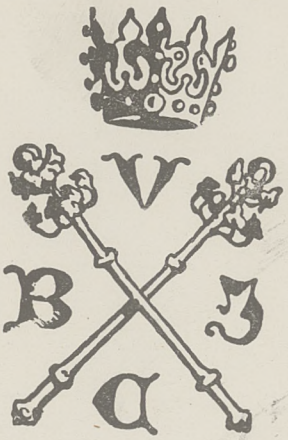

CONTRIBUTIONS TO OUR KNOWLEDGE OF NON-TYPICAL TYPHOID FEVER.

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With Introductory note by DR. VANDYKE CARTER.

[*Introductory Note.*—The following article has been translated from the German (*Münchener Medicinische Wochenschrift*, 1889, Nos. 46 and 47), mainly by the author himself; and, at my suggestion, more particularly for English readers in India. For this brief prefatory note, I am responsible.

A correct discrimination of disease lying at the root of all progress in medicine, it may, I think, be said that in India little aid towards the diagnosis of typhoid has yet been derived from current etiological views; whilst the more obvious clinical signs are sometimes so obscure, that demonstration of the true nature of a fever-case either becomes deferred until the autopsy, or fails when that test is impracticable. Under these circumstances, an additional and surer means of diagnosis should be welcome. According to most authorities, the *typhoid bacillus* is quite pathognomonic; and hence its presence in the stools (after its liberation at ulcer-sites in the ileum) must be regarded as proof of the typhoid infection, however obscure the origin and however vague the symptoms in any particular illness. There will, doubtless, be medical officers in India having the requisite opportunity and leisure, who are practically acquainted with the methods of bacteriological research; and to them, especially the investigations of Dr. Karlinski cannot but appear suggestive. And so important would it be thus to ascertain the actual range of typhoid fever at our chief stations, both civil and military, that some encouragement from Government might well be invited in aid of local skilled investigation. By such special enquiries not only might sanitary medicine be advanced, through the detection of little known or unsuspected sources of the typhoid infection; but also our clinical knowledge benefited, in so far that the long list would be shortened, of fever-cases hitherto vaguely termed "febricula," "simple continued fever," "remittent fever," or "intermittent." And if the range of "typhoid" were somewhat enlarged to the displacement of "malarious" and so-called "climatic" fevers, this result need hardly be regretted; since the prospect of effectual preventive measures would thereby be improved, and the principles of treatment correspondingly amended. A general conformity rather than absolute identity of eastern with western experience, being the most probable result of inquiry; the possibility also arises of some new features of Indian fevers being elicited, to the desirable advantage of clinical medicine.

Dr. Karlinski's description of his station in Lower Austria, applies in some obvious points to many localities in India; and the tendency of modern progress being to assimilate the teachings of tropical to extra-tropical experience, evidence of a general correspondence of all wide-spread insanitation-diseases may be anticipated. The interaction of the malarial and typhoid infections, as revealed by symptoms, forms another subject worthy of fresh study. Personally, I should gather from the present research that specific typhoid is, in its clinical aspects, not less *protean* than has been demonstrated for ague and spirillum fever: this inference equally resulting from the laborious application of modern pathognomonic tests, now for the first time (to my knowledge) done in elucidation of aberrant enteric fever.] V. C.

IN the southern districts of Herzegovina there prevails, during the summer months, a form of intestinal catarrh, which is known officially as "gastro-enteritis endemica" and popularly as the "hundskrankheit" or "dog-disease." This affection appears year after year, spreads locally, and then subsides with the advent of cold weather. Though cases are seldom exactly alike, yet the majority present the following clinical features:—As premonitory symptoms, headache, anorexia, constipation, malaise and transient chilliness; after which a sudden rise of temperature to 103.4° F. or higher, with a pulse of 100 to 110, full and firm. This febrile onset is not preceded by rigors, and it is sustained in continuous form for four to six days, the pulse during this time declining to 60; the conjunctivæ become injected, the tongue coated behind, bowels costive, and abdomen uneasy: severe occipital headache, and occasionally delirium are also present. Defervescence by crisis then ensues, and with it smart diarrhœa (if aperients be not previously given): the patient becoming very weak, and remaining unfit for work for a further period of three weeks or longer. Chart A illustrates the usual course of pyrexia.

