per cubic centimeter of urine is plotted against time, and the one-half-hour sample includes the volume of urine present in the bladder prior to the test. The value given for each point on the graph is the average of two determinations. Physiological saline has been used as a control, and the urinary excretion of penicillin confirms the statement that penicillin administered without buffer or antacid is absorbed to a slight extent (*9*).

When penicillin is combined with an antacid powder containing a mixture of sodium bicarbonate, colloidal kaolin, magnesium trisilicate, and bismuth subcarbonate, or sodium bicarbonate alone, the urinary excretion of penicillin surpasses that observed by any substance of the group studied. We have been able to obtain reproducible urinary penicillin excretion curves, when a combination with the antacid powder mixture was used. The same results have been found not only on the subject under study but also on several other male individuals.

Table 2 summarizes the total percentage recovery of penicillin in the urine after six hours by multiplying the values of the unit potency per cubic centimeter of urine by the volume of urine. From these values it is again apparent that the maximum excretion occurs when antacid combinations or sodium bicarbonate alone have been used.

TABLE 2

PERCENTAGE RECOVERY OF PENICILLIN IN URINE

Material administered	Per cent	Units
Aluminum gel	2.0	500
Aluminum hydroxide gel	2.6	650
Calcium carbonate U.S.P.	2.6	650
Sodium phosphate (dibasic)	3.20	800
Cottonseed oil in gelatin capsule	2.5	625
Sodium chloride U.S.P.	1.9	475
Sodium citrate U.S.P.	5.0	1,250
Sodium bicarbonate U.S.P.	8.7	2,175
Antacid powders containing sodium bicarbonate, colloidal kaolin, magnesium trisilicate, and bismuth subcarbonate	9.0	2,250

Therapeutically, the use of sodium bicarbonate has its limitations, due to the danger of alkalosis. However, with antacids containing several buffers and smaller amounts of sodium bicarbonate, no apparent change in the urinary hydrogen-ion concentration has been observed.

Antacid powders used in combination with penicillin produced a unit potency of penicillin excretion of 20 Oxford units/cc. of urine within the first hour (Fig. 2), whereas the maximum for aluminum hydroxide gel was 4–6 units/cc. and for sodium citrate, 7.5 units/cc. Furthermore, the total penicillin recovery after oral administration with antacid powders exceeds that observed with any of the group studied.

The penicillin values obtained from the urinary excretion do not necessarily infer a corresponding blood level. It is merely suggested that this may be the case.

The necessity of restricting our investigations to males became evident when it was found impossible to obtain reproducible characteristic penicillin urinary excretion with the females studied. Similar findings in females have also been reported by Perlstein, *et al.* (*8*), who found an unexplainable maximum excretion in the eighth hour. The mechanism of urinary clearance would seem to vary in males and females. A similar difference in kidney physiology between males and females has been reported by Smith (*11*). Moreover, Oster (*7*) has recently found a histochemical difference in the kidneys of male and female rats.

Summary. Combinations of sodium bicarbonate, colloidal kaolin, magnesium trisilicate, and bismuth subcarbonate with penicillin produce a higher penicillin titer in the urine than the various antacids and buffers recommended for oral penicillin therapy.

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Transmission of *Salmonella enteritidis* by *Pulex irritans* and *Ctenocephalus canis*

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The possibility of transmitting an infection by means of *Pediculis vestimenti* as a host of *Salmonella enteritidis* has been studied by Huang and Lien (*1*).

Later, Steinhaus (*3*) isolated the following Salmonelleae from insects: *Eberthella pyogenes* from *Neobius fasciatus* var. *fasciatus* and *Eberthella insecticola* from *Conocephalus fasciatus* var. *fasciatus, Oncopeltus fasciatus,* and *Loxa variegata.*

More recently, Parker and Steinhaus (*2*) proved

that *Dermacentor andersoni* becomes infected with *S. enteritidis* by ingesting the germs. These can be found in the feces of the vector, which is able to transmit the infection to guinea pigs 35 days after the contaminated meal has been ingested. It is possible to transmit the infection to the descendants of the tick by means of their eggs. Supported by the fact that epizootics caused by *S. enteritidis* can develop in guinea pigs inoculated with *Ripicephalus sanguineus,* the authors have suggested the possibility of natural infection of the latter with such Salmonella.

