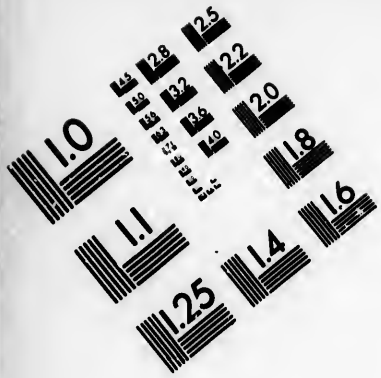

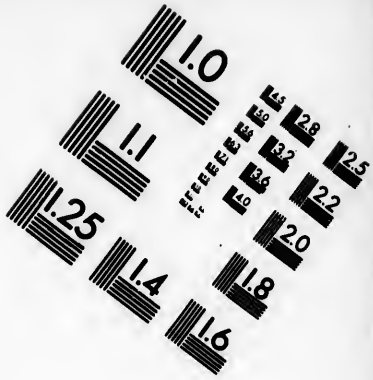

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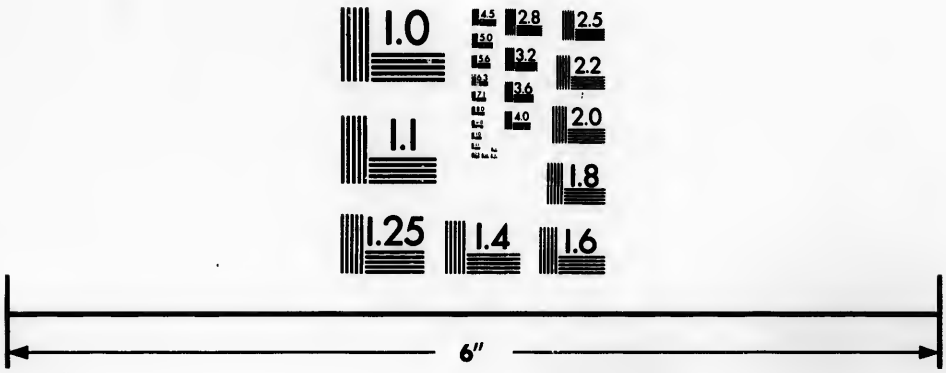

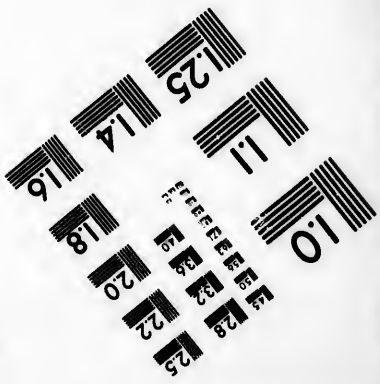

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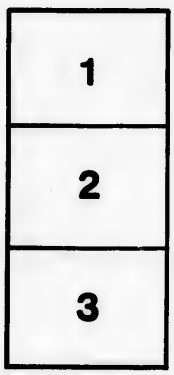

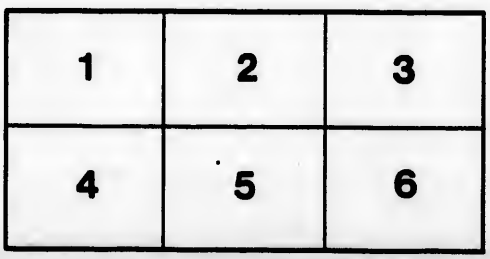

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ENTERIC FEVER

IN CHILDHOOD

BY

A. D. BLACKADER, M.D.

Montreal, Canada

D. D S. Lewis OCT 23 '81

ENTERIC FEVER IN CHILDHOOD.*

BY A. D. BLACKADER, M.D.,

Montreal, Canada.

Typhoid fever as met with in children under fifteen years of age presents some characteristics which distinguish it from the disease as met with in the adult. These points of difference have already been referred to by several members of the American Pediatric Society.

During the past five years several outbreaks of this disease have occurred in Montreal, due in two instances at least, to the infection being conveyed in milk. Quite a number of children suffered, but a comparison between the numbers of children and of adults who were attacked I am unable to make, owing to defective registration of all the cases of the disease which occurred.