Variations are, however, extremely frequent; the fever sometimes being rather less pronounced and lasting only two days or less, though convalescence is still as long delayed: epistaxis and intestinal hæmorrhage may occur, also post febrile

delirium, spasms, and even temporary unconsciousness. The death-rate of this disease is low, and whilst during 1887 and 1889 I had met with five casualties in 60 treated, according to the experience of other medical officers, the mortality would not seem to exceed one per cent. Neither age nor sex seem to influence greatly the incidence of the affection. Relapses are common and usually mild. More than natives, new-comers to the country, are liable to suffer, and that more severely.

The credit of first directing attention to this remarkable disease belongs to Dr. A. Pick of the Austrian Army (*Wien. Med. Woch.* 1886, Nos. 33-4) who, however, regarded it as an affection *sui generis*, and dissimilar to typhoid, notwithstanding certain general and lesional characters concordant with "enteric fever," which he has described. During my service at the Military Hospital in Vienna, I witnessed many striking or even startling cases of aberrant typhoid; and very soon after seeing here the first case of "dog-sickness," I could not hesitate to recognise its enteric character (*Berlin. Klin. Woch.* 1888, No. 46), later observations and the bacteriological results stated below only confirming such earlier view.

The first case I met with was in Bosnia, and occurred in a policeman, who, a week after returning from leave to his post at Foca, showed the usual premonitory symptoms, and died on the third day of high fever. Autopsy revealed sparse yet characteristic typhoid ulcers in the lower part of the ileum, infection of Peyer's glands and splenic turgescence, as well as parenchymatous degeneration of the heart-muscle: and, moreover, microscopic sections of intestine and spleen displayed the presence of the typhoid bacillus of Eberth. During part of 1889, I made four other completer autopsies of patients dying of "dog-sickness," and was able also to make a bacteriological examination of the intestinal evacuations in 30 contemporary surviving cases; the combined result of my enquiries tending to verify the opinion that this disease is no other than a modified or erratic form of *typhus abdominalis*.

As most of the cases in question were seen in the town of Stolac, and seemed due to a malhygienic state of the locality, it may be as well to mention that this town is situated in a narrow valley and on the steep sides of a small river, the Bregava: the inhabitants number 4,800, lodged in about 400 roughly-built stone dwellings. Over one-half the people are Mussalmen, nearly one-half adherents of the Greek Church, and a few Roman Catholics. The soil is bare lime-stone, and highly absorbent. During the last four years the mean yearly rainfall has been about 26 inches: the two prevailing and alternating winds are the south-west and the north-east ("bora"); the latter blowing strongly from January to March, and being occasionally attended with snow. Minimum-temperature recorded was 21.2°F. (early in March): the mean noon-temperatures during July and August 103° F. (in the shade). In this country the hot and dry season sets in promptly after the last "bora" tempest, about the middle of March; radiation and reflection of heat from the stony surrounding aggravate the atmospheric warmth. Drinking-water is derived from a deep well near the hospital, from a district spring which dries up usually in summer, from six cisterns of modern construction, as well as from four others; and, lastly, from the river itself. This stream becomes converted during the hot season into a series of stagnant pools, the contents of which are greatly disturbed and contaminated by the people then resorting thither for purposes of ablution, the washing of clothes, and the watering of cattle: additional impurity accruing, also, from the entry by side-channels of excrementitious matters. A second sanitary defect consists in the numerous cesspools and open sewers around, which either dry up by absorption into the ground of their watery contents, or are emptied only at long intervals and very perfunctorily, when ordered by authority: the military establishments alone being, in fact, properly attended to. When further count is taken of the many burial-places situated in the town, it will be seen that the locality is hardly better than an Augean stable, for the cleansing of which vast time and trouble would be needed. These prevailing evils are too aggravated by popular customs and habits; according to which the Mussalman periodic fasts alternate with excesses: and the Greek and Roman months of meagre diet also tend to impairment of the public health. Efficient medical aid being either neglected or disregarded, infantile diarrhœa during summer, agues, tuberculosis at all ages, syphilis with its sequelæ, hooping-cough, pneumonia, and typhoid fever, are here very common. Remarkable, nevertheless, is the frequent impunity witnessed of even severe injuries and illness: thus, I have seen wounds of the skull exposing the brain and covered with earth, grass, or leaves, heal without attendant meningitis; also recoveries after epidemic puerperal fever with very high temperatures: the fatalistic apathy of the several castes co-operating as it were, with a singular tenacity of vital power. Under circumstances such as the above, it is no wonder that typhoid fever persists; and if this year I have seen fewer typical and non-typical cases amongst natives than amongst foreigners, the explanation seems to be that a certain immunity is acquired by residence.

