1954 Summary of Disease Outbreaks

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"W HEN pestilence falls on the people there is a story to tell," Geddes Smith wrote in 1941 (1).

Our story of the epidemics and other unusual occurrences of disease that "fell on the people" of the United States in 1954 concerns groups of people—children in school and in camps, families, picnickers, hospital and other institution inmates, restaurant and hotel patrons, and others.

More than 10 percent of all reported outbreaks of staphylococcal food poisoning and foodborne or waterborne outbreaks of shigellosis, salmonellosis, typhoid fever, and undifferentiated gastroenteritis occurred in public and private schools (table 1). Three-fourths of the 12 reported foodborne or waterborne epidemics of Shigella infections were in schools. In addition to these 9 outbreaks there was another epidemic of 234 cases in which the infection was considered to be transmitted by person-toperson contact. One epidemic of typhoid fever occurred in a private school. The 26 outbreaks of various types in schools were reported from 12 different States and about half of them from 3 States. It is quite probable that many other unreported outbreaks occurred in the remaining 36 States. These outbreaks, even

Dr. Dauer is medical adviser to the chief of the National Office of Vital Statistics, Public Health Service, and Mr. Sylvester is biostatistician with the Morbidity Branch of that office. though they occurred in a limited number of areas, point to a need for improving the environment of children in public and private schools.

All reported foodborne and waterborne outbreaks of shigellosis, with one exception, occurred in schools, hospitals, and institutions. In the latter group, predominantly institutions housing mentally deficient and mentally diseased persons, there also were four outbreaks of shigellosis which were considered to have been transmitted by person-to-person contact. All of them occurred in the institutions of one State, but similar unreported outbreaks undoubtedly occurred in other States. Because of the inherent difficulties in maintaining reasonably high standards of personal hygiene in these populations, such outbreaks are not unusual.

The outbreaks listed as occurring in households or families were relatively numerous, but most of them consisted of a few cases. The large proportion of typhoid fever occurrences is not surprising since carriers commonly prepare food for consumption in their homes. The list of household outbreaks would be even more impressive if trichinosis and botulism were added since these diseases occur predominantly in families.

The outbreaks and persons affected among patrons of restaurants, hotels, and private clubs or dining halls were numerous, as would be expected since large numbers of persons eat in these establishments. A large proportion of outbreaks followed a reception or a banquet in such places.

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A large number of persons were affected in outbreaks following attendance at picnics and similar social gatherings, but this may possibly be a reflection of the numbers who attended, as well as increased opportunities for consumption of food exposed at temperatures favorable for bacterial growth. Outbreaks following church socials included the familiar story of a typhoid fever epidemic following a church supper.

The number of outbreaks in summer camps was not large since all of them were reported by two States. None of the more serious types of foodborne or waterborne diseases, such as shigellosis, salmonellosis, and typhoid fever, were reported in this group in 1954. Outbreaks in labor camps were also few in number, possibly because such groups are not as numerous as some of the others listed.

The small number of outbreaks among passengers on trains, airplanes, or ships may be due in part to under-reporting since many patrons of dining services on trains and airplanes would have reached their destinations and would have scattered before onset of symptoms. On the other hand, the small number of outbreaks may also be a reflection of the attention given to dining car sanitation on trains and supervision of

food services on other interstate carriers (2). No outbreak was reported among patrons of railway dining cars, although one did occur among members of a dining car crew.

The outbreaks listed under the category of communities consist of those in which there was distribution of infected foods from bakeries and other retail stores to various persons in a community. They also include those in which polluted water caused illness in a community.

Waterborne Disease Outbreaks

In 1954, only four outbreaks were reported in which there was good evidence that water was the vehicle of infection. There were also three other outbreaks in which water was suspected as the source of infection.

One of the four waterborne outbreaks was typhoid fever in a coal mining village where water was pumped from a worked-out section of a mine into the distributing system of the town. Two outbreaks of gastroenteritis were reported. One was explosive and followed contamination of the water supply after heavy rains; the other occurred in a recreational area where untreated well water was used.

