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COMMUNICABLE DISEASE CENTER

SALMONELLA

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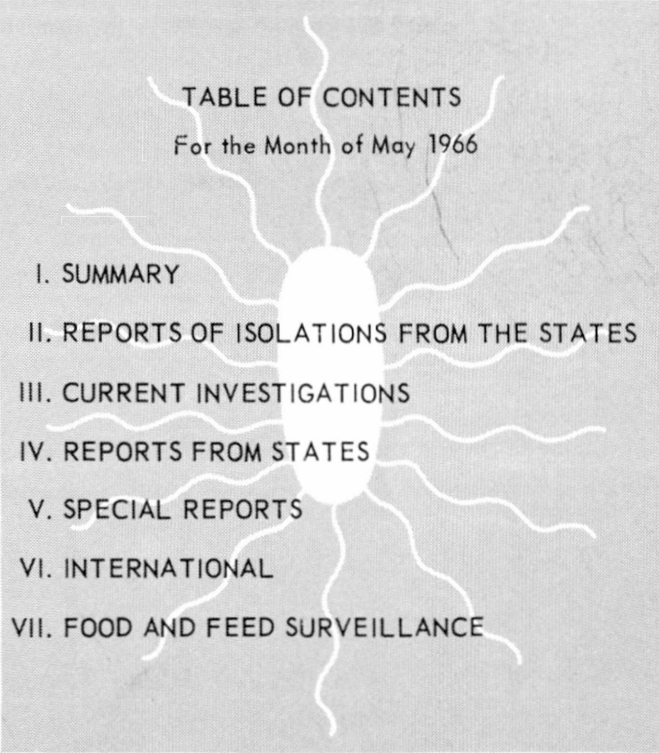
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SURVEILLANCE

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For the Month of May 1966

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PREFACE

Summarized in this report is information received from State and City Health Departments, university and hospital laboratories, the National Animal Disease Laboratory (USDA, ARS), Ames, Iowa, and other pertinent sources, domestic and foreign. Much of the information is preliminary. It is intended primarily for the use of those with responsibility for disease control activities. Anyone desiring to quote this report should contact the original investigator for confirmation and interpretation.

Contributions to the Surveillance Report are most welcome. Please address to:

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PHILIP RARICK EDWARDS

August 30, 1901 - May 16, 1966

An Appreciation

It is fitting that this publication take formal notice of the untimely death on May 16, 1966, of Philip Rarick Edwards at Atlanta, Georgia. In one sense, a major portion of its effectiveness stems from his efforts and studies throughout more than forty years during which Dr. Edwards maintained a constant interest in the genus Salmonella, extending our understanding of the basic relationships among this extensive group of pathogens and of the sometimes subtle but epidemiologically significant differences between any two of its members. Furthermore,

Dr. Edwards was directly or indirectly responsible for the training of a veritable army of bacteriologists who supply the working data for this surveillance activity.

Dr. Edwards was born on August 30, 1901, at Owensboro in his beloved Kentucky. It is of interest that the generic name Salmonella had been proposed by Lignieres barely a year earlier. After graduation from the University of Kentucky in 1922, Dr. Edwards was privileged to earn, in 1925, a Doctor of Philosophy degree under Professor Leo F. Rettger at Yale University where he first became absorbed in the bacterial genus to which he devoted so many brilliantly productive years. Immediately thereafter, he joined the staff of the Department of Animal Pathology of the University of Kentucky. It was there in Lexington that he and I first forged the bonds of friendship which for my part were born out of appreciation both of the man himself and of his scientific ability and acumen. Six years later I forsook Kentucky but not that friendship. In the interim, I well remember the time when Dr. Edwards walked into my laboratory and, displaying Bruce White's original monograph on Salmonella, demanded: "Do you think there's anything to this?" Obviously he was intrigued then; subsequent events speak for themselves.

