Transport of Streptococci on Filter Paper Strips

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PROBABLY the most prevalent bacterial pharyngitis of humans today is that caused by beta hemolytic streptococci of group A. The clinical diagnosis of such an upper respiratory infection, although reasonably good in some instances (*1*), depends on a clinical picture which is not characteristic in all age groups (*2*, *3*). Adjunct laboratory aid, by isolation of the causative organism, is therefore valuable in determining and evaluating therapy and its duration and is a necessity for intelligent control and prophylaxis. The latter measures apply not only to the streptococcal infection, but even more importantly, to the nonsuppurative sequelae of rheumatic fever (*4*) and acute diffuse glomerulonephritis (*5*).

Procedures for isolating bacteria are not available to the average physician or to health officers in some areas. Even when these pro-

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The study was supported in part by a grant from the D. A. Beattie Fund. (Manuscript received for publication October 7, 1959.)

538772—60——5

cedures are available, methods of transporting pharyngeal materials to a laboratory are cumbersome and do not always assure the arrival of viable bacteria. To obviate some of these difficulties, a method for mail transport of throat swabbings on sterile filter paper in enclosed kits was recently developed (*6*). The method appears reliable for use in the diagnosis of group A streptococcal infection: beta hemolytic streptococci, 80 percent of which were of group A (*7, 8*), were recovered by culture after 2 to 10 days in transit on the filter paper strips (FPS). The results of testing more than 2,500 children compared favorably with those obtained from immediate culturing, by usual techniques, of simultaneous paired control swabs.

The present study was made to test further the FPS method for reliability, reproducibility, effects of transport distance, and other factors on the isolation of beta hemolytic streptococci from pharyngeal swabs.

Clinical Material

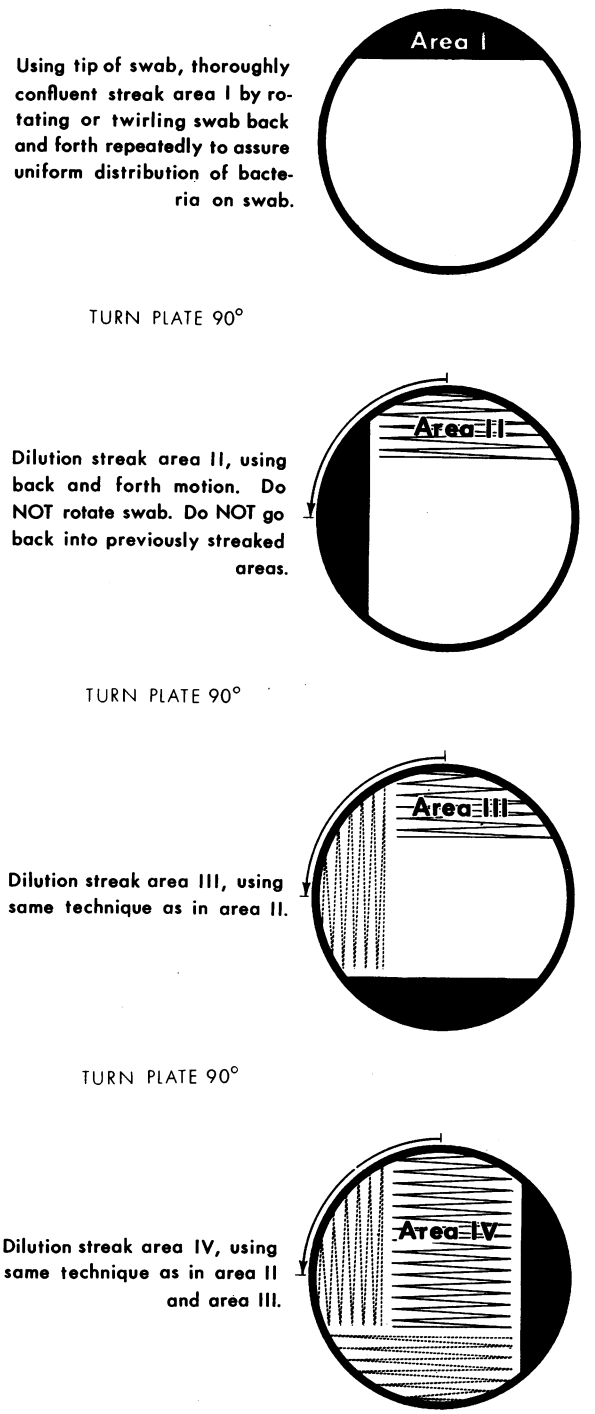
A total of 400 paired throat swabbings were supplied by three source laboratories, W, X, and Z, located in California. Laboratories W and X obtained 264 of the paired swabbings from patients in the closed population groups at a private pediatrics office, at the outpatient pediatrics clinics, and in a cooperating county health department (*7*).

