Statistics and treatment of typhus and typhoid fever : from twelve years' experience gained at the Seraphim Hospital in Stockholm, (1840-1852) / by Magnus Huss ; translated from the Swedish original by Ernst Åberg.

STATISTICS AND TREATMENT

OF

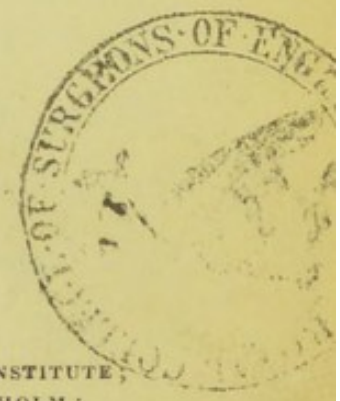
TYPHUS AND TYPHOID FEVER,

FROM

TWELVE YEARS' EXPERIENCE

GAINED AT THE SERAPHIM HOSPITAL IN STOCKHOLM,

(1840—1852).



BY

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TRANSLATED FROM THE SWEDISH ORIGINAL

BY

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1855.

and the results obtained, this treatment has, by the entrance of these pupils into independent practice, been spread, and, as I have no reason to doubt, been very generally adopted in our country. It is, therefore, not the experience of one but of many, it may consequently be considered to posses some value.

I have divided the treatise into three chapters. In the first, under the form of an introduction, I thought it right to account for the reasons, on which I founded the opinion, that the typhus process is one, but that it has several forms; and that I have, in the exposition as well of the statistics, as of its treatment, united the forms, occurring in the north, typhus petechialis and typhus abdominalis, into one disease. I have dedicated the second chapter to statistical calculations, as well with respect to several ætiological points, as to the modes of termination and some of the most important symptoms. In the third I have detailed the special therapeutics during the different stages of the disease, the convalescence, and the most important of the sequelæ. I have everywhere endeavored to be as brief as possible, without neg-

lecting anything that could be deemed important: I have also for the sake of brevity omitted to quote the statements of other authors, supposing those, who are conversant with the typhus literature, will easily distinguish what is my own and what is taken from others.

Although I have in several places in this work declared, that my statements are exclusively founded on experience as to the typhus process, as it occurs in the north, I now beg the indulgent reader always to bear this in mind that doubts may not arise as to the conformity of my observations to nature. The results from other countries may for many reasons differ from those I have obtained, although neither my observations nor those of others are incorrectly made. Notwithstanding the chief characters of the diseases are the same in all countries of Europe, the same disease may be modified in many ways in different localities: certain symptoms may be more evident and frequent in some places than in others, and a certain mode of treatment may give in one locality results altogether dissimilar to those in another. Should then the indulgent reader find that the experience I have

made does not agree with his own, I think the reason must for the most part be sought in this circumstance.

As there are no new remedies in the special therapeutics I have detailed, I have endeavored chiefly to direct the attention to a more accurate definition of the indications for the remedies already known. These indications, such as they have appeared to my observation may at least serve the young practitioner as a guide, and may besides be considered as a contribution to the therapeutic geography of the typhus process, if I may so express myself. I consider it to be a very important chapter in the history of the typhus process, which until now, as far as I know, has been but little attended to, a chapter treating of the different effect and applicability of different modes of treatment, in different climates and under different local circumstances. I venture to assert, that it would be a very important contribution to a more accurate knowledge of the therapeutics of the typhus process, with respect to its diversity in different countries, if other physicians, not residing in the north, would do as I have endeavored to do, viz.

state with exactness the action of the remedies employed, together with strict indications under what special conditions each remedy should most judiciously be administered and consequently when we may be most likely to gain the intended effect of a remedy.

I see full well the defects of this treatise. Severe censure may be expected from those places especially, where the two forms of the typhus process are considered as two distinct morbid processes, because I have, both in the statistics and the treatment, classed and treated them promiscuously. But I have followed my experience and the results it gave; the future must decide, whether I have construed this experience correctly or not. In this as in other points, I hope the critic will not be too severe.

CONTENTS.

ADDENDA ET CORRIGENDA.

Page.	Line.				
8.	30	*omit the words*	in abundance.		
14.	16	*for*	crethism	*read*	erethism.
,,	18	*for*	petecchial	*read*	petechial.
,,	25		*id.*		*id.*
15.	11	*for*	resorbtion	*read*	resorption.
,,	20	*for*	nothern	*read*	northern.
18.	4	*for*	present	*read*	presents.
20.	30	*after*	partial palsy	*insert*	partial dropsies.
21.	24	*for*	happened also to	*read*	happened; as also to.
22.	26	*for*	scolilina	*read*	scarlatina.
26.	19	*for*	till	*read*	to.
30.	14	*for*	two	*read*	three.
32.	18	*after*	that year,	*insert*	being exactly the month of the beginning of the epidemy,
48.	22	*for*	differs	*read*	differ.
54.	20	*for*	30,0 p. c., 25,4 p. c. and 29,0 p. c.	*read*	30,0, 25,4 and 29,0.
67.	18	*for*	incresed	*read*	increased.
72.	2	*for*	and to those	*read*	and in this especially to those.
74.	12	*for*	smothness	*read*	smoothness.
75.	3	*for*	76,4:	*read*	76,8:
76.	18	*for*	sudamina was	*read*	sudamina were.
,,	27	*for*	armpit	*read*	epigastrium.
77.	3	*for*	axilla	*read*	epigastrium.
81.	23	*for*	amount	*read*	amounts.
,,	24	*for*	68 p. c.	*read*	63,5 p. c.
89.	5	*for*	The 14:th	*read*	The 17:th.
,,	6	*for*	the 17:th	*read*	the 14:th.
90.	1	*for*	died	*read*	dead.
95.	28	*for*	These cases	*read*	Those cases.
96.	4	*for*	coaguluted	*read*	coagulated
97.	19	*for*	effects	*read*	cause
100.	1	*for*	eleminate	*read*	eliminate
103.	17	*after*	giddiness	*insert*	or of general debility,
104.	2	*for*	symptom	*read*	symptoms.
109.	7	*for*	way	*read*	may.
,,	10	*for*	vay	*read*	way.
110.	15	*for*	chlorate	*read*	chloride.
126.	4	*for*	prefered	*read*	preferred.
,,	9		*id.*		*id.*
130.	21	*for*	8—12 to 16	*read*	8—10 to 12
133.	13	*for*	it may	*read*	they may.
134.	17	*for*	chryst	*read*	cryst.
135.	13	*for*	10 to 15	*read*	10 to 12.
136.	20	*for*	mucous	*read*	mucus.
139.	24	*for*	prō dosis	*read*	pro dosi.
142.	8	*for*	resōrbtion	*read*	resorption.
143.	23	*after*	possible,	*insert*	fresh air,
144.	27	*after*	blood	*insert,*	putrid stinking.
149.	18	*for*	Ammoniacum	*read*	Ammonium.
150.	7	*for*	no good	*read*	more good.
,,	8	*after*	ammonia	*insert,*	than from that of camphor.
154.	13	*for*	belong	*read*	belongs.
155.	21	*for*	pyæmie	*read*	pyæmic.
156.	7	*for*	desertspoon	*read*	dessertspoon.
,,	15		*id.*		*id.*
157.	20	*after*	tinctura opii	*insert*	(15 to 25 drops).
159.	8	*for*	2 or 3	*read*	1 or 2.
,,	9	*after*	each	*insert*	once or twice daily.
161.	6	*after*	every	*insert*	other or.
,,	29	*for*	ressolved	*read*	resolved.
163.	29	*for*	varm	*read*	warm.
169.	22	*for*	diphteritis	*read*	diphtheritis.
170.	6	*after*	with	*insert*	concentrated.
,,	21	*for*	my	*read*	may.
171.	3	*for*	Diphteritis	*read*	Diphtheritis.
,,	29	*omit the word*	plastic		
173.	2	*after*	thrombus	*insert*	or embolus.
175.	28	*after*	Quininæ grxxxvj	*insert*	— grxxjv.
176.	3	*for*	desertspoon	*read*	dessertspoon.
,,	28	*for*	is	*read*	are.
181.	22	*for*	desertspoon	*read*	dessertspoon.
185.	18	*after*	evinces	*insert*	rapidly.
186.	6	*for*	bowel	*read*	bowels.
,,	11	*for*	subdivision 5	*read*	subdivision 6.
187.	25	*for*	bowel	*read*	intestines.
188.	19	*after*	daily	*insert*	or in form of extract gr℔ pro dosi as often.
190.	16	*for*	℥iß	*read*	℥ß.
191.	9	*for*	subdivision 5	*read*	subdivision 6.
192.	22	*for*	endermetically	*read*	endermatically.
,,	28	*for*	subdivision 5	*read*	subdivision 6.
194.	20	*for*	spincter	*read*	sphincter.
196.	10	*for*	adopted	*read*	adapted.
200.	1	*omit. the word*	such		

The reader is requested to correct minor typographical errors.

ON TYPHUS AND TYPHOID.

CHAPTER I.

INTRODUCTION.

§ 1. At a period, when so much has been written, in almost all the countries of Europe, on typhus and typhoid fever (*Typhus petechialis* and *Typhus abdominalis*), it seems as if the question might have been decided, whether the two diseases, to which we apply these terms, are two distinct morbid processes, or only two different forms of one and the same. There is, however, no such agreement of opinion; most of the French and several English authors place typhus and typhoid fever in their nosological systems under two different heads, while on the other hand the opinion of their being identical, or at least, nearly related, is favored in general by the physicians of Germany and Scandinavia. Without doubt the causes for this diversity of opinion are, to some extent, the variety of climate in different countries and localities, and the different circumstances and habits of

life among the people. Hence the same morbid process may be modified in many ways, and in one place assume predominant symptoms proceeding from various organs, altogether dissimilar to those it presents in another, according to the different causes to which it owes its origin and farther progress. Many writers also, in discussing these fevers, have not paid attention to their historical development, to the continuance of their course as epidemics, from the bubon-typhus of the middle ages to the petechial typhus of later times and the abdominal typhus of the present day, and how these typhus forms at first presented themselves simultaneously, then sometimes succeeded and sometimes changed entirely from one to the other. The different opinions have been considerably influenced by the circumstance, that many physicians look upon certain symptoms and groups of symptoms, or certain alterations found after death, as thoroughly determining the nature and specific diversity of the two morbid processes in question, while others assert that these very symptoms or these pathological alterations, which are considered as forming a distinction between typhus and typhoid fever, may occur together, and that the two diseases ought to be regarded as one and the same. To this may be added, that in certain cases, where the symptoms during life had been thought to make good the diagnosis of typhus, alterations were, on examination after death, sometimes found, which should be considered as peculiar to and characterizing the typhoid fever. Finally it seems as if the opinion of the faculty should have been to a great extent acted upon by the endemic or epidemic conditions under whose in-

fluence these complaints have been studied. The typhoid fever is endemic in the metropolis of France, and in consequence all the authors, who have gained their experience in that place, and who consider the specific alterations of the intestinal glands almost entirely a constituting feature of this disease, must maintain the opinion of the specific difference between typhus and typhoid fever. Typhus is on the other hand endemic in Ireland, and the physicians of that country never find these alterations in the intestinal glands, or only as mere exceptions; which, together with the character of the eruption, seems to warrant some of them in admitting the difference between the two morbid processes.* Where those endemic influences are not so pronounced it is evident, that the two processes often occur at the same time, succeed each other or alternate; and that the opinion of their distinct nature must be shaken. Certainly the disease appears sometimes under the epidemic influence exclusively as typhus, at others as typhoid fever; but there are also epidemics, in which they appear simultaneously, so that for instance one case in the same family or in the same house, has assumed the form of typhus, another that of typhoid fever. It very often happens also, at least in the north, that epidemics, presenting at the beginning, or when at their height, all the characters peculiar to typhus, at the close have entirely assumed the form of typhoid, after the gradual

* Bubon-typhus is still prevalent in the Danubian principalities together with petechial and abdominal typhus, and in consequence of the war now raging in these countries, medical science will most certainly have to expect a greater amount of information in these matters by more accurate observations, than have yet been made.

development of several intermediate forms during the course of the epidemy. This fact then has been cited as a proof that the two diseases differ only in form, and are not two distinct morbid processes. In support of this last mentioned view, the typhus process has further been compared to certain eruptive forms of fever, for instance scarlet fever. The symptoms in scarlet fever can present such different features, not only during the course of the same epidemy but of different epidemies, that we could be tempted to consider it as quite a different complaint. Not only does the eruption on the skin show great differences, but also and particularly the symptoms proceeding from the brain and nervous system, the throat, the chest and the abdomen. One may have a violent delirium, while another retains his senses during the whole course of the disease; one may suffer from prostration of strength, adynamic and putrid symptoms, and another scarcely seem ill; one may have extensive sloughing in the throat, another only a redness and some difficulty in swallowing; in some epidemies the intestinal glands may be swollen in others not, etc. The differences, said to exist between typhus and typhoid fever, are not greater than those between the different forms of scarlet fever; therefore the different forms of typhus fever may, for the same reason, be placed under one and the same head, as the varieties of the scarlet fever are united and counted as but different forms of the same pathological process.

§ 2. To enter upon a thorough investigation of these different opinions, is not now my object. My in-

tention is only to give an account of the statistics and treatment of the typhus fevers. For such an investigation it would be necessary to make partly an historical exposition of the different varieties, the typhus process has exhibited formerly and at the present, to be able to prove the identity and the continuance of that process in its subsequent different forms, partly to have thoroughly studied the two pathological processes in their home, as it were, for instance the typhoid fever at Paris and the typhus fever in Ireland. But the opinions of those, who have an opportunity of making such a comparison, are exceedingly different, some uniting what others separate. I am therefore obliged to found my opinion principally on my own observations, collected in that sphere of activity, where, during the lapse of twenty years, I have with predilection devoted my studies to these particular forms of fever. My experience is consequently entirely gained in the north, in the capital of Sweden, and at the largest civil hospital of that metropolis. In this my own experience, I include also that of several of my Swedish colleagues, as well in the capital, as in other parts of the kingdom.

§ 3. The conclusion I draw from this experience is, that the typhus and typhoid fever, such as they appear in the climate of the north, belong to one and the same pathological process, but that that, which we may call the typhus process, presents several different varieties. These varieties or forms arise from the circumstance that certain groups of symptoms, sometimes from one, sometimes from another of the organs or systems, are more pro-

minent in one individual case than in another. It must certainly be allowed, that the difference may sometimes seem great enough to warrant the admission of distinct diseases instead of only varieties of the same, but considering the intermediary forms between the two, and how they often change from one to the other and how they unite, the result must be their classification under the same pathological process. It may be very easy to distinguish the two remotest links in the chain, of which the typhus process may be thought to be composed, and then to decide if any particular case is one of typhus or typhoid fever; but even the most penetrating discernment may be baffled in attempting to distinguish one of the intermediary forms, which lie between the two extremes and partake a little of each, and it may perhaps be impossible to make a correct diagnosis.

§ 4. I will now state the grounds upon which this conclusion is founded. I have gathered them from my own observations and those of other Swedish physicians: that they do not in all respects agree with the observations made in other parts of Europe, may be ascribed to the more limited sphere in which they have been made, together, probably, with the particular and contrasting qualities of climate and other circumstances, which are peculiar to the north in comparison with the south. They agree however for the most part, with the statements of the majority of German writers.

§ 5. The facts which the epidemics furnish must be mentioned in the first place. I have endeavored to

follow with attention two rather considerable epidemics of typhus, one of which commenced in September, 1841, and continued until July, 1842, the other in December, 1845, to July, 1846. 503 typhus patients were received in the wards of the Seraphim hospital during the course of the former, 414 during the latter epidemic. In neither instance were the cases exclusively typhus or typhoid fever, on the contrary there were some of both; so that in the beginning and to the height of the epidemic the cases were for the most part typhus, and at the end the typhoid fever almost entirely prevailed. This statement is founded not merely on the symptoms each individual case presented, but also on the results of the post mortem examinations. With the exception of four, all who died were examined: there were 55 fatal cases in the former epidemic, 33 in the latter. Of the former 55, 36 presented those alterations of the intestinal tube, and mesenterical glands, which are peculiar to typhoid fever, and 19 no such alterations. Of the latter 33, only 29 were examined; of these, in 19 the glands were changed in different degrees, the remaining 10 showed no change.* During both these epidemies a contagion or nosocomical miasma developed itself within the hospital, which attacked a few patients, who had entered the hospital with other complaints, as well as some of the nurses and medical students. These

* As a contrast to these epidemies in which cases of typhus and typhoid fever occurred simultaneously, it may be mentioned that *v. Düben* published a paper on another epidemic in the Seraphim hospital, 1852, which had every character of the exclusively abdominal form, all the post-mortem examinations, with the exception of one only, exhibiting the usual changes in the intestinal glands.

got, what is called nosocomical fever, but this fever agreed in every respect with the prevailing epidemic. Some cases exhibited the petechial form, others the abdominal.

I have had an opportunity of studying another epidemic, but of more limited extent. At the barracks of the gensdarmes, out of 250 men 64 were taken ill in the course of 6 weeks. Although the men lived under exactly the same circumstances, were exposed to the same etiological agents, were all between 20 and 40 years of age, the disease assumed the distinct form of typhus in one part of the cases, of typhoid in another, and in a third took an intermediate form. In the private house of a cabinet maker I saw 17 cases within a fortnight, of which 10 were typhus and 7 typhoid fever, although here also the dwelling and other circumstances, with the exception of age and sex, were the same for all.

The following incident may also merit notice: a man had died, it was stated, of typhus. The brother and his wife went to live in the house of the deceased and used his clothes, without previous airing and cleaning. They were soon taken ill and brought to the hospital, where they both died. The husband had violent delirium and a profuse petechial eruption, the post mortem examination showing no change of the intestinal glands; the wife had milder cerebral symptoms, and a very scarce crop of eruption; but on examination swollen mesenterical glands and swollen and ulcerated peyer plaques were found in abundance.

The same experience has been made during those years, when typhus has occurred only sporadic; some cases have taken the characters of typhus, others of typhoid fever, though the latter were, under these circumstances, always more numerous. The season also has in this matter shown a decided influence; sporadic typhus occurring during autumn and winter, while spring and summer have introduced the typhoid cases.

Although these facts are founded on observations made in Stockholm, I believe I may state, with probability if not with absolute certainty, that the same may be said of the rest of Sweden, to judge from the communications received from physicians of different parts of the country.*

In those places, where the epidemic influences, in the above mentioned way, evidently produce at the same time the two manifestations of the typhus process, the petechial and the abdominal, it appears to me, that we are not justified in admitting so great a difference be-

* Amongst other information, which has been communicated by my colleagues in the country, the following from *D:r Fr. Lang* in Gothenbourg, merits special notice, as it proves that the typhus process in other parts of the country agrees, in the respect in question, with that of the metropolis. A traveller came to a small island, situated on the western coast of Sweden. He was sick when he arrived, and was the same day laid up with a fever. The disease showed all the marks peculiar to typhus petechialis, viz. clearly marked alteration of the blood, and a very copious typhus eruption (ecchymotic petechiæ) and ended on the 9:th day fatally. Seven persons were successively taken ill on the island, only one of these presented the marks characterizing typhus; the remaining six cases, of which one was fatal, were all clearly distinct typhoid. The course of this limited epidemic made it evident, that it was produced by infection from the first diseased person who came ill, before whose arrival, no case of typhus or typhoid had been seen for several years, either on the island or in the neighbourhood, and that the same contagion produced both typhus and typhoid fever.

tween the two as would constitute two distinct morbid processes. In other places again where one or the other of the two forms exclusively prevails, there might, I allow, though only conditionally, seem to exist reasons sufficient to induce us to admit the probability of the propriety of considering them as two distinct morbid processes.

The question will, I hope, before very long, be decided. Experience tells us, that two epidemic diseases may appear simultaneously at the same place; for instance scarlet fever and the measles, (nay it has been said that these two diseases may occur at the same time in the same person), but the symptoms of these complaints present such a characteristic difference, that it is very easy to decide to which of the two the case in question belongs. It was not so with the epidemic typhus cases I noticed. A number of intermediate forms were of very frequent occurrence, making it utterly impossible to determine the true nature of the case, whether petechial or abdominal, as there were symptoms of both. Often such symptoms were observed as seemed to announce an affection of the intestinal glands, but the post mortem examination did not discover any; in other cases these alterations were found and the symptoms had indicated the petechial form. It may certainly be objected, that such occurrences depended on want of capacity in making a correct diagnosis; but when the »signa diagnostica» are uncertain, the diagnosis itself must be so too; but more on this subject in another place.

By means of comparison with other diseases, which also occur in epidemic forms, some, at least probable,

proofs may be adduced. What others have observed respecting the scarlet fever has already been noticed. I can from my own experience confirm these statements. I have attentively followed an epidemic of scarlet fever, during the course of which some and fifty patients of both sexes and between 15 and 25 years, were entered at the Seraphim hospital. In these cases there was, with the exception of the cutaneous eruption, a greater variety in the symptoms presented, than is ever found in those of the typhus forms. Some were ushered in by a violent delirium, which soon passed into a complete adynamic state, others had from the beginning more exclusive symptoms of gastric disorder followed by great prostration, also closely resembling a typhus abdominalis; in others again the cerebral and gastric functions were but slightly disturbed. A more or less copious eruption was quite independent of the malignancy or mildness of the other symptoms. In two cases with cerebral symptoms, which were examined after death, I saw appearances analogous to those so frequently found in petechial typhus, viz. a congested state of the brain and its membranes, the blood dark and liquid, the spleen enlarged and its substance softened; in another case, which had begun with the intestinal symptoms the glands of Peyer were affected in the like manner as in typhus abdominalis. The difference between these forms of scarlet fever appears to me to be quite as great as that between typhus petechialis and abdominalis; and when, notwithstanding this, the different forms of scarlet fever are brought together as one disease, it seems to me but right to adopt an analogous junction in reference to the

typhus fevers. The most important objection to the establishment of this analogy is the uniform and decided character of the eruption in every form of scarlet fever, in opposition to the diverse cutaneous eruptions admitted to characterize the different forms of typhus. I will return to this in the next paragraph.

§ 6. I will now pass on to a short examination of some of the symptoms and anatomico-pathological lesions, which are especially considered to mark the distinction between typhus petechialis and typhus abdominalis.*

In the first place then we notice the eruptions on the skin and the relation between petechiæ and »les taches rosées lenticulaires», the former considered to characterize typhus, the latter typhoid fever. It is true, that the processes may generally be distinguished by these two eruptions, as long as the epidemic bears decidedly the stamp of one of the two forms; or where the endemic influences call forth only one of the forms. But when an epidemy commences preeminently as typhus, and finishes preeminently as typhoid, the distinction in the intermediate forms that occur, can not be satisfactorily established. In many cases the eruptions appear simultaneously, so that the petechiæ and the lenticular spots may both be found copious at the same time. The petechiæ are, however, in these cases light red and more superficial, and assume neither the purple nor bluish

* Amongst French authors on typhoid fever, *Louis* occupies the first place; amongst English, who have latest written on typhus, *Jenner* and *Hope* are the principal.

hue, nor the ecchymotic character which is peculiar to the graver cases of typhus petechialis. In other cases, and they are not uncommon, there appears during the first 4—6 days an eruption of petechiæ, which may sometimes be of a bright sometimes of a more dusky red (very seldom ecchymotic), but which, again disappearing after the lapse of 2—3 days, gives place to »les taches lenticulaires». The reverse of this, or the lenticular spots appearing first and the petechiæ afterwards, I do not recollect having seen; as I have never witnessed an epidemic, in the beginning typhoid, become at its close typhus, but only the reverse.

These two eruptions, which may, as we have seen, appear separately, united or succeeding each other, are still no diagnostic marks to determine the two forms of typhus. They may be entirely wanting. Such an instance is certainly less frequent during an epidemy, but not uncommon in sporadic cases of these distempers. Every trace of the eruption of the abdominal form is often wanting, although all the other symptoms have proved the diagnosis, which besides has been put beyond all doubt by examination after death. The eruption of the petechial form is certainly of more constant occurrence, although that also may be wanting; it is sometimes of such short duration that it may appear and disappear in a few hours; sometimes it is so pale as easily to be overlooked. Finally it must be added that I have seen cases, where during life petechiæ alone have appeared, and where yet after death all the lesions of the glands of peyer and mesenterium, which are con-

sidered as exclusively belonging to the typhoid fever, have been found.

As regards miliary vesicles and sudamina, they appear to be merely an accidental symptom, and so much the less help us to distinguish the two forms, as they occur in both, but more especially in the typhoid form. Their presence in greater or less abundance, seems to depend on a peculiar character of certain epidemics; they occur principally on patients whose skin during the whole course of the disease has either been covered with a clammy perspiration, or is preternaturally dry and barky.

If we now fix our attention to the cerebral and nervous symptoms the same indecision will be manifest, the same signs frequently occurring in both forms. The cerebral symptoms as congestion, crethism, delirium, are certainly in general more marked and severe during the first stage (stadium irritationis) of the petecchial form, but a similar severity may also be noticed in the abdominal form. During the second stage (stadium depressionis) the cerebral and nervous symptoms are frequently so very nearly the same, that guided only by them we should find great difficulty in deciding under which form an individual case should be placed. The severest cases of the petecchial and the mildest of the abdominal form, afford exceptions to this rule. To define a decided limit by means of the symptoms furnished by the respiratory organs, is still less possible. In both forms the mucous membrane of the air passages shows the same proclivity to become affected, although this may vary to a great extent in different epidemics.

The petechial form has perhaps a greater disposition for the affection called pneumonia typhosa; but it is of no rare occurrence in the abdominal form. In the later stage of the last mentioned, where the intestinal ulcerations are widely spread, pneumonia lobularis is often superadded, in the same manner as it happens in pyæmia; this affection is rare in typhus petechialis, and I believe never appear, unless sloughing and suppuration depending there on, whether from decubitus or other reasons, have occurred. Its cause seems in both forms to be the same, viz. resorbtion of matter from ulcerating surfaces.

The state of the organs of circulation gives no evidence of the difference sought for; the pulse varies in the different stages of the different forms in so many ways that it can furnish no characteristics to be relied on. Neither does the action of the heart, nor its sounds, give us any grounds for distinction. The proclivity to epistaxis, which we are told is so characterizing of typhoid fever, seems not to be in nothern countries of such frequent occurrence as in the southern. Under certain epidemical influences, it is seen to take place oftener here also than under others, but in typhus too epistaxis will sometimes appear during the prodroms, and the first stage of the disorder.

It is from the organs of digestion that the most important and decisive marks of distinction are to be derived. From the state of the tongue or mouth nothing however can be concluded, it being almost the same in both forms. To a still greater extent attention has been paid to the state of the intestinal tube. Most of the

French authors take »les coliques, la diarrhée, le météorisme, le gargouillement dans la fosse iliaque, comme des phénomenes presque constants dans la fièvre typhoïde». It is beyond all doubt, that these signs are of very frequent occurrence in the abdominal form of typhus, but not only may a single one be wanting, but all of them at the same time. I speak merely from my own experience in this country. Colic pains are with us even a rare symptom; diarrhea is present only in two thirds of the cases; decided meteorism is very uncommon,* and a gurgling in the iliac fossa may be noticed in most cases, but not as a regular occurrence. It has by no means been an exception, to find the characteristic ulcerations in ileum in cases which presented none of the above mentioned signs from the intestines; and if sometimes a gurgling in the iliac fossa has been observed, we must remember how often such a thing takes place in other diseases which have nothing in common with typhus. In the petechial form, it is stated, these symptoms referable to the intestines are wanting, or are met with only exceptionally. As a rule it may be said, that no trace of them is found in the severest cases, especially in those, where the petechiæ are in great abundance covering the whole surface of the body, and have a dusky bluish hue or are ecchymotic, but in milder cases where the latter are lighter, scarcer, and more rapidly transient, you will not seldom see the

* This rareness of meteorism, a symptom, which by several authors is thought to be most commonly met with, may depend on the use of *the Neptune-girdle* or cold water compresses on the abdomen, as before I was in the habit of using this remedy, the meteorism was more frequent. This manner of treatment will be noticed below.

abdominal symptoms, and dissection proves that they have the same origin as in the purely abdominal form. In the above mentioned intermediate forms, where, as I before said, it is often very difficult to decide under which of the two forms the case is justly to be classed, in those we find the abdominal symptoms of greater frequency and more decidedly pronounced, as the epidemic tends to assume the abdominal form. *My experience is consequently this: that the extreme links of the typhus chain, the severer cases of typhus petechialis and the clearly marked ones of typhus abdominalis, are easily distinguished by the absence in the former and presence in the latter, of symptoms referable to the intestinal tube; but that a number of forms between the two extremes, occur, in which this distinction by no means holds good.*

It now remains to examine the results the dissections offer. Some authors have gone so far in partiality, as to contend that if all the symptoms during life have clearly marked a case of typhus petechialis, but dissection has notwithstanding shown ulcerations of the glands of peyer, it must have been a case of typhus abdominalis; and if the symptoms of typhus abdominalis were ever so distinct, but the ordinary lesions of the intestinal canal not found, the case could not have been one of typhus abdominalis, but some other disease. This systematic partiality is contrary to and refuted by experience. As it was just observed, we find, as a rule, the changes of the intestinal and mesenterical glands, wanting in the graver forms of typhus petechialis, as exceptions enlargement sometimes both of the solitary and peyer glands. It has by no means been uncommon though, to see as

well enlarged glands as spread ulcerations in milder cases, although with a distinctly pronounced petechial eruption. When these enlargements and ulcerations are perfectly similar with those the abdominal form present, it appears, at least to me, very difficult to explain, why the symptoms during life distinctly marking typhus petechialis, it must nevertheless be a case of typhoid fever, only because there have been ulcerated glands. It is true that these ulcerations occur less spread and less in copiousness in the petechial than in the abdominal form, which seems to me to be occasioned *by the existing antagonism between the skin and the intestinal mucous membrane, so that the more copious the eruption is on the skin, the less are the intestinal glands affected, and the contrary.* But we have also cases, with all the symptoms and signs of typhoid fever, the rash included, in which nevertheless the intestinal and mesenterical glands have been healthy. Certainly these cases appertain to rare exceptions, but must not therefore be left unnoticed. An explanation of this fact may be offered by the supposition that the case has proved fatal either before the changes of the glands had formed, or through some subsequent disease, the convalescence already being perfectly established, the enlargement vanished and the ulcerations healed. This explanation is not, however, admissible, because the internal changes take place simultaneously with the external symptoms, which mark the diagnosis of typhoid fever; before the former are developed no sure diagnosis can be made. A very long time after the recovery, weeks nay months, the experienced observer will detect marks of preexisting enlarge-

ment, and more especially ulceration of the intestinal glands. It must consequently be allowed that typhoid fever can exist without affected intestinal glands, unless we suppose those physicians, who have communicated these statements, incapable of making a correct diagnosis. The experience so many times confirmed must also be added, that these affections of the intestinal glands bear no direct relation to the complex of the symptoms offered by the system at large. How often do we not meet a typhoid fever, of an apparently mild nature, even without any diarrhea, and sudden death, by perforation of the intestines, reveals on dissection extensive ulcerations? how often see we not cases, in which death is preceded by very violent symptoms of intestinal derangement, and nevertheless the peyer glands are enlarged in but a small degree, with or without a few solitary ulcerations? *The conclusion, that in all cases of typhoid fever with a happy termination, the intestinal glands have been affected, is by no means so infallible, not even so admissible as has been advanced.* The same remark may also be made, in reference to typhus petechialis, that in patients that recover it is impossible to decide, whether the intestinal glands have been affected or not.

