TABLE III.

	Sterilization	Wt. of Fraction of Stool	Lactic* Acid in Fraction	Added Lactic Acid	Total Lactic Acid* Found	Recovery
	min.	gm.	mg.	mg.	mg.	%
A. 50 gm. stool plus 129 mg. lactic acid	0	5	.17	12.9	.18	0.08
B. 50 gm. stool plus 129 mg. lactic acid	30	5	.17	12.9	10.73	82.00

*Sulphite binding substances expressed as lactic acid.

various sugars. It is with difficulty, however, that our results can be explained on the basis of complete absorption, for lactic acid has been found in the stools of infants.[8, 9] The obvious explanation is that the intestinal flora of the adult destroy lactic acid. This conclusion is confirmed by the incubation for 24 hours at 37°C. (Table III) of lactic acid added to stool before and after sterilization. The lactic acid added to a stool incubated for 24 hours disappears. The usual recovery was found when the lactic acid was incubated with a sterilized stool. Kendall, Friedemann and Ishikawa[10] have shown that bacteria in the resting state destroys lactic acid. This is particularly true of the colon bacillus group.

Conclusions. 1. A rapid method for determining lactic acid in stools is presented. 2. Only a few milligrams of sulphite binding material was found in the study of the stools of 2 normal adults. 3. Evidence is presented that lactic acid is destroyed by intestinal bacteria.

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Complement Fixation in Variola and Vaccinia.

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Certain writers have drawn attention to the application of the

[8] Gerstley, J. R., Wang, C. C., and Wood, A. A., *Am. J. Dis. Child.*, 1930, **39**, 487.

[9] Gerstley, J. R., Wang, C. C., and Wood, A. A., *Am. J. Dis. Child.*, 1930, **39**, 729.

[10] Kendall, A. I., Friedemann, T. E., and Ishikawa, M., *J. Infect. Dis.*, 1930, **47**, 186.

complement fixation reaction in variola as a possible method in diagnosis. While in general the results have been irregular, they have, nevertheless, indicated that the reaction may be specific. Studying the serologic reactions of vaccinia, Bedson and Bland[1] have recently demonstrated that fixation conducted at room or ice box temperature is superior to that carried out at 37°C., the temperature apparently uniformly used heretofore. The work of Gordon,[2] elaborated by Burgess, Craigie and Tulloch,[3] and others, revealed a high degree of sensitivity and specificity in the flocculation test in variola, and showed the possibility of an *in vitro* diagnostic test.

To be of value, such a test must be applicable early in the disease. It must be sensitive and specific, and should require only a small amount of material.

The following technique was employed. Rabbits were hyper-immunized to vaccinia by intravenous and intraperitoneal injections of the neurovirus of Levaditi, previously prepared by testicular passage. The serum of these animals fixed complement with the homologous antigen in a dilution of 1 to 64. The well-known tendency of rabbit serum to anticomplementary action and non-specific fixation was avoided by using a 1 to 10 dilution. To reduce the volume sufficiently, the reagents were titrated by the drop method, using capillary pipettes, the same pipettes being used in the test. The final volume was about 0.3 cc. in tubes of 10x75 mm. Material collected from vesicles or pustules in capillary tubes was diluted with 2 drops of saline, half being used in the test and half serving as an anticomplementary control of the antigen. The usual reagent controls were included, and fixation carried out for 3 hours in the ice box.

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TABLE I.

Source	No. of Cases	Time of Collection	Number Positive	Number Negative	Remarks
Vaccinia	7	6 to 10 days after primary vaccination	7	0	
Variola	16	1 to 14 days of eruption	14	2	Negative on 12th and 14th days. Decrustation almost complete.
Control	10		0	10	Varicella, impetigo, pemphigus, exfoliative dermatitis.

[1] Bedson, S. P., and Bland, J. O. W., *Brit. J. Exp. Path.*, 1929, **10**, 393.

[2] Gordon, M. H., Med. Res. Council, Special Report Series, **98**.

[3] Burgess, W. L., Craigie, James, and Tulloch, W. J., Med. Res. Council, Special Report Series, **143**.

ment of Bridgeport, Connecticut, it was possible to obtain material from a number of cases of variola. This was studied as indicated above in the complement fixation reaction. The results obtained are summarized in Table I. The data show that material from all except 2 cases of variola gave complete fixation. In those not fixing complement, the material was obtained on the twelfth and fourteenth days of the eruption, when only a few pustules remained. There was no fixation by any of the material derived from a number of different conditions, and in no instance was the antigen anticomplementary.

On the basis of these observations it is suggested, therefore, that complement fixation may be of value in the early diagnosis of variola.

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Relation of the Lipids to Physiological Activity. Changes in Lipids of the Epidermis During Keratinization.*

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Bloor[1] has shown relationships between physiological activity and the nature of the lipids in various tissues of the animal body. A high degree of activity is paralleled by a high phospholipid to cholesterol ratio. Since cells of the epidermis undergo a marked change in physiological activity during keratinization, we determined some of the lipids in epidermal cells before and after this process. The epidermis was separated from the cutis by digesting the skin, from which all subcutaneous fat had been removed, in cold 1% acetic acid. The completeness of the separation was confirmed by microscopic examination of sections of the skin. Several samples of epidermis were analyzed separately. Since it was impossible to obtain sufficiently large samples composed entirely of *stratum germinativum,* material containing considerable but varying quantities of this layer of active cells was scraped from the proximal surface of the epidermis and analyzed. Samples composed entirely of stratum corneum, trimmed from the soles of feet,

* This work was made possible by a grant from the Lambert Chemical Company.

[1] Bloor, W. R., Okey, R., and Corner, G. W., *J. Biol. Chem.*, 1930, **86**, 291.