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COMMUNICABLE DISEASE CENTER

SALMONELLA

SURVEILLANCE

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For the Month of December 1965

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U. S. Department of Health, Education, and Welfare / Public Health Service

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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I. SUMMARY

During December, 1,834 human isolations of salmonella were reported. The average number of isolations per week (367) represented a decrease of 22 from November, but an increase of 22 over December, 1964. The number of human isolations reported during December followed the expected pattern (See Figure 1). Nonhuman isolations during December totaled 726, 147 more than November.

In this issue is a report of the isolation of salmonella organisms from plastic novelty items imported from Hong Kong and used for cooling drinks. Also in the CURRENT INVESTIGATIONS Section is the final report on an outbreak of *Salmonella saphra* in children. A report of salmonellosis related to child care groups in Kansas is presented in REPORTS FROM THE STATES, and the distribution of salmonella serotypes in Japan is discussed in the INTERNATIONAL Section of this report.

ERRATUM: Salmonella Surveillance Report # 44, Page 12, first paragraph last sentence reads: "In addition, a number of asymptomatic excreters were uncovered:" It should read: In addition, a number of asymptomatic excreters (cattle) were uncovered and slaughtered: Third paragraph, last line reads: "Two hundred and four of the 244 isolations of *S. newington* were from frozen turkeys." It should read: Two hundred and four of the 244 isolations of *S. newington* were from frozen ducks.

II. REPORTS OF ISOLATIONS FROM THE STATES

A. Human

The seven most frequently reported serotypes during December were:

Rank	Serotype	Number	%	Rank Last Month
1	*S. typhi-murium* and *S. typhi-murium var. copenhagen*	570	31.0	1
2	*S. heidelberg*	147	8.0	2
3	*S. newport*	130	7.1	3
4	*S. enteritidis*	110	6.0	5
5	*S. infantis*	92	5.0	4
6	*S. saint-paul*	81	4.4	7
7	*S. derby* and *S. javiana*	57	3.1	13 9
	Total	1187	64.6	
	Total (all serotypes-December) 1,834			

During December, 78 different serotypes were reported. The seven most common accounted for 64.6 per cent of all isolations.

Salmonella derby and *S. javiana* are the only new serotypes among the seven most common. *Salmonella derby*, after appearing consistently on this list during 1963 and 1964, became much less common during 1965. During December, *S. derby* isolations were reported primarily from eastern states, but no marked concentration in any one state was noted.

Salmonella javiana, in the past has been confined primarily to the southeastern states and has represented one of the serotypes which could be clearly associated with one region of the country. The states which have reported S. javiana most commonly are Florida, Louisiana, and Texas. In addition to those states, New York also reported a significant number of S. javiana isolations during December. Of the 57 isolations reported, 53 (93 per cent) were reported from those four states: New York (14), Florida (15), Louisiana (6), and Texas (18). No common source outbreak related to these isolations has been discovered, though all of the isolates in New York were reported from one county (Erie). Those from the other states came from several counties scattered throughout each state.

The age and sex distribution (Table III) was consistent with past experience. During December, 362 (19.7 per cent) persons, reported as harboring salmonellae, had other members of their family simultaneously infected. This too is consistent with past experience.

B. Nonhuman

There were 726 isolations of salmonella from nonhuman sources during December, 147 more than November. Fifty-eight different serotypes were represented among those isolations which were submitted by 37 different states (See Table V).

The seven most frequently reported serotypes were as follows:

Rank	Serotype	Predominant Source and Number	No.	%	Rank Last Month
1	S. heidelberg	Turkeys (78)	133	18.4	2
		Chickens (21)			
2	S. typhi-murium,	Bovines (39)			
	S. typhi-murium	Turkeys(26)			
	var. copenhagen	Chickens (16)	103	14.2	1
3	S. saint-paul	Turkeys (37)	44	6.1	3
4	S. infantis	Turkeys (17)			
		Chickens (13)	40	5.5	4
5	S. anatum	Turkeys (10)			
		Bovines (5)			
		Chickens (4)	37	5.1	7
6	S. san-diego	Turkeys (23)	30	4.1	Not listed
7	S. blockley	Chickens (12)			
		Turkeys (10)	24	3.3	5
	S. newport	Turkeys (11)			
		Bovines (6)			
		Total	411	56.7	

The four sources, from which most of the recoveries were obtained, were: turkeys, 291 (40.1 per cent); chickens, 125 (17.2 per cent); eggs, 65 (9.0 per cent) and bovines, 63 (8.7 per cent).

III. CURRENT INVESTIGATIONS

A. Outbreak of Salmonella saphra in Children. Reported by Van C. Tipton, M.D., Director, Communicable Disease Division, State of Texas Department of Health; Richard N. Fenno, M.D., Director, Communicable Disease Service, Houston Health Department; Ben Primer, M.D., Director, Austin City Health Unit; J.C. McGuire, M.D., Director, Brazoria County Health Unit; and Albert R. Martin, M.D., EIS Officer, Investigations Section, CDC, Atlanta, Georgia

In a recent issue (SSR #43) an outbreak of Salmonella saphra infection was reported to have occurred among children living near the Gulf of Mexico. The 10 children involved live in 4 Texas cities and of particular interest were the ages of these children. All but 1 were less than 2 years old. As with previous outbreaks of this rare serotype, S. saphra appeared in cities near the Gulf coast, in a group of young children, and without an apparent common vehicle of infection. An investigation was carried out in the hope of finding the source of these sporadic outbreaks.

The children involved were separated geographically and had no direct contact with each other. The families were not of one socioeconomic group. The occupations of the fathers varied; the sources of food were different as were the hospitals utilized by the families. Though some of them had recently traveled and dined in restaurants, there was nothing common to the group.

Five of the children were less than 3 months old at the time of their illness and had limited contacts. For this reason it appeared that something brought to the home, particularly a food item, was the likely vehicle of infection; however, no common source could be found. Seven of the 10 children were fed a particular brand of rice cereal, and this product was common to all the younger children, but further inquiry revealed that it is prescribed for infants by almost all of the pediatricians in the area. This proportion of children eating this cereal would thus not be uncommon in the community. No other items in the children's diets were common to the group. Though none of the twenty adult contacts were found to harbor S. saphra when cultured, the items in the family menu were also scrutinized. Some types of food were common to the families, but differed in source or brand name.

Pets were owned by only 4 of the families and possible contact with animals of any type could be found in only 6 of the 10 children. Less likely sources of infection such as children's toys, stuffed animals, pacifiers, and various other baby products were checked, and no apparent common source was revealed.

In light of the rarity of this organism, its peculiar geographic distribution, and its predilection for children some common factor would seem to be involved in these cases. The vehicle would likely be particularly related to children. Salmonella saphra may be an organism of low virulence which doesn't cause clinical infection in adults, however the presence of only 1 asymptomatic carrier among 35 family contacts, this a 15-month-old child, would suggest that the source is more closely related to small children. As has been the case in previous investigations of S. saphra, the source of this outbreak was not found. Hopefully, careful epidemiologic follow-up of all future cases will elucidate the means by which this organism is spread.

B. Contamination of Imported Plastic Novelties with Salmonella Organisms. Reported by Val Jonsson, Dr. PH, Director of Laboratories, City of St. Louis Health Department; Michael Ballas, Laboratory Director, Mecklenburg County Health Department, Charlotte, North Carolina; George H. Agate, M.D., Epidemiologist, Michigan Department of Health; Dr. Robert A. MacCready, Director of Laboratories, Massachusetts Department of Health; Philip Brachman, M.D., Chief, Investigations Section, CDC, and James Mason, M.D., Deputy Chief, Laboratory Branch, CDC.

In recent weeks a wide variety of bacteria and fungi have been isolated from plastic novelty items known as "Ice Balls", "Ice Kools", and "Pink Elephants" imported from Hong Kong and used for cooling drinks.

The presence of salmonella organisms in these novelty items has now been reported by 4 different states and confirmed by Laboratory Branch, CDC. Salmonella typhi phage type D6 was recovered from a "Pink Elephant" by the St. Louis City Health Department Laboratories. This phage type, frequently isolated in Asia, is very uncommon in the United States. The state of Massachusetts has recently isolated S. typhi phage type C1 from "Ice Balls". This phage type is frequently found in the United States.