Respecting the other anatomical lesions we meet with in the two forms, it may be stated, that they afford no marks of distinction. The brain and its membranes are certainly oftener congested in typhus than in typhoid fever, but may also be found in a similar state in the latter disorder. The lessened tenacity or softening of the heart, existing to a greater or less degree especially in its left half, is oftener seen in typhus, but is not

wanting in the severer cases of typhoid fever. The state of the blood is the same, both on physical and microscopical examinations. In typhus the lungs are oftener found congested or in a state termed *spleenization*, or *hepatization* or offering foci apoplectici; but are not unfrequently seen similarly affected in typhoid fever. The state of the bronchial tubes is the same in both forms. The spleen is, according to rule, during a certain period of typhoid fever, enlarged and softened; a similar condition, if not invariably, is, however, often observed in typhus, although the enlargement in the latter variety, never acquires the same extent as in the former.

If we direct our attention to the whole course of the two forms, we shall, as a rule, find in both a stadium prodromorum of longer or shorter duration, marked in general by the same symptoms; a stadium irritationis, from 5—7 days; and lastly a stadium depressionis, from the 7:th to the 14:th or longer. As a rule the symptoms of the first stage are more prominent in typhus than in typhoid cases, but in the last they may sometimes resemble each other perfectly, with the exception of the cases in which the abdominal symptoms of the typhoid fever are uncommonly pronounced. The recovery on the other hand, is more frequently slower in typhoid cases, and strongly marked by symptoms of intestinal disorder, as also the strength is usually more diminished, the emaciation greater. The slow recovery of typhoid cases is also, sometimes, found connected with the development of lobular pneumonia, decubitus or sloughing, and at times partial palsy, depending on spontaneous coagulation of the blood in arteries or veins. These differences

disappear, more or less, in the above-mentioned intermediate forms.

Some have tried to make out the distinction between the two forms by some facts, the etiology is said to furnish. Both, we consider, liable to be propagated by contagion, but typhus in a greater degree; this accords with my own experience, although the contagiousness of the one or the other, is much influenced by the varied nature of different epidemics. But a question of more importance is, whether the contagion which produces typhus, differs materially from that, causing typhoid fever, or whether the very same contagion cannot produce both forms. I have already stated my experience during the epidemics, I have followed attentively, how in the beginning and to its height, typhus prevailed, but became by degrees typhoid during the course of the epidemic, which ended in this latter form. It may certainly be said that the typhus contagion was transformed to typhoid contagion, and that such an occurrence is no proof of the identity of the two contagions; but when we add the observation likewise mentioned above, that in the barracks, where the men lived under the same hygienic conditions, the two forms were nevertheless seen simultaneously; and in the private house, where the same thing happened also to the man and his wife, who had evidently taken the same infection, but still died of the two different forms, it appears to me difficult to deny, that the same contagion can produce the two forms. Which form the disease assumes seems to depend on individual circumstances difficult, if not altogether impossible, to find out. To me, according to my experience,

temperament and constitution seem to have a decided influence. During the prevalence of an epidemic, sanguine and phlegmatic persons are especially attacked with typhus, lymphatic and nervous with typhoid; strong and robust constitutions with the former; the weak and the slender with the latter. Still, as there are many exceptions, I would not lay too much stress upon this rule. In the places, where endemic agents always produce either typhus or typhoid fever exclusively, the contagion, when it exists, seems able to generate only one certain form, but this fact must be ascribed to the endemic agent, whose nature we are not yet acquainted with.

Amongst other etiological points, the age of the patient has been considered of great importance, especially the fact that the occurrence of typhoid fever after 40, becomes by degrees less frequent, and is never seen after 55, while, on the contrary, typhus is as common between 40—50, as during the two preceding decennia, and is sometimes met with after 55. I shall below return to a more particular investigation of these statements, and now only remark, that I cannot consider what has been said, if ever so true, as sufficient reason for placing typhus and typhoid as two different morbid processes. For why should not different ages show a different proclivity to become affected by different forms, as is really the case with, for instance, scolilina, in which, the form with a tendeney to exsudation within the cranium, appertains especially to the age before 10, and is more rare after that period.

In several other etiological respects, especially in their sporadic origin, the two maladies are perfectly

congruous, unhealthy, overcrowded, ill ventilated dwellings, poverty and its privations, care and sorrow, and a certain process of acclimation, for such persons as come from the country to inhabit large cities, etc. etc. being the remote causes of both.

These are, briefly, the principal grounds by which I support my opinion, *that typhus and typhoid fever (typhus petechialis et typhus abdominalis), such as they appear in the climate of the north, neither can nor ought to be considered as two distinct maladies, but only as two varieties of the same morbid process.*

§ 7. To these two forms of the typhus-process, the other forms ought certainly to be added, or should at least be mentioned, viz. Typhus pectoralis or Broncho and Pneumo-Typhus, and Cerebro and cerebro-spinal typhus. The first of these is in northern climates, especially during the damp and cold season, so intimately connected with both the petechial and abdominal form, that they can scarcely be separated. There are few cases in which the air tubes are not more or less affected, and the substance of the lung and the pleura are also often attacked. In consequence of this, I have not been able to separate this form from the preceding.

In reference to cerebro-typhus, when that term is applied to an epidemic typhus, with decided tendency to exsudation within the cranium, I may state, that I have never seen this form as an independent epidemic, but have only, during the prevalence of petechial typhus, now and then met with a case, in which such an exsudation with concomitant symptoms occurred. Under similar cir-

cumstances, but more seldom, I have observed the spinal typhus form. In consequence of this more limited experience, I have thought it but right to class the cases, which have occurred, under the form of the prevailing epidemic.

These are the reasons, which have induced me to place typhus petechialis and typhus abdominalis, not under the heads of two distinct morbid processes, but as varieties of the same. I have done so in accordance with my own experience; my colleague Prof. *Malmsten* entertains the same views; and, I am persuaded, such are the opinions of the majority of Swedish physicians; this may consequently be considered, as the opinion of the north on this subject. I have thought this short exposition necessary to explain, why I have, in the following chapters, united the two forms.

CHAPTER II.

STATISTICS.

§ 1. During the lapse of 12 years, from 1840 to 1851 inclusive, the whole number of typhus patients received at the Seraphim hospital in the fever wards, under the care of Prof. *Malmsten* and myself, has amounted to 3,186. Different years have given different numbers, according to the epidemic or but sporadic prevalence of the disease.

The following are the numbers for each year:

Year.	Typhus patients.
1840	211.
1841	326.
1842	443.
1843	238.
1844	222.
1845	199.
1846	518.
1847	132.
1848	104.
1849	66.
1850	284.
1851	443.
Total	3,186.

The greatest numbers occur in the years 1846, 1842, 1851. The smallest in the three years, which succeeded the epidemic of 1846, gradually diminishing, the year 1849 showing only 66, the smallest number of all the 12 years. It seems therefore, as if the extensive epidemic of 1846, when 518, the greatest number in one year, were entered, should have lessened the disposition to become affected by typhus, until this inclination had arrived at its minimum, when again an increase in the number occurred, so that a new epidemic developed itself in the end of 1850, and continued the first half of 1851. During the 12 years three epidemics have taken place; an average of one every fourth year. Typhus and typhoid fevers are consequently always in the capital of Sweden, but only at certain intervals as epidemics. The last epidemic, before the years I have mentioned, was in 1837; from that year to 1842 there are 5 years; from 1842 till 1846, 4 years; from 1846 till 1851, 5 years; it seems therefore, as if it could be inferred from this, that the epidemic cyclus of the typhus fever, varied between 5 and 4 years. On the other hand if we count from the end of one epidemic to the beginning of the next, the space between the epidemic of 1841—42, and the following of 1845—46, is 3 years and 5 months; from the latter to the next of 1850—51, 4 years and 4 months. The future only can decide whether such a periodicity is to be an established fact, or what has been above stated was but accidental. Before touching on the possible causes of the return of these epidemics, I will give the numbers of the sick in the different months.

§ 2. Typhus patients.

Year.	Month.												Total.
	Jan.	Febr.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	
1840	15	15	10	6	14	34	27	35	23	13	8	11	211
1841	16	11	23	16	18	20	23	15	31	33	43	77	326
1842	53	52	49	53	64	48	30	25	23	20	8	18	443
1843	6	3	10	17	13	13	9	17	17	43	42	48	238
1844	46	27	32	34	24	11	7	3	3	5	10	20	222
1845	9	17	10	11	14	14	11	20	21	20	19	33	199
1846	49	46	61	79	69	77	17	28	31	27	13	21	518
1847	13	4	3	9	9	20	19	17	11	9	8	10	132
1848	12	10	6	10	14	8	8	5	5	12	10	4	104
1849	3	4	3	3	2	3	11	7	5	7	6	12	66
1850	20	16	13	8	23	23	21	13	28	28	46	45	284
1851	34	23	35	41	101	76	47	23	12	9	18	24	443
Total	276	228	255	287	365	347	230	208	210	226	231	323	3,186

3,186.

From this table it will appear, that May, June and December give the largest, August and September the smallest number. If typhus in this respect made the only exception, it would be a sufficiently important point in its etiology, but in our climate the firstmen-

tioned months are exactly those, in which acute maladies in general most frequently occur, being, on the contrary, in the two last mentioned very few in number, in case no epidemic, as cholera or dysentery, takes place. Typhus seems therefore to be subject to the same laws as other acute maladies, with reference to its frequency in the different months, wherefore I do not consider this difference between the respective months in the frequency of the malady, as being of any particular importance. So much the more so, however, is this table, as it shows the beginning and duration of the epidemies, which have appeared during the space of these 12 years. The epidemic of 1841—42 commenced in September, arrived at its height in December, and did not end till the following June. The next, of 1845—46, commenced in December and finished in June. The last, of 1850—51 came in November and disappeared in July. The first consequently lasted 10, the second 7, the third 9 months; during the first period 503 patients were received in the wards, 414 during the second, and 448 during the last. They all commenced in the latter months of the year, in autumn and the beginning of winter, continuing afterwards during the winter and spring until summer. Hence we may with probability conclude, that the typhus miasm in the north does not before autumn gain sufficient intensity to produce an epidemic; but as this does not occur every year, the cause could be sought in certain atmospheric conditions, which in some years are more favorable to the development of an epidemic than in others. To explain this we must compare the occurrence of the epidemies with the meteorological observations.

§ 3. 1. Mean temperature for each month.*

(Centigrade thermometer.)

Year.	Month.											
	Jan.	Febr.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
1840	—3,46	— 2,89	—1,79	+5,19	+ 6,75	+14,07	+15,38	+15,50	+12,33	+ 4,69	+1,62	—3,74
1841	—6,32	— 6,21	—0,30	+2,86	+12,16	+14,42	+14,73	+15,57	+10,73	+ 6,42	+0,84	+1,94
1842	—2,09	+ 0,60	+0,18	+3,22	+11,23	——	——	——	——	——	——	——
1843	—0,35	— 3,23	—2,13	+1,11	+ 6,33	+13,07	+17,05	+18,33	+11,10	+ 5,14	+1,91	+1,48
1844	—4,88	—10,72	—4,36	+4,43	+10,87	+13,09	+14,14	+14,54	+11,09	+ 6,26	+0,36	—3,79
1845	—0,28	— 8,80	—5,83	+2,98	+ 7,27	+15,22	+17,57	+16,19	+11,16	+ 4,73	+3,23	—1,80
1846	—3,39	— 4,37	+1,59	+3,06	+ 7,50	+14,74	+18,40	+20,90	+12,70	+10,84	+3,01	—5,86
1847	—3,85	— 5,54	—1,15	+0,10	+ 7,27	+14,70	+16,07	+17,67	+11,68	+ 5,11	+5,13	+0,22
1848	—6,50	— 2,39	—0,12	+4,04	+11,31	+15,59	+17,05	+14,34	+11,21	+ 6,74	—0,74	—1,30
1849	—5,83	— 1,57	—1,62	+1,95	+ 9,91	+13,13	+16,03	+15,68	+11,35	+ 5,18	+1,18	—2,93
1850	—8,50	— 1,54	—3,79	+2,64	+10,90	+16,43	+17,96	+17,33	+10,63	+ 4,69	—0,46	+0,14
1851	—1,65	— 1,98	—3,33	+3,95	+ 7,73	+14,52	+16,67	+15,17	+11,33	+ 8,43	+2,23	+0,45

* The mean taken from observations, 6 óclock a. m., 2 and 9 p. m. at the Observatory in Stockholm.

The last half of 1841 presents no marked changes of temperature, which is also the case with the years 1845 and 1850; and nevertheless in these years epidemics did break out. July, August and September, of the years mentioned, being the months in which miasmata are thought to be particularly developed, especially if the temperature is very high, show no remarkable deviations. On the contrary the mean temperature during these months is lower than in the corresponding months of several of the other years. The mean temperature for the trimestre July—Sept: 1841, is = +13,67; 1845 = +14,97, and 1850 also = +14,97, while, during the same months of 1843, it is = +15,49, of 1846 = +17,33 and of 1847 = +15,14; the two last years, when no epidemy occurred, showing a higher mean temperature, than the years in which during the last months there was an epidemy. These years have not even had the lowest mean temperature during the said months, as it in 1844 is = +13,25, 1848 = +14,20, and 1849 = +14,35. It must hence be inferred, that the mean temperature for the months July, August and September of the years, in which an epidemic, during or after the autumn, has occurred, lies nearly between the highest and lowest mean temperature for the same months of these other years.

Mean temperature of July—September in the years 1844, 1848 and 1849 = +13,93; in the years 1841, 1845 and 1850 = +14,53; in the years 1843, 1846 and 1847 = +15,98.

This result is not in accordance with the usual statement, that the warmer the summer months, the more

apt will the state of the atmosphere become to produce epidemics during the autumn; here the reverse is shown, viz. that the mean between a high and a low temperature, induces the greatest disposition for epidemic typhus.

2. Mean reading of the barometer

(in decimal inches).

Year.	Month.											
	Jan.	Febr.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
1840	25,25	25,71	25,67	25,69	25,55	25,47	25,45	25,53	25,52	25,51	25,45	25,83
1841	,48	,74	,42	,64	,94	,53	,44	,60	,99	,38	,46	,46
1842	,93	,67	,48	,70	,73	,43	,52	,81	,70	,49	,36	,51
1843	,26	,45	,69	,60	,66	,54	,51	,67	,61	,21	,42	,34
1844	,12	,18	,34	,50	,51	,25	,28	,28	,50	,30	,52	,87
1845	,43	,44	,43	,45	,44	,43	,45	,38	,38	,36	,37	,15
1846	,42	,18	,29	,44	,49	,50	,39	,57	,48	,48	,58	,25
1847	,69	,25	,48	,32	,49	,43	,47	,55	,34	,48	,46	,63
1848	,83	,14	,46	,34	,52	,39	,38	,30	,50	,51	,16	,61
1849	,25	,29	,41	,47	,63	,29	,40	,38	,58	,42	,44	,61
1850	,63	,06	,38	,54	,45	,43	,44	,36	,59	,32	,25	,31
1851	,53	,38	,39	,48	,43	,38	,32	,41	,65	,40	,36	,46

The state of the atmosphere, when the reading of the barometer has continued either high or low, has also been looked upon as one of the more or less probable causes for the origin of epidemics. As all the above mentioned epidemics commenced in the last months of the year, it is most suitable to take the mean reading of the barometer for the last half of every year, and compose the mean readings.

MEAN READING OF THE BAROMETER FOR JULY—DEC.

Year.	Mean for 6 months.
1840	25,548
1841	,555
1842	,565
1843	,460
1844	,458
1845	,348
1846	,458
1847	,488
1848	,410
1849	,471
1850	,345
1851	,433

The lowest mean reading of the barometer was seen in the years 1845 and 1850; 25,348 dec. inches in the former, 25,345 in the latter, both being years in which epidemics commenced. But the third epidemic, which commenced 1841, was preceded and followed by an unusually high reading of the barometer, viz. 25,555, not being the very highest, during the twelve years, but next to this maximum, which took place in 1842. Besides in September of that year, we find the highest mean reading, seen in any month during all the 12

years, viz. 25,99. If we take the mean for the last 6 months of all the 12 years, it will be = 25,461; 1845 is lower than this mean reading by 0,113; 1850 by 0,116; while 1841 is higher by 0,094. It must also be stated, that during 7 of the other years, when no epidemic took place in the autumn, the mean reading of the barometer the last 6 months was about the same, and varied but little from the above stated mean reading for these months. We find consequently, that during two of those years, when an epidemic broke out, the mean reading of the barometer during the months, which preceded the epidemical outbreak and at its beginning, was very low; but unusually high before and at the beginning of the third epidemy. This seems to corroborate the old opinion, that an unusually high or low degree of atmospheric pressure, is likely to produce epidemics.

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3. Average of Rain

(in decimal inches).

Year.	Month.											
	Jan.	Febr.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
1840	1,19	0,13	0,00	0,29	1,40	1,13	3,32	1,08	2,67	4,60	3,31	0,32
1841	0,00	0,00	0,00	0,48	0,66	2,41	1,45	1,02	0,80	3,18	0,80	2,90
1842	0,18	0,11	1,03	0,10	0,97	1,39	1,91	1,29	2,09	1,14	1,09	0,73
1843	0,63	0,25	0,17	0,70	0,68	2,00	0,40	0,20	0,96	1,83	1,69	0,53
1844	0,37	0,31	0,47	0,81	1,39	2,32	2,93	4,10	2,52	3,07	1,25	0,38
1845	0,10	0,53	0,16	0,15	0,60	0,35	1,22	1,67	2,17	2,81	2,04	1,24
1846	0,63	0,63	1,44	1,13	0,53	1,25	1,40	3,59	0,23	1,50	0,48	1,16
1847	0,25	0,29	0,16	0,41	0,81	0,98	0,25	1,83	1,84	0,95	1,34	0,71
1848	0,03	0,29	1,06	1,57	0,83	1,38	0,78	2,38	0,90	1,70	1,38	0,62
1849	0,87	0,56	0,14	0,84	0,16	1,19	2,16	2,47	0,72	0,50	0,71	0,32
1850	0,00	0,00	0,14	0,03	1,16	1,43	1,74	3,50	1,49	2,22	1,69	0,02
1851	0,20	0,37	0,02	2,60	1,01	1,33	1,78	2,46	0,48	0,81	3,95	0,70

Both the extreme conditions, of continual drought or of continual rain, have been classed amongst the causes which favor the development of epidemics. The warm season being chiefly considered to promote the

noxious influence of these conditions, and the typhus epidemics being developed only at the end of the year, I consider, that, in accordance with what has been done above to determine the mean reading of the barometer, the average of rain should also be known for the last 6 months, with a view of thereby possibly coming to some conclusions.

AVERAGE OF RAIN FROM JULY—DECEMBER.

Year.	Average for 6 months.
1840	2,55
1841	1,70
1842	1,37
1843	0,93
1844	2,37
1845	1,85
1846	1,39
1847	1,15
1848	1,29
1849	1,14
1850	1,77
1851	1,69

According to the above calculation, the highest average of rain, during the last 6 months of the year, occurred in the years 1840 and 1844, and the lowest in 1843. No epidemic commenced during these years; the maximum or minimum of rain has consequently not shown any influence in this respect. The years 1847, -48 and -49 are nearest the minimum; and present, as above shown in the table § 1, the smallest number of patients, of all the twelve years. 1841, -45 and -50 agree to a remarkable extent with each other, giving 1,70, 1,85, and 1,77 respectively; these numbers are cer-

tainly next to the maximum, but still considerably below that point. During these years the epidemics were developed. The average fall of rain during the last six months of the twelve years is = 1,60, while the average fall during the three years, when epidemics commenced, is = 1,77. These numbers differ but slightly. The only conclusion, therefore, we are able to draw is, that typhus epidemics are developed, neither in unusually rainy nor unusually dry weather, but in those years, when the average of rain is rather between the maximum and minimum, taken from the latter six months of 12 years.

From this comparison between the meteorological observations and the more or less frequent occurrence of the typhus fevers, the following general conclusions may be drawn; and the future alone can decide as to their truth.

1. Neither a very high nor a very low average degree of temperature during the summer months seems to generate an inclination for the development of typhus epidemics during the autumn months; but this inclination seems to be at its height in years, when the average degree of temperature has kept the medium between the high and low general mean temperature.

2. The mean reading of the barometer has been either unusually high or low, during the months which immediately preceded the outbreak of a typhus epidemic. Both the extremes seem to promote such epidemics. But as the low reading occurred twice and the high but once, the former condition might be considered to have a more powerful influence.

3. The average fall of rain during the months, which preceded the epidemics, and during which they commenced, has been neither very high nor very low, but nearest the mean for the same time during all the 12 years. Copious rain or drought seems not to have any influence on the development of typhus epidemics.

§ 4. The sexes offer a remarkable difference, as shown by the following table:

Year.	Men.	Women.	Total.
1840	119	92	211
1841	234	92	326
1842	285	158	443
1843	172	66	238
1844	163	59	222
1845	125	74	199
1846	356	162	518
1847	93	39	132
1848	70	34	104
1849	38	28	66
1850	217	67	284
1851	309	134	443
Total	2,181	1,005	3,186

It is seen by this table that the number of men is more than twice the number of women, or 68,4 % men, and 31,5 % women of the whole. We must not however conclude from this fact, that the male sex should have twice as great a proclivity to become affected by typhus, as the female sex. The women, especially the married ones, have a certain unwillingness to enter a hospital, and they will leave their homes only in the last extremity, while the men, on the contrary, willingly change theirs for the hospital. We must only infer from the above fact, that the men in general have

a greater disposition for typhus than women; but not that this disposition is so much greater as these numbers show. This disproportion between the sexes was seen to the largest extent in 1850, when three parts of the whole number were men and only one part women; or, more exactly, the former 76,4 %, the latter 23,5 %; to the smallest extent in 1840, when the men were 56,3 %, the women 43,6 % of the whole number.

§ 5. The different proclivity of different ages to be affected by typhus, has, in an etiological point of view, attracted no slight attention.

TYPHUS PATIENTS ACCORDING TO AGE.

Year.	Under 10 years.	Between 10—20.	Between 20—30.	Between 30—40.	Between 40—50.	Between 50—60.	Between 60—70.	Above 70.	Total.
1840	—	60	123	22	5	1	—	—	211
1841	2	72	172	53	19	8	—	—	326
1842	8	85	212	90	33	14	1	—	443
1843	—	42	132	53	7	4	—	—	238
1844	1	28	118	49	24	1	1	—	222
1845	1	30	127	30	10	1	—	—	199
1846	—	77	291	111	25	13	1	—	518
1847	—	26	79	23	3	1	—	—	132
1848	2	20	46	21	9	4	2	—	104
1849	—	5	46	6	5	4	—	—	66
1850	—	45	168	52	12	7	—	—	284
1851	9	78	227	86	35	6	1	1	443
Total	23	568	1,741	596	187	64	6	1	3,186

Respecting the first column, headed under 10 years, it must be observed, that all cases placed there have been patients between 8 and 10 years of age, as children under 8 are only exceptionally received at the hospital. From the small number, only 23, received, no comparison can be established with the other ages; the number of children entered being naturally very limited, as parents will seldom part with their fever-sick children, but rather nurse them at home.

The table shows further, that the ages between 20 and 30 years furnish the greatest number of patients, more than half of the whole, in fact = 54,6 %; which seems to prove that people at that age have the greatest liability to be affected by typhus, a statement, which agrees with that of all the authors I have had an opportunity of consulting. The ages between 10 and 20 years, and between 30 and 40, give very nearly the same number, the former decennary 17,8 %, the latter 18,7 %. We must note though, that three fourths of those classed under the former head, have been, between 15 and 20 years, and only one fourth between 10 and 15; hence it follows, that the liability to be affected by typhus is greater between 15 and 20, than between 30 and 40. After 40 years the liability seems to decrease rapidly, the number of patients at the hospital between 40 and 50 years, being only 5,8 % of the whole; between 50 and 60 years, 2,0 %; between 60 and 70, 0,18 and above 70 years, 0,03 of the whole.

It has been stated that the abdominal form of typhus, is never caught after the 55:th year; this does not coincide with my experience, as of 20 patients be-

tween 55 and 60, 6 had this form, the remainder the petechial. Among 6 patients between 60 and 70, two had the abdominal form. The one above 70 (72 years) had the petechial form.

§ 6. A comparison between age and sex, with a view of ascertaining if the sexes at different ages show a different liability to be affected by typhus, is also not without some interest as well as importance in the future examination of the mortality in different sexes and ages.

TYPHUS PATIENTS ACCORDING TO SEX AND AGE.

	Under 10 years.	Between 10 and 20.	Between 20 and 30.	Between 30 and 40.	Between 40 and 50.	Between 50 and 60.	Between 60 and 70.	Above 70 years.	
Men.	12	390	1,241	421	88	25	3	1	2,181
Women.	11	178	500	175	99	39	3	—	1,005
	23.	568.	1,741.	596.	187.	64.	6.	1.	3,186.

This shows some very remarkable facts. Before 10 years, or more correctly, between 8 and 10, the number of male and female patients is nearly the same. From the 10:th to the 40:th the average number, 70,6 % men, 29,3 % women approaches that of sex, independently of age, which has been above stated § 4, viz. 68,4 % men, 31,5 % women. Between 10 and 20 it is 68,6 % men, 31,3 % women; from 20 to 30, men 71,2 %, women 28,7 %; from 30 to 40, men 70,6 %, women 29,3 %. After the 40:th year there is a complete change. Of patients between 40 and 50, there are only 47,0 % men, but 52,9 % women; between 50 and 60, men 39,0 %, women 60,9 %; between 60 and 70 the number of both sexes is again the same. The conclusion drawn from this is, consequently, that between 8 and 10, as between 60 and 70 years, the disposition to typhus appears to be the same in both sexes, between 10 and 40 more common in the male, between 40 and 60 in the female.

§ 7. Percentage of Deaths arising from typhus in the different years.

Year.	Patients.	Deaths.	Percent.
1840	211	18	8,5
1841	326	36	11,3
1842	443	54	12,1
1843	238	21	8,8
1844	222	26	11,7
1845	199	25	12,5
1846	518	39	7,5
1847	132	21	15,9
1848	104	19	18,2
1849	66	5	7,5
1850	284	29	10,2
1851	443	46	10,3
Total	3,186	339	10,6

The great variation in the percentage of deaths in different years is the first point that attracts attention. This percentage varies from the minimum 7,5, to the maximum 18,2, which difference announces, that the disease has shown different degrees of intensity in different years. In years when epidemics have prevailed, the mortality has by no means been greatest; on the contrary during the very extensive epidemic of 1846, it was at the minimum = 7,5, during the epidemic, 1842, it was = 12,1, and 1851 = 10,3; which figures accordingly measure the severity of the respective epidemics. During the two years which succeeded the epidemic of 1846, the percentage of deaths was the greatest, being 15,9 in the year 1847, and 18,2 in 1848. The number of typhus patients in the hospital was during these years unusually small, although 1849 shows a still smaller, and yet the very minimum of percentage of deaths = 7,5. We can discover no rule for these variations; nor give any other reason, than, that the cases of greater severity in certain years, have oftener resisted the efforts of art, which were the same during the whole period.

The average percentage of deaths for all the twelve years is = 10,6, being very small in comparison with the reports of the foreign civil hospitals, I have had an opportunity of seeing. This small number would indicate that typhus is less severe in the north, than in other countries of Europe, if we may not ascribe to the treatment adopted a share in the happy result.

If we further compare the number of patients with the number of deaths, we find this result, that the average number is one death among 9,39 patients.

The smallest average number of deaths, and consequently the most favorable result, is given in the two years 1846 and 1849, being only one in 13,2. The largest again we find in 1848, when one in 5,4, and in 1847, when one in 6,2 died.

§ 8. Deaths by typhus in the respective years and months.

Year.	Month.												Total.
	Jan.	Febr.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	
1840	1	1	3	1	2	3	—	—	3	3	1	—	18
1841	1	—	8	3	4	3	1	3	1	6	1	5	36
1842	12	6	3	2	8	8	5	3	3	1	1	2	54
1843	1	2	1	1	—	1	—	2	1	1	6	5	21
1844	7	2	4	4	4	1	3	—	2	1	4	—	26
1845	5	—	—	4	1	2	1	2	2	1	4	3	25
1846	4	3	5	6	8	4	—	2	4	—	2	1	39
1847	1	1	—	—	5	1	3	5	2	1	1	1	21
1848	3	2	1	1	3	1	—	2	2	3	1	—	19
1849	—	—	—	1	1	—	—	1	—	1	—	1	5
1850	3	6	3	2	2	2	2	2	2	1	4	5	29
1851	5	1	5	2	5	9	4	1	4	2	3	5	46
Total	43	24	33	25	43	35	19	23	22	19	25	28	339

January and May, winter and spring months, show the greatest number of deaths. This is, however, in our climates, not peculiar to typhus, as the mortality from other acute diseases is also at its height during the same months. Nearest to these are June and March, or the beginning of summer and the end of winter. The smallest mortality we find in July and October.

§ 9. PERCENTAGE OF DEATHS IN DIFFERENT MONTHS.

Month.	Patients.	Death.	Percent.
January . . .	276	43	15,7
February . .	228	24	10,5
March	255	33	12,9
April	287	25	8,7
May	365	43	11,7
June	347	35	10,0
July	230	19	8,2
August . . .	208	23	11,0
September .	210	22	10,4
October . . .	226	19	8,4
November . .	231	25	10,8
December . .	323	28	8,6
Total	3,186	339	—

According to this table the greatest mortality from typhus occurs in January, March and May, the smallest in July, October and December. Typhus is, therefore, severest during the three former, mildest during the three latter. The difference between the greatest and smallest percentage of deaths in a month is no less than 7,5. As this circumstance cannot be considered a mere accident, it follows that typhus is severest in January, the coldest winter month, and mildest in July, the warmest summer month, the mortality during the former in proportion to the latter being as 15,7 : 8,2.

§ 10. The mortality in the different sexes.

Year.	Men.	Women.	Total.
1840	14	4	18
1841	22	14	36
1842	40	14	54
1843	15	6	21
1844	21	5	26
1845	17	8	25
1846	30	9	39
1847	15	6	21
1848	14	5	19
1849	3	2	5
1850	25	4	29
1851	36	10	46
Total	252	87	339

According to this table the difference between the male and female sex in this respect seems to be so considerable, that the number of deaths among the men was three times that of the women. But if we compare these numbers with the whole number of patients, we shall find, that 11,5 % of the men, and 8,6 % of the women have died, that is one in 8 of the men, and one in 11 of the women. We conclude, consequently, that typhus is more fatal in the male, than in the female sex, in proportion as 11 : 8.

We find further considerable variations in the mortality of the different sexes in different years; still we cannot infer any thing of importance from this fact.

Even during those years, when epidemics have prevailed, the mortality does not seem to have followed any certain rule; as 1842 it was 14,0 % of men, 8,8 % of women; 1846 8,4 % of the former, 5,5 % of the latter; 1851 11,6 % of the former, 7,4 % of the latter. There is also the same disproportion the other years as, for instance, 1840, the percentage of deaths among the

men was = 11,7 %, among the women = 4,3 %. 1843 = 8,7 % of men, 9,0 % of women; 1845 = 13,6 % of the former, 10,8 % of the latter and so on.

§ 11. The mortality at different ages.

