In the normal animal, a prompt lowering of the K/Ca ratio takes place, followed by a series of fluctuations until a time of maximum injury occurs, when a ratio as low as 0.8 may be reached. The primary drop in the ratio (due to a slight increase in the calcium and a considerable decrease in the potassium) is evidently associated with a primary stimulation of the splanchnic organs. The cellular effort to reestablish the normal equilibrium probably accounts for the fluctuations in the ratio after the primary drop.

During the periods of low K/Ca ratio, an increase in the lymph volume and lymph concentration give evidence of a coincident increase in permeability of capillaries and tissues.

The CO_2 combining power takes a progressive course downward without marked fluctuations of the curve.

The period of maximum injury is usually followed by an antimortem increase in the ratio, due probably to the liberation of potassium from the red blood corpuscles. At this time a most marked gastro-intestinal symptomatology usually occurs (vomiting and diarrhea).

Animals in whom a low K/Ca ratio is present before the injection is started, have an initial response that is paradoxical, *i. e.*, the K/Ca ratio increases primarily. The complete details of the experiments will be published in the *Archives of Internal Medicine* and the *Journal of Infectious Diseases.*

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Skin Reactions with B. Typhosus Filtrate.

KATHARINE M. HOWELL AND MARION CORRIGAN.

From Kuppenheimer Fund and Otto Baer Fund for Clinical Research of the Michael Reese Hospital and the Nelson Morris Institute for Medical Research, Chicago.

For several years we have been studying skin reactions produced by a variety of bacterial filtrates in healthy persons, and in patients with different diseases. The recent typhoid epidemic in Montreal seemed to offer an unusual opportunity for further observations on the result of skin reactions with typhoid filtrates in typhoid fever patients. Through the courtesy of Dr. Ralph Lynch, of the Montreal General Hospital, observations were made on skin reactions of 22 typhoid patients in different stages of the disease. Intracutaneous tests with typhoid filtrates were also observed in other groups; for

example, those who had no history of typhoid fever or of antityphoid vaccination, vaccinated persons, patients with other diseases, and 4 typhoid patients in Chicago.

After preliminary tests, the following technic was adopted: The typhoid bacillus employed in the test was the Rawling's strain. The medium used for the bacterial culture was a sugar-free, beef infusion broth 1% peptone, pH 7.4, to which was added 0.1% dextrose; the inoculated broth was incubated for 72 hours; then filtered through a Berkefeld filter and cultured for sterility. One:100 dilution, and in most instances 1:500 dilution in 0.1 cc. amount was injected intradermally in skin of forearm. Uninoculated broth, incubated and filtered in similar manner to the inoculated broth was used for control skin tests. Positive skin reactions appeared within 18 to 24 hours and persisted for at least 48 hours. A strongly positive skin reaction had an elevated, dark red, indurated center at least 2 cm. in diameter, frequently surrounded by a less definite halo of 2 to 3 cm. The severe reactions lasted from 48 hours to a week, then became pigmented, and frequently there was a slight desquamation. In only 2 instances were there systemic reactions.

Six different groups of people were tested with the typhoid filtrate. The first group comprised 12 healthy adults who gave no history of typhoid fever or antityphoid vaccination. One person only reacted positively to the typhoid filtrate. The second group contained 11 persons who had received one or more immunizing courses of typhoid vaccine, 1 to 10 years prior to the skin tests. All reacted positively. The third group consisted of 4 persons who gave a history of typhoid fever, 2 years, 20 years, 23 years, and 30 years respectively before the skin tests were made. Three had strongly positive reactions, and one a weakly positive reaction.

The fourth group tested consisted of 26 patients in the course of typhoid fever, 22 of whom had positive typhoid blood cultures or positive Widals or both. Four of the typhoid cases occurred in Chicago and 22 in Montreal. Dr. Lynch injected these typhoid patients of the Montreal General Hospital with our typhoid filtrate and broth control in 1:100 and 1:500 dilution in 0.1 cc. amount. The results as shown by his description correspond to those obtained by us in persons reacting positively. In this series of 26 patients, 24 positive skin reactions occurred and 2 negative reactions. The two patients reacting negatively had both positive typhoid blood cultures and positive Widals. No correlation could be found between the severity of the skin reaction and the day of disease upon which the skin tests were made.

A fifth group of 88 adults with diseases other than typhoid fever were tested with the typhoid filtrate; 42 of these skin reactions were negative; 27 weakly positive and 19 strongly positive. A sixth group of 47 children, ranging in age from 3 to 15 years, received the intradermal tests with *B. typhosus* filtrate. Thirty-six of the children were in a cardiac camp and were not ill at the time the tests were made. The other 11 children were in a children's hospital ward and were convalescing from a variety of diseases. So far as could be determined, none had had typhoid fever or antityphoid vaccination. Nine positive reactions occurred in this group, but only two persisted 48 hours. One occurred in a boy 13 years old convalescing from an acute poliomyelitis, and the other in a boy of 13 who had a history of repeated attacks of acute rheumatic fever.

The skin reactions with the filtrate of *B. typhosus* suggest that the reaction is allergic in nature. A positive reaction apparently indicates immunity to typhoid fever, since those immunized against typhoid fever, those with a history of typhoid fever, and those in the course of typhoid fever tend to react positively in most instances, while only 40% of other adults and 4% of children react positively. The results indicate that preliminary skin tests might determine whether or not artificial immunization against typhoid fever was necessary in a given individual.

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Contraction and Evacuation of Gall-Bladder Caused by Highly Purified "Secretin" Preparation.

A. C. IVY AND ERIC OLDBERG.

From the Division of Physiology and Pharmacology, Northwestern University Medical School.

The numerous reports in the literature showing the marked efficacy of fats, egg yolk and protein in emptying the gall-bladder convinced us that the effect of "secretin" on the evacuation and motor activity of the gall-bladder should be studied, since it is well known that these substances stimulate the pancreas, and that "secretin" (very impure solutions) promotes the formation of bile.

For some time we (Kloster, Ivy and Lueth) have been working on the purification of "secretin". Starting with the "new secretin" of Weaver, Luckhardt, and Koch,[1] we prepared solutions of such