2. Failure to diagnose these conditions often results in harm to the pregnant patient. Helpful diagnostic points may be menstrual irregularity, dyspareunia, repeated unexplained abortion or miscarriage and repeated malposition of the fetus. Bleeding during pregnancy is not to be regarded as a casual symptom.

3. The use of two uterine sounds is most helpful in diagnosis. Uterosalpingograms yield the most complete information available. Six of my patients were so studied (roentgenograms are shown).

4. Fertility in this group is high, but miscarriage and abortion are also frequent. Our 11 patients had thirty-two pregnancies—with seventeen abortions (53 per cent). Most patients may be allowed to become pregnant but must be made to understand the potential difficulties. Efforts to correct such conditions by surgery in the interest of later pregnancy are of doubtful validity.

5. Care of the pregnancy demands general and special measures to strengthen and protect the ovular attachment. The progress of the nonpregnant horn is to be followed as carefully as possible. My experience in this connection has been of interest.

6. At delivery, operative equipment for the management of vaginal and cervical anomalies, and for cesarean section if indicated, should be immediately available. Adherent placenta, hemorrhage from faulty involution and other irregularities may characterize the third stage and early puerperium.

548 Medical Arts Building.

ABSTRACT OF DISCUSSION

DR. NORMAN F. MILLER, Ann Arbor, Mich.: Dr. Schauffler is to be commended for bringing this subject before us. The malformation is not a common one, but it occurs with sufficient frequency to merit attention, especially when one realizes that many of these patients come with a history of mismanagement due usually to misunderstanding. Some years ago I reported 54 cases of true uterus didelphys collected from the literature and 1 from our own clinic. There are three times in life when the presence of this malformation is likely to be noted. First, at adolescence, when some menstrual disturbance brings the patient for examination and the anomaly is discovered. Second, at the time of marriage, either because of dyspareunia or some other marital difficulty or in the course of a premarital examination. Third, it may be discovered by the physician during pregnancy, at the time of antepartum examination or during labor. While Dr. Schauffler's cases are mostly examples of uterus didelphys, case 7 appears to be better classified as an ordinary double uterus. In reporting these cases it would seem wiser to adhere to one type of malformation, as the type makes a difference in evaluating the incidence of complications. Generally the more extensive the malformation the higher the incidence of complication. In my experience labor was complicated, first, through interference with the presenting part; second, because of faulty power, and, third, by retention complications. Hemorrhage was not common. I subscribe to Dr. Schauffler's conservative attitude regarding the management of these cases. Sixty per cent of patients with this complication who become pregnant are likely to go to term, and 30 per cent of those who go to term have complications of some sort, the complication frequently being a minor one. Pregnancy need not be restricted in these patients. Fertility is usually not impaired and, as has been pointed out, the complications that do occur can be adequately taken care of provided the lesion is recognized. One must keep in mind that pregnancy may occur in both uterine horns. When this happens we probably have an indication for double cesarean section. Any anomaly of the lower generative tract should suggest the possibility of some malformation higher up.

DR. GOODRICH C. SCHAUFFLER, Portland, Ore.: Perhaps a psychologic factor is responsible for many of these misdiagnoses; the fact that we do not keep the condition in mind is responsible for many misdiagnoses. If we have any value in this presentation, it is perhaps a reemphasis of the simple and more available diagnostic measures. I refer specifically to the use of sounds and careful vaginal and cervical examination technic. Perhaps some of you have had the unfortunate experience of curetting a patient for therapeutic termination of pregnancy and having the patient go serenely on without terminating. We have all seen such cases and I believe that not infrequently it is the result of the invasion of an unsuspected nonpregnant horn of a double uterus. Also I believe occasionally a pregnancy in both horns may be responsible for such a condition; in fact, it has been reported more than once. Also in an elderly woman the invasion of such a double uterus for the diagnosis of cancer may give false results, owing to the revision of the wrong uterus by the cure.

SULFATHIAZOLE FOR ACUTE DIARRHEA AND DYSENTERY OF INFANTS AND CHILDREN

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AND
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STATISTICAL ANALYSES BY MRS. ESTELLE W. BROWN AND RUTH BENNETT, M.D.
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Previous studies on mice by one of us (M. L. C.) [1] showed that one dose of 2 mg. of sulfathiazole or sulfapyridine administered by stomach tube three hours after the animals were infected with Shigella paradysenteriae (dysentery bacilli) resulted in survival of all mice inoculated with two minimum fatal doses, survival of the majority of mice inoculated with 100 minimum fatal doses and survival of a few mice inoculated with 1,000 minimum fatal doses.