Table 1. Certain foodborne and waterborne disease outbreaks, by type of population, 1954

		Staphylococcal food poisoning			Shigellosis			Salmonel- losis ²			Typhoid fever ²			Other types gastroenteritis		
Type of population	Number States reporting	Number out- breaks	Number cases reported	Number States reporting	Number out- breaks	Number cases reported	Number States reporting	Number out- breaks	Number cases reported	Number States reporting	Number out- breaks	Number cases reported	Number States reporting	Number out- breaks	Number cases reported	
Public and private schools Colleges Households Church socials Restaurants and hotels Private clubs and dining halls Pienics Summer camps Labor camps Hospitals Institutions Common carriers Communities	5 1 1 4	5 1 21 4 19 12 11 2 2 4 3 4	309 469 93 102 278 1, 020 1, 564 111 92 208 92 203 165	7	9	945 	2 1 4 2 4 2 1	2 1 8 2 5 3 1	157 16 91 440 107 106 	1	1 12 1	21 38 12 7	5 4 6 2 4 6 3 1 3 2	9 5 19 2 14 6 4 7 6 4 2 1 6	824 252 129 98 312 285 1, 235 311 376 226 110 428	

¹ Outbreaks on military establishments excluded.

² Includes single-case family occurrences.

Other outbreaks suspected of being waterborne included three of gastroenteritis following consumption of water of doubtful sanitary quality. Single cases of typhoid fever were also reported in which it was found that infection followed the use of water from wells. However, these are not included in table 2. Thirteen cases of gastroenteritis were reported among members of a basketball team who drank water from a school well which, on examination, was found to be polluted.

Milkborne Disease Outbreaks

The number of outbreaks in which there was definite evidence that milk or a milk product was the vehicle of infection was not large. In one instance, four persons in a family developed brucellosis after drinking raw milk from a cow that had aborted. The source of infection of six cases of typhoid fever in two families was traced to raw milk from a dairy farm where a carrier was found handling the milk. outbreak of salmonellosis followed the consumption of eggnog in an institution. The person who prepared the eggnog was found to be a carrier of Salmonella typhimurium, the same organism that was recovered from the patients. Another outbreak in a hospital in which S. typhimurium was isolated followed the consumption of a food in which cheese was an ingredient. A group of five persons became ill with staphylococcal food poisoning following the consumption of ice cream. The chef who prepared the ice cream harbored Staphylococcus aureus in his throat, and he also had chronic paronychia on all fingers of both hands.

Nine persons in a family outbreak developed gastroenteritis after eating a food containing a cream cheese from which a gram-positive coccus was isolated. A staphylococcal food poison outbreak of about 100 cases was traced to ice cream. The ice cream mix had been allowed to stand at room temperature for several hours prior to freezing. Several cases of tuberculosis in children followed the consumption of milk from herds of cattle, in one of which 80 percent were found to be tuberculin reactors.

Four outbreaks were reported in which milk

Table 2. Foodborne and waterborne disease outbreaks reported in 1954 by vehicle of infection

	Wε	ater	and	ilk milk lucts	Other foods			
Area	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases		
United States	7	452	9	200	234	11, 704		
New England:								
Maine New Hampshire Vermont					2 2	11 111		
Massachusetts					5	202		
Connecticut					$\frac{1}{2}$	159 150		
Middle Atlantic: New York	2	50	1	42	33	1, 634		
New Jersey Pennsylvania					3			
East North Central: Ohio					3			
Indiana Illinois					11	176 909		
Michigan			<u>i</u> -	8	17	1, 442		
Wisconsin West North Central:					2	24		
Minnesota Iowa					2 1	100		
Missouri Kansas						50		
South Atlantic:					3	458		
Maryland District of Colum-					5	210		
bia Virginia					1 4	$\begin{array}{c} 32 \\ 622 \end{array}$		
West Virginia North Carolina	<u>ī</u> -	9	1	6	ī	3		
FloridaEast South Central:					8 5	525 286		
Kentuckv	1	13			2	93		
Tennessee West South Central:	1	180			7	1, 689		
Arkansas					2	70		
Texas					1	74 500		
Montana					1	15		
Colorado New Mexico					1	2 35		
Utah Nevada					1	27		
Pacific:					1	3		
Washington Oregon			1	20	8 7	149 29		
CaliforniaAlaska	2	200	3	20	86 1	1, 609		
Hawaii			 1	100	3	26 257		

