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## ORIGINAL COMMUNICATIONS.

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### PUERPERAL MALARIAL FEVER.

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BY

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(With chart.)

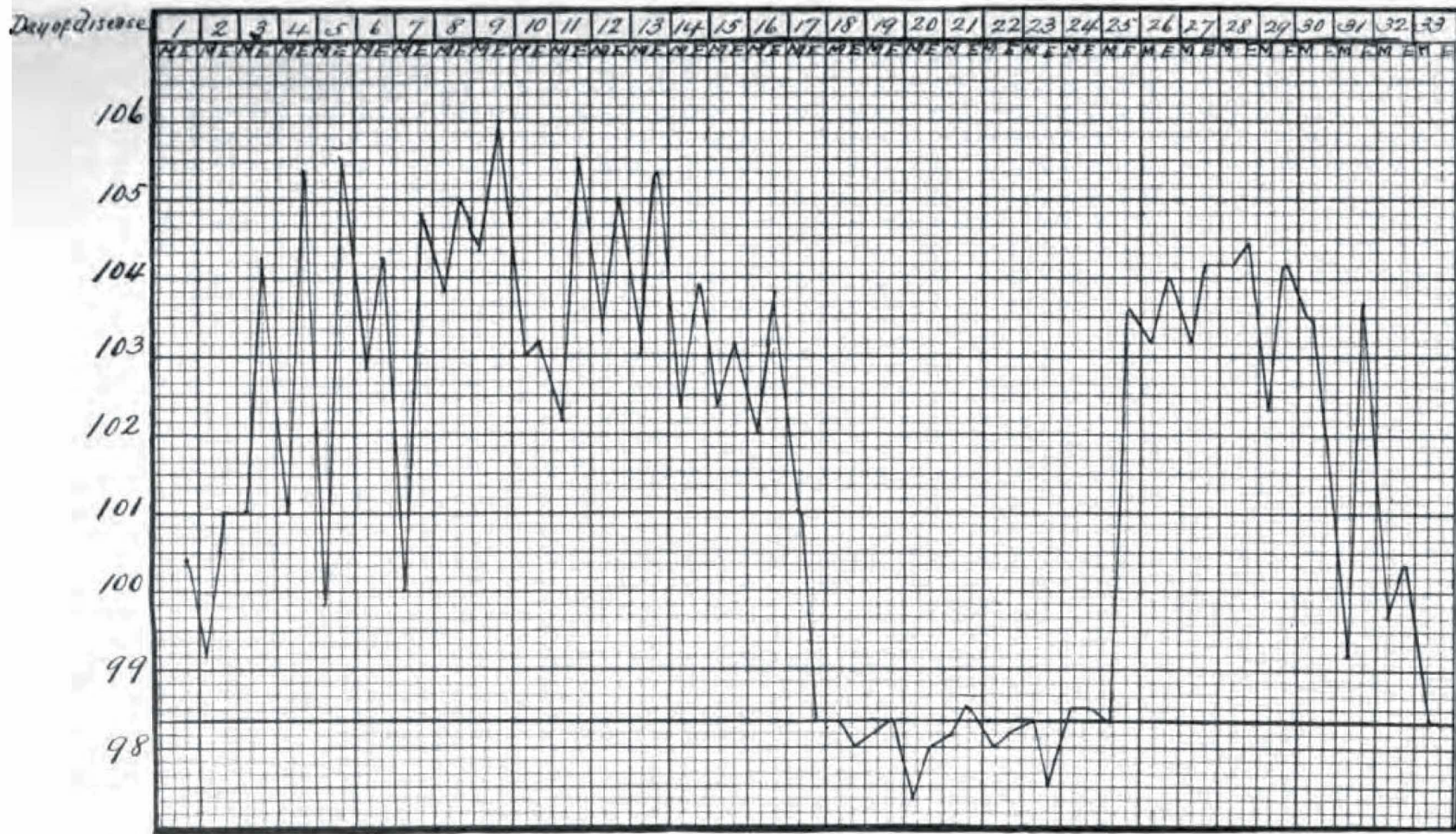
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UNDER this term I wish to describe a fever, of greater or less severity, of a continuous character, beginning soon after childbirth, and due to malarial intoxication. At once the difficulty appears of differentiating such a fever from ordinary puerperal sepsis. The danger of the error that might result has been kept carefully in mind and has, for some time, delayed my purpose of calling attention to the subject. It is far safer to treat malarial fever for septic than *vice versa*, and my fear has been that more harm than good might come from a paper directing particular attention to malarial fever complicating the puerperium. The occurrence of a severe case of the disease which caused me the greatest anxiety, and others seen in consultation more recently, have finally led me to brave the

dangers, hoping to offset them by calling attention to the careful differentiation of the two affections.

