SPECIAL ARTICLES

RELATION OF EXTERNAL ENVIRONMENT TO COURSE OF A B. ENTERITIDIS INFECTION IN MICE

IN a previous communication[1] it was reported that if corresponding groups of rats are fed massive doses of cultures of *B. enteritidis* and kept in cold and warm rooms respectively the mortality is greater among those kept in the cold room. The results were not, however, conclusive, because rats are highly resistant to infection and infant rats and massive doses of bacteria had to be used.

The experiments are now being repeated with mice, and thus far the results indicate clearly that the external environment has a profound influence on the course of a *B. enteritidis* infection in mice. Animals kept in a cold room with a high relative humidity reacted quite differently from those kept in a warm room with a low relative humidity. The results varied also with the mode of infection.

Equal numbers of young mice of about the same weight (10 to 12 grams) were placed in battery jars. One set was kept in a cold room with a temperature range of 7° to 10° C., and a relative humidity of 70 to 80. The other was kept in a room incubator at a temperature of 28° C. and a relative humidity of 40 to 50. When the mice were infected intraperitoneally or subcutaneously the period between the day of infection and the first fatality was longer and the number of survivors greater in the cold than in the warm room. When the infection was given per os the reverse was the case: the incubation period was shorter and the mortality greater in the cold than in the warm room. A summary is shown in tabular form.

Dose (No. of bacteria) and method of infection	Temperature	No. of mice	Incub.* in days	No. of deaths	No. of survivors		Average duration of life from day of infection
3,000 ...	28° C.	8	4	5	3		
i.p. ...	9° C.	8	6	3	5		
30,000 ...	28° C.	9	2	8	1		5½
i.p. ...	9° C.	9	4	7	2		6
300,000 ...	28° C.	9	1	9	0		3
i.p. ...	9° C.	9	2	8	1		4½
3,000,000 ...	28° C.	10	0	10	0		1.9
i.p. ...	9° C.	10	0	9	1		2.4
3,000,000 ...	28° C.	7	2	5	2	(30 per cent.)	5.8
subcut. ...	9° C.	5	6	3	2	(40 per cent.)	7.7
200,000,000 ...	28° C.	10	...	0	10		
per os ...	9° C.	8	10	7	1		
1,000,000,000 ...	28° C.	8	9	2	6		
per os ...	9° C.	8	8	8	0		

* Equals days until first death appeared.

In other words, the septicemic type of infection runs a more rapid course at a higher temperature, while the oral type is much more severe at the lower temperatures. These results may account for the seasonal character of typhoid-paratyphoid epidemics in man as well as in mice.[2] They may also provide an explanation for the lower case fatality in countries with a warm climate than in those with a temperate one. The investigation is being continued with a view to ascertaining the precise effects of temperature and humidity on the variation in host resistance recorded above.

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BOTANICAL AND GEOLOGICAL EVIDENCE FOR AN ANCIENT LAKE

THE presence, in early postglacial times, of a large lake in northwestern Wisconsin is indicated by the distribution of certain plants collected in that region during the summer of 1928. The first clue was given by *Juncus balticus*, var. *littoralis*. This rush, common along the shores of the Great Lakes, was first found in the interior of Wisconsin on the shore of Crystal Lake, in Dane County, near Prairie du Sac. Crystal Lake is described[1] as a relic of a larger glacial lake. The *Juncus* was next found on Lake Wingra, a few miles to the southeast, also a relic of a once larger body of water. In northwestern Wisconsin the plant was found last summer on a number of lakes (Fig. 1 shows the range in Wisconsin of *Juncus balticus*, var. *littoralis*). These lakes all have certain features in common, notably broad sandy shores and abandoned beaches several feet higher than the present water level. On each of such lakes, also, some or all of the following species, elsewhere unknown in that part of the state, were invariably found: *Panicum albemarlense, P. meridionale, Muhlenbergia uniflora, Stenophyllus capillaris, Rycho-*

[1] I. J. Kligler, *Proc. Soc. Exp. Biol. and Med.*, 25: 20, 1927.

[2] I. J. Kligler, *Jour. of Hyg.*, 27: 14, 1927; Ida W. Pritchett, *Jour. Exp. Med.*, 41: 209, 1925; 43: 173, 1926.

[1] W. C. Alden, U. S. Geol. Sur. Prof. Paper 106: plate III, 1918.