

carboxylated and deaminated at the same time to yield acetaldehyde which is dismutated to form equimolar quantities of ethyl alcohol and acetic acid. If the reaction proceeds by way of pyruvic acid, deamination appears to be the controlling factor of the rate of utilization of serine as evidenced by the marked shift in pH optimum from 6.0 for pyruvic acid to the neighborhood of 7.5 for serine. These results, considering the experimental errors involved, suggest that the degradation of serine by washed suspensions of *Cl. botulinum* may be represented as



The closely related amino acid, alanine, is not attacked directly by *Cl. botulinum* but only when a suitable H-acceptor is also present. Therefore, substitution of an hydroxyl group for a H-atom on the β -carbon of alanine produces a compound that may be employed singly as a source of energy by *Cl. botulinum*. These above results show that *Cl. botulinum* may obtain a portion of its energy requirements by direct utilization of amino acids such as serine as well as through coupled reactions between pairs of different amino acids (Stickland reaction) as previously described.

11273 P

Nasopharyngeal Cultures in Pertussis.*

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The generally accepted method for the bacteriological diagnosis of pertussis is the cough-plate culture, originally described by Chievitz and Meyer,¹ or some modification of their procedure. The percentage of positive cultures obtained by this technic varies considerably in the hands of different workers and under various conditions.²

We have found the cough-plate method satisfactory for older children, but in infants we have obtained positive cultures in only

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¹ Chievitz, J., and Meyer, A., *Ann. de l'Inst. Pasteur*, 1916, **30**, 503.

² Sauer, L. W., *J. Ped.*, 1934, **5**, 246.

about 25%, even when the cultures were made during the catarrhal period of the disease. This low incidence seems to be due to the fact that the young infant does not cough as vigorously as does the older child, thereby resulting in an inadequate inoculation of the medium.

During the course of a comparative study of various technics for making cultures, we were impressed by the favorable results obtained from culturing the nasopharynx. Recent reports^{3, 4, 5} have described the advantages of the nasopharyngeal culture in the bacteriological diagnosis of pneumonia. This present report describes the results obtained by making simultaneous nasopharyngeal, throat and cough-plate cultures in a series of 25 consecutive cases of pertussis observed in the pediatric clinic during the past 4 months. The procedure follows.

The medium was prepared as previously described⁶ and poured into ordinary Petri dishes. Medium more than 3 days old was discarded. The cough-plate cultures were made by exposing the medium during a paroxysm at a point about 6 inches in front of the patient's mouth. The nasopharyngeal cultures were taken by passing a sterile swab, consisting of a small bit of cotton tightly wrapped about the end of a thin, flexible copper wire, through the nose until it touched the posterior wall of the pharynx. Throat cultures were taken by means of a similar swab.

The results obtained in the present comparative study are shown in Table I.

Cultures were made on 25 cases, 17 of which were but 2 years of age or less. In this group, it is apparent that the results obtained by nasopharyngeal culture were distinctly superior to those by the throat culture or by the cough-plate method. In the 25 primary cultures, 17 were positive. Of this group, the nasal culture was positive in 14 instances, as compared to 8 positive cough-plates and to 4 positive throat cultures. Of the entire group of 40 cultures, there were 22 positive nasal, 10 positive cough-plates and 5 positive throat cultures. In only 3 cases were the cough-plate cultures positive when negative nasopharyngeal cultures were obtained. These patients were 4, 6, and 7 years of age, respectively, and were presumably able to cough vigorously.

³ Hodes, H. L., Stifter, W. C., Jr., Walker, E., McCarty, M., and Shirley, R. G., *J. Ped.*, 1939, **14**, 417.

⁴ Poole, F. D., and Fousek, M. D., *J. A. M. A.*, 1939, **113**, 1854.

⁵ Auger, W. J., *J. Ped.*, 1939, **15**, 640.

⁶ Bradford, W. L., and Slavín, B., *J. Clin. Investigation*, 1937, **16**, 825.

TABLE I.
A Comparison of Culture Methods in Pertussis.

Patient	Wk of Cough-		Naso-		Patient	Wk of Cough-		Naso-		Patient	Wk of Cough-		Naso-	
	Age	plate	Throat	pharynx		Age	plate	Throat	pharynx		Age	plate	Throat	pharynx
We	8 wk	2	0	0	Be	2 yr	2	0	0	Bi	9 mo	1	0	0
	4	4	0	0			4	0	0			2	0	0
	6	6	0	0			8	0	0			4	0	0
Ho	3 mo	4	+	+	Wa	6 wk	2	0	0	Sa	5 mo	3	0	0
	6	6	0	0			3	0	0	O'K	3 yr	2	0	0
Al	1 yr	5	0	0	Sp	3 mo	4	0	0	O'K	6 "	2	+	0
	6	6	0	0			5	0	0	Le	6 "	4	0	0
DeL	3 mo	5	0	0			7	+	+	Co	4 "	5	0	0
	6	6	0	0			10	0	0			8	0	0
Ce	2 yr	1	0	0	McK	2 yr	2	0	0	Le	7 "	4	+	0
Bu	2 "	4	+	+	Bo	2 "	3	0	0	Le	8 "	2	0	0
	6	6	0	0	Ko	4 mo	2	0	0	Hn	4 "	4	0	0
Sm	7 wk	3	0	0	Hu	2 yr	1	+	+	Ba	8 mo	1	+	+
Ar	3 yr	2	+	+										

Of a total of 25 positive cultures, there were 22 nasal, 5 throat, and 10 cough-plate.
Of the 25 primary cultures, 17 were positive; 14 nasal, 4 throat and 8 cough-plate.

In addition to the higher percentage of positive nasopharyngeal cultures obtained, the difference in the number of colonies which developed on the plates was striking. In repeated instances, there were only a few colonies of *Hemophilus pertussis* on a cough-plate or throat-plate culture, while the nasal culture revealed numerous colonies. Sometimes the growth was practically pure. The nasal culture often showed but a minimal growth of secondary invading organisms, while a heavy growth, on the other hand, usually occurred on the media inoculated from the throat. We believe that this difference in the occurrence of secondary invading organisms largely explains the difference in the percentage of positive cultures of *Hemophilus pertussis* isolated from the two sources. It may be, however, that the pertussis bacillus occurs in greater numbers in the nasopharynx during the disease and remains there for a longer period of time during convalescence. Further study will be necessary to decide this point.

A comparative study of the cough-plate, throat and nasopharyngeal cultures in pertussis indicates that the nasopharyngeal method is definitely the best, particularly for use in infants.

11274

**Anticatalase Activity of Sulfanilamide and Related Compounds.
V. Bacteriostatic Activity of some Sulfonhydroxamides.**

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This is a report of a study in which the ability of sulfanilamide to produce catalase inhibition is compared with that exhibited by acyl aminobenzenesulfonhydroxamides. Since the latter compounds contain a hydroxylamino group, they are analogous in structure to the intermediate assumed to be responsible for the anti-catalase activity of sulfanilamide in bacterial cultures.^{1, 2, 3} Possibly because of the presence of this group, the sulfonhydroxamides are capable of exerting a more rapid and more intense bacteriostatic effect than sulfanilamide.

¹ Locke, A., Main, E. R., and Mellon, R. R., *Science*, 1938, **88**, 620.

² Main, E. R., Shinn, L. E., and Mellon, R. R., *PROC. SOC. EXP. BIOL. AND MED.*, 1938, **39**, 272.

³ Shinn, L. E., Main, E. R., and Mellon, R. R., *PROC. SOC. EXP. BIOL. AND MED.*, 1938, **39**, 591.