It would be far from the truth to assume that Dr. Edwards was as narrow a specialist as the preceding remarks may imply. His interests and competence ranged widely throughout the fields of medical and veterinary bacteriology. In recognition of this, his colleagues both at home and abroad bestowed many honors upon him and put his fertile mind and his many abilities to work in many ways. To this the following incomplete list attests:

Director, National Salmonella Center, Lexington, Kentucky (1939-1948).

Bacteriologist-in-Charge, Main Salmonella Center for the Western Hemisphere, Communicable Disease Center, U.S. Public Health Service, Atlanta, Georgia (1948-1962).

Distinguished Service Award, U.S. Department of Health, Education, and Welfare (1955).

Recipient (with Dr. W. H. Ewing), Kimble Methodology Award of the Conference of State and Provincial Public Health Laboratory Directors (1956).

President, Society of American Bacteriologists (1959).

Honorary Doctor of Science degree (University of Kentucky, his alma mater, 1959).

Member and former Joint Chairman, Enterobacteriaceae Subcommittee, International Association of Microbiological Societies.

Member and former Joint Chairman, International Committee for Enteric Phage Typing, International Association of Microbiological Societies.

Editorial Board, The Public Health Laboratory.

Member and President, American Academy of Microbiology.

Member: American Society for Microbiology; Society for Experimental Biology and Medicine; American Public Health Association; Society for General Microbiology; American Veterinary Medicine Association (Honorary); Gamma Alpha; Sigma Xi; RESA.

Dr. Edwards' career was interrupted by his final illness while serving as Chief, Bacteriology Section, CDC, a post which he assumed in 1962 after having served as Chief of CDC's Enteric Bacteriology Unit since 1948. He will long be remembered in various ways as scientist, administrator, counselor, teacher, benefactor; above all as a man -- honest, sincere, modest and considerate. In his family life he was a warm and devoted husband, father and grandfather. His colleagues throughout the world respected him for all these facets of his character, and many were proud to call him friend. It is in the last capacity that I shall cherish verdant memories of a good companion, sterling host, considerate guest and genuine friend.

Earle K. Borman, Director
Laboratory Division
Connecticut State Department of Health

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I. SUMMARY

During May, an average of 358 recoveries of salmonellae from human specimens was reported per week. This represented an increase of 41 isolations over April, but a decrease of 63 from the number reported during May 1965. The cumulative number of isolations reported for the first 5 months of 1966 (6,751) is 6.3 percent less than the same period last year (7,206); the seasonal pattern is similar to that observed in 1965 (See Figure 1).

Five hundred thirteen recoveries of salmonella from nonhuman sources were reported during May, an increase of 77 over April.

II. REPORTS OF ISOLATIONS FROM THE STATES

A. Human

The seven most frequently reported serotypes during May were:

<u>Rank</u>	<u>Serotype</u>	<u>Number</u>	<u>Percent</u>	<u>Rank Last Month</u>
1	<u>S. typhi-murium</u> and <u>S. typhi-murium var.</u> <u>copenhagen</u>	389	27.2	1
2	<u>S. enteritidis</u>	142	9.9	5
3	<u>S. heidelberg</u>	136	9.5	3
4	<u>S. infantis</u>	106	7.4	2
5	<u>S. newport</u>	78	5.5	4
6	<u>S. saint-paul</u>	51	3.6	6
7	<u>S. blockley</u>	43	3.0	7
	Total	945	66.1	
	Total (all serotypes)		1,431	

Salmonella enteritidis, which usually accounts for 5 percent of isolations, increased to 10 percent during May. Fifty-nine of the 142 isolations reported were from Georgia, and most of these were associated with a chain of restaurants in the state, primarily in the Atlanta area. Although the vehicle of infection has not been identified as yet, studies by the State Health Department staff are presently underway.

Five new isolations of S. new-brunswick were reported during May. Attempts are presently underway to obtain food histories from these individuals to determine if there is any association of these cases with instant nonfat dry milk (See Table II).

The age-sex distribution of individuals reported as harboring salmonellae during May was compatible with past experience (Table III).

