MASON (A.L.) With the writer's compliments.

al

NOTES ON TYPHOID

FROM

676 CASES ADMITTED TO THE BOSTON CITY HOSPITAL IN 1890 AND 1891.

BY

A. L. MASON, M. D.

Reprinted from the Boston Medical and Surgical Journal of April 7 and 14, 1892.

BOSTON:
DAMRELL & UPHAM, PUBLISHERS
No. 283 Washington Street.
1892.

S. J. PARKHILL & CO., PRINTERS
BOSTON

NOTES ON TYPHOID FROM 676 CASES ADMITTED TO THE BOSTON CITY HOSPITAL IN 1890 AND 1891.[1]

BY A. L. MASON, M.D.

As typhoid fever is chiefly a hospital disease, few physicians being called upon to treat a large number of cases in their private practice, it is interesting from time to time to compare the hospital reports from various sources with reference to the average results attained, so that by the light of general experience and progressive therapeutics we may try to determine how far our methods may be improved, and whether it is a duty to insist upon any systematic plan of treatment with the hope that a further saving of life may be effected as has been elsewhere claimed. I refer especially to the bath-treatment of Brand, and to intestinal antisepsis. With the exception of 87 cases reported by Drs. Edes and Stedman, in the Boston City Hospital Reports, Vols. II, III, Brand's system of immersion in the cold bath has not been adopted at the City Hospital, but pyrexial symptoms have been met by cold sponging and affusions, with the internal administration of antipyretics, antiseptics and tonics. Such other dietetic, stimulating and symptomatic measures have been applied as each individual case has demanded.

With the co-operation of my colleagues and the valuable assistance of Dr. Augustus S. Knight, who has given much time and attention to this subject, I am able this evening to present the results in a series of cases extending through the last two years.

[1] Read before the Boston Society for Medical Improvement, January 25, 1891.

During 1890 and 1891, 676 cases of typhoid fever were entered upon the records of the City Hospital. Of these, 70 were fatal, 10.4%. This includes all cases, mild, moribund and doubtful, which entered the hospital during those years.

The diagnosis, "typhoid fever," is made provisionally in a certain number of cases which result fatally, but which present symptoms by no means always typical of that disease, some entering in a moribund, others in a delirious or unconscious state. Of such cases there were 18 in the present series, 15 moribund, that is, dying within three days after admission, and at least three of doubtful diagnosis. There were autopsies in three of them only, and where post-mortems are few, owing to the law which requires the written consent of friends, verification of the diagnosis is often impossible. Indeed, there were but 15 autopsies out of the 70 fatal cases, therefore the notes which follow must be mainly clinical rather than pathological.

During the same period, 47 cases were classed as "febricula," a diagnosis which probably covers some abortive typhoids.

In 33 cases, according to the charts, defervescence took place before the sixteenth day, but the date of commencement was often inexactly determined, and these cases, which were entered in the books as "typhoid fever," are included in the series.

So many accidental circumstances affect the result in typhoid fever that it seems almost impossible to determine numerically the proportion of recoveries which may be due to therapeutic measures. Such factors are the age, sex, and previous condition of the patient, the period of the disease when he comes under treatment, and the concurrence of other affections which lessen the chances of recovery. The virulence of the disease may vary at different times and in different countries,

so that no practical conclusions can be drawn from a small number of cases. How large that number should be in order to eliminate chance is also uncertain.

Thus if we divide our 676 cases into thirteen series of 50 cases each, it is found that the mortality in the different series varied from 6% to 20%.

Between six series of 100 consecutive admissions each the death-rate ranged from 6% to 14%; whereas three series of 200 cases each differed by one per cent. only, namely: 10%, 10.5% and 11% respectively. But in two series of 300 cases each there was a difference of more than two per cent in the mortality, namely: 9⅓% and 11⅔% respectively.

In the hospital there are three medical services to which the cases, as admitted, are allotted in turn. To show still further the fallacy which may arise from the attempt to draw conclusions from small numbers of cases I may state that one of the services received 54 *consecutive cases without a death.* Six of these patients had relapses. Again there were:

31	cases	without a death.			
42	"	with one death,	equal to	2.4	per cent.
30	"	" one death,	"	3.3	"
46	"	" two deaths,	"	4.3	"
39	"	" one death,	"	2.5	"
242	cases,	with five deaths,	equal to	2	per cent.

These figures do not compare unfavorably with some results of which we read as having been brought about by Brand's method in no larger numbers of cases. But as before stated the mortality in our whole series was 10.4%.

For purposes of comparison, I have selected the very interesting statistics of Dr. F. E. Hare, of the Brisbane Hospital, Queensland,[2] as being impartial,

[2] The Practitioner, March, 1891.

logically drawn up, and relating to a sufficient number of cases to admit of practical conclusions. In that institution before 1887, under the expectant plan, it was found that in three series of 600 cases each the death-rate varied between 14.3% and 15.3%, or only one per cent. So the conclusion was that groups of 600 cases were large enough to allow an estimate of the comparative effects of treatment when Brand's method was adopted, since the probable error from accidental causes would be small.

