mixture of adenine and guanine was run through the column a second time. The fractions thus obtained were neutralized with concentrated NaOH and precipitated with $CuSO_4$ and $NaHSO_3$. The separated fractions were converted to picrates and purified to constant radioactivity by repeated recrystallization from 25% acetic acid. The counts were corrected to infinite thinness and are recorded in the table.

We found 39% of the administered 4(5)-amino-5(4)-imidazolecarboxamide in the pooled urines, using the colorimetric procedure of Bratton and Marshall (*8*). Of this amount, at least 13% was present in a nondiazotizable form, which was freed on mild HCl hydrolysis.

Isolation and separation of the allantoin and 4(5)-amino-5(4)-imidazolecarboxamide from the urine were effected by the allantoin procedure of Valentine, Gurin, and Wilson (*9*), involving $AgNO_3$ and NH_4OH precipitation (the imidazole compound precipitated first) followed by mercuric acetate precipitation of each of the fractions. There was obtained 0.69 g of the crude imidazole picrate which, on purification, showed no significant difference in radioactivity from a sample of the picrate of the administered material. The allantoin (0.274 g) was purified to constant radioactivity after treating with Dowex 50 to remove any basic material. The radioactivities are shown in Table 1.

TABLE 1

Compound	Cpm/mg comp. inf. thinness
1 4(5)-amino-5(4)-imidazolecarboxamide picrate	1,160
2 4(5)-amino-5(4)-imidazolecarboxamide picrate from urine	1,110
3 Nucleic acid guanine picrate	103
4 Nucleic acid adenine picrate	134
5 "Nucleotide" adenine picrate	122
6 Allantoin	482

The carbon of the 4(5) position of 4(5)-amino-5(4)-imidazolecarboxamide appeared in the adenine of the nucleotides and the adenine and guanine of the nucleic acids, as well as in the allantoin of the urine. Some of the unchanged imidazole appeared in the urine with its radioactivity undiluted. This indicates there is no appreciable pool of this material in the body of the rat and suggests that the imidazole compound is not formed as a normal intermediate.

References

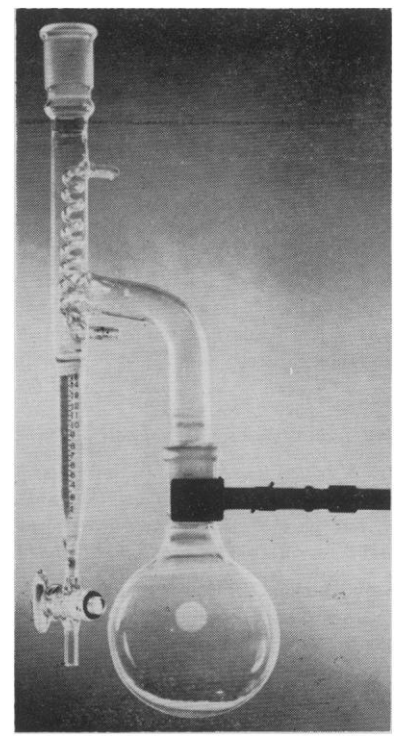
1. Schulman, M. P., Buchanan, J. M., and Miller, C. S. *Fed. Proc.*, **9**, 225 (1950).
2. Cook, A. H., Heilbron, I., and Smith, E. *J. Chem. Soc.*, 1440 (1949).
3. Woolley, D. W., and Shaw, E. *J. Biol. Chem.*, **181**, 89 (1949).
4. Inglis, J. K. H. *Organic syntheses.* New York: Wiley. 1932, Coll. Vol. I, p. 249.
5. Corson, B. B., Scott, R. W., and Vose, C. E. *Organic syntheses.* New York: Wiley, 1932, Coll. Vol. I, p. 173.
6. Windaus, A., and Langenbeck, W. *Ber. chem. Ges.*, **56**, 683 (1923).
7. Cohn, W. E. *Science*, **109**, 377 (1949).
8. Bratton, A. C., and Marshall, E. K., Jr. *J. Biol. Chem.*, **128**, 537 (1939).
9. Valentine, J., Gurin, S., and Wilson, D. W. *Fed. Proc.*, **8**, 262 (1949).

An Improved Water Separator

Richard N. Blomberg and William F. Bruce

Wyeth Institute of Applied Biochemistry, Philadelphia

Many reactions in chemistry involve the removal of water from a reaction mixture through azeotropic distillation with a solvent lighter than water such as benzene or toluene. The water separates from the condensate as it cools. Most of the devices used for this purpose, such as the Dean-Stark receiver, return the condensate through hot vapors to a reservoir where the water separates. We have found that cooling the material in the reservoir greatly hastens the collection of water, and therefore have modified the condenser so that part of the cooling surface is in contact with the condensate, keeping it cold through the help of convection currents. The built-in spiral condenser (see figure) is more compact than the ordinary



type. The reservoir, which is made from a graduated centrifuge tube, has a stopcock that permits the use of the apparatus for automatic separation of large quantities of water when a large-scale condensation is done, since an inverted L of rubber or glass tubing attached at the stopcock can be arranged as an automatic water takeoff. A ground joint above the spiral gives a place for an additional condenser if a very rapid reflux is needed.