

On the affections clinically simulating typhoid fever : with especial reference to and reports of cases of Brill's disease / by H. Fred Lange Ziegel.

Contributors

Ziegel, Hermann Fred Lange, 1876-
Royal College of Surgeons of England

Publication/Creation

New York : William Wood, 1910.

Persistent URL

<https://wellcomecollection.org/works/r6fjs6q6>

Provider

Royal College of Surgeons

License and attribution

This material has been provided by This material has been provided by The Royal College of Surgeons of England. The original may be consulted at The Royal College of Surgeons of England. where the originals may be consulted. Conditions of use: it is possible this item is protected by copyright and/or related rights. You are free to use this item in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s).



Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>

6/5

22.

ON THE AFFECTIONS CLINI-
CALLY SIMULATING TY-
PHOID FEVER, WITH ES-
PECIAL REFERENCE TO
AND REPORTS OF CASES OF
BRILL'S DISEASE

BY

H. FRED LANGE ZIEGEL, B.S., M.D.
NEW YORK

Adjunct Attending Physician to the Beth
Israel Hospital

REPRINTED FROM THE
MEDICAL RECORD

June 25, 1910

WILLIAM WOOD & COMPANY
NEW YORK

ON THE AFFE
LATING TY
ECIAL
REPO
BR

By H. FRE

AGENCY ATTENDING

ATTESTING to the
which our present
of the exanthema
facts¹ that from S
ning of the eightee
was applied to no
and that only abou
distinction recogni
fever. Owing larg
investigations in v
pioneer, the termin
exceptional cases o
changes. Thus th
was often replaced
of the outbreaks
typhoid" were diff
typhoid fever." H
distinctive clinical an
dences a further a
separate though u
common condition
graded as atypical
Some of the acu

Copyright.

ON THE AFFECTIONS CLINICALLY SIMULATING TYPHOID FEVER, WITH ESPECIAL REFERENCE TO AND REPORTS OF CASES OF BRILL'S DISEASE.

By H. FRED LANGE ZIEGEL, B.S., M.D.,

NEW YORK.

ADJUNCT ATTENDING PHYSICIAN TO THE BETH ISRAEL HOSPITAL.

ATTESTING to the evolution in clinical observation which our present knowledge of the differentiation of the exanthemata represents are the historical facts¹ that from Sydenham's time up to the beginning of the eighteenth century the term scarlet fever was applied to no less than four distinct diseases and that only about seventy-five years ago was the distinction recognized between typhus and typhoid fever. Owing largely to important bacteriological investigations in which Gärtner² in 1888 was the pioneer, the terminology of the older writers as to exceptional cases of typhoid fever began to undergo changes. Thus the appellation "abortive typhoid" was often replaced by "food poisoning" and some of the outbreaks previously regarded as "mild typhoid" were differentiated as epidemics of "paratyphoid fever." Based on interpretations of distinctive clinical and negative bacteriological evidences a further advance is the relegation into a separate though unclassifiable group of a fairly common condition which has previously been regarded as atypical typhoid fever.

Some of the acute infectious diseases which oc-

Copyright, William Wood & Company.

casional assume a temporary clinical picture of typhoid fever are miliary tuberculosis, septic endocarditis, malaria, influenza and the meningitides. Let us disregard this casual simulation in a *tentative classification* of the conditions which frequently bear more or less clinical resemblance to typhoid fever: (1) Intestinal Sapremia. (2) Coli Infections. (3) Meat Poisoning. (4) Paratyphoid Fever. (5) Brill's Disease.

1. *Intestinal Sapremia*.—In conditions of marked constipation, headache, apathy, a dry furred tongue, anorexia, prostration, abdominal pain, sustained temperature elevation, palpable spleen and an eruption may all be present to suggest the possible existence of typhoid fever. The eruption is, however, profuse and blotchy, macular and erythematous, and is not likely to be mistaken for a roseola nor for the eruption peculiar to Brill's disease (*vide infra*). Moreover, the administration of a brisk saline purge causes prompt defervescence and rapid disappearance of the rash. If, however, the duration of symptoms is not definitely ascertainable, or if they have been of longer duration than usual, the suspicion of typhoid fever may make active catharsis inadvisable. Such circumstances have been known by the writer to prolong for a week or more the ultimate exclusion of typhoid fever by means of the clinical course and the diagnostic aids of the laboratory.