For this period I have the notes of twenty-nine cases of typhoid fever, the greater number of which occurred in my own private practice, but which include a few cases seen in consultation with other physicians. I have also examined the records of forty-eight cases treated in the Montreal General Hospital during this period, many of which occurred in my own wards; others I report by the courtesy of my *confrères;* also the records of twenty-three cases admitted into the wards of the Royal Victoria Hospital, the notes of which were kindly placed at my disposal by the attending physicians; making in all a total of one hundred consecutive cases occurring in children under fifteen years of age.

I have thought that a brief *résumé* of the characteristics of the disease as manifested in these cases, and of the relative frequency of the various symptoms and of the results obtained by

*Read before the American Pediatric Society, Washington, D. C., May 1, 2, 3, 1900.

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treatment, might present some points of interest to the Society. Of these one hundred children

1	was	under	the	age	of	1	year		7	were	under	the	age	of	9	years
3	were	under	the	age	of	2	years		10	"	"	"	"	"	10	"
3	"	"	"	"	"	3	"		9	"	"	"	"	"	11	"
5	"	"	"	"	"	4	"		9	"	"	"	"	"	12	"
5	"	"	"	"	"	5	"		8	"	"	"	"	"	13	"
8	"	"	"	"	"	6	"		8	"	"	"	"	"	14	"
6	"	"	"	"	"	7	"		9	"	"	"	"	"	15	"
9	"	"	"	"	"	8	"									

Four infants were thus under the age of two years, thirteen between two and five years, forty between five and ten years, and forty-three between ten and fifteen years.

Of the four cases under the age of two years, one was received into the Montreal General Hospital under the charge of Dr. Finley; two occurred in private practice; and one was seen in consultation.

In the case of the one received into the hospital the diagnosis was at first doubtful. The history was that of an infant of thirteen months, apparently healthy, with the exception of a perforated drum membrane, the result of an attack of scarlet fever seven months previously. A discharge from this ear persisted. Five days before its entrance into the hospital diarrhea set in, the infant became listless, fretful and drowsy, and food was refused. Two days afterwards it was seen by a medical man and recommended for admission into the wards. Its condition at the time resembled that of a child suffering from incipient meningitis. It was restless, turning from side to side, and moaning; its face had a cyanotic hue; the abdomen was slightly distended; no rose spots were visible; the spleen was distinctly palpable; the lower edge of the liver could be felt; a few moist râles were heard at the base of both lungs; the pulse was rapid and very weak; the heart was normal; loose fecal movements occurred four or five times in the twenty-four hours. The infant died in the morning of the fifth day after its admission. The Widal reaction was absent. The *post-mortem* examination revealed typhoidal lesions and the presence of typhoid bacilli in the intestines.

Two cases occurred during the spring of 1897 in my own practice. In both cases other children in the family were at the time suffering from well-marked symptoms of typhoid fever. Infection in these cases had been conveyed through the milk. They did not run a severe course. The temperature ranged

between 102° F. and 104° F. for the first week. In the second week between 100° F. and 102° F., but subsided to normal before the close of the third week. Rose spots were distinct in one, absent in the other. In both, the spleen was enlarged; in both, loose movements of the bowels were present, but the diarrhea was not sufficient to call for special medication. The only treatment employed was tepid baths at a temperature of 95° F. reduced to 90° F.

In the fourth case I was called to see an infant of eighteen months suffering from cerebral symptoms which the attending physician regarded as probably due to tubercular infection. At the consultation, a few rose-colored spots were discovered on the slightly distended abdomen, the spleen was found to be enlarged, and three or four loose movements of the bowels had occurred each day since the onset of the sickness. A probable diagnosis of typhoid fever was made, which I was afterwards informed had proved correct. After an illness of sixteen days an uninterrupted convalescence set in.

Typhoid fever in the infant is generally regarded as a comparatively rare affection. Marfan states (*Traité des Maladies de l'Enfance,* Grancher, Paris. 1897. Vol. i., p. 332), that it is remarkable for the vague character of the clinical picture and its difficulty of diagnosis. The more exact methods recently placed at our disposal for the determination of the presence of the typhoid bacillus will remove the difficulty in diagnosis; and all cases of continued, perhaps it would be better to say, remittent fever in the infant, unaccompanied by any distinct localization of disease, should be carefully investigated. My personal belief is that instances of this infection will be found more numerous than the facts elicited in previous discussions on the subject in our Society would lead us to think.