Therefore our series of 676 cases may be regarded as a suitable number for comparison in the future or with the records of the past, while the results in smaller groups of 100, 200, or 300 cases may so vary as to be of little value.

GENERAL CONSIDERATIONS.

Season. — Although typhoid fever is an autumnal disease, I think that more cases than formerly come to the hospital in the winter and spring months. Thus in these two years the admissions have been as follows:

January	17	July	63
February	16	August	97
March	20	September	165
April	12	October	139
May	28	November	63
June	27	December	29

Total, 676; 401, or 60% in August, September and October; 527, or 80%, between July 1st and December 1st.

Locality. — The records contain little evidence that typhoid fever was contracted away from the city in any large proportion of cases. About ten per cent. were recently arrived immigrants or "transients," that is, persons who had been in Boston less than one month. Some of these may have brought the disease with them, and others may have picked it up during visits to the country, but probably nine-tenths of the cases originated in Boston.

The 70 fatal cases were distributed as follows:

City proper	33
South Boston	12
Roxbury	8
Charlestown	6
East Boston	4
Suburban	4
Hull	1
Unknown	2
Total	70

Among these were:

Recent immigrants, or "transients"	6
Residents of less than 1 year	6
" " 5 years	20
" " 10 years	10
Total	42

The birth-places of the fatal cases were as follows:

Massachusetts (11 of foreign parents)	19
British Provinces	19
Ireland	19
United States (outside of Massachusetts)	7
England	1
Scotland	2
Sweden	1
Russia	1
Unknown	1
Total	70

Age. — Early age has an important bearing on the prognosis, as has been a matter of common observation. Hölscher's [3] 2,000 autopsies in patients who had died of typhoid showed but six girls and two boys under ten years of age. Among these were two infants of two months and nine months respectively. Fifty-six cases were over fifty years of age, and three over seventy years.

The mortality according to ages in our series is appended.

[3] Münchener Med. Wochenschrift, January, 1891.

Age.	Cases.	Deaths.
Under 5	2	0
5 to 10	18	0
10 to 15	45	2
Totals	65	2 = 3%
15 to 20	120	13
20 to 25	207	25
25 to 30	137	9
30 to 35	59	8
Totals	523	55 = 10.5%
35 to 40	32	1
40 to 45	14	1
45 to 50	9	2
50 to 55	8	2
55 to 60	2	1
60 to 65	2	0
70 to 75	1	0
Unknown	20	6
Totals	88	13 = 14.8%

It will be seen that the small fatality among children and the high death-rate after thirty years of age counterbalance each other, leaving the general mortality as stated above at 10.4%.

Of the two patients who died before or within the sixteenth year, one was a boy of fifteen who entered during a relapse in the fourth week and died on the thirtieth day from pulmonary œdema and exhaustion. The other was a girl of thirteen years who came in on the sixth day and died on the twenty-ninth day of simple pyrexial exhaustion.

Between the ages of fifteen and twenty there were 120 admissions and 13 deaths. Seven of these were females, all of whom died of pyrexial exhaustion, complicated in one case by tuberculosis and in another by pneumonia and pregnancy. Of the six males two had no complications. One was a very doubtful case with symptoms indicating meningitis, fatal on the ninth day. Two died from perforation of the bowel at the age of

nineteen, and one from intestinal hæmorrhage at the same age, this being the earliest period of life at which these fatal accidents occurred.

Between the ages of twenty and thirty, 344 patients entered and 34 died, namely, 12 males and five females from febrile exhaustion; two males and *three females* from perforation; nine males and *one* female from intestinal hæmorrhage; two with chronic Bright's disease. Of the above number, two had also delirium tremens and two pneumonia.

Beyond the age of thirty were 127 cases with 15 deaths, or 11.8%. With advancing years other degenerative changes were more frequent factors in producing the fatal result. Thus phthisis, chronic Bright's disease, chronic mitral insufficiency and sudden syncope from cardiac weakness were accountable for one death each. Two died with delirium tremens; two from perforation of the bowels; three from hæmorrhage; six from febrile exhaustion, which was complicated in one case by pneumonia and in one by syphilis.

Time of Admission. — Other things being equal, delayed admission is regarded as greatly increasing the danger of death from exhaustion in typhoid fever.

Let us see the bearing of our figures upon this point. The records state that the patients entered as follows:

DATES OF ADMISSION.

	Cases.	Deaths.
First week	269	30 = 11%
Second week	294	22 = 7.4%
Third week	87	9 = 10.3%
Fourth week	12	3 = 25%
Not stated	14	6 = 43%
Totals	676	70

Thus more than one-third of our cases entered during the first week, but still the mortality was higher than among those who entered during the second and

third weeks. This may be accounted for in two ways: (1) By error in statement as to the beginning of the disease; (2) By the fact that the severer the onset the earlier patients seek the hospital.

The mortality was highest among those who entered in the fourth week and those about whom no information on this point was elicited.

