is convenient, since lifting off the bell jar renders all parts readily accessible. Most of the sublimed material drops into the crystallizing dish, from which it can be easily removed. This materially affects the speed. In most forms of sublimation apparatus the solid is condensed directly above the unsublimed portion, and all that drops must be re-sublimed, with no consequent gain in purity. The material comes in contact with nothing but glass and platinum. This is unimportant with stable substances such as naphthalene, but with easily decomposed substances such as salicylic acid it is important. The apparatus can be readily calibrated so that the approximate temperature can be determined by having an ammeter in the circuit.

The above apparatus for vacuum sublimation has been in use at the Bureau of Standards for over a year, during which time it has given complete satisfaction in the last step in the purification of the naphthalene and benzoic acid issued by the Bureau as standard calorimetric samples. It is rapid and efficient, the process is under complete control, and the apparatus requires but little attention.

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## NOTES.

*An Improved Extraction Apparatus.*—The extraction apparatus here illustrated and described was designed early in the year 1909 for special use with a number of unusual solvents, but has since been employed quite extensively in the laboratories of this Bureau for general purposes. It represents the result of an attempt to combine in an all-glass device the principal advantages of the Wiley and Soxhlet forms. It was desired to make a compact, convenient apparatus free from stoppers, seals and ground connections, the separate parts of which should be simple and interchangeable as well as readily accessible for cleaning, alteration or repair.

It consists of three essential parts, a straight outer tube A, a condenser, B, terminating at the lower end in a small glass hook, and a suitable extraction tube, C, for holding the material to be extracted. The extraction tube (shown in perspective) is suspended from the hook on the condenser by means of a semi-circular wire bail of such a size that it may be swung out of the way when filling or emptying the tube. While it may readily be adapted to meet any special requirements, it is usually