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WITH THE COMPLIMENTS OF THE AUTHOR

REMARKS

ON

Typhoid Fever in the Young.

BY

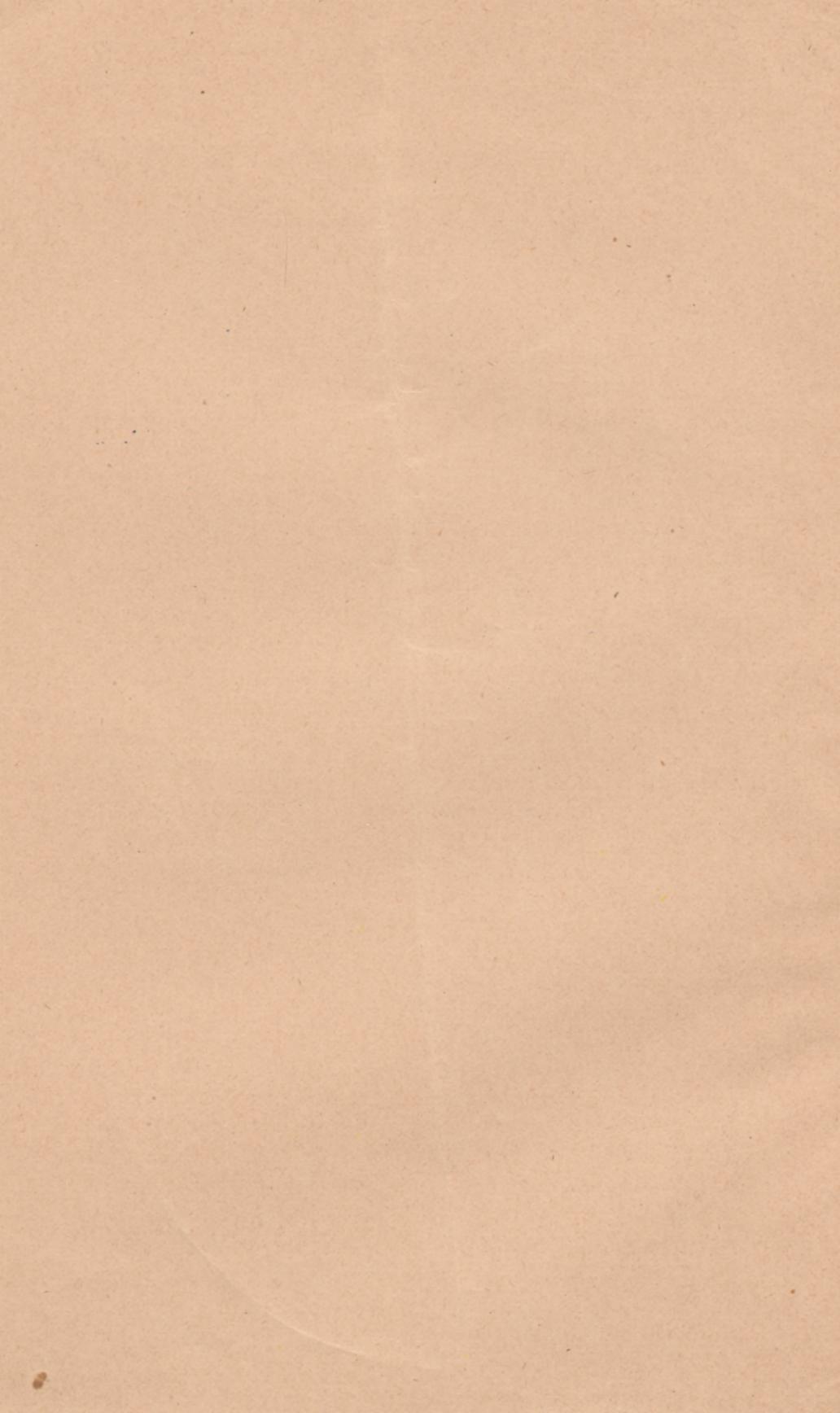
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REMARKS ON TYPHOID FEVER IN THE YOUNG.