The statistics of typhoid fever in infancy are still too meagre to enable us to draw any broad conclusions. Thus far only the more severe cases have been recognized. With the more accurate means of diagnosis now at our disposal, the typhoid fever of infancy may be shown to run a comparatively mild course.

After a careful investigation of the records of those cases occurring after two years of age, I do not feel inclined to draw a dividing line at any special age. While in patients over fifteen years, the disease generally assumes the characteristics met with in the adult, in my experience up to the age of fifteen it main-

tains the type met with in childhood; the symptoms are milder, and the duration in the great majority of cases is under three weeks.

In thirteen of my cases, the *onset* was sudden. Children apparently in good health were suddenly taken ill, so that within a few hours symptoms of disease were well-marked. In every case in which I have noted this fact, the sudden onset was associated with the disturbance of the gastro-intestinal tract, attributed at the time to an indiscretion in diet.

Of the well-recognized *initial symptoms*, headache was observed as present in 68 cases, (or 83 per cent. of the children over six years of age.) It is noted as severe in 16, (or nearly 20 per cent.) Vertigo is noted in 19 cases (22 per cent. of those over six.) Anorexia is noted in 49 cases. While no distinct chill is reported, in 12 cases the patients complained of a feeling of chilliness. In 18 cases vomiting is said to have taken place, but did not occur after the first day. Movements of the bowels, looser and more frequent than normal, were noted in 36 cases. Of these, 10 cases were distinctly diarrheal in character. Six of these were children in whom the sudden onset was attributed to indiscretions in diet. In only 4 cases did the diarrhea persist and require special medication. Constipation was present in a more or less pronounced degree in 59 cases, requiring rectal injections. Slight fulness of the abdominal parieties was noted at the onset in 48 cases. In 29, it is distinctly stated that no distension was present. Abdominal pain was noted as a complaint in 33 cases, while pain on pressure, a dubious symptom always in young children, is only stated to have been present in 15. Epistaxis occurred in 23 cases. Tonsillitis was present in 6 cases. A slight convulsion was stated by the mother to have occurred at the onset of the attack in an infant of two years and eight months, but as this was one of the instances in which, apparently, the sudden onset was precipitated by injudicious feeding, it has probably little value as an indication of typhoid fever infection. The personal equation enters so largely into any estimate of the value of these initial symptoms that it is impossible for us to draw conclusions from them as to the prognosis of the attack.

Investigating the symptoms occurring during the course of the disease, we observe that the temperature range presents some peculiarities worthy of notice. A resemblance to Wunder-

lich's ascent at the onset was observed in only 8 out of the 100 cases. This small number is doubtless due to the fact that the temperature in hospital cases, and, indeed, in private practice, is rarely accurately recorded before the fourth or fifth day of the disease. Three of these 8 were cases in which the affection appears to have been contracted in the hospital, and as the temperature records were systematically registered, in them the step-like ascent is distinctly noticeable, in 1 for three, and in 2 for four days. After the first week, in the large majority of cases, the temperature became in a marked degree remittent. In those who were admitted into the wards towards the close of the first, or during the second, week of the attack, the temperature was remittent from the outset; a fall of from two to four degrees being recorded in the morning, as compared with the record of the previous evening. During the third week, these extreme ranges (in 62 out of the 87 charts at my disposal) came to an end, either gradually subsiding or more or less abruptly ceasing; so that at the end of the twenty-first day there was an evening temperature of not higher than 99 degrees. More frequently in the child than in the adult do we find the temperature at the close of this period remaining persistently subnormal for some days. In five cases it is noted that the rectal temperature remained between 96° F. and 98° F. for from three to four days. In one case for four days in succession, it recorded 95.5° F. as a morning temperature.

Of the 87 temperature charts which I have been able to compare, in 19 the temperature on several occasions reached or exceeded 105 degrees, and the fever persisted for four weeks or more. In 37 the temperature on several occasions reached 104 degrees, and the duration of the fever was about three weeks. In 15 cases the duration of the fever was between two and three weeks, but the highest range of temperature was 103° F. In 16 cases, while the temperature may have occasionally reached a high point, the duration of fever was under two weeks. Of the remaining 13 cases, the temperature charts are either wanting or too defective to make use of them, but of these, 4 I have characterized as severe in my notes taken at the time, and 9 as moderately severe. Taking the temperature curve, therefore, as some indication of the severity of the disease, I may refer to 23 of my 100 cases as being severe, 46 as moderately severe, and 31 as running a moderately mild course.