2. *Coli Infections*.—Cases of aggravated constipation exhibiting typhoidal symptoms are occasionally met with in which isolation from the urine and blood of the *Bacillus coli communis* or positive and exclusive agglutination of the patient's serum against most strains of this organism prove these exceptional cases to be a general coli infection

rather than an intest
of this nature has bee
Sanarelli has show
intestine increases in
typhoid fever.¹ Moreo
tients frequently giv
with races of *Bacillu*
typhoid fever shows th
in the urine.² The c
relationship of the *Bacil*
problem for future s
3. *Meat Poisoning*
poisoning which occur
course of the disease
of the cases the symp
enteritis; some of the
nostris; while still of
as pathological resem
the last type different
been made practicabl
cient cause, which i
bacillus, or the *Borill*
these organisms can
from the colon bacill
and recent studies
the serum of patients
larly agglutinates kn
organism.³

Poisoning caused b
in decayed meat and
terial food poisoning
for the reason that th
likely to be mistaken
4. *Paratyphoid Fer*
one infectious diseas
bacillus through mater

rather than an intestinal sapremia.³ An epidemic of this nature has been reported in Bavaria.⁴

Sanarelli has shown that the bacillus coli in the intestine increases in number and virulence in typhoid fever.⁵ Moreover, the serum of typhoid patients frequently gives an agglutinative reaction with races of *Bacillus coli*; and a bacteriuria in typhoid fever shows the presence of this organism in the urine.¹ The clarification of the exact relationship of the *Bacillus coli* to typhoid fever is a problem for future solution.

3. *Meat Poisoning*.—In the outbreaks of meat poisoning which occur from time to time the clinical course of the disease varies considerably. In many of the cases the symptoms suggest a simple gastroenteritis; some of the severer cases resemble cholera nostras; while still other cases bear clinical as well as pathological resemblances to typhoid fever.⁶ In the last type differentiation from typhoid fever has been made practicable by the discovery of the efficient cause, which is either Gärtner's enteritidis bacillus, or the *Bacillus paratyphosus* B. Both of these organisms can be distinguished biologically from the colon bacillus and the *Bacillus typhosus*; and recent studies have conclusively shown that the serum of patients ill with meat poisoning regularly agglutinates known cultures of the causative organism.⁷

Poisoning caused by the proteus or colon bacillus in decayed meat and certain other forms of bacterial food poisoning have not been touched upon for the reason that the symptoms produced are not likely to be mistaken for those of typhoid fever.

4. *Paratyphoid Fever*.—That there exists at least one infectious disease not caused by the Eberth bacillus though materially componental of the pre-

viously so-called typhoid fever was firmly established nearly a decade ago by the studies of Achard and Bensuade, Widal, Gwyn, Durham, Cushing, Schottmüller, Coleman and Buxton, Meltzer, and others.⁸ An important and more recent contribution to the literature of this subject is that of Herbert Fox.⁹

Indistinguishable clinically from typhoid fever, and occurring both sporadically and in epidemics, paratyphoid fever can be diagnosed only with the aid of the bacteriologist, who must isolate from the blood, urine or feces the paratyphoid bacillus, or else obtain properly controlled positive agglutination reactions against this organism either (preferably) with the serum of a highly immunized animal or with the patient's serum. In bacteriological investigations of epidemics abroad the *Bacillus paratyphosus B.*, is recovered much more frequently than the *Bacillus paratyphosus A.*, while in America the reverse seems to hold true.⁹ Thus Proescher and Roddy have reported forty-eight cases of type A paratyphoid occurring in Allegheny.¹⁰ Recently, however, in an epidemic in Virginia, agglutination tests were positive exclusively against the *Bacillus paratyphosus B.*¹¹ In another recent epidemic in a barracks in France similar results were obtained after the *Bacillus paratyphosus B.* had been isolated from the blood in seven of the eight cases in which cultures were made.¹² There is still some uncertainty, however, as to the diagnostic accuracy of such serum reactions without other definite bacteriological proof as to etiology. Occasionally, as in Libman's celebrated case,¹³ the serum of a patient from whose blood a paratyphoid bacillus has been isolated will agglutinate, not only this organism, but also the