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The number of typhoid fever cases treated in the Children's Pavilion of Bellevue Hospital, from October, 1882, to September, 1884, and recorded in the books, was 25; of these 11 were males, 14 females; 17 ran a single course, 5 had relapses, 3 were sick over a period of from 4 to 6 weeks without permitting the second attack to be distinguished from the first by an alleviation of the symptoms. In 7 cases, a distinct chill was mentioned as ushering in the sickness; in half a dozen more, several attacks of chilliness. The ages of the patients were from 2 to 14 years; the average 9. Pain in the ileo-cecal region was complained of in 14 cases; diarrhea was noticed in 15; bloody stools, not exactly hemorrhages, in 3; in 6 constipation was mentioned as a notable fact; in 6 the first week of the disease was marked with epistaxis. Tumefaction of the spleen has been noted in 16 cases; roseola was observed in 14 cases. Its first appearance took place between the

fifth and tenth days; it lasted from 5 to 10 days. Premonitory symptoms were reported in 9 cases; in 4 they lasted 2 weeks. They consisted in lassitude, loss of appetite, change of temper, and in some cases diarrhea set in a week before the initiating chill or chilliness.

Five of the cases died, one remained stupid and hard of hearing for some time, the others recovered.

In a lecture on typhoid fever published by me in the *Medical Record* (1879, Nos. 17 and 18), I insisted upon the average mildness of the typhoid fever of infancy and childhood, and pointed to the low rate of mortality as a fact. Indeed, the younger the child, the more favorable is the prognosis. How is it that our Bellevue service should have a mortality of about 20 per cent.? That the mortality rates of many authors are as high? Oesterlen estimates it at 22 per cent.; Friedrich at 23 per cent. for children under 5 years of age.

In the years 1882 and 1883, we had a great deal of typhoid fever in New York City, and severe cases. The epidemic commenced early in the autumn, many cases were imported into the city by the summer guests of the country. In those seasons, the infants and particularly the half-grown children were more seriously attacked than usually. From amongst these our Bellevue patients were mostly recruited. Besides, there is an important source of mistake in the statistics of hospitals. This mistake is occasioned by the fact that the hospitals with us do not contain the average cases, but, as a rule, those only which fare badly and promise badly. A poor family will nurse their own children while they require but little care; only that one who is seriously ill, gives a great deal of trouble, and yields a bad prognosis, is sent to the hospital. Of that class a great many will die, and thus the mortality rate of a hospital does not permit of a conclusion as to the general character of an epidemic. No stronger proof is required as to the insufficiency of statistics on the part of hospitals. The general practitioner is the better judge and statistician. He sees all the cases in a family,—those remaining at home and those

sent to a hospital,—sees the mild and the severe cases, and counts those who survive. Six cases in a family, of which one is sent to the hospital, may give the family practitioner a mortality of 16 per cent., the hospital attendant a mortality of 100.

The average severity of our cases was greater than normal in these two years. The intestinal affections in at least 15 cases were very marked. This, however, is not the rule in all years. We are justified in saying that our New York typhoid fevers do not exhibit by any means the severe diarrhea of which we hear so much in European reports. We know of many epidemics in which the peculiar stools do not make their appearance at all, or are but rare, and less characteristic; still the disease is unmistakably the same, and the morbid changes in the intestinal mucous membrane are met with at autopsies. If that be so in the adult, it is still more so in the young. The infant and young child yields but little typhoid diarrhea, indeed the most striking symptoms of the disease may be absent. The spleen may be but little swollen, meteorismus trifling, roseola absent in many instances, bronchial symptoms scarce—still the case is one of typhoid fever. Why this should be so is not easy to determine. In former times, I explained the fact by the smallness and small number of Peyer's plaques in early infancy. This portion of the lymphatic system—in contradistinction from what is known of the general activity of the lymph system in the young—is but little developed. Thus, as it yields a prominent localization of the disease, I thought that the fever became less severe in proportion to its lesser appearance in the ileo-cecal region. But Peyer's plaques are so low down in the intestinal tract that we need not fear the absorption of much poison in that place. Before the poison reaches the valve at all, its whole mass or larger portion must have been absorbed into and circulate in the blood. It is possible, therefore, that Gerhardt's theory is more correct. He refers to the fact that infants and children drink but little water, and that such as they do par-

take of is mostly boiled, and thereby made innocuous. Thus, it is possible that the typhoid poison, which may enter through either the respiratory or the digestive organs, is more or less excluded from the alimentary tract of the young, and that the gradual introduction of the poison into and through the lungs is the main road through which typhoid fever enters the organism of the infant and child. That would explain, first, why the character of the disease is so much milder in the young; second, why diarrhea is frequently missed, and constipation is apt to take its place in so many typhoid infants and children.