Table 3. Foodborne, waterborne, and other disease outbreaks by type of infection, reported in 1954

Area	Typhoid Section 1			Salmonel- losis		Shigel- losis		Trichi- nosis		Botu- lism		Staphylo- coccal food poi- soning		Gastro- enter- itis		Toxic agents and toxic foods	
	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	
United States	16	92	26	1, 164	19	1, 471	6	53	8	18	100	4, 868	103	5, 914	10	279	
New England:																	
Maine New Hampshire					- 		1	6			$-\bar{2}^-$	111	1	5			
Vermont	1				1	60											
Massachusetts Rhode Island			1	16						-	3	86	2	159 159			
Connecticut			1	50							1	100		100			
Middle Atlantic:	1												1				
New York New Jersey			3	123	6	201					12	531	26	1, 399	3	27	
Pennsylvania							2	17			₁ -	5					
East North Central:											1						
Ohio		7	1	20	1	150	1	6	;-								
Indiana Illinois		5	1 3	26 233	2 2	198 264			1	2	9	451	6	762 494	-		
Michigan				200		201						101		101			
Wisconsin							1	17			1	7		.			
West North Central: Minnesota	.		2	40	1	15	1						. 1	68			
Iowa			-	40	1	15					<u>ī</u> -	50	1	00			
Missouri	1	5											.				
Kansas	·		1	350		- -					1	57	1	51			
South Atlantic: Maryland								Ì	1	2	1	135	3	73			
District of Columbia	1	2	1					1		-	i	32					
Virginia	-		.	.		1				1	2	569	2	53			
West Virginia North Carolina		15	1								1 3	3					
Florida		1 -							-		3	425 230	6 2	300 56			
East South Central:													-				
Kentucky	- :-		.	.				.	-	.	2	93	1	13			
Tennessee West South Central:	- 1	21		-	2	287			-		. 3	556	2	1, 005			
Arkansas			.					.			. 1	39	1	31		.	
Louisiana	-	-	-	-					1		. 1	74		l l	. 1	160	
Texas Mountain:	-	-	-	-	·		-	-	-	-	. 1	500		-	·	-	
Montana	_ _		. 1	15		.									1	1	
Colorado	_				ŧ				1	2				_			
New Mexico		-		-		-			-	-	. 1	35		- <u></u> -	.	-	
Utah Nevada		-	- :	-	-	-	-	-	<u>i</u>	3		-	- 1	27		-	
Pacific:		-	-	-	-		-		- 1	3		-	-	-		-	
Washington		8	1	21	1	15		7		2	3	80		39		-	
Oregon			- 1		1			-	- 1	1	26				- 1	3	
California Alaska	_ 3		9	150	2	274		-	- 2	6	36	452 26		1, 220	4	2	
Hawaii	_		1	100	-		_				i	100			1	5	
Puerto Rico		1 -	1 -		1	-	-	1	1		ī				1 -	_	

Note: Includes outbreaks reported on military installations. Includes outbreaks not shown in table 1.

or milk products were suspected as vehicles of infection. Four cases of typhoid fever occurred in a family which used raw milk, but definite proof that milk was the vehicle of infection was not obtained. In a school, 61 cases of shigellosis occurred under conditions which suggested that milk was contaminated by a student assistant in the cafeteria. Λ sour cream sauce was considered to be the vehicle of infection in 20 patrons of a restaurant who developed gastroenteritis, but no laboratory specimens were available for examination. Cheese used in preparation of a food, and from which a gram-positive coccus was isolated, was regarded as the source of infection in a family outbreak of gastroenteritis.

Other Foodborne Outbreaks

As in the past few years, food other than milk and milk products accounted for the vast majority of the outbreaks reported. As shown in table 2, there were 234 outbreaks reported in 32 States, the District of Columbia, and two Territories. In these outbreaks, 11,704 cases were reported, compared with 9,914 cases in 194 outbreaks for 1953. The foods most frequently incriminated were turkey, custardfilled pastries, and ham, followed by chicken and potato salad. Foodborne outbreaks of Salmonella and Shigella types of infection, in many instances, were traced to a carrier who prepared or assisted in preparation of food. As in previous years, evidence of improper handling of food or lack of adequate refrigeration was frequently found on investigation of foodborne disease outbreaks.

