

temperature constant, changing the environmental humidity from "dry" to "humid" activates the thyroid gland. This activation

represents an adaptive reaction of the body to the sudden change in the surrounding humidity.

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Two New Salmonella Types Belonging to Somatic Group D.

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A. *Salmonella napoli*. This type was represented by 10 cultures, of which 4 were isolated from cases of gastro-enteritis in United States soldiers, 3 from apparently normal soldiers and 3 from Italian civilian food-handlers. The first culture to be typed was isolated by Captain W. H. Ewing of the 15th Medical General Laboratory from a fecal specimen of an Italian civilian food-handler. The micro-organism possessed the cultural and biochemical characteristics of the *Salmonella*. Acid and gas were produced from arabinose, dulcitol, glucose, maltose, mannitol, rhamnose and xylose. Inositol, lactose, salicin and sucrose were not fermented. Sodium citrate and dextrotartrate were utilized. Gelatin was not liquefied. The organism produced hydrogen sulphide but did not form indol.

Examination of the somatic antigens of *S. napoli* showed that it belonged to group D of the Kauffmann-White classification. Alcoholized suspensions were agglutinated to the titre of *Salmonella gallinarum* antiserum and absorption of the serum with *S. napoli* removed all somatic agglutinins for the homologous strain. Somatic antigen I was found to be lacking in 6 strains, but was demonstrated in 4 by the use of an appropriate dilution of *Salmonella senftenberg* antiserum. The somatic antigens of *S. napoli* are [I], IX, XII. . .

When the flagellar antigens of *S. napoli* were examined it was found that the bacterium displayed α - β phase variation. Phase I was flocculated by *Salmonella* H antisera containing agglutinins for antigen I. . . When tested with absorbed serums possessing the factors v, w, z₁₃ and z₂₈ respectively, it was agglutinated

only by z₁₃. In absorption tests it completely removed H agglutinins from *Salmonella uganda*, phase 1, antiserum. The antigens of phase 1 of *S. napoli* are l, z₁₃ . . .

Phase 2 of the microorganism was agglutinated to titre by serums derived from the β phases of *Salmonella abortus-equi* (e, n, x, z₁₆, z₁₉) and *Salmonella glostrup* (e, n, z₁₅, z₁₇, z₁₉) respectively. It also was agglutinated by e, h antiserum. When tested with absorbed serums possessing factors for h, n. . . , x, z₁₅, z₁₆, z₁₇ and z₁₉ respectively, it was agglutinated by n. . . , x, and z₁₆. Absorption of *S. abortus-equi*, β phase, antiserum by *S. napoli*, phase 2, left agglutinins for the homologous strain as well as for the β phase of *S. glostrup*. However, a serum derived from the second phase of *S. napoli* was completely absorbed by *S. abortus-equi*, phase 2. The second phase of *S. napoli* behaves in very much the same way as do *Salmonella abortus-bovis* ([I], IV, XXVII, XII. . . : b—e, n, x. . .) and *Salmonella lomolinda* (IX, XII. . . : a—e, n, x. . .), both of which have deficiencies in their β phases not explained by the lack of antigen z₁₉. The 2nd phase of *S. napoli* may be expressed as e, n, x, z₁₆ . . .

The diagnostic formula of *S. napoli* is [I], IX, XII. . . : l, z₁₃ . . . — e, n, x. . .

B. *Salmonella italiana*. This type was represented by two cultures. The first was sent to us by Lieutenant Colonel Robert Hebble of a General Hospital. It was isolated from an Italian civilian who had experienced repeated attacks of severe bloody diarrhea. This culture was also examined by Major Kingston S. Wilcox of the Army Medical

TABLE I. Non-specific Antigens of *S. italiana*

Serums	Antigens	Antigens prepared from the homologous serum strain.									
		1, 2 . . .	1, 3 . . .	1, 6 . . .	1, 7 . . .	1, 10 . . .	1, 11 . . .	1, 12 . . .	1, 13 . . .	1, 14 . . .	1, 15 . . .
<i>S. paratyphi B</i>	Absorbed by	10	5	10	10	10	10	10	10	10	10
	Unabsorbed	10	5	10	10	10	10	10	10	10	10
<i>S. newport</i>	Absorbed by	10	5	10	10	10	10	10	10	10	10
	Unabsorbed	10	5	10	10	10	10	10	10	10	10
<i>S. cholerae-suis</i>	Absorbed by	10	5	10	10	10	10	10	10	10	10
	Unabsorbed	10	5	10	10	10	10	10	10	10	10
<i>S. anatum</i>	Absorbed by	10	5	10	10	10	10	10	10	10	10
	Unabsorbed	10	5	10	10	10	10	10	10	10	10
<i>S. gaminara</i>	Absorbed by	10	5	10	10	10	10	10	10	10	10
	Unabsorbed	10	5	10	10	10	10	10	10	10	10
<i>S. cardiff</i>	Absorbed by	10	5	10	10	10	10	10	10	10	10
	Unabsorbed	10	5	10	10	10	10	10	10	10	10
<i>S. italiana</i>	Absorbed by	10	5	10	10	10	10	10	10	10	10
	Unabsorbed	10	5	10	10	10	10	10	10	10	10

* Antigens prepared from the homologous serum strain.

School. The second culture was isolated by Captain Ira C. Evans of a Station Hospital from a case of gastro-enteritis in a soldier of the United States Army. The cultural and biochemical characteristics of the bacterium were the same as those of *S. napoli*. On serological examination it was found that in agglutination tests with O serums, *S. italiana* gave reactions similar to those obtained in testing *S. napoli*. Its somatic antigens are IX, XII . . .

The microorganism was diphasic and phase 1 was flocculated by *Salmonella H* antisera containing agglutinins for antigen 1 . . . Tests with absorbed serums possessing the factors v, w, z₁₃ and z₂₈ respectively revealed the presence of antigen v. In absorption tests it completely removed H agglutinins from serum derived from phase 1 of *Salmonella bredeney*. The antigens of phase 1 of *S. italiana* are 1, v . . .

Phase 2 of the bacterium was agglutinated by serums derived from all the non-specific phases, but tests with absorbed serums containing agglutinins for factors 2, 3, 5, 6, 7 and 10 respectively produced no flocculation. The non-specific antigens were examined more closely by agglutinin absorption tests, the results of which are given in Table 1. It was found that the second phase of *S. italiana* contained a strong flagellar factor peculiar to itself. To this antigen the symbol 11 is assigned. Due to the complexity of the 1, 5 . . . series of non-specific antigens, *Salmonella panama* (1, 3, 5 . . .) was established as the phase to be combined with *Salmonella gaminara* (1, 7 . . .) and *Salmonella cardiff* (1, 10 . . .) in order to remove the heterologous agglutinins from *S. italiana*, phase 2. This phase of *S. italiana* is expressed as 1, 11 . . .

The diagnostic formula of *S. italiana* is IX, XII . . . : 1, v . . . — 1, 11 . . .

Summary. Two new *Salmonella* types were described. *S. italiana* contained an undescribed antigen in phase 2 and was assigned the formula IX, XII:lv-1, 11 *S. napoli* was represented by the formula IX, XII:lz₁₃-e, n, x

Technical assistance was given by Private Bernard J. Joyce in establishing these new types.