The local changes in the intestine are less marked than in the adult. In many cases, the region of the ileocecal valve only is affected, its redness being either dendritic or uniform; not often is the colon, also, with the exception of its upper part, in a condition of catarrhal congestion. The mucous membrane exhibits but rarely the peculiar infiltration so common in the adult. The ileum has but slight and superficial erosions; deep ulcerations are not frequent, in infancy they are but exceptional. The assumption, however, that where there are ulcerations, there must be diarrhea, is not founded on uniform facts. In Ward 28 of Bellevue Hospital, I had a patient, eight or nine years ago, a girl of eleven years, who was under our observation for typhoid fever several weeks. The case was one of unusual severity—spleen, lungs, skin, nervous system, yielding the usual symptoms; but there was no diarrhea at any time. She died with the symptoms of perforation. Perforation of one of the typhoid ulcerations was found at the autopsy. Nor is this the only case of the same description in my experience. In the proceedings of the Pathological Society ten years ago, there is mentioned the case of a man who died in my service in the Mount Sinai Hospital, with the same symptoms of perforation without any diarrhea in the course of his illness.

Even in the cases in which, in children, diarrhea may set in about the end of the first, or in the second week,

the beginning of the illness shows constipation of the bowels rather than looseness. Many, however, of the cases which form the basis of these remarks, had diarrhea as one of the first symptoms. In some, it preceded the chill or chilliness by a week or even two weeks.

The symptoms belonging to the nervous system, such as restlessness, or coma, or delirium, were marked in five or six of our cases. As a rule, however, the average typhoid of infancy or childhood enjoys great immunity. The temperature of the body in mild cases is seldom high; it ranges often between 101° and 104° . Frequently, the patient feels very easy with these elevations; indeed, it is a peculiar feature in the typhoid fever of all ages that the feelings of the patient stand in no relation to the height of the fever. There is but seldom that regularity of the temperature curve of typhoid fever of which we hear and read so much. Reading the accounts of actual or alleged temperature curves in typhoid fever, no matter whether left to themselves or under the influence of medicinal agents, is enough to make one believe that nature acts under police laws, with prohibition principles. Instead of one daily curve, we have often noticed two; instead of a morning remission we have had evening remissions; instead of a gradual increase in temperature from day to day, we had many times sudden high temperature; instead of the regular two weeks and a half or three of fever, we had a sudden relief about the end of the second week or before, and mostly in exactly those cases which commenced with very serious symptoms and great elevations of temperature. We had no tumefaction of the spleen—at least none sufficient to be diagnosticated by percussion—in several cases, an inconsiderable increase in others; in some, it is true, a considerable swelling. In some, it would decrease in the beginning of the third week; in some, too slowly for a favorable prognosis. The latter depends, to a great extent, on the condition of the spleen towards the end of the disease. When the spleen remains large, I prepare for a relapse.

Amongst the complications incidental to the typhoid fever of infants and children those located in the respiratory organs are apt to be of great importance. The bronchial catarrh attending every case is liable to develop into a mild or serious bronchitis; the latter into broncho-pneumonia. Though this may be met with in the adult, sometimes to such a degree as to give rise to gangrene, its frequency in advanced age cannot by any means be compared with the large number of cases in the young. In them it appears at an earlier period of the typhoid fever, and is more serious than the hypostasis in the lungs of the adults. Gangrene in the lungs of children suffering from typhoid fever I have seen in but a very few instances in the course of my professional life. In the young, hypostatic pneumonia is not frequent. After the age of eight or ten years it is sometimes found; at that age the typhoid fever assumes more and more the character it exhibits in more advanced age. Pulmonary edema is sometimes the termination of broncho-pneumonia in a very adynamic case. Fibrinous pneumonia is very rare. Pleurisy, when occurring, is always secondary. Parotitis is very rare indeed; so are laryngeal ulcerations; I never saw a case in a patient under ten years. Noma and cutaneous gangrene are not so frequent in typhoid fever as they are in measles. Renal affections are not frequent; some of those recorded may be accidental complications rather than the outgrowth of the infectious disease. The brain and its meninges are liable to be affected with hyperemia, as in every disease connected with a high fever of an adynamic character. I remember cases, however, in which a lowered innervation in later life had to be attributed to the meningeal and encephalic hyperemia of the fever and the non-restoration of the cell structure. Such was the one mentioned above.