Adverting now to the immediate subject in hand, it may be best to narrate first the fatal cases seen of a typic typhoid.

Case No. 1. —J.V., *æt.* 21, of strong frame, but thin, had a year ago an attack of intermittent fever, recovering well: now for six days has been complaining of loss of appetite, nausea, and constipation, and for two days of debility with headache. On admission his temperature was 102.9° F., pulse 100, the spleen enlarged to a finger-breadth below the costal margin, and abdomen generally tender. Calomel and quinine were given. Next day morning temperature 103·6°, and on third day 104.2° F., at which elevation it persisted for three days longer, in spite of cold sponging and large doses of quinine: death ensuing on the sixth day after admission.

See Temperature Chart of Case No. 1.

Purgatives given were without effect, and enemata brought away large quantities of hard fæces. With the rise of temperature, the pulse declined in frequency to 64 per minute: the tongue became thickly furred, and the spleen much enlarged. Autopsy was made six hours after death, and for bacteriological examination I first extracted, with a sterilised syringe, a little of the fresh spleen-pulp. The spleen itself was four times the normal size; there was cloudy swelling of heart and liver-cells, enlargement of the abdominal lymph-glands, infarction of the Peyerian glands, and at end of the ileum a typhoid ulcer as large as a dollar. Bacteriological examination of the spleen-pulp was made after Esmarch's method of culture, and revealed the presence of numerous typhoid-bacilli, whose specific character was then confirmed by cultivation on potatoes.

Case No. 2.—Occurred about a week later, and displayed different clinical features V. K., *æt.* 23, had been in good health until his admission with a sudden rise of temperature, costiveness, and general debility. The spleen was enlarged, pulse slow (56, 68), and abdomen uneasy. In the course of the next three days the temperature ranged between 103.6°F. and 104.6°F., and then suddenly fell to normal. The constipation (for which calomel had been ordered once) now changed into persistent diarrhœa: the splenic enlargement remained, and weakness continued. The patient felt drowsy and had occasional epistaxis. On the 14th day after cessation of fever, there occurred hæmorrhage *per anum*, and then death. An autopsy made seven hours later revealed distinct typhoid-ulcers in the small intestines, enlargement of the solitary glands there and in the cæcum: turgescence of the spleen and of the retro-peritoneal lymph-glands, and accumulation of blood in the bowels. In this case also I was able by pure culture to obtain typhoid-bacilli from the spleen-pulp.

Case No. 3.—N. S. policeman, *æt.* 28, had a month ago quotidian ague, and has since then felt rather weak, though still remaining on duty in his very malarious district. Complaining of continued headache and weakness, he at length came to hospital; and during the earlier days of observation showed a continuous rise of temperature from 103.3° to 104.2° Pulse 80, the spleen enlarged, stools normal, and no abdominal uneasiness. On the 6th day, pyrexia promptly declined; headache, lumbar pains, and weakness with loss of appetite remaining. On the 12th day, fever suddenly returned. Evening temperature 104.4°, and it so persisted continuously for four days more, the patient then dying at critical defervescence 18 days after admission. It is to be noted that this man never complained of any abdominal pain, and that the stools (two or three daily) were of natural consistence. The autopsy here showed distinct typhoid ulcers in the lower part of the ileum, enlargement of the spleen, and of the mesenteric glands; some old renal infarcts, opacity of the pia-mater, old pleuritic adhesions, and some gastric catarrh.

See Temperature Chart of Case No. 3.

Typhoid bacilli were obtained on pure culture of the spleen-pulp and contents of the retro-peritoneal glands in this case.

