Growth in fluid media was slight; no fermentative reactions could be elicited in dextrose, mannitol, xylose, arabinose, saccharose, or maltose. Lactose broth became slightly acid in 10 days, without gas formation. The organisms were non-motile. Each of 2 rabbits were inoculated intravenously with 1 cc. of emulsion from the 13th serial plate; in one case the organisms were living, in the other, killed by heating at 65°C. for an hour. No effects were apparent in the animals, and the inoculations were repeated at intervals to produce agglutinating serum.

After 5 injections of 1 cc. each, the serum agglutinated the homologous organisms in a dilution of 1:640. The serum was also tested against various strains of typhoid, paratyphoid, colon, Shiga, and Flexner dysentery bacilli. No agglutination was noted except in the case of one strain of Flexner dysentery bacilli, which agglutinated in a serum dilution of 1:80. Absorption agglutination tests showed that the agglutinins for the Flexner strain could be completely removed without lowering the titer of the agglutinins for the river water organism.

This feebly growing, biochemically inert organism, occurring in a filterable form in polluted water, may have some sanitary significance, especially in view of the fact that it appears to be antigenically related to a known producer of dysentery. Repetition of these experiments, and further studies, including animal feeding tests are in progress.

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Skin Reactivity of Mothers and Infants to Gonococcus Vaccines.*

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The skin reactivity of the newborn and young infant to intradermal injections of specific and non-specific substances has been studied by many investigators. Their results have invariably indicated that the skin in early life responds poorly or not at all to substances that cause marked reactions in adults and older children. Thus the dermal response to antigens prepared from the diphtheria

* We wish to thank Dr. Russel D. Herrold for the gonococcus antigens used in this study.

bacillus, scarlet fever streptococcus, tubercle bacillus and Staphylococcus aureus is comparatively negative in young infants but nevertheless consists in large reactions in adults (Ruh and McClelland,[1] Cook,[2] Kobak and Pilot[3]). It was likewise shown that protective antibodies are not the factors in negative dermal reactivity in early infancy. The basis for this is believed to be the lack of development of a mechanism of skin reaction to intradermal irritants (Friedberger and Heim,[4] Tschertkow[5]). The skin is also sluggish in its response to non-specific antigens and dermal irritants during infancy (Friedberger and Heim,[4] Adelsberger[6]). The phenomena of inert dermal response in early life was confirmed in laboratory animals by Freund[7] who used tuberculin (in guinea pigs) and vaccines of virulent pneumococci (in rabbits). This investigator also noted that the state of development of many immune bodies was likewise much less in the young rabbit as compared to the older animal.[8]

Staphylococcus aureus filtrate and vaccine were used by Kobak and Pilot to investigate the effect of intradermal reaction to bacterial products from organisms to which babies are clinically very susceptible. They obtained the staphylococci from boils and cases of Pemphigus neonatorum. For this study a series of mothers and their newborn babies, and another series of infants of various ages were injected. The results were quite similar to those where the diphtheria, scarlet fever and other antigens were used, namely, a high proportion of reactivity in mothers and a very low proportion in infants in whom the percentage of positive reactions gradually increased as older babies were tested. At the time this work was being completed we were inquiring into the effects of gonococcus antigens. The clinical susceptibility of infants to this organism is well known. Herrold[9, 10] prepared toxic filtrates and vaccines from the gonococcus which gave marked dermal reactions.

Our patients for this study were obtained from the Obstetrical

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Department of the University of Illinois where 26 mothers and their babies were studied, and from the St. Vincent's Infant Asylum where 94 babies ranging from 2 weeks to 2 years were studied. We found that the gonococcus filtrate gave marked reactions in adults but progressively deteriorated and the skin response rapidly decreased in a short time. We, therefore, have employed the more stable vaccine from diluted broth culture. The dosage used was the amount that produced an average reaction of from 3 to 4 cm. in adults. This dosage was likewise given to all infants tested. The injected area was measured 24 hours later and the length and width were noted. The average of these 2 dimensions was the size recorded. Reaction consisted usually of an elevated area of hyperemia which reached its height in 24 hours and gradually disappeared in 3 to 5 days. All adults studied gave large reactions, and the average of the puerperal mothers was 3.6 cm. Reaction in the infants was both of a lesser degree and in smaller proportions. The average size and percentage of positive cases increased when older babies were injected. The findings (Table I) are in accord with the observations on staphylococcus, diphtheria and scarlet fever streptococcus skin studies reported by others.

TABLE I.
Skin Reactions to Intradermal Injections of Gonococcus Vaccine.

	No. Tested	Reactions Positive	Reactions Negative	% Positive	Average Size of Reactions*
Mothers					
Several hr. to 10 days puerperium	26	26	0	100.0	3.6
Newborn Babies					
Few hr. to 10 days	26	15	11	57.7	1.2
Infants					
2 weeks to 3 mo.	12	4	8	33.3	1.17
3 to 6 mo.	30	17	13	56.6	1.5
6 to 9 mo.	17	11	6	64.7	1.3
9 to 12 mo.	12	10	2	83.3	1.6
12 to 24 mo.	23	16	7	70.0—	1.8

*Average of reactions includes only positive cases of each group.

Conclusions. The poor skin response to gonococcus antigens to which newborns and older infants are clinically more susceptible resembles that of other bacterial preparations similarly used. We believe this phenomenon ("anergy") to be due to an underdeveloped mechanism for dermal reactivity in early age.