The rules of general therapeutics hold good for every individual case; but they must be intelligently and conscientiously applied. The fever lasts a certain time—care must be taken that the organism is placed in a condition to resist its influence. The main dangers may arise from

the elevation of temperature, the loss of blood, the diarrhea, the insufficiency of nutrition,—this insufficiency depending on the condition of the nervous system impaired by the poison, and injured digestion,—finally the debilitated heart. If the expectative method of treatment means, as it has frequently been understood, the letting alone of the disease, it is all right; if it means letting alone the patient, it is all wrong. It is not the disease we have to look after, but the sick. It is true that three weeks will finish the disease unaided or undisturbed, as a rule, but also that a week or two may finish the patient, unaided.

To reduce high temperatures, quinia has frequently been recommended, though it has not served me well in infectious diseases. A dose of from 8 to 10 grains (gramme 0.5–0.6) may be given during the remissions. It may be used internally or hypodermically. Now and then injections into the rectum or suppositories are required or advisable when the stomach cannot be relied upon. The preparation to be used in the rectum must be one of those which are most soluble, the bisulphate, muriate, bromide, carbamide. No acid must enter the solution, large quantities of glycerine are objectionable. The rectal dose is to be at least 50 per cent. larger than that employed internally.

The internal administration is often hindered by the taste of the drug. Thirty parts of the compound known as elixir simplex cover the taste of one part of the sulphate, provided the mixture is made with each dose and not kept ready; thus, the drug is to be prescribed in the form of a powder to be mixed with the elixir when needed. Preparations of coffee, either infusion or syrup, hide the taste of quinia quite well; so does, to a certain extent, liquorice extract. The neutral tannate of quinine is tasteless, but the dose must be two and a half times as large of that of the sulphate. The muriate agrees best with an irritable stomach, the bromide with an impressionable brain. It is slow in producing cinchonism. The best preparation for hypodermic injections is the carba-

mide of quinia, which dissolves easily in five parts of water, remains in solution, and yields no deposits of quinia in the subcutaneous tissue. I have now employed it for years, exclusively, and observed serious local irritation in but one instance.

The salicylate of sodium I have often used to the exclusion of quinia. After I found that a combination of quinia and salicylate of sodium would act well in many cases of hectic fever which resisted the effect of either, I combined them for the purpose of relieving obstinate temperatures. This form of administration will but seldom be required, however. The dose for a child a year old is from 3 to 5 grains every hour or two, until 15 or 20 grains are taken.

Antipyrin I have used largely in an extensive general hospital service. In private practice, where I see cases irregularly only, my experience with it must not count. The cases I have administered it in were typhoid fever, pneumonia, hectic fever. Altogether, its effect is pleasant, fifteen or twenty-five grains given to an adult, one or twice, in intervals of from one to three hours, will reduce the temperature considerably and bring the relief expected. But the cases were not selected; good and bad cases, strong and feeble hearts gave no indications. The only question in regard to the new remedy was its antipyretic effect. This it has undoubtedly. But in some cases, the intense perspiration was a source of weakness and discomfort, and in a few where rational medication was very desirable indeed, because of the severity of the case, the rapidly increasing debility of the heart, frequent and small pulse, weakness, approaching collapse, necessitated its discontinuation, in spite of the administration of stimulants. In some instances after I discontinued antipyrin, I employed the salicylate of sodium, and, though its effect on the heart is apt to be unpleasant, sometimes, it gave better results, being better tolerated, than the antipyrin. I dare to predict that it will keep its place a little longer than kairin, which deserves the oblivion which has already overtaken it.