B. Nonhuman

There were 513 isolations of salmonella from nonhuman sources during May, 77 more than April. Fifty-seven serotypes were represented among these isolations, which were from 33 different states (See Table V).

The seven most frequently reported serotypes were:

Rank	Serotype	Predominant Source and Number	No.	%	Rank Last Month
1	<u>S. typhi-murium</u> and <u>S. typhi-murium var.</u> <u>copenhagen</u>	Bovine (14) and Chickens (11)	57	11.1	1
2	<u>S. heidelberg</u>	Turkeys (13), Chickens (10), and Eggs (9)	44	8.6	2
3	<u>S. oranienburg</u>	Turtles (36)	43	8.4	Not Listed
4	<u>S. anatum</u>	Turtles (9) and Turkeys (8)	33	6.4	4
5	<u>S. montevideo</u>	Animal Feed (11), Dry Milk (9), and Chickens (6)	27	5.3	3
6	<u>S. tennessee</u>	Chickens (17)	24	4.7	Not Listed
7	<u>S. senftenberg</u>	Turkeys (9) and Animal Feed (8)	21	4.1	Not Listed
Total			249	48.5	
Total (all serotypes)			513		

The most prominent nonhuman sources of salmonella reported during May were chickens, 109 (20.7 percent); turkeys, 94 (17.9 percent); animal feed, 88 (16.7 percent); and dry milk, 40 (7.6 percent). See Table IV for other sources.

III. CURRENT INVESTIGATIONS

NONE

IV. REPORTS FROM THE STATES

NONE

V. SPECIAL REPORTS

NONE

VI. INTERNATIONAL

NONE

VII. FOOD AND FEED SURVEILLANCE

A. Progress Report on Pilot Food and Feed Surveillance Program

During investigations of the problem of salmonellae in nonfat dry milk, it was learned that this product is used as a milk replacer in feeds for young calves. These milk replacer feeds were selected for examination during the months of May and June. From May 16 to June 6, 93 samples of milk replacer received from 8 states have been examined for salmonellae, Escherchia coli, coagulase positive staphylococci and enterococci. Seventeen different brands were represented. E. coli was recovered from 2 samples, and all samples contained enterococci. No salmonellae or coagulase positive staphylococci were found. The majority of these samples contained either chlortetracycline hydrochloride or oxytetracycline hydrochloride in concentrations of 50 gm. to 100 gm. per ton of feed. Many of

these milk replacer products also contained dried whole eggs. In addition, 33 samples of calf starter feeds were received from three states. These products did not contain dry milk, but they did contain cottonseed meal and soybean meal. S. worthington was isolated from one sample. During this period, May 16 to June 6, 34 samples of nonfat dry milk, a food product for human use, representing 14 brands, were examined, and no salmonellae or coagulase positive staphylococci were found. E. coli was recovered from 4 samples and enterococci were present in 33.

B. Results of Examination of Eggs and Egg Containing Foods for Salmonella

Reported by the United States Food and Drug Administration

The FDA has provided information concerning their examinations of samples of eggs and foods containing egg products during the fiscal years of 1964, 1965, and the first 3 quarters of 1966. The data includes both official samples and those collected during investigational studies. The percent of salmonella isolations from these sources continued to increase through the first quarter of 1966. In the second quarter there was a slight decrease in isolations from investigational samples and a much greater reduction from official samples. This trend has continued through the third quarter with an even more drastic decrease in salmonella isolations from both investigational and official samples.

Results of Samples of Eggs and Foods Containing Egg Products Examined for Salmonella Organisms*

Fiscal Years:	INVESTIGATIONAL					OFFICIAL				
	1964	1965	1966 (Quarters)			1964	1965	1966 (Quarters)		
			1st	2nd	3rd			1st	2nd	3rd
Samples examined	107	162	40	86	35	109	220	76	112	92
Percent positive	23.0	28.3	42.5	32.6	11.4	28.0	36.8	46.0	23.2	12.0
Subsamples examined	1008	2370	634	1329	532	855	2141	733	916	1076
Percent positive	11.0	10.6	12.9	10.5	0.94	11.0	17.4	20.0	9.3	2.5

* Source of data - USFDA

This apparent improvement in the problem of salmonella contamination in egg products may be related to increased compliance with recent pasteurization regulations.