Moribund. — Fifteen patients were in such bad condition on admission that they died within three days, namely:

Died within twelve hours	4
Died within twenty-four hours	2
Died within forty-eight hours	3
Died within three days	6

Sex. — Of the total admissions 445 were males, 231 females; nearly two to one. This is about the usual proportion. Forty-three males died, or 9.6%; and 27 females, or 11.6%. The mortality among the women was two per cent. greater than among the men, as is usually the case in this disease, and this disproportion is in no way due to the intestinal lesions, which are much more fatal to men, as the following table shows:

Recognized perforations of bowel:
Males 6 = 1.35% Females 3 = 1.3% Total 9 = 1.33%

Intestinal hæmorrhages:
Males 27 = 6% Females 5 = 2.1% Total 32 = 4.7%

Hæmorrhage was fatal in 14 cases:
Males 11 = 2.4% Females 3 = 1.3% Total 14 = 2%

Intestinal accidents as a whole, occurred in 41 cases, namely: males 33 (7%), females 8 (3.5%), total 41 (6%). They were fatal in 23 cases: males 17 (4%), females 6 (2.6%), total 23 (3.4%).

If then we deduct from the general mortality the mortality from intestinal lesions *per se*, we have for the two sexes the following:

Males:
- General mortality in 445 males 9.6%
- From intestinal lesions 4%
- From other causes 5.6%

Females:
- General mortality in 231 females 11.6%
- From intestinal lesions 2.6%
- From other causes 9%

Thus it appears that the death-rate, apart from intestinal perforation and hæmorrhage, is 3.4% higher among the females than the males.

Effect of Cold Baths on Intestinal Ulcers. — Although Brand, in his earlier publications, thought that his method would greatly reduce the frequency of relapses and the danger from the intestinal lesions, this has not been borne out by later experiences on the part of others. To compare, for instance, our 676 cases with 1,173 cases treated after Brand's method by Dr. Hare at the Brisbane Hospital, with a mortality of 7.84%,[4] we find the following results:

Brisbane Hospital:
- Males 739. Fatal cases 69 = 9.3%
- Females 434. Fatal cases 23 = 5.3%

Boston City Hospital:
- Males 445. Fatal cases 43 = 9.6%
- Females 231. Fatal cases 27 = 11.6%

Perforations of the bowel:
- Brisbane. Males 27 = 3.6% Females 7 = 1.6%
- Boston. Males 6 = 1.4% Females 3 = 1.3%

Fatal hæmorrhages:
- Brisbane. Males 13 = 1.70% Females 3 = .69%
- Boston. Males 11 = 2.4% Females 3 = 1.3%

Fatal intestinal lesions, as a whole:
- Brisbane. Males 5.4% Females 2.3%
- Boston. Males 3.7% Females 2.6%

Total mortality from intestinal lesions:
- Brisbane Hospital (Brand's method) 4.2%
- Boston City Hospital 3.4%

From this comparison it will be seen that under Brand's method of bathing, the death-rate among

[4] Practitioner, March, 1891.

males was about the same as ours, while among females it was not half as high as that which obtained at the City Hospital. The mortality from the severity of the intestinal lesions was somewhat in our favor, therefore, the reason for our higher death-rate must be sought chiefly in the large number of females who died from other causes, that is, from conditions peculiar to their sex and from their feebler resistance to pyrexial exhaustion. It is in preventing this exhaustion that the virtue of Brand's method seems to lie.

Perforation. — Nine cases, six males, three females. This accident occurred in two patients within forty-eight hours after admission; twice in relapses, and in one patient who had aborted. Several other fatal cases presented symptoms of perforation, not in a typical manner, and autopsies were not obtained. The earliest recognized perforation occurred on the nineteenth day of the disease.

Hæmorrhages. — Of the 32 cases of hæmorrhage from the bowels, 14 were fatal. One died within forty-eight hours after entrance. The earliest fatal hæmorrhage was on the twelfth day of the fever and no patient died from the effect of a single hæmorrhage. Two had also delirium tremens and died on the fourth and sixth days after admission respectively. Two others, with complicating nephritis, had fatal bleeding from the bowels. Transfusion of a saline solution was resorted to in three cases, two males and one female. One recovered and two died from recurrent hæmorrhage.

GENERAL COMPLICATING CONDITIONS.

Phthisis. — There were seven cases of phthisis of whom three succumbed.

Pneumonia. — Thirty-four cases had pneumonia; 28 recovered and six died.

Pleurisy complicated 11 cases, of whom three died.

Bronchitis was noted as a severe symptom in 74 cases (11%); and in two this was a complication which had much to do with causing death.

Œdema — Dangerous œdema of the lungs occurred in 25 cases, of whom 10 died.

Nephritis. — In 60 cases (nearly 10%) the urine had albumen and casts. At least three of these had chronic Bright's disease and proved fatal. Twelve others died, in whom the nephritis was probably an acute process. Besides, there were many cases of febrile albuminuria.

Cardiac. — There were 12 cases of chronic valvular disease, of whom two died; and two cases of acute endocarditis, one fatal. One patient had acute fibrinous pleuritis and pericarditis, and acute nephritis.

Diarrhœa was present in about half the cases, but was the chief cause of exhaustion in five cases only.

Hyperpyrexia was noted in but three fatal cases, two males and one female. The latter had extreme distension. The highest temperature recorded was 108° F.