Sulfathiazole was employed because our experience with the sulfonamide drugs indicated that sulfathiazole was tolerated better than sulfapyridine and also because our earlier experiments on mice showed that sulfathiazole and sulfapyridine were equally effective therapeutically. This study was started before sulfaguanidine became available, and the use of sulfathiazole was continued until a sufficient number of observations had been obtained from which conclusions could be drawn.

All patients were classified on admission into certain age groups: from birth to 6 months, from 6 months to 1 year, from 1 to 2 years, from 2 to 4 years, and over 4 years. Every other patient in each age group was treated with sulfathiazole.[2] The dose was 2 grains per pound (0.13 Gm. per 454 Gm.) of body weight a day administered by mouth. One half of the dose calculated for the first twenty-four hours was given as the initial dose. Subsequent doses were administered every four hours and each consisted of one sixth of the calculated dose for twenty-four hours. Administration of the drug was continued for three days after the patient's temperature became normal.

Special history sheets were prepared and pertinent information was recorded on them daily. The treatment of these patients consisted of that customary in our hospitals. Frequent determinations were made of the carbon dioxide combining power of the blood serum, and, when indicated, sodium bicarbonate was admin-

From the Children's Hospital Research Foundation and the Department of Pediatrics of the University of Cincinnati College of Medicine.

1. Cooper, Merlin L., and Keller, Helen M.: J. Pediat. **18**: 458-468 (April) 1941.

2. Supplied by E. R. Squibb & Sons.

istered. Blood transfusions were given when they would appear to be helpful, and parenteral fluids were administered when dehydration existed. Two stools were obtained for culture, usually within eight hours after the patient was admitted to the hospital. All stools were cultured on at least two Petri dishes each of sodium desoxycholate citrate medium, MacConkey's medium and S-S (Difco) medium. Suspicious colonies were picked and identified culturally and at times serologically. The details of the culture studies will be reported separately.

In order to evaluate the drug therapy, four factors were chosen for comparison, a procedure which largely obviated the question of individual judgment. These factors were (1) the length of time from admission until the patient's temperature became normal, (2) the length of time from admission until the patient's temperature became less than 100 F. (rectal), (3) the length of time from admission until the stools became normal and (4) the length of time from admission until the patient had apparently completely recovered or all symptoms had disappeared.

AGE DISTRIBUTION OF PATIENTS

In table 1 it is seen that there was a total of 123 patients studied from the Cincinnati General Hospital and the Children's Hospital. Fifty-nine, or 47.9 per cent, had S. paradysenteriae in their stools, which was the approximate incidence found in our previous study.[3] The incidence of dysentery in the respective age groups in the present study (table 1) increased from 19.5 per cent in patients in the first six months of life to 91.6 per cent in the group over 4 years of age.

STATISTICAL ANALYSIS OF DRUG THERAPY

A statistical analysis of the 64 patients whose stools were negative for S. paradysenteriae is seen in table 2. The mean days for the four factors chosen for analysis are compared in the control and the treated group. It

TABLE 1.—*Age Distribution and Incidence of Dysentery*

Patients	By Culture		By Age	Per Cent Positive by Age
	Positive	Negative		
First 6 months	9	37	46	19.5
Second 6 months	14	19	33	42.4
Second year	17	6	23	73.9
3 and 4 years	9	1	10	90.0
Over 4 years	11	1	12	91.6
Total	59	64	123	47.9

TABLE 2.—*Sixty-Four Patients Whose Stools Were Negative for Shigella Paradysenteriae*

Mean Days from	Control	Treated	Value of P*
Onset to admission	6.2	7.4	0.6
Admission to normal temperature	6.7	7.3	0.6-0.5
Admission to temperature less than 100 F.	4.7	5.4	0.7-0.6
Admission to normal stools	5.8	5.5	0.9-0.8
Admission to recovery	8.1	9.1	0.5

* If P is 0.05 or less, the difference between the two groups may be considered significant.

is seen first that there was no significant difference in the mean days from onset of infection to admission to the hospital in the control and treated groups. This demonstrates that, for this important variable, these two groups were satisfactory for study. It is observed, as regards the four factors, that the value of P in each instance was far too great to indicate a significant difference. These findings led to the conclusion that the treated group of patients whose stools did not contain S. paradysenteriae derived no appreciable benefit from the drug.