C. Salmonellae in Imported Shredded Coconut

Reported by the United States Food and Drug Administration

When the problem of salmonellae contamination in shredded coconut came to the attention of the Food and Drug Administration in 1961, sampling of the product was initiated at its port of entry into the United States. During that year 208 samples were examined, and 28 were detained because of salmonella contamination. In 1962, 301 samples were examined, and 39 were detained. Considerable improvement was apparent in 1963 when 114 samples were examined and only 1 was found to contain salmonellae. This trend has continued, and in 1965 none of the 19 samples examined was found to contain salmonellae.

D. Survey of State Public Health Laboratory Directors Concerning Surveillance of Foods and Feeds for Salmonellae

During the March 1966 meeting of the State and Territorial Laboratory Directors, a questionnaire on surveillance of foods and feeds for salmonellae was distributed. Replies obtained from 45 States are listed below:

	<u>Yes</u>	<u>No</u>	<u>Other*</u>
1. Are food and feed samples examined for salmonellae in your laboratory?	45		
2. If yes, under what conditions are samples collected?			
a. Follow-up of suspected case or outbreak?	43	2	
b. Special study on a specific type of product?	30	9	6
c. Continuous monitoring of various suspect items?	13	22	10
3. Are salmonella isolations from examinations in 2 b and c included in reports to the Salmonella Surveillance Unit?	31	4	10

*Includes no response, not applicable and unknown.

It is encouraging to note that 43 of the 45 states responding examine food samples during investigations of outbreaks of salmonellosis. Thirty conduct special short-term studies on specific types of products when indicated, and 13 have programs for continuous monitoring of suspect items.

Figure 1.