Delirium Tremens. — Alcoholism was one of the gravest sources of danger in a large number of cases, and was no doubt responsible for many of the cardiac, renal and pulmonary complications which contributed to fatal exhaustion. Delirium tremens was present in eight cases, of which five resulted fatally at an early period, twice accompanied by intestinal hæmorrhages and once by chronic Bright's disease. Three cases recovered.

Parotitis. — Of two cases of parotitis one died.

Pregnancy complicated the fever in seven cases: six normal pregnancies, one fleshy mole. Four recovered without aborting. One gave birth to a seven months' child weighing two and a quarter pounds, at the beginning of convalescence, which went on to complete

recovery. The child also lived, and, at the end of seven months of careful rearing, weighed twelve pounds. One pregnant patient died from pneumonia, as mentioned elsewhere, without aborting; and the patient with fleshy mole had septicæmia and perforation. Thus, of these seven cases, miscarriage occurred in two only. It is interesting to note in this connection that the advocates [5] of Brand's method have not hesitated to plunge menstruating, nursing and pregnant women, who had typhoid, into the cold bath, and without ill result it is said.[6] Still, the pregnant state must be regarded as a dangerous complication, and Hölscher's analysis of 813 autopsies in women showed that two were pregnant, two had just aborted, 27 were in the puerperal period and four had puerperal fever.

Phlegmasia alba dolens. — Thrombosis of the iliac or femoral veins occurred in nineteen patients, of whom four died, two from consequent embolism of the pulmonary arteries and two from exhaustion.

Embolism, resulting in gangrene of an extremity, did not occur in this series of cases, but the following case was in my service in 1889:

Gangrene of the left Leg from Femoral Embolism; Recovery. — W. S., age twenty, entered the hospital September 21, 1889, on the sixth day of typhoid. Heart weak and irregular. Urine: acid; 1028; trace of albumen; a few hyaline and granular casts. On the 15th day of the typhoid the left leg became cold and very tender over the calf. On the 18th day it was cold, and discolored for ten inches above the malleoli. No pulsations had been felt below the middle third of left thigh. Mildly delirious. Skin of foot became dry and hard, like parchment. Circumfer-

[5] Ziemssen and Immermann: Kaltwasserbehandlung d. Typhus Abdominalis, p. 20.

[6] Bouveret: Lyon Medical, April 26, 1891.

ence of left calf two inches more than right. October 9th (24th day) a line of demarcation formed between the upper and middle third of leg. The affected part was kept clean by charcoal poultices. November 12th (58th day), all tissues gone at demarcation, except bone. Operation by Dr. Cheever. Pulse 156, and feeble at beginning. Sawed through, one and one-half inch above the bare bone, about four inches below knee-joint. Operation hurried because of patient's poor condition. He recovered well from ether. Wound healed gradually by granulation. Good stump. On November 29th (75th day), he was about the ward on crutches, improving in general condition very rapidly. Discharged.

Dr. Cheever had seen one or two similar cases, and thought delay less dangerous than amputation during the fever, as the event proved.

Dr. Drewitt[7] reports the case of a girl, age twelve, in whom on the 26th day of the fever, absence of femoral pulsation was noted. Three weeks later, the fever having abated, amputation above the knee was performed. Recovery in three months.

Murchison, Liebermeister and Trousseau relate similar occurrences, and the latter author states that when the upper extremity is involved death is almost inevitable. Sphacelation of the cheek and ear may occur.

Doubtless this accident has been occasionally recorded in other hospitals, but this, I believe, is the first instance at the City Hospital in 4,250 cases of typhoid. Hölscher reports but four cases of iliac and femoral embolism in his 2,000 typhoid autopsies.

Neuritis. — Peripheral neuritis caused much pain in the legs with delayed recovery in 21 cases, 3%. The usual duration was from two to four weeks, but in one case, at least, there was much wasting of the calves of

[7] The Lancet, November 8, 1890.

the legs and contracture at the knee-joints, which lasted several months before the patient could walk. Her mind also was very much weakened, but eventually she recovered.

Insanity. — Two cases of post-typhoid insanity were transferred to other institutions, and the result is not known.

Otitis. — Twenty-two cases of purulent otitis, about 3%, are recorded, and there were probably more, as such cases usually passed into the hands of the aural surgeons, Drs. Green and Leland, whenever typhoid deafness occurred.

Peritonitis. — As stated above there were a few cases, mostly fatal, in which there may have been perforation or perhaps appendicitis, but the symptoms of this latter condition were marked in one case only and that recovered.

Relapses. — One hundred cases had relapses, 15%, and of these, three relapsed twice; two, three times. Eighteen were under fifteen years of age, none fatal. But one boy in his sixteenth year, who entered in a relapse in his fourth week, died on the 30th day. Three adults died in relapse, namely; one male and one female from perforations, and one female of twenty years from simple exhaustion; 6% of the deaths occurred in relapse; Hölscher gives 8%.

Prolonged Pyrexia. — In 35 cases the initial fever did not fall to the normal point for thirty days or more, and in nine cases it continued without defervescence for more than forty days.