Bacillus typhos
the facts that
conferred by a
there is a para
complicating ty
Because of
Bacillus paraty
terial food poi
there is a com
acute form as
as paratyphoid
probably be sol
petent bacteriol
investigations
5. Brill's Di
tomatology and
caution should
affection bear
typhoid fever
the condition
by all internists
ogists except E
bation be it sa
taken advantag
new disease fr
actness and ba
the scope of th
authorities are
based upon th
action is prese
(b) the Ebert
blood in over
roseola is an
in a large num
is regularly ab
are regularly

Bacillus typhosus in low dilutions. Interesting are the facts that immunity from paratyphoid is not conferred by a previous attack of typhoid and that there is a paratyphoid cholecystitis similar to that complicating typhoid fever.¹⁴

Because of the etiological relationship of the *Bacillus paratyphosus* B. to certain forms of bacterial food poisoning, the question arises whether there is a common infectious disease assuming an acute form as meat poisoning and a subacute form as paratyphoid fever. Some of these problems will probably be solved by the continued studies of competent bacteriologists such as the recent painstaking investigations of Proescher and Roddy.⁷

5. *Brill's Disease*.—Because of the complex symptomatology and protean typology of typhoid fever caution should be exercised before stating that an affection bearing clinical resemblance to atypical typhoid fever is not the same disease, especially if the condition has hitherto remained unrecognized by all internists except N. E. Brill and by all pathologists except E. Libman. In no spirit of disapprobation be it said that both of these observers have taken advantage of and have been able to evolve a new disease from the criteria born of scientific exactness and bacteriological scrutiny which now limit the scope of the term typhoid fever. Fortunately all authorities are now agreed as to certain criteria based upon the following facts: (a) the Widal reaction is present in about 95 per cent of all cases; (b) the Eberth bacillus can be isolated from the blood in over 90 per cent of all cases; and (c) the roseola is an almost constant sign. If, therefore, in a large number of cases the true roseolar eruption is regularly absent and the blood culture and Widal are regularly negative, we are justified in conclud-

ing that the great majority of these cases, to say the least, are not typhoid fever. Similar negative evidence with reference to the paratyphoid roseola and the paratyphoid organisms and agglutination reaction also establishes the exclusion of paratyphoid fever. Furthermore, if there are definite and constant clinical characteristics in the cases referred to distinguishing them from typhoid and paratyphoid fever, such a deduction is indisputably warrantable.

Every practical clinician of to-day, provided that he has fair training, experience and acumen, must recollect having at one time or another treated what passed for atypical typhoid fever—not, however, without the conviction that he was not actually dealing with typhoid. That this is true is shown by the following incident. The house physician at Beth Israel Hospital had suggested influenza as a discharge diagnosis, and on being questioned as to the propriety of this designation, Dr. S. Horwitt replied that he knew the case was not really influenza, but that the system of nomenclature in vogue at this hospital (the Bellevue system) excluded vague terms like autointoxication; and furthermore that though the condition resembled typhoid or paratyphoid somewhat, neither of these appellations would be justifiable. The interne's response demonstrated his recognition of an unclassifiable condition, which in fact was a typical case of the disease which we have called Brill's disease in spite of the undesirability of eponymic nomenclature.

For a detailed description of this affection the reader is referred to Brill's convincing and comprehensive presentation of the subject in the *American Journal of the Medical Sciences* for April, 1910,¹⁶ and for a critical survey to an editorial in

the Manual. Record for communication we shall justify the propriety of this and the practical in cases.

As early as 1896 Brill described somewhat similar features irreconcilable with typhoid fever;¹⁷ and two years later, in "A Study of Seventeen Cases of Typhoid Fever Resembling Typhoid,"¹⁸ he continued ever since with facilities for agglutination and cultures, all of which were carried out with the latest methods and have proven that the condition is common with typhoid fever or intermediate between the two. Speaking before the New York Medical Society, E. Liberman, in 1907, described a group of cases described by Brill as resembling typhoid fever somewhat, but considered to have been typhoid fever, we could not find organisms from the blood, and therefore, be classed as a group.¹⁹

The discussion following the publication of this subject in the *New England Medical Journal* evinced a hesitancy to class the disease a condition

the MEDICAL RECORD for April 30, 1910.¹⁶ In this communication we shall limit ourselves to: (a) a justification of the proposed admittance into medical nosography of this affection; (b) remarks on the facility and practical importance of differentiating it from typhoid fever; and (c) reports of three cases.