The pulse in the great number of cases was only moder-

ately quickened, but in the few instances to which I will refer later on, it was rapid and dicrotic.

The spleen is noted as palpable in 70 cases. In 8 additional instances, the splenic dulness was noted as increased under careful percussion. Tenderness on pressure over the spleen is noted in 18 cases. Rose spots were noted in 55 cases. In three only are they said to have been numerous. A diffuse erythema of the neck and chest is noted to have occurred during the first week in 2 cases.

In 8 cases during the course of the illness the abdomen is stated to have become distinctly distended. In 5 of these, diarrhea was present. In two cases rigidity and tenderness existed, which subsided on the application of an ice bag. In 4 cases, 2 of them under ten years of age, traces of blood were observed in the stools between the eighteenth and the twenty-third days of the disease, but no severe hemorrhage occurred.

In 19 cases sonorous and sibilant râles are noted to have been present at the bases of both lungs. In 1 case a child of seven years is stated to have attended the out-patient department of the hospital for six days with symptoms indicative of an attack of bronchopneumonia. The physical signs noted were an impairment of resonance at both bases with numerous submucous râles; sibilant and sonorous râles over the upper portion of both lungs; and distant tubular breathing at the lower angle of the right scapula; temperature 103°; pulse 112; respiration 44. After admission into the hospital the spleen was found to be enlarged, and two days later, an eruption of rose spots occurred on the abdomen; the temperature assumed a remittent character, and the lungs cleared. Complete defervescence took place on the sixteenth day of the fever, followed by a relapse on the twenty-third day of the attack, lasting eight days. The temperature then fell to normal and convalescence ensued.

At the onset of almost all these cases, and throughout the attack in cases of moderate severity running a regular course, the pulse remains slow even under the stimulation of a high temperature, indicating possibly some action on the pneumogastric centre by the toxins of the typhoid bacillus; in severe cases, however, this action would appear to be more than counteracted by the effect of the toxin on the muscular wall of the heart, as indicated by the frequent development in children of a soft, systolic murmur heard frequently both at base and

apex. Its presence is noted during the second or third week in twenty-two of my cases. At the same time in three cases murmurs evidently more organic in character were also reported.

A mild nocturnal delirium is noted as present in eighteen cases. In only one instance was the delirium noisy. Restlessness in sleep, or sleeplessness, occurring during the second or third week is noted in 15 cases. In 12 cases drowsiness was a marked feature of the first week; and in 4 cases a condition of semi-stupor existed during the first few days after entrance into the hospital. In 1 case, with a dicrotic pulse there was muttering delirium, picking at the bed clothes, and subsultus, with a temperature of 105.5°. These symptoms fortunately passed off under free stimulation, continuous spongings, and the application of ice over the precordium. In a second case, in addition to the condition of stupor, a coarse tremor of the fingers was noted, and abolished reflexes. When convalescence set in a paretic condition of the muscles of the leg with dragging of the toes was noted. I have no record of the occurrence of temporary aphasia, instances of which have been reported by other writers, but Dr. Finley told me that in one instance this condition had been present for two weeks, but passed off completely during convalescence. A paretic condition of the bladder, requiring the use of the catheter, was noted in three cases during the second and third week of the attack. One instance of tenderness of the toes was recorded.

In only five instances is it stated that a trace of albumin was present in the urine; in two of these a few epithelial casts were also found.

Otitis occurred in four cases.

A benign non-suppurative periostitis is noted in one case.

A tendency to subsequent furunculosis was noted in two instances.

Relapses have been noted in 15 of the cases. In 1 case there were two distinct exacerbations. Relapses followed after both severe and mild attacks. It is stated by Marfan (*Loc. Cit.*) that they may be foretold by the persistence of the enlargement of the spleen, by the temperature failing to assume a normal and regular course, by the failure of the tongue to clean, and by the facial expression. I have failed to verify any of these statements, beyond noting that in 5 of the cases, the exacerbation occurred in the fourth week after a severe attack before the temperature had quite assumed a normal range.