TABLE I.

COMPLICATING CAUSES OF DEATH.

	Recovered.	Died.	Total.
Phthisis	4	3	7
Pneumonia	28	6	34
Pleurisy	8	3	11

	Recovered.	Died.	Total.
Bronchitis (severe)	72	2	74
Œdema of lungs	15	10	25
Nephritis	45	15	60
Cardiac	11	4	15
Parotitis	1	1	2
Pregnancy	5	2	7
Phlegmasia	15	4	19
Perforations		9	9
Intestinal hæmorrhages	18	14	32
Delirium tremens	3	5	8

TABLE II.

OCCASIONAL COMPLICATIONS AND SEQUELS (NON-FATAL).

	Cases.		Cases.
Abscess	2	Orchitis	1
Acute rheumatism	3	Otitis purulenta	22
Carbuncle	1	Pelvic cellulitis	1
Diphtheria	3	Periostitis	2
Empyema	2	Perityphlitis	1
Epididymitis	2	Purpura	1
Erysipelas	3	Scarlet fever	1
Furunculosis	2	Tonsillitis	7
Insanity	2	Tubercular peritonitis	1
Jaundice	1	Ulcer of leg	1
Neuritis	21		

CASES NOT AMENABLE TO TREATMENT.

In estimating the probable effects of treatment certain classes of cases may be excluded as having little bearing upon the question of therapeutics. Such are cases moribund at entrance; cases of intestinal perforation and hæmorrhage, and those fatal through delirium tremens, phthisis, chronic Bright's disease, chronic endocarditis or syphilis. Pregnancy must also be included as exposing females to an additional danger.

Therefore I have tabulated the following fatal cases on which the treatment would have had little influence, namely:

Moribund at entrance	15
Perforations of bowel (9)	7
Intestinal hæmorrhage (14)	13[8]
Phthisis	3
Chronic nephritis	2
Endocarditis (chronic)	2
Endocarditis with pneumonia	1
Pregnancy with pneumonia	1
Abortion with septicæmia and perforation	1
Delirium tremens	2
Delirium tremens with intestinal hæmorrhage	2
Delirium tremens with chronic Bright's	1
Total	50

The case of abortion with perforation and two cases of delirium tremens with hæmorrhage are entered twice. This leaves us 23 fatal cases in which the acute renal, circulatory and respiratory disturbances, diarrhœa and other conditions were probably due to pyrexial exhaustion. Of these, however, four had lobar pneumonia, of whom two entered on the fifth day of the fever and died on the eleventh and twelfth days, respectively. The pregnant woman with pneumonia, alluded to above, is not included. She entered on the fourth day and died on the eleventh day of the typhoid, in the sixth month of pregnancy.

One case only of fatal lobular pneumonia is recorded. He entered on the fourteenth and died on the thirty-fifth day. This complication is usually a late one.

One case died as mentioned above with acute aortic endocarditis, one with acute pleuritis, pericarditis and nephritis, and one with parotitis; and after defervescence, two from embolism of the pulmonary artery, and two from extensive thrombosis of the iliac and femoral veins.

The 15 autopsies are entered below. They were performed by Dr. Gannett and Dr. Mallory.

[8] Two cases had perforation, and one had fatal hæmorrhage soon after entrance, and are included among the moribund.

Perforations (5).

Case I. Man, thirty-three. Entered on 7th day. Died on 21st. Perforation one-third inch in diameter at junction of cœcum and ileum. Another, ten inches further up ileum, one and one-half inch long and one-half inch in diameter apparently confined to a Peyer's patch. Typhoidal enteritis. Acute fibrinous peritonitis.

Case II. Man, nineteen. Entered on 21st day. Died on 27th. Perforation of ileum a little above ileo-cœcal valve. Typhoidal ulceration of two or three Peyer's patches in ileum. Acute fibrinous peritonitis.

Case III. Female, twenty-nine. Entered on 29th day. Died on 54th. Perforation in cœcum corresponding to ulcer on mucous surface. Fifteen to twenty typhoid ulcers in cœcum and a few in lower ileum. Acute peritonitis.

Case IV. Female, twenty-six. Entered on 8th day. Died in relapse on 42d day. Perforation through Peyer's patch in lower ileum. Few typhoid ulcers in colon and lower part of ileum. Acute general peritonitis. Acute fibrinous pleurisy. Cloudy swelling of kidneys. Chronic mitral endocarditis with stenosis and insufficiency.

Case V. Man, fifty-three. Entered on 28th day. Died on 31st. Perforation two and one-half feet above cœcum, large enough to admit lead pencil. Typhoidal ulceration of Peyer's patches. Acute purulent peritonitis.

Hæmorrhages (4).

Case I. Female, twenty-one. Entered on 7th day. Died on 19th. Large intestine full of dark fluid blood. Typhoidal enteritis. Acute aortic endocarditis.

Case II. Man, twenty-four. Entered on 14th day. Died on 32d. Partly digested blood through-

out small and large intestines. Typhoidal ulceration of Peyer's patches in lower ileum and in colon. Cloudy swelling of liver and mesenteric glands. Œdema of lungs.