The remaining paired swabbings were supplied from a field trial in which more than 500 paired throat cultures were obtained from children or their parents in less than 3 hours. This field trial was conducted at an open county clinic during a 1-day Salk vaccine inoculation program. The microbiologists on temporary assignment from laboratory Z found that the 500 paired cultures were not obtained by the method proposed and the filter paper strips were not air dried 3–5 minutes. Of these 500, the first 136 controls and the paired filter paper strips are reported for comparison with data obtained by the proposed method.

Methods

To obtain paired throat cultures, simultaneous swabbing was employed. Two throat swabs were held in one hand and thoroughly rotated over the pharynx of the patient, care being taken to obtain an entirely satisfactory specimen. Without delay, one swab was dilution streaked onto 10 percent defibrinated sheep

Figure 1. Method of streaking blood agar plate



blood agar (fig. 1) which was incubated immediately at 37° C. and designated as the control culture by source laboratory W, X, or Z.

The other swab was streaked heavily back and forth onto a filter paper strip in an opened kit as described (*6*, *7*). The strip was air dried 3–5 minutes before the kit was refolded, placed in a Manila envelope, and mailed or transported to a receiving laboratory, *p*, *q*, *r*, or *s*. Two of the source laboratories in California also acted as receivers. The other receiving laboratories were in Georgia and Maryland.

After 2–10 days the filter paper strip was removed from the kit and plated (fig. 2), except for strips which were plated after 5 to 21 days by receiver *s*. In plating, the FPS was removed from the kit and placed inoculum side down on the blood agar surface without prior treatment of any kind. Before the plate was inverted for incubation, the plated strip was inspected to see that it had absorbed moisture from the medium. Any part of the strip which was dry was pressed gently against the surface of the agar until it appeared wet. After 6 hours' incubation at 37° C., the filter paper strip was removed from the primary plate and placed inoculum side down on a second or replica plate. Both replica and primary plates then were incubated 18 hours at 37° C., making a total of 24 hours for the primary plate.

The visual reading was then made with the strips removed so that isolates could be picked. If the growth was heavy, only the primary plate had discrete beta hemolytic colonies, the replica plate having confluent lysis. Occasionally, if growth was very light the primary plate had no lysis, but this finding was exceedingly rare. Plating was on 10 percent defibrinated sheep blood agar in laboratories *p* and *r* and on 3–5 percent defibrinated rabbit blood agar in laboratories *q* and *s*. Three of the laboratories were relatively unfamiliar with the FPS technique.

Cultures from paired swabs were designated by number. In order to eliminate bias, the controls and filter paper strips were matched as pairs only after final reports were received. Each of the four receiving laboratories was sent 34 inoculated FPS kits by each of three source laboratories, 408 in all. Eight kits were reported lost, leaving 400 paired cultures in the study. Of each set of 34 kits, 17 were estimated to be negative and 17 positive on the basis of preliminary visual reading of the control cultures at the source laboratory.

From all positive cultures (control and filter paper strip) isolates were identified by serologic grouping (*9*). At two laboratories (*q* and *s*) grouping was done with antiserums from the Communicable Disease Center, Public Health Service, Chamblee, Ga. All other grouping was done by laboratory *r* with antiserums from a biological supply company (Difco).

Two statistical estimates on pooled data are presented, the difference between two proportions and twice the standard error of the difference between these proportions. The difference between the two proportions is considered significant only if it is more than twice the standard error (*10*).