Typhoid Fever

During 1954, 9 States and the District of Columbia reported 16 outbreaks of typhoid fever with a total of 92 cases (table 3), as compared with 12 outbreaks with 75 cases in 1953. These figures do not include single-case family outbreaks. In 5 of the 16 outbreaks in 1954, carriers were found in close association with the cases. Milk was considered to be the vehicle of infection in one instance, and water was suspected in another. A cook was found to be a carrier, upon investigation of an out-

break of 21 cases in a school, and in another instance a carrier helped prepare food for a wedding reception. Twelve guests developed typhoid fever following the reception. The probable source of infection of an outbreak in a mining town was water from a worked-out section of a coal mine which was used to supplement the usual water supply from a drilled well. All of the cases occurred in the area receiving the untreated mine drainage. Raw milk, handled by a carrier, was suspected as the vehicle in another outbreak.

The person who developed the initial case in a small outbreak had been swimming daily in a stagnant pool of water and had eaten crayfish from the pool. Two additional cases developed in family associates of the first case. Five cases of typhoid fever developed in two families, after one of them had returned from a visit in Mexico. Spread appeared to be by contact among the members of the two families.

Salmonellosis

Reports of 26 outbreaks of salmonellosis were received from 12 States and 1 Territory in 1954. While the number of outbreaks is only 5 more than the 21 reported for 1953, the number of cases (1,164) associated with them were more than double the 533 given for 1953. Of the total cases reported in 1954, 1,090 cases in 22 outbreaks were associated with food. Three large outbreaks, in which 100 or more cases developed, were reported during the year. one State, 350 cases occurred among a group of church members who had eaten a turkey dinner. Eleven of 25 food handlers were found to harbor a Salmonella organism following the outbreak. In another outbreak, 100 cases occurred in a community after residents had eaten pork which had been roasted and packaged in what appeared to be unsanitary con-The other large outbreak occurred ditions. among pupils in four schools participating in hot-lunch programs. The schools were served from a central kitchen, and it is believed that the food was contaminated by a carrier, although none was found. Two outbreaks resulted from milk products, and in one outbreak contact with chicks was regarded as the probable source of infection. Chicks given away at Easter were found to harbor S. typhimurium.

In one outbreak, the vehicle of infection was watermelon which was found to contain a Salmonella organism (3). It was demonstrated that the melons had been contaminated in the process of cutting in a market. The source for many outbreaks was not definitely established, but in 11 outbreaks a carrier was found or suspected.

Ten types of Salmonella organisms were isolated from stool specimens of cases and/or carriers, or from food. S. typhimurium was the most frequently isolated. Other types reported were S. newport, S. bredeny, S. oranienburg, S. montevideo, S. munchen, S. enteriditis, S. tennessee, S. panama, and S. sendai-miami.

Shigellosis

Outbreaks of shigellosis were reported by 10 States (table 3). All but 2 of 19 outbreaks were in schools (9), institutions (6), and hospitals (2). The exceptions were outbreaks in a slum housing area and a transient labor camp. The mode of spread of the latter 2 outbreaks were similar, in that washing facilities were common to several families. The spread was probably by person-to-person contact which was favored by a lack of personal cleanliness. A large outbreak involving 234 cases in a school also was associated with fecal contamination. The initial cases probably resulted from children playing in water contaminated with sewage following heavy rains which had caused an overflow from sewers in a poor section of the community.

Carriers were discovered in six outbreaks in which food was the vehicle of infection. In two other outbreaks of shigellosis, the vehicle of infection was not determined, but the presence of carriers was suspected. In an outbreak of 61 cases which occurred in a school, the investigation revealed that a student assistant, subsequently found to be carrying *Shigella* organisms, was using a bad technique in handling milk and could easily have contaminated it. However, other unsanitary conditions were also found in the school.

Most of the outbreaks (11) were from Sonne

types of organisms. Seven were flexneri types, and one was a paradysenteriae.

Staphylococcal Food Poisoning

The number of reported outbreaks of staphylococcal food poisoning has been increasing continuously during the past few years, and it is likely that this is due, in part, to better reporting.