Case III. Male, twenty-five. Entered on 8th day. Died on 18th. Typhoid ulcerations in lower three feet of ileum. Granular degeneration of liver and kidneys. Emphysema of lungs.

Case IV. Male, nineteen. No history. Typhoidal enteritis. Hæmorrhagic infarction of spleen.

Pneumonia (3).

Case I. Male. Acute fibrinous pneumonia at both bases. Typhoid ulcerations in lower ileum.

Case II. Female, twenty-five. Entered on 5th day. Died on 12th. Acute pneumonia. Acute fibrinous pleurisy. Granular degeneration of kidneys and liver. Typhoid ulcerations in first four feet above cœcum.

Case III. Male, twenty. Entered on 6th day. Died on 21st. Acute fibrinous pericarditis. Acute fibrinous pleurisy. Acute parenchymatous nephritis. Hypostatic pneumonia. Cloudy swelling of heart and liver. Typhoidal enteritis.

Pulmonary Embolism (2).

Case I. Male. No history. Embolism of pulmonary arteries. Hæmorrhagic infarction of lung. Thrombosis of common iliac and internal iliac veins. Acute septic pleurisy. A nodule of septic necrosis of spleen with extension through diaphragm. Cloudy swelling of heart and kidneys. Injection of vessels of brain. Typhoid ulcerations in lower ileum.

Case II. Male, twenty-eight. Entered on 16th day. Died on 43d. Embolism of pulmonary artery. Thrombosis of right external iliac and both femoral veins. Injection of lungs, kidneys and liver. Typhoid ulcerations in lower six inches of ileum.

Exhaustion and Pyrexia (1).

CASE I. Female, twenty-one. Entered on 5th day. Died on 11th. Cloudy swelling of heart, kidneys and liver. Typhoidal ulcerations in colon and lower ileum.

THERAPEUTICS.

Brand had collected, two years ago, 20,000 cases of typhoid fever treated by his plan, chiefly in Germany and in Lyons, with a mortality of about 7.5%. Most of the physicians who had tried it reported a considerably lower death-rate, this sometimes falling, in small series of cases and under favorable circumstances, to two or three per cent., or even to zero. It is to be noticed, however, that such results usually came from hospitals where many children and young persons were treated, and from the army hospitals in Germany where healthy young soldiers compose the material. Under these conditions many of the causes of a high mortality are eliminated.

In Paris, last year a committee was appointed to report to the Société Médicale des Hôpitaux as to the mortality from typhoid fever in the Paris hospitals and the influence of treatment. This report[9] was on the whole favorable to Brand's method. It shows that under various modes of treatment, chiefly expectant, the mortality from 1866 to 1881 was 21.5%. From 1882 to 1888 it was 14.1%; in 1889, 13.5%.

Twenty-one reports from various *chefs de service* show 916 cases with 114 deaths, 12.44%, under different kinds of treatment.

In 1888 and 1889, 1,063 cases treated symptomatically showed 133 deaths, 12.51%; whereas, in 323 cases treated by baths, 32 died, or 9.9%.

Jaccoud, with the use of tonics, cold lotions and antipyretics, lost in sixteen years, 71 cases out of 655, or 10.8%.

[9] Gazette Médicale des Hôpitaux, July 10, 1890.

Bouchard at the Hôpital Lariboisière, since 1884, with baths gradually cooled, intestinal antisepsis, quinine, etc., had a mortality of 11.16% in 421 cases, instead of 21% as before.

In this country, since the cases of Drs. Edes and Stedman at the City Hospital, reported about fifteen years ago, the system of Brand has not been brought before the profession in a practical manner until recently, when Dr. James C. Wilson, in Philadelphia, Dr. Baruch, in New York, and other physicians have reported a few cases. Dr. Wilson, at the German Hospital in Philadelphia, treated 66 cases without a death.

Under the use of prolonged tepid baths, Riess, in 900 cases, had a mortality of 7% to 8%; and under simple expectancy with four or five litres of drinking water daily, Debove, at the Hôpital Andral, of 9.2%.

Dr. James Barr, of Liverpool, England, reports[10] twelve cases of severe typhoid treated successfully by prolonged immersion in a tank filled with water at a temperature of 90° to 98° F. Patients were kept in the tank constantly for periods varying from six to thirty-one days. The inconveniences of such a method are obvious but the results appear to have been very good.

At the City Hospital latterly cold spongings and affusions have been applied very thoroughly, at frequent intervals day and night if necessary, the water being cooled with ice during the warmer months and sponging of the whole surface being continued long enough to lower the temperature materially. As 100 typhoids, more or less, are in the wards for many weeks continuously, this involves more labor probably than the administration of full baths, and the discom-

[10] Lancet, March 20, 1890.

fort to the patient is quite as great. The effect upon the pyrexial symptoms, however, has been manifest.

It seems, then, that hydro-therapeutic measures in some form or other have received the general approval of the medical profession and the only question is as to the best methods. I think that the full bath of Brand is the most efficient and convenient.