Recovery by Streptococcal Group

Group A streptococci were isolated from control cultures and cultures of filter paper strips.

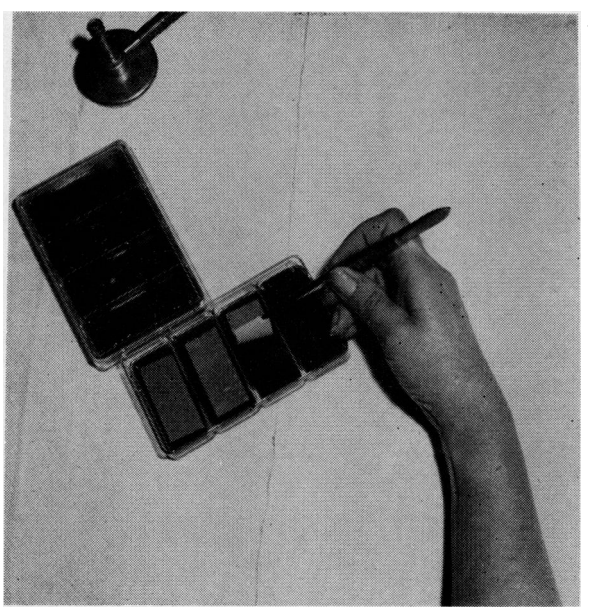


Figure 2. Plating a filter paper strip

The filter paper strip is placed, inoculum side down, on the surface of the blood agar medium. The strip absorbs moisture from the medium and is plated directly upon removal from the kit without treatment of any kind.

The percentage recovery was the same, although controls were plated at once from throat swabbings, while inoculated FPS were in transit or were held 2–17 days prior to culturing. Of the 206 group A strains recovered, 106, or 52 percent, were from controls, and 100, or 48 percent, were from filter paper strips (table 1). Basing the percentage estimate for group A on the 400 cultures reported by receiving laboratories, recovery was 25 percent from FPS and 26.5 percent from controls. These percentages are not different; on pooled data the difference between proportions equaled 0.015, and twice the standard error equaled 0.062.

The transit and holding period prior to culture of the 100 filter paper strips from which group A streptococci were isolated was 2–17 days (table 2). Within the designated parameters (2–10 days holding time) of the study, 87 group A streptococci were isolated from FPS and 88 from control cultures plated immediately, a striking record. Due to the small numbers plated each day and to the finding that one set of 34 filter paper strips had no growth on culture after a transit and holding period of 15 days, statistical estimates are not considered valid for percentage recovery based on a single day or on time periods beyond the anticipated 2–10 days before plating (table 2).

The percentages in table 3 show that group A streptococci survived equally as well when the FPS were shipped 2,500 or 3,000 miles into Maryland or Georgia as when shipped 400

Table 1. Number of positive cultures, controls and paired filter paper strips, by streptococcal group

Streptococcal group and receiver	Source W		Source X		Source Z		Total controls	Total FPS	Total
	Controls	FPS	Controls	FPS	Controls	FPS			
Group A									
p	12	9	12	17	11	12	35	38	73
q	11	8	8	8	0	3	19	19	38
r	14	12	5	7	8	2	27	21	48
s	10	11	12	11	3	0	25	22	47
Total	47	40	37	43	22	17	106	100	206
Percent							52	48	100
Group B									
p	1	1	0	1	3	0	4	2	6
q	2	3	1	0	0	0	3	3	6
r	0	0	0	0	0	0	0	0	0
s	0	0	0	0	1	0	1	0	1
Total	3	4	1	1	4	0	8	5	13
Percent							61	39	100
Group C									
p	3	2	1	1	7	1	11	4	15
q	3	1	1	2	0	0	4	3	7
r	1	0	4	1	7	3	12	4	16
s	2	0	0	0	6	0	8	0	8
Total	9	3	6	4	20	4	35	11	46
Percent							76	24	100
Group G									
p	1	0	1	1	4	4	6	5	11
q	1	1	0	0	0	0	1	1	2
r	2	3	4	2	2	2	8	7	15
s	5	2	2	1	2	0	9	3	12
Total	9	6	7	4	8	6	24	16	40
Percent							60	40	100
All groups	68	53	51	[1] 53	54	27	173	[1] 133	[1] 306

[1] Includes one nongroupable strain.

