

fected persons not suffering from the disease. The primary epidemic disease of the autumn is considered identical with that of the early summer, with the added complication of broncho-pneumonia in the colder weather. The bacillus of Pfeiffer is the apparent cause of the epidemic disease but its causal relationship is not conclusively proved. Rest in bed, warmth and bodily comfort, promptly enforced at the outset, are the most important elements in the treatment. Prophylaxis includes avoidance of contagion and general hygienic measures to enhance natural resistance and retain it at a high level. Vaccines are of questionable value.

Influenza has been endemic in France for many years, and during the war this infection appears to have assumed a more virulent type in this country, small epidemics having been recognized in the British Army in the winter of 1916-17 and in the fall of 1917. American troops in France suffered very much from influenza, especially in the winter of 1917-18, the disease apparently being the same as that which became epidemic in 1918. The evidence suggests that the epidemic of influenza originated in France from the endemic influenza widely prevalent there. It is probable that the large numbers of American soldiers in France, subjected to strange environmental conditions, furnished a fertile soil for the propagation of the disease. The epidemic was evidently carried by ships from Europe to the United States and to South Africa.

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**The disinfectant action of glycerol in varying concentrations.**

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Previous studies of the disinfectant action of glycerol have for the most part been conducted in relation to its supposed destructive action on invading organisms in vaccine virus. M. J. Rosenau made an exhaustive investigation of the subject in 1903 and concluded that "Glycerol has distinct but very feeble germicidal and

antiseptic properties." F. R. Blaxall reported a similar study in 1902-3, his work including only one concentration of glycerol, 50 per cent. More recently G. Mathers and G. H. Weaver have noted the remarkable viability (14 to 30 days) of various micrococci and streptococci in 50 per cent. glycerol suspension, and the persistence of the organisms for 90 days on blood agar lightly covered with 50 per cent. glycerol.

Our own work was undertaken in connection with the study of the specific effects of salt solutions upon the permeability of bacterial cells, and in connection with this investigation the effect of glycerol in concentrations varying from 9.2 per cent. to 100 per cent. has been determined, *Bacillus coli* being the test organism.

The glycerol used was an analyzed commercial preparation (Merck) with maximum limits of foreign substances .1814 per cent. The analysis showed absence of carbonizable matters, and heavy metals. Pure, ammonia free water was used in making solutions, and for the controls.

Glycerol solutions of varying concentrations (9.2, 27.6, 46.0, 64.4, 82.8, 100 per cent.) were made up in 50 and 100 c.c. portions. Young cultures of *B. coli* (16-20 hours) were washed from agar slants with 2-3 c.c. of the test solution. One c.c. of this suspension was added to the bottles of the solution, and after dilution,

VIABILITY OF COLON BACILLI IN GLYCEROL SOLUTIONS OF VARYING CONCENTRATION.

Concentration of Glycerol.	Percentage of Number Originally Present Found After				
	2-3 Hours.	4-5 Hours.	5-7 Hours.	8-9 Hours.	18-24 Hours.
0 . . . . .	99	108	114	110	146
9.2 per cent. . . . .	82	118	—	—	185
27.6 per cent. . . . .	117	—	—	—	52
46.0 per cent. . . . .	87	77	55	50	17
64.4 per cent. . . . .	75	41	18	10	5
82.8 per cent. . . . .	53	38	15	6	4
100.0 per cent. . . . .	8	4	.6	.35	.005

agar plates were made. The solutions were incubated at 37°, one c.c. portions being removed at definite time intervals and plated after dilution. The test solutions up to 64.4 per cent. were shaken carefully by hand before removing the portion to be

plated; the solutions of high concentration, 64.4, 82.8, 100 per cent. were placed in a shaking machine and shaken for 5 minutes. Uniform distribution of the organisms was thus obtained even in the concentrated solutions.

The average results of 23 different series of tests are shown for typical time intervals in the table above. They suggest the following conclusions.

1. Glycerol in 9 per cent. solution exerts no appreciable effect upon the viability of *B. coli*.

2. Glycerol in solutions of strengths between 28 per cent. and 100 per cent. exerts a distinct disinfectant action, the effect increasing progressively with increase in the concentration, a 100 per cent. solution of glycerol causing the destruction of nine tenths of the bacteria present in three hours.

### 53 (1428)

#### **The effects of intravenous injections of dichlorethylsulphide in rabbits.**

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The effect of intravenous injections of dichlorethylsulphide (mustard gas) was studied in a small series of rabbits. The minimum lethal dose was found to be from 0.005 gm. to 0.01 gm. per kilo. The injection was followed by emaciation, diarrhea, and, in animals dying within a few hours following the injection, extreme restlessness, incoördinate movements, retraction of the head, and transient spasticity, but no definite paralyses or convulsions. Animals dying within twenty-four hours or so showed irregular pulmonary edema. The most interesting effects were found in the hemato-poietic system. Usually on the second day after the injection, the circulating blood showed a marked leukopenia, which in the terminal stages became extreme, leukocytes falling to 1,000 per cubic mm. or less. In animals which recovered there followed a gradual restoration to the original level. The leukopenia was accompanied by a relative but not absolute, mononucleosis. The erythrocytes appeared to be less severely injured.