As early as 1896 Brill had "noticed a type of disease somewhat similar, but characterized by many features irreconcilable to the picture of typhoid fever;"¹⁵ and two years later Brill published "A Study of Seventeen Cases of a Disease Clinically Resembling Typhoid Fever, but Without the Widal Reaction."¹⁷ These studies have been continued ever since with the best obtainable laboratory facilities for agglutination tests and blood, stool and urine cultures, all of which were most systematically carried out with the last fifty cases of Brill's series, and have proven that "the affection has nothing in common with typhoid, paratyphoid and typhoid-colon or intermediate group infections."¹⁸ In 1906, speaking before the Johns Hopkins Hospital Medical Society, E. Libman stated that "in the group of cases described by Dr. Brill, which resemble typhoid fever somewhat, and which have been considered to have been possibly cases of paratyphoid fever, we could not succeed in isolating any organisms from the blood. There is no proof as yet that they are cases of paratyphoid, and should, therefore, be classed for the present as a *separate group*."¹⁸

The discussion following Dr. Brill's original presentation of this subject before the Section on Medicine of the New York Academy of Medicine evinced a hesitancy to accept as a newly discovered disease a condition for which there existed only

negative bacteriological and pathological evidence. Some of the participants in this criticism seemed to be oblivious of the fact that medical nosology was well established before the advent of the bacteriologist. Were his services required to distinguish measles from scarlet fever, typhoid fever from typhus, and infantile scurvy from rheumatism?

It is no exaggeration to state that the clinical differences between Brill's disease and typhoid fever are so pronounced and easy of recognition that the practical differentiation is less difficult than that between German measles and measles or that between German measles and scarlet fever. Let us now consider these differences seriatim.

The most striking mark of differentiation is the *eruption*, which appears as a single crop usually before the seventh day of the disease. There are no new crops. Appearing first on the abdomen and back, the rash spreads rapidly to the chest wall and extremities, is sometimes seen on the neck, palms and soles, and is often more profuse on the upper extremities than on the trunk. The rash is a profuse one and sometimes a number of the lesions run together to form small patches. The spots are maculopapular in character and usually have an oval, indistinct outline. On stretching the skin or making pressure over the spots, the latter fade somewhat but do not disappear entirely. Sometimes hemorrhagic spots are seen interspersed with the other lesions and frequently there are present in addition suspicious but not typical roseolæ. The eruption fades rapidly at the time of defervescence, but its remains are seen for some days in the form of brownish stains.

The febrile invasion is usually abrupt and is ushered in with a chill or chilly sensations followed

by very severe
variable period
general malaise
is some in abor
tained till the ti
perature charts
fever lasts the
small proportio
Apathy and pe
patient till with
as sick in the
in the second

Just as dist
recovery of th
After the tem
high for a pe
there is a fall
thereafter, in
perature neve
has been obs
sequelæ, and
of crisis or

comes bright
tient says tha
ficult and app
in bed for as
has fallen. C
to complete

A leucocyte
Usually the a
is normal.

The negati
blood, stool,
dwelt upon.
The unico
features me

by very severe headache and high fever. For a variable period previous to the invasion there is general malaise. The temperature curve reaches its acme in about three days and then remains sustained till the time of crisis or rapid lysis (see temperature charts of illustrative cases). While the fever lasts the headache persists severe and in a small proportion of cases there is also meningismus. Apathy and prostration develop very early, and the patient ill with Brill's disease looks as poisoned and as sick in the first week as does the typhoid patient in the second or third week.