Year.	8—10.	10—15.	15—20.	20—25.	25—30.	30—35.	35—40.	40—45.	45—50.	50—55.	55—60.	60—65.	65—70.	72.
1840	—	—	4	6	4	1	1	—	2	—	—	—	—	—
1841	—	1	7	9	9	4	2	1	2	1	—	—	—	—
1842	—	—	3	11	12	7	8	6	1	3	2	—	1	—
1843	—	—	2	5	2	6	4	—	1	1	—	—	—	—
1844	—	—	3	4	4	4	4	4	2	—	—	1	—	—
1845	—	—	5	7	4	3	2	3	1	—	—	—	—	—
1846	—	—	5	7	9	9	3	1	1	3	—	1	—	—
1847	—	1	4	5	4	2	1	2	1	—	—	—	—	—
1848	—	—	3	8	2	1	—	1	1	1	—	2	—	—
1849	—	—	—	—	2	—	1	2	—	—	—	—	—	—
1850	—	—	6	7	6	2	1	1	1	4	1	—	—	—
1851	1	—	2	12	7	6	6	8	2	—	1	—	—	1
Total	1	2	44	81	65	45	33	29	15	13	4	4	2	1
		46.		146.		78.		44.		17.		6.		

339.

According to this table, the mortality in typhus is, before 15, as great as after 65. It is greatest between 20 and 25, and decreases gradually until 72, with the exception of the age between 15 and 20, which lies between the two ages 30 and 35, and 35 and 40, but nearer the former. The exact result, however, is only obtained, by comparing this table with the one in § 5, containing the number of patients received at the different ages.

Age.	Patients.	Deaths.	Percent.
8—10	23	1	4,3
10—20	568	46	8,0
20—30	1,741	146	8,3
30—40	596	78	13,0
40—50	187	44	23,5
50—60	64	17	26,5
60—70	6	6	100,0
72	1	1	100,0
Total	3,186	339	—

From this it is evident, that the mortality in typhus rises with age, and that the prognosis becomes more unfavorable with every decennium. The increase does, however, not follow a decided series. The greatest probability of restoration to health is found between the ages of 8 and 10 years; the smallest after 60. It is perhaps a mere accident that every patient above 60 died; but it shows nevertheless, that typhus very rarely allows us to entertain hopes of recovery after that age.

No special calculation having been made of the number of patients between 10 and 15, but only one comprising the whole decennium between 10 and 20 years, it is impossible to say at which year the mor-

tality more decidedly begins to increase, we may however with probability allow, that this increase commences with the 15:th year, there being only two deaths between 10 and 15.

The difference between the percentages of deaths is greatest in the decennia 30—40 and 40—50, where it is not less than 10,5 %. An alteration within the human system has, accordingly, taken place during this period, so that the typhus process becomes more dangerous to life, than it was during any of the former ages. This diminished power of resistance of the system, becomes more evident between 50 and 60, during which decennium the percentage of deaths surpasses the one between 30 and 40 by 13,5.

If we compare the smallest percentage of mortality, the one for patients between 8 and 10, with the others, we find this percentage, during the ages 10—20 and 20—30, to be 1,8 times as great; during the period between 30—40, 3,0 times as great; during that between 40—50, 5,4 times as great; and between 50 and 60, 6,1 times as great, as that during the age between 8 and 10 years. The hopes of recovery differs during the different ages according to this progression.

§ 12. The mortality in different sexes and ages.

Year.	8—10.		10—15.		15—20.		20—25.		25—30.		30—35.		35—40.		40—45.		45—50.		50—55.		55—60.		60—65.		65—70.		72.
	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.
1840	—	—	—	—	4	—	3	3	4	—	1	—	1	—	—	—	1	1	—	—	—	—	—	—	—	—	—
1841	—	—	1	—	4	3	5	4	6	3	2	2	1	1	1	—	2	—	—	1	—	—	—	—	—	—	—
1842	—	—	—	—	2	1	8	3	10	2	6	1	5	3	6	—	1	—	1	2	—	2	—	—	1	—	—
1843	—	—	—	—	1	1	3	2	1	1	5	1	3	1	—	—	1	—	1	—	—	—	—	—	—	—	—
1844	—	—	—	—	—	3	4	—	4	—	2	2	4	—	4	—	2	—	—	—	—	—	1	—	—	—	—
1845	—	—	—	—	3	2	5	2	4	—	1	2	2	—	2	1	—	1	—	—	—	—	—	—	—	—	—
1846	—	—	—	—	4	1	5	2	7	2	7	2	3	—	1	—	—	1	3	—	—	—	—	1	—	—	—
1847	—	—	1	—	4	—	4	1	2	2	1	1	—	1	2	—	—	1	—	—	—	—	—	—	—	1	—
1848	—	—	—	—	2	1	7	1	1	1	1	—	—	—	1	—	—	1	1	—	—	—	1	1	—	—	—
1849	—	—	—	—	—	—	—	—	2	—	—	—	—	1	1	1	—	—	—	—	—	—	—	—	—	—	—
1850	—	—	—	—	5	1	7	—	5	1	1	1	1	—	1	—	1	—	4	—	—	1	—	—	—	—	—
1851	—	1	—	—	1	1	9	3	7	—	5	1	6	—	5	3	2	—	—	—	1	—	—	—	—	—	1
Total	—	1	2	—	30	14	60	21	53	12	32	13	26	7	24	5	10	5	10	3	1	3	2	2	1	1	1
	1.		2.		44.		81.		65.		45.		33.		29.		15.		13.		4.		4.		2.		1.
	1.		46.				146.				78.				44.				17.				6.				1.
	339.																										

We must compare these numbers with those given above in § 6 relating to the typhus patients of different sexes and ages, in order to be able to draw any conclusions. The view will be rendered easier by making separate tables of the two sexes, containing the total number of patients, their age, the number of deaths and the per-centage of deaths.

	Men.			Women.		
Age.	Patients.	Deaths.	Per cent.	Patients.	Deaths.	Per cent.
8—10	12	—	0,0	11	1	9,0
10—20	390	32	8,2	178	14	7,8
20—30	1,241	113	9,1	500	33	6,6
30—40	421	58	14,0	175	20	11,4
40—50	88	34	38,4	99	10	10,1
50—60	25	11	44,0	39	6	15,5
60—70	3	3	100,0	3	3	100,0
72	1	1	100,0	—	—	—
Total	2,181	252	—	1,005	87	—

Amongst the men we consequently see the mortality increasing with every decennary, that is to say, typhus becomes more fatal the more a man advances in age. This increase in the mortality is most marked after 40, the mortality in the decennary between 40 and 50 being more than twice that of the preceding decennary between 30 and 40. In the decennary between 50 and 60 the mortality increases to nearly the half of the whole number of hospital patients at that age, after the 60:th year every case has been fatal. These facts are consequently of great importance in relation to the prognostic. None of the 12 cases between 8 and 10 being fatal, it will appear, that typhus at

that age is mild, in perfect contrast to what it becomes after 60. This mild nature of typhus seems to continue until the 15:th year, 2 deaths only taking place among the males between 10 and 15. Between 15—30 the rate of mortality seems to be about the same, 8 or 9 per cent, increasing in a marked degree only after 30.

In respect to the women the case is very strikingly different from that of the men, there being no increase of mortality with advancing years. At every age the percentage of deaths is lower in the female than in the male sex, excepting before ten years, there being among 11 patients one of death (when of 12 male patients none died) and at the age between 60 and 70, in which all died as among the men of the same age. Excepting between 60 and 70, the highest percentage of deaths occurs in the same decennary among the women as among the men, viz. between 50 and 60, though that of the men is nearly three times as great as that of the women, 44,0 % of the former 15,5 % of the latter, or every 2,2 having died among the men, every 6,5 among the women. If it is not to be ascribed to mere accident, typhus should be considered mildest in women at the age between 20 and 30, as the percentage of deaths is then lowest, only 6,6 of the whole, or one death in every 15,1; in the following decennary the percentage of deaths is = 11,4, or one death among 8,7 patients.

§ 13. The number of days, different for those who recovered and for those who died, which the patients have remained at the hospital from their re-

ception to their discharge, also merits notice, as several valuable conclusions might be drawn thence. We may be able to judge with some exactness the severity of the disease, from the comparative slowness of the recovery during different years and in the two sexes. It is true that some have left the hospital before they were perfectly recovered, and that others have remained after their recovery, on account of consequent or other diseases; but these circumstances cannot have any great influence on the whole number, from which we draw our conclusions.

THE NUMBER OF DAYS, DURING THE DIFFERENT YEARS, THAT THOSE OF THE TWO SEXES WHO RECOVERED REMAINED AT THE HOSPITAL.

MEN RECOVERED.

Year.	Patients.	Days.	Average number of Days.
1840	105	3,168	30,1
1841	212	5,613	26,4
1842	245	6,285	25,6
1843	157	4,352	27,7
1844	142	4,605	32,5
1845	108	3,133	29,0
1846	326	7,015	21,5
1847	78	2,376	30,4
1848	56	1,662	29,5
1849	35	1,217	34,7
1850	192	5,198	26,5
1851	273	5,855	21,4
Total	1,929	50,479	26,1

WOMEN RECOVERED.

Year.	Patients.	Days.	Average number of Days.
1840	88	2,831	32,1
1841	78	2,556	32,7
1842	144	4,321	30,0
1843	60	2,163	36,0
1844	54	1,831	33,9
1845	66	2,401	36,3
1846	153	3,901	25,4
1847	33	1,083	32,8
1848	29	860	26,6
1849	26	994	38,2
1850	63	2,407	38,2
1851	124	3,601	29,0
Total	918	28,949	31,5

MEN AND WOMEN.

	Recovered.	Days.	Average number of Days.
Sum total	2,847.	79,428.	27,89.

The most striking result of this is that the women in general remained longer at the hospital than the men, the women having 5 days each more than the men, that is to say the recovery of the woman from typhus is slower than that of the man. To a certain extent it may depend on the comparative weakness of the woman's constitution, she being in all acute diseases generally more prostrated than the man, and in consequence her recovery slower; but not the less on the greater liability of the woman to be attacked by abdominal typhus than the man who oftener has the petechial form, and the recovery from the former affection, according to rule being slower, increases in no small degree the average number of days the women spent at the hospital.

Examining separately the numbers relating to the men, we find that the average number of days in the different years, varies between the lowest = 21,4 and the highest = 34,7. In those years, when epidemics have prevailed, as in 1842, 1846 and 1851, the average number is the lowest, being 25,6; 21,5; 21,4; for the years respectively. This seems partly to be occasioned by the more rapid course of the cases during an epidemic, partly by the greater number then received into the hospital, whence the stay of some of the patients, prolonged from some reason or other more than usual, interferes in but a trifling degree with the average number. Another very important ground for the smaller number of days during the epidemic prevalence of the disease, consists in the prominent number of cases then of typhus petechialis, typhus abdominalis being on the other hand predominant when it is only a sporadic complaint. The

former variety, as has just been observed, has a more rapid recovery, which in the latter is often very much retarded by the remaining lesions of the intestines, decubitus or affections of the lungs. The epidemic of 1842, having a larger average number of days of residence at the hospital, than the two other epidemics, must in consequence have been of a severer kind. To confirm this statement we need only compare the respective percentage of deaths (§ 7) which in 1842 is 12,1 %; in the two others 7,5 % and 10,3 %. The largest average number of days occurs in the year, when the number of patients was the very smallest; 1849 there were only 35 patients, of whom every one on an average spent 34,7 days at the hospital; but all were cases of typhus abdominalis.

For the women the days of sojourn at the hospital varies between 25,4 and 38,2, the same distance between maximum and minimum being observable as for the men. We find also the epidemic years of 1842, 1846 and 1851, offer for the women as for the men the smallest average number of days, 30,0 %, 25,4 % and 29,0 % respectively. 1848 has still a somewhat smaller than 1842, viz. 29,6. The largest number 38,2 occurs in 1849 and 1850.

In respect to the average number of days of both sexes together during all the twelve years, it may be stated at 27,89, that is, every patient, who recovered, has on the average spent 28 days at the hospital. This is not to be interpreted so as if typhus in general should offer this average duration, from the beginning to the end of the disease, that is, to the perfect reestablishment of health. The patients are seldom admitted before the

5:th day after being taken ill, most frequently between the 5:th and 7:th day, as they for the most part postpone entering the hospital till the severity of the disease convinces them of the impossibility of being properly attended to at home. A great many, especially married persons, leave the hospital, when their recovery commences, as soon as they get sufficient strength, and consequently before their perfect recovery. In the one as in the other case, some days must be added to the stated average number, if we wish to find the average duration of the disease. In general 5 to 7 days, preceding the admittance of the patient, may be added and consequently the mean duration estimated at 33 or 35 days. The number of those, that leave the hospital before perfect recovery, should then be considered to make up for the others that remain a shorter or longer period on account of sequelæ.

§ 14. Average stay of the two sexes deceased in the different years.

Men deceased.

Year.	Deceased.	Days.	Average number of Days.
1840	14	202	14,4
1841	22	247	11,2
1842	40	462	11,3
1843	15	114	7,6
1844	21	270	12,8
1845	17	212	12,4
1846	30	378	12,6
1847	15	209	13,9
1848	14	165	11,7
1849	3	48	16,0
1850	25	315	12,6
1851	36	327	9,0
Total	252	2,949	11,8

Women deceased.

Year.	Deceased.	Days.	Average number of Days.
1840	4	58	14,5
1841	14	188	13,4
1842	14	127	9,0
1843	6	86	14,31
1844	5	98	19,6
1845	8	163	20,3
1846	9	88	9,7
1847	6	177	29,5
1848	5	24	4,8
1849	2	26	13,0
1850	4	26	6,5
1851	10	132	13,1
Total	87	1,193	13,7

Men and Women.

	Deceased.	Days.	Average number of Days.
Sum total	339.	4,142.	12,2.

The average number of days of the deceased men varies not so much as that of the women. The smallest number of days spent by the former at the hospital is 7,6 the largest 16,0; the smallest number of days of the latter is 4,8 the largest 29,5. The larger the average number of days is, that is, the longer the patients have withstood the disease before death, the more evident is it that there have existed complications. We may therefore suppose that the longer the average stay before death has been, the greater has been the proclivity to secondary affections, and that death has rather been occa-

sioned by these affections, not by the typhus fever only as such. The women show the greatest inclination to be thus secondarily affected, at least during certain years. From the average number of days that the men, the women, and both together have remained at the hospital, it may be inferred that the women have in general staid 2 days longer than the men before death, 13,7 being the average stay of the former, 11,8 of the latter, and 12,2 of both together. It seems to follow from these numbers, that, as the period of the convalescence of the women is more protracted than that of the men, their death from typhus or its sequelæ should likewise come later. I dare not, however, advance this conclusion as fully to be depended on, there being very often a great difference in the stay of those who die from their admittance to their death, one expiring within 1—3 days, another on the 40:th or 50:th after their entrance, &c. &c. An instance of the former case is afforded in 1848, when the 5 fatal cases together lay only 24 days; of the latter, 1847, when the 6 patients, who died, were at the hospital not less than 177 days. We may account for the difference between the average stay of the men and the women by the larger number of deceased men, because when the greater part always die within the first days after their entrance, the average stay, taken from a larger number, must in this way be smaller. When I therefore admit that the stated average stay of the two sexes separately, does not give us a result strictly to be relied on, the same must be the case with the average stay of both sexes together.

§ 15. In order to facilitate the view, the conclusions, which may be drawn from the preceding §§, from § 4 to § 14 inclusively, have been comprised under the following points:

1. Men are oftener attacked by the typhus process than women, in a proportion of about 68 : 31.

2. The age has a decided influence on the liability for typhus. The period between 20—30 has the greatest liability, then that between 15 and 20, next that between 30—40, and from 40 to 72 years the liability decreases, until at the latter age it may be said to cease.

3. The sexes differ in this respect materially at the different ages. Between 8 and 10 the liability for typhus of both sexes seems to be the same, as well as between 60—70; between 10 and 40 it is greatest in the male sex, between 40 and 60 in the female.

4. The mortality varies in different years. It may be from 7 % to 18 % of the number of cases, according to the severity the disease may assume, but independently of its being epidemic or sporadic. The average mortality for 12 years is 10,6 % of the number of cases.

5. The seasons influence the mortality in typhus. The greatest number of deaths occurs in January, consequently during the severest cold; the smallest in July, during the greatest heat. The difference between the mortality in these two months is shown by 15,7 % deaths of the cases in January, and but 8,2 % in July.

6. The mortality in typhus is different in the two sexes. More men die than women, there being 11,5 % of the male, and only 8,6 % of the female patients; thus every 8:th man dies, but only every 11:th woman.

7. The mortality increases with the age. It is smallest between 8—10, greatest after 60. It suddenly rises after 30, being between 15 and 30 8 %, but 13 % between 30 and 40; 23 % between 40 and 50, and 26 % between 50 and 60. Every patient above 60 years died.

8. The mortality is also different in the sexes at different ages. This becomes most striking after 40, when 38 % died of the male patients between 40 and 50, but only 10 % of the female; and between 50 and 60 44 % of the male, but only 15 % of the female patients. Between 10 and 20 the percentage of deaths for the two sexes is nearly alike, between 20—30 and 30—40 there is a difference of about 3 % between the sexes, the men having 3 % more deaths than the women.

9. The average number of days passed within the hospital by those who recovered differs in different years. During epidemics this number is smaller than when the disease is sporadic. The average number of days is smaller for the men than the women in a proportion of 26,1 to 31,5. The average number of days for those of both sexes who recovered is 27,89. If from 5 to 7 days be added to this number, being the days that commonly pass from the beginning of the disease until the entrance at the hospital, the average duration of the disease is obtained, being from its beginning until perfect convalescense from 33 to 35 days.

10. The average number of days of those who died is also different during different years. It is also different for men and women in the proportion of 14,8 to 13,7, whence it may be concluded, that as the women

require a longer time before they recover, they also resist longer before they die. The average number of days for the deceased of both sexes is 12,2.

§ 16. In order to be able to give a more detailed account of several of the most important symptoms, I have considered it both necessary and of some interest to put in the form of tables the results, obtained from 250 cases, whose histories have been with great care noted down, in similar formules, during the last months of 1843 and the beginning of 1844. There was a certain disposition to an epidemic outbreak during these months, but never being fully developed it has not been reckoned among the more evident and extensive epidemics. The medical attendants then at the clinic, now D:rs of Medicine *Böttiger*, *Lindhagen*, *K. Levin*, *Lundqvist* and *A. R. Åberg*, helped me in noting down these histories with an exactness, and ability fully to be relied on, for which I may here be allowed to express my most grateful acknowledgements.

Of these 250 cases, 182 were men and 68 women; 225 recovered, 162 men and 63 women; 25 died, 20 men, 5 women. In the following table their age is shown:

Age.	Patients		Recovered		Deceased	
	men.	women.	men.	women.	men.	women.
10—15	7	4	7	4	—	—
15—25	91	35	87	33	4	2
25—35	66	20	58	18	8	2
35—45	16	9	9	8	7	1
45—55	1	—	—	—	1	—
55—65	1	—	1	—	—	—
Total	182	68	162	63	20	5
	250.		225.		25.	
			250.			

4. Symptoms from the brain and nervous system.

Age.	Delirium						Stupor.		Hardness of hearing.		Subsultus tendinum.		Prostratio virium.	
	mite.		furibundum.		mussitans.									
	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.
10—15	2	2	—	—	—	1	5	3	3	2	1	—	—	—
15—25	26	9	2	—	6	2	62	23	24	15	7	2	6	2
25—35	21	5	2	—	10	2	55	17	14	7	8	—	5	—
35—45	8	2	—	—	9	—	12	7	5	8	4	—	4	—
45—55	1	—	—	—	—	—	1	—	—	—	1	—	—	—
55—65	—	—	—	—	—	—	1	—	—	—	—	—	—	—
Total	58	18	4	—	25	5	136	50	46	32	21	2	15	2

We find *delirium*, of one or other form, in 110 cases; it is somewhat less than the half or 44 %. The men have shown a greater inclination to become affected with this symptom than the women, as of 182 men 87, or 47,8 %, and of 68 women 23 only, or 33,8 %, became delirious. Delirium mite has occurred in 58 male cases or 31,8 %, and in 18 female cases or 26,4 %. Delirium furibundum has occurred only in 4 men. Delirium mussitans in 25 men or 13,1 %, and in 5 women

or 7,3 %. The age between 25—35 is marked by the greatest proclivity to delirium (with the exception of the only patient between 45—55), when not less than 46,5 % of the patients were affected in a similar manner; the smallest tendency is shown at the age between 15—25 with only 35,7 %.

There has been *stupor* in 186 cases. It is to be understood, that several of those, who during the first stage had delirium, in the second stage sunk into stupor; others showed stupor from the beginning and retained it during the whole course of the disease; others again had stupor in the first and at the beginning of the second stage, but became afterwards at the close of this stage affected with delirium mussitans. If we compare the number of those who presented this symptom, with the number of all the patients, we shall find 74,4 %. The tendency to stupor has been nearly the same in both sexes, 74,7 % of the men 73,5 % of the women. In respect to the age, we see that between 25—35 years (with the exception of the two, cases between 45—65) the proclivity to stupor is greatest, as marked by 83,7 % of the patients; the age between 15—25 with only 67,4 % shows the smallest.

Deafness was found in 78 cases, or 31,2 %. The women are nearly twice as much inclined to this affection as the men, there being 47,0 % of the former, 25,2 % of the latter. This deafness, which may subsist in a greater or less degree, does not make its appearance before the second stage or at its close, and announces almost always, either already commenced or approaching recovery per lysin. It has occurred most frequently at

the age between 35—45, rarest between 25—35; making 52,0 % of the former, 24,4 % of the latter.

Subsultus tendinum has been seen in only 23 cases, or 9,2 % of the whole. The tendency to this symptom is much more marked in the men than in the women, as shown by 11,5 % of the former and 2,9 % only of the latter. Most often has this symptom occurred at the age between 35—45 (with the exception of the only case between 45—55) and most seldom between 15—25; there being 16,0 % of the former, 7,1 % of the latter.

Prostratio virium, by which we comprehend the state, when the patient lying on his back sinks down in the bed, and the excretions are involuntary, has been noted in 17 cases or 6,8 %; 8,2 % of the men, 2,9 % of the women; the age between 35—45 marked by the largest, 16,0 %, that between 25—35 by the smallest, 5,8 %.

2. Symptoms from the heart and circulatory system.

Age.	Sounds of the heart						Pulse						Bleeding from the nose.	
	both weak.		first sound short and weak.		first sound scarcely audible.		below 80.		above 120.		irregular.			
	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.
10—15	—	—	3	2	1	—	3	1	1	1	—	1	1	—
15—25	5	1	51	15	6	3	26	5	4	5	4	1	10	6
25—35	4	1	38	10	9	2	9	2	2	2	6	1	4	—
35—45	1	—	9	6	1	1	1	2	2	3	—	—	—	2
45—55	1	—	—	—	—	—	—	—	—	—	—	—	—	—
55—65	—	—	—	—	—	—	1	—	—	—	—	—	—	—
Total	11	2	101	33	17	6	40	10	9	11	10	3	15	8

The sounds of the heart have been observed to differ from the natural in not less than 170 out of the 250 patients, or = 68,0 %. The sounds of the heart did not show any remarkable changes in the remaining 80 cases, during the whole course of the disease. The changes in question appertained all to the second or the depressed stage of the disease. At the beginning of this stage the sounds of the heart lose their power *(the examination ought to be made at the orifice of aorta)*, we

find them less strong than usual, which in most cases is united with another unnatural change. This change consists in an altered state of the first sound (the systolic sound), which has lost its prolonged quality, is become short, and very often so resembling the second sound, that the two, both in quality and in duration, become almost exactly alike. This seems to depend on nothing else, but the participation of the heart in the general debility, the general depression of the muscular power. The weaker the muscular tissue of the heart is, with the less power must also its contractions be performed, the weaker must the sounds be, and especially the first. When this debility or flabbiness of the heart has attained its height, the first sound is scarcely audible. Thus by these changes of the sounds we may measure very exactly, the state of depression of the system at large.

The first column contains the cases in which the sounds have been weak, but have preserved their relation to each other. The second column, again, comprehends cases, where the sounds were weak and their relation to each other altered, in as much as the first sound was shortened like the second. In the third column are, finally, arranged those cases, in which the first sound has been shortened and weakened in a manner to make it perceptible but with difficulty. When we find only 13 cases in the first category and not less than 134 in the second, we may draw the conclusion, that in most cases, as soon as the sounds are beginning to grow weak, the first also is shortened. The cases of the last category are rare, there being 23 out of 250 cases, or 9,2 %. Such cases are the most severe in respect to the prog-

nostic, as we seldom see a patient recover, in which the first sound of the heart was scarcely audible. In respect to age, the first sound was shortened in 5 cases under 15 years, or 45,4 % of the patients of that age; in 66 cases between 15—25, or 52,3 %; in 48 cases between 25—35, or 55,8 %; and in 15 cases between 35—45, or 60,0 %. It was scarcely audible in one case under 15 years, or 6,6 %; in 9 cases between 15—25, or 7,1 %; in 11 cases between 25—35, or 12,7 %; and in 2 cases between 35—45, or 8,0 %.

The state of the pulse has been classed under only 3 heads: when it was below 80 in a minute, when above 120, or when irregular. I have not thought it worth while to note the numbers between 80 and 120, as they vary so much from one day to another, that we can come to no decided result. All the three variations appertain to the second stage of the disease; the first, when the pulse during this stage kept below 80, varied between 64 and 80; the second, when, during a later period of this stage, it exceeded 120; the third when, under the last mentioned conditions, it became irregular. There have in all been 83 cases of the three different variations; the remaining 167 cases having a pulse varying between 80 and 120. In 50 cases the pulse was below 80, that is 20 % of the whole number; 21,9 % of men and 14,7 % of women. In 20 cases it was above 120, or 8 % of the whole; 4,9 % of the men and 16,1 % of the women. In 13 cases the pulse was irregular, consequently 5,2 % of the whole. If we compare the age of those, whose pulse has been below 80, the result will be that the tendency to a slow pulse has been greatest

at the age below 15 years, and afterwards gradually diminished with every decennary. Under 15 years 36,3 % have had the pulse below 80; between 15—25 years 24,6 %; between 25—35 years 12,7 %; between 35—45 years 12,0 %. The only case between 55—65 is not taken into the account. The tendency to a slow pulse is more peculiar to the male sex, as 21,9 % of the men and only 14,7 % of the women, have been affected with it. Pulse above 120, has, in respect to age, shown the following relation; 18,1 % of those below 15 years; 7,1 % between 15—25 years; 4,6 % between 25—35, and 20,0 % between 35—45 years. The greatest disposition to the frequent pulse is consequently shown by the patients between 35—45 years; the least by those between 25—35 years. The men showing, as above stated, a greater tendency to a slow pulse, we observe the reverse with respect to the frequent, the women being more inclined to the incresed frequency of the pulse, as illustrated by the above statement, that of patients with the pulse above 120, there have been 16,1 % women, 4,9 % men.

Bleeding at the nose has occurred only in 23 cases or 9,2 % of the whole; 8,2 % of men, 11,7 % of women. The smallness of the number, that have had this symptom, may be explained by only such cases having been noted down, in which the bleeding took place after their entrance at the hospital, as the uncertainty of the answers of the patient would otherwise render any conclusion too indefinite. The greatest proportionate number occurs at the age between 15—25 with 12,6 %, the smallest between 25—35 with only 4,4 %.

3. Symptoms from the organs of respiration.

Age.	Capillary catarrh.		Pneumonia.		Pleuritis c. exsudatione.	
	m.	w.	m.	w.	m.	w.
10—15	3	1	—	—	—	—
15—25	7	7	3	2	1	—
25—35	14	4	4	1	1	—
35—45	1	7	1	—	—	—
55—65	1	—	—	—	—	—
Total	26	19	8	3	2	—
	45.		11.			

Under the head *capillary catarrh* only the severest cases are arranged, as catarrh in a milder degree was almost always to be observed; it is plain, that in this capillary catarrh, the larger air-tubes were also affected. Of the 250 patients 45 had this severer kind of catarrh; that is 18 %. The women were nearly twice as much inclined as the men to this complication, 27,9 % of the former and 14,2 % of the latter being affected by it. With the exception of the only case between 55—65 years, the age between 35—45 has shown the greatest disposition to the catarrhal affection, as not less than 42 % of all the patients at that age have suffered from it, the smallest, again, the age between 15—25 years with only 11,1 %.

Pneumonia has only been seen in 11 cases, making 4,4 % of the whole number; both sexes have been in the same degree inclined to this complication, 4,3 % of men, 4,4 % of women being affected. In respect to age, that between 25—35 shows a small superiority in number, 5 % of the patients at this age suffering from the affection, and 3,9 % of the patients between 15—25 years. From the small number of cases with the above

complication we must not conclude, that pneumonia is so seldom added to typhus, as seems here to be the case. It has been a mere accident, that at the time, when I collected the cases now noticed, the pneumonia was a rarer complication than usual, being, again, in other years of more frequent occurrence. Upon an average it may be admitted, that cases complicated with pneumonia are about 8—10 % of the whole number of typhus patients.

Pleuritic effusions were marked only twice, and in males.

4. Symptoms from the organs of digestion.

Age.	Tongue dry. m.	Tongue dry. w.	Tongue covered with a crust. m.	Tongue covered with a crust. w.	Vomiting. m.	Vomiting. w.	Diarrhea. m.	Diarrhea. w.	Involuntary evacuations. m.	Involuntary evacuations. w.	Constipation. m.	Constipation. w.	Pain in the ileo-coecal region. m.	Pain in the ileo-coecal region. w.	Total	
10—15	5	2	1	—	—	—	1	—	—	—	—	1	—	—	125	164.
15—25	59	15	16	5	9	5	25	14	5	2	10	6	48	19	39	58.
25—35	45	15	17	5	8	3	20	7	8	1	7	4	31	17	42	27.
35—45	15	7	8	6	1	1	4	3	5	1	2	4	11	5	16	75.
45—55	1	—	—	—	—	—	—	—	1	—	—	—	—	—	18	23.
55—65	—	—	—	—	—	—	1	—	—	—	—	—	—	—	9	34.
Total	125	39	42	16	18	9	51	24	19	4	19	15	90	41	131.	

The state of the tongue has been divided under two heads, either dry, without any real covering, or covered with a hard crust. The tongue has been moist in all cases not referred to these two heads, either furred or without fur, and then of a more or less bright red hue. In 222 cases the tongue was dry and covered with a crust, and consequently was moist in 28 cases only. It must be remarked, that the dry tongue covered with a hard crust at the commencement of the disease, and often during the whole of the first stage may have been moist, but is understood to dry up and be covered with crust in the second stage; the moist tongue, again, continues so during the whole course of the malady.

Dry tongue has been observed in 164 cases or 65,6 % of the whole number; in 125 or 69,2 % of the men, in 39 or 57,3 % of the women; thus the men in typhus showing a greater inclination to have a dry tongue than the women. With the exception of the only case between 45—55, the liability to a dry tongue has been greatest between 35—45, 88 % of the patients at that age having a dry tongue; on the other hand this liability is least at the age between 15—25, which has 58,7 %.

Tongue covered with crust has occurred in 58 cases, or 23,5 % of the whole number. The liability to this symptom was the same in both sexes, but seems to increase with age, those at 10—15 having 9,0 %; at 15—25, 16,6 %; at 25—35, 25,5 %; and at 35—45, 56 %.

Vomiting was noted down in 27 cases. It occurred during the first stage, and seems to me to be a more

accidental than essential symptom. The women seemed more disposed than the men, the former having 13,2 %, the latter 9,8 %.

Under the head *diarrhea* have been placed such cases in which the patient has had 3—6 and more thin stools during the day, not such in which there has been only a few loose ones. All the patients, that are not placed under this head or under *constipation*, have had either one natural stool or a few loose ones a day. The diarrheas, which have been noted, have either commenced with the disease and continued afterwards, or begun later during the progress of the disease; in some cases the evacuations have been more or less bloody, but only in two cases has the bleeding from the intestinal tube been more copious. 75 patients have had diarrhea or 30 %. The women have been more disposed to this affection than the men, giving a percentage of 35,2 %, the men only 28,0 %. With the exception of the ages below 15 and above 55 years, all the remaining ages have shown nearly an equal disposition.