Staphylococcus aureus was isolated in 23, and Staphylococcus albus in 3 of the 97 outbreaks listed in this category. The type of etiological agent was not established in many of the remaining outbreaks because there was no food available for laboratory examination. Only a few of the food handlers yielded staphylococci on examination of throat swabs or material from lesions on exposed surfaces.

Lack of refrigeration and improper food handling practices were considered frequently to be contributing factors.

Botulism

Eight outbreaks of botulism were reported in 1954. In three of these, the organism was identified as type A. Five of the outbreaks resulted from home canned foods—peaches, okra, beets, and asparagus. The vehicle of infection was not found for one outbreak, and a glass-packed pork product manufactured by a local company was responsible for another. All unused lots of the pork were recalled, and no additional cases have occurred. Botulinus toxin was demonstrated among the recalled lots. Investigation revealed unsanitary conditions and a faulty process at the plant.

Other Types of Poisoning

Several types of poisoning were reported during 1954. Poisoning following the eating of fish was reported in three groups of persons. Each outbreak was described as scrambroid fish poisoning, a type of intoxication which is due to the production of a histaminelike substance resulting from bacteriological action on the flesh of fish.

Poisoning was reported in five persons who ate mussels taken from the ocean during the season when these shellfish are known to contain toxic substances.

Two cases of poisoning were reported following consumption of tree tobacco (*Nicotiana glauca*).

Three outbreaks of chemical poisoning were reported. One outbreak of 160 cases followed the drinking of an acid fruit juice which had been stored overnight in a galvanized container. Another outbreak followed consumption of a soft drink which, on laboratory examination, revealed the presence of arsenic. Parathion poisoning in 10 laborers living in a migrant labor camp was suspected. One patient had signs of central nervous system involvement, but normal cholinesterase blood levels were found in all patients.

Trichinosis

Six outbreaks of trichinosis were reported in 1954 as compared with the 13 for 1953. The total (53) cases for 1954 was also similar to that (40) reported in 1952. In 1953, one large outbreak associated with infected hogs accounted for 73 cases, while the largest outbreak in 1954 involved 17 persons who ate sausage from two infected hogs which had been butchered by a friend. Three other outbreaks in 1954 were associated with pork products, and one was from the ingestion of bear meat. In one instance, grain fed hogs were implicated. The source of the infection was probably rats observed on the farm where the meat was obtained. In one State, some meat markets were found to be grinding beef without adequately cleaning grinders after grinding pork products. This practice may have resulted in at least one case. In each of the five outbreaks reported in 1954, examination of meat specimens revealed the presence of Trichinella.

Gastroenteritis

In 63 of the 103 outbreaks of gastroenteritis reported in 1954, there was not sufficient information from epidemiological reports to classify the etiological agent. For more than half of these, no food was available for laboratory tests, and for a large number no pathogens were isolated from the suspected food. For a few, no

bacteriological examinations were performed. Five of these outbreaks were probably of viral origin and may have been spread by person-toperson contact. An additional 13 outbreaks involving 489 cases were associated with various organisms. In three outbreaks, streptococci were isolated, and in a few, gram-positive cocci were isolated. In other outbreaks enterococci, Escherichia coli, paracolon and proteus organisms were isolated.

Of the total of 103 outbreaks, 68 resulted from food, 5 from water, and 3 from milk; for 27, the source was not found. Three outbreaks were associated with milk products. One waterborne outbreak was caused by drinking water that had been contaminated with flood waters.

A large proportion of the gastroenteritis outbreaks resulted from improper handling of food in restaurants and cafeterias. Some occurred in picnic and labor groups following the consumption of food left unrefrigerated for hours in the open. Many outbreaks were in private homes and schools.

In 1953, a number of outbreaks were associated with Government surplus stock turkeys. Although turkeys were responsible for a large number of outbreaks in 1954, none implicated Government surplus stock.

A large outbreak involving approximately 50,000 cases is not shown in table 3. This outbreak occurred in the general population of a metropolitan area. Extensive laboratory examinations were made, but the etiological agent was not determined.