REPORTED HUMAN ISOLATIONS OF SALMONELLA
IN THE UNITED STATES

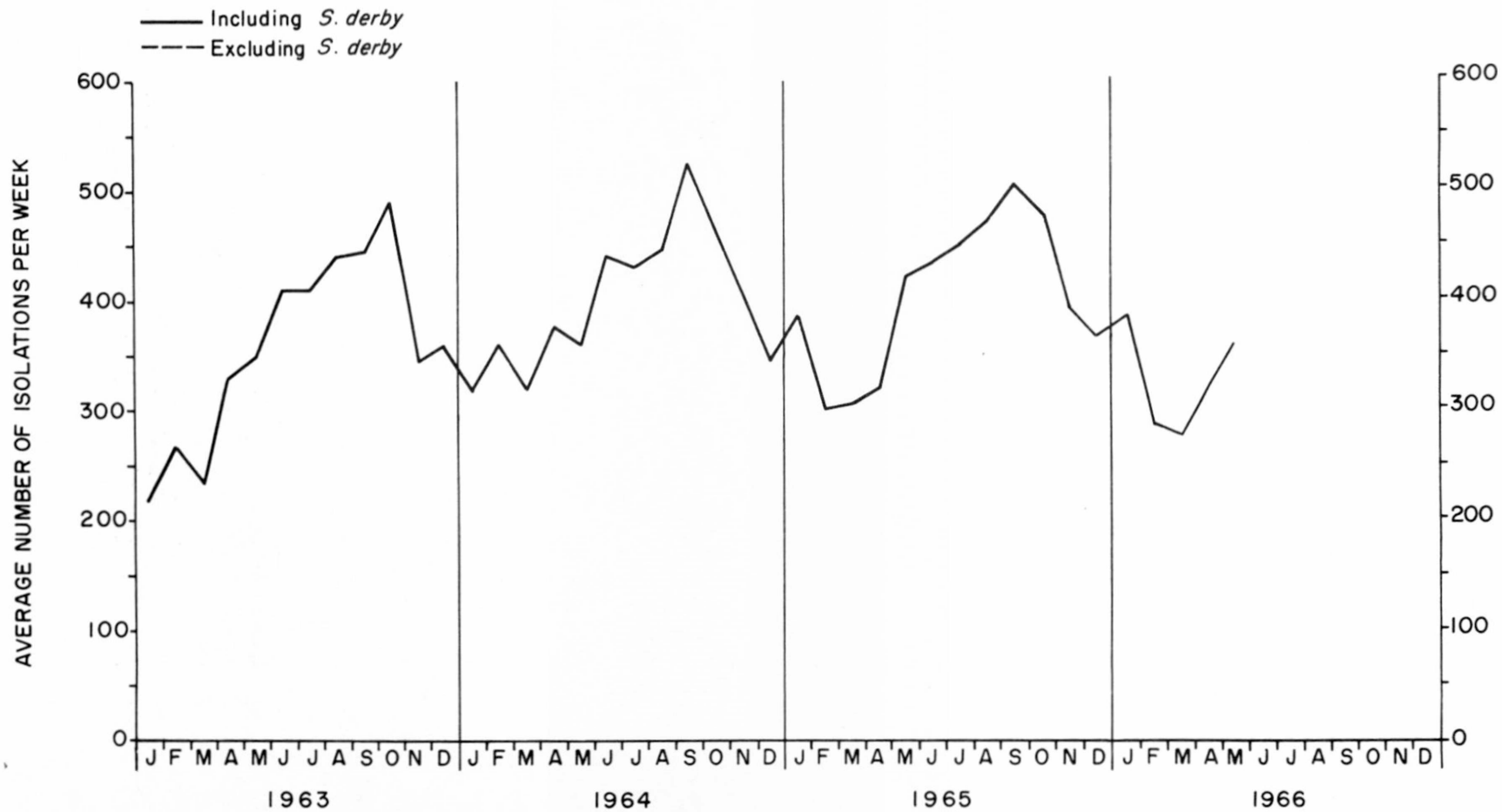


TABLE II
UNCOMMON SALMONELLA SEROTYPES ISOLATED FROM HUMANS DURING 1966

SEROTYPE	REPORTING CENTER																																
	ALA	ALAS	ARI	ARK	CALIF	COLO	CONN	DEL	DC	FLA	GA	HAI	IDA	ILL	IND	IOWA	KAN	KY	LA	ME	MD	MASS	MICH	MINN	MISS	MO	MONT	NEBR	NEV	NH	NJ	NM	
aberdeen					1																												
abortus-bovis														2						1													
alachua					1																1												
albany																						1											
atlanta											2	2										1											
austin																											1						
ball					2																												
binza											1										1				1								
boniara					1																	1											
bovis-morbificans																					1												
bradford						1											1																
brandenburg												1																					
california					2						1			1																			
carrau												2		1																			
cerro																																	
cholerae-suis						1																	1										
colorado																																	
duesseldorf					1																	1											
duisburg																						2											
eimsbuettel																																	
fayed																																	
gaminara																																	
garoli																					1												
glostrup																						1											
grumpensis																																	
hartford					1						2	1																					
inverness																																	
irumu						2																											
kaapstad					1	1																											
lanka																																	
menston																																	
minnesota																																	
mission											1						1																
mjimwema																																	
molade																																	
muenster			1		1						2				2																		
nagoya					1						2	2																					1
new-brunswick							2				2	2			1							1	1	1	2								
norwich				1							1																						
ohio					4																												
oritamerin																																	
os																																	
oslo					2																												
paratyphi A					1							6																					
paratyphi C						1																1											
pomona																																	
pullorum																																	
reading																																	
rubislaw			1		6						1				9																		
siegburg					2										14																		
simsbury					2																												
stanley																																	
stockholm															1																		
tallahassee															1																		
virchow																																	
wassenaar																																	
westerstede																																	
untypable group G																																	
untypable group O					2						1																						
Total	0	0	2	1	31	6	2	0	0	13	7	8	0	31	1	1	3	0	18	0	3	5	5	4	0	2	1	0	0	0	0	1	1

