Further investigations of amphibians, reptiles, and lower forms of life and their environmental interrelationships may help to define the role of pathogenic or saprophytic leptospires in the epidemiology of leptospirosis.

We thank A. Ritchie, National Animal Diseases Laboratory, Ames, Iowa, for performing the electron microscope studies on the frog isolate. This investigation was supported in part by grant *CC*-00071 from the Communicable Disease Center, U.S. Public Health Service, Atlanta, Georgia.

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Effect of Cellular Lipid on the Sensitivity of some Gram-positive Bacteria to Penicillins

It is possible to increase the lipid content of Gram-positive bacteria by sub-culture in nutrient broth containing glycerol and to deplete cellular lipid by treatment of the cells with pancreatic lipase.

Using benzylpenicillin, cloxacillin, methicillin and quinacillin[1] and *Bacillus subtilis*, N.C.T.C. 3601, *Streptococcus faecalis*, N.C.I.B. 8553 and *Staphylococcus aureus* (three strains) Oxford, N.C.T.C. 8452 and 100110 isolated at Queen Mary's Hospital for Children, Carshalton, we find that lipid enhancement invariably increases the resistance, as measured by the minimum inhibitory concentration for a constant inoculum of 10^3 cells/ml. and depletion invariably produces an increase in sensitivity. Results are summarized in Table 1.

Total lipid was determined by extracting dried cells with chloroform–methanol, 2 : 1, and by electrophoresis in the presence of 10^{-4} M sodium dodecylsulphate[2].

Preliminary experiments, using thin-layer chromatography and silicic acid-impregnated paper chromatography, indicated that this change in resistance could not be attributed to any particular component of the bacterial lipid as obtained by solvent extraction.

It is clear that changes in lipid content of cells markedly effect their susceptibility to penicillins and it is not impossible that such changes may occur *in vivo*, subsequent to infection.

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Table 1. Effect of Lipid on the Sensitivity of Gram-positive Bacteria to Penicillins

Organism	Treatment	Lipid content (% w/w of whole dried cells)	Mobility (μsec^{-1} V^{-1} cm^{-1}) in the presence of 10^{-4} M sodium dodecylsulphate	Minimum inhibitory concentration (μg/ml.)			
				Quinacillin	Benzylpenicillin	Methicillin	Cloxacillin
Staph. aureus (Oxford)	Control	6·39	−2·84	0·3	0·03	8·0	0·35
	Grown with glycerol	18·3	−4·56	20·0	2·0	20·0	8·0
	Lipase treated	6·4	−2·40	0·1	0·01	6·0	0·25
Staph. aureus N.C.T.C. 8452	Control	6·5	−3·21	0·7	Destroyed	1·0	0·5
	Grown with glycerol	7·0	−3·68	2·0	Destroyed	2·0	0·8
Staph. aureus 100110	Control	—	−3·69	5·0	100	26	1·0
	Grown with glycerol	—	−3·68	5·0	100	26	1·0
	Lipase treated	—	−3·0	3·5	100	24	0·8
Strep. faecalis	Control	5·3	−2·42	110	3·2	45	40
	Grown with glycerol	5·9	−3·01	350	10·0	100	200
B. subtilis	Control	8·6	−4·56	8·0	0·6	0·4	0·01
	Grown with glycerol	19·0	−5·48	40	5·0	1·0	0·03
	Lipase treated	8·3	−3·45	5·0	0·3	0·2	0·008

AGRICULTURE

Paternal Effect on Grain Size in Wheat

Varieties of wheat can differ in yield of grain even when unfavourable factors such as disease, unsuitable soil nutrient status and lodging are eliminated as completely as possible. Methods of breeding for high yield could be made more objective if the physiological processes responsible for the yield differences were understood. There are two possibilities. First the assimilative capacity of the plant after anthesis may be the principal limiting factor, or secondly, the grain may be a limited sink for photosynthates, either as a result of its rate of growth or its ultimate size.

The investigation reported here was carried out to obtain information on the potential capacity of the grain as a sink for photosynthates. Tests were made for genetically determined differences in grain size. The effects of variation in grain number, and of the assimilative capacity of the plant, on the supply of photosynthates to each grain were eliminated by making comparisons using common maternal parents. Genetic differences in the grain were obtained by artificial cross-pollination.

Table 1. Naturally Selfed Parents

	Mean weight per grain (mg)
'Holdfast'	41·6
'Cappelle-Desprez'	58·4
F_1 'Holdfast' × 'Cappelle Desprez'	53·5
Least significant difference $P < 0·05$	3·3
$P < 0·01$	4·7

Two varieties of winter wheat were used: 'Cappelle-Desprez' which has large grain and 'Holdfast' which has relatively small grain (Table 1). In 1963 the varieties were crossed reciprocally and also selfed by hand, a separate ear being used for each treatment. The experimental variation was too great for a paternal effect to be detected. This effect was likely to be small, because the male parent contributes only one-third of the endosperm genotype.