Table 2. Number of isolations of streptococci by group in relation to holding and transit time

Number of days FPS held	Group A isolations			Groups B, C, and G isolations		
	Controls positive	FPS positive		Controls positive	FPS positive	
		Number	Percent		Number	Percent
1	0	0	----------	0	0	----------
2	7	6	86	1	0	0
3	10	8	80	3	[1] 2	67
4	10	10	100	5	5	100
5	4	3	75	5	3	60
6	32	30	94	30	15	50
7	12	15	125	3	3	100
8	6	6	100	2	2	100
9	3	6	200	1	0	0
10	4	3	75	1	1	100
Total 2–10 days	88	87	99	51	30	59
11	5	4	80	2	0	0
12	4	4	100	2	1	50
13	1	1	100	0	0	----------
14	2	2	100	0	0	----------
15	4	[2] 1	25	9	[2] 0	0
16	1	1	100	0	0	----------
17	1	0	0	3	1	33
Total 2–17 days	106	100	94	67	[1] 33	49

[1] Includes one nongroupable strain.
[2] No growth for one set of 34 kits, paired with controls having 3 group A and 9 B, C, or G isolates.

miles or less from the source laboratories in California. Agreement for group A isolates was 86–100 percent among all receivers (*p*, *q*, *r*, *s*) and all sources (W, X, Z), percentage estimates being based on the total negative controls. For negative controls, percentage figures below 100 percent indicate that group A streptococci were isolated from the matched filter paper strip cultures. For positive group A controls, laboratories receiving FPS from sources W and X were in approximate agreement, with a record of 74–86 percent recovery (table 3). This 74 to 86 percent range in percentage recovery is no greater than would be anticipated from prior investigations of throat flora (*11,12*). In the investigations cited, variability was so great that it was deemed impossible quantitatively to interpret the growth on throat cultures.

In contrast to the agreement with sources W and X, the percentage agreement for positive group A controls varied from 0 to 91 percent among laboratories receiving FPS from source Z. These filter paper strips were not obtained under the conditions described for the study nor were they air dried. The set of 34 kits sent receiver *q* had no paired positive controls, the set sent receiver *p* was estimated to consist only of positives, and the 34 kits sent receiver *s* showed no growth when the FPS were plated at 15 days, or 5 days after the designated holding period of 2–10 days.

There was remarkably close agreement (100 isolations from filter paper strips, 106 isolations from controls) in the recovery of group A streptococci, regardless of holding time, source, location of receiver, and previous use of the technique (tables 1 and 2).

Groups B, C, and G beta hemolytic streptococci, on the other hand, apparently have been recovered in significantly greater percentages from the control than from FPS cultures (tables 1 and 2), but inspection of the data results in reservation of an opinion. Within group C, only about 25 percent and within group B or G only about 40 percent of the streptococci isolated were from filter paper strip cultures (table 1). However, a review of

the original records shows that 46 percent (31 of 67) of all the FPS paired with groups B, C, and G positive controls were from source Z and were not air dried. For this reason tabulation by holding time before plating does not yield additional useful information on these groups (table 2). Insufficient data were obtained in the study to support a valid conclusion on the efficiency of the filter paper strip technique for use in recovery of group B, C, or G streptococci. Additional study is warranted.

Recovery by Source and Receiver

Sources W, X, and Z. Of all paired cultures 57 percent, or 227, were negative controls and 43 percent, or 173, were positive controls (table 4). There were 306 positive isolates, of which 33 percent, or 133, were from cultures of filter paper strips. This is significantly less than the percentage of positive controls (difference between proportions on pooled data equaled 0.100 and twice the standard error equaled 0.067). Interpretation of this difference is complicated by conditions which obtained at source Z.

The pattern of agreement of reports on matched filter paper strip and control cultures for the entire study (table 5) is somewhat similar to the pattern of agreement of group A isolation (table 3). For the entire study there is 81–100 percent agreement for FPS reports matched with negative controls. The 81 percent indicates that 7 of the filter paper strips from which positive cultures were obtained were matched with negative controls (sources W and X, receiver *p*, table 5).