TABLE II (Continued)
UNCOMMON SALMONELLA SEROTYPES ISOLATED FROM HUMANS DURING 1966

REPORTING CENTER																			MAY TOTAL	1966 CUM. TOTAL	MONTH LAST REPORTED	STATE LAST REPORTED	TOTAL PREVIOUSLY REPORTED TO SAL. SURV. UNIT 1962-1965	SEROTYPE					
NY-B	NY-BI	NY-C	NC	ND	OHIO	OKLA	ORE	PA	RI	SC	SD	TENN	TEX	UTAH	VT	VA	VI	WASH							WV	WIS	WYO		
		1																					1	1	May 66	Calif Ill	1	aberddeen	
																							1	3	May 66	Calif	21	abortus-bovis	
																							4	4	Apr 66	Minn	15	alachua	
																							2	2	May 66	Ga	25	albany atlanta	
1																								1	1	Feb 66	Mo	0	austin
																								2	2	Jan 66	Calif	0	ball
																								4	4	Apr 66	Fla-Minn	54	binza
1																								1	1	Apr 66	Calif	0	bonlare
																								2	2	Feb 66	NYA-La	44	bovis-morbificans
																								2	2	Feb 66	Colo	2	bradford
																								1	1	Apr 66	Ga	10	brandenburg
																								2	5	May 66	Calif-Va	64	california
													2											3	3	Jan 66	La	12	carrau
																								1	5	May 66	Tex	28	cerro
	2				1																			5	5	Apr 66	Mass	61	cholerae-suis
		1																						1	1	Feb 66	La	8	colorado
																								4	4	Feb 66	NYC	7	duesseldorf
1												1												2	2	Feb 66	Wash	1	duisburg
																								2	2	Feb 66	Tenn	3	eimsbuettel
			5																					5	5	Mar 66	NC	6	fayed
		1																						1	1	Jan 66	La	20	gaminara
																								1	1	Mar 66	NYC	0	garoli
																								1	1	Apr 66	Md	1	glostrup
																								1	1	Apr 66	Va	11	grumpensis
						1																		2	8	May 66	Calif-Wisc	90	hartford
																								1	1	Feb 66	Mich	13	inverness
																								2	2	May 66	Colo	108	irumu
																								1	1	Mar 66	Colo	3	kaapstad
																								1	1	Apr 66	Calif	0	lanka
																								1	1	Jan 66	Kan	14	menston
1													1											2	2	Mar 66	Tex	40	minnesota
																								3	3	Mar 66	Fla	7	mission
																								1	1	Jan 66	NYA	0	mjimwema
																								1	1	Feb 66	Wisc	0	molade
																								3	7	May 66	NJ-Calif-Ill	26	muenster
																								1	1	May 66	Tex	1	nagoya
																								5	17	May 66	Minn-Mass		
																								2	7	May 66	Md-Ind	32	new-brunswick
																								2	7	May 66	Ore-Tex	51	norwich
																								5	5	Mar 66	Calif-Ohio	13	ohio
																								1	1	Mar 66	NYC	0	oritamerin
																								3	3	Mar 66	La	0	os
																								3	9	May 66	Calif-Hai		oslo
																								1	2	May 66	Kan	15	paratyphi A
																								1	2	May 66	Md	34	paratyphi C
																								1	1	Mar 66	Colo	7	
1																								1	2	May 66	Md	4	pomona
																								10	10	Mar 66	La	4	pullorum
																								5	27	May 66	Calif-Fla		
																								4	4	Mar 66	Ore-Wash	102	reading
																								4	4	Mar 66	La	42	rubislaw
																								5	5	Apr 66	Tex	19	siegburg
																								1	1	Apr 66	Ill	16	simsbury
																								1	2	May 66	NC	26	stanley
																								1	1	May 66	Ohio	0	stockholm
																								1	1	May 66	NC	14	tallahassee
																								1	4	May 66	Ore	16	virchow
																								1	1	Apr 66	La	0	wassenaar
																								1	1	Mar 66	NYC	5	westerstede
																								2	2	Mar 66	NM		untypable group G
																								2	2	Jan 66	Calif		untypable group O
5	2	6	7	0	4	2	3	1	0	0	0	4	7	0	0	2	0	6	0	3	0		36	198				Total	