The Mecklenburg County (North Carolina) Health Department has reported isolations of S. typhi-murium and Shigella flexneri 3a from "Ice Balls". Recovery was made by inoculating the sediment obtained from centrifugation of 200 cc of fluid obtained from the balls on selective media. The Michigan Department of Health has reported the recovery of S. heidelberg from "Ice Balls". These isolations have been confirmed at CDC.

It is emphasized that to date no human disease has been attributed to contact with any of these items. Sale of the items has been discontinued in many communities under the authority of local health departments. We would welcome additional reports of isolation of salmonella organisms from these items or of possible human illness related to contact with same.

IV. REPORTS FROM THE STATES

A. Connecticut

Common Source Outbreak of Salmonellosis at a University. Reported by Barbara Christine, M.D., Epidemiologist, James C. Hart, M.D., Director, Division of Preventable Disease, Connecticut Department of Health.

Approximately 25 male college students developed diarrheal illness following a turkey dinner served at a fraternity house on November 18, 1965. Many of the students became ill while at home on the weekend following the banquet and did not report their illness to authorities until after December 1. Illness was quite severe in several patients, and one person was hospitalized. Stool specimens obtained from 3 students were all positive for Salmonella typhi-murium. No food samples were available for examination. Retrospective analysis of the outbreak suggested that salad and salad dressing might have been the vehicle of infection. The manner in which this became infected is not clear but it is hypothesized that the chef may have contaminated ingredients for the salad and salad dressing with organisms present in the uncooked turkeys.

Arrangements were made for additional education and training in the proper means of handling potentially dangerous foods in each of the fraternities and eating establishments on campus.

B. Hawaii

An Outbreak of Gastroenteritis Due to Multiple Salmonella Serotypes. Reported by Ralph B. Berry, M.D., Chief, Epidemiology Branch, and Harold Matsuura, Communicable Disease Investigator, State of Hawaii, Department of Health.

Approximately 200 employees attended a catered party on October 22, 1965. Several cases of diarrhea were reported following the banquet and an investigation was initiated by the Communicable Disease Section of the Hawaii Department of Health.

One hundred and fifty of the 200 employees attending the party were contacted and 52 (34.7 per cent) reported diarrheal illness which occurred at a mean of 25 hours after the meal in question. The age of the victims ranged from 21 to 57 years and symptoms experienced included abdominal cramps, fever, chills, diarrhea, and prostration. Nine persons required medical attention but none were hospitalized. Of the 52 afflicted employees only 8 were willing to submit stool specimens. Those from 5 employees were positive for salmonellae; S. panama and S. worthington were recovered from 1 employee and the remaining 4 had one of the following: S. heidelberg, S. panama, or S. worthington. Food histories obtained from 98 of those not affected and 42 ill persons did not indicate one food item as the source of infection. The foods served at the catered party included roast turkey, roast beef, baked ham, potato-macaroni salad, salad, rolls, baked beans and cake. A visit was made to the catering establishment responsible for the meal in question. Most of the meat products were baked in the morning and then boned or sliced by knife on a chopping block and left at room temperature until served at 8:00 p.m. that night. Of the six food handlers who prepared the foods for the meal in question, none reported gastrointestinal symptoms. Two consecutive stool specimens 24 hours apart were requested from the 6 food handlers, and 2 had positive cultures. A 38-year-old kitchen helper was found to be excreting S. bareilly, S. give, and S. worthington, and a 42-year-old cook was found to be excreting S. give. Both food handlers were referred to their physician for treatment and were released after 3 consecutive negative stool cultures. Extensive environmental swabs from working areas and equipment were taken including complete swabbing of all chopping blocks. Salmonella panama, S. infantis and S. give were isolated from the crevices of a large chopping block where cooked meat products were processed.

Editor's Comment: In this outbreak multiple salmonella serotypes were isolated from victims who consumed the banquet meal, food handlers involved in its preparation, and from environmental sources in the food preparation area. The presence of so many serotypes would indicate that contamination did not come from a single source but that it built up in the environment over a period of time from many sources. At least two major defects in good food handling technique were discovered: inadequate refrigeration after cooking of meats and use of a porous chopping block with deep crevices. The chopping block probably served as a reservoir of salmonellae for weeks or months prior to the incident and represented a source of potential contamination of a wide variety of food items. The porous chopping block, usually made of wood, with many areas difficult or impossible to clean, represents a hazard to food operations similar to meat-slicing equipment (SSR #41).

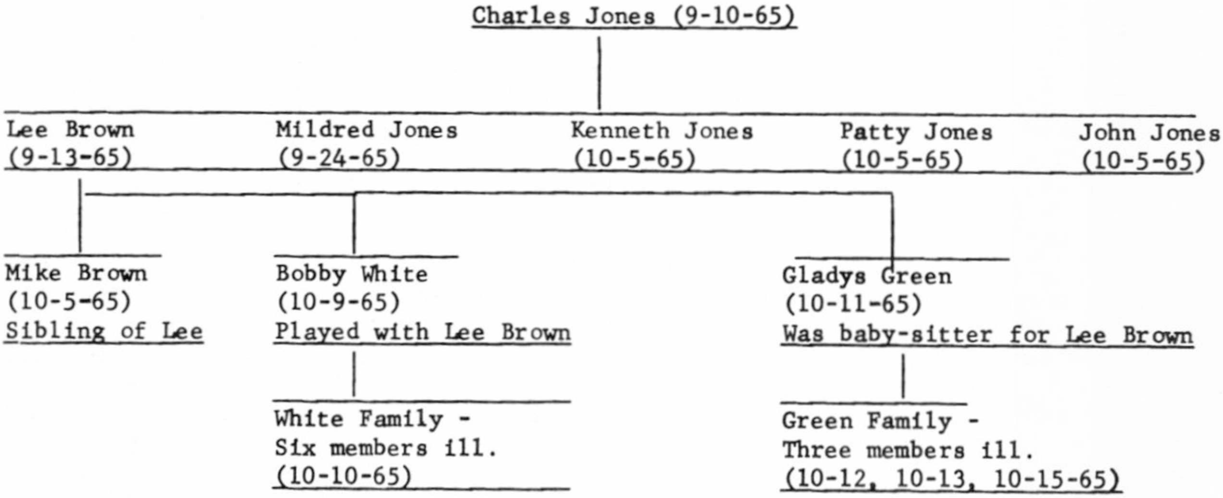
C. Kansas

(1) Salmonellosis Related to Child Care Groups. Reported by Rosemary B. Harvey, M.D., Director, Division of Preventive Medicine, Wichita-Sedgwick County Department of Public Health, and Don E. Wilcox, M.D., Director, Communicable Diseases, Kansas State Board of Health.

Two outbreaks of diarrhea were investigated in which the illness was apparently spread by baby-sitters. One group of illnesses began on September 17, 1965, when Jeff Johnson*, age 2, developed diarrhea and vomiting. A stool culture was positive for *Salmonella newport* on October 8. From September 24, until the end of October, Jeff was cared for in the home of Mrs. Vivian Turner who also provided care for Carl McKay, age 2 and her own sons, Jack, age 3 and Jimmy, 11 months. Jack Turner became ill on October 5, Carl McKay on October 6, and Jimmy Turner on October 8. Stool cultures were taken from all of the children, but only Jack Turner had a culture positive for *S. newport*. The other two cultures were negative for enteric pathogens. The source of Jeff Johnson's primary illness is not known, but within two weeks all of the children in his child care group had become secondarily infected.

A much more extensive outbreak occurred when 1-year-old Lee Brown was being cared for in the home of Mrs. Mildred Jones. Mrs. Jones' husband developed diarrhea and vomiting on September 10, and Lee Brown developed the same symptoms on September 13. The child continued to have diarrhea until late October, and *S. infantis* was isolated from a stool culture taken October 18. A number of persons who had contact with Lee Brown in early October developed similar symptoms of vomiting and diarrhea. Their illnesses were clinically compatible with salmonellosis, but stool cultures were not obtained in any of these cases.