Antipyretic Drugs. — The rapid disfavor into which these drugs have fallen owing to their depressing influence in unsuitable cases has, I think, led to their too general abandonment. Phenacetine, especially, in three, five or ten grain doses often proves valuable in allaying fever and modifying the nervous symptoms. Phenocoll, a newer compound, has been used in a few cases with similar effect.

Laxatives in the first week fulfil a rational indication and of these I think the salines are preferable.

Internal Antisepsis by the use of minute doses of calomel, salol in five-grain doses several times daily, naphthaline, salicylate of bismuth and naphthol, has been attempted in a more or less systematic manner at the City Hospital. Of these agents hydro-naphthol in doses of from two to four grains every two hours has appeared to have influence in modifying diarrhœa and the offensive character of the stools. But it is doubtful whether the infecting germs and poisonous alkaloids can be effectually neutralized in this way by any harmless agent.

Hydro-naphthol. — Between May 9, 1891, and January 1, 1892, 103 cases of typhoid were admitted to the second medical service, 83 males and 20 females; 48 had diarrhœa, 55 had not; 45 were treated with hydro-naphthol, 58 were treated without hydro-naphthol. Of the former series two died; of the latter series seven died. None of those who used hydro-naphthol had hæmorrhage from the bowels, while

three of the others had. In 27 patients diarrhœa diminished or ceased while using this drug, often after a few days, sometimes not for two weeks. Relapse took place in six patients who were treated without hydro-naphthol and in four who took this drug.

About 30 patients without regard to the presence or absence of diarrhœa were treated from the time of admission continuously with hydro-naphthol, at first, every two hours, later every four or six hours until convalescence was well established, in the hope of preventing relapse. Two of these patients had relapses, nevertheless, and one died with symptoms of perforation of the bowel. No ill-effects attributable to the drug itself were noticed in any case. These facts were tabulated by Dr. Benjamin Tenney, house-physician, who watched all the cases.

Stimulants. — Too early use of stimulants as well as their over-use, is to be guarded against. But with the large number of alcoholic subjects who come under treatment it is often difficult to decide how far it is prudent to withhold their accustomed stimulus. A weak heart and rapid pulse should be the guides, in spite of nervous symptoms which may supervene. As in pneumonia, delirium tremens often comes on in typhoid patients several days after admission.

In general, careful attention to the digestion and to the eliminating organs, a free supply of drinking-water, correct estimation of danger-signals, and prompt application of such measures as each case may demand are of more importance in the management of this complicated malady than any systematic method, however brilliant its results may appear to be.

But we cannot escape the fact that the mortality from typhoid fever has diminished all the world over during the last twenty-five years, and that Brand's system of bathing is thought by a large number of the

best observers to be an important factor in this reduction.

CONCLUSIONS.

(1) That in the Boston City Hospital the mortality in typhoid fever from patients admitted moribund and with grave complications is 4%.

(2) That at least 3% more die from intestinal perforation and hæmorrhage.

(3) That little diminution in the mortality from these causes can be expected under any mode of treatment.

(4) That the mortality from renal, pulmonary and circulatory disturbances, from diarrhœa and pyrexial exhaustion, is about 3.5%.

(5) That, excluding deaths from intestinal perforation and hæmorrhage, the mortality among females is 3.4% greater than among males.

(6) That a diminution of 2% in the general mortality might be expected from the systematic use of cold baths, the reduction being largely in females.

(7) That favorable results followed the trial of intestinal antiseptics, but that relapses were not prevented thereby, and that a much wider experience is necessary to determine their value.

DISCUSSION.

Dr. Geo. B. Shattuck: It is true that figures in themselves are apt to be dry; but if they show us that we have made a decided progress from the past, and if they point out how we may make progress in the future with reference to practical results in the improvement of treatment of a disease which is so constant as typhoid fever, and which is with us always, as one may literally say in our large cities now, then figures are not dry. I think that none of us have

found that Dr. Mason's paper was dry. On the contrary, it was very interesting and instructive. As well as I remember, Dr. Upham's series of cases (1864–1870), which he tabulated for the City Hospital, gave a mortality of something like fourteen per cent., and even if we make no reductions whatever from the cases reported by Dr. Mason, that shows that we have at least kept pace with the tendency to improvement in the death-rate from this disease, which he says, and rightly, is to be found all over the world; and I think we not only have kept pace with it, but more than that.

Of course, the interesting practical point upon which these figures have a bearing is that of the treatment of typhoid fever by Brand's method, whether it should be adopted by us or not. I think that Dr. Mason's paper is a much more reasonable and rational paper and one which certainly, individually I may say, wins my confidence more than that of a great many utterances which have been made in regard to this subject. It seems to me there is nothing in regard to which the proverbial fallacy of statistics may be so applicable as that of any one system of treatment to a disease like typhoid fever, and I think we must take all the statistics with reference to Brand's method with a great deal of caution. Now, if it can be shown that that method or any other will produce a diminution in the death-rate of this disease of two per cent. or more, then it is our duty to adopt the method, whatever the inconvenience and the cost may be. At the same time, it seems to me that it is not injudicious that we should perhaps allow other hospitals and other cities to prove that for us in this country. Certainly the material which we have to deal with, its outside surroundings, the time of admission to the hospital, and our facilities for applying the method,—all these factors differ very much from those which obtain abroad; and it is there-