TABLE III

Age and Sex Distribution of Individuals Reported
As Harboring Salmonellae During May 1966

<u>Age (Years)</u>	<u>Male</u>	<u>Female</u>	<u>Unknown</u>	<u>Total</u>	<u>%</u>	<u>Cumulative %</u>
Under 1	98	73	2	173	16.9	16.9
1 - 4	142	114	1	257	25.1	42.0
5 - 9	73	64		137	13.4	55.4
10 - 19	51	53		104	10.1	65.5
20 - 29	34	46		80	7.8	73.3
30 - 39	25	32		57	5.6	78.9
40 - 49	25	33		58	5.7	84.6
50 - 59	30	36		66	6.4	91.0
60 - 69	19	26		45	4.4	95.4
70 - 79	17	17		34	3.3	98.7
80 +	5	8		13	1.3	100.0
Child (Unspec.)	11	3	2	16		
Adult (Unspec.)	6	21		27		
Unknown	<u>204</u>	<u>143</u>	<u>17</u>	<u>364</u>		
Total	740	669	22	1,431		

TABLE V-A
OTHER SEROTYPES REPORTED DURING 1966
FROM NONHUMAN SOURCES

SEROTYPE	MONTH(S)	REPORTING CENTER(S)	NUMBER OF ISOLATIONS
abortus-bovis	Mar	La	1
adelaide	Mar	La	1
alagbon	Mar	NJ	2
amsterdam	Jan	Ohio	1
babelsberg	Jan	Ind	1
bovis-morbificans	Jan	Calif	1
bradford	Jan	NJ	1
braenderup	Jan-Feb	Ark(4)	
	Jan	Calif(1)	
	Jan	Miss(1)	
	Feb	Ala(1)	
	Feb	Tex(1)	
	Mar	Va(1)	
	Apr	Conn(1)	10
cambridge	Apr	La	1
caracus	Mar	La	1
carrau	Apr	Mass	2
champaign	Mar	La	2
cholerae-suis	Feb	Calif	1
colorado	Mar	NJ	1
corvallis	Apr	La	1
eppendorf	Jan	NJ	1
fayed	Apr	La(1)	
	Apr	NC(1)	2
grumpensis	Mar	La	1
habana	Apr	Md	1
halmstad	Mar	La	3
hamilton	Jan	La	1
hartford	Mar	Fla	1
illinois	Mar	Minn	1
java	Jan-Feb-Mar	Calif(6)	
	Jan	Fla(1)	
	Jan	Ill(1)	
	Feb-Mar	Pa(4)	
	Mar	Conn(3)	15
johannesburg	Mar	Mich	1
kaapstad	Mar	La	1
kottbus	Feb	Ga	1
lille	Mar	NJ	1
manila	Jan	Ind(1)	
	Apr	Md(1)	2
miami	Feb	Calif(1)	
	Feb	Tex(1)	2
mississippi	Mar	La	1
new-haw	Mar	NJ	1
ohio	Feb	Iowa(7)	
	Feb	Minn(1)	8
pharr	Jan	Mich	1
pomona	Mar	NJ	1
simsbury	Jan	Ind(1)	
	Feb-Mar	Calif(2)	
	Mar	NJ(1)	4
taksony	Feb	Calif(1)	
	Apr	Md(1)	2
tournai	Mar	NJ	1
tuebingen	Jan	Mich	1
typhi	Jan	Mo	1
typhi-suis	Feb-Mar	Calif(6)	
	Mar	Minn(1)	7
urbana	Mar	Md(1)	
	Apr	La(1)	
	Apr	Pa(1)	3
vejle	Apr	La	1
westhampton	Mar	Kan	1
Total			94