These patients, their contacts, and the dates of onset of vomiting and diarrhea are diagramed in the following chart:



Apparently Lee Brown developed her illness while in the Jones' home and transmitted the illness to the Green family while being cared for by Mrs. Gladys Green. In addition the White family developed the illness after Lee Brown played with one of the children.

*All names are fictitious.

Editor's Comment: The spread of salmonellae by baby-sitters was suggested by an outbreak reported in a previous Salmonella Surveillance Report (SSR # 43). In these two reports from Kansas we have further indication that this mode of spread may be important epidemiologically. In the second of these two outbreaks we do not have proof that all the cases were in fact salmonellosis, or that they were spread in the manner postulated. The history of contact, the clinical appearance of the cases, and the dates of onset are suggestive, however. In neither instance do we know the vehicle of spread within the group. Among children salmonellae may be spread by person to person contact, but food prepared by one of the infected adults could easily have been the vehicle of infection.

(2) An Outbreak of Salmonella infantis Related to a Restaurant. Reported by Rosemary Harvey, M.D., Director, Division of Preventive Medicine, Wichita-Sedgwick County Department of Public Health, and Don C. Wilcox, M.D., Director, Communicable Diseases, Kansas State Board of Health.

Stool cultures from two 15-year-old boys were found positive for S. infantis. Epidemiologic study revealed that both boys had recently experienced diarrhea and vomiting, one developing symptoms October 6, 1965, the other October 7. Both boys had eaten frequently at a small cafeteria and remembered that a high school acquaintance working at the cafeteria as a waitress, had also been ill. Stool culture obtained from this girl on October 12, was positive for S. infantis. The other cafe employees, the owner, cook, dishwasher, and a second waitress, each had a stool culture positive for S. infantis, though none of them remembered having had symptoms. On October 15, S. infantis was isolated from a stool of a 71-year-old man. He had become ill on October 8 after eating at the same cafeteria. Follow-up studies of personal contacts of the cases show that 4 relatives of those found to be harboring this organism also had cultures positive for S. infantis. When faced with the fact that all 5 employees were excreting salmonella, the owner of the cafeteria voluntarily closed his establishment, so that the necessary steps could be taken to eliminate salmonella from the environment.

Editor's Comment: Once salmonellae are introduced into a restaurant, they often become disseminated throughout the environment, frequently infecting most of the employees. The people, the working surfaces, and the utensils become a massive reservoir of infection. This cycle is difficult to break until a thorough cleaning of the premises and restricting of infected workers from food handling is undertaken. A similar situation was discussed in an earlier issue of the Salmonella Surveillance Report (SSR #41).

D. Rhode Island

Family Outbreak of Salmonella blockley Gastroenteritis. Reported by Joseph E. Cannon, M.D., Director of Health, and Beryl J. Rosenstein, M.D., EIS Officer, assigned to the Rhode Island Department of Health.

A family outbreak of salmonellosis among persons sharing a Thanksgiving turkey dinner on November 25, 1965, was recently investigated. At no other time had the group in question shared a common meal. Between November 27 and November 29, 4 of the 8 persons attending the Thanksgiving dinner developed febrile gastroenteritis. One patient was severely ill and required hospitalization. Cultures were obtained from all 8 persons attending the meal and 6 of these were positive for Salmonella blockley. Food histories were not available for all victims, but it is suspected that turkey acted as the vehicle of infection.

Editor's Comment: During 1964, 114 isolations of S. blockley were reported from nonhuman sources. Of these, 35 isolations (30.2 per cent) were reported from turkeys.

E. Illinois

Submitted by Paul Schnurrenberger, D.V.M., Chief Public Health Veterinarian, Illinois State Department of Public Health.

Doctor Franklin D. Yoder, Director of the Illinois Department of Public Health, has submitted the following information to all school administrators.

In the study reported by Williams and Heldson in the May, 1965, Journal of the American Medical Association, salmonella was found on the turtle or in the water in the turtle dish. Dr. Leslie P. Williams, Jr., and Harry L. Heldson, who conducted the study for the Minnesota Department of Health, concluded that their findings suggest the following control measures be recommended by public health authorities to persons possessing or handling pet turtles:

1. Children should not be allowed to handle turtles unless they are responsible enough to wash their hands following this contact.

2. Turtle water should not be discharged into the kitchen sink or allowed to contaminate the food preparation area.

3. A special container should be designated as the turtle dish and should be used for nothing else.

4. Only one person, who is careful to wash his hands, should care for the turtle.

5. Other household pets should not drink from the turtle dish.

V. SPECIAL REPORTS

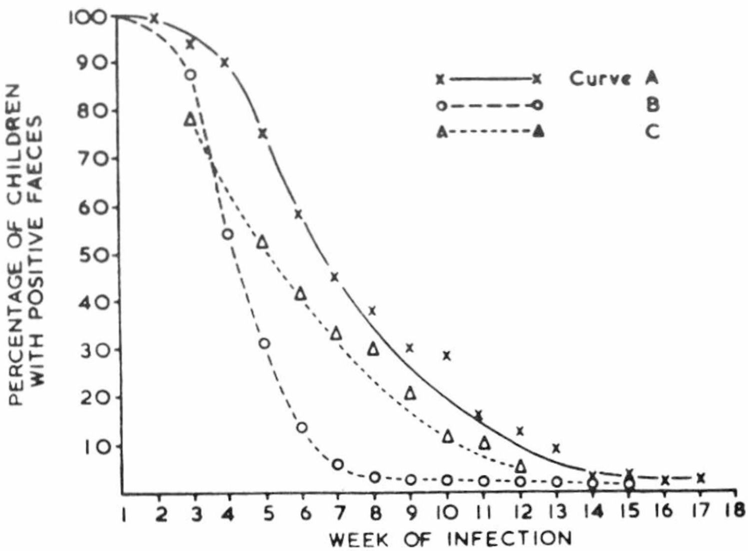
Effect of Antibiotic Treatment on Duration of Excretion of Salmonella typhi-murium by Children. Abstract from British Medical Journal 2: 1343-1345, 1965, by J. M. S. Dixon, M.D.

Salmonellae may be present in the feces for some weeks or months after patients have clinically recovered from gastroenteritis. Treatment with antibiotics to which the organism is sensitive in vitro often fails to eradicate the organism from symptomless excreters. Some authors have suggested that antibiotic treatment may actually prolong the period of excretion. In this paper a comparison is made of the duration of excretion of S. typhi-murium in two groups of school children.

In one incident, in Suffolk during 1964, 63 of the 67 infected children (94 per cent) were treated with antibiotics to which the organism was sensitive in vitro. A total of 103 courses of treatment with antibacterial drugs were given to the 63 children. Twenty-nine children had 1 course, 28 had 2 courses, and 6 had 3 courses. The antibiotics used included neomycin, streptomycin, ampicillin, tetracycline, and chloramphenicol. Courses of treatment were of at least 5 days' duration.

In another outbreak which occurred in South Wales in 1954, most of the 64 children who were infected received no anti-microbial treatment. Apart from the fact that the children in only one of the outbreaks were given specific treatment,the two incidents were remarkably similar. The author has taken advantage of this similarity to assess the effect of antibiotic treatment on the duration of excretion of S. typhi-murium by the Suffolk children.

The bacteriologic methods used for the examination of specimens from the two outbreaks were almost identical, and it is unlikely that there was any significant difference in sensitivity between them. From the 67 children infected during the Suffolk outbreak (treated group), 623 fecal specimens were examined. Most continued to excrete the organism for the first four weeks; thereafter there was a steady diminution in the number remaining positive until the 18th week when all were free from infection. The results of examinations of fecal specimens from the South Wales outbreak indicated that the duration of their excretion of the pathogen was clearly shorter than that of the Suffolk children. Excretion curves of the two outbreaks was shown in the accompanying figure.



Duration of excretion of *Salm. typhimurium* in the faeces of children infected in two outbreaks. Curve A, treated children (Suffolk); Curve B, untreated children (Wales); curve C, Suffolk children examined by less sensitive techniques.

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In addition a third curve (C) indicates the results of fecal cultures of the Suffolk children when examined by a much less sensitive technique-namely by the omission of enrichment in selenite F and reliance solely on direct plating on deoxycholate citrate agar. Even as measured by this relatively insensitive cultural technique the Suffolk children excreted the salmonella for a longer period than the South Wales children.