In corroboration of the value of the Widal reaction in diagnosis, I would state that in 43 of my cases it was carefully sought for with the following results:

3	gave	it	on	the	4th	day	1	gave	it	on	the	14th	day
2	"	"	"	"	5th	"	1	"	"	"	"	15th	"
2	"	"	"	"	6th	"	2	"	"	"	"	16th	"
3	"	"	"	"	7th	"	2	"	"	"	"	17th	"
2	"	"	"	"	8th	"	3	"	"	"	"	18th	"
1	"	"	"	"	9th	"	1	"	"	"	"	19th	"
3	"	"	"	"	10th	"	1	"	"	"	"	20th	"
5	"	"	"	"	11th	"	1	"	"	"	"	21st	"
4	"	"	"	"	12th	"	2	"	"	"	"	22nd	"
3	"	"	"	"	13th	"	1	"	"	"	"	28th	"

In 3 cases the reaction failed.

We may simplify these figures by stating that 12 gave the reaction on or before the eighth day; 13 gave the reaction after the eighth but before the twelfth; 12 after the twelfth but before the eighteenth; and 6 after the eighteenth and before the twenty-eighth.

The only death which occurred in this series of 100 cases was that of the infant thirteen months old which was received into the hospital in a condition of profound depression of the circulatory and nervous system, and died on the fifth day after admission.

The treatment of the majority of these cases was by the regular systematic employment of cool or cold baths. In 53 cases the bath was employed whenever the temperature rose above 102.4° F. In 19 instances the first few baths were given at 90° F. reduced to 85° F. and afterwards continued at 85° F. reduced to 75° F. Their duration was ten minutes; and they were repeated every three hours if the temperature remained high. In 25 instances the first baths were given at 85° reduced to 80° and afterwards continued at 80°, reduced to 75°. The duration of the bath was ten minutes; and it was repeated if necessary every three hours.

In nine instances after a few baths at slightly higher temperatures, the bath was given at 75° F. reduced to 68°.

In thirty instances systematic spongings with water at a temperature of 65° to 70° F. were given every two or three hours associated with the employment of ice applied either to the head or in four instances to the precordium.

In three instances a cold pack was employed.

In fourteen instances the treatment was merely symptomatic.

Stimulants in the form of either whisky or brandy were employed cautiously in some instances, but freely in a few cases, regarding them not only as a stimulant, but as a rapidly and easily appropriated food. Strychnin was the chief cardiac stimulant employed. Milk formed the chief dietary, but a careful watch was kept over the stools that the quantity given should not be in excess of the digestive powers of the child. Frequently it was more or less modified by the addition of some diluent.

In regard to the use of cold baths and the Brand method in the treatment of typhoid fever in children, perhaps a short expression of my opinion may not be out of place. I am convinced of the great value of the regular and systematic employment of the cool or cold bath in the treatment of this affection. In my opinion it should be employed regularly without too rigid adherence to Brand's rule of only using it when the fever reaches 102 4° F., and a great fall in temperature as the result of its employment is not to be desired. Rapid falls, as we all know, are almost invariably followed by an equally rapid rise. As a recent writer has said: baths are to be employed for their action not on the temperature, but on the nervous system and through it on the heart, respiration, and secretions, especially the secretion from the kidneys. The nervous system of the child responds more quickly and energetically to the cool bath than does that of the adult, and the amount of response has to some extent an inverse proportion to the age. It is therefore unnecessary and undesirable that as low temperature should be employed in the case of a young child as in the case of an adult. The duration of the bath, the temperature of the water, and the frequency with which the baths are employed should be modified to suit each case in the same way as we modify the dosage of other therapeutic remedies. All sudden and severe shock should be avoided. I believe it to be a great shock to a young child to plunge it at the outset into a bath of 68° or even 75° F.; while a bath of 90° F. cooled to 85° and repeated regularly for the first few days of the attack gives rise to neither resistance, nor signs of shock or collapse on the part of the child. Later on in the disease lower temperatures may be employed if found necessary. Even after the pyrexia falls below 102° F., I believe that the regular use of the cool bath once or twice a day strengthens the heart action and tends to a more rapid convalescence.

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