The data from the statistical analysis of the 59 patients whose stools contained S. paradysenteriae and

TABLE 3.—*Fifty-Nine Patients Whose Stools Were Positive for Shigella Paradysenteriae*

Mean Days from	Control	Treated	Value of P*
Onset to admission	6.1	4.1	0.7-0.6
Admission to normal temperature	10.6	5.2	0.01-0.001
Admission to temperature less than 100 F.	7.8	3.5	0.02-0.01
Admission to normal stools	11.2	4.7	<0.001
Admission to recovery	12.7	7.0	0.01-0.001

* If P is 0.05 or less, the difference between the two groups may be considered significant.

TABLE 4.—*Total Group of One Hundred and Twenty-Three Patients*

Mean Days from	Control	Treated	Value of P*
Onset to admission	6.2	5.9	0.9-0.8
Admission to normal temperature	8.8	6.4	0.05-0.02
Admission to temperature less than 100 F.	6.3	4.5	0.1-0.05
Admission to normal stools	8.5	5.2	0.01-0.001
Admission to recovery	10.5	8.1	>0.05

* If P is 0.05 or less, the difference between the two groups may be considered significant.

who had clinical dysentery are seen in table 3. Again it is noted that there was no significant difference in the mean days from onset of illness to admission to the hospital in the control and the treated patients, indicating that this was a satisfactory group of patients for such a study. The comparison of the control and the treated group from the standpoint of the four factors chosen for analysis shows, in each instance, a decidedly significant difference in favor of the treated group as judged from the value of P. It is interesting that sulfathiazole was effective only in the treatment of patients whose stool cultures were positive for S. paradysenteriae.

In table 4 all 123 patients, those with and those without dysentery, are compared after being divided into control and treated groups. The value for P for each of the four factors is significant and in favor of the patients treated with sulfathiazole. These significant differences are not so well defined, however, as are those obtained when only the dysentery patients are considered (table 3). This lessened significance is accounted for by the inclusion into this group of the nondysentery patients who did not derive benefit from the sulfathiazole.

A statistical analysis of the duration of illness among the control and the treated patients is seen in table 5, in which the patients are compared on the basis of stool cultures being positive or negative for S. paradysenteriae. It is to be noted that both groups were satisfactory for such a study (as judged by the value of P for the duration of illness from onset to admission to the hospital). If the control patients are considered first, it is seen that the value of P for three of the four factors is significant and in favor of the patients whose stool cultures were negative. The value of P was 0.08 for the fourth factor (the length of time from admission to the time when the temperature became less than 100 F.); this figure, although slightly above the upper limit of significance (0.05), would be considered acceptable by many statisticians. The interesting point is that the

3. Cooper, Merlin L.; Furcolow, M. L.; Mitchell, A. Graeme, and Cullen, Glenn E.: J. Pediat. **15**: 172-182 (Aug.) 1939.

significant difference in duration of illness is in favor of the patients with negative stools, indicating that they were sick a shorter time than were those patients whose stool cultures were positive for S. paradysenteriae when neither group received sulfathiazole. When the patients

TABLE 5.—*Duration of Illness in the Control and Sulfathiazole Treated Patients with Positive and Negative Stool Cultures*

Mean Days	Control			Sulfathiazole		
	Positive	Negative	P*	Positive	Negative	P*
Onset to admission	6.1	6.2	0.90	4.0	7.4	0.23
Admission to normal temperature	10.5	6.7	0.04	5.1	7.3	0.12
Admission to temperature less than 100 F.	7.8	4.7	0.08	3.5	5.4	0.16
Admission to normal stools	11.2	5.8	0.005	4.7	5.5	0.47
Admission to recovery	12.7	8.1	0.012	7.0	9.1	0.17

* If P is 0.05 or less, the difference between the two groups may be considered significant.

who received sulfathiazole are considered, it is seen that there was no significant difference in duration of illness between those whose stool cultures were positive for S. paradysenteriae and those whose stool cultures were negative. This absence of any significant difference was due to the shortening of the period of illness among the patients with positive stool cultures as a result of treatment with sulfathiazole. This point of view, together with the information seen in table 3 in which the treated and the untreated patients with positive stools are compared, emphasizes the fact that the drug was effective only in the patients with positive stools.