The parallel study of these two outbreaks offered a rare opportunity for observations on the effect of antibiotics on salmonella excretion. The points of similarity between the groups were: the infecting organism in each incident was S. typhi-murium; both outbreaks occurred in groups of 65 to 70 school children, 5 to 11 years of age; fecal specimens from all the children infected were examined at regular intervals, weekly or less, until 3 negative results were reported. The only significant difference between the two groups was that 94 per cent of the Suffolk children received antimicrobial treatment. The effect of strain differences of S. typhi-murium is unknown but probably not of major importance.

The author reviews the recent literature dealing with the failure of various antibiotics given singularly or in combination to eliminate salmonellae from the intestinal tract after gastroenteritis. Failure of treatment is not generally associated with the development by the organisms of resistance to the unsuccessful antibiotic. There is experimental evidence to support the hypothesis that antibiotic therapy may eradicate those constituents of the normal flora of the large gut which are concerened with the natural clearance mechanism. The re-establishment of the normal flora may be an important mechanism in clearing the gut of foreign bacteria.

VI. INTERNATIONAL

A. Japan

Distribution of Salmonella Types in East Asia. Abstract from Endemic Diseases Bulletin of Nagasaki University 7:192-220, 1965 by Yoshio Aoki.

Enteric fever caused by salmonellae has decreased in Japan since World War II. Typhoid cases have diminished from a reported 40,706 in 1940 to less than 1,000 cases in 1964. The attack rate per 100,000 population has decreased from 57.4 in 1940 to less than 1.0 in all years since 1950. Similarly, infections with Salmonella paratyphi A and B as well as S. sendai have decreased markedly. Each of these organisms was an important cause of enteric fever during the 1920's and 1930's in Japan. Among the paratyphoid organisms S. paratyphi A is the most common type whereas prior to 1940 S. paratyphi B was the more prevalent.

Despite the overall decrease in illness caused by S. typhi and S. paratyphi, serious outbreaks related to these organisms still occur. There were 5 such outbreaks in 1960, 2 in 1961, 3 in 1962, 4 in 1963, and 6 in 1964. Some of these involved as many as 150 patients. Apparently there is a low level of endemic disease with the potential for an epidemic occurring when the appropriate circumstances are present.

Salmonella gastroenteritis has not been decreasing in frequency. Organisms other than S. typhi and S. paratyphi actually seem to be increasing as a cause of illness in the Japanese population. The degree to which this change has occurred is difficult to document because of inadequacies in reporting, particularly in the period immediately following World War II. Sakazaki and Nakaya in 1964[1] reported a group of isolations from the Japan Salmonella Center. Their figures are listed as numbers of foci rather than as cases. Each focus represents a common source of infection. These data listed in order of frequency give some idea of the relative prevalence of different serotypes. S. typhi and S. paratyphi are not included:

S. enteritidis	112
S. potsdam	64
S. typhi-murium	58
S. thompson	52
S. narashimo	42
S. senftenberg	38
S. give	24
Total	390
Total all types	736

[1] Sakazaki and Nakaya Endemic Disease Bulletin of Nagasaki University; 6:167-73,1964.

Editor's Comment: The experience with salmonella in Japan has been similar to that in most other countries. As investigation and control of sanitary procedures improves, infection due to the host specific human salmonellae, S. typhi and S. paratyphi, has diminished markedly. Sporadic outbreaks occur when a human carrier comes in contact with food or water supplies, but as the general endemic level decreases below a certain point, the likelihood of such outbreaks diminishes. In contrast the animal-borne salmonellae are widely distributed in nature and are easily disseminated in foods and food products.

The prevalence of S. paratyphi A over S. paratyphi B infections is common in Asia whereas S. paratyphi B is much more common in Europe and the western hemisphere.

B. New Zealand

Isolation of Salmonella typhi-murium from a Vacuum Bag.
Submitted by R. A. Robinson, Principle Scientific Officer, New Zealand Department of Agriculture, Ruakura Animal Research Station, Hamilton, New Zealand.

A 4-year-old boy developed an acute episode of nausea and vomiting lasting 24 hours. Salmonella typhi-murium was isolated from a fecal specimen. Clinical recovery was prompt and uneventful, but despite antibiotic therapy with tetracycline and ampicillin S. typhi-murium was isolated from stool specimens for approximately 8 weeks. Both parents had negative stool cultures at the time of the incident and on several subsequent occasions.

The child's father was engaged in investigating infected livestock, and he seemed the most likely source of infection. Repeated cultures of dust from the household vacuum cleaner were positive for S. typhi-murium; this machine had been used on repeated occasions to clean the interior of the family automobile as well as the house. During the course of the father's work fecal contamination of the floor of the automobile probably occurred frequently. Whether or not the vacuum cleaner dust was positive for S. typhi-murium prior to the child's infection is not known, but it is possible that contamination of the machine may have taken place while it was being used to clean the car. Subsequently the porous bag fitted to the vacuum cleaner could have generated aerosols throughout the house.

This outbreak suggests to the author that dust from the household vacuum cleaner could serve as a useful epidemiologic marker in salmonella infections where food is not involved. It could be used to measure possible surface contamination in a household. This was suggested by Bate and James[1] after their investigation of a dustborne outbreak of S. typhi-murium infection in a children's hospital ward.

VII. FOOD AND FEED SURVEILLANCE

The Veterinary Public Health Laboratory recently surveyed several types of foods in which salmonellae had been reported previously. These foods were purchased in the local markets. Salmonellae were recovered from 12 (43 per cent) of 28, 1-lb. packages of 4 brands of fresh pork sausage. These findings indicate little or no change in the percentage of salmonella contaminated sausage. Nine packages of 3 brands of cake mix were examined and no salmonellae were found. Twenty-eight sirloin beef patties were also examined and salmonellae were not recovered. In both the cake mixes and beef patties, however, other Gram negative organisms were present. Organisms in the cake mixes included Escherichia coli and providencia, and in the beef patties, E. coli, providencia, citrobacter and aerobacter.

[1] Bate and James, Lancet 2:713, 1958.

TABLE I
SALMONELLA SEROTYPES ISOLATED FROM HUMANS DURING DECEMBER

SEROTYPE	NEW ENGLAND							MIDDLE ATLANTIC						EAST NORTH CENTRAL					
	MAINE	NH	VT	MASS	RI	CONN	TOTAL	NY-A	NY-BI*	NY-C	NJ	PA	TOTAL	OHIO	IND	ILL	MICH	WIS	TOTAL
anatum														3	2	2			7
atlanta																			
bareilly																1			1
berta														1		1			2
binza																			
blockley				1	6		7	1	2		2	11	16			1	1		2
braenderup								1					1						
bredeney										2			2	1					1
california																			
carrau																			
cerro																1			1
chameleon																	1		1
chester								2					2			1	3		4
chingola								1					1						
cholerae-suis										1			1	1					1
cholerae-suis v kun																			
cubana				4		1	5		1				1	1		1	2	1	5
derby			2	1		2	5	3	1	1	1	8	14	4		5	1	1	11
eimsbuettel																			
enteritidis				10	3	5	18	6	3	3	4	15	31	4		6		1	11
essen																			
gaminara											1		1						
give								1				1	2						
hartford																1			1
heidelberg				13		1	14	4	3	2	5	8	22	3	1	8	4		16
horsham																			
indiana												5	5		2				2
infantis				4			4	2	1	1	2	4	10	9	4	6	4	3	26
irumu																			
java																3			3
javiana								14					14						
kentucky																			
kottbus																1			1
larochelle																			
lexington																			
litchfield																			
livingstone																1			1
madelia																			
manhattan														2		3	1		6
meleagridis																			
menston																			
miami																			
minnesota																			
mission																			
mississippi																			
montevideo				3		3	6			2	1	4	7	3	1	3	1	1	9
muenchen			1	1			2	1		1			2	1			1		2
muenster																			
new-brunswick				1			1										1		1
newington												1	1						
newport			1				1	1	2	3	1	6	13	2		13	3	1	19
norwich																			
ohio											1		1						
oranienburg						1	1	1		2			3	4		1			5
panama									1				1						
paratyphi B					2		2			1			1						
paratyphi B v odense																	1		1
pomona																			
poona											1		1						
reading																			
rubislaw																			
saint-paul				3		4	7		1	1		3	5	4	6	5	5	1	21
san-diego														1					1
schwarzengrund																1			1
senftenberg									1				1				1		1
siegburg																			
simsbury								1					1						
tennessee						1	1					1	1			2			2
thomasville																			
thompson						4	4		3			3	6	5		2	2	1	10
typhi						1	1	1	1	1		3	6	8	4				12
typhi-murium	2		2	48	1	13	66	20	10	15	5	45	95	24	12	25	11	15	87
typhi-murium v cop				9		6	15				3		3				2		2
urbana																			
virchow																	1		1
weltevreden																			
westhampton																			
worthington																			
untypable Group B		2			1		3	1		1			2						
untypable C1		1					1												
untypable Group C2																			
untypable Group D		1			1		2												
untypable Group E																			
untypable Group I																			
unknown					1		1											3	3
Total	2	4	6	98	15	42	167	61	30	37	27	118	273	81	32	94	46	28	281