Closely connected with this is the following head, *when the stools have been involuntary*. Such an occurrence during the last stage of the disease, is certainly most common in cases with preexisting diarrhea, but may sometimes be met where the bowels have not before been loose. Of involuntary evacuations there have only been noted 23 cases, or 9,2 % of the whole; 10,4 % of male, 5,8 % of female patients.

Cases, in which during the whole course of the disease there have been no evacuations without the aid of medicine, are placed under the head *constipation*. This

appertains chiefly, although not exclusively, to the petechial form of typhus, and to those cases in which there is a considerable congestion to the brain. 34 cases have been noted, or 13,6 %. The tendency to this affection was twice as great in the women as in the men, viz. 22,0 % of the former and 10,4 % of the latter.

Pain in the ileo-coecal region either complicated with gurgling or not, or with meteorism in different degrees, has been observed in not less than 131 cases, consequently 52,4 % of the whole; in 49,4 % of the men, and 60,2 % of the women. This symptom was never seen in cases below 15 or above 45 years. At the other ages it was found in 53,1 % of the patients between 15—25 years, 55,8 % of those between 25—35, and 64 % of those between 35—45.

To this group of symptoms ought also to be added the state of the spleen, but the notes made of its enlargement or non-enlargement are not sufficiently complete to be given.

5. Symptoms from the skin.

Age.	The skin				Eruptions.						Temperature (centigrade thermometer).										Bed-sores.		Parotitis.	
	hot and dry.		perspiring without crisis.		Petechiæ.		Taches lenticulaires.		Sudamina.		40°		39°		38°		37°		36°					
	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.
10—15	7	3	—	1	1	1	4	2	—	—	2	1	1	3	3	1	—	—	—	—	—	—	—	—
15—25	82	27	9	8	18	8	51	21	1	—	9	6	28	14	23	12	14	3	16	1	1	2	1	—
25—35	57	18	9	2	17	2	34	11	—	—	9	2	19	6	19	15	7	3	5	1	—	—	—	1
35—45	14	7	2	2	2	2	11	6	—	—	2	3	7	3	3	2	2	2	1	—	2	1	1	—
45—55	1	—	—	—	—	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—
55—65	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—
Total	162	55	20	13	38	13	101	40	1	—	22	12	56	26	49	30	23	8	22	2	3	3	2	1
	217.		33.		51.		141.		1.		34.		82.		79.		31.		24.		6.		3.	
	250.				192.						250.													

The skin has been *hot and dry* in 217 out of the 250 cases, thus in 86,8 %; in 89,0 % of the males and 80,8 % of the females. I understand by the expression »hot and dry» the increased degrees of temperature, which are also arranged in the table, in conjunction with a certain dryness and roughness. Increased temperature with dryness and roughness of the skin, more or less sensible to the touch, is consequently as a rule a peculiar symptom of the typhus fever-process, though belonging only to its latter stage, as during the first the skin often enough preserves its natural temperature, softness and smothness; but the farther the disease advances, the more evident become these morbid changes. Sometimes, however, we observe them already from the beginning. Less frequent are the cases in which the patients, from the beginning and during the whole progress of the malady, have an increased temperature of the skin, which is nevertheless moist and perspiring; this moisture or perspiration continues sometimes equal during the whole day, it commonly increases during the night or towards morning. There have only been 33 such cases, that is 13,2 %; 10,9 % of the men, 19,1 % of the women.

The eruptions on the skin have been ranged in three different classes: petechiæ, taches lenticulaires and sudamina. The two former being considered only as characterizing the two forms of the typhus-process, viz. the petechial and abdominal or typhoid, I will consider them more closely. In 192 cases out of 250 these eruptions have occurred, or in 76,8 %. They have not appeared in 58 cases, consequently in 23,2 % of the whole number.

The cases in which there has been an eruption are to those, in which there has been none, as 192 : 58, or in percentage as 76,4 : 23,2. As it has been mentioned in the introduction, that the two eruptions may occur simultaneously in the same person, and also succeed each other, the cases have in the table been classed according as the one or the other form was most prominent. In reference to the cases, in which no eruption has taken place, nor any trace of a preceding one has been discovered, during the residence of the patient at the hospital, I must acknowledge the possibility of their existence, and disappearance without leaving any trace before the entrance of the patient; but it is not the less true, that the typhus process in its two before mentioned forms, may go through its whole course without the appearance of any eruption whatever during any of its stages. I am perfectly convinced of this fact, as well from the nature of the other symptoms, as from facts gathered at dissections.

Petechial eruption has occurred in 51 cases, or 20,4 % of the whole; the sexes have been nearly in the same degree liable, as shown by 20,8 % of the men, 19,1 % of the women. The different liability of the different ages is of small amount, the maximum being 22,0 % of those between 25—35, the minimum 16,0 % of those between 35—45, the two above 45, as not having had this kind of eruption, not being taken into the account.

The typhoid eruption, or the so called taches lenticulaires, was seen in 141 cases, or 56,4 %; in 55,4 % of the men, and in 58,8 % of the women. With the

exception of the only one between 45—55, we find in respect to age, the maximum liability to this kind of eruption between 35—45 years, 68 %; the minimum between 25—35 years, 52,3 % of the whole.

If we admit that each of these two eruptions should characterize one of the forms of typhus, the former typhus petechialis, the latter typhus abdominalis, the relation between those two ought to show the relation in frequency between the two forms; thus the frequency of typhus cases should be to the frequency of typhoid cases as 51 : 141, or in round numbers as 50 : 140, or as 5 : 14. But, as both forms may exist without any eruption, such a calculation becomes less exact, the more so as one or other of the eruptions, during certain epidemic conditions, may be more prevalent, and thus the result of the calculation at one time be totally different from that at another.

Sudamina was seen but once. It is true that this form of eruption here in the north, at least according to my experience, is rather uncommon; but not to such a degree, as one case out of 250 would show. It must either have been some neglect in taking the notes, or the effect of a mere accident, that among the observed cases during these months sudamina occurred but once.

The temperature of the skin has been subject to observations in every case. The observations have been made in the armpit, and with a sensible centigrade thermometer. The number of degrees put down indicates the heat of the skin at the acme of the disease, the mean being taken of 3 sometimes 4 days; the observations were made at 5—7 o'clock p. m. To avoid unne-

cessary tediousness the degrees are given only in integers. The highest number of degrees observed in the axilla was 40°, the lowest 36°. The greatest part of the patients (82), had 39°; (24) being the smallest number, had only 36°. In percentage we find 13,6 % having the temperature of 40°; 32,8 % of 39°; 31,8 % of 38°; 12,4 % of 37°; and 9,6 % of 36°. The temperature of the skin according to the numbers obtained from observations in 250 cases, gives as follows: the greatest number having 39° and so decreasing to 38°, 40°, 37° and 36°. In respect to the sexes, the percentage of women has been greater in the higher temperature of 40°, 39° and 38°, the number of men, again, more numerous in the lower of 37° and 36°. It seems, therefore, to follow that the women in typhus are more liable to an increased temperature of the skin than the men. The largest difference is at 38°, when 26,9 % of the whole number are men, 44,1 % women.

Decubitus has only been observed in 6 cases. In those sloughing ulcerations occurred; the milder forms of redness, excoriations and but superficial ulcerations have not been noted down.

Only 3 cases of *Parotitis* have occurred. Swelling of parotis gland and infiltration of the surrounding cellular tissue is rarely seen in this northern climate; still I cannot consider the proportion of 3 out of 250 as a rule; in certain years, however, I have seen it twice or three times as great or even greater.

A gap in the exposition of the principal symptoms has been unavoidable, by the circumstance, that, at the time when the histories of these cases were noted down, I did not fix necessary attention to the state of the

urine, especially its containing chlorates during the different stages of the disease. I am to some extent able to fill up this gap by means of later observations, but these observations being gathered from other cases, than those on which I have founded my calculations, I think I ought to exclude them, intending in the future to return to the subject, when I have completed some researches respecting the changes of the composition of the urine in certain diseases.

§ 17. A knowledge of the duration of the typhus process from the beginning of the disease until the beginning of the convalescence, both the prodrome and convalescence stages being omitted, the period in question including only the two stages proper to the disease, viz. the stages of irritation and depression, is also of very great importance. The same cases, which have served as materials for the above calculations respecting the principal symptoms, have also been used for the following respecting the duration. With a view to determine exactly the beginning of the disease, every case has been chosen in a way to ensure the greatest possible certainty, only such being taken, in which we could rely on the information given by the patient himself or by his friends. The setting in of the disease has been counted from the first shivering fit, in the absence of which, I have counted from the day, when the increasing weakness obliged the patient to go to bed.

Out of the above mentioned 250 cases, 225 have recovered and 25 died; it is of the former or those who recovered I shall now speak, respecting the duration of the disease.

THE DAY ON WHICH CONVALESCENCE COMMENCED.

Age.	9:th.		10:th.		11:th.		12:th.		13:th.		14:th.		15:th.		16:th.		17:th.		18:th.		19:th.		20:th.		21:st.		After 21:st.	
	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.
10—15	—	—	1	—	1	—	—	—	—	—	—	—	1	—	1	2	—	1	—	—	—	1	—	—	1	—	2	—
15—25	2	1	2	—	1	1	2	1	7	1	5	2	13	2	10	1	10	3	13	3	6	3	2	2	3	3	11	10
25—35	—	—	—	—	1	—	4	—	2	1	4	1	7	2	8	1	2	1	8	—	4	3	5	3	3	2	10	4
35—45	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1	1	—	1	2	—	1	—	2	1	—	3	2	2
55—65	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	2	1	3	—	4	1	6	1	9	2	9	3	22	4	20	5	12	6	23	3	11	7	9	6	7	8	25	16
	3.		3.		5.		7.		11.		12.		26.		25.		18.		26.		18.		15.		15.		41.	

Men 162. Women 63.

Total 225.

As a general result and consequently as a rule to be gained from this table, we may state that convalescence begins only after the 14:th day, as it seems to be a mere exception when it commences before that day. The number of cases where convalescence commenced after the 14:th day is 184, or 81,7 % of the whole, before that day only 41, or 18,2 % of the whole. Convalescence on the 9:th day, or rather at its end, was seen only in 3 cases, or 1,3 %. Thus recovery beginning on this day is very uncommon and takes place only in cases of the petechial typhus form; I can not remember to have seen it in those of the abdominal. The same number of cases as on the 9:th day we find also on the 10:th; and the same remark is applicable also to these latter cases. It is worthy of observation, that all 6, which showed a beginning to recovery on these days, were below 25 years of age, and that there were 5 men and but one woman.

Convalescence beginning on the 11:th day occurred in 5 cases, or 2,2 % of the whole number. It is also uncommon for an abdominal case to enter convalescence on that day; should it happen oftener, it must be in consequence of epidemical causes, particularly when a petechial typhus epidemic begins to change into the abdominal form, that is, in the intermediary or transition cases.

On the 12:th day 7 cases commenced recovery; on the 13:th, 11; and on the 14:th, 12; or in percentage of the whole 3,1 % on the 12:th, 4,8 % on the 13:th, 5,3 % on the 14:th. From the 9:th and 10:th is on each day observed a slow and gradual increase in

the numbers of patients entering convalescence all along until the 14:th; after which and on the 15:th, the number is all at once more than double that of the preceding day. From the 9:th until the 14:th, 33 men have entered convalescence, consequently 20,3 %; but only 8 women, or 12,6 %, which clearly establishes the fact, that the men show a considerably greater disposition to commence convalescence on these days than the women. As to age, it seems worthy of remark, that none of those between 35—45 years, have begun to recover before the 15:th day, which, however, was the case with the only patient between 55—65; 18,1 % of the patients at the age between 10—15, commenced convalescence before the 15:th day; between 15—25 years 20,8 %, and between 25—35 years 17,1 %; the inclination to enter convalescence before the 15:th day seems, consequently, nearly equal at the ages from 10 to 35 years.

A commencement of convalescence on the 15:th day, took place in 26 cases, or 14,5 %; 22 men and 4 women, or 13,5 % of the men and 6,3 % of the women. From this day onwards to the 21:st, the number of convalescent patients varies between 26 and 15 on each day; the whole number amount to 143, consequently 68 % of the whole. As on the preceding 6 days only 41, or 18,2 %, commenced convalescence, it is evident how much greater the disposition of typhus patients is for convalescence after the 14:th day, than on or before it. The inclination to convalescence on any of the 7 days from the 15:th to 22:nd, is about the same in both sexes, as shown by 64,1 % of the men, and 61,9 % of the women. In the different ages the inclination for com-

mencing convalescence on the days between the 14:th and 22:nd, seems, with the exception of the only case between 55—65, the greatest at the age between 35—45 years, as 76,4 % of that age began to recover during these days, the other ages showing only from 61 % to 64 %.

After 21 days 41 patients began to recover, or 18,2 % of the whole number of the recovered; of these 25 men, or 15,4 %; and 16 women, or 25,3 %; the women being thus distinguished by a greater inclination for convalescence after that day.

The final result will be, that from the 9:th day until the 15:th 18,2 % have commenced convalescence; from the 15:th to the 22:nd, 63,5 %, and after the 21:st day 18,2 %.

§ 18. As an appendix and supplement to the preceding § may be added an exposition of the cases in which he convalescence commenced by crisis or lysis.

CONVALESCENCE COMMENCED BY CRISIS OR BY LYSIS.

Age.	Crisis.						Lysis.	
	Perspiration.		Sleep.		Other crises.			
	m.	w.	m.	w.	m.	w.	m.	w.
10—15	—	—	4	2	1 (epistaxis)		2	2
15—25	15	3	17	3	1 (diarrhea)		54	27
25—35	10	1	7	6	—	—	41	11
35—45	—	—	1	—	—	—	8	8
55—65	—	—	1	—	—	—	—	—
Total	25	4	30	11	2	—	105	48
	29.		41.		2.		153.	
	225.							

My experience shows, that when typhus prevails as epidemic, crises oftener occur than when it is sporadic. The petechial form is marked by a far greater proclivity to promote crisis, than the abdominal. Certain epidemics are also distinguished by a special inclination to promote a certain kind of crises, in preference to others. It may be said of the cases in question, that, being gathered at a period, marked by only a tendency to epidemic, not by a more general outbreak, they form, if I may so express myself, a mixture of epidemic and non epidemic forms, possessing consequently both epidemic and sporadic qualities. It is from this cause that no certain results can be inferred from them, respecting the relative number of the different modes of crisis in purely epidemic or sporadic cases. It is also very remarkable, that among all the 225 recovered cases, in no one the crisis should have taken place by means of increased secretion of urine, a mode of crisis, which I have not unfrequently seen occur during more decided epidemics.

Of the 225 cases the recovery has been caused by means of crisis in 72, or 32 %. 57 of these have been males and 15 females; 35,1 % of the former and 23,8 % of the latter, which numbers give evidence of a greater disposition to crisis in the male sex. Referring to ages, we find a very large disproportion so, namely, that, with the exception of the only case between 55—65 years, the age between 10—15 has 7 cases of crisis out of 11 patients, or 63,6 %, and that between 35—45 has only 1 case in 17, or 5,8 %; the age between 15—25 years has 39 cases of crisis in 120 recovered,

or 32,5 %; that between 25—35 years, 24 cases in 76, or 31,5 %. It appears as if the power of nature to promote crisis decreases with the age, being greatest at the age between 10—15 years, smallest between 35—45 years.

Crisis by means of perspiration has occurred in 29 cases; 25 men and 4 women; consequently 12,4 % of the whole number, and 15,4 % of the men, 6,3 % of the women. There was no case below 15 or above 35 years, in which this kind of crisis took place; it appertained exclusively to the age between 15—35. The two decennaries between 15—35 give almost the same number, the one between 15—25, 15 % that between 25—35 14,4 %.

In 41 cases sleep seems to have had a critical influence. It is true, that to the critical sleep a more or less increased secretion of the skin has often been allied; but cases were also seen, in which such was not the case, the skin after sleep only losing its high temperature, dryness and roughness, decided marks that the sleep indicated commencing convalescence. Of the 41 cases 30 were men, 11 women. Of the whole number 18,2 % have had critical sleep; 25 % of the men, 17,4 % of the women; the male cases being as in the preceding mode of crisis, more numerous. Excepting the only case between 55—65 years, the age between 10—15 showed the greatest disposition to this kind of crisis with 54,5 % of the recovered; the smallest again occurs at the age 35—45 with only 5,8 %. It has been about the same in the two decennaries between 15—35, 16,6 % in the former, 17,1 % in the latter.

Of other kinds of crisis, 2 only have been remarked; in one case the recovery commenced after a copious bleeding from the nose, in another after a violent sero-bilious diarrhea.

Under the head *lysis* have been arranged those cases, in which recovery took place gradually without any sudden transition. We count here not less than 153 cases, or 68 % of the whole number of those who recovered. Of these 105 are men, 48 women; 64,8 % of the men recovered, and 76,1 % of the women. As the man has a greater disposition to recover by means of crisis, so the woman oftener recovers by lysis.

As a further illustration of the relative occurrence of the different kinds of crisis during an epidemic, it will certainly not be without interest, to refer to the conclusions in this respect, which we may draw from the history of the epidemic, mentioned above in the introduction (page 8). This epidemic, which in a barrack containing 250 men, during 6 weeks attacked 64 persons, of whom 62 recovered and 2 died, I have more nearly described in »A summary account of the clinic instruction, and treatment of the sick in the wards for internal diseases, at the Royal Seraphim Hospital, in the year 1842.» In the 62 cases which recovered were observed the following decided kinds of crisis:

Day from the beginning of the disease.	Sleep.	Sleep and perspiration.	Sleep and urine.	Sleep, perspiration and urine.	Perspiration.	Perspiration and urine.	Urine.	Total.
9	5	—	—	—	—	1	—	6
10	—	1	1	—	—	—	—	2
11	1	2	1	—	4	—	3	11
12	—	1	—	—	—	—	—	1
13	—	1	—	1	—	1	—	3
14	—	—	—	—	3	1	2	6
Total	6	5	2	1	7	3	5	29

29.

When only 2 died of 64 patients, we may suppose, that the epidemic with respect to the result of the cases was one of the milder, although the disease itself showed great intensity; of this, the histories of the cases recorded in the above mentioned »Account» give evident proofs. This epidemic is also remarkable for an uncommon inclination to promote crises, when 29, or 46,7 %, almost the half of the whole number, recovered by their means. The relation of the different kinds of crisis to each other is also worthy of attention, sleep alone or in connection with perspiration or increased secretion of urine, taking place in 14 cases; perspiration alone or in conjunction with increased urine in 10 cases, and increased secretion of urine alone in 5 cases. In respect to the day on which crisis occurred we find from the table that no crisis took place after the 14:th day, but on all the preceding days from the 9:th until the 14:th. On the 11:th the number was greatest, on the 12:th smallest.

The days on which the crises took place in the above mentioned 225 cases, will be noticed lower down, for the sake of comparison.

In noticing the properties of the crises during this epidemic it has not been my intention to assert, that these properties are always similar in other epidemics. I have on the contrary said above, that they vary much during the course of different epidemics, and perhaps one epidemic is never found to resemble another exactly in this respect.

§ 19. I shall now observe the days, on which the crises took place in the 225 cases in question:

CRISIS BY MEANS OF PERSPIRATION.

Age.	Day from the beginning of the disease.																			
	10:th.		11:th.		12:th.		13:th.		14:th.		15:th.		16:th.		17:th.		18:th.		19:th.		20:th.	
	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.
15—25	—	—	3	1	6	—	4	1	1	—	—	—	—	—	—	—	1	—	—	—	—	1
25—35	2	—	1	—	1	—	2	—	3	—	—	—	1	—	—	1	—	—	—	—	—	—
Total	2	—	4	1	7	—	6	1	4	—	—	—	1	—	—	1	1	—	—	—	—	1
	29.																			

In the first place we must observe that no crisis of this kind occurred on the 15:th and 19:th or after the 20:th day. The greatest number we find on the 12:th and 13:th, 7 cases on each, or 14 together, being nearly the half of the whole. Next in number comes the 11:th and 14:th having 5 on the former and 4 on the latter day; 2 occurred on the 10:th and 4 after the 14:th. Thus the greatest disposition to crisis by means of perspiration is found from the 10:th until the 14:th day, from which day it becomes more rare.

Crisis by means of sleep.

Age.	Day from the beginning of the disease.																									
	9:th.		10:th.		11:th.		12:th.		13:th.		14:th.		15:th.		16:th.		17:th.		18:th.		19:th.		20:th.		After the 21:st.	
	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.
10—15	—	—	1	—	—	—	1	—	—	—	—	—	—	2	—	—	—	—	—	—	1	—	—	—	1	—
15—25	2	—	—	—	2	1	1	—	2	1	2	1	2	—	3	—	2	—	1	—	—	—	—	—	—	—
25—35	—	—	—	—	1	1	—	1	1	—	3	1	—	—	—	—	2	1	—	1	—	—	—	1	—	—
35—65	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—		—
Total	3	—	1	—	3	2	2	1	3	1	6	2	2	2	3	—	4	1	1	1	1	—	—	1	1	—

41.

Sleep of a critical nature has consequently taken place every day from the 9:th until the 20:th and in one case after the 21:st. The greatest number of this kind is found on the 14:th day; the half of the whole number from the 9:th to the 13:th inclusive. The 14:th day comes after the 17:th in number, having the same as the 11:th or 5. The 14:th, 17:th and 11:th have consequently been particularly critical days in this respect.

The only case of crisis by bleeding from the nose occurred on the 14:th day; the case with critical diarrhea on the 9:th.

If we compare these results with what was stated in the preceding § of the crises during a limited epidemic, it is remarkable that during the epidemic no crisis took place after the 14:th day, while in the last mentioned not less than 21 or 29,1 % of the whole number of crises occurred, which fact would go far to show that the crises in the epidemic forms occur earlier than in the sporadic.

Other comparisons, for which these tables may be used, are so easily made, that they are left to the reader's own observation.

§ 20. Finally it remains to give an account of the cases that ended fatally. Of the 250 patients, 25 died, or 10 %. Of these 20 were men and 5 women, which makes 10,9 % of the men and 7,3 % of the women.

With regard to age (§ 16) none below 15 years died; the only patient between 45—55 died, but the only one between 55—65 recovered. Of the other ages the mortality is greatest in that between 35—45, with 32 %

died; smallest at 15—25 with only 4,7 %; the age between 25—35 gives 11,6 % of deaths. The mortality consequently increased with the age, if we except the only case between 55—65 years.

Some information of interest may be furnished by an exposition of the days on which death took place, counted from the beginning of the disease.

DAY OF DEATH, FROM THE BEGINNING OF THE DISEASE.

Age.	6—10.		10—15.		15—20.		20—25.		After 25.	
	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.
15—25	—	1	2	—	1	—	1	—	—	1
25—35	2	—	4	—	1	1	1	1	—	—
35—45	4	—	2	—	1	1	—	—	—	—
45—55	1	—	—	—	—	—	—	—	—	—
Total	7	1	8	—	3	2	2	1	—	1
	8.		8.		5.		3.		1.	

No one died before the 6:th day, but from that to the 10:th we find 8, and from the 10:th to the 15:th also 8 dead, consequently before the 15:th day 64 % of the whole number. After the 15:th day the mortality decreases, 5 having died between the 15:th and 20:th day, 3 between the 20:th and 25:th, and only one after the last mentioned day. One woman died before the 15:th day, and 15 men, whence it appears that the women resist the malady longer than the men.

It may be said, as instances of the day on which death took place, counted from the entrance of the patient at the hospital and not from the beginning of the disease, that 10 died between the 1:st and 5:th day from their entrance, 7 between the 5:th and 10:th, 6

between the 10:th and 15:th, and 2 between the 15:th and 20:th.

§ 21. All the bodies were dissected. The principal changes peculiar to the typhus process, which were found, are best illustrated by the following table:

MORBID APPEARANCES.

Age.	Congested state of the brain and its membranes.		Pneumonia.		Enlarged spleen.		Swollen intestinal glands.		Intestinal ulcers.		Fluid blood in the cavities of the heart.		Coagulated blood and fibrin in the cavities of the heart.	
	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.	m.	w.
15—25	—	—	1	1	1	—	2	1	—	1	2	1	1	—
25—35	6	—	1	—	4	1	4	1	2	1	5	1	1	—
35—45	2	—	3	—	4	—	3	—	1	1	2	—	3	—
45—55	—	—	—	—	—	—	1	—	—	—	1	—	—	1
Total	8	—	5	1	9	1	10	2	3	3	10	2	5	1

A congested state of the brain and of its membranes has occurred in 8 cases, or 32 % of the whole

of those who died. They were all males. In subdivision 1 of § 16, 4 men are stated to have had delirium furibundum; all these died and 4 others, who had during life less intense symptoms of congestion to the brain. As no woman showed after death any marks of a similar congestion, we may suppose that the women are less disposed to this symptom than the men. Under the head »Congested state of the brain and its membranes», such cases only are placed, in which this congestion was more evidently developed, in conjunction or not with oedema meningum, increased quantity of fluid in the ventricles of the brain, or on the basis cranii. In none of the examined cases was there within the skull any trace discoverable of products of inflammation.

Pneumonia was found in 6 cases; 5 of which were men, 1 woman: consequently in 24 % of the whole; in 25 % of the men and 20 % of the women who had died. In § 16, subdivision 3, there are said to have been 11 cases of pneumonia out of the 250 patients. Of these 11 cases 6 were fatal, the percentage of mortality of the typhus cases complicated with pneumonia being consequently 54,5. 3 of the 6 had lobular pneumonia, of the form which occurs during the first and in the beginning of the second stage of the disease; the remainder the lobular variety, which is peculiar to the latter period of the second stage, when the ulcerations of the intestines are more extensively spread; the female case belonged to this last class. The first form of pneumonia belongs more especially to typhus petechialis, the second to typhus abdominalis. But the latter may also be developed in cases of typhus petechialis, where

there has been an intense capillary catarrh during the first stage, or when sloughing ulcerations or more extensive parotitis or matter has been generated in other parts. The age between 35—45 seems to be particularly disposed to pneumonia, 3 out of 8 or 37,5 % of this age being affected.

Enlarged spleen has been observed in 10 cases or 40 % of those who died; 9 men and 1 woman. Nothing has been said above about the state of the spleen amongst the symptoms, because the enlargement of the spleen, to a greater or less extent, being a symptom, with but few exceptions, seldom wanting in a typhus case, especially during its first stage, no detailed account of it has been given. During the second stage this swelling begins to subside, and if this stage is protracted, the swelling is superseded by its reverse, or contraction, that is diminished bulk, not seldom to a degree far from the natural volume. As a rule the enlargement of the spleen is connected with the softening of its substance as also in most cases with a change of colour. The 10 cases of enlarged spleen here mentioned, have thus died in the last half of the first stage, or in the beginning of the second. The men died earlier than the women, which accounts for the more common occurrence of this change in the former than in the latter. Half the number of those who died, as well at the age between 25—35 as 35—45 years, showed this enlargement of the spleen.

Under the head »*swollen intestinal glands*» cases have been placed, in which at the dissection the peyer glands of ileum were more or less swollen and infiltrated, either

entirely devoid of ulcerations, or having only a few of a more superficial nature. Such cases were found to the number of 12, or 48 % of the deceased; in 10 men and 2 women, consequently 50 % of the men, and 40 % of the women.

The head »*intestinal ulcers*» comprises the cases, in which the glands were found ulcerated in several or few places, the ulcers being either arrested by the muscular coat, or having penetrated deeper. Such an occurrence had taken place in 6 cases, that is 24 %, in 3 men or 15 % of the men, and in 3 women or 60 % of the women.

If we add these cases of intestinal ulcers to those of swollen glands, the whole number of cases, in which the intestinal glands have been morbidly altered is 18, or 72 % of the deceased. This affection was found in all the women that died, but only in 13 men out of 20, which would imply that the women have much greater inclination for the intestinal affection in typhus than the men.

In seven of the fatal cases there was no affection of the glands; 7 in 25 makes 28 %. If we adopt the opinion, that the affection of the intestinal glands forms a mark of distinction between typhus petechialis and abdominalis, an opinion, which, as already stated in the introduction, I do not perfectly approve, and if the results of the dissections were applied to the recovered, supposing the mortality in both forms to be equal, the relation of typhus petechialis to typhus abdominalis in 250 cases would be as 7 : 18. 70 ought consequently to have had typhus petechialis and 180 typhus abdo-

minalis, a calculation, whose correctness I am not able to control. In § 16, subdivision 5, are noted 51 cases with typhus eruption, and 141 with that of the typhoid, and thus, in accordance with this approximative calculation, 19 cases of typhus petechialis should have been without the petechial eruption and 39 cases of typhus abdominalis without that of typhoid.

Applying the same approximative calculation to the whole number of typhus patients, with whom the calculations in the first part of this chapter are made, viz. 3,186, we find that of these, 892 ought to have been cases of typhus petechialis, and 2,294 of typhus abdominalis.

In no one of the 6 cases of intestinal ulcers has perforation occurred. Intestinal ulcers terminating in this way are very seldom seen at the Seraphim hospital, by far less commonly, than abroad, to judge from the authors who have given statements respecting other countries. The cause of this, I am inclined to believe, is the simple treatment adopted, especially the avoiding of the purgative mode of treatment, so highly commended by the latest French authors.

A special column has not been given to the swelling of the mesenterical glands because, in the cases, in which swelling or ulceration of the glands of peyer in ileum exists, these glands are, generally, more or less swollen also.

These cases, in which the blood in the heart, especially in its left half, was fluid, without the formation of any coagula, are placed under the head »*Fluid blood*

in the cavities of the heart.» There are 12 such cases. In 7 other cases, which have not been classed under any separate head, the blood in the right cavities was partly coaguluted in clots, partly fluid; these clots consisted either of blood alone, or with a small admixture of a yellowish trembling jelly, of a consistency like the white of an egg.

The remaining 6 cases have been classed under the head »*Coagulated blood and fibrin.*» In these there were, besides coagulated blood, clots of fibrin, sometimes of a looser, sometimes of a firmer consistency. These same cases will also be found under the head *pneumonia*, the fibrin of the blood, after the development of an inflammation of the lungs, retrieving in part its power to coagulate separately, a power, which it, under the influence of the typhus process, has entirely lost.

I have perhaps dwelt too long upon, and given too much space, to these statistical tables and calculations. I hope however the indulgent reader will excuse this prolixity, which I have considered necessary in order to give such a view of the state of the typhus fevers in the north, as would serve in comparing them with those in other countries of Europe, should any one think it worth while to make such a comparison. I cannot venture to assert that the results, to which I have arrived, are infallible, as calculations, founded upon a still longer period and a greater number of cases, might possibly fall out differently; but this I can say, that they are as near the truth as it was possible to come with the materials, that were at my disposal.

CHAPTER III.

TREATMENT.

§ 1. The general principle, which I have tried to follow in the treatment of the different forms of the typhus process, has been to allow the »vis medicatrix naturæ» to act as freely as possible. In those cases only, where this healing power of nature appeared insufficient and consequently in need of help, I have considered it right to prescribe a more or less active treatment. The treatment I have followed has, therefore, not been in conformity with any special method before decided, unless we should apply this term to the expectative proceeding in those cases, in which the power of nature was deemed sufficient to accomplish a happy result, and where consequently no active treatment was resorted to. The treatment has been directed against the most prominent of the symptoms, and in treating these, such means have been employed, as experience and scientific combination have shown to be indicated. Such a symptomatic treatment does not prevent us from treating at the same time the alleged primitive effects of the morbid process. In most cases both these courses may be easily adopted.