Just as distinctive as the eruption is the *prompt recovery of the patient at the time of defervescence*. After the temperature has remained continuously high for a period varying from one to two weeks, there is a fall to normal in from ten to sixty hours; thereafter, in the great majority of cases, the temperature never again rises above normal. No case has been observed with a relapse or with serious sequelæ, and the mortality is nil. At the time of crisis or rapid lysis, the mental condition becomes bright, the headache disappears and the patient says that he is entirely well. It is usually difficult and apparently unnecessary to keep the patient in bed for as long as a week after the temperature has fallen. Characteristic is this rapid convalescence to complete recovery.

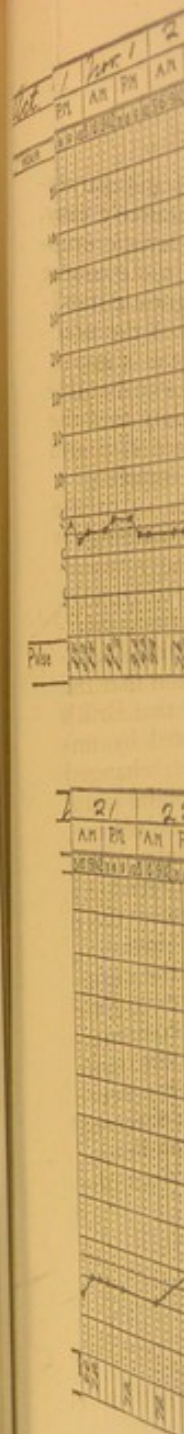
A leucopenia in this disease is exceptional. Usually the absolute and differential leucocyte count is normal.

The negative agglutination reactions and negative blood, stool, and urine cultures have already been dwelt upon.

The uniformity of the symptoms, the distinctive features mentioned above and their unlikeness to

comparable manifestations in typhoid and paratyphoid fever make the diagnosis comparatively easy. Moreover, with the help of the characteristic eruption the diagnosis can be made early in the course of the disease, a fact which from a prognostic standpoint is of great practical significance to the practitioner. Is it not a boon when a patient is apparently seriously ill with a febrile disease to be able to predict with a fair measure of certainty that the patient will be up and about in between two and three weeks and that recovery will be complete?

Speculations will not be indulged in as to the pathogenesis, about which practically nothing is known. Clinically the disease bears more resemblance to mild typhus fever than it does to typhoid. Brill states that during an epidemic of typhus differentiation from mild cases would probably be impossible. Yet Brill is firmly of the opinion that the disease is *not* typhus. Against the view that Brill's disease is typhus modified and attenuated by importation, new environment or other changed conditions are its nonepidemic occurrence, its usual noncommunicability, its uniform clinical picture, and the absence of grave and fatal cases. Immunity from Brill's disease is not conferred by a previous attack of typhoid fever. Since there are apparently periods of incubation, invasion, continued fever, and decline, by analogy the designation "infectious" is justifiable. There is little evidence to indicate that the disease is communicable. In Brill's 221 cases members of the same family or occupants of the same house were never attacked. Warren Coleman has, however, observed four cases from the same family and same household—cases in which Dr. Brill concurred in the diagnosis.



The following case is of the hope of aiding in interesting affection more than Brill's case.

Case I.—A woman, 35 years of age, was admitted to the hospital of Dr. J. E. Reinhardt. Married when 16 years of age. Children who were all born healthy. She began suddenly with a chill followed by fever. There were severe headache and diarrhea (about 10 times a day). On admission the patient was prostrated. There was a profuse macular rash on the trunk and extremities interspersed among the normal skin. She was well nourished and robust. The spleen was not palpable. The temperature curve is shown in the accompanying graph. The white count averaged 10,000. The phoscular count was positive. On the 10th day the temperature dropped to subnormal. Repeated blood cultures were negative. The disease by its rapid recovery was rapid.

Case II.—A native of Russia, 25 years of age, came to the service.