New York (A-Albany, B-Beth Israel Hospital, C-City)

*The Beth-Israel Salmonella Typing Center in New York is a reference laboratory and processes many cultures from other states which are assigned to the respective states although reported by N.Y.-B.I. Beth Israel reported a total of 82 isolations for December

TABLE I (CONTINUED)
BY SEROTYPE AND REPORTING CENTER

REGION AND REPORTING CENTER																		
WEST NORTH CENTRAL								SOUTH ATLANTIC										
MINN	IOWA	MO	ND	SD	NEBR	KAN	TOTAL	DEL	MD	DC	VA	WV	NC	SC	GA	FLA	TOTAL	SEROTYPE
						1	1									1	1	anatum
															1		1	atlanta
															1		1	bareilly
											2					1	3	berta
																		binza
1			1				2				2				2	2	6	blockley
											1						1	braenderup
									1							7	8	bredeney
											2						2	california
																1	1	carrau
																		cerro
																		chameleon
																		chester
																		chingola
																		cholerae-suis
															2		2	cholerae-suis v kun
																		cubana
		1					1		6	2			1		1	5	15	derby
																		eimsbuettel
		1					1	1	9	1	8				13	4	36	enteritidis
		1					1											essen
																		gaminara
															1	1	2	give
																1	1	hartford
5						1	6		4	1	3		5		7	3	23	heidelberg
																		horsham
																1	1	indiana
4	1		1			4	10	4	4		4		1		5	3	21	infantis
		2					2											irumu
1							1				1					2	3	java
						1	1								1	15	16	javiana
																		kentucky
																		kottbus
		2					2											larochelle
		3					3											lexington
																		litchfield
									1								1	livingstone
																		madelia
											2						2	manhattan
																1	1	meleagridis
						6	6											menston
									1						1	5	7	miami
																		minnesota
																2	2	mission
															1		1	mississippi
4							4	1		1						1	3	montevideo
						2	2									2	2	muenchen
																2	2	muenster
																		new-brunswick
	1						1		1							1	2	newington
5						2	7		3	1	3		2		7	18	34	newport
																		norwich
																		ohio
1		5				5	11								1	4	5	oranienburg
																		panama
	1						1				1						1	paratyphi B
																		paratyphi B v odense
																		pomona
																		poona
																		reading
																		rubislaw
		1				2	3		3		3		2		4	6	18	saint-paul
																		san-diego
													1			5	6	schwarzengrund
																		senftenberg
																		siegburg
																		simsbury
															1		1	tennessee
																		thomasville
1						1	2					3			12	2	17	thompson
1		3					4									6	6	typhi
12	3	6	2			4	27		10	4	9	2	3		21	13	62	typhi-murium
	1						1	1									1	typhi-murium v cop
																1	1	urbana
																		virchow
																		weltevreden
																		westhampton
																1	1	worthington
	2						2			3							3	untypable Group B
																		untypable Group C1
										1							1	untypable Group C2
										1							1	untypable Group D
																		untypable Group E
														1			1	untypable Group I
			1				1			1							1	unknown
35	9	25	5	-0-	-0-	29	103	7	43	16	41	5	15	1	82	117	327	Total

TABLE I (CONTINUED)

SEROTYPE	REGION AND REPORTING CENTER																		
	EAST SOUTH CENTRAL					WEST SOUTH CENTRAL					MOUNTAIN								
	KY	TENN	ALA	MISS	TOTAL	ARK	LA	OKLA	TEX	TOTAL	MONT	IDA	WYO	COLO	NM	ARI	UTAH	NEV	TOTAL
anatum							2	1	1	4							1		1
atlanta																			
bareilly							4		1	5									
berta							3			3	1								1
binza																			
blockley		1			1		3	1		4									
braenderup							4			4									
bredeney			1		1		4		1	5							1		1
california							1			1									
carrau							1			1									
cerro																			
chameleon																			
chester		1			1	3	1			4						1			1
chingola																			
cholerae-suis																			
cholerae-suis v kun																			
cubana			1		1				2	2									
derby							5		1	6				1		1			2
eimsbuettel								1		1									
enteritidis	4				4	1			1	2						3	1		4
essen																			
gaminara																1			1
give							1			1									
hartford							1			1									
heidelberg		3			3	1	1		3	5				15		1	2		18
horsham																			
indiana		1			1		4			4									
infantis		1			1	1	1		1	3				2		1	1		4
irumu														1					1
java																			
javiana							6		18	24						1			1
kentucky																			
kottbus																			
larochelle																			
lexington																			
litchfield									1	1									
livingstone							1			1									
madelia																			
manhattan																			
meleagridis																			
menston														5					5
miami																			
minnesota																			
mission							1			1									
mississippi							2			2									
montevideo								4		4									
muenchen							4			4									
muenster																			
new-brunswick																			
newington	1				1		1			1									
newport	1	4	1	1	7	2	8	2	18	30				3		3			6
norwich		1			1											1			1
ohio																			
oranienburg							4		6	10									
panama									2	2									
paratyphi B																			
paratyphi B v odense																			
pomona																1			1
poona	1				1		2		1	3									
reading																1			1
rubislaw							2			2									
saint-paul							4		1	5	1								1
san-diego									1	1									
schwarzengrund		1	1		2		2			2						2			2
senftenberg							1			1									
siegburg									1	1									
simsbury																			
tennessee																			
thomasville																			
thompson			1		1		3			3									
typhi		1			1	2	4		1	7					1	1			2
typhi-murium	4	7	2	1	14	2	9	4	22	37	1			14		4	12		31
typhi-murium v cop		1			1		5			5						2			2
urbana									1	1									
virchow																			
weltevreden																			
westhampton																			
worthington																			
untypable Group B									1	1					9				9
untypable Group C1															7				7
untypable Group C2																			
untypable Group D	1				1														
untypable Group E															5				5
untypable Group I															1				1
unknown									1	1									
Total	12	22	7	2	43	12	95	13	86	206	3	-0-	-0-	41	23	24	18	-0-	109

TABLE I (CONTINUED)