The patients in this study were not so acutely ill as those reported in a previous study.[3] It was desirable to know whether the patients in the present study had been seen earlier in the course of their illness. A comparison of the mean days from onset to admission in these two groups (table 6) shows that there was no significant difference in the days of illness before admission to the hospital, indicating that the patients in the present study did not receive hospital care any earlier than the previous and more acutely ill group.

The fatality rate among the patients in this study was lower than that in any group previously studied. There were 6 deaths, and 5 of these were among patients whose stool cultures were negative. Only 1 of the patients who died received sulfathiazole, and he was given the drug late in the course of his illness. Five of the deaths occurred in children under 5 months of age and 4 of the 6 had been sick less than one week before admission to the hospital.

TABLE 6.—*Mean Days from Onset to Admission Among Patients in the Years 1940 and 1938*

Patients	1940	1938*	P
Negative stool cultures	6.8	8.3	0.22
Positive stool cultures	5.2	6.2	0.57

* Onset to first stool, which was usually the day of admission.

Symptoms of drug reactions were noted in 6 patients. Of these, 2 showed microscopic hematuria on the third and seventh days of therapy respectively, at which times drug administration was stopped. In 4 other patients cutaneous lesions similar to erythema nodosum developed, a type of drug reaction apparently peculiar to sulfathiazole. These lesions as well as the hematuria disappeared promptly when drug therapy was stopped.

A comparison of the condition of the patients during the period they were in the hospital is seen in table 7. More patients whose stool cultures were negative were classified as being in a "poor" and "serious" condition, while more of those whose stool cultures were positive were classified as in "good" and "fair" condition. More patients treated with sulfathiazole were classified as being in a "poor" and "serious" condition, while more of those who did not receive the drug were in a "good" and "fair" condition.

In this study we are not justified in drawing any conclusion regarding the influence of sulfathiazole therapy on the disappearance of S. paradysenteriae from the stools, since no organized effort was made to obtain repeated stool cultures at regular intervals. However, the data (table 8) show that there was an average of three and two-tenths stools examined per patient in the group which received sulfathiazole and four and three-tenths stools per patient in the group which did not receive sulfathiazole. Only 1 of 17 patients treated with sulfathiazole still had a positive stool culture when discharged from the hospital. In comparison, 17, or 50

TABLE 7.—*Condition of Patients While in the Hospital*

	Patients			
	Good	Fair	Poor	Serious
By disease				
Negative stool	6	16	36	6
Positive stool	10	32	15	2
By treatment				
Sulfathiazole	5	21	29	4
No sulfathiazole	11	27	22	4

TABLE 8.—*Influence of Sulfathiazole on the Disappearance of Shigella Paradysenteriae from the Stools*

	Sulfathiazole		No Sulfathiazole	
	Patients	Stools Cultured	Patients	Stools Cultured
Stools became negative	16	53	17	79
Stools did not become negative	1	2	17	69
Totals	17	55	34	148

per cent, of 34 patients who did not receive the drug still had positive stool cultures at the time they were discharged from the hospital.[4]

SUMMARY

The stools of 59, or 47.9 per cent, of 123 patients suffering from acute diarrhea were positive for S. paradysenteriae, Flexner and Sonne.

All patients were classified into age groups on admission to the hospital, and every other patient in each age group was treated with sulfathiazole.

Four factors were chosen for statistical analysis and evaluation of the drug therapy. These factors were (1) the length of time from admission to the hospital until the patient's temperature became normal, (2) the length of time from admission until the patient's temperature became less than 100 F. (rectal), (3) the length of time from admission until the stools became normal and (4) the length of time from admission until the patient had apparently completely recovered.

Statistical analysis showed that sulfathiazole was of therapeutic value in patients whose stools were positive for S. paradysenteriae but was without demonstrable

4. Since this material was submitted for publication a similar study has been instituted in which sulfaguanidine is being used, and the results will be published in the near future.

effect in the treatment of patients whose stools were negative for S. paradysenteriae.

Six patients died. Five of these had negative stool cultures. Only 1 of these 6 patients received sulfathiazole, and in this instance the drug was started late. Four of the patients who died had been sick less than a week when admitted to the hospital.

Our data indicate that sulfathiazole hastens the disappearance of S. paradysenteriae from the stools of the treated patients.