The primitive cause of the typhus process, as far as it is accessible to our understanding, seems to be a peculiar change in the blood. The chemical characters of this change are: diminished proportion of fibrin and increased proportion of several inorganic salts especially carbonate of soda. This change in the blood is caused by the introduction into the system of some foreign matter, sometimes a miasm, sometimes a contagion, sometimes a decided poison (putrid water, putrid food). It is this foreign matter, introduced by means of the respiratory or digestive act (by the reception into the stomach of putrid water or food), that alters the blood in its chemical composition and vital power. We apply consequently the term zymotic to diseases generated in the said way. But a certain quantity of this foreign matter appears to be necessary for the development of the typhus process, the quantity required being probably different in different individuals, according to their different receptivity, it being often seen, that of several persons, exposed to the same noxious influences, some are not affected at all, some only in a small degree, while in others the disease is completely developed. In one the disease assumes the form of typhus petechialis, in another of typhus abdominalis, in still other cases it takes an intermediate form between these two extremes. The fever process with all its different phases, in whatever form they occur, is a manifestation of the endeavors of the system, to render innocuous or to throw off the foreign and noxious matter received into the body. The symptoms of this struggle, may vary very much; they are sometimes localized on the surface of the body

in the form of characteristic eruptions, sometimes in the intestinal glands, in different degrees of development; sometimes the action of the brain becomes affected, causing a more or less violent delirium, or only a more or less deep stupor; at other times the mucous membrane of the air tubes or the substance of the lungs are affected, sometimes free from affection &c. &c.

Whether these different manifestations depend on a different quality, different composition or different quantity of the miasm, of the contagion or of the poisons, or only on different individual disposition, it is and will remain, I believe, impossible for our investigations to explain. The difference of these manifestations, that is the origin of the different varieties of the typhus process, evidently appears often to depend on individual constitution, as it is not seldom found, that among persons living under the same influences, the strong and robust constitutions are most commonly attacked with the petechial form, whereas the weak and delicate generally have the abdominal form. The typhus process, once fairly established within the system, must pass through its given periods; no treatment, I believe, has as yet been discovered by which it can be shortened. The so called abortive cases form an exception to this rule. These cases occur when an epidemic is rife and in such a way that persons, exposed to the continued influence of the miasm or contagion, have all the symptoms, which mark a commencing typhus fever, but which, being suddenly arrested, never becomes fully developed. This curious fact can only be explained by the supposition that the power of resistance in the system in these per-

sons has been strong enough to eleminate the noxious matter in some way or other, without the aid of a complete pathological process.

From this summary exposition of the opinion entertained of the nature of the typhus process, the views with regard to its treatment are easily deduced. Thus as long as the symptoms, generated by the endeavors of the system to throw off the noxious matter, keep within certain limits, the treatment ought to be more or less expectant; but as soon as these limits are in one way or other surpassed, the treatment must be more active, that is, the general plan of treatment must be expectative and symptomatic.

§ 2. The following general indications for treatment, may be put down and deduced from the above:

a. Remove all such causes, by whose influence the typhus process is generated and all such conditions, which experience teaches might promote its malignancy. Hence all the hygienic prescriptions, change of abode, strict attention to ventilation and to cleanliness &c. &c., to which we shall return in another place.

b. Counteract the assumed primitive cause of the disease, the altered state of the blood, so that it may be kept within the limits, necessary to render the preservation of life possible.

c. Act upon those symptoms, from whatever organ they may proceed, which are developed with such intensity, as to require a special attention, and which may not be comprised under the preceding indication.

d. Promote convalescence, when once commenced, to which it also belongs to treat the sequelæ, and endeavor as far as possible to prevent their development.

The special indications in the choice of each of the different remedies or of each special method of treatment, when, under certain conditions, the one or the other is applicable cannot be separated from the observations on the special remedies and will therefore be determined when they are treated of.

§ 3. In the preceding chapter when treating of the statistics of the most important symptoms (§ 16:th and following), I have examined several of the most important, their connexion and their signification. The object of this treatise not being to give a complete nosography of the typhus process, but chiefly to treat of the therapeutics, I will pass over the symptomatology of these forms of fever, supposing every physician to be familiar with it. I think, however, I must give a short account of the different stages, through which the disease passes, not because my observations on these stages, differ in any way from what so many other authors have stated but because they are very often to be referred to in the following pages. In the two forms of typhus mentioned above, the stages agree perfectly as regards the succession of the general symptoms; their duration may, however, be somewhat different.

In reference to the time of incubation, that is to say, the period which intervenes between the reception by the system of the noxious matter and the development of the first premonitory signs, or when these do

not appear, of developed disease, I have little to say with certainty. In order to decide the length of this period, I have endeavored to be guided by inquiries whether the patients had visited other typhus sick, and then reckoned the time of incubation from this visit. The few cases, in which I have succeeded in getting such information, have not enabled me to come to any conclusions. One day, sometimes two or three, nay ten days, might intervene between the visit and the commencement of the prodroms. In a few rare cases I saw weariness and general uneasiness follow within a few hours after such a visit. In short, I do not feel justified from my own experience in fixing a mean duration of the period of incubation.

1. *Stadium prodromorum.* This stage is, according to my experience, very seldom wanting, but its duration varies much. The patients, who had not this stage, state, that, while feeling perfectly well, they were suddenly attacked with a violent shivering fit, a vertigo or faintness, immediately succeeded by high fever. This happens either during more severe epidemics or from the influence of an intense contagion.

The length of this stage might be from 1 to 4, nay 12 days. 1 to 4 or 5 days is most common. The longest duration of the premonitory stage, I ever saw, was 12 days.

The symptoms, which occur during the premonitory stage, are not characteristic of typhus, if no epidemic prevails on the contrary; that being the case, the feeling of languor and weariness, the heaviness in the head, associated or not with glimmering before the eyes, pain

in the back and legs, feeling of general uneasiness and drowsiness, either failing, or not unfrequently increased appetite, with uneasy sensations after the patient has taken food, might be considered, with more or less probability, as' announcing that the sufferer has within him the seed of a speedily approaching typhus. The same premonitory symptoms are seen also in sporadic typhus, but may be perfectly similar in several other diseases, especially in agues, the prodroms and beginning of which, during more severe epidemics, often show a perplexing resemblance to typhus. The nearer the disease approaches its outbreak, the more distinct become the symptoms, until the attack takes place either by means of a more or less severe shivering fit, or by a succession of several fits. These rigors may however not unfrequently be wanting, and the patient experiences vertigo instead, faintness or a feeling of giddiness, which obliges him to lie down. Sometimes there is no clearly marked transition, but the weariness and weakness increase by degrees associated with heaviness and pain in the head and fever is superadded.

2. *Stadium irritationis*, is counted from the above mentioned outbreak, and is consequently the *first stage* of the disease. As a rule its duration is 7 days; rarely only 5; more uncommonly it is seen to continue until the 9:th day. General symptoms, which mark this stage are: continued fever with erethic character, sometimes bordering on inflammation; congestive character of the local affections, either of the brain and its membranes, or of the mucous membranes of the air tubes or intestinal canal; eruption of petechiæ or taches lenticulaires;

the eruption accompanied sometimes by an increase of the above symptom, sometimes without any change.

3. *Stadium depressionis.* This stage lasts from 4 to 7, nay till 14 days, that is to say, until the 11:th, 14:th or 21:st day from the setting in of the disease. It most commonly lasts till the 14:th day, especially when the typhus is sporadic; during epidemics I often saw that the 11:th day was the limit of this stage. If it passes the 14:th, it may terminate on each of the intervening days until the 21:st, in rare cases it may be prolonged over that day. It may be said, that in typhus petechialis this stage is in general shorter than in typhus abdominalis, the former running through it in from 11 to 14 days, the latter commonly in this stage passing that day. The symptoms, in general characterizing this stage, are prostration of strength and sinking power of reaction. The action of the brain is debilitated to a deep stupor, or into delirium mite or mussitans, while the patient lies on his back more or less indifferent to what takes place; the fever assumes a torpid character the reverse of the former erethic; the local affections change their character of congestion into passive stasis, tending to emollition; the se- and ex-cretions are decomposed, so that the alvine excretions become putrid stinking, the urine often alkalic, the air expired cadaverous, &c. &c.

4. *Stadium convalescentiæ.* Sometimes when crisis has taken place, this stage possesses a very decided limit, beginning immediately from this event. It is more common though, that no such decided limit exists, but the amelioration is effected per lysin. The petechial form

shows a greater tendency to crisis than the abdominal. The length of this stage cannot be decided, depending as it does, on how low the strength is sunk and whether sequelæ in one form or other are present. The beginning of this stage is announced by a marked decrease of the fever, a more free action of the brain, an increase in strength; the patient recovers the perception of his own state, which often causes him to consider himself worse than during the preceding disease; the desire for food comes back and all the functions return by degrees to their natural state.

§ 4. Before passing to the details of the special treatment, I ought to state, that this treatment is the result of 20 years practice at the hospital. My private practice has also confirmed it. The above mentioned 3,186 cases do not entirely come under my own experience, as my colleague at the hospital, Prof. *Malmsten*, has treated about the fourth part of this number. But the views of Prof. *Malmsten* and myself respecting the treatment of the typhus fevers, agree in the main point and so far that the results we obtain, are quite similar. Thus the experience of one completes that of the other.* As the physicians of Sweden, all get their clinical instruction at the Seraphim hospital, and consequently witness during their studies the results of the treatment there employed, a result of this has been, that all those, who have completed their studies during the last 15 years,

* I must gratefully acknowledge, having received from Prof. *Malmsten* many important contributions and much information respecting the special treatment.

have adopted and in general followed this plan of treatment; in consequence of which, it is extensively spread in our country, and in several places many times confirmed.

It is not my intention to give here an account of, and still less to censure, the many methods lately proposed of treating typhus. I have tried a great part of them, but not obtaining any more satisfactory results, I have not thought it worth while to abandon the one I have adopted. From these experiments I have, however, learnt much, and come to the conviction, that there is no therapeutic method exclusively applicable to typhus, but that we must arrange our indications in accordance with the most prominent of the symptoms, and that we in the choice of our remedies are perhaps as often obliged to relinquish the strict method, as we are able to follow it. Eclecticism is therefore the only way, according to my experience, that we can or ought to follow. It is possible, nay probable, that certain methods or certain proceedings may suit in one locality better than in another, that that which does harm in one place, may possibly be of use in another, especially during a state of epidemy, and possibly also in different people or different classes of people. It is therefore I have said above, and now repeat, that my experience is exclusively gained in the north, in the metropolis of Sweden: my statements are applicable to that locality. Whether they are applicable out of Sweden I dare not decide; I have, however, some reason to suppose them to be so on the ground, that, when all the essential features of the disease in the north agree with the accounts of those in

the southern climates, a conformity in the effects obtained form the remedies, as well in one place as in the other, may also be found.

§ 5. Treatment of stadium prodromorum.

Within hospital practice this stage can only be subjected to treatment in those cases, when so called nosocomical fever is generated. This nosocomical fever is, according to my experience, nothing but typhus, sometimes petechialis, sometimes abdominalis; it has been seen once or twice within the Seraphim hospital during those years when epidemics have prevailed. When the rooms have for a considerable period been filled with typhus patients, a contagion is generated, which communicates to the servants, the students who attend the lectures, and to those, who have entered the hospital with other diseases. These nosocomical fevers have never been extensively spread within the hospital, and have soon subsided in consequence of proper measures having been employed.

In accordance with the above stated opinion, that the typhus process is not by any means to be cut short, it follows, that our endeavors at treatment of the premonitory stage can only be intended to answer the question: whether there is any treatment of this stage, by which we may succeed in mitigating the symptoms of the subsequent stages, and thus give the disease a milder, and consequently a less dangerous nature?

My experience is not extensive enough to give a decided and satisfactory answer to this question. The remedies and prescriptions I have used are as follows:

1. *An emetic of Ipecacuanha.* When the tongue is coated with a yellow grayish fur, the taste bitter, and epigastrium tense, the patient experiences much relief from an emetic; the head feels less heavy and the tension at the epigastrium is lessened. In most cases I have thought, the irritative symptoms of the first stage became milder afterwards, than in those cases, where under the same conditions, no emetic was given. I have found emetics to be contraindicated, when the tongue was clean and red, and where signs of congestion to the head existed. If an emetic be administered during that state, the tongue is flayed the epigastrium becomes tender and the symptoms from the head grow worse; I believe also that the irritation during the first stage is increased. Emetics must also be avoided in case of a copious epistaxis or tendency to this affection. Emetics may accordingly have both their indications and contra-indications. I have many times observed, that, when seemingly indicated they have proved to be ineffectual, and the decision difficult, whether their administration was beneficial or not.

2. *Cathartics.* Experience tells me, that purges of all kinds can most commonly do harm and only be of service exceptionally. They are indicated by a severe headache, a feeling of giddiness and determination of the blood to the head, in robust persons especially in case of preexisting constipation. Under other circumstances contraindicated, purges may, if employed, cause great loss of strength, or diarrhea continuing even after the disease has fairly set in. In the cases where I considered a purge useful, I have prescribed in mild cases Castor-

oil, in severer Glaubers salt, a teaspoonful every other hour until it acted. When there was constipation and tension of the abdomen and purges not indicated, I have been in the habit of using a simple clyster.

3. *Blood-letting.* General bleedings I consider decidedly injurious, as causing loss of strength, which certainly way to some extent mitigate the symptoms during the stage of irritation, but increases the depression during the second stage and retards convalescence. The only vay of bleeding that I have found useful consisted in the application of 2 or 3 cupping glasses to the back of the neck, in cases of marked signs of congestion to the head. The weight and pain in the head were hence diminished for the time, and the symptoms from the brain were often milder during the following stage. I have seen, not so seldom, patients, who, before their entrance into the hospital, have been bled during the prodrom stage, either die or have the stage of depression unusually severe and the convalescence uncommonly protracted.

4. *Diet.* As soon as I had reason to fear premonitory symptoms of typhus, I have thought it right immediately to forbid all substantial food, though the patient's appetite was good, and only allow light soups, milk and wheaten bread. People of the lower classes very often when sick, force themselves to eat, from the belief that they will not be sick if they eat, and that they, on the contrary, will be so if they do not eat. Such as have overloaded their stomachs until the outbreak of the disease, generally have much severer symp-

toms during the stage of irritation, than those, who have for some days before the attack taken little or no food.

5. *Hygienic measures.* Within a hospital I consider it a very important regulation, that a patient, who shows marks of having received the contagion, immediately changes the room, where he got it, as the longer the contagion continues to act, the more probable it is, that the developed morbid process will be more intense. Such a patient must therefore, if possible, be placed in another room, where there are no signs of the presence of the contagion, and change bed clothes. This principle should also be employed in private practice; which is very easy among the more wealthy, generally impossible among the poor. As a means of desinfection I would recommend a solution of chlorate of zinc, from a half to a whole drachm in a libra of distilled water, to sprinkle about the room, and the bed and bed-clothes. This solution must be used at least 2 or 3 times a day.

§ 6. Treatment of the first stage of the disease, or the stage of irritation.

1.

Evacuantia.

a. *Emetic of Ipecacuanha.* On the 1:st, 2:nd or at most 3:rd day from the setting in of the disease, Ipecacuanha in full dosis can to a limited extent be indicated. In most cases this remedy has appeared to me to be injurious; its administration requires therefore circumspection. It is indicated when the stomach is overloaded; that is to say, the patient has taken food immediately before the illness, the tongue is furred and

the epigastrium tense, and when the disease begins with symptoms of a bronchial catarrh. An emetic is decidedly injurious in cases where the tongue, either on the edges or all over, is bright red, the papillæ swollen, and any inclination to dryness is perceived; in case epigastrium or the coecal region is very tender on pressure, as well as when there are signs of preexisting severe disease of the stomach, for instance an ulcus ventriculi. Also in congestion to the head or tendency to delirium. Given under the last mentioned conditions, the strength sinks, the state of irritation in the mucous membrane of the stomach and the intestinal tube is increased, the general state becomes much worse. On the other hand if it is given, when indicated, as stated above, the patient feels relieved, the symptoms of irritation in the stomach, intestinal tube and mucous membrane of the bronchii is diminished, any existing diarrhea is also mitigated, and the disease upon the whole seems to assume a milder decursus, than we in the beginning could have anticipated. The use of emetics after the third day, I consider almost always detrimental.

b. *Cathartics.* The so termed purgative method in treating typhus, I have tried, but found no favorable results. The use of purges I only saw indicated during the first three days of this stage, and then only in the presence of a considerable congestion to the brain together with a more or less violent delirium. The symptoms from the brain are often very soon and to a great extent reduced in such a case, the patient becomes more calm, without any aggravation of gastric symptoms. I have chosen the purge in accordance with the state of

the tongue. If bright red, with tendency or not to dryness, castor-oil is given in a full dose or a teaspoonful every other hour until it acts. If the tongue is coated with a yellow grayish fur the breath stinking, the abdomen tense, and the patient has a robust constitution, Calomel grx was given at once, and if it did not act within 2 or 3 hours, a tablespoon of castor-oil. Should the patient, presenting a similar state, be of a weaker constitution, Sulphate of soda, a teaspoonful every other hour until it acted, was prescribed. In cases, where no congestion to the brain exists, I consider cathartics contraindicated; if nevertheless prescribed they increase the preexisting inclination to, or may generate, a diarrhea, and very much reduce the strength of the patient.

The use of enemata is nearly connected with that of the purges. If, notwithstanding a purge has been given, the congestion to the brain still remains, a simple enema to which either oleum lini, or if this should not have the desired effect ætheroleum terebinthini 3ij—iij, is added, has often been of great advantage in obtaining the object, viz. in mitigating the congestion to the brain and the delirium. In cases, in which no cathartic may be used, when the patient is constipated and we find from percussion colon descendens containing fæcal matter, a common aperient enema must be administered; the consequent evacuation will afford the patient relief in many respects.

c. *Blood-letting.* My experience entirely condemns the use of general bleeding. I have given it a fair trial when there was a strong determination to the brain with marks of impending exsudation and violent delirium, as

in capillary bronchitis and congestion to the substance of the lungs, but have never seen the effect correspond to my expectations. On the contrary the strength of the patient sinks rapidly after the use of the lancet; the tendency to exsudation from the membranes of the brain, or to paralysis of the brain, seems to increase rather than diminish; the congestion to the bronchii and lungs is lessened immediately after the bleeding, but soon returns, often in a severer form. Although I thus condemn the use of venesections, I will not assert, that they may not be useful under certain epidemic conditions, of which, however, I have had in this respect no experience. These epidemic conditions seem to exist when typhus occurs in a cerebral form or as the so called meningitis epidemica. Such cases, I have only seen as sporadic.

The topical bleedings are on the other hand oftener indicated, and prove useful and beneficial. They are effected either by means of cupping or leeches, the former appeared to me preferable. They must not be prescribed after the 4:th or at latest 5:th day from the beginning of the disease: a later application does not act against the symptom for which it was intended; it may rather be injurious, by causing prostration of strength. Topical bleeding is indicated:

1:o. In congestion to the head, when the face is red and suffused, selerotica injected and the patient is either violent and delirious, or lies more or less prostrated in a kind of lethargic state with closed eyelids, 3 or 4 cupping-glasses should be applied to the back of the neck. It is a favorable sign, when the pulse,

which before was tense and full, becomes, after the cupping, weaker and more compressible.

2:o. In a congested state of the spinal marrow; announced by convulsive or tetanic fits and tenderness on pressure of one or more of the vertebræ, or only severe pain between the shoulders or at the lower part of the back. 4 cupping-glasses, 2 on each side of the tender part of the spine, will often soon and effectually produce an abatement of these symptoms, especially if succeeded by the application of the cold water compresses.

3:o. In capillary bronchial catarrh with sibilant rattle and difficulty of breathing and a somewhat hard pulse. If cupping with 4—6 glasses is here applied on the chest, the breathing will be more free the rattle in the bronchii often mucous, the pulse becomes weaker and the symptoms in the chest often mitigated through the whole course of the disease.

The same is the case in congestion to the substance of the lungs. This affection may often be cut short in its very beginning, by the immediate application of cupping to the part corresponding to the congested place, and be prevented from going on to fully developed pneumonia.

4:o. In considerable tension and tenderness on pressure of the regio ileo-coecalis. Such a state, during the first days of the disease, announces a stronger determination of blood, than in ordinary cases, to the lower part of ileum, and consequently the danger of more extensive ulcerations. Cupping with 2—4 glasses or if the tenderness, which sometimes happens, should be so great, as to forbid their application, 8 to 12 leeches on the same

place considerably diminish the congestion, and evidently lessen the danger of a too extensively spread ulcerative process. After the 5:th day I do not think such a blood-letting indicated, as a general rule: exceptional cases however may occur, in which it may be employed later.

From what I have just stated it follows, that the use of evacuantia is not so often required, and is rather to be considered as an exception, and also that it must always be prescribed with discernment, in order not to injure the patient by its untimely employment, by spending his strength, and thus causing the stage of depression to be much severer, than it otherwise would have been.

2.

DERIVANTIA.

1. *Application of ice to the head.* In general there is no remedy, which so much abates the congestion to the head during this stage as the application of ice, whether the patient suffer at the same time from delirium or not; this application is made by means of ice put into a bladder or in an indian-rubber bag. In all cases, where there are no signs of congestion to the head it is not in its place, but strongly contraindicated. Most patients, in whom this application is indicated, experience from its use such relief, that they like to have the ice on their heads; others cannot bear it, seem to become more restless, and try to get rid of it. In such cases I have considered it right to follow the instinct of the sick; when therefore a patient, who was still conscious, expressed or showed uneasiness, the ap-

plication was instantly removed. If the patient is violent and delirious, and endeavors to get the ice away, we must nevertheless try to keep it on, as I have seen such violently delirious patients, become more calm from the use of the ice, and again begin to be violent, when it had fallen off; in such instances it is necessary to keep the bladder on for at least 5 or 6 hours together. It may be considered as a rule that the ice should be kept on uninterruptedly, but I allow the feelings of the sick to decide this also, as it sometimes happens that patients, who are perfectly conscious, seem to feel better, when the ice is now and then taken away and again replaced, than by keeping it on continually. This application continues to be indicated by the above mentioned condition, during almost the whole of this stage, but as soon as the face begins to collapse and becomes less flushed, delirium is followed by stupor and the pulse becomes weak and frequent, it must immediately be taken away; if continued after this period it acts injuriously. I never saw this application contraindicated, either by a capillary bronchial catarrh or congestion to the substance of the lungs or a commencing pneumonia. The application of ice to other parts of the body will be noticed in another place, under the treatment of some special symptoms.

2. *Mustard-poultices or hot embrocations of turpentine.* Their effect is very similar, the latter having the advantage of a more continued application as they do not raise blisters as the former do, if kept a longer time on the same place. The former are chiefly used on the extremities as a derivative from the head; their

efficacy in cases of congestion has not appeared to me to be very great; excepting in the way of adjuvantia to the before mentioned cupping on the back of the neck and application of ice, when they may be of some use. In cases, again, especially towards evening and during the night, of a slight delirium independent of congestion to the brain, but purely nervous, and where neither ice nor cupping is applicable, in such cases mustard-poultices on the calves, inside the thighs, on the neck or back, are often beneficial and calming. Fomentations with turpentine are most useful on the abdomen and chest. In the former case against the tension in the intestines, meteorism, tenderness on pressure, and to counteract the diarrhea. In the latter in bronchial catarrh, beginning congestion to the substance of the lungs or irritation on the pleuræ.

3. *Blisters*, whereever employed, are, as a rule, to be condemned. In one case only I consider blisters indicated, having seen good results from their use. When, in an existing congestion to the head united with delirium or not, the patient begins to squint, or is with difficulty able to raise either of the eyelids or the pupils become much dilated, either in a similar or different degree, in a word, on symptoms of impending or commencing exsudation on the basis cranii, a blister ought to be applied to the back of the neck and be kept in a state of as profuse suppuration as possible. It will not always answer the purpose, but it is much, if it sometimes contributes to a happy result under such unfavorable circumstances. A blister applied at a wrong time to the neck does harm by disturbing the patient,

increasing the delirium and pain, and has besides a great inclination to slough. In the above mentioned state cauterium actuale has been applied to the neck; I have tried this once or twice, but find blisters act more derivating on account of the copious suppuration, which takes place almost immediately after the application.

4. *Heating cold water compresses.* My experience of these compresses is in the highest degree favorable and I do not hesitate to assert that it is one of the most important remedies in treating abdominal typhus. These compresses must, however, be properly applied to have the desired effect; improperly managed, they may prove injurious, nay dangerous. In the beginning of my practice I was in the habit of employing poultices; I have for some years entirely abandoned these, and use now exclusively the cold water compresses. The use of these on the abdomen, I venture to assert, is indicated in every case of typhus abdominalis. They lessen the tension and the gurgling in the intestines, they remove the tenderness on pressure especially if, when considerable, a mustard-poultice or fomentation with turpentine, has been applied first. They counteract the inclination to meteorism, lessen the diarrhea, and prevent, I believe, the ulcerations in the ileum from spreading too much; perforations of the intestines have at least been of much rarer occurrence, since I commenced to use these compresses, than they formerly were. I now always prescribe them immediately on beginning the treatment of a case of typhus abdominalis. They may be administered in two ways: in both the compress is soaked in water of $+15^0$ to $+12^0$ nay $+8^0$ Celsius, is well

wrung, and applied so as to cover the whole abdomen, and is changed 2 to 3 times a day, according to its tendency to dry, as it must then be replaced, and also if the patient should feel chilly. One mode of application consists in laying over the whole abdomen a 4- to 8-double compress of coarse linen, which is afterwards covered with oiled silk or indian rubber stuff, in order to prevent a too rapid evaporation; or the drying of the compress. According to the other method a coarse sheet is folded lengthwise to a breadth that will cover the abdomen; a sufficiently large part is then dipped in water, wrung and applied to the abdomen, the remaining dry part, is taken round the body and thus again covering the abdomen, is fastened as tight as possible. At the changes a new compress must always be had in readiness to be put on immediately. The compress applied according to the former method dries more slowly than the other. In the one case it is only necessary to change twice a day, in the latter 3 or 4 times. It is very important to observe that the compresses fit as closely as possible, and are not displaced by the patient's changing position; if this is not the case the air enters, cold instead of heat is produced, which may act very injuriously. Their manner of acting consists in generating a moist heat which increases the action of the skin and they thus act derivatively from the internal parts. They must therefore be replaced as soon as dry, but may remain untouched as long as moist and warm. Their efficacy is invigorated by sponging the abdomen slightly with water of the above temperature, when they are changed. The use of these com-

presses is continued not only during the whole of this stage, but also, as I shall observe in another place, during the next.

More limited is the employment of these compresses in typhus petechialis, the abdominal symptoms being in that form less common; but they are useful even in this complaint, when the abdomen is tense, and especially when epigastrium is tense and tender on pressure. I have also thought that the symptoms from the brain have been mitigated, that is to say, they acted derivatively on the congestion to the brain I never saw them contraindicated by the eruption, except when the petechiæ were of a bluish hue and ecchymotic, the strength being in almost every such case so prostrated, that the compresses do not generate the heat necessary for their beneficial action. Such a state of the petechiæ is, however, seldom seen during this stage.

These heating compresses may further be employed on the chest. In case of capillary catarrh and pneumonia, with or without irritation of the pleuræ, they generally act very well, had the symptoms even been severe enough to make a topical bleeding necessary. Mustard-poultice or embrocations with turpentine may be used first. The application on the chest is done in the same way as above described while speaking of the use of the sheet to the abdomen, with this difference only, that so much of the sheet is soaked as will cover the whole thorax extending in breadth from the axilla down to the basis of the thorax. This application, however, as it must be drawn tight to prevent the air from entering, embarrasses the breathing, and is therefore

difficult for some to bear. If not tightly drawn it will cause a disagreeable feeling of chilliness; in which case it is not beneficial. I have followed the wish of the patient in such cases, and have never prescribed it, where he seemed in any way to suffer from its use. Where tolerated, it must be changed 2 to 3 times daily.

In reference to the cold affusions I may state, that I have only now and then tried their efficacy, but not found it satisfactory, for which reason I cannot recommend them by my own experience. Gentle cold ablutions of the legs made from above downwards, and repeated a few times daily, I found lessen congestion to the brain and consequent delirium.

I have tried several means proposed, as spongings with aqua chlori, or vinegar and water, &c. &c. but have now entirely abandoned them, not finding the benefit correspond to the disadvantage of often disturbing the patient.

3.

Mineral acids.

If the primitive cause of the typhus process is an alteration in the component parts of the blood, preceded by the reception of some foreign substance within itself, one of the principal objects of the treatment must be, to endeavor to restore it to its natural state. The chemical characters of this alteration have been above given in accordance with the confirmed statements of other authors, viz. diminished fibrin and increased carbonated salts, especially soda. Numerous physiological experiments have shown, that in animals, which have for a long time been submitted to the use of alkalis, the blood has

become destitute of fibrin and rich in carbonated alkalis. On the other hand it has also been shown by means of experiments, that the blood of animals to which mineral acids have during a certain period been administered, has become rich in fibrin but almost destitute of carbonated alkalis. These two remedies have consequently a contrary effect on the chemical composition of the blood. The blood during the typhus process having a similar chemical composition with that of animals, which have for a longer period taken alkalis, and this composition of the blood in the animals changing to its reverse by the administration of acids, the conclusion may be formed as a truth, that acids given to typhus patients may concur in restoring the blood of these patients to a more natural state. Acids must, therefore, on the ground of the above stated physiological experiments, be considered rationally indicated against the primitive cause of the typhus process. But long ago, even several centuries before these experiments were made, experience had confirmed the use of acids in treating typhus. Experience and theory perfectly agree therefore in this respect.

As to the manner in which the acids produce this alteration of the blood, but little is at present known. A portion of the acid is probably already in the stomach combined with the carbonated alkalis and earths it there meets and is changed into salts, another portion passes as free acid into the blood, where it decomposes the excess of the carbonated alkalis, and forms with these new salt combinations. As it is just the excess of the carbonated alkalis, that keeps the fibrin in a state

of solution, or perhaps more correctly prevents the albumen from transforming itself or passing into fibrin, this state must be lessened and cease to exist in the same degree as the excess of the carbonated alkalis is diminished. The objection may be raised, that if a free acid is received into the blood, the albumen of the blood must be coagulated, and a more serious evil produced, than the one we intended to cure. But here also physiological experiments come to our help, when we learn that, on injecting diluted acids, such as are given for medical use mixed with one or other vehicle, into the veins, the blood does not coagulate, which is effected only by concentrated acids, and of these a greater quantity is necessary. But if we on chemical grounds should not be able to admit, that any part of the acid in a free state passes into the blood, but that it immediately, as soon as in contact with the protein corpuscles in the stomach and intestinal tube, forms with these new combinations, these combinations, or at least the most important of them, viz. that with the albumin, is soluble, and becomes again decomposed by the carbonates of the blood, as soon as they come in contact. The acid either in a free or combined state received into the blood, acts upon the carbonated alkalis, sets a part of the carbonic acid free and forms new salt combinations, which no longer keep the fibrin in a state of solution, or prevent its formation, which is exactly the object aimed at in the treatment of typhus.

1. *Acidum Phosphoricum.* The phosphoric acid is the mildest of all the mineral acids employed in medicine and approaches in some respects the vegetable acids.