Sources W and X compared with Z. For positive controls the percentage agreement was equivalent for sources W and X regardless of receiver (74–81 percent), but this is not the case for source Z (0–64 percent, table 5). There is no difference between the percentage of positive isolates from air dried filter paper strips (40 percent) and from controls (45 percent, table 4, sources W and X). The difference between proportions on pooled data equaled 0.05 and twice the standard error equaled 0.086.

There is a difference in recovery if the inoculated FPS are not air dried. For instance, from source Z percentage recovery from strips is only half that from positive controls, 20 and 40 percent respectively (table 4).

Table 3. Isolation of group A beta hemolytic streptococci from filter paper strips and controls by source and receiver

Source and receiver	Negative controls [1]				Positive controls [2]			
	Negative FPS	Positive FPS	Total	Percent agreement	Positive FPS	Negative FPS	Total	Percent agreement
Sources W and X								
p	38	6	44	86	20	4	24	83
q	43	2	45	96	14	5	19	74
r	45	3	48	94	16	3	19	84
s	40	3	43	93	19	3	22	86
Total	166	14	180	92	69	15	84	82
Source Z								
p	21	2	23	91	10	1	11	91
q	31	3	34	91	0	0	0	----
r	26	0	26	100	2	6	8	25
s	[3] 31	0	31	[3] 100	[3] 0	3	3	[3] 0
Total	109	5	114	96	12	10	22	55
Total W, X, and Z	275	19	294	94	81	25	106	76

[1] Negative controls=no streptococci isolated or streptococci other than group A.
[2] Positive controls=group A streptococci isolated.
[3] No growth.

Table 4. Number of negative and positive cultures for beta hemolytic streptococci by source and receiver

Source and receiver	Total paired specimens [1]	Negative		Positive	
		Control	FPS	Control	FPS
Source W					
p	34	17	22	17	12
q	34	17	21	17	13
r	34	17	19	17	15
s	34	17	21	17	13
Source X					
p	34	20	14	14	20
q	30	20	19	10	[2] 11
r	33	20	23	13	10
s	31	17	19	14	12
Total	264	145	158	119	[2] 106
Percent	100	55	60	45	[2] 40
Source Z					
p	34	9	17	25	17
q	34	34	31	0	3
r	34	17	27	17	7
s	34	22	[3] 34	12	0
Total	136	82	[3] 109	54	27
Percent	100	60	[3] 80	40	20
Total W, X, and Z	400	227	[3] 267	173	[2] 133
Percent	100	57	[3] 67	43	[2] 33

[1] The total of the paired specimens equals the sum of the negative and the positive controls.
[2] Includes one nongroupable strain.
[3] No growth from one set of 34 kits, FPS plated at 15 days.

Moisture, Drying Surface, and Temperature

Two previous studies indicate that a greater number of recoveries of beta hemolytic streptococci can be obtained upon culturing filter paper strips, air dried after inoculation with these organisms in throat swabbings, than can be made from similarly inoculated strips which are not air dried before a 2–10 day transport period (*6,7*). In these two studies the effect of temperature was not explored.

Working in Zurich, a team of three investigators (*13*) found recovery of *Streptococcus pyogenes* following drying was improved if the relative humidity was very low or zero. A room temperature of 20° C. favored recovery, whereas temperatures of 30° and 37° C. decreased the colony count on culture following drying. The three investigators demonstrated that, after drying, 10 to 80 times as many streptococci remained on a glass coverslip as were washed free by 4 minutes of shaking followed by 10 minutes of soaking in the rinse water. This difficulty in removal of organisms from glass is comparable to removal from cotton (*14*). The successful use of filter paper strips for transport of streptococci is in conformity with the finding that viability and recovery of streptococci depend not only on drying but on inoculating on a rough surface and culturing the transport material itself rather than streaking or rinsing it (*13*).

Further documentation of the successful recovery of group A streptococci from filter paper strips, upon culture after a 2–10 day transit and holding period, is unnecessary. The equivalence of control and FPS techniques is evident in all group A tabulations.