The following case reports are submitted with the hope of aiding in the general recognition of this interesting affection, for which we know no better name than Brill's disease:

CASE I.—A woman 29 years of age, born in Russia, was admitted on October 22, 1909, to the service of Dr. J. E. Reinthaler at Beth Israel Hospital. Married when 16 years old, she had had five children who were alive and well. The present illness began suddenly five days before admission with a chill followed by high fever. Since the onset there were severe headache, anorexia, prostration, fever and diarrhea (about six bowel movements a day). On admission the temperature was 104.6°. There was a profuse maculopapular eruption spread over the trunk and extremities with suspicious roseolæ interspersed amongst the other lesions. The patient was well nourished and well developed but greatly prostrated. The skin was hot and dry. The pharynx was congested. The pulse was not dicrotic. The spleen was not palpable. The course of the temperature curve is shown in Chart I. Five leucocyte counts averaged 10,200 with an average polymorphonuclear count of 70 per cent. The diazo reaction was positive; otherwise the urine was negative. On the 10th and 11th days of the illness the temperature dropped within 30 hours to subnormal, was subnormal for 24 hours, and then remained normal. Repeated Widal reactions were negative and a blood culture performed on the ninth day of the disease by Dr. J. J. Hertz was negative. Recovery was rapid and the patient was out of bed one week after defervescence.

CASE II.—A man 25 years of age, unmarried, a native of Russia, was admitted on May 12, 1910, to the service of Dr. A. H. Friedenberg at Beth

Israel Hospital. Twelve days before admission there developed general malaise, anorexia, and constipation; these symptoms continued for nine days and then the patient took to his bed because of the development of chilliness, fever, headache, and prostration. The temperature on admission was 103.6°. The pulse was dicrotic. Though well nourished and robust, the patient was markedly apathetic and prostrated. The tongue was moist and uniformly coated. The skin was hot and dry. A profuse maculopapular eruption, hemorrhagic in areas, was scattered over the abdomen, back, chest wall and extremities. The spots were of a dull red color and not completely effaced on stretching or making pressure over the skin. In certain areas a number of spots ran together to form small patches. There were numerous lesions on the forearms and a small number on both soles. Otherwise physical examination was negative. The spleen was not palpable. The temperature remained sustained (see Chart II), never more than one degree above or below 103, until the ninth day, when it fell to normal within 36 hours and remained so. The symptoms during the febrile period were severe headache, apathy, prostration, anorexia and constipation. No new lesions appeared on the skin during the time of observation and the original crops faded rapidly at the time of defervescence. On the seventh and eighth days of the disease the headache was extreme, and there developed moderate rigidity of the neck and slight Kernig's sign. The meningismus disappeared at the time of crisis. The absolute and differential leucocyte counts were normal. The urine was negative. Repeated Widal's during and after the febrile course were negative. A blood culture performed on May 16th, by Dr. J. J. Hertz,

was negative.
rupted.

Case III.—A
age, with six livin
29, 1909, to the
at Beth Israel
illness previous
before admission
ache, general p
been general m
this onset. On
the pulse 110.
throat was con
of the neck, no
papular eruption
and extremities.
The patient was
complained of s
examination w
mained elevated
the illness, wh
hours and then
culture perion
disease was ne
continued afte
the temperatur
the mental cor
returned and t
after deferves

1. Abbott and
II, Part I.
2. Gartner: C
cine von Thürin
3. Ker, Claude
4. Dr. Ham
Meislingen, Ba

ital. Twelve days before admission
ed general malaise, anorexia, and con-
ese symptoms continued for nine days
patient took to his bed because of the
of chilliness, fever, headache, and pros-
temperature on admission was 103.6°.
as dicrotic. Though well nourished
patient was markedly apathetic and
The tongue was moist and uniformly
skin was hot and dry. A profuse
er eruption, hemorrhagic in areas, was
r the abdomen, back, chest wall and
The spots were of a dull red color
letely effaced on stretching or making
the skin. In certain areas a number
together to form small patches. There
is lesions on the forearms and a small
th soles. Otherwise physical exami-
gative. The spleen was not palpable.
ure remained sustained (see Chart
ore than one degree above or below
ninth day, when it fell to normal
rs and remained so. The symptoms
brile period were severe headache,
ation, anorexia and constipation. No
appeared on the skin during the time
and the original crops faded rapidly
defervescence. On the seventh and
f the disease the headache was ex-
ere developed moderate rigidity of
slight Kernig's sign. The absolute
ed at the time of crisis. The absolute
leucocyte counts were normal. The
ative. Repeated Widal's during and
le course were negative. A blood
ed on May 16th, by Dr. J. J. Hertz,

was negative. Recovery was rapid and uninter-
rupted.