Case No. 4.—T. M., soldier, complained for six days at the usual morning inspection of weakness, impaired appetite and constipation; and out-door treatment not affording relief, he was admitted to hospital. The same evening his temperature was 104·4°; and the pyrexia subsequently assumed a quasi-intermittent course (*vide* Chart). There was distinct splenic enlargement, and some iliac gurgling. The patient remained very drowsy, and had much abdominal tenderness: his bowels at first costive, soon became relaxed, the stools being copious watery, and 6-8 daily. Death took place on the 6th day after admission at night.

See Temperature Chart of Case No. 4.

Autopsy showed numerous distinct and deep typhoid ulcers in the ileum, enlargement of the Peyerian glands and of the spleen, cloudy swelling of heart-muscle and liver-cells. Bacteriological scrutiny of the stools passed after the third day revealed, on culture-plates, numerous colonies of the typhoid bacillus; and so the spleen-pulp and mesenteric glands.

Proceeding now to the consideration of other instances where recovery ensued, more abundant evidence becomes available of the existence of non-typical typhoid as diagnosed by bacteriological methods. Some details I have already published in the Centralblatt f. Bakter, VI. 1889, No. 3; and, in sum, of all instances scrutinised thus nearly three-fourths were found by sufficiently extended observation, to furnish the decisive bacillar proof. For examination of the stools of patients I used a 10 p. c. beef-tea-pepton-gelatine with 1 p. c. of sugar added; and I am convinced that by adequately diluting the suspected material and making a large

number of separate plate cultures, it is possible to eliminate the disturbing influence of the many transient putrid bacteria present in the stools. Upon plates duly prepared, the typhoid bacilli develope in a characteristic manner; and knowing this, the final testing by potatoe culture is much facilitated. It is true that sometimes on as many as ten plates, only a very few typhoid colonies may be found; and I can but congratulate those who like Prof. Uffelmann can on Agar-plates alone differentiate the colonies suspected to be typhoid from all the other growths inevitably present. From my own observations the following instances are selected, as being interesting on account of their atypical pyrexial course and clinical aspect.

Case No. 5.—S. V., private soldier, complained of general weakness and constipation for two days, and being very feverish at inspection visit was then admitted to hospital. The spleen was found to be enlarged, and there was slight cœcal tenderness. Pyrexia was high, but not continuous; lasting under an intermittent form for seven days. During this time the aperients given produced perfectly normal stools; but with critical defervescence on the 8th day smart diarrhœa set in, and on the 10th I was able to detect some colonies of the typhoid-bacillus in the evacuations passed. For 12 days longer, the stools contained bacilli. Although fever had then completely ceased, convalescence and fitness for duty were delayed for a whole month.

See Temperature Chart of Case No. 5.

Case No. 6.—F. S., corporal, had a febrile attack of 14 days' duration, in which it would be difficult to trace a resemblance to the pyrexia of ordinary typhoid. The stools, too, were of quite natural aspect throughout; and in them the typhoid-bacilli were seen for the first time on the 14th day, when the temperature had reverted to the normal.

See Temperature Chart of Case No. 6.

Another instance shewed fever of barely two days' duration; and the diarrhœal stools in which typhoid-bacilli could be detected, first appeared on the 14th day of observation. Here also convalescence proceeded very slowly.

Cases No. 7 & No. 8.—These examples illustrate the occurrence of typhoid fever under the form of an intermittent, assuming sometimes the tertian type. In both cases a bacteriological examination of the fæces demonstrated the characteristic bacilli; and in No. 8 the inference of *typhus abdominalis* was confirmed by the appearance of blood in the stools during the second week of illness.

See Temperature Charts of Case No. 7 and No. 8.

During the height of the current summer I frequently met with atypic typhoid of ambulatory character, in which without any preceding chills but only two or three days' prodromata of headache and malaise, there ensued an abrupt rise of temperature to 104°-105°. Such fever might last hardly two days, being attended with intolerable headache; and it then terminated critically with profuse sweats. After an apyretic interval of 10-14 days the temperature would again suddenly rise, and for a brief period remain almost continuous at 103.3°—104.2°. During the whole of this time, the headache and feeling of indescribable languor with anorexia and sleeplessness, were almost unbearable. The second febrile onset, or relapse, lasted commonly one or two days; and after another fortnight, a third recurrence might take place: so that before true convalescence, a period of four or five weeks would elapse. In such cases, also was I able to demonstrate the typhoid character of the illness, by means of bacteriological examination.