Its use may be continued longer than that of other acids, without acting injuriously on the digestive power. Received into the blood, either free or in combination with albumin, it must according to chemical laws of affinity form salt with the soda and potash. Respecting its effect on the system during several chronic diseases, I have endeavored to collect a very extensive experience: this experience induces me to believe that the phosphoric acid, besides the effect of acids in general, possesses something more, a stimulating, and if I may so express myself, a regulating influence on the central parts of the nervous system. This power it must receive from its base, phosphor namely, in the same way as muriatic acid retains the special power of chlorine, and more evidently still the jodic acid of jodine, and arsenic acid of arsenic. In the treatment of typhus fevers, I admit that the phosphoric acid acts partly as an acid, partly from its containing phosphor. If even some important objections may be raised against this last view, I can nevertheless not give up my experience, according to which, I place this acid in the first and most eminent rank of all the remedies I have tried in treating typhus fever, especially on account of the general benefit and the few contra-indications with which it may be administered.

The physicians of France and England seem very seldom to make use of this acid in treating typhus. In Germany its use is often spoken of, in Sweden it is at present the remedy, which the physicians most commonly employ. Swedish experience certainly does not weigh much in the balance of science, I think however that in this matter it merits being tried as well by the phy-

sicians of France in treating typhus abdominalis, as by those of England in the treatment of typhus petechialis.

During the first stage of typhus, occurring either in abdominal, petechial or an intermediate form, the phosphoric acid is indicated; its use is excluded by other acids only under certain conditions, which will be stated below. The indications for its employment are the symptoms, which characterize the typhus process in general. No symptom from the gastric organs contraindicates its use, although some additions may be required in certain instances. The tongue may be furred or clean, it may be bright red, its epithelium peeled off or its aspect natural; the abdomen and epigastrium may be tense or not, tender or indolent; there may be diarrhea or constipation; it is of service in all these different states. It is only in bleedings from the intestinal tube that it has shown too little power, especially when they are somewhat copious. Neither is it contraindicated by the common catarrh, amongst the symptoms from the respiratory organs, as long as it has its place in the larger bronchii; but as soon as it becomes capillary, the phosphoric acid being then no more admissible, indications for other remedies begin, as will be stated below. The same may be said in cases of pneumonia. With regard to the state of the pulse, the phosphoric acid appears to be less powerful than the muriatic acid, as long as the pulse continues high, full and more or less tense; but in cases, where the pulse has become, or was from the beginning weak and small, it is thoroughly indicated. Congestion to the brain and delirium furibundum no more contraindicate the use of this acid than do undis-

turbed intelligence, drowsiness or stupor; should however the congestion be considerable and the delirium very violent other means, which will be afterwards noticed, must be prefered. Nor does the state of the skin offer any contraindication; it may be dry and hot, soft and perspiring, it may be the seat of eruptions or not. Is, however, the petechial eruption of a bluish hue and ecchymotic, the sulphuric acid, of which more below, is to be prefered.

From what has now been said it is evident how extensively the phosphoric acid may be used, cases, where it can be given, being the rule, where not, the exceptions. I will, however, not assert, that its employment alone, if alone administered, caused the happy result, when it took place, but I consider it to have concurred, and to have contributed in rendering the course of the disease milder, than it otherwise would have been.

The Phosphoric acid is given diluted and prepared according to the prescription of the Swedish Pharmacopoeia under the name of *Solutio acidi Phosphorici.* Ten grains of this solution contain 2½ grains, that is 25 % of the phosphoric acid, which is commonly called acidum phosphoricum glaciale. In consequence of the mode of preparation it is entirely free from metals and not contaminated with any other substances. The stated solution is used in doses of 10 to 15 minims every other hour, according to the following formula:

Rec. Solut. acidi Phosphor. ʒij—iij,
Decoct. Althææ ℥jv,
Syrup. Sacchar l. Althææ ℥ijj.
M. S. 1 table-spoonful to be taken every other hour.

2. *Acidum hydrochloricum.* I used the hydrochloric acid more in the beginning of the period accounted for, than I have done lately. The reason of this was, that I found the phosphoric acid much more suitable and applicable. I consider the hydrochloric acid to be indicated *when, in congestion to the brain, with or without delirium, the pulse is not only hard and full, but also more or less tense.* This takes place during the first 4 or 5 days. Under the use of the hydrochloric acid the pulse soon becomes lower and weaker, and with this change the phosphoric acid is indicated. I use, therefore, the hydrochloric acid only in exceptional cases, as a tense pulse is very seldom met with. Contraindications occur often and are: all cases of irritation in the bronchi, whether severe or not, and of congestion to the substance of the lungs, and if during its use a catarrh should be developed, which we very often see, its employment must immediately be suspended. It is also contraindicated when the tongue is red and devoid of epithelium, as it in such cases increases the tension in the epigastrium and causes inclination to meteorism. Bronchial catarrh, being of late oftener associated with the typhus process, has induced me to abstain from the use of hydrochloric acid, although the experience of all countries even from former times has attested its usefulness.

The hydrochloric acid prepared according to the Swedish Pharmacopoeia, has 1,19 sp. weight, and consequently contains 30 % hydrochloric acid gas, and is stronger than that of most other Pharmacopoeias. It is given in doses of 6 to 10 drops, according to the following receipt:

Rec. Acidi hydrochlorici ʒi—iℊ,
Decoct. Althææ ℥jv,
Syrup. Althææ,
Mucil. g:i arab. aa. ℥iß.
M. S. A table-spoonful every other hour.

In connection with the use of the hydrochloric acid, I must not omit to notice that of the aqueous solution of chlorine, whose chief power in the treatment of typhus seems to depend on the presence of hydrochloric and hypochloric acid, generated by the decomposition of water in the aqueous solution of chlorine. I have no favorable experience of this remedy, although it has been much praised in different places, as I saw its use during 2 or 3 days almost always cause such an irritation of the larynx and bronchii that I was obliged to leave it off. The use of this remedy does not seem to be attended with any beneficial effects in a northern climate.

3. *Acidum sulphuricum.* The sulphuric acid I seldom use during the first stage of the typhus fevers; it belongs rather to the second and third stages. If this acid is administered during the first stage, it will sometimes cause the tongue to become dry and raspy, the epigastrium tense, the intestines to be filled with gas, the breathing hurried with a feeling of oppression, and the pulse often more frequent. This does not happen always, but often enough to induce me to consider its use in general not indicated during this stage. In certain cases, again, the sulphuric acid is indicated and is then more powerful than the phosphoric acid. These cases are: 1:o. *In a bloody diarrhea,* or when the excretions are more or less mixed with blood. When this

takes place it announces that either the ulcerations in ileum are bleeding, or the congestion to the mucous membrane of the intestines is so strong that it causes rupture of the capillaries. In such cases the sulphuric acid acts more astringent than the other acids, and arrests the bleeding in most cases. Should the bleeding, notwithstanding this, continue or be so copious that pure blood, whether fluid or in clots, is excreted, we have indication for a special treatment which will be noticed farther on. 2. *When the urine contains blood*, that is, when the typhus congestion to the kidneys causes bleeding from their substance. 3. *In case of bleeding from the womb*, whether menstrual and too copious, or taking place between the periods and to an amount, which renders it necessary to arrest it. 4. *In epistaxis*, when from its frequent return or copiousness it must be arrested. 5. *In case the petechiæ should be ecchymotic*, and *sugillations*, with or without tendency to bleeding, occur under the epidermis, I have thought the sulphuric acid more powerful than the phosphoric in rendering the petechiæ of a lighter hue, and preventing the sugillations from spreading, bursting or bleeding. 6. *In profuse perspiration*. It is not seldom the case that typhus patients, especially in the abdominal form, even from the beginning of the disease, suffer from copious and clammy perspirations. These perspirations seem to weaken the patient much more than the diarrhea. For abating and arresting this symptom it has appeared to me, that more utility has been derived from the sulphuric than from any other acid.

The diluted acid, acidum sulphuricum dilutum, intended for medical use, has, according to the Pharmacopoeia, a sp. weight of 1,092, and contains 11,11 % of the distilled acid. Should we, in the cases mentioned above, expect a rapid effect, it must be given in a considerable dose, 15 to 20 drops every or every other hour. The formula used is this:

Rec. Acidi sulphur. dilut. ʒij—iij,
Decoct Althææ ℥iv,
Syrup Althææ
Mucilag. G:i arab. aa. ʒiß.
M. S. A tablespoon in water gruel every or every other hour.

We may also mix, as a beverage for the patient, ʒij—iij of Syrupus acidi sulphurici, to be drunk in 24 hours. I consider, however, this mode of administration less serviceable for several reasons.

Liquor acidus Halleri possesses the same power as the sulphuric acid; I believe, however, that it acts more powerfully in arresting bleedings from the nose and the womb. It is given in doses of 8—12 to 16 drops in a mucilaginous vehicle, every or every other hour.

I have no experience, respecting the use of other mineral acids. I have a few times tried nitric acid, but, finding it in most cases cause tension and heat in the epigastrium, as well as inclination to meteorism, I desisted from its use. The vegetable acids, as citric, acetic, tartaric, malic and carbonic acid, are less powerful in their effects than the mineral acids, wherefore I consider them alone not sufficient to fulfil the above indications for

acids, but to form excellent adjuvantia to the mineral-acids, if mixed with the drinks of the patient, to which subject I shall advert farther on.

4.

Treatment of special symptoms.

The principal symptoms, which may require special notice, above what has already been stated in this respect, proceed chiefly from the digestive and respiratory organs.

Of these may first be mentioned:

1. *Diarrhea.* I do not consider that a diarrhea during the first stage should be arrested, but abated and mitigated if too violent. If it is suddenly arrested by astringents, in whatever way applied, meteorism is produced and pains in the intestines, often vomitings and aggravated symptoms from the brain with increased fever. Should, on the other hand, the diarrhea be too copious, with more than three to four evacuations a day, or the quantity considerable, and of a watery consistency, it weakens the patient too rapidly, and the danger of the ulcerative process, spreading too extensively, is increased. In such a case the diarrhea must be cautiously abated. For this purpose mucilaginous drinks as rice-water, infusion of linseeds, decoction of althæa, saleb &c. &c. are used, but the first of all the remedies I have tried, is Ipecacuanha in small doses. This remedy given in small and repeated doses appears to retard the motus peristalticus, to mitigate the state of irritation in the ganglionic system, and thus to lessen the increased secretion from the intestinal mucous membrane. The dose

must be regulated so that no vomiting ensues; the feeling of nausea which sometimes follows after the first dose soon disappears with continued use. Ipecacuanha may in ordinary cases very properly be added to the phosphoric acid, and to the sulphuric acid, in cases, where the too copious excretions are mixed with blood. I never saw any inconvenience from the use of this remedy, but should ever a case occur in which the sensibility is so great, that the stomach cannot bear the smallest doses, we must desist. I may state, that in cases where there were preexisting nausea and vomiting, I saw the Ipecacuanha allay these symptoms, and in other respects act beneficially. Neither a dry, furred nor bright red tongue contraindicate its use; nor meteorism, in which state it is, on the contrary, to be recommended. Should there be no diarrhea, but a bronchial catarrh with troublesome cough and ropy mucus in the bronchi, the ipecacuanha is indicated; it appeases the irritation to cough, and seems to reduce the state of congestion, which exists in the mucous membrane of the bronchi.

The ipecacuanha is consequently chiefly to be prescribed in cases of typhus abdominalis, to counteract the then existing inclination to diarrhea, and in those of typhus petechialis which are complicated with bronchial affection. We may commence its use whenever we like, and continue throughout the whole of this stage. The following is the common formula:

Rec. Rad. Ipecacuanh. nuper pulv. grxv—3ℓ,
infund. per hor. dimid c. suff. quant.
aquæ bullient. ut f. colatur. ℥vj,

cui adde
Solut. acidi Phosphor. ʒiij,
Syrup. Althææ,
Mucilag. G:i arab. aa. ʒiß.
S. 1 tablespoonful every other hour.

Should the sulphuric acid in accordance with the indications stated above, be considered more in its place than the phosphoric acid, the formula is the same, with only the change of the acid. Should the diarrhea, notwithstanding these means, continue with copious excretions, enemata with starch, gum arabic or mucilaginous substances prove serviceable, especially in cases where there is an inclination to tenesmus; it may be repeated as often as required.

2. *Vomiting.* It happens in some cases of typhus abdominalis, that the tongue being either thickly furred or bright red, the epigastrium tense and tender, a very distressing vomiting returns at short intervals, which exhausts the strength of the patient. In conjunction with mustard poultices or fomentations with turpentine on the epigastrium, I have not found anything more efficient in allaying this symptom than ice, swallowed in small pieces, and the administration, now and then, of small quantities of carbonated water. This vomiting does not contraindicate the use of the phosphoric acid. The before mentioned heating cold water compresses must not be omitted in such cases, but should be replaced a little oftener than above stated.

3. *Bleeding from the intestinal tube.* At the end of the first stage it happens, sometimes, in severe cases of abdominal typhus, that blood partly fluid, partly in

clots, begins to be evacuated in large quantities per anum. This is a consequence of the separation of an eschar from some of the sloughing peyer glands, by which separation a larger or smaller vessel has been ruptured and bleeds. Such cases are certainly most commonly fatal, whatever course of treatment may be followed; I have however seen cases, in which recovery has taken place under these unfavorable conditions. Here is only one indicatio urgens, viz. to arrest the hæmorrhage, and, disregarding every thing else, one is obliged to act energetically and promptly. I found in these cases

Sugar of lead most serviceable, internally and in clysters. This remedy is given in doses of grij, every half hour, or even every quarter, afterwards with longer intervals, according to circumstances until the bleeding is arrested. It is best given dissolved:

Rec. Acet. plumbici chryst. grxxjv,
Solve in
Acid. acet. dilut. ʒj,
Aqu. destillatæ ℥vj.
S. A tablespoonful every half hour.

At the same time a clyster must be applied containing sugar of lead, with or without opium.

Rec. Acet. plumbici grx—xv,
Solve in
Aqu. destill. tepidæ ℥jv,
Adde
Tinct. opii gttxx—xxx.
S. Clyster.

Such a clyster may be repeated in 4 or 6 hours if required.

I have employed other means against intestinal hæmorrhages, but in later stages, as will be noticed in its place.

Besides the administration of the sugar of lead, pieces of ice must be swallowed repeatedly, as well as applied (in a bladder) to the abdomen.

4. *Bleeding from the nose* is sometimes so copious and obstinate, as to attract notice as a symptom, which may become, if not often fatal, always too severe a drain upon the strength of the patient, and should therefore be arrested as soon as possible. In conjunction with the above prescribed use of *Liquor acidus Halleri* in a dose of 10 to 15 drops repeated a few times every hour or every half hour, injections in the nose of water and vinegar, of an infusion of Salvia with vinegar, and cold compresses applied to the nose, are often sufficient. Should these means not stop it, I advise plugging of the nose, in order not to lose time with further trials.

5. *Bronchial catarrh.* As long as this affection has its place in the larger bronchi no special attention is necessary, as the treatment with the phosphoric acid, and infusion of ipecacuanha, is then sufficient. Yet as soon as it extends to the smaller air tubes, and is become more or less capillary, it demands a special treatment. I have before said that in such cases embrocations of turpentine and subsequent applications of the compresses are indicated. I never saw any remedy more powerful in preventing this affection from assuming a dangerous character, either by transition into pneumonia, or by stopping up the finer tubes in a greater or less degree, than

Aetheroleum terebinthinæ. If given in the form of emulsion this remedy neither irritates the stomach, the intestines, nor the vascular system. In cases only where the tongue is bright red and its epithelium peeled off, whether moist or dry, the turpentine is not easily borne by the stomach, as it causes vomiting or nausea, or a painful smarting and burning of the throat. I also found that it must be suspended in cases of stronger delirium with determination of the blood to the head, especially if the pulse is in any degree tense; we must at least change the smaller and often repeated doses to larger, as I will state below. It is also contraindicated by a bloody diarrhea. It may, however, be given in cases of simple diarrhea should the abdomen also be tense and tender, whether the tongue is dry or moist, the pulse slow or frequent, whether there is a slight delirium or stupor, whether the skin is dry and burning hot, or only warm, or soft and pliable.

During the use of the turpentine the irritation to cough is reduced, the mucous in the bronchi becomes loose, the catarrh is resolved, which again lessens the fever, the pulse becoming more full; the quantity of urine is increased and the skin loses somewhat both of its heat and dryness.

Before one has tried the turpentine under these conditions, it would seem, à priori, that being an æther-oleum it ought to act irritating as well on the mucous membrane of the stomach and intestines, as on the circulating and nervous system. Experience shows us the reverse, or if it acts irritating, this irritation must prove beneficial, as I never saw it do harm, where the contra-

indications stated above had been observed, but in a considerable number of cases it has acted advantageously, in the most marked manner. We must not, however, continue its use too long, not longer than indicated by the specific affection.

Turpentine is best given in the form of emulsion with the yolk of an egg; in this form it is best tolerated, and its unpleasant taste covered.

Rec. Aetherol. terebinth. depur. ℥ß,
Vitell. ovi unius,
Aqu. destill.,
Mellis aa. ℥ij.
M. f. l. a. emulsio.
S. A teaspoonful every other hour,

or should the honey be contraindicated by the presence of a severe diarrhea:

Rec. Aetherol. terebinth. ℥ß,
Vitell. ovi unius,
Mucilag. g:i arab. ℥iij,
Aqu. destill. ℥j.
M. f. l. a. emulsio.
S. A teaspoonful every other hour.

In cases, where its taste is too repugnant to the patient, it may be given in capsules, each containing 8 to 10 drops; 1 or 2 of these may be taken every other hour.

The turpentine is ordered either alone or alternating with the mixture of phosphoric acid (with or without Ipecacuanha) so that the patient in the latter case takes one hour turpentine the other phosphoric acid. As soon as the catarrh is entirely resolved the use of turpentine

must be discontinued, as it would otherwise sometimes irritate the mucous membrane of the stomach, announced by a more or less bright red tongue without epithelium.

6. *Pneumonia.* According to what has been stated above, I consider a topical blood-letting by cupping serviceable in the commencement of a determination of the blood to the substance of the lungs, whether preceded or not by a bronchial catarrh. This cupping must, however, be reserved for the severer cases, where the congestion takes places suddenly and is extensive. In milder cases it is not required. After the exudation, that is, when the hepatization is developed, I consider it contra-indicated. Whether cupping has been ordered or not, the cold water compresses, above mentioned, must immediately be applied round the chest, as soon as there is congestion to the lung. We must continue the use of these compresses, if even hepatization is formed, until perfect resolution. I may again repeat, what has been said above, that these compresses are the most important means in the treatment of as well the congestion as the developed pneumonia.

I recommend as strongly the use of turpentine in treating pneumonia of different degrees, as I above recommended it in the severer cases of bronchial catarrh. I had tried diverse remedies much recommended in such cases, as general blood-lettings, calomel, tartarus antimonialis, digitalis, sugar of lead, quinia, morphia &c. &c. but almost always with an unhappy result. But since I commenced the administration of turpentine the result has been so satisfactory, that some years only a third part, other years the half of those attacked with

pneumonia typhosa died. On the ground of this experience I must recommend this treatment to my colleagues: I feel convinced, that every one will adopt it as a rule if once tried. Besides I have a rather long experience of this treatment with turpentine, as I before said in the »account of the treatment within the hospital 1842», with respect to pneumonia typhosa, »that the use of the turpentine in certain cases of typhus fevers is one among the greatest steps forward, the medical art has made of late in the treatment of these forms of disease.»

As soon as a congestion to the substance of the lungs takes place under the first stage of the typhus process, or if it should not be subjected to treatment before hepatization is developed, I immediately order turpentine to be given in doses as stated above according to the formula. I then consider the pneumonia to be of such importance as to endanger the life of the patient, so that I think all possible contraindications must be disregarded. The only thing, that may forbid its use, is such a state of irritation of the mucous membrane of the stomach that it is not retained, or when it increases a preexisting diarrhea. In the former case I add 10 drops pro dosis aqua Laurocerasi to the turpentine emulsion; in the latter 10 to 15 drops vinum Ipecacuanhæ to each dose.

In most cases the congestion is prevented by the use of turpentine from passing into hepatization; should it however take place or if already formed before the commencement of the treatment, it is brought to resolution, often with a rapidity, that could not be anticipated

under such circumstances. We continue in either case the use of turpentine until resolution is complete, as also some time afterwards to prevent a relapse; it having not so seldom happened, that a premature discontinuance, has again aggravated the state of the patient. I may, however, add that I do not ascribe this happy result to the turpentine alone in all cases, but also to the cold water compresses; these two means should, therefore, as far as possible, always be employed simultaneously. How the turpentine acts in these cases I cannot venture to decide or explain. That it has a special action on the tissue of the lungs, I must suppose, because I have seen it act most beneficially in certain states of pneumonia without typhus.

7. *Pleuritis.* Either as a consequence of pneumonia or alone, pleuresy may occur now and then, with a rapid effusion. It seldom, however, alone causes a fatal termination, but the typhus, notwithstanding its presence, runs through the common decursus, and it then remains as one of the *sequelæ*, and will afterwards be treated among them. The best means of stopping its progress is the application of the cold water compresses on the side attacked, after the use of hot fomentations of turpentine. I have tried blisters, but saw no decided advantage from their use during the progress of the fever. I have no certain experience of any internal remedies, which could stop this exudation, but in the treatment I think only of the typhus process, after having applied the external means.

8. *Congestion to the brain,* when it occurs during the 3 or 4 first days and is violent, accompanied by

a delirium, more or less furibund, requires a special treatment.

Some rules have above, under the heads evacuantia and derivantia, been laid down for treating a congestion to the brain. In severe cases a purging dose of calomel, cupping in the neck, application of ice to the head, mustard-poultices on the extremities. I refer to that place respecting the indications of the use of these remedies; they are usually quite enough. Cases may, however, be seen where the delirium continues unabated together with a hard and tense pulse, notwithstanding these means have been employed. In these I was formerly in the habit of using calomel in doses of gr. v, 3 times a day, in order to produce and keep up a stronger derivation from the brain, by increased secretions of the liver, stomach and intestines; but I have given up this course on account of the great depression of strength, which followed. I have instead used, of late, tartarus antimonialis with more success. It was given in aqueous solution from ¼ to ½ grain every other hour. This remedy must not be administered longer than 2 to 3 days, the sign for leaving it off is when the pulse becomes more compressible and weaker, as the delirium at the same time abates, the mind of the patient becomes clearer and calmer, and the mineralacids indicated. Prof. *Malmsten* gives, in similar cases of congestion to the brain, a purge consisting of ʒij Ætherol. terebinthinæ and ℥i℈ Ol. olivarum to be taken at once.

Should, during existing congestion to the brain, symptoms arise, indicating that exudation has taken place, it must in general be allowed that every effort

of art is ineffectual, but a blister must nevertheless be applied to the back of the neck in milder cases, and to the shaved head in severer, as I have once or twice seen apparently hopeless cases recover by this means. Internally I usually prescribe Arnica, although I would not pretend to say that this remedy has any decided power to stop the exudation or promote the resorbtion; it is given in conjunction with the phosphoric acid according to the following formula:

Rec. Flor. Arnicæ ℥ij
infund. p. hor. ½ c. suffic. qvant.
aqvæ bullient ut f. colatur. ℨvj
Colat. adde:
Solut. acid. Phosphor. ℥iij
Syrup Althææ ℨij.
S. A table-spoonful every other hour.

5.

Dietetic and hygienic rules.

The dietetic rules during the first stage of a typhus fever are easily found, as the patient's instinct leads him to abstain from every kind of food. Art must follow this instinct by not forcing the patient to take food for which he feels repugnance, and from which he generally becomes worse. The patient is, however, so much the more pressing for a sufficiency of drink and for a change thereof. If the presence of diarrhea demands mucilaginous drinks, ricewater, soups of sago and saleb, water-gruel &c. &c. are useful; if not deemed necessary, then fresh and good water is the best thing we can give the patient. For a change we may take car-

bonated water (aqua carbonica), milk and water, half of each, water with some acid juice, or decoct of some acid fruit, according to the taste of the patient. I allow the patient to take as much as he likes of these drinks; the carbonic acid I never saw do harm, even in cases of flatulency or meteorism. They can also be used in cases of diarrhea mixed with any of the stated mucilaginous drinks.

I have made it a hygienic rule within the hospital, not to place the typhus patients in separate rooms, but 2 at most 3 in each room, (the rooms have each 8—12 beds and 800 to 1000 cubic feet of air for each patient), in company with other patients. My experience shows, that the greater the number of typhus patients placed together, the easier is a nosocomical miasm and its effect nosocomical fever generated; if the patients are spread this miasm is but seldom produced. Such a miasm was never generated, but when epidemics prevailed, and the reception of typhus patients was so considerable that space did not permit of their distribution in different rooms.

Attention to cleanliness, changes of bedclothes as often as possible, are, in summa, the other hygienic rules which must be observed.

§ 7. Treatment of the second stage, or stage of depression.

1.

As the character of this stage is chiefly marked by sinking strength and decreasing power of reaction, delirium mite or higher degree of stupor, frequent, very

weak and very small pulse, dry tongue with or without diarrhea, a dry and burning hot skin, tendency to passive stases, together with the indication to counteract the admitted primitive cause, the alteration of the blood, another new indication is added. viz. to sustain the strength and increase the power of reaction, that is, to counteract the tendency to paralysis, which exists within the central parts of the nervous system. In order to fulfil these indications we employ mineral acids, excitantia and tonica, and in special cases sedativa.

2.

Mineral acids.

1. *Acidum Phosphoricum* is as good in this stage as in the first. A great number of the typhus fevers, especially of the abdominal form, were, during their whole decursus, treated with this acid alone until convalescence commenced. There are in general no contra-indications against its use during this stage. It is however not always sufficient alone, but must, in cases which will be stated below, be added to other remedies, as it must also in certain circumstances be replaced by others, which have proved more efficacious. It is given in the same doses and form as stated above.

2. *Acidum Sulphuricum.* If during this stage the diarrhea is too copious, whether continued from the former or superadded during this stage, the sulphuric has the preference before the phosphoric acid, especially if the evacuations are mixed with blood and involuntary. In presence of other hæmorrhages, from whatever part they come, from the nose, uterus, kidneys

or the skin, the sulphuric acid, either pure or as Liquor acidus Halleri, is to be preferred. Such is also the case in the presence of continued clammy perspiration, which is both annoying and weakening to the patient. At the first sign of bedsores or sloughing this acid must be prescribed. The dose and form is the same as before stated.

3.

Excitantia.

The use of the exciting and stimulating remedies in the treatment of the typhus process is exclusively restricted to the stage of depression and the beginning of convalescence. Notwithstanding all that of late has been said from different places against the use of these remedies, I consider them, on the ground of my own experience, as very important and applicable, nay, it seems to me, in many cases, altogether necessary, if employed in accordance with accurately noted indications. The object of their application is to increase the active power of the nervous system and prevent it from sinking lower than is consistent with the preservation of life. Thus the general indication for their administration arises, when the strength is reduced, the stupor is become deep, the delirium has assumed the form of mite or mussitans, the pulse becomes weak and small, the first sound of the heart is shortened and weakened, and consequently the energy of the heart diminished, the tongue dry, the skin hot, dry and rough. Although the symptoms in these instances seem to proceed from the nervous system alone, we must not forget that the altered state of the blood still remains the same, and that also the indica-

tion is left to attend to this change, at the same time that we try to increase the nervous power. Of all the exciting remedies the first is:

1. *Camphora.* I pass in silence the views of those, who consider camphor as a cooling and depressing remedy, as I have never been able to observe such an effect, either as primary or secondary. I have only noticed its exciting and stimulating effect in a functional depression of the nervous system, especially of the brain when the energy of the heart is diminished, that is, its power of contraction weakened. It is exactly this state we find during the latter stage of the typhus process.

Indications for camphor are: depressio virium, stupor or delirium mite; dry tongue covered with crust; weak, small and easily compressible, or very weak and very small pulse, with frequency not surpassing 116—120; both sounds of the heart weak, the first, examined at the orificium aorticum, short, resembling or weaker than the second; the skin hot and dry. Some of these indications are of more importance than the others. Depressio virium with stupor or delirium mite must always in some degree be present; the tongue may on the contrary be moist and smooth, and camphor nevertheless be indicated on account of the other symptoms. The state of the pulse may vary, but must always be characterized by weakness smallness and compressibility; it must not be irregular and not more frequent than 116 to 120. To study the sounds of the heart, and especially its first sound, I consider to be very important and very useful in determining the use as well of camphor as of the other exciting remedies. The state of this sound is certainly closely connected

with that of the pulse, but I think the ear a more accurate observer of the strength of the heart, than the finger of that of the pulse. I have above (§ 16, 2) briefly noticed, that weak sounds are caused by a diminished energy of the contractions of the heart, that is to say, by weakness of its muscular tissue. The weakness of the muscular system in general being a sign of the general depressio virium, the weakness of the action of the heart, measured by the change of its sounds, is an accurate, nay the most accurate measure of the general depression, and indicates most exactly the use of excitantia. In cases where the sounds do not undergo any alteration these are neither indicated nor necessary. An instance of this may be taken from § 16, 2, just now cited, where it is stated, that of 250 patients 80 presented no change of the sounds of the heart; in these 80 cases no exciting remedies were indicated nor were any prescribed, but mineral acids were administered alone, in the way above stated, throughout the whole course of the disease.

Contraindications against the use of camphor, notwithstanding the indications already laid down may more or less clearly appear, are: congestion to the brain remaining from the first stage; this congestion, being passive, that is, stasis, may be increased by the camphor, a superirritation produced, and consequent paralysis of the brain. As soon as any marks of such a superirritation are discoverable during the use of camphor, it must immediately be suspended. When the tongue is flayed, bright red or has the colour of red sealing wax, camphor acts unfavorably; it causes tension of the

epigastrium, nausea, inclination to meteorism, very often increased diarrhea, and the patient becomes generally restless and agitated. In bleedings, from whatever part, camphor ought to be held contraindicated, or must be given with the utmost care; the bleeding is often increased, and it is only in special cases that it sometimes, in conjunction with sulphuric acid, may prove beneficial, for instance, in a diarrhea with a small admixture of blood. When the pulse has a frequency of above 116—120; camphor will then often cause the pulse to be more frequent and also irregular, the extremities to be chilly, the strength to sink still lower, in a word, the state of the patient to become aggravated. If during the use of camphor the frequency of the pulse is increased, without a corresponding increase of its fullness, we must immediately desist from its use. Camphor is contraindicated in all cases where the pulse is irregular and consequently the action of the heart irregular. In cases, where the skin is perspiring, and this perspiration does not possess the characters which belong to the critical kind, but is partial or clammy, of long continuance, I also saw camphor rather aggravate than ameliorate the state, whence I consider it contraindicated.

Camphor is best given in emulsion in doses of half or at most a grain, every or every other hour.

Rec. Camphor. depur. grviij,
Gummi arab. pulv. ʒj,
Emuls. amygdal. ℥viij.
E contrit. f. emuls.
S. 1—2 tablespoons every or every other hour.

Should it be deemed advisable to increase the action of the camphor, ʒj—ij æther spirituosus is either added to this emulsion, or the camphor is given dissolved in this æther in the form of Liquor nervinus Bangii.

When, as above stated, mineral acids are generally indicated at the same time as camphor, they are given alternately, one hour the camphor emulsion, the other the acid, or mixed after the following formulas, according as the one or other acid may be indicated.

Rec. Solut. acidi Phosphor. ʒij,
Emuls. camphor. ℥vj.
M. S. A tablespoon every or every other hour.

Rec. Emulsion. camphorat. ℥vj,
Syrup. acidi sulphur. ℥ij.
M. S. A tablespoon every or every other hour.

