

hours with a return to normal in 48 hours; one showed a slight decrease in 24 hours with a return to approximately normal in 48 hours; while only 2 showed a definite increase (from 0.340 to 0.444 mg. and 0.340 to 0.466 mg., respectively). In each of these latter dogs peritonitis was present, and one of them being quite ill at the time it was sacrificed. One animal (No. 8) died 4 hours after the operation with symptoms of hypoglycemic convulsions; its blood sugar dropped from 104 mg. to 41 mg. and the guanidine from 0.409 to 0.337 during the 4 hours. All of these dogs showed liver injury on microscopic examination and most of them showed an increase in blood esterase.

From these experiments it appears that injury to the liver due to mechanical obstruction of the hepatic veins does not affect the guanidine content of the blood in the same manner as injury to the liver induced by acute poisons. It is suggested, although without any experimental basis, that the poisons used by Minot and Cutler may have injured the parathyroids as well as the liver.

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Skin Reactivity of Mothers and Infants to Staphylococcus Aureus Filtrate and Vaccine.

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The negative response to the Dick and Schick tests in the new born and young infant gave rise to the supposition that neutralizing antibodies were present. These antibodies were considered to be of transplacental origin at birth, and then later might be obtained from the breast milk. Further clinical support is found in the apparent lack of diphtheria, scarlet fever, or other infectious diseases in early infancy. However, the Dick and Schick tests are often negative in the newborn although their mothers may be definitely positive (Cooke,¹ Ruh and McClelland²). Furthermore, the blood serum of the young infant also lacks the antitoxins that might neutralize the toxin of the scarlet fever streptococcus (Cooke¹) or the diphtheria

¹ Cooke, J. V., *Am. J. Dis. Child.*, 1927, **34**, 969.

² Ruh, H. C., and McClelland, J. E., *Am. J. Dis. Child.*, 1923, **25**, 59.

bacillus (Von Göer and Kassowitz,³ Friedberger, Bock and Fürstenheim⁴). These antitoxins are usually found in the serum of adults who are negative to the Dick and Schick tests. In addition to the skin tests it has likewise been reported that the skin at this age responds neither to the filtrates from other specific organisms nor to certain non-specific antigens and eczematogenous irritants (Tschertkow,⁵ Adelsberger,⁶ Friedberger and Heim⁷).

There is still, however, a lack of study of skin response to antigens prepared from organisms to which the newborn and young infants are clinically very susceptible. This communication is limited to a report of the skin reactions after intradermal injections of *Staphylococcus aureus* filtrate and vaccine in mothers and their babies, as well as in older infants. This organism has been shown by Falls⁸ and other investigators to cause pemphigus and impetigo in the newborn. The filtrate was prepared according to the method of Pilot and Afremow⁹ and the organisms were obtained from boils, abscesses, puerperal sepsis, pemphigus, and impetigo. Thus a series of 46 mothers and babies were simultaneously injected with 0.1 cc. of 1:100 filtrate as soon after labor as possible. Thirty-four of these were also given injections of vaccines 0.1 cc. of 50 to 100,000,000 per cc. suspensions. The tested area was read and measured 20 to 24 hours later and only an erythema of 1 cm. in diameter or larger was considered as positive.

A large majority of the mothers responded with a definite reaction, some even as large as 3 to 4 cm. in diameter and in dilutions as high as 1:500. Their babies, however, gave little or no response. Another series of 82 infants, from one week to one year, were studied at the St. Vincent's Infant and Maternity Hospital. A tabulation of the entire series is appended to show the comparative reactivity of mothers and infants. In general, the latter respond very little in the first few months, and the proportion of positive reaction increases up to the end of the first year. The reactions were small in size and not much larger than 1 cm. in diameter. Those less than 1 cm. were considered negative, and there was a small number in this group with reactions of approximately 0.5

³ Von Gröer, F., and Kassowitz, K. (quoted by Cooke).

⁴ Friedberger, E., Bock, G., and Fürstenheim, A., *Z. Immun. forschg.*, 1929, **64**, 294.

⁵ Tschertkow, L., *Z. Immun. forschg.*, 1929, **64**, 407.

⁶ Adelsberger, L., *Z. f. Kinderh.*, 1927, **43**, 373.

⁷ Friedberger, E., and Heim, F., *Deutsch. M. Wochenschr.*, 1929, **55**, 132.

⁸ Falls, F. H., *J. Infect. Dis.*, 1917, **20**, 86.

⁹ Pilot, I., and Afremow, M. L., *J. Am. Med. Assn.*, 1927, **89**, 939.

TABLE I.
Skin Reactions (24 hours) to Intradermal Injections of *Staphylococcus Aureus*
Toxin and Vaccine.

	No. Tested	Reactions		% Positive
		Positive	Negative	
<i>Mothers</i>	T* 46	45	1	98.7
Several hours to 6 days puerperium	V† 34	30	4	88.5
<i>Newborn Babies</i>	T 46	0	46	0
Few hours to 5 days	V 34	1	33	2.9
<i>Infants</i>	T 39	1	38	2.5
1 week to 2 months	V 39	0	39	0
<i>Infants</i>	T 21	1	20	4.8
2 to 4 months	V 21	3	18	14.3
<i>Infants</i>	T 14	2	12	14.2
4 to 8 months	V 14	5	9	35.6
<i>Infants</i>	T 8	6	2	75.0
8 to 12 months	V 8	5	3	62.5

* Toxin. † Vaccine.

cm. which were considered traumatic. These injections were entirely harmless to the mothers or babies, *i. e.*, no general reactions or skin complications followed.

Negative skin reactions were present in one case of pemphigus, 4 of generalized furunculosis, and 2 with abscesses. *Staphylococcus aureus* was isolated from the pemphigus and furunculosis babies. Further work on the skin reactivity of infants will be carried on with reference to gonococcus filtrate and other non-specific skin irritants. In the study of the sera of 15 mothers and babies who were positive and negative respectively to these tests, it was seen that the mother's opsonic index very frequently exceeded that of her baby (cord blood).

Conclusions. A report of skin reactivity to filtrate and vaccine of *Staphylococcus aureus*, which often causes infection in newborn, is presented. It includes a study of a series of mothers and their babies, and another of older infants. The response to intradermal injections of these preparations is parallel with the Dick, Schick, and other bacterial filtrates to which the skin of young infants is comparatively refractory. This lack of response is not associated with the presence of a protective mechanism, but rather, we believe, to an inherent lack of the reactive mechanism at this early age. Mothers and older infants give positive reactions in the proportions designated.