According to my experience hitherto, young persons suffer the most severely from this form of illness. A prior attack does not exclude the possibility of a later one; and instances are known to me of individuals suffering, year after year, from the "dog-sickness." This local form of typhoid is not rare amongst children, and in them its course is even more atypical than in adults.

There is another circumstance worthy of remark here; namely, that in nearly 90 per cent. of cases seen, the patient gave a history of recent ague. The proximity of large marshes and a river delta, would sufficiently account for the prevalence of malaria. At present, I am unable to decide if a prior attack of ague had any influence upon a typhoid infection acquired soon afterwards; but sometimes it has happened to me to treat limited house-epidemics, in which individuals attacked with ague during the previous spring season showed a highly erratic form of typhoid; whilst other members of the same family who were never the subjects of malarial infection, displayed marked and typical forms of typhoid. The manifestations of malarial disease in this country hardly differ from those recorded in Italy and America; thus, I have seen nearly every phase of the *plasmodium malariæ* during the febrile accession; and, very often, after an intermittent has ceased I have found pigment-relics in the red blood discs. I have also seen such relics in most cases of "dog-sickness": and this circumstance rather confirms my suspicion that possibly a prior aguish attack is the cause of a non-typical course of subsequent typhoid: the human organism becoming, as it were, partially protected by the earlier infection.

"Hundskrankheit" occurs in Herzegovina as an endemic disease; its distribution so far resembling that of malarial disease. Amongst

the troops here, it causes much seasonal disqualification for duty; and by experience the preferable plan of meeting it seems to be transferring the garrison to the hills near, during the summer months. As an illustration of this, I might mention that in the summer of 1889 we had at Stolac a battalion of the 18th Infantry, in which at the beginning of May this disease breaking out had very soon attacked more than a hundred men. Three companies (300 men) were then sent to the hills, and amongst them only sporadic cases afterwards occurred: whilst amongst the 100 men remaining in camp, "dog-sickness" became so rife that often only 30 men were fit for duty.

During the period in question nearly all the officers remaining below were attacked, whilst at the hills all were unaffected. The indigenous inhabitants of the locality suffer much less than new-comers; the great majority of whom ere-long become affected. During the winter months the general health amends; both malarial and typhoid fevers abating and the "dog-sickness" ceasing: whilst with onset of the hot weather, these endemic maladies tend to re-appear.

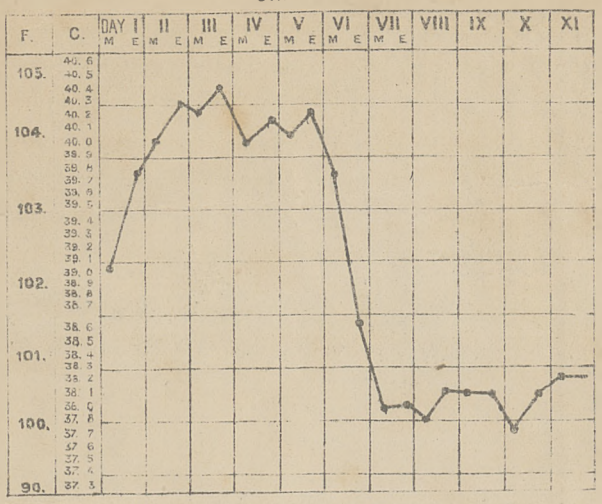
In several cases of "hundskrankheit" I have seen a roseolar eruption; and then on the abdomen and thorax, just as in ordinary typhoid. Rose-spots are not, however, in my opinion of much diagnostic value; for they are often wanting, and cannot always be seen on the dirty skin of native patients. When detected, no doubt they would confirm a diagnosis; but their absence would not alone be of negative import. By long practice of bacteriological methods, I have been led for the positive diagnosis of typhoid, to rely rather upon the demonstrated presence of specific bacilli in the alvine evacuations. It is true this method of proof entails some delay, since the characteristic growth is not to be detected till the 9th day of illness at earliest; but of course upon reasonable suspicion the stools would be disinfected from the first; and in a therapeutic sense, the inevitable delay of sure diagnosis is not of greatest importance, since no specific remedy of typhoid is yet known.