2. *Ammoniacum carbonicum.* The carbonate of ammonia I consider to replace camphor in cases where exciting remedies are indicated, but camphor contraindicated. It is thus indicated in a passive congested state of the brain, and in a state more or less approaching to sopor. Although there is but little hope of the recovery of the patient in such a state, I have occasionally been happy enough to see amelioration arise from the use of this remedy, and afterwards recovery. When the tongue is bright red or of the colaur of red sealing wax, and camphor not borne, the carbonate of ammonia is tolerated, given in a mucilaginous substance. In hæmorrhages it is as little in its place as camphor. Most beneficial I found carbonate of ammonia in cases with

a frequent as well as irregular pulse. As soon as its frequency surpasses 116 to 120, I always order this remedy, most commonly with the favorable result, that the pulse becomes less frequent and more full, and the state in general improves. This remedy has sometimes regulated the irregular pulse. In case of clammy perspiration I saw no good from the use of carbonate of ammonia.

I give the carbonate of ammonia in the form of powder and in doses of grv—viij every other hour.

Rec. Ammonii carbonici grv—viij,
Sacchari albi grx.
M. f. pulv.
S. 1 powder every other hour.

Compounds of ammonia may sometimes be of use under other circumstances than those now noticed. As such we may consider, when the patient is very restless towards evening, has been for several days without sleep, and shows some inclination to wandering; in whatever state the pulse, the tongue or abdomen may be in such a case, 30 drops of Liquor cornus cervi, given once at night, acts very beneficially in rendering the patient calm, and often procuring him a sound and refreshing sleep.

3. *Moschus orientalis.* Not entering into the debate as to the advantages or disadvantages of this remedy in treating typhus fevers, I will only state the experience, I have gained of its use and fitness on certain occasions. If administered under suitable circumstances, I have seen the most favorable effects; if given where it is not indicated or, as often happens, as unctio extrema, it is, if not injurious, in every respect unnecessary. I have

endeavored to find out, when and against what symptoms it ought to be prescribed, and consider musk indicated in cases of delirium mussitans, with or without subsultus tendinum, a very weak and very small pulse, being besides more or less frequent, regular or irregular; the first sound of the heart at the orifice of aorta, so weak that it is scarcely audible; the breathing heavy and laboring, the skin soft and warm, not dry and hot. Musk given under these conditions often improves the state very rapidly, the delirium is abated and ceases, the patient becomes calmer and sometimes falls asleep; the pulse improves in strength, the first sound of the heart becomes more audible, the breathing more free, and the skin grows moist. When this change has taken place, the doses of musk are given at longer intervals, until it is no longer considered necessary, camphor or carbonate of ammonia, according to before stated indications, being afterwards prescribed. If musk is given under other conditions, than those now stated, I think, we must either not expect any effect, or its use was not needed.

I have ordered musk in doses of 5 grains every or every other hour, and continued in this way 5 or 6 doses; if these do not produce the desired effect, I think little is to be expected from its use. We see also, that, improvement having taken place and continued during several hours under the use of musk, the state of the patient again declines, and we are again obliged to have recourse to this remedy. I have employed musk in the form of powder, and given it either alone, or in conjunction with camphor, in case the pulse was regular

and below 116, or with carbonate of ammonia if it exceeded 116 or was irregular.

Rec. Moschi orientalis grv,
Sacchar. alb. grx.
M. S. One powder every other hour.

Rec. Moschi orientalis grv,
Camphoræ depur. grj,
Sacchar. albi grx.
M. S. One powder every other hour.

Rec. Moschi orientalis,
Ammonii carbonici,
Sacchar. albi āā. grv.
M. S. One powder every other hour.

4. *Phosphorus.* Although I have not had any very extensive experience in the use of phosphor, I think I must not pass it over in silence, as I have once or twice seen decided benefit from it. To judge from the cases I have observed, I believe I am able to lay down the following indications for its use. The patient should be in a state of the utmost torpor and exhaustion; lying on his back, quiet, without delirium, indifferent and with difficulty roused from his apathy, the pulse rather slow than frequent, about or below 100, weak and small, the first sound of the heart weak and short, but audible; the breathing slow but free, the skin dry and rough, its temperature sunk, about or below 36° Cels. If I see a patient laboring under these conditions, which constitute a most unfavorable prognosis, I do not hesitate to administer phosphor, the more so as the other excitantia have then been found more or less without effect. Under the use of this remedy, the pulse and the action

of the heart improve first, the skin begins to recover its warmth and the patient is roused from his lethargy. I allow that this improvement is not always lasting, and that the patient in this case relapses again into a still deeper state of depression, from which he can never more be roused. But in other cases, again, the improvement is lasting, and the patient is saved. The main difficulty consists in deciding how long phosphor can and ought to be given, as a too prolonged use produces super-irritation, which easily exhausts the last spark of vital power. Thus as soon as the pulse grows fuller and becomes more frequent, and the warmth of the skin begins to return, it must be given at longer intervals, and be replaced by camphor. I caution, above all, against the trial of phosphor, if there is any form of delirium, as I have always seen an aggravation thereof follow, on account of its then producing superirritation, which may rapidly exhaust the last powers of the patient.

I have prescribed phosphor in doses of $\frac{1}{10}$—$\frac{1}{12}$ grain, every, every other, or every third hour. The most applicable form is solution in fat oil, for dissolved in ætheroleum or alcohol it would irritate the mucous membrane of the stomach too much, and cause tension and pain in the epigastrium, an inconvenience I never saw from the solution in oil, if not prescribed in too strong and too frequent doses.

Rec. Phosphori grvj,
Olei amygdal. dulc. ʒvj.
Digere ad perfectam solutionem.
D:r ad vitrum epistomio vitreo obturatum.
S. 4 to 5 drops to be given every, every other or every third hour.

5. *Vinum.* Wine I only use as an adjuvans to the preceding excitantia and mixed with the drink. It seems useful together with all the above mentioned, although I consider it an injurious practice to prescribe too strong doses. I allow only so much to be mixed with the drink, that it gives it a slight taste, the whole quantity allowed in a day being one or two wine-glasses. Port and Sherry are the kinds I have used. Its effect must, however, be closely watched, and if the wine excite too much, it must no longer be given.

4.

Tonica.

The use of these remedies belong rather to stadium convalescentiæ, than to stadium depressionis, and will consequently be treated of in another place. Only one tonicum, should, I believe, be mentioned here, viz.:

Quina. I cannot agree in praising, as of late has been done, the use of quinine during the whole course of the typhus process from the beginning to the end. My experience in this respect has not been favorable. That one or other, case, or perhaps even a greater number of cases, can under the use of quinine, or rather in spite of its use, recover, I certainly allow, but according to my experience, the cases, where it has been used during the first stage of the disease, have become severer, than they otherwise would probably have been. Where this has not taken place I do not hesitate to doubt the correctness of the diagnosis, supposing, it to have been either a larvated or irregular intermittens or an intestinal catarrh with depression of the action of the nervous

system, against which the treatment succeeded. But also in various conditions during the second stage I saw quinine act injuriously, and beneficially only in exceptional cases. The stated possibility of cutting short the typhus process by quinine, as we do an intermittens, I must also doubt as opposed to the before expressed view of the nature of the typhus process, which, once established, must go through its stages, art being unable to interrupt its onward course.

The state, in which quinine during the stage of depression, is indicated, is the following. When the excitantia have been given, and the symptoms against which these were prescribed are subdued, but the fever nevertheless continues and the strength is very low, without any sign of approaching improvement; the pulse continues frequent and irritated, the skin either dry and rough, or covered with clammy perspiration, the spleen more or less swollen, but the tongue clean and moist, the quinine is in its place. Also when, in consequence of the intestinal ulcerations or suppurating ulcerations elsewhere, a state resembling the pyæmie is developed; as well as in the cases, where there exist marked remissions in the fever, which is not seldom seen in typhus cases occurring during a prevalent epidemic of intermittens. I then order 1 to 2 grains of quinine, 4 to 6 times a day, dissolved and combined with either Sulphuric or phosphoric acid, according as the one or the other of these acids agree with the above stated indications. The sulphuric acid is especially indicated in the presence of ulcerations, diarrhea or sloughing anywhere, in other instances the phosphoric acid.

Rec. Sulphat. quin. grxxiv
Solve in
Acid. sulphur. dilut. ℥ij—iij
Adde
Decoct. Althææ ℥vj
Syrup. Althææ ℥ij.

S. A desertspoon or a tablespoon to be taken 4 to 6 times a day.

Rec. Quiniæ grxxiv
Solve in
Solut. acid. Phosphor. ℥iij
Adde
Decoct. Althææ ℥vj
Syrup Althææ ℥ij.

S. A desertspoon or a tablespoon to be given 4 to 6 times a day.

5.

Sedativa.

Sedativa may sometimes be required in the treatment of this stage, but their use being suited for rather special symptoms I will detail it under the following head.

6.

Treatment of special symptoms.

In conformity with the plan adopted above that after the account of the general treatment of the first stage, a description of some special symptoms was given which required a special treatment, I will now also give a similar description with reference to those which occur during the second stage, and which merit special notice:

1. *Diarrhea.* A continued use of the cold water compresses on the abdomen, which has been proposed and commended during the first stage, I consider as one of the best means both against the diarrhea, and the tension and tenderness of the abdomen during this stage also. They are applied in the manner stated above. As long as excitantia are not indicated, we continue the use of phosphoric or sulphuric acid with infusum ipecacuanhæ in accordance with the given formulas. If camphor is indicated, it is combined with the ipecacuanha and the acids, so that ℥ij of vinum ipecacuanhæ are added to ℥viij of the mixtures, which have been prescribed when speaking of camphor under head 3. Should the state of things, on the other hand, be such, that carbonate of ammonia or musk were prescribed, when the evacuations also are almost always involuntary, a little port wine mixed in a mucilaginous drink has often proved beneficial. In cases where the evacuations are too copious enemata of starch, with the addition or not of tinctura opii must be administered. The diarrhea continues rather often, when the other symptoms, with the exception of the exhaustion of strength, have subsided, in which case it requires a special treatment during the beginning of the stage of recovery.

2. *Hæmorrhage from the intestines.* Such a bleeding during this stage proceeds from the ulcerations of the small intestines, a larger or smaller bloodvessel being corroded and ruptured. Dangerous as I have stated this circumstance to be during the first stage, it is equally so during the second. Every other indication must be left aside, the only one, that of arresting the bleeding,

attracting our whole attention. For the rest the same treatment with sugar of lead, as above § 6, 4, prescribed for bleeding from the intestines during the first stage, must here also be employed. It is evident, that as long as the bleeding lasts, or there is any danger of a return, no purges ought to be prescribed. In case we succeed in arresting the bleeding, afterwards, when the sugar of lead is discontinued, acids must be given, especially sulphuric acid, or, perhaps still better, liquor acidus Halleri added to a decoct of Cinchona, if the state of the intestinal tube is such as to tolerate it. At the first sign of the bleeding, a bladder filled with pounded ice, must be applied to the region of the navel, and a clyster of sugar of lead as above directed, administered.

This is the plan of treatment I always follow, but if the bleeding continues, although somewhat lessened, after the lapse of 6 to 8 hours, I have prescribed secale cornutum, and succeeded in two desperate cases with this remedy in restoring the patient to health. I gave it in the form of powder or infusion 5 grains every quarter of an hour at the beginning, making the intervals between the doses longer by degrees as the bleeding decreased. I have also tried tannin, but without success.

3. *Meteorism.* Since I commenced employing the cold water compresses on the abdomen during the whole course of the disease, I have more seldom observed this most painful and often very dangerous symptom. Before it was nothing uncommon. The cases I have seen of late have been mild and rarely required special treatment. When it was necessary, I found it most answer the purpose to apply the compresses colder than directed

above; they must be of a temperature of + 7° to + 8° Cels. and oftener changed, say every third or fourth hour, and internally must ætheroleum terebinthinæ be prescribed in form and dose as stated above § 4, 4. This remedy appears to stop the generation of gas, and promotes the elimination of that already generated; thus restoring sufficient tone to the intestines. The effect of the internal use is assisted by clysters with 2 or 3 teaspoons of turpentine added to each. If required some of the excitantia may be given alternately with the turpentine, which is also given alone. The same contraindications as stated in the § just cited are applicable here also.

4. *Peritonitis.* Inflammation of the peritoneum is generally caused by the ulcerations in ileum and valvula coli, less frequently from those in coecum, the beginning of colon adscendens or processus vermiformis, most rarely by suppuration of a mesenterical gland. These ulcerations beginning in the intestinal glands, spread to the adjoining muscular coat, and produce, when come to peritoneum, inflammation of that membrane, an inflammation decidedly tending to rupture, or so called perforation. In preventing the formation of this so dreaded inflammation, the cold water compresses seem also powerfully to concur, as since their use has been introduced, this affection has become much rarer than before. Putting aside all other indications it must be the only endeavor of art to prevent rupture, at the first sign of danger from the formation of this inflammation. That the inflamed part adheres and grows together with the adjoining parts, most commonly the bowel, but also the bladder,

uterus or peritoneum, is the only possible way to prevent a rupture. The chief, nay the only means of art to promote such an adherence, consists in bringing the bowels to a state of as perfect rest as possible, that is, in retarding and stopping motus peristalticus, and most strictly avoiding every thing that may act in any way to increase it. Besides keeping the patient as quiet as possible, every kind of food, nay drink must be shunned, perhaps water may in small quantities be allowed, but clysters must be particularly avoided. A bladder of ice is laid on the place where the inflammation has its seat, and internally opium or morphin is prescribed. This is the only remedy, I can from my own experience recommend. The chief point consists, however, in giving it at the first sign of inflammation and in a sufficient dose to produce the desired effect, as soon as possible. I have succeeded with this remedy several times, or I believe I succeeded, as the diagnosis is not always so positively decided. Should we put off the use of the remedy until the diagnosis was positively ascertained, every effort will probably be too late, as rupture has then already taken place, after which every mode of treatment will generally be in vain, although exceptional cases occur where health has been restored even after perforation had taken place.

In such cases I give morphin in doses of a quarter of a grain, in the beginning every other hour and so every third hour; afterwards at longer intervals, according to its effect, and as the symptoms require. It is given either in the form of a powder or better, perhaps, dissolved.

Rec. Acetat. Morphici griv
Solve in
Acid. acet. dilut. ℥ℓ
Adde:
Aq. destill. ℥iv.
S. A teaspoonful every third hour.

Some of the graver symptoms of narcotism do not appear, and the inconvenience of constipation must not be counteracted either with purges, or clysters, nature will in this respect help herself at last.

Opium in substance is preferable in cases where, together with the beginning of peritonitis, there is a coexisting diarrhea. The diarrhea ceases most commonly when the peritonitis is developed, but should it nevertheless continue, opium is prescribed for a few times in doses of grj every hour, then every other hour, every third and so on, as the inflammatory symptoms subside.

When peritonitis occurs after this stage, that is, during the stage of convalescence, from the same cause, the same treatment must also be followed, as will be observed in another place.

5. *Bronchial Catarrh.* Should, during this stage, this affection either occur in the capillary form or continue from the first stage with an intensity, which would seem to require special notice, turpentine is the best remedy, as already stated above. It is given either alone, or alternating with the phosphoric acid or some of the excitantia according to existing indications. It must be continued until the catarrh is perfectly ressolved and the expectoration easy. It would seem as if turpentine should act injuriously on the ulcerations in the

bowels, but I have never observed such an effect, and give it consequently without hesitation even when there is diarrhea. The dose and form have been stated above.

6. *Pneumonia.* Congestion and inflammation of the substance of the lungs, may during this stage sometimes occur independently, sometimes, and oftener be developed from the capillary catarrh, sometimes may take the form of pneumonia hypostatica and of the so called pneumonia lobularis. In the first case the hopes of recovery are greatest, in the second less, in the two last cases least; in all the prognosis is very dubious. The same treatment as in the first stage, is good also here, with the exception of the topical bleedings, and the addition of excitantia. At the first sign of congestion to the lungs flannel dipped in hot turpentine is applied to the chest, until the skin becomes red; when the cold water compresses are applied. Internally emulsion of turpentine, according to the above formula, is given, a teaspoon every other hour, in urgent cases every hour. If the strength is so much reduced that excitantia are required, the turpentine is given alternately with carbonate of ammonia, musk or camphor (Liquor nervinus Bangii) according to the special indications for each, as stated above.

I have before, in speaking of the treatment of pneumonia during the first stage of typhus fever, said, that of all the remedies that I have tried, turpentine gave the most favorable results; I now add that my experience is the same of its use in pneumonia during the second stage. The pneumoniæ of the second stage are certainly severer and tend more to a fatal termination,

the general result of the treatment has however been, during some years, one death in two, in others only one in three. The chief point consists in carefully watching the first development of the pneumonia and instantly directing the treatment against it; is this overlooked, which easily happens, if the state of the lungs is not daily physically examined, it may have attained, within a few hours a point, from which return is impossible.

7. *Laryngitis typhosa* or the, although with less propriety, so called *Oedema glottidis*. That form of inflammation in the larynx, which has been so termed, is of rare occurrence, generally not seen oftener than once in about 100 cases. It is one of the most dangerous complications, that accompany typhus. The patients affected by it generally die; recovery is very rare. The mode of treatment I have adopted consists in applying, as soon as any sign of impending laryngitis was discoverable, nitrate of silver to epiglottis and glottis, by means of lint or a soft sponge dipped in a concentrated solution (gr.vj in ℥j aqu. destill.) and introduced into the throat behind the tongue, which is protruded and depressed. Immediately after this application the symptoms are often aggravated, but in the most fortunate cases soon subside; it must be renewed if the aggravation returns. Simultaneously nitrate of silver is rather freely applied externally to the larynx, in a way to produce vesication, and the neck is covered with cold water compresses, which I have found more serviceable, than the varm poultices. Should the state, notwithstanding these means, become worse and suffocation threaten, tracheotomy must be made, although the hopes of success

from such an operation under these circumstances are always very slight.

These cases of laryngitis are often so rapidly followed by death, that the physician has scarcely time to administer any thing, or the symptoms show from the beginning such a malignancy, that he finds every effort unavailable: such is especially the case should capillary catarrh or pneumonia precede or accompany the development of laryngitis.

8. *Delirium.* Sometimes, and in certain cases, a special treatment of a continued delirium may be required during this stage. Sometimes the patient is delirious without interruption both day and night, and although under the form of delirium mite, his gestures and hallucinations are very lively. Sometimes the patient in this state either suddenly or by degrees falls into a natural sleep, which continues several hours, and from which he awakens either in the commencement of the stage of convalescence, or at least perfectly free from delirium. Such a beneficial sleep produced by nature herself occurs, commonly, between the 11:th and 14:th day, most frequently on these days themselves. Art must in such cases endeavor to follow the directions given by nature, and by promoting sleep lead the disease either to convalescence or at least to a better state, which makes convalescence more possible, than it otherwise would have been. This imitation, so to say, of nature will succeed, so far as we are able to choose the state, in which the disease permits it.

For this purpose I have employed *opium* and *belladonna*. The following are the indications for the use of *opium*. The patient must be delirious either continually

or towards night, with lively gestures and hallucinations, but *free from signs of congestion to the brain;* the pulse ought to be low and weak, but not very small and very weak; the first sound of the heart must be distinctly audible; the skin ought to be soft and limber, rather moist, and consequently neither dry nor hot, but it may be hyperæstetic; the pupils ought to be natural or somewhat dilated; it must be between the 11:th and 14:th day from the beginning of the disease. If due attention is paid that all these symptoms are present and opium is then once given in full dose, it generally acts very beneficially by producing sleep, after which the delirium ceases, or at least becomes slighter, and the state of the patient is ameliorated. To administer opium under other conditions than those just named, I consider highly dangerous. It is given only once and towards night, and must not be repeated the following but the night after that, if the delirium returns, and only the the half of what was ordered the first time is then given. I combine opium in those cases with carbonate of ammonia or camphor, according to the indications for these remedies, which have been stated above.

Rec. Opii depurati grj
Ammon. carbon.
Sacchar. albi āā. grvj.

M. f. pulv. S. To be taken at once towards night.

If camphor is given, equal parts of camphor and opium are prescribed, one grain of each to be taken at once.

Afterwards the remedies considered indicated for the occasion are ordered, most commonly phosphoric acid, or excitantia, should they be deemed more suitable, in

smaller doses and with more precaution than under other circumstances.

The indications for *belladonna* are exactly the same, as those for opium, except the state of the pupils. When the pupils have been contracted I have seen opium ineffectual and belladonna most efficient in producing the desired effect. Belladonna is also given but once and towards night in full dose, and, if required, repeated in half doses as has been directed respecting opium; it is also combined with carbonate of ammonia or camphor.

Rec. Extract. folior. Belladonnæ spirituos. gr. ¼.
Ammonii carbonici,
Sacchar. albi āā. grvj.
M. f. pulv. S. Taken at once towards night.

My experience as to the different effects of opium and belladonna, I gained first on patients in delirium tremens, seeing that opium given to those, who had contracted pupils, did not act as a sedative as usual, but oftener the reverse, when belladonna in such cases produced the sedative effect. This experience I also found confirmed in typhus patients, and, therefore, applied it afterwards in such cases.

9. *Effusion between the membranes of the brain.* This may take place as well at the end of the first, as in the beginning of the second stage. Generally a rather violent delirium precedes its generation. Its development is marked, when it has its seat on the superior surface of the hemispheres, by sopor, often preceded by convulsive twitchings. When it takes place on the basis cranii above pons Varoli along the chiasma, paralysis of one or both of the superior eyelids sets in

together with dilated pupils and sometimes strabismus. Although both these states afford a very unfavorable prognosis we may now and then succeed in restoring the patient, especially when the effusion is situated on the basis cranii.

In treating these affections, when the symptoms mark effusion on the superior surface of the hemispheres, I generally shave the head immediately and blister the scalp; should symptoms of effusion on the basis cranii be present, the blister is applied at the back of the neck. A clyster with ʒij ætheroleum terebinthinæ is put; and in both cases arnica with carbonate of ammonia is prescribed.

Rec. Flor. Arnicæ ʒij
infund. p. hor. ½ c. suff. quant.
aquæ bullient. ut f. colatur. ℥viij.
Colatur. adde:
Ammonii carbonici ʒj—iß.
S. A tablespoon every other hour.

10. *Retentio urinæ.* Every experienced physician is well aware how important it is to pay due attention to this symptom, which chiefly accompanies the delirium mussitans. Easily detected by percussion over the bladder, it is removed by catheterism twice a day or oftener if required. We must not be put off our guard, and because the urine passes involuntarily in small quantities, consider the bladder emptied. We must always try, by means of percussion, to learn the true state.

11. *Bed-sores.* In cases where either the severity of the disease or its protracted duration give reason to fear a tendency to bed-sores, every thing must be done

to prevent them, by changing the position as often as possible, by often repeated washings with brandy, aqua Saturni or brandy beaten up with the white of an egg, of the parts particularly exposed. Should bed-sores, notwithstanding these precautions, still be formed and covered with a crust, it is best to apply warm linseed poultices, which are changed from 3 to 4 times a day, and advise the patient to lie, if possible with his face downwards. When the sloughing is arrested, and the crust begins to separate from the edges, the patient has most commonly already entered the stage of amendment, the treatment of which will be given below.

12. *Gangrene in the extremities.* The parts chiefly exposed to gangrene are one or several of the toes, or some other part of the feet; it is more unfrequently found to affect the fingers and hands. During malignant epidemics and in sporadic cases of a severer kind, the physician must never neglect to inspect the extremities as often as possible, to be able to direct proper treatment, immediately on observing the first marks of gangrene. The gangrene is almost always preceded, if the patient has any power of observing his state, by a more or less acute pain in the part it afterwards attacks, and by a dark or bluish redness, with or without the formation of bullæ on the part. In some cases nothing is felt before the affected part is already black and without sensation. From the toes or fingers it may extend over the feet or hands, nay over the legs and arms; in other cases it stops in a toe, a limited spot on the ankle, in a finger, &c. &c. This gangrene, whether limited or extended depends in certain cases on the extreme weak-

ness with which the circulation is carried on in the parts most remote from the centrum, or in others on arrested circulation, that is on the formation of a thrombus in a larger or smaller artery, corresponding to the extension of the gangrene. The indication for the treatment is therefore to promote and stimulate the circulation by topical means, where it is arrested or threatens to become so. I think I saw the best effect by freely applying the nitrate of silver to the affected place, at the first sign of gangrene, and by covering the whole part, for instance the foot, the hand with compresses dipped in warm portwine with the addition of camphor, the solution in brandy appeared less powerful. These compresses are protected by oil skin or oil silk in order to keep them as warm as possible and are changed as soon as they begin to be cold. When the gangrene is arrested and the line of separation formed, warm linseed poultices and the usual after treatment are prescribed.

13. *Gangrene in the mouth and throat.* Most fortunately such an occurrence is seldom seen in typhus patients in the north. This kind of gangrene is sometimes preceded by diphteritis, to which we will return farther on, but may also be generated without a sign of such an affection preexisting. It is of the utmost importance to discover its presence as soon as possible, as if unobserved, it spreads very rapidly, extends backwards from the throat to the larynx, accompanied in this case by inevitable death, or forwards to the buccæ and the lips, when such a loss of substance not seldom ensues, that the greater part of the soft parts are destroyed. As soon, therefore, as any swelling of the lips

or cheeks is observed, and above all if the breath of the patient becomes stinking, the mouth and the fauces must carefully be examined; should a dark or discolored spot be seen anywhere, with or without a diphteritic layer or circumference we must employ topical measures without delay. Cauterisation with sulphuric or muriatic acid has appeared to me to answer the purpose best. It is executed by mixing equal parts of sulphuric or muriatic acid with honey; a pencil of lint is dipped into this mixture, and applied to the affected part. In more fortunate cases the gangrene is arrested by this means, a line of separation is formed, a vital activity produced in the circumference, until the eschar is thrown off, leaving a fresh ulcus. Immediately on the cauterisation and afterwards also the mouth must be rinced with an infusion of chamomile or salvia, to which a little vinegar is added. The cauterisation may be repeated, if circumstances require it. Should, notwithstanding this, the gangrene continue to spread, the prospects are very dark; success in arresting it, with, however, a greater or smaller loss of substance, my sometimes follow injections of decoct of cinchona with the addition of vinegar and tincture of myrrh.

In all these cases of gangrene, wherever it is situated, sulphuric acid is given internally, either alone or in combination with quinine or excitantia, according to what has been stated before respecting these remedies.

It sometimes occurs, especially when the gangrene affects the toes, that the pain, which accompanies its development, is insupportable and that the patient suffers to such a degree, as to render his state in general much

worse. In such cases a full dose of morphin ought to be given, and repeated if necessary.

14. *Diphteritis in the mouth and throat.* The physician must follow with great attention the generation of the diphteritic patches, wherever they occur in the mouth, on the tongue, buccæ, soft palate, tonsills or pharynx. Once generated, they are very apt to spread, and may thus soon extend downwards to the larynx, and then occasion a sudden fatal termination, occasionally they also pass into, or more correctly, are signs of approaching gangrene. As soon therefore as the characteristic patches show themselves anywhere, they must without delay be attacked by topical means, which are the surest to stop their farther progress. It seems to me most judicious to apply nitrate of silver or alum to the patches. Should this not be powerful enough, but the patches continue to increase and form more coherent membranes, sulphuric or muriatic acid must be employed. One third of either of these acids is mixed with two thirds of honey; with this the parts covered with the membranes are pencilled; afterwards lukewarm tea of chamomile flowers or salvia leaves is injected. Should the membranes not separate in 24 hours the cauterisation is renewed. When they have separated and fallen off, the subjacent surface is vividly red, often superficially excoriated; nitrate of silver must now be sparingly applied to it in order to prevent the formation of new plastic exudations. Simultaneously and afterwards injections are made, and the patient desired to gargle with the tea or decoction of malva or althæa. The same

internal treatment, as above prescribed in the case of gangrene, is also here beneficial.

15. *Parotitis.* The importance of this symptom varies in different epidemics, as well as in different individual constitutions; in some it is as a rule a good sign, in others not seldom a bad one; having in others again no influence whatever on the course of the disease; it is, however, to the patient a very painful symptom, should one side only, or as sometimes happens, both sides be similarly affected. When parotitis occurs I have made it a rule, to let nature have its own way entirely. In ordinary cases it is therefore left to go on either to resolution or suppuration; the swelling is covered only with warm emollient poultices. If there are signs of suppuration already formed, the abscess must be opened as soon as possible, in order to prevent a too extensive generation of pus, and this from burrowing and making its way to the outer auditory meatus or corroding processus mastoideus. In severer cases, where the inflammatory tension is too great, we may be obliged to apply a greater or smaller number of leeches around the swelling, which is afterwards covered with warm emollient poultices. A more or less extensive suppuration, when once established, is treated according to general principles.

16. *Hemiplegia.* Fortunately of a rarer occurrence, although often enough to attract the attention of the physician is paralysis of the extremities, which sets in during the second stage of the typhus process, especially in the abdominal form. They appear sometimes in both extremities of either side, sometimes only in one arm a

leg, &c. &c. They owe their origin to coagulation of blood, or formation of a so called thrombus, either in some of the arteries of the brain, especially artt. fossæ Sylvii, or in some of the larger arteries of the extremities. In the former case the symptoms show a perplexing resemblance to apoplexy; in the latter the decrease of the power of locomotion is preceded or accompanied by neuralgic pains often associated with hyperæstesis of the skin and sometimes with spasmodic twitchings of the muscles. The possiblity of a restoration to health depends in the one case as in the other, on whether the local anæmia, caused by the obstruction of the artery, may be replaced by the formation of a collateral circulation or not.

In case the obstruction takes place in the brain, I think art can do but little. The cases I have seen were all fatal with one exception. This one, a female of 18 years, presented a complete paralysis of the whole side; she recovered, though a weakness remained in the whole side, by the use of the ice bag on the head, and internally camphor, arnica, preparations of cinchona and finally martialia. I cannot venture to decide whether the treatment did anything in this case or nature all. The same or a similar treatment has been without effect in others. I can therefore not advance any treatment as sure in this state. I see also by the works of other authors, that it still remains to be discovered. The fatal termination is caused by ramollition taking place in the part of the brain corresponding to the obstructed artery.

In case of obstruction of any of the arterial trunks, which go to the extremities, the treatment is often more

successful. The paralysis, arising from this cause, disappears sometimes very soon, at others it remains a longer period. I think it most suitable to apply immediately cold water compresses to the affected extremity, in order to keep up as lively a capillary action as possible by means of the generated and sustained heat, and thus promote the collateral circulation. Should there exist weakness of the muscles with or without diminished sensibility, when the neuralgic pains and the hyperæsthesy by means of these applications are gone, irritating frictions are indicated, and gymnastics and electricity, should the weakness remain after perfect recovery in other respects. In spite of every remedial effort, the affected part often becomes more or less atrophic and weak. Sometimes gangrene supervenes, to a greater or less extent in the extremity to which the arterial trunk runs, in consequence of its obstruction. If the gangrene is extensive, for instance spread over the whole foot or the leg, every attempt at treatment is generally of no avail, as the general state sinks lower and lower until death ensues. Should it, however, be of less extent, affecting, for instance, one or several toes, the treatment detailed under head 12 is employed, the whole extremity being covered with the cold water compresses.