Seventeen of 34 patients who did not receive sulfathiazole had positive stool cultures when discharged from the hospital, while only 1 of 17 patients treated with sulfathiazole had a positive stool culture at the time of discharge.

Elland Avenue and Bethesda.

ALCOHOL AND THE PEDESTRIAN IN TRAFFIC ACCIDENTS

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From time to time, publications have appeared on the effect of alcohol on the driving efficiency of operators of motor vehicles. Attempts have been made to correlate the amount of alcohol in the blood, urine or expired air of drivers in traffic accidents and to determine the lowest quantity of the intoxicant in blood, urine and expired air above which it would be reasonably safe to infer that an impairment of reactions and reflexes would occur. Among the observers who have studied this problem are Schwarz,[1] Heise,[2] Carlson,[3] Naville and Rosselet,[4] Turner [5] and Selesnick.[6] The Committee on Tests for Intoxication of the National Safety Council [7] has recommended that "all persons having a level of alcohol in the blood above 0.15 per cent by weight are sufficiently impaired to be unsafe drivers."

With the exception of work by Gerber,[8] who found a blood alcohol concentration above 0.15 per cent in 37.3 per cent of 314 pedestrians who were killed in traffic accidents, and our published studies,[9] we have been unable to find any reference in the literature on the relation of alcohol to fatal and nonfatal accidents involving pedestrians.

In an attempt to add to the meager data on this phase of the subject and to obtain information on the relation of alcohol to violent deaths other than traffic fatalities, a large number of quantitative alcohol determinations on all types of violent deaths were carried out as a routine measure for a number of years. Tables 2 and 3 represent that part of the study which is concerned with fatal traffic accidents.

In a study of 6,000 fatal accidents, some related and others unrelated to trauma, Gettler and Tiber,[10] taking into consideration the clinical histories, attempted to classify the relation of the physiologic effects to the alcohol content of the brain (table 1).

It is evident from table 1 that the brain alcohol content of persons who have partaken of a beverage containing alcohol ranges from 0.005 and 0.6 per cent. Occasionally figures above 0.6 per cent have been observed. During the past twenty years only 1 case has been encountered in which the brain alcohol content has been as high as 0.9 per cent.

An analysis of the table indicates that practically no abnormal physiologic effects occur in persons having a brain alcohol content below 0.1 per cent (1 plus).

Persons with a brain alcohol content of above 0.1 per cent and up to 0.25 per cent (2 plus) exhibited definite physiologic disturbances, as indicated in the table. In a majority of this group unbalanced equilibrium, staggering gait or other signs commonly indicative of "drunkenness" were absent. In some of the cases in which these phenomena were observed, values between 0.2 per cent and 0.25 per cent were obtained.

According to our studies, persons having a brain alcohol content of 0.25 per cent or more showed definite evidences of intoxication. By the term "intoxication" is meant unstable equilibrium, disturbances of the various faculties and incoordination resulting in a staggering gait. That this is true was demonstrated by Gettler and Freireich,[11] whether the person is a habitué or an abstainer, male or female, young or old, robust or sickly, and is based on the amount of alcohol present in the brain and not on the quantity of alcohol consumed by the person nor on the amount of alcohol found in the gastrointestinal tract. It is common knowledge that one person may become "dead drunk" from a given quantity of whisky while another person from the same quantity may show little or no effect. It is exactly for this reason that we are not concerned with how much alcohol the person has consumed nor how much is present in the gastrointestinal tract but emphasize that the brain or liver must be used for analysis in fatal cases. It is a well known fact that tolerance to alcohol depends on the rapidity with which the substance is oxidized in the tissues. A habitué has ordinarily acquired this property of oxidation to a high degree. If the same quantity of alcohol is consumed by an abstainer and a habitué, the rapidity of the oxidation process in the habitué prevents its accumulation in the brain to a greater degree than in the abstainer. Therefore the abstainer may show signs of intoxication while the habitué will remain apparently sober. The analysis of the brain will bear out this contention, namely the abstainer showing a large amount (3 plus) and the habitué considerably less, or 1 plus. Should the habitué continue to take alcohol, manifestations of intoxication may develop and a chemical analysis may reveal, after death, a brain alcohol content of 3 plus or more.

ANALYTIC PROCEDURES

Organs Best Adapted for Determining Alcohol Intoxication.—It is evident at the outset that the alcoholic content of the stomach and intestine is of no value

From the chemical laboratories of the Chief Medical Examiner's Office of New York City.

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