Miscellaneous Outbreaks

Information was received regarding 10 outbreaks of diarrhea of the newborn which affected 140 infants and resulted in 27 deaths. In one instance, cases followed the return of a nurse who had been off duty 2 days with diarrhea. Two outbreaks occurred concurrently with numerous cases of diarrhea in the communities in which the hospitals were located. Overcrowding in the nursery for the newborn was considered as a contributing factor in one outbreak. Of the 27 deaths, 12 were reported to be in premature infants. In two outbreaks, *E. coli* were found in stool specimens.

Only two instances of laboratory infections were reported. In one, seven cases of endemic typhus fever probably resulted from inadequately sterilized equipment. A case of diphtheria developed in a laboratory technician who accidentally spilled a suspension of infectious material on her hands.

Information on 5 outbreaks of diphtheria was received from 4 States. Sixty-nine cases were reported, of which 25 occurred in and around a small town of 375 inhabitants. This was an unusually high incidence for an area of that size. In one State, the disease appeared among persons in older age groups, especially those housed in cheap transient hotels.

Streptococcal infections were reported by only two States. In one, there were 5 cases in a camp; in the other, 3 schools were involved and approximately 400 pupils developed the disease. In all instances, the disease was spread by personal contact.

An outbreak of arthropod-borne encephalitis was reported in the Rio Grande Valley of Texas during August and September 1954. It is estimated that about 600 cases occurred. The St. Louis type of virus was isolated from two fatal cases, and serologic tests also indicated this type of infection. In California, 96 laboratory confirmed cases of St. Louis encephalitis and 22 cases of western equine type of infection were reported in July through September. In 1952, 375 laboratory confirmed cases of western equine encephalitis and 45 cases of St. Louis type of infection were reported. In addition to these outbreaks, an unusually large number of meningoencephalitis cases were reported in Oregon.

Marsh gas poisoned 11 persons of a crew who were constructing a sewer line through marshy land. Poor ventilation in the trench permitted a sufficiently high concentration of gas to cause symptoms in some workers.

Epidemiological information was received on 34 outbreaks of infectious hepatitis. The infection in most of these outbreaks was considered to have been spread by person-to-person contact. No common source—such as food, milk, or water—was found in any of these outbreaks. Twenty-five of the total outbreaks occurred in schools and institutions, particularly institutions housing mentally ill patients.

Three outbreaks were among persons of low-income status. While the number of cases reported in epidemics was 1,315 in 1954, compared with 1,578 for 1953, the total numbers of cases reported weekly for 1953 and 1954 were 33,382 and 49,739, respectively. This indicates that many outbreaks probably were not investigated or reported.

The only outbreak of locally acquired infection reported was a group of four cases of malaria in one family. A high incidence of Coxsackie virus infections was reported in various parts of a State, and group B virus was isolated from many of the cases. Several hundred cases of an infection characterized by a purplish maculoannular rash was reported in one area, the etiology of which was not determined. Numerous reports on the epidemiological investigation of tularemia cases were received, all of which followed exposure to rabbits. Other reports included information on cases of ringworm, psittacosis, scrub typhus, mycotic infections, leprosy, Rocky Mountain spotted fever, brucellosis, anthrax, and leptospirosis.

Epidemiological information on 9 cases of human rabies occurring in 1954 were received, 3 from 1 State, and 1 each in 6 different States.

Only 2 instances of plague infection were reported in continental United States, and 2 in Hawaii. Each of these represent an isolation from rat fleas.

Information on 8 suspect cases of smallpox in 6 States was received. However, acceptable criteria for confirmation of diagnosis were lacking in each of them.

Although some outbreaks of poliomyelitis were reported, they are not included in this report.

There were no widespread outbreaks of influenza in the United States in the winter of 1953-54. Its sporadic occurrence has been reported by Davis (4).

Summary

This report summarizes the outbreaks and epidemiological information on unusual occurrences of diseases in the United States in 1954. Since outbreaks from common sources—food and water—appear to be brought more com-

monly to the attention of public health officers and to be investigated, reports on these outbreaks constitute a large part of the material presented here.

The relative frequency of the various types of disease outbreaks, by States, and the frequency of foodborne and waterborne disease in different groups of persons are discussed.

There is reason to believe that the reports received represent only a fraction of the outbreaks that actually occurred. Reports appear to be relatively complete in some States and poor or nonexistent in others.

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