17. *Local oedem.* This affection occurs chiefly in the extremities especially the lower, commonly on one side, seldom on both at once. It is caused by coagulation of the blood; that is the formation of a thrombus in some of the venous trunks leading from the extremity. If the subsequent obstruction be complete, the oedem will be suddenly generated and considerable; otherwise

it is smaller and slower in its formation. Distention of the subcutaneous veins commonly accompanies the oedematous swelling; whether accompanied by pain or not. Excepting in the cases which will be noticed below, I never saw this state become dangerous in typhus, although it may retard the recovery. It is cured by the establisment of a collateral circulation, and thence the indication will be the same as in the preceding affection, to promote this circulation as much as possible. This is effected by placing the affected extremity in an elevated position; by keeping it very warm, by means of the cold water compresses; and the internal remedies are given, which the general state may require. Should the oedem remain, after perfect recovery in other respects, irritating fomentations are used, and the oedematous extremity is bandaged.

In a few rare cases I saw such a thrombus in a venous trunk suppurate, whence all the symptoms which belong to pyæmia resulted, as lobular pneumonia, abscesses &c. As this, when it takes place, is a most dangerous affection, art must, endeavor to counteract it if possible from the very first signs. The most powerful remedy in this as in pyæmia in general is quinine either alone or with morphia. These remedies must, however, both be given in tolerably large doses, grij—iij of the former, with gr ⅛, ⅙, ¼ of the latter, 4 to 6 times a day.

Rec. Quininæ grxxxvj
Morphinæ griij
Solve in
Acidi Sulphur. dilut. ℥ij

Decoct. Althææ ℥jv
Syrup Althææ ℥iij.
D. S. A desertspoon to a tablespoon every third hour.

In some cases, equally rare, it happens that the formed thrombus loosens, is carried to the heart with the current of the blood, and thence to some of the branches of the arteria pulmonalis, which it plugs. In such cases either gangrene in a smaller or larger part of the lung ensues, or a dyspnea of a severe or mild kind. I know of no help for the former state under the above conditions, or of anything that could be tried with hope of success; the latter leads also to certain death in severer cases, in milder it is cured by nature herself.

Now and then erysipelas occurs at the same time as the oedem, or is superadded after the lapse of a day or two. In such cases the cold water compresses are also in their place; should they, however, not be tolerated, but increase the pain, and the erysipelatous swelling continues to spread, compresses dipped in brandy (of 0,94 sp. gr.) may be substituted with advantage. These are changed as soon as dry, and the patient feels them heating. When erysipelas occurs tonic remedies must be given, should there be no important contraindications. Preparations of cinchona or quinine or chlorate of iron, dissolved in spirit and æther as *Solutio chloreti ferrici spirituoso-ætherea* in doses of 10 to 15 drops, every other or every third hour, is then prescribed. The use of tonics seems best to control the spreading of the erysipelas, and especially prevent its transformation into gangrene.

7.

Dietetic and hygienic rules.

The dietetic prescriptions during the first stage being in conformity with the patient's own feelings limited to abstinence from food; the same proceeding is not quite so applicable during the second. My experience has shown that the patient then feels well from taking some food, although it must be of the simplest and mildest kind. For drink I allow warm milk from the beginning of this stage, mixed with carbonated water in equal parts, or soups of oats, sago, rice, also mixed with this water and some wine, according to circumstances. Later in this stage small quantities of chicken- or veal-broth are given, a tablespoon several times a day. We must, however, carefully watch its effects, as should the broth seem to excite too much, its use must be suspended. Jellies, animal and vegetable, too expensive to be employed at hospitals, are in private practice very useful during this stage, if given in small quantities and often repeated. The same rules as above given for the first stage may be applicable as regards the drink.

The hygienic rules are the same. We must now try by every means to prevent the occurrence of bedsores. As before said the patient must, if possible, often change his position; as soon as there is any sign of redness in the skin, the inflamed parts are covered with gold-beaters-skin, and washed with aqua Saturni, brandy beaten up with the white of an egg, or with a solution of sulphate of zinc or tannin, as each of these means may seem best to answer the purpose. Friction of the red parts with oleum Jecoris Aselli seems also beneficial. When the

skin is very dry and rough, and the patient restless, and especially if the surface of the skin is hyperæstetic, spongings with vinegar and water, with or without a little brandy or wine, prove serviceable. Gentle ablutions with sponges dipped in water of 15° to 12° C. have often showed themselves very beneficial.

§ 8. Treatment during the stage of recovery.

1.

The signs, which announce that recovery has set in, having manifested themselves, new indications for the treatment arise. The disease has now, so to say, exhausted its force. The preserving power of the system has vanquished the noxious agent, which produced and kept up the disease. The blood has got rid of the foreign substance which it had received, it begins to regain its power of reproduction. The vital power rises from the state of depression, to which it had sunk. Nature alone, or nature and art in conjunction, has overcome the disease, and the result of this victory is the reestablishment of health. The principal signs of this are: the appearance of the patient loses the depressed expression, the look is more free, the intellect more clear: the tongue becomes moist, either on the edges or all over; the pulse becomes slower and increases in power; the skin loses its high temperature and its softness is restored; if the excretions were involuntary, the patient now announces his wants, desire for food returns, &c. When this has taken place, the indication for the treatment is to restore the strength as soon as circumstances will permit. This is effected by means of tonics,

in the beginning with æthereo-oleosa, at last alone, in conjunction with a suitable strengthening regimen. We must observe that in many cases, especially in those, where the amendment has begun per crisin, no pharmaceutic treatment for restoring the strength is required, that will return quickly and surely only by giving suitable nourishment.

2.

Æthereo-oleosa.

1. *Serpentariæ radix.* Notwithstanding all that has been said from many quarters of the uncertain and small virtue of serpentaria, I must consider it a good remedy in forming a kind of transition from the excitantia in the stricter sense to tonica, in cases where such a transition is deemed necessary. In all cases where camphor has been administered as excitans, serpentaria is generally suitable when recovery sets in as also in cases, where no exciting remedy was used during the stage of depression. Serpentaria gently stimulates the energy of action in the brain and spinal cord, it does not increase the frequency of the pulse, but its strength, and is usually borne without inconvenience by the stomach and intestinal tube. It is given in the form of infusion, ʒij—iij in ℥viij colature, a tablespoon every other or third hour. Should the pulse, during the beginning of the convalescence, continue frequent, about 100, it is good to unite serpentaria with phosphoric acid. If diarrhea remains or an inclination thereto, or in cases where sloughing is still going on anywhere, it must be given in conjunction with sulphuric

acid. Valeriana has nearly the same power as Serpentaria; it is, however, in general not equally appliable, while its use often causes the tongue to be dry with an uneasy feeling of tension and fullness at the epigastrium, the pulse accelerated, in short it seems to produce congestion to the mucous membrane of the stomach and feverishness depending thereon. This is especially the case, where the tongue during any period of the disease has been flayed and bright red, and valeriana must consequently never be given in such cases at the beginning of the convalescence.

2. *Arnicæ flores.* When recovery takes place in the severer cases, where the strength is much reduced, the intellect still obtuse, the patient, with the sense of hearing diminished, lies in a half slumbering state, with a weak and small pulse, and where carbonate of ammonia, musk or phosphor have before been given, in such cases arnica is very serviceable. It increases the power of the nervous centra sooner than serpentaria. It is given in infusion, ℥ij—iij in ℥vj, with the addition of ℥ij mucilago gummi arabici, to counteract its sometimes irritating effect on the stomach and intestinal tube. Of this a tablespoon is ordered every other or third hour.

3.

TONICA.

When some of these æthereo-oleosa have been given 3, 4 to 6 days, tonica will commonly be indicated. Should the use of the æthereo-oleosa not be deemed necessary, we allow the patient to leave off all internal

treatment for a day or so, until we may begin the administration of tonica.

1. *Cortex Cinchonæ* is the principal of all the tonics. It is given first in an infusion and so in decoction, 4 to 6 tablespoons a day; ℥ij—iij are employed in making ℥vj colature. Instead of this quinine may be given with the same advantage, in doses of grj—ij, 3 to 4 times a day. It is best dissolved.

2. *Calumba radix* is more suitable than cinchona for those cases, where, during the stage of recovery, diarrhea or tendency to loose bowels exists, or where bark seems to irritate the mucous membrane of the stomach or the intestines. It is prescribed in the form of decoction, ℥jv—vj in ℥viij colature, a tablespoon 4 to 6 times a day.

3. *Martialia.* When the patient has left his bed, the digestive organs have regained their power, and emaciation and weakness only remain, the convalescence is best accelerated by the use of martialia. Of preparations of steel, I have used most commonly Griffith's pills and mixture, the former in doses of 4 pills 3 to 4 times a day, and a desertspoon of the latter as often.

4.

Dietetic and hygienic rules.

The principal dietetic rule is to allow the patient, only by degrees, should even his desire for food be increased, a bland but also nourishing food. Faults against this rule are always injurious, often dangerous, especially in the recovery after the abdominal form. The rules for giving the food and its quality are exactly the same as after

acute diseases in general; it is best to give little at once and often. We begin with milk, broth, soft boiled eggs, and then easily digested fish and at last meat &c. More or less wine is mixed in the drink, and pure wine may be taken at meals.

As soon as the strength will permit, the patient must be dressed leave his bed, and be taken to a separate room for convalescents. The improvement now goes on more or less rapidly or slowly, according to the preceding loss of strength; it may be disturbed or retarded by several consequent disorders, the treatment of which I will give briefly in the next §. When the skin, especially after the abdominal form, is dry and rough during the stage of recovery, a tepid bath, taken as soon as the strength will permit, acts very beneficially.

§ 9. Treatment of the sequelæ.

1.

Among the diseases, which either remain or take place after the two forms of the typhus process, some are nearly related to this process, others have no such relation, but have been preexisting or appear accidentally during convalescence. Here only the former can be treated. I will state the principal of these and my experience of their treatment.

2.

A. From the organs of respiration.

1. *Remaining bronchial catarrh.* It happens not seldom, that when the catarrh during the preceding stage

has been of a severer kind, it remains during the convalescence, making itself known by an overloading of the bronchi with phlegm, difficult expectoration, together with a greater or smaller degree of dyspnoea. As long as this continues, the recovery is retarded, and the strength does not return; on the contrary it decreases sometimes, and a hectic state seems impending. In such cases the indication is to promote the expectoration and thus make the entrance of the air into the vesicles of the lungs more free, that is, promote the sanguification, paying due attention to the increase of the strength by means of tonica. I have found the best effect in these cases produced from a combination of senega and cinchona.

Rec. Rad. Senegæ incis ℥ß,
Cort. Cinchonæ reg. contus. ʒij—iij;
Coque per horam c. suff. quant. aquæ, ut remaneant ℥viij.
Colaturæ adde
Liquor. ammon. anis. ʒj.
S. A tablespoon 4 to 6 times a day.

When the desired effect is obtained, preparations of steel, as Griffith's pills or mixture, are serviceable. The improvement seems often to be promoted by irritating friçtions to the external respiratory muscles. Nourishing and suitable food, with wine or porter according to circumstances, is also to be prescribed. Jelly of Iceland moss, or caraghen mixed with warm milk, is very beneficial and of much service in such cases.

2. *Oedem in the lungs.* Oedem in the substance of the lungs occurs as well after a preceding capillary catarrh or pneumonia, as caused, without any of these

affections preceding, only by the general weakness and exhaustion of strength. The same treatment, as has just now been stated for the catarrh is generally as useful in these cases.

3. *Acute tuberculosis.* On account of the great difficulty there is in deciding, whether it is acute tuberculosis or a capillary catarrh, it is also very difficult to decide as to which treatment would be the best in the former affection. In cases, which prove fatal, the diagnosis is easily made at the dissection, but it is by no means sure, in case of recovery from similar symptoms, whether it has been an acute tuberculosis or a mere capillary catarrh. The acute tuberculosis may occur as well in cases, where the lungs and bronchi have been previously affected during any of the stages of the disease, as where both have been free from affection. The former is, however, most commonly seen. The question whether an acute tuberculosis after typhus may end in perfect health or not, I pass over in silence, only with the remark, that I think it probable, that it may sometimes be arrested, and if of a more limited extent, it may in this way end in recovery, if only for a time; future symptoms will sooner or later decide whether the acute deposition of tubercles has opened the way for the chronic process or not.

The acute tuberculosis presenting the same symptoms or at least the greatest resemblance to those of the capillary catarrh, the treatment is in the beginning the same for both. We begin, therefore, with prescribing the emulsion of turpentine above mentioned as long as there is fever; when the fever has left, the decoction of

senega and cinchona is ordered. The cough being somewhat reduced, the strength, and the power of digestion by this means improved, codliver oil, 3 tablespoons a day, is perhaps the best remedy to prevent the progress of the tuberculisation. Should the patient not be able to bear this oil, recourse must be had to a general tonic treatment. Externally irritating frictions on the chest prove beneficial.

4. *Pleuritic effusion.* In stating the treatment of certain special symptoms during the stadium irritationis it was said, that pleuritic effusion is sometimes superadded during this stage, and once formed in most cases remains, unless death takes place from other causes, until recovery commences, and then requires special attention. Unfortunately such an effusion often leads sooner or later to an unhappy termination, and dissection shows it to consist of pus of a thick consistency. The great proclivity this effusion evinces to become purulent, explains clearly the difficulty art finds in reducing it. Should the quantity of the effusion be small, blisters, kept in a state of copious suppuration, will sometimes be of service; at the same time jodide of potassium is given internally, either dissolved in an infusion of cinchona or in connection or alternating with quinine. Twice I have had recourse to paracentesis, and both times with unhappy results. The mode latest used of employing injections in the cavity after the paracentesis, may possibly be executed with hopes of a more successful result.

B. From the organs of digestion.

1. *Peritonitis* may supervene as well during the stage of convalescence as when the patient seems to

have been perfectly restored to health, often without any external cause that can be discovered, but most commonly in consequence of exposure or faults in the diet. It is as well the most insiduous as the most dangerous of all the sequelæ. It is caused by a subsisting ulceration of the bowel somewhere, which, from one reason or other, does not heal but advances until it reaches peritoneum. The inflammation, generated in this way, having a decided tendency to rupture and perforation, the treatment must be of the most active kind. Exactly the same treatment as is stated in § 7, subdivision 5, for the stage of depression, would be here in all respects suitable. I, therefore, refer to what has been said there, repeating only the caution, that the treatment with opium and morphia must be employed immediately at the first sign of peritonitis, even at the risk of an uncertain diagnosis, for should it be delayed until that is perfectly decided, the treatment would, as a rule, come too late.

2. *Remaining diarrhea.* The evacuations continue often, even after recovery in other respects, to be more or less thin and watery. This may be caused by remaining ulcerations in the smaller intestines, but also by a catarrh with ulcerations or not of the larger. In the one as in the other case the increased secretions must be arrested, as soon as possible, as the progress of the recovery is retarded as long as they continue, besides the danger of peritonitis and perforation from their continuance. The strictest attention must in the first place be paid to the diet of the patient in all such cases of diarrhea. It is often caused by a fault in the

diet, still oftener kept up from such a cause. A bland food, capable of being assimilated in the stomach and upper part of the small intestines, must be ordered, as broths, gruel, jellies, &c. &c. of different kinds. Whether we consider the remaining ulcerations or a catarrh of the large intestine to be the cause of the diarrhea, oleosa and mucilaginosa must first be prescribed; I have seen much advantage from an emulsion of wax according to the following formula:

Rec. Ceræ albæ ℥ij,
Cui leni calore liquefactæ in mortario calefacto admiscentur
Gummi arab. pulv. ℥vj;
Optime contritis adduntur sensim
Decoct. Althææ calidi ℨviij,
ut f. l. a. Emulsio.
S. 1 to 2 tablespoons every other hour.

Should these remedies not prove efficient, recourse must be had to tonica and adstringentia. Of the former, first decoct of calumba, then quinine dissolved in sulphuric acid; of the latter, sugar of lead, &c. &c. of one or other kind. Sometimes it is necessary to add opium; in other cases tincture of nux vomica, 8 to 10 drops pro dosi. When the diarrhea is very obstinate and originates in the large bowel, clysters with mucilaginosa, adstringentia and opium will be of service.

I have seen, during the stage of convalescence, a bloody diarrhea, with diphteritis in the large intestine, follow on some serious fault in the diet. This may often lead to a sudden and fatal termination. At the first sign of such a state, the abdomen must be covered

with applications of warm turpentine; then we employ the cold water compresses, changed every 4:th or 6:th hour. A laxans oleosum is prescribed internally to evacuate the remaining food, then linctus oleosus or emulsio ceræ, 8 to 10 drops of tincture of opium being added each time.

3. *Atony of the digestion, or dyspepsy.* It sometimes happens that the patients show no more signs of disease, but the strength does not return, it rather decreases and the emaciation continues. Such patients have either no appetite or a loathing for food, or if they feel a desire to take food it seems, not being properly assimilated, to do no good to the system. I think this state must be ascribed to atony of the digestive power, that is, a certain degree of paralysis in the ganglionic system. The amara and tonica commonly in use are of little or no service. I found nux vomica best, in form of a tincture 8, 10 to 12 drops 4 times daily, in conjunction or not with an aromatic infusion. It also proved beneficial to allow the patient cautiously some spiced food, especially salted, and a more generous wine as Sherry, Madeira, Port &c. &c.

4. *Remaining enlargement of the spleen.* I observed more rarely the spleen to have remained enlarged more or less hard to the touch after perfect recovery. This was especially the case when there was an epidemic ague, the reigning genius epidemicus apparently showing its influence even on the typhus cases. Sometimes this enlargement of the spleen was connected with a more or less marked intermittens, sometimes without any sign of such paroxysms. In either case quinine is the surest

remedy, given in full doses when there are paroxysms, else in small.

C. From the nervous system.

1. *Tingling in the ears and deafness.* Especially after the petechial typhus form, the patients often complain, during the progress of recovery, of a painful tingling in the ears. It is sometimes strong enough to prevent sleep, and keep up a state of constant agitation and uneasiness. It is usually connected with hardness of hearing, more seldom with its reverse. This inconvenience disappears most commonly without any special treatment, when the general strength returns. In other cases it remains; I then saw the best effect from an infusion of flores arnicæ; it is made of ʒij in ℥viij, and given a tablespoon 4 times a day. Tincture of arnica is, at the same time, applied behind the ears. In cases where a greater degree of deafness subsists, which may depend on an effusion in the cavitas tympani or the inner part of the ear, generated during the preceding congestion to the head, blistering applications, frictions of irritating ointments, or real blisters behind the ears, are necessary in conjunction with infusion of arnica internally. A blister at the back of the neck I have also seen of service in such cases. Should, in spite of this, the deafness still continue, it must be treated according to the special treatment of diseases in the ear, although it must then most commonly be considered incurable.

2. *Stupidity.* After typhus cases, in which the congestion to the brain has been violent and of long

standing, a dulness of the mental faculties remains, more or less bordering on stupidity. This state may either depend on a certain paralysis of the brain, caused by the pressure, exercised on it during the preceding congestion, or on a plastic effusion between the membranes over the hemispheres. A slight degree of this mental dulness often disappears of itself when the strength returns. Should this improvement not take place, and symptoms only mark diminished action, a consequence of the pressure during the congestion, excitantia are indicated, and of these especially arnica in increasing doses. I follow under these circumstances the following method in giving arnica. First an infusion of ℥ij in ℥viij, of which 1 tablespoon is given 4 times a day; every third day the strength of the infusion is augmented by adding ℥i℔ of flowers to the same quantity of water. I go on in this way increasing the dose, but giving only 4 tablespoons daily, until nausea and vomiting occur. By this time, in some cases even before, the mental dulness of the patient has usually disappeared. To this manner of administering arnica I add the cold douche, applied rapidly on the head and spine, every or every other day, according to the degree of reaction it seems to promote. In cases, where there is reason for the belief, that the presence of an effusion is the cause of the mental dulness, the prospects of recovery are certainly dark; I have, however, even then succeeded by the application of a seton to the neck and often repeated frictions with Authenrieth's ointment on the shaved head, during the internal use of jodide of potassium dissolved in infusum florum arnicæ; ℥ij jodide of po-

tassium being added to ℥viij of an infusion prepared of ʒij flowers; of this 1 tablespoon, 4 times a day, is given. Should the patient be subject to constipation, which is commonly the case in this state, I have replaced the arnica with gratiola, by preparing the mixture in the same way of ʒij in ℥viij water with the addition of ʒij of jodide of potassium; 1 tablespoon 3 to 4 times daily.

3. *Paralysis.* Besides the paralysis stated above, § 7, subdivision 5, I have observed another kind of paralysis as one of the sequelæ of typhus petechialis. I have seen, in cases, where the congestion to the brain has been intense and of long standing, the patients sometimes at the beginning of convalescence or at the end of the stage of depression complain of a severe pain in the feet and legs. This pain is sometimes connected with hyperæsthesy of the skin, sometimes not; when it has continued a day or two it is succeeded by a feeling of numbness which gives way to weakness and palsy, the hyperæsthesy is also occasionally followed by its reverse anæsthesy. In this way a paralysis or rather a paresis is developed in the feet and legs, which I cannot explain otherwise, than that it consists in a diminished or weakened influence of the brain and spinal cord on the remotest peripheric parts. I have not seen it in any connection with a stasis in the arterial or venous system, nor have other symptoms indicated the existence of an effusion within the membranes of the brain or the cord. In order to lessen the pain and the hyperæsthesy, of which the patients usually complain very much, I have with success given opium or morphine in full doses once or twice a day, if the rest of the symptoms did not contra-

indicate its use, and applied the cold water compresses. When paresis, with anæsthesy or not, was developed and the convalescence in other respects was perfect, I have given internally nux vomica as a tincture, extract or as strychnine, together with irritating frictions of the affected parts, for instance with tincture of arnica with the addition of ammonia or tinctura nucis vomicæ.

D. From other organs.

1. *Incontinentia urinæ.* In those, which during the stage of depression had either involuntary excretion or retention of urine, the incapacity of retaining the urine now and then subsists even during the convalescence, depending on paralysis in the sphincter vesicæ. This inconvenience most commonly disappears with the returning strength, but in some cases it requires special notice. Preparations of nux vomica in conjunction with tonica, for instance cinchona and steel, are remedies I have employed. In a few cases, where I remember these remedies to have failed, the complaint has been cured, by the application of a blister to the lower part of the back and by administering in it strychnine endermetically. In women the application of nitrate of silver at the orifice of the urinary passage and its circumference is often very effective.

2. *Dropsical swellings.* Respecting the partial dropsical swellings in any of the extremities depending on obstructions in the venous system I have above, § 7, subdivision 5, stated my opinion, and refer the reader to that.

After cases of typhoid, when complicated with a severe affection of the chest or with a protracted diarrhea, or a considerable loss of blood, we often see oedema more or less considerable supervene in the legs and feet. This is caused by the general state of weakness and requires only the full application of the ordinary tonic treatment. The disappearance of the oedema is promoted by spirituous-aromatic frictions and the application of linen bandages to the affected parts. I have sometimes observed the urine albuminous during the presence of the oedema, but I have not found it require any special notice, as the albumen has disappeared, when the strength returned. Albuminous urine, to a small degree, however, may often be seen during the progress of the disease as well in the first as the second stage, owing its presence to the typhus congestion to the kidneys. On this congestion follows atony of the secreting organ; this atony and the thin state of the blood causes a part of the serum of the blood to escape with the urine, which consequently becomes albuminous. It is thus we can explain, why the albumen disappears under the administration of tonics. Should, however, the urine continue during a longer period to be more decidedly albuminous and have a low specific gravity, we must suspect the presence of Bright's disease, either preexisting or developed through the influence of the typhus process.

More rarely I observed ascites as one of the sequelæ. Its development may originate from several sources. Most common is perhaps the irritation of the peritoneum, which must be a consequence of extensive and deeply penetrating ulcerations of the intestines; in other cases its de-

velopment may be connected with preexisting diseases, which have no relation to the typhus process. In the former case the water is formed within the peritoneum slowly and by degrees, and is never in any considerable quantity; in the latter the diagnosis is decided by the nature of the preexisting diseases, for instance: in the liver, spleen, kidneys, heart, &c. &c. In the former case a cautious tonic treatment has given the best results, as the strength of the patient, by the development of this form of ascites, in consequence of the preceding obstinate diarrhea, is very much reduced. Cinchona, quinine and martialia I found most suitable, should the intestinal tube be able to bear them. The latter form must be treated, if possible, in conjunction with the diseases, to which it owes its origin.

3. *Ulcerations of the cornea.* It is of less frequent occurrence, that patients during the stage of depression, especially in the petechial form, keep their eyes constantly halfclosed, which depends on laxity in the spincter of the eyelids. The anterior parts of the eyeballs, thus to a certain extent deprived of their natural protection, and exposed to the constant action of the air and light, are kept in a state of more or less violent irritation, which is afterwards communicated to the parts of the bulbi that are still covered. Cornea and the conjunctiva become at first dry and rough; then the vessels of the conjunctiva are congested. The secretion from the conjunctiva and the glands of the tarsal borders is increased and vitiated; it becomes mucopurulent and dries up in crusts. If these are removed we find

sometimes small ulcerations on the conjunctiva most common in the circumference of the cornea.

The cornea is, however, the part which is soonest and most deeply affected. The dryness makes it dull; it takes the appearance of ground glass, and becomes afterwards in spots or all over yellowish white, from suppuration in its substance, or greyish white ash colored, when it has lost its vitality and mortification sets in. This severer kind of affection of the cornea is fortunately very rare; most commonly it is limited to a smaller part of the membrane, most often to the nether segment of it, where, after the separation of the mortified layers an ulcus remains, which may sometimes perforate, when the aqueous humor escapes and the iris prolapses. A milder degree of affection of the cornea is, however, the most common, it being softened only superficially and superficial ulcers formed. These ulcerations, of one kind or other, may remain during and after the convalescence, and consequently be reckoned to the sequelæ. Without doubt the general state of those, in which this affection takes place is for the most part so low that they die, I have, however, seen some recover. It is important to endeavor to prevent the generation of these ulcerations; in order to accomplish this object, the eyes must be covered with linen compresses dipped in tepid water or decoct of althæa, as soon as the patient seems unable to close the eyelids perfectly; these compresses must often be changed, and by some contrivance retained, should the patient try to shake them off. If nevertheless ulcerations are formed, the applications, to which spiritus camphoratus is added, are to be continued. The supra-

orbital and temporal regions are several times daily to be rubbed with spiritus rosmarini compositus, or some such tincture. The eyes must be carefully kept clean by spongings with tepid water or milk, and the tarsal borders protected by the application of oil of almonds. Should superficial or perforating ulcers be already formed on the cornea, they must, according to their position and extent, be treated in accordance with the rules laid down by ophtalmology in such cases.

The general treatment is adopted to the state of the patient according to the indications given above as he is yet in the stage of depression or in the beginning or progress of amelioration. It must be added that topical bleedings about the eyes, or topical antiphlogistic measures, are decidedly contraindicated.

4. *Increased action of the skin.* In some cases a more or less continued, copious perspiration occurs in the beginning of or during the progress of the convalescence, which, if allowed to go on, not only retards the convalescence, but also weakens the patient and consequently makes him worse. This perspiration may have existed during a longer or shorter period of the preceding disease and is then only a continuation, from the disease to the convalescence. I think it is right to class it among the sequelæ; for the patient it is a very painful affection. The sweat is clammy, viscid and gives acid reaction. All the other functions may be natural, only the urine is scanty and the bowels are usually inclined to be confined. I have seen such patients, that had a very good appetite, and satisfied it without inconvenience, rather lose than gain in strength. I also

saw that when this state was left too long to itself and allowed to continue, an almost dangerous degree of weakness and emaciation ensued. Art must consequently endeavor to stop it as soon as possible. I have found it best to allow the patient to be dressed, in order to relieve him from the warmth of the bed. To remove the sweat by means of spirituous and astringent washings, I found occasion a temporary relief to the patient, but it did not cure the affection; the perspiration is on the contrary not seldom increased after such washings. Quinine dissolved in diluted sulphuric acid, grij in 10 to 20 drops 4 times daily, I have found efficient; cases have, however, occurred, where these remedies were ineffectual. Agaricus albus has then an almost specific power, I can at least not recollect a single case, which withstood this remedy. Agaricus is given in the form of powder with sugar and in doses of 5 to 8 grains 4 times daily; the perspiration is often very soon checked and the remedy is continued until it entirely ceases. In order to convince myself of the reality of this power, I have several times desisted from its use too early, but have then often seen the perspiration again become more copious. I have also used sugar of lead in doses of grij, 4 times daily, but found it much less efficient than agaricus.

5. *Bedsores.* One of the most common causes of a protracted convalescence, is the presence of bedsores as sequelæ, especially when situated on the os sacrum or trochanteres. They alone may sooner or later cause a fatal termination, either by exhaustion from the too copious suppuration, by pyæmic infection and its conse-

quences, or by the supervention of caries in the subjacent bones. It has above been said, that the sloughing bedsores are best treated with emollient poultices from the beginning. This is continued until separation of the sloughs has taken place. I have tried different means proposed with a view of circumscribing the sloughing, but have returned to the poultices, as being the most efficient. Linseed poultices or poultices prepared of boiled carrots appeared to be the simplest and the most suitable: they must be changed 3 or 4 times a day. When the separation is either complete or has begun in some places, the separated parts must be removed as soon as possible, the ulcer washed with chlorine water or a weak solution of chloride of zinc, and the sinuses filled with plumbi quercitannas. This last remedy I think very efficient, partly in promoting fresh granulations, partly in lessening and improving the secretion, and I believe, in preventing the danger of pyæmic infection. It is prepared by precipitating a decoction of oakbark with a solution of diacetate of lead; the precipitate is washed and used wet, so that the sinuses of the ulcer is completely filled with it, whence the whole is covered with an emollient poultice. The dressing is renewed every morning and evening. Under the use of this dressing the ulcus contracts and is sooner or later healed, sooner than I have seen it heal from other modes of treatment, which have been proposed. Oleum Jecoris Aselli may also be used with advantage; the ulcus is filled with lint soaked in this oil. This dressing is changed twice daily; it is more advantageous

than plumbi quercitannas in larger ulcers and in caries in the subjacent bones.

I have now ended the exposition of my experience of the treatment of the typhus process in its different forms and varieties. When I look back on what I have written, I see very well its faults. I find how very little of what I have communicated is new, and consequently how little I have enriched the science by my work. At the present time, when the majority of treatises in medical literature regard as their chief object the precision of an exact diagnosis, as far as possible founded upon pathological anatomy, and investigation into the physiology of the morbid processes, with less and often too little attention to the special therapeutics, I have ventured to attempt a contrary way. I have supposed the diagnosis and other particulars of the disease to be known, and chiefly turned my attention to the special therapeutics. My reasons, for choosing this way, have been, that I found the descriptions, from southern countries, of the symptomatology of the different forms of the typhus process which science possesses, to be in the principal points so like what I have seen and observed in the north, that I thought it of very little use to repeat, what was so well known every where and by every physician. The statements of the special therapeutics from the different countries do not agree so well; on the contrary they are discordant in many essential points. We see not seldom a mode of treatment, stated to give

such very brilliant results in one place, in another prove less beneficial, in another, again, even unfavorable. I concluded, therefore, that it would not be without interest for science to communicate what special treatment is in use in the north, and its results, for the sake of comparison with the experience of southern countries. And this the more so, as no special and more complete treatise in this respect, founded on a more extensive experience, has of late been published in the north. I do not claim the merit of having discovered any new method or new remedies; all that I have stated has been more or less old, more or less known. The only merit, if it is one, which I venture to claim is the having endeavored to decide the special indications for the special remedies, as experience has taught me. These statements may at least serve as guides for the beginner in medical practice. I have, consequently, as is already stated in the preface, communicated my experience rather for the purpose of serving the beginner, than of instructing the experienced practitioner. I hope therefore that my exposition of the special therapeutics may be judged in accordance with this my object.