Summary

The filter paper strip technique for transport and holding of throat swabbings for subsequent culture of beta hemolytic streptococci further was tested by investigators in five collaborating laboratories. Of these five, located in Georgia, Maryland, and California, the three

Table 5. Isolation of beta hemolytic streptococci from filter paper strips and controls by source and receiver

Source and receiver	Negative controls				Positive controls			
	Negative FPS	Positive FPS	Total	Percent agreement	Positive FPS	Negative FPS	Total	Percent agreement
Sources W and X								
p	30	7	37	81	25	6	31	81
q	34	3	37	92	[1] 21	6	[1] 27	[1] 78
r	35	2	37	95	23	7	30	77
s	32	2	34	94	23	8	31	74
Total	131	14	145	90	[1] 92	27	[1] 119	[1] 77
Source Z								
p	8	1	9	89	16	9	25	64
q	31	3	34	91	0	0	0	----
r	17	0	17	100	7	10	17	41
s	[2] 22	0	22	[2] 100	[2] 0	12	12	[2] 0
Total	78	4	82	95	23	31	54	43
Total W, X, and Z	209	18	227	92	115	58	173	66

[1] Includes one nongroupable strain.
[2] No growth.

in California served as source laboratories. Using two swabs for simultaneous swabbing on each patient, each source laboratory immediately inoculated a control culture and a paired FPS. Each source sent a set of 34 inoculated filter paper strips to each of four receiving laboratories. Of the FPS in each set, one-half were estimated to be positive on the basis of preliminary reading of controls. In all, 400 filter paper strips were received and held for variable time periods. From both controls and filter paper strips 306 strains of beta hemolytic streptococci were isolated, 305 of which were groupable. The findings were tabulated by streptococcal group, percentage agreement by positive and negative controls, and by source and receiver as well as by time held prior to plating.

The filter paper strip technique proved to be highly satisfactory for transport and holding of group A streptococci. Of the 206 strains of group A streptococci isolated, 106 were from controls and 100 were from FPS. This record of recovery, 52 percent from controls plated at once and 48 percent from filter paper strips held or in transit 2–17 days before culture, is remarkable in view of the geographic distribution of receiving laboratories and the fact that three of four receiving laboratories were relatively unfamiliar with the technique. For group A isolates, source and receiver achieved equally good percentage agreement with respect to negative controls and to recovery from filter paper strips air dried after inoculation.

Data on percentage recovery of groups B, C, and G streptococci by the filter paper strip technique are inconclusive. Half of the FPS paired with controls positive for B, C, or G were not air dried and one-sixth were plated at time intervals beyond the 2–10 day period designated for the study. Of 100 B, C, and G isolates, 33 percent were from FPS and 67 percent from controls. Any conclusion as to recovery is complicated by the conditions which obtained for those filter paper strips cultured and matched with controls positive for these groups of beta hemolytic streptococci, and additional studies are warranted.

Attention is directed to the necessity for adhering strictly to the described technique for throat swabbing and for handling filter paper strips. Because of the possible deleterious ef-

fects of high humidity or high temperature air drying is essential, even if a longer period is required, but air drying will not insure satisfactory recovery of streptococci if the swabbing is unsatisfactory.

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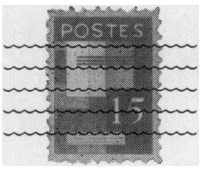
Use of Heptachlor on Crops Banned

The use of the pesticide heptachlor under conditions which leave residues on harvested crops was prohibited on January 19, 1960, by the Food and Drug Administration, through the rescinding of a regulation permitting small residues on harvested food and forage shipped interstate.

New scientific data have shown that in addition to residues of heptachlor, a breakdown product, called heptachlor epoxide, is present after heptachlor treatments, and that residues of epoxide appear in meat and milk when forage containing it is fed to experimental meat and dairy animals. No residues of heptachlor itself have been found in meat or milk. How much epoxide may be present under varying conditions and the toxicity of the substance have not been determined. No action will be taken against crops already treated within previous regulations.