During the current typhoid season, many of my ordinary typical cases were complicated with pneumonia; whilst amongst the non-typical cases of typhoid only bronchitis appeared, and that very rarely.

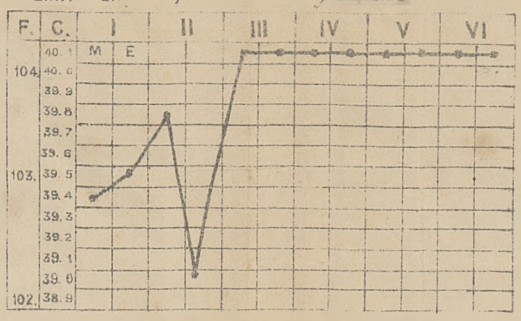
As regards treatment attention was directed to the symptoms present. The customary antiperiodics seemed to have but little good effect; for constipation, calomel with rhubarb was very serviceable; and in order to overcome depression alcoholic drinks were freely ordered.

Respecting etiology, I am of opinion that typhoid fever in this locality cannot be attributed to specific contamination of the drinking-water used. At least, I have many times examined bacteriologically samples of such water; without ever detecting the presence of typhoid-bacilli. Even when at the first outbreak of a localised house-epidemic, the water was examined which every individual partook of. I could not with the greatest care find any specific organisms present. The neighbouring garrison of Ljubinje had their water-supply conveyed from the spring at Stolac and from the river Bregava during the summer season when "hundskrankheit" raged in the garrison of Stolac; and yet amongst them cases of this disease were but rare and sporadic only. I regret being unable to furnish detailed statistics of the annual incidence of typhoid here: but from all the enquiries hitherto made, one fact seems clearly elicited; namely, that typhoid affections have become considerably diminished since adequate drainage and other sanitary measures were actively prosecuted. The conservancy of the Bregava undertaken in 1882, leading to removal of large fœtid stools, had for its immediate effect a reduction in the typhoid admissions from 70 cases in 1882 to 16 cases in the following year; the strength of the garrison being meanwhile unchanged. Amongst the native population, the most impoverished and uncleanly sections suffer in greatest degree: and after Sundays and holidays, and also after pay-day of the troops, the number of observed cases rises considerably: and a similar augmentation of "hundskrankheit" has been observed after rainfall. In my opinion, the immediate cause of sickness seems referable to great defilement of the porous soil, whence in some way it passes into the human organism. According to observations hitherto made by me, the typhoid-bacillus is able to live in dry ground over three months, and in soil frequently moistened more than one month. I hope hereafter to be able to obtain some more exact data on this subject of the connection between contaminated soil and endemic outbreaks of typhoid fever, as prevalent here.

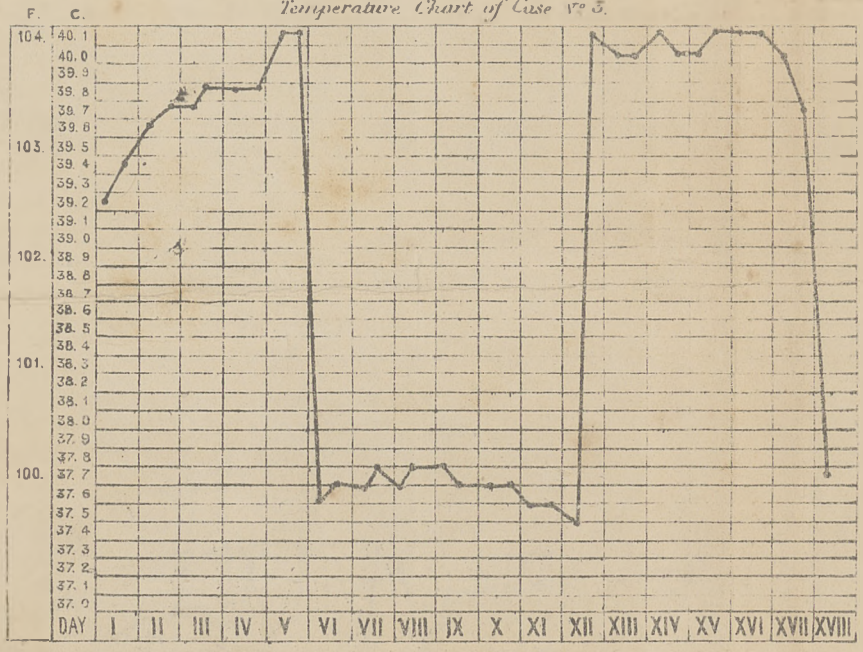
CHART A.