CASE III.—A married Russian woman 41 years of
age, with six living children, was admitted on March
29, 1909, to the service of Dr. A. H. Friedenberg
at Beth Israel Hospital. Having had no serious
illness previously, the present one began ten days
before admission with chilliness, fever, severe head-
ache, general pains and prostration. There had
been general malaise for some days previous to
this onset. On admission the temperature was 105°,
the pulse 110. The tongue was dry and red, the
throat was congested. There was slight rigidity
of the neck, no Kernig's sign. A profuse maculo-
papular eruption was scattered over the trunk, neck
and extremities. The spleen was palpably enlarged.
The patient was somnolent, markedly prostrated and
complained of severe headache. Otherwise physical
examination was negative. The temperature re-
mained elevated above 102° till the thirteenth day of
the illness, when it dropped to normal within 60
hours and thereafter remained normal. A blood
culture performed on the thirteenth day of the
disease was negative. Frequently repeated Widal's
continued after defervescence were negative. As
the temperature dropped the headache disappeared,
the mental condition became brighter, the appetite
returned and the patient was up and about six days
after defervescence.

REFERENCES.

1. Allbutt and Rolleston's *System of Medicine*, 1906, Vol. II, Part I.
2. Gärtner: *Correspondenzblatt des Allgem. ärztl. Vereins von Thüringen*, 1888, No. 9.
3. Ker, Claude Buchanan: *Infectious Diseases*, 1909.
4. De Haan and De Jonge: *Laboratte Weldobrecken Medelingen*, Bavaria, 1902.

5. Sanarelli: "Etudes sur la fièvre typhoïde expérimentale," *Ann. de l'Inst. Pasteur*, Vol. VI, 1892, and Vol. VIII, 1894.
 6. Dieudonné, Adolph: "Bacterial Food Poisoning," translated, with additions, by Charles Frederick Bolduan, 1909.
 7. Proescher and Roddy: "Bacteriological Studies on Paratyphoid A and Paratyphoid B," *Archives of Int. Med.*, March, 1910.
 8. Meltzer, Samuel J.: "Paratyphoid," *New York Medical Journal*, Jan. 25, 1902.
 9. Fox, Herbert: "The Nature of Paratyphoid Fever and Its Closely Allied Infections," *Univ. of Penna. Med. Bulletin*, Vol. XVIII, 1905.
 10. Proescher and Roddy: "A Report of Forty-eight New Cases of Paratyphoid Fever (Type A)," *Journ. Am. Med. Assn.*, Feb. 6, 1909.
 11. Hoskins, H. F.: "An Epidemic of Paratyphoid Fever," *Journ. Am. Med. Assn.*, March 19, 1910.
 12. Sacquepee and Bellot: "An Epidemic of Paratyphoid Fever Caused by a Carrier," Abstracted and translated in the *Am. Journ. of the Med. Soc.* for April, 1910, from "Progres Médicale," 1910, No. 3.
 13. Libman, E.: "On the Bacteriological Study of a Case of Paracolon Infection Probably Secondary to Typhoid Fever, with Remarks on Serum Reactions in Paracolon Infections and on the Thread Reaction," *Journ. of Med. Research*, New Series, Vol. III, 1902.
 14. Cecil, Russell L.: "Paratyphoid Cholecystitis," *Archives of Int. Med.*, May, 1910.
 15. Brill, Nathan E.: "An Acute Infectious Disease of Unknown Origin; a Clinical Study Based on 221 Cases," *Am. Journ. of the Med. Sc.*, April, 1910.
 16. Editorial: *MEDICAL RECORD*, April 30, 1910.
 17. Brill, Nathan E.: "A Study of Seventeen Cases of a Disease Clinically Resembling Typhoid Fever, but without the Widal Reaction," *N. Y. Med. Journ.*, Jan. 8 and 15, 1898.
 18. Libman, E.: "On Some Experiences with Blood Cultures in the Study of Bacterial Infections," *Johns Hopkins Hospital Bulletin*, Vol. XVII, No. 184, July, 1906.
- A complete bibliography up to date on Food Poisoning is given by Bolduan (see above, No. 6), and on Paratyphoid Fever by Proescher and Roddy (see above, No. 7).

8 WEST EIGHTY-SIXTH STREET.