INTERNATIONAL MAIL POUCH

Regionalization in Paraguay

The 7-month course to train auxiliary nurses in Encarnación was the first fruit of our efforts to demonstrate regionalization. It was the first full-time training for health personnel ever offered outside the capital of Paraguay. The 16 students will complete 1,050 hours of instruction and supervised practice. This is to be a permanent program with one such group being prepared in Asunción, the capital, and other groups in three regional health centers.

— ROBERT T. SCHOLES, M.D., *chief, health and sanitation division, U.S. Operations Mission, Paraguay.*

Cost Cutting

Mounted on motorcycles, two sanitary inspectors did the work of five by completing in 7 months their routine inspections as well as special survey work over an area of 2,000 square kilometers of Surinam. The motorcycles cost about half the salary of a single inspector.

—ROBERT BREWER, *former acting sanitary engineer, U.S. Operations Mission, Surinam.*

Santa Teresa

The new health center in Santa Teresa, Nicaragua, has sparked civic improvements. Even before all the equipment was installed, other changes were planned: a new marketplace and park, and improved water supply and garbage disposal systems. The mayor, the village priest, and the school authorities are most cooperative, and the villagers themselves are enthusiastic.

The staff of the Santa Teresa center and the second new center in Diriá were given an orientation course since some of them are inexperienced in this kind of health work. Their responsibilities are heavy because they are the only medical units in that part of Nicaragua. They designed a basic medical data form which was used to gather information house-to-house in the two communities. The survey's results will serve as a baseline for evaluating the effectiveness of the rural health centers.

Perhaps the most important task they face is to reduce the incidence of infestations of intestinal parasites. Of the first 100 people examined at the Santa Teresa center, 98 were found to be infected, some with as many as four different varieties of parasites. Gastroenteritis is the principal cause of death in Nicaragua.

The supervising sanitarian, with the sanitary engineer consultant and the Ministry of Public Health, worked out a plan for this rural area's excreta disposal. Sanitary latrines combined with the education efforts of the center's staff is expected to show definite results shortly.

—PATRICK J. SULLIVAN, *former chief, and* MAHLON H. HAWORTH, *former business manager, health and sanitation division, U.S. Operations Mission, Nicaragua.*

Promotion

One of our graduates has become sanitary foreman of the main construction camp of the Brokopondo dam project in Surinam. Two and a half years ago he started to work for us as a day laborer and his technical skill was limited to handtools and driving a car.

After working with the sanitary engineer, he can use a slide rule like an expert, perform chemical and bacterial tests for water treatment, assemble portable purification plants, and put into operation a complete water treatment plant as well as training its staff.

—ROBERT BREWER, *former acting sanitary engineer, U.S. Operations Mission, Surinam.*

Diagnosis of Streptococcal Infections

It has been estimated that about 2 million people living in the United States today have already had, or will develop, rheumatic fever at some time during their lives. Of these, more than 500,000 will probably die because of the rheumatic process or some complication developing directly from it.

Rheumatic fever most often strikes children between the ages of 5 and 15, and the resulting rheumatic heart disease causes about 50 percent of all heart disease in this age group. It is estimated that in the 5- to 19-year age group in this country there is a current annual incidence of about 60,000 cases of rheumatic fever. About half of these are recurrences, and the remainder are first attacks. It is the recurrent attacks of the fever which cause the actual damage to the heart itself.

While the past 40 years have shown a marked reduction in rheumatic fever mortality, the problem is far from solved. In 1957, rheumatic fever and rheumatic heart disease combined to cause the deaths of about 20,000 in the United States. However, by the application of what is currently known about these diseases, some real progress has been made.

What causes rheumatic fever is not fully understood, but research has shown that cases usually begin with a streptococcal infection—primarily of the throat. The specific pathogen has been identified as group A beta hemolytic streptococci.

Antibiotics can eliminate streptococci, and effective prophylaxis can prevent the secondary attacks of rheumatic fever. Indeed, penicillin prophylaxis appears to be accelerating the decline of rheumatic fever.

First attacks of rheumatic fever can be prevented through prompt treatment of streptococcal infection which entails the use of an antibiotic (preferably penicillin) for a period of 10 days. But therein lies the physician's dilemma. A "strep throat" cannot always be distinguished clinically from sore throats caused by other organisms, but every "strep throat" is a potential case of rheumatic fever.