The best antipyretic is cold. Very few remarks may suffice in this connection. Its use has been praised and condemned, as deserves everything that is employed either properly or thoughtlessly. Most cases will do quite well with sponging, or friction with wet and cold towels. The latter plan acts both as a refrigerant and a stimulant. Cold bathing was once eulogized immensely and again abhorred, and warm bathing placed in its stead. The *rationale* of cold bathing is the cooling of the surface (that is, of fourteen square feet in the adult; proportionately in the young) with its immense surface circulation. As long as this continues to be active, new blood will come to the surface every moment, and the whole body is thereby cooled. When it is no longer active, the heart weak, the extremities cold, cold bathing is dangerous. The rule I have prescribed many years ago was this: No cold bath for cold extremities; no more cold bath when once, after it, the extremities remain cold or cool. In these cases, the surface becomes colder than before, it is true; the interior, however, warmer than it was. I have reported the case of a little child, many years ago, who was the first to teach me that lesson. A few cold baths had reduced his temperature and his tendency to convulsions. Then another appeared to be indicated. It appeared to render the required service, but the baby became convulsed. The temperature in the rectum had risen from $104\frac{1}{2}^{\circ}$ to 106° . A hot bath, instantly given, restored the external circulation, and ten minutes afterwards the temperature was below 102° . A great promoter of circulation, and thereby of radiation, from the skin, is surface warmth, and particularly warm extremities. Warming-pans ought always to be used to the feet and legs when cold is to be applied. In place of cold bathing, I have always employed cold packing, from the chest down to the thighs, the arms mostly outside the pack. Nothing is easier than to wrap a baby up into a single wet towel, which is covered by a small blanket; in a case of urgency, it is replaced by another one (spread out beforehand), every two or five minutes. From twenty to forty minutes'

packing will reduce the temperature from 106° to 101° , and below. If below, it is often necessary to warm the little body comfortably afterwards.

Now, is it always necessary to use a cold bath, or pack, or friction, or sponging, or an antipyretic medicine, in cases of typhoid fever? Is it advisable not to allow the temperature to rise above 103° , but to reduce it forcibly—such was the rule with the German clinicians—as soon as it reaches that point? Is it at all probable that the disintegration of tissues in general, which is so much dreaded, is so sure to follow every case of elevation of temperature? Do we not know that the mortality in relapsing fever, where the temperature is so very high, is but trifling? The answer in the latter instance is this: that when a period of fever has passed by, one of apyrexia follows, with recuperation; and in typhoid fever, that, when there is the usual remission in the morning, or the two decided remissions in the course of twenty-four hours, the patient is not endangered, as he would be if there was no remission. Where this takes place, a rise to 103° or 104° , which is but temporary, is of but little account, and debilitates but little.

Thus, the question whether antipyretics ought to be employed at all, or how long, is answered by the general condition. As long as this is satisfactory, and particularly as long as the heart holds out, a febrile temperature harms but little. The common sense and ripe experience of the physician has to decide in every individual case, whether or no, the heart requires strengthening or stimulation. As long as the pulse remains good, and not frequent, we need not hurry with either antipyretics or cardiac stimulants. The latter will often be more indicated than the former, and by improving the surface circulation, will reduce the temperature also. In this sense digitalis and caffein are antipyretics. In some cases they may be combined to advantage with strychnia or ammonia, or camphor, and alcohol.

From this point of view I desire that the strong recommendations of digitalis in all sorts of febrile diseases

should be judged. Even veratrum with its depressing influence on the heart has found those who praised it as *the* remedy in typhoid fever.

Is digitalis an antipyretic? There are still those who believe it to be so, on the erroneous assumption that the drug diminishes the labor of the heart, and that the alleged slower circulation is followed by diminished oxidation. Still, if it be an antipyretic, it is so for other reasons.

Digitalis can be expected to act as an antipyretic only while the arterial pressure is diminished. It must not be forgotten that in a fever this pressure may be lowered, normal, or increased. In the two latter conditions it is useless. When the pulse in a fever is frequent and small, the blood accumulating in the large veins of the interior organs, and stagnating in the visible larger veins of the surface, while a pale or cyanotic hue covers the whole integument, thus preventing the cooling of the surface (which can result from lively circulation only)—in these cases only, digitalis can be considered an antipyretic and prove useful, particularly when combined with others of the same class. But even in those cases, Traube looked for its effect in thirty-six hours only. This slowness of action makes it useless in practice in such conditions as described; a delay of thirty-six hours will usually mean the hour appointed for the funeral. In these cases, prompt action and effect are required, and larger doses than Traube was in the habit of using.

If digitalis has been recommended as a remedy—by some *the* remedy—in typhoid and scarlet fever, in measles, pleuritis, pneumonia, peritonitis, hepatitis, and rheumatism, the inference is not that the authors of such recommendations were incompetent observers, but that they published their cases when they had seen such only as had amongst their prominent and most dangerous symptoms the peculiar debility of the heart which required correction. The very fact of the self-limitation of infectious diseases renders the prognosis favorable when there are no peculiar complications. It is but necessary in many cases to guide the patients over a certain time,

and digitalis will do that when the heart is the source of danger.

