that produced in the hen that brings about in her the same result, although there is no direct evidence to show that this is the real explanation.

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Agglutination of bacteria in vivo; its relation to the destruction of bacteria within the infected host and to septicemia.

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An intravenous injection of immune serum causes an abrupt disappearance of the bacteria from the circulating blood of animals having a bacteremia or a septicemia. This is due to an immediate agglutination of the bacteria and to an accumulation of the bacterial clumps in the lungs, liver, spleen, etc. The clumps of bacteria are phagocyted and destroyed mainly by the polymorphonuclear leucocytes which accumulate in the internal organs following an intravenous injection of foreign protein substances. The septicemia or bacteremia does not recur as long as the immune serum is kept in the blood in a sufficient concentration.

These phenomena occur very typically following intravenous administration of specific immune sera in rabbits infected with pneumococci or Shiga dysentery bacilli. If the rabbits are actively immune to these bacteria, the same phenomena follow an intravenous injection of the bacteria. If the immune animals are given sufficient quantities of the bacteria, death may be caused by intoxication in the absence of a septicemia.

In natural immunity the above described phenomena follow immediately upon an intravenous injection of the bacteria. Rabbits have a comparatively high natural immunity to many bacteria, of which the following have been studied in this respect: typhoid bacilli, colon bacilli, dysentery bacilli of the Flexner group, *Staphylococcus aureus* and *albus*, non-virulent bacilli of the *mucosus capsulatus* group, and non-virulent influenza bacilli. All of these are agglutinated, phagocyted, and destroyed in normal rabbits as pneumococci are in immune rabbits and none of them causes a true septicemia in these animals.

Rabbits exhibit little or no resistance towards a virulent strain of *Bacillus avisepticus* while dogs are not affected by a subtoxic dose. These bacteria are not agglutinated in the circulation of rabbits and soon begin to multiply and produce a fatal septicemia. In dogs, on the other hand, they are agglutinated and rapidly disappear from the circulation and no true septicemia follows, and as stated, a subtoxic dose causes no symptoms in these animals.

Hence, in the several instances studied, agglutination of bacteria within the circulation of the infected animal is followed by an abrupt disappearance of the bacteria from the blood stream, by accumulation of the agglutinated bacteria within the internal organs, and by phagocytosis of the bacterial clumps by the polymorphonuclear leucocytes, and a true septicemia does not arise.

21 (1085)

Accumulation of nitrogen in the tissues in renal disease.

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The retention of nitrogen as a manifestation of certain types of renal disease is a well-recognized phenomenon. When the conditions of study are carefully controlled with accurate analyses of the food and excreta the amounts of nitrogen retained in the body is, with severe cases, very large—two grams per day for periods of two weeks is not an exceptional amount. Since these patients are usually quite sick and commonly manifest no sign of improvement so long as the retention persists it is inconceivable that this nitrogen is retained for tissue growth in a physiological sense. On the other hand while the blood of these patients often shows on analysis an increase in non-protein nitrogen the figure may not r'se to any significant degree and never becomes sufficiently high so as to account for more than a small fraction of the nitrogen retained. We have also noted with several patients during metabolism studies a flushing out of nitrogen so that there resulted large minus balances during periods of improve-