fore necessary that the method should be tested especially for us here, and that being the case, it is, it seems to me, as I said, not injudicious that we should allow others to test it for us if they are willing to do so. In New York at Bellevue, in Philadelphia at the German Hospital and elsewhere, they seem disposed to try it. Of course, there are two questions with reference to the adoption of that method. One is the question of therapeutics; the other is the question of hospital administration. If there are only a certain number of reliable attendants who can be secured for any given hospital service, and if there is only a certain amount of money disposable for a hospital service, then I must frankly say that if it is a question between being deprived of either liberality in the way of nourishment and stimulants and other therapeutic measures and of good nursing, — if we have to choose between this and the application of the cold-water treatment according to Brand's method, — I should certainly prefer to have the first mentioned rather than the second. If the hospital facilities and the hospital funds and the hospital administration will permit of both, and it is satisfactorily proved for us in this country that the Brand method will reduce the mortality in our hospital cases by two per cent., then it seems to me that we must have it, and if it is proved that the mortality can be reduced by two per cent., the profession is in such a position and the public is in such a position, that they can demand from municipalities and boards of trustees that sufficient provisions should be made for all necessities as they arise under those circumstances.

If we deduct, as Dr. Mason suggests, the cases which are inevitably fatal, which come in late and die early after admission, and deduct the cases giving a large percentage from intestinal complications such as perforation and hæmorrhage — and the ratio at the City

Hospital from perforation was a very large one — of course, it reduces the mortality very much indeed, a mortality which is already favorable. I do not think to-day it is claimed by impartial observers with reference to Brand's treatment that his method does reduce these two important and constant factors of hæmorrhage and perforation. There is one other thing to be said about it, that those who advocate his method began by claiming that it was successful on account of combating the hyperpyrexia. Then it was claimed it was successful on account of some mysterious and yet unexplained influence upon the nervous centres. What precisely that action is, has not so far been explained; but all the advocates, Brand himself and all the advocates of his method, constantly reiterate that, in order to have it successful, and in order to have a fair test of the method, it should be applied from the very early stages of the disease, and that is where he has his advantage in dealing with the army cases, not simply that they are young and vigorous, but also he is able to take them from the beginning. Well, that we never can do in our municipal hospitals. The patients come in late, or if they do not come in late, they come in, as Dr. Mason suggests, because they are particularly severe cases. Now, according to the claims of the advocates of this method, a very large percentage of our cases are not suitable subjects for that method; and if the application of the method is unsuccessful in our cases, then the answer is that they were not taken early enough. Then there is a great number of the cases taken very early in the very first days of their symptoms, in regard to which the diagnosis cannot possibly be a positive one, and never would be a positive one if they are rapidly cured. I entirely agree with what Dr. Mason has said in regard to the small value of conclusions drawn from a few cases, and

have but very little confidence in intestinal antisepsis.

Dr. F. H. Williams: I have been very much interested in Dr. Mason's paper. Dr. Shattuck has discussed it in its broader features, and there hardly remains anything for me to say except to speak of one or two details. I am very glad to be able to confirm Dr. Mason's observations in regard to the use of hydronaphthalin. It seems to me the intestinal symptoms are decidedly milder, there is less diarrhœa, less distension of the abdomen, and the patients are rather more comfortable with hydronaphthalin than without it. With the hydronaphthalin I used a special food through the co-operation of Dr. Rowe, with whom I arranged to use evaporated milk, that is, milk prepared in a way which enables one to give it to a patient in a fresher and better condition than one usually can do. That was used in the typhoid cases during the two months of the service I had last summer. I have not observed a great deal of difference between the hydronaphthalin with and without the evaporated milk. The number of cases, however, was not large enough to base an opinion on.

Dr. C. P. Putnam: With regard to the source of the contagion, do not the records show where the patient had been a short time previous to entrance, or were the statements only taken from his residence?

Dr. Mason: The statement I made was only with reference to the residence of the fatal cases. There was not time to investigate the whole series, so that I cannot answer that question. There was but one fatal case that came from a distant town. The great majority had lived in the city.

Dr. Geo. B. Shattuck: Since Dr. McCollom read his paper some weeks ago I have questioned my patients pretty carefully as to whether, though residents of

Boston, they went to picnics outside, and especially to one dangerous locality, and I have found that only two or three had been to such picnics.

Dr. Mason: When I was in Germany twenty years ago, this matter of cold baths interested me, and it was then that this second edition of Brand was published. Other works were written by Ziemssen, Bartels and Liebermeister. I found that the results varied much in different cities. There was a great difference between the results in Berlin and Vienna, where the method had been tried on a comparatively small scale but without reduction in the mortality; still it has always seemed to me a rational procedure. We recognize the desirability of cold water, of hydrotherapeutics; and I think that if we are going to bathe at all, we might as well use the easiest and most efficient method. It certainly is less trouble for ward attendants to put the patient into the tub-bath and let him lie there than to sponge him fifteen or twenty minutes.