In this laboratory guinea pigs were injected with several groups of *B. annulatus, B. microplus,* and *A. persicus,* and colonies of *S. newport, S. enteritidis, S. typhimurium,* and *S. poona* were isolated from the spleens of some of the guinea pigs. It it believed that the infection was due to other causes than the existence of Salmonella infection in the ticks in the experiment.

Experimental studies on infection and transmission of *S. enteritidis* by *Pulex irritans* and *Ctenocephalus canis* have recently been undertaken by us.

White mice were infected intraperitoneally with *S. enteritidis.* After 24 hours, when the animals showed clear signs of acute disease and blood cultures made were positive to Salmonella, fleas of the species mentioned above were fed on the infected mice. It was possible to isolate *S. enteritidis* 24, 48, and 96 hours after the fleas were fed. The isolation was carried out by culture of a portion of the grounded fleas on the usual Salmonella media. Cultures made from the feces of the fleas 24 hours following infection were found negative to Salmonella.

In another experiment fleas infected 24 and 48 hours before, and then maintained fasting for 24 hours, were used. These were fed on 12- to 14-day-old mice, since younger animals are more susceptible. All the mice showed no symptoms after one month. Cultures made with ground spleen of the animals on the 1st, 2nd, 4th, 6th, 20th, and 30th days after being bitten were negative.

Another lot of fleas were infected in the same way and then fed on two 28- and 30-year-old adult men. After a month of clinical observation we were not able to note any symptoms, and repeated cultures made from their feces were negative.

The negative results obtained in attempts to transmit *S. enteritidis* infections by the bite of several fleas infected with such germs seem to demonstrate that if such infection is produced, it is so slight that it cannot be diagnosed either in man or in young mice.

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The Eurasian Continental Glacier of the Late Pleistocene

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Three-quarters of a century ago Prince Kropotkin reported his discovery of glacial erratics and of ancient moraines which indicated the former presence of a continental glacier in eastern Siberia (*3*).

Against the view of Lyell, current at the time, that such evidence could be explained by the "drift" of icebergs, Kropotkin offered cogent arguments. That the observations of so competent and reliable an explorer-geologist were generally disregarded is explained by the powerful influence of the well-known Russian climatologist, Woikov (*6*), and the highly placed geologist, Tscherski (*5*), each of whom acted to strongly discredit them. Woikov wrote in 1881:

> Geologists are agreed that at least since the Pliocene the great climatic features of the Asiatic Continent have remained essentially unchanged. The high mountains and plateaus were there and the interior portions of the continent were therefore cut off from the moist regions of the north, west and south. . . . Such an aridity naturally excludes and excluded glaciers, with the exception of some quite small ones in the high mountains.

Despite the influence of this oracular pronouncement of Woikov, some Russian explorer-geologists in Siberia continued to collect evidence of a past glaciation, and the outstanding geologist, W. A. Obrutschev, for 40 years piled up the evidence, until in his "Geologie von Siberien," published in 1926,[1] he supplied a short summary account of a Siberian glaciation. Four years later he treated the subject much more fully and supplied a sketch map of the glaciated area (*4*). After another seven years (1937) there appeared the first volume of the *Great Soviet atlas,* in which large-scale glacial and soil maps were included.[2]

Due to World War II, which opened as this volume was issuing, it is likely that glacialists are only beginning to know of these Eurasian continental glaciations,

[1] This appeared in *Fortschr. Geol. Paleontol.,* 1926, **15,** 381–399.

[2] This *Great Soviet world atlas,* Pt. I: *Maps of the world,* was prepared under the cooperative editorship of A. F. Gorkin, O. J. Schmidt, V. E. Motylef, M. V. Nikitin, and B. M. Shoposhnikov. The director of the Scientific Editorial Institute was V. E. Motylef. The soil map is Plate 40–41–42, and the glacial map, Plate 90–91.

Three years later there appeared a translation into English of the titles and subtitles of this superb work which has no parallel in any other country (*Great Soviet world atlas.* Pt. I. Trans. by Andrew Perejda and Vera Washburne under the direction of George B. Cressey, Department of Geology and Geography, Syracuse University, Syracuse, New York. Ann Arbor, Mich.: Edwards Bros., 1941).