Since there are many objections to indiscriminate penicillin therapy, the physician usually considers it advisable to delay treatment for 2 to 3 days until the causative agent can be identified by a throat culture. He is repeatedly forced to decide whether to postpone treatment until a definite diagnosis is made, and perhaps save the patient some money, as well as lower the risk of a future penicillin sensitivity, or to treat the infection with penicillin immediately on the chance that it is "strep."

To date, prevention of the first attack has been almost impossible to achieve, since there was no quick, certain way for the physician to identify streptococci. Now the fluorescent antibody technique has provided a means for overcoming this obstacle.

The fluorescent antibody test works this way: Antibodies for a specific disease are stained with a fluorescent dye and then dropped onto a slide which has been smeared with material taken from the patient whose disease is to be diagnosed. If the smear contains a germ for which the antibody is specific, the antibody will immediately attach itself to the germ. When the liquid containing the antibody is washed off the slide, the antibody and the germ will remain, and, under ultraviolet illumination, a greenish fluorescence resembling minute neon lights will show up on the slide. If the germ is not present in the specimen, the antibody will wash off the slide along with the liquid that contained it.

The use of the technique by State laboratories as a diagnostic aid to physicians must necessarily be a gradual, natural growth. Lack of trained personnel is only one of many problems connected with initiating such a service program in a State or community. Other difficulties involve submission and transportation

Coons Receives Lasker Award

A major contributor to progress in public health, Dr. Albert Coons was presented with the Lasker Award at the 1959 meeting of the American Public Health Association in Atlantic City, N.J., in October.

Dr. Coons developed the fluorescent antibody test in the early 1940's with associates at the Harvard School of Medicine, where he is continuing studies along these lines. He has been a career investigator with the American Heart Association since 1953.

of specimens from the physician's office to the laboratory, a system for reporting the results back to the physician, and the maximum number of tests that can be performed by a single technician in any given period. In addition, the necessary equipment—the ultraviolet light source, filters, and special microscope—is relatively expensive and not in plentiful, immediate supply.

Through the following actions, however, the Public Health Service is helping to extend the use of the test as rapidly as possible:

- Local personnel have been trained by the Communicable Disease Center and equipment left on indefinite loan in the areas that participated in the field tests.
- About 40 Public Health Service physicians assigned to State and local health departments held a special meeting in Philadelphia on October 27, 1959, to determine the best ways in which they could help health departments, medical societies, and heart associations throughout the country to take advantage of the new research avenues which the fast strep test has opened.
- A 2-week training course for laboratory personnel of 12 State health departments was held at the Communicable Disease Center in January 1960.
- Materials and equipment will be lent to laboratories as soon as they have personnel trained to use them.
- Financial assistance is provided through grants from the National Heart Institute for research projects and through State grants-in-aid for purchase of equipment.

Influenza Research Promoted by PHS Committee

Influenza research was encouraged by a meeting January 13, 1960, of the Public Health Service Committee of Investigators, composed of leading authorities on influenza and related diseases.

Committee members agreed to accelerate their own research during 1960 and to encourage long-range studies. All influenza research projects will receive special review at the National Institutes of Health and qualified projects will be approved rapidly.

Among subjects the committee cited as needing study were:

- Assessment of the value of vaccine given in the 1957 epidemic as to its possible degree of protection.
- The present degree of immunity of unvaccinated persons who had influenza in 1957.
- The physiological effects of influenza on cardiovascular and respiratory systems.
- The neuromuscular effects of influenza.

The Committee of Investigators was established on the recommendation of the Surgeon General's Advisory Committee on Influenza Research.

Members of the Committee of Investigators are: Dr. Robert Wagner, University of Pennsylvania, chairman; Dr. George Burch, Tulane University; Dr. Fred M. Davenport and Dr. Thomas Francis, University of Michigan; Dr. Ivan Bennett, Johns Hopkins University; Dr. George Hirst, Public Health Research Institute of the City of New York, Inc.; Dr. Maxwell Finland, Boston City Hospital; and Dr. Roderick Murray, National Institutes of Health, Public Health Service.