REGION AND REPORTING CENTER													
PACIFIC						OTHER	TOTAL	PERCENT OF TOTAL	1965 TOTAL	PERCENT 1965 TOTAL	1964 TOTAL	PERCENT 1964 TOTAL	SEROTYPE
WASH	ORE	CAL	ALASKA	HAWAII	TOTAL	VI							
4		4		1	9		23	1.3	301	1.4	279	1.3	anatum
							1		8		5		atlanta
							7		104		99		bareilly
							9		47		48		berta
		1			1		1		20		22		binza
1		5			6		44	2.4	400	1.9	427	2.0	blockley
		3			3		9		85		102		braenderup
		1			1		19		160		220		bredeney
							3		22		31		california
		1			1		3		7		3		carrau
				1	1		2		13		9		cerro
							1		1				chameleon
							12		116		75		chester
							1		2				chingola
							2		10		15		cholerae-suis
							2		36		31		cholerae-suis v kun
							14		145		63		cubana
		1		2	3		57	3.1	632	3.0	2,360	11.2	derby
							1		3				eimsbuettel
1		2			3		110	6.0	1,065	5.1	801	3.8	enteritidis
							1		4		6		essen
							2		13		3		gaminara
		1			1		6		116		79		give
							3		22		11		hartford
11		20		9	40		147	8.0	1,620	7.8	1,717	8.1	heidelberg
		1			1		1		1				horsham
							13		66		54		indiana
2		9		2	13		92	5.0	1,145	5.5	1,523	7.2	infantis
							3		23		5		irumu
		7			7		14	0.8	199	1.0	231	1.1	java
		1			1		57	3.1	361	1.7	256	1.2	javiana
		1		2	3		3		19		21		kentucky
							1		9		1		kottbus
							2		2				larochelle
							3		5		1		lexington
		2			2		3	0.2	99	0.5	69	0.3	litchfield
				2	2		5		34		15		livingstone
		1			1		1		3		1		madelia
	1	1			2		10		125		181		manhattan
							1		140		48		meleagridis
							11		11				menston
							7		95		49		miami
		2			2		2		14		13		minnesota
							3		16		2		mission
							3		38		41		mississippi
		2		1	3		36	2.0	457	2.2	524	2.5	montevideo
							14		219		261		muenchen
							2		12		7		muenster
							2		20		4		new-brunswick
							6		57		71		newington
1		12			13		130	7.1	1,256	6.0	1,036	4.9	newport
							2		24		12		norwich
							1		9		4		ohio
		1			1		36	2.0	592	2.8	550	2.6	oranienburg
2		4		3	9		12		229		189		panama
1					1		6		177		175		paratyphi B
							1		1				paratyphi B v odense
							1		3				pomona
							5		48		45		poona
		1			1		2		21		36		reading
							2		11		18		rubislaw
5	1	14		1	21		81	4.4	768	3.7	645	3.1	saint-paul
		5			5		7		229		178		san-diego
3		3		1	7		20		115		155		schwarzengrund
		1			1		4		74		108		senftenberg
		1			1		2		16		2		siegburg
							1		2		6		simsbury
							5		173		332		tennessee
1					1		1		3		3		thomasville
1		5		2	8		51	2.8	561	2.7	421	2.0	thompson
1		15			16		55	3.0	721	3.5	703	3.3	typhi
19	6	89		7	121		540	29.4	6,531	31.3	5,656	26.8	typhi-murium
							30	1.6	203	1.0	206	1.0	typhi-murium v cop
							2		33		25		urbana
							1		2		4		virchow
				1	1		1		35		23		weltevreden
				3	3		3		7				westhampton
2					2		3		46		48		worthington
	4				4		24		295		276		untypable Group B
	1	1			2		10		92		71		untypable Group C1
							1		57		40		untypable Group C2
							9		48		37		untypable Group D
	1				1		2		51		30		untypable Group E
							1		1				untypable Group I
							7		114		94		unknown
55	14	218	-0-	38	325	-0-	1,834		20,886		21,113		Total

(VI- Virgin Islands)

TABLE I-A
SEROTYPES REPORTED FROM HUMANS PREVIOUSLY DURING 1965

Serotype	Month(s)	Reporting Center(s)	Number of Isolations
adelaide	May	NY-A	1
alachua	Mar	Mass(1)	
	Jul	Tenn(1)	
	Jul	Calif(1)	
	Sept	Ill(1)	
	Nov	RI(1)	5
albany	Jan-Feb-Sept	Ill(3)	
	Feb	Conn(1)	
	Aug	Va(1)	
	Sept	Fla(1)	6
allandale	Jul-Sept	Fla	2
amager	July	NY-BI	1
arkansas	Jun	Calif	1
belem	Jul	Texas	1
bilthoven	Apr-Jun	Calif(2)	
	May	Mich(1)	3
blegdam	Feb	SD	1
bovis-morbificans	Mar	Calif(1)	
	Apr-Jun-Aug-Sept	Hai(26)	
	May-Jun-Sept	Mass(4)	31
brandenburg	Jun	Ill	1
butantan	Aug	Mich	1
cambridge	Nov	Wash	3
chailey	Sept	NY-BI	1
champaign	Nov	NJ	1
clifton	Nov	Mo	1
colorado	Jan-May-Jun	Hai	3
corvallis	Feb	Hai	1
daytona	Mar	Tenn(1)	
	Sept	La(1)	2
denver	Feb	La	1
dublin	Feb-Mar-Apr	Calif	3
duesseldorf	Jan	Ohio(1)	
	Apr-Jun	La(2)	
	Sept	Fla(1)	
	Sept	NY-BI(1)	5
duisburg	Jul	Ark	1
eastbourne	Jun-Aug-Sept	Calif(3)	
	Jul	Ark(1)	4
emek	May	Tenn(1)	
	Sept	Colo(1)	
	Oct	Calif(1)	3
fayed	Mar	NC	1
florida	Jan-May	Fla	2
fresno	Mar	Tenn	1
gatuni	Nov	Texas	3
glostrup	Jul	La	1
guinea	Aug	Ill	1
haifa	Sept	NY-BI	1
hato	Nov	La	1
heilbron	Jan	Mo	1
inverness	May	Calif (1)	
	Jun-Jul-Sept-Nov	Fla(4)	
	Aug	Ariz(1)	
	Sept	Mich(1)	7

TABLE I-A (Continued)
SEROTYPES REPORTED FROM HUMANS PREVIOUSLY DURING 1965

Serotype	Month(s)	Reporting Center(s)	Number of Isolations
johannesburg	Jun	Minn(1)	
	Nov	Ala(1)	2
kaapstad	Feb-Jun	Colo	2
leeuwarden	Jun-Aug-Sept	Texas	3
lindenburg	May	Colo(1)	
	Sept	Kan(2)	2
loma-linda	May-Oct	Ore	2
lomita	May	Ore(1)	
	Jun	Ohio(1)	
	Sept	La(1)	3
london	May	NY-C	1
luciana	Jan	Ariz	1
maastricht	Sept	Ill	1
michigan	Sept	Calif	1
minneapolis	Jul	Conn	1
mishmar-haemek	Feb	Calif(1)	
	May	Texas(1)	2
nagoya	Jun	Texas	1
nottingham	May	Ark	1
nyborg	Nov	NY-C	1
oslo	Jan-Jun	Hai(3)	
	Mar-May-Oct	Calif(3)	
	Apr-May	Wisc(7)	
	Aug	Mich(1)	14
paratyphi A	Jan-May-Jun-Jul-Oct	Calif(8)	
	Mar-Sept-Nov	NY-C(3)	
	Aug	Del(1)	12
paratyphi C	Jun	Iowa	1
pensacola	Feb	Okla(1)	
	May-Oct	NC(2)	
	Jul	Ga(1)	4
portland	Nov	NY-C	1
remo	Mar	Va(1)	
	May	Pa(1)	2
richmond	Jul	Kan(1)	
	Jul	Fla(1)	2
saphra	Sept-Oct	Texas	13
sara-jane	Sept	NJ	1
stanley	Jan	Kan(1)	
	Apr	Ill(1)	
	Jun	Ariz(1)	
	Jul	Calif(1)	
	Jul-Nov	NY-C(2)	
	Aug	NY-A(1)	7
sundsvall	Jun	Calif	1
takoradi	Oct	NY-C(1)	
	Nov	NY-BI(2)	3
taksony	Jan	NY-BI	1
tallahassee	Sept-Nov	Fla	4
tamale	Aug	Fla	1
uganda	Sept	Ill(1)	
	Oct	La(1)	2
westerstede	Oct	Md(1)	
	Nov	Fla(1)	2
yalding	Jun	Texas	1
Total			198

TABLE II

Infrequent Serotypes

Serotype	Center	December	1965*	Total 1963 & 1964**	Comment
S. atlanta	GA	1	8	16	All 1963 to 1965 isolates have been reported from GA.
S. carrau	CALIF, FLA	3	7	4	Mainly reported from the gulf coast states.
S. chameleon	MICH	1	1	0	First time reported to this unit as a cause of human disease; first isolated from a chameleon.
S. chingola	NY-A	1	2	0	Second time reported to this unit.
S. essen	MO	1	4	6	Majority of previous isolates have been from COLO.
S. gaminara	ARIZ, N.J.	2	13	6	First isolated in Uruguay from the lymph nodes of normal swine at time of slaughter.
S. hartford	FLA, ILL. LA	3	22	27	Involved in an interstate epidemic of undetermined cause during 1962.
S. horsham	CALIF	1	1	1	1963-64 isolate also from California.
S. irumu	COLO,MO	3	23	83	See SSR #44 on outbreak of *S. thompson* in MO.
S. kottbus	ILL	1	9	5	One previous case this year was turtle associated.
S. larochelle	MO	2	2	0	Has been previously isolated from turtles in this country.
S. lexington	MO	3	5	3	First isolated from swine in KY.
S. madelia	CALIF	1	3	2	Of 25 non-human isolates reported to the CDC, 20 were from dogs.
S. menston	COLO,KANS	11	11	1	An unusually large number of isolates in one month; last reported from MD during 1963.