TEMP. DAY *Temperature Chart of Case No. 1*

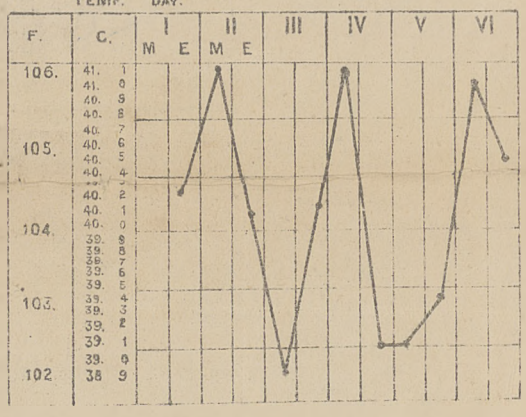


Temperature Chart of Case No. 3.

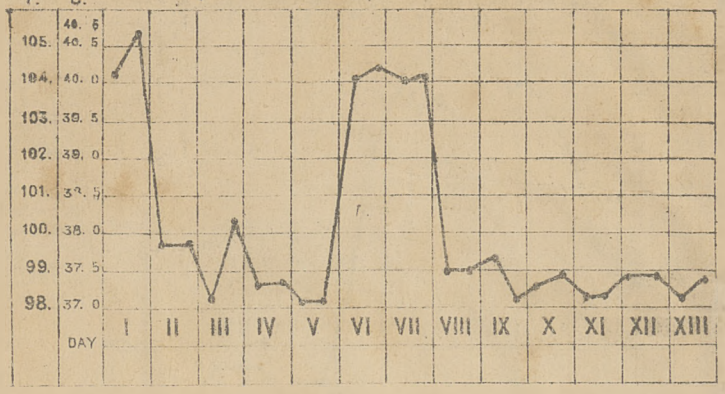


Temperature Chart of Case No. 4.

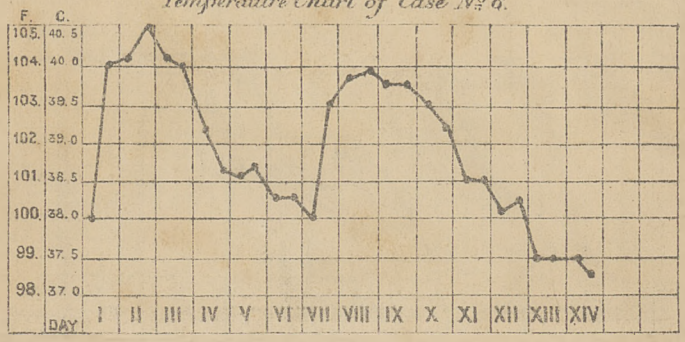
TEMP. DAY.



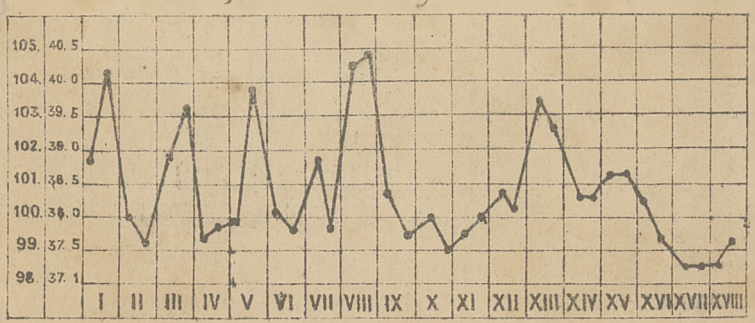
Temperature Chart of Case № 5.



Temperature Chart of Case № 6.



Temperature Chart of Case № 7.



Temperature Chart of Case № 8.