In the *Archiv der Heilk.*, vol. x., 1869, there is a paper by E. Hankel on the usefulness of digitalis in enteric fever. The statement is made that the fever diminished, delirium improved, the pulse grew stronger,—complicating Bright's disease, notwithstanding,—that the gastric symptoms increased, the course of the disease lengthened, and the mortality swelled to 43.7 per cent. So the typhoid fever would have got well, it appears, if the patient had not died.

Digitalis, with its peculiar incompetencies in practice, its frequent inequality in regard to the state of its preservation, its difficult solution and absorbability, its slowness in developing its effect, and finally its cumulative and undesirably persistent action, may often be replaced by another remedy, viz., caffein. Like digitalis, it regulates the heart's action and promotes diuresis, it increases the arterial pressure, and reduces the number of contractions of the heart. Its action is more rapid than that of digitalis, because it is very soluble; but it is more evanescent, because of its speedy elimination. The latter precludes the possibility of cumulative effect, but shortens the duration of its therapeutic action. Thus, it is better when time permits, and a certain quantity only is to be administered in the course of a day, to give it in more frequent and divided doses. An adult will take from fifteen to thirty grains a day. Two or two and a half grains (0.12–0.15) every two hours is a fair dose for an adult, half or a quarter of that for a child. It may be increased to twice that quantity for the first few doses, every two, three, or four hours. Palpitations, dyspnea resulting from heart disease, pulmonary edema, insomnia, are favorably influenced by caffein; only the latter is not always reduced by it. On the contrary, I have read of cases, and have met a few myself, in which caffein produced rather than relieved insomnia. Still it is possible that the doses were too large in the individual cases. The main indications for its use are heart diseases of the class in which digitalis is recommended, besides

renal hyperemia, and nephritis complicated with cardiac affections, and cardiac debility depending on the primary or acquired muscular weakness of the heart muscle.

The stomach, the rectum, and the subcutaneous tissue tolerate and absorb it quite well. For the two first I have mostly used the citrate, in some cases the bromide. For hypodermic administration I have employed, for the last four or five months, the salicylate or benzoate of caffein and sodium, which, together with the cinnamylate, have been introduced into practice by Rossbach in the Congress for Internal Medicine held at Berlin, April, 1884. The latter salts are soluble in water in a proportion of one to two. Thus, eight or ten drops of the solution contain a powerful dose for an adult. But very lately I had an opportunity of watching its beneficial effects in a lady of fifty odd years. She is an anemic woman with an irritable stomach, and for more than twenty years a sufferer from mitral insufficiency and hypertrophy and dilatation of the right heart. She was taken with acute pneumonia and high fever. On the third day, about 3 P.M., she had a suppressed pulse of 150° , almost no radial pulse, acute pulmonary edema and cyanosis, the foam rising from both mouth and nares. She looked moribund, and I had hardly any hope of her living more than an hour. Still, I injected four grains of the salicylate of caffein and sodium into her subcutaneous tissue, and repeated the dose twenty minutes afterwards. Instead of finding her dead two hours after, she was greatly relieved, her pulmonary edema restricted to the lower lobes, her cyanosis gone, her pulse returned and 116, and her temperature fallen from 104° to 102° in consequence of the return of the surface circulation. The above dose was then repeated and was followed by a few more in the course of that night. She finally recovered, so that at present she is in her former condition. This is not the only case in which I have seen a speedy effect, both in adults and children; thus, my experience with it gives me the courage to recommend it for further experiments and more extensive administration.

I shall go no further. It is self-understood that alcoholic stimulants find their place easily. They must not be delayed until increasing debility is clear to the very beginner. Also that liquid and digestible food must be given in regular intervals, and usually more than the patient asks for. Also that bleeding from the intestinal ulcerations requires ice and compression externally, bismuth, opium, alum, lead, perchloride of iron; also ergotin in subcutaneous injections. May be that Unna's keratin capsules will in future do good in hemorrhages as well as ulcerations of the small intestines. Finally, I need not say that collapse requires speedy and powerful interference,—mostly by subcutaneous injections, if the quickest possible effect is aimed at,—of alcohol, camphor in alcohol or ether or oil, camphor and caffeine.