Table II (Cont'd)

Serotype	Center	December	1965*	Total 1963 & 1964**	Comment
S. mission	FLA, LA	3	16	4	Isolated primarily in the gulf coast states.
S. muenster	FLA	2	12	12	Has been isolated from coconut, eggs, poultry, swine and horses.
S. new-brunswick	MASS, MICH	2	20	10	Reported isolations of this serotype over three times as frequent as previous years.
S. norwich	ARIZ, TENN	2	24	25	Has been isolated from chickens in IND.
S. ohio	NJ	1	9	4	Most of the previous isolates have been from CALIF.
S. siegburg	CALIF, TEX	2	16	2	Has been isolated from eggs and egg powder.
S. simsbury	NY-A	1	2	12	Both 1965 isolates have been from NY.
S. thomasville	WASH	1	3	14	Cause of a family outbreak in ILL during 1963; has been isolated from frozen eggs.
S. virchow	MICH	1	2	5	Has been isolated from eggs and red meat.
S. westhampton	HAI	3	7	2	Reported from meat scraps and bone meal in WASH during 1964.

* Represents 20,886 human isolations during 1965.

**Represents 39,762 human isolations of salmonellae during 1963 and 1964.

TABLE III

Age and Sex Distribution of 1,789 Isolations of Salmonellae Reported for December 1965

Age (Years)	Male	Female	Total	%	Cumulative %
Less than 1	126	120	246	19.8	19.8
1 - 4	188	119	307	24.7	44.5
5 - 9	85	68	153	12.3	56.8
10 - 19	58	64	122	9.8	66.6
20 - 29	42	62	104	8.3	74.9
30 - 39	29	40	69	5.6	80.5
40 - 49	24	28	52	4.1	84.6
50 - 59	26	42	68	5.5	90.1
60 - 69	22	34	56	4.5	94.6
70 - 79	19	23	42	3.4	98.0
80 +	7	18	25	2.0	100.0
Unknown	289	256	545		
Total	915	874	1789		
% of Total	51.1	48.9			

TABLE IV
REPORTED NONHUMAN ISOLATES BY SEROTYPE AND SOURCE, DECEMBER 1965

Serotype	poultry	chicken	turkey	pigeon	goose	macaw	pheasant	game fowl	avain	equine	bovine	ovine	porcine	canine	feline	mouse	rat	guinea pig	rabbit	monkey	mink	zoo animal	lion	deer	egg	egg yolk	powdered egg	frozen egg	frozen albumen	powdered egg food	hamburger	headcheese	cookie dough	sweet potato	turkey and dressing	egg custard	chicken feed	feather meal	meat and bone scraps	feed	tankage	turtle	water	sewage	river water	turtle water	water from iceballs	aquarium	unknown	Total	12 Mos. Total	Serotype
alachua			2										1																												1									4	20	alachua
albany		1	2																																															3	8	albany
amager		1																																																1	1	amager
anatum		4	10							1	5									2								1					3			2			3	1	1	1							3	37	268	anatum
bareilly																												1																						1	33	bareilly
berta		1																													2																	1		4	25	berta
binza			1																1																				1											3	52	binza
blockley		12	10																									2																						24	213	blockley
bovis-morbificans																																												1						1	1	bovis-morbificans
braenderup		1	1																	1																														3	25	braenderup
bredeney		3	5								1																												2	1	1	2				1				16	110	bredeney
california		1																																																1	49	california
cerro																									2	1														2										5	63	cerro
chester			5																																															5	184	chester
cholerae-suis													1																																					1	2	cholerae-suis
cholerae-suis v kun													10																																					10	114	cholerae-suis v kun
cubana																		5																																5	25	cubana
derby			4										1																			1									2			1						9	106	derby
dublin											9																																							9	49	dublin
eimsbuettel		1																																					2											3	63	eimsbuettel
enteritidis		2													1																																			3	52	enteritidis
gallinarum		2	2																																															4	37	gallinarum
give		2	2																						1																									5	95	give
hartford																																														1				1	2	hartford
heidelberg		21	78																		1	1						4						1	1												1		25	133	831	heidelberg
indiana		1																																																1	37	indiana
infantis		13	17						2	1											1						1	1	1											1				2						40	384	infantis
java																																										11								11	25	java
kentucky		1	3																						4														3											11	48	kentucky
kottbus																																														1				1	1	kottbus
lexington																																							1	1										2	8	lexington
livingstone		2																																						3										5	82	livingstone
lomita																														1																				1	1	lomita
manhattan			1																																															1	40	manhattan
meleagridis		5	3												1													2																						11	80	meleagridis
minnesota																				1																														1	33	minnesota
montevideo		3												1											1	2													1	2		1								11	213	montevideo
muenchen			1																																															1	50	muenchen
newington		3	4								1																2				1																			11	48	newington
newport		1	11				2				6			1		2				1																														24	203	newport
ohio																																												2						2	9	ohio
oranienburg		1																							5		1	2					2						1	1						1		4		18	182	oranienburg
orion			1											1																										1										3	9	orion
panama			2																																															2	32	panama
pullorum		4																																																4	200	pullorum
reading			7																																															7	49	reading
saint-paul		1	37								1																	2																					3	44	271	saint-paul
san-diego		3	23										1											1																									2	30	158	san-diego
schwarzengrund			22																													1																		23	162	schwarzengrund
senftenburg	1		7																								1										1	1		1	1									13	127	senftenburg
siegburg																												4																						4	13	siegburg
taksony		1																																																1	2	taksony
tennessee		1									1														2		8																1	1						14	117	tennessee
thompson		13	1																				1		1		2	1														1								20	198	thompson
typhi-murium		9	19	1	1	1		1		4	35	1	2	1														3																1	1	1	1		1	83	977	typhi-murium
typhi-murium v cop		7	7								4						2																																	20	284	typhi-murium v cop
typhi-suis													1																																					1	2	typhi-suis
worthington		3	2										1															6																						12	84	worthington
untypable Group C1		1																																																1	14	untypable Group C1
untypable			1																																															1	3	untypable
Total	1	125	291	1	1	1	2	1	2	6	63	1	18	4	2	2	2	5	1	5	2	1	1	1	16	3	15	29	1	1	3	2	5	1	1	2	1	1	14	14	6	16	1	8	1	5	2	5	34	726	6,817	Total

Source: National Disease Laboratory, Ames, Iowa, weekly Salmonella Reports from individual States and US-FDA-Division of Microbiology, Washington, D.C.

