serums of rabbits immunized against *A. gypsoides* fixed complement equally with antigens prepared from *A. gypsoides* and *A. asteroides*, and in lower dilutions with *M. tuberculosis*, but not at all with *A. bovis* and *A. maduræ*. The serums of rabbits immunized against *M. tuberculosis* fixed complement with the homologous antigen, and in lower dilutions, with antigens prepared from the acid-fast *Actinomycetes*, *A. asteroides* and *A. gypsoides*, but not with *A. bovis* and *A. maduræ*. It would seem, therefore, that the acid-fast *Actinomycetes* are more closely related to the acid-fast bacteria than to the non acid-fast Actinomycetes.

A. gypsoides does not secrete a soluble toxine, but forms a very protent endotoxine. By careful vaccination there can be produced in rabbits an active protective immunity. The serum of such rabbits injected into guinea pigs gives the latter partial protection.

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The effect of sodium benzoate and sodium hippurate, and other drugs upon the glomerular circulation in the frog.

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The effect of injection of sodium benzoate and sodium hippurate on the circulation through the glomeruli of frogs' kidneys was studied by Richards's[1] method of direct observation. Sodium benzoate, .008 to .020 mil of a ten per cent. solution per gram frog, invariably causes increased circulation through the glomeruli, increasing both the number of functionating glomeruli, the number of active loops in each glomerulus, and the velocity of flow in each capillary. Sodium hippurate, .008 to .020 mil of a fourteen per cent. solution per gram frog, had the opposite effect. This harmonizes with the work of H. B. Lewis,[2] and F. B. Kingsbury and W. W. Swanson,[3] who demonstrated that sodium hip-

[1] Richards, A. N., *Am. J. Med. Sc.*, 1922, clxiii, No. 1.

[2] Lewis, H. B., *J. Biol. Chem.*, 1914, xviii, 225. Lewis and Karr, *J. Biol. Chem.* 1916, xxv, 13.

[3] Kingsbury, F. B., and Swanson, W. W., *Arch. Int. Med.*, 1921, xxviii, 220–36.

purate was excreted more slowly than sodium benzoate in the mammal.

This phenomenenon is of particular interest because Bunge and Schmiedeberg[1] demonstrated that hippuric acid is synthesized from benzoic acid and glycocoll in the kidney, while hippuric acid merely passes through it. It is interesting to speculate upon the possibility that the process of synthesis may bring about or be associated with a local vasodilation.

Among other drugs studied, nitroglycerine, one five-thousand solution, theobromine, one per cent. solution, and sodium indigo sulphonate, one per cent. solution, increased the glomerular circulation in a similar manner; and indigo sulphonate definitely stained the glomerular capsule blue. This shows that sodium indigo sulphonate is excreted through the glomeruli as well as through the tubules. Heidenhain[2] had demonstrated the excretion of this substance through the tubules but not through the glomeruli.[3]

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The bile factor in pancreatitis.

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We have investigated the bile factor in pancreatitis from two chief aspects, the anatomic and the experimental.

Anatomically, two mechanisms have been suggested whereby bile can be passed into the pancreatic duct. One is based on the possibility that an obstruction could occur at the exit of the common bile duct in a manner to convert the two ducts into a continuous channel. We studied the relationship of the common bile duct to the pancreatic duct and their mode of entrance into the

[1] Bunge, G. and Schmiedeberg, O., *Arch. exper. Path. u. Pharmacol.*, 1876, vi, 233.

[2] Heidenhain, *Pflüger's Arch. f. d. ges. Physiol.*, 1874, ix, 1; Hermann's Handbuch der Physiol., 1883, v, 279–373.

[3] We desire to thank Dr. F. B. Kingsbury for furnishing the sodium hippurate and for suggesting this phase of the problem.