TABLE V
REPORTED NONHUMAN ISOLATES BY SEROTYPE AND STATE, DECEMBER 1965

Serotype	Ala	Ark	Calif	Colo	Conn	Del	Fla	Ga	Ida	Ill	Ind	Iowa	Kan	La	Md	Mass	Mich	Minn	Miss	Mo	NH	NY-A	NY-C	NC	Ohio	Ore	Pa	SC	SD	Tenn	Tex	Utah	Va	Wash	WVa	Wisc	Wyo	Total	12 mos. Total	Serotype
alachua			3								1																											4	20	alachua
albany																															3							3	8	albany
amager								1																														1	1	amager
anatum			10					3		5	1		3					3			1	2			2						6					1		37	268	anatum
bareilly							1																															1	33	bareilly
berta							2	1														1																4	25	berta
binza			2															1																				3	52	binza
blockley			7				2	4		1																							2	2		6		24	213	blockley
bovis-morbificans			1																																			1	1	bovis-morbificans
braenderup			2																												1							3	25	braenderup
bredeney			4					1		4	2								1	1		1			1	1												16	110	bredeney
california		1																																				1	49	california
cerro								1				1													3													5	63	cerro
chester																															2					3		5	184	chester
cholerae-suis																									1													1	2	cholerae-suis
cholerae-suis v kun											7													1						1			1					10	114	cholerae-suis v kun
cubana																	5																					5	25	cubana
derby			3								2							1													2			1				9	106	derby
dublin			9																																			9	49	dublin
eimsbuettel								1		1																										1		3	63	eimsbuettel
enteritidis																1			1																	1		3	52	enteritidis
gallinarum		2																						1							1							4	37	gallinarum
give								1											1										1						2			5	95	give
hartford																															1							1	2	hartford
heidelberg	1	4	64					6			1	3			2		3	24		5	2			2		9					5	1		1				133	831	heidelberg
indiana											1																											1	37	indiana
infantis			22					1		4	3						1	1							1	1					1	1	3			1		40	384	infantis
java			1		3					7																												11	25	java
kentucky			4									1						2				1							3									11	48	kentucky
kottbus																				1																		1	1	kottbus
lexington																		1							1													2	8	lexington
livingstone			2																						3													5	82	livingstone
lomita										1																												1	1	lomita
manhattan			1																																			1	40	manhattan
meleagridis			7																									1			1	2						11	80	meleagridis
minnesota										1																												1	33	minnesota
montevideo			2			1		2		1															5													11	213	montevideo
muenchen																															1							1	50	muenchen
newington			8				1			1																										1		11	48	newington
newport			15		1			1						2								2					1				1					1		24	203	newport
ohio			2																																			2	9	ohio
oranienburg			1				1	1					6							1					2				4			1			1			18	182	oranienburg
orion																		1							1											1		3	9	orion
panama																															2							2	32	panama
pullorum																		1										1					1			1		4	200	pullorum
reading												1																			5		1					7	49	reading
saint-paul			36											1				2						1							2	2						44	271	saint-paul
san-diego			19					1																		4		1			5							30	158	san-diego
schwarzengrund			21					1																										1				23	162	schwarzengrund
senftenberg	1							2						2				5					1												1	1		13	127	senftenberg
siegburg							4																															4	13	siegburg
taksony			1																																			1	2	taksony
tennessee			10		1																		1		1				1									14	117	tennessee
thompson		6	4				1				1							1	4						1					1			1					20	198	thompson
typhi-murium	1	2	51	1					1		3	3					2							1	1	2	3				3	3	3			2	1	83	977	typhi-murium
typhi-murium v cop			6		2	2		2			1						1	1	2							3												20	284	typhi-murium v cop
typhi-suis			1																																			1	2	typhi-suis
worthington								2			1								1												6				2			12	84	worthington
untypable Group C1			1																																			1	14	untypable Group C1
untypable			1																																			1	3	untypable
Total	3	15	321	1	7	3	12	32	1	26	24	9	9	5	2	1	12	44	10	8	3	7	2	6	23	20	4	3	9	2	48	10	12	5	6	20	1	726	6,817	Total

Source: National Disease Laboratory, Ames, Iowa, weekly Salmonella Reports from individual States and US-FDA-Division of Microbiology, Washington, D. C.

New York (A-Albany; C-City)

TABLE V-A
OTHER SEROTYPES REPORTED DURING 1965
FROM NONHUMAN SOURCES

Serotype	Month(s)	Reporting Center(s)	Number of Isolations
alabama	Aug	Ind	1
amsterdam	Nov	Ohio	1
bern	Oct	Minn	1
bonariensis	Sept	Kans	1
brandenburg	Jan	NC	1
cambridge	Apr	Ind(1)	
	Oct-Nov	Wash(2)	3
carrau	Jul	Conn	1
corvallis	Oct	Ill	1
drypool	Jul	Fla(1)	
	Aug	Wisc(1)	2
duesseldorf	Apr	Mass(1)	
	Jun	Me(1)	
	Nov	NJ(5)	7
florida	Jan	Ill	1
gaminara	Aug	Ind	1
gatow	Jul	Pa	1
goerlitz	Jan	Wash	1
grumpensis	Jul	Miss	1
hidalgo	Nov	Calif	1
illinois	Mar-Jul	Minn(2)	
	May	Md(1)	
	Jul	Ind(2)	
	Sept	Iowa(1)	6
inverness	Jun	Calif(1)	
	Oct	La(1)	2
irumu	Sept	Mo	1
javiana	Jan	Fla(1)	
	Mar	Calif(1)	
	Jun-Jul-Sept-Nov	Texas(6)	
	Jul	Pa(1)	
	Oct	Kans(2)	11
johannesburg	Mar	Utah(1)	
	Jul	Ga(4)	
	Aug	Ind(1)	
	Aug	Miss(1)	7
lindenburg	Jun	La	1
litchfield	Jun	Hai(1)	
	Jul	RI(1)	
	Aug-Nov	La(10)	
	Aug	Minn(1)	
	Oct	Kans(4)	
	Nov	Okla(1)	18
madelia	Sept	Minn	2
manila	Apr	Tenn(1)	
	Jul	Ind(1)	
	Aug	Dela(2)	4
menston	Mar	Va(1)	
	Apr-Jun	Wash(2)	3
miami	Feb	Minn(1)	
	Feb	Mo(1)	
	Apr	Mich(1)	
	Jun-Jul-Oct-Nov	Fla(5)	
	Jul	NY-A(1)	
	Sept	Calif(1)	
	Oct	Ga(1)	11
mikawashima	Mar	Ind	1
minneapolis	Oct	Minn	1
mission	Jan	Ark(1)	
	Jan	SC(1)	
	Jul	Miss(1)	3

TABLE V-A (Continued)
OTHER SEROTYPES REPORTED DURING 1965
FROM NONHUMAN SOURCES

Serotype	Month(s)	Reporting Center(s)	Number of Isolations
poona	Jan	Tenn(1)	
	Mar	Calif(3)	
	Mar	Mass(3)	
	Jul	Ark(1)	
	Jul	Minn(1)	
	Aug	Mich(1)	
	Sept	Wash(1)	
	Oct	Kan(2)	13
rubislaw	Apr	Mont(1)	
	Jul-Aug	Kans(4)	5
ruiru	Apr	Md(1)	
	Aug	Dela(1)	2
simsbury	Jul	Ark(1)	
	Jul	Fla(2)	
	Jul	Iowa(1)	4
stockholm	Oct	Ohio	1
tallahassee	Jan	Fla	1
thomasville	Mar-Apr	Md(4)	
	Apr-Sept-Nov	Minn(4)	
	Aug	Dela(1)	
	Sept	Mo(1)	10
tuindrop	Oct	Minn	4
muenster	Jan-Mar	Fla(2)	
	Jan-Apr-Nov	Miss(5)	
	Mar	Ohio(1)	
	Aug	Ala(1)	
	Oct	Ill(1)	
	Oct	Minn(1)	11
new-brunswick	Nov	Calif	1
norwich	Feb	NC	1
oslo	Mar-Apr-Sept-Nov	Ill(6)	
	Jun	Calif(6)	12
paratyphi B	Mar	Texas(1)	
	May	Pa(2)	
	May	NY-BI(1)	
	Jun	Md(1)	
	Aug-Nov	Wash(2)	7
pomona	Apr-Aug	Mich	2
typhi Cl	Oct	Calif	1
urbana	Mar	Fla(2)	
	May	Conn(1)	
	Jun	NY-A(1)	
	Jul	Wisc(1)	
	Sept	Ohio(2)	
	Oct	Kan(22)	29
wassenaar	Apr	Ill(1)	
	Aug	Mich(1)	
	Oct	Kan(2)	4
weltevreden	Oct	Calif	1
westerstede	Jan	Miss	2
westhampton	Feb	Mass(1)	
	Jun	La(1)	
	Jul	SC(1)	3
Total			210

Figure I.

REPORTED HUMAN ISOLATIONS OF SALMONELLA
IN THE UNITED STATES