It is well known that pregnancy offers a certain immunity against the outbreak of malarial manifestations. On the other hand, the conditions existing after childbirth awaken the dormant properties of the poison. Fortunately the milder types of the disease are met with—periodical neuralgia, or fever, either intermittent in character or with marked exacerbations, having distinctive periodicity. I have observed not a small number of such cases in my hospital and private practice, but all have yielded to the free administration of quinine. During the present year eighteen per cent of the women delivered at Columbia Lying-in Hospital developed intermittent fever after childbirth. Passing over the milder and more characteristic manifestations of malarial poisoning to the graver and less distinct form of the disease occurring during the puerperal period, I will first briefly report the following case :

Mrs. X., a primipara, was delivered by forceps December 24th, 1894, after a tedious labor. She gave a history of having contracted malaria in September, 1893, while visiting in Massachusetts. The disease was of an intermittent type and promptly yielded to treatment. Again in June, 1894, she had a recurrence. She was pregnant, and the affection failed to respond to treatment so readily. The attacks were of the tertian form and persistently recurred until the latter part of September. From this time until confinement she was in excellent health. On the morning after delivery the temperature was  $99.2^{\circ}$ ; in the evening,  $101^{\circ}$ . The highest rise during the next day was  $104.3^{\circ}$ , at 4 P.M., and the following day, at 7 P.M., it reached  $105.4^{\circ}$ ; the next morning it came down to  $99.8^{\circ}$ . In the meantime the patient had been actively treated for puerperal sepsis, although there were no indications pointing to that condition other than the existence of fever. Intrauterine irrigations were administered every three hours, the vagina kept clean, and lacerations cauterized, and dusted with iodoform powder after each irrigation. There was no odor to the lochia, no sensitiveness about the pelvic organs, the uterus was undergoing involution, and the expression of the patient contraindicated a septic condition. Quinine was given in four-grain doses, increased on the second day to eight grains, and later to ten grains at a dose. The patient was very sensitive to the effect of the drug, and profound cinchonism limited pushing it further. After the fourth day the intrauterine irrigations were



Case of Mrs. X.

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discontinued, as they produced no apparent effect upon the fever. At this time the blood was examined by a competent microscopist, who reported undoubted evidence of malarial poisoning. On the sixth day, when the temperature had dropped to  $100^{\circ}$ —a lower point than for some time—fifteen grains of tartrate of urea and quinine were administered hypodermatically, and followed by forty grains of the sulphate by mouth during the succeeding night. The following day thirty grains were given from 8 A.M. to 2 P.M. No impression upon the fever resulted. On the seventh day three intrauterine douches were given, but discontinued again as no good effect was apparent. The fever was continuous, and on the ninth day reached its highest point,  $106^{\circ}$  (see chart). Blood examination made by another microscopist confirmed the result of the first examination. Microscopical examination of the uterine secretion was negative. On the twelfth day of the puerperium the uterus measured three and three-eighths inches. The patient now presented a serious condition. The continuous high temperature was telling severely on her strength. She was delirious, her tongue was dry and coated, and she presented the symptoms of a low typhoid state. Arsenic, cold sponge baths, milk, beef juice, and whiskey completed the treatment. The application of the ice cap and the hypodermatic use of morphia acted well in quieting the excited nervous state. The bowels were inclined to be constipated, and calomel triturations, sulphate of magnesia, or enemata were used to overcome it. On the evening of the fifteenth day the temperature registered  $103.8^{\circ}$ . The next morning it was normal, and remained practically so for seven days. The patient recovered rapidly and was sitting up, when, on the afternoon of the eighth day of convalescence, the temperature suddenly shot up to  $103.7^{\circ}$ . For the next three days it remained between  $103.2^{\circ}$  and  $104.5^{\circ}$ ; it then gradually abated and became normal after the seventh day. The patient experienced no further trouble and was completely restored to health, although annoyed for some months by deafness and tinnitus aurium. She has since been confined again and without complications.

The following additional cases have more recently come under my observation and will be briefly referred to.

Dr. Henderson Suter delivered Mrs. S. of her second child May 16th, 1895. Fever developed on the third day after childbirth and continued daily thereafter, with evening exacerbations reaching  $105^{\circ}$ . Intrauterine and vaginal douches were

administered daily. I saw the patient in consultation June 6th, the eighteenth day of fever. I removed with the dull curette a small quantity of decidual tissue, but there was no odor or sign of uterine infection. The uterus was then washed out with a two per cent carbolic acid solution and packed with iodoform gauze. The immediate effect of the manipulation was to increase the fever. I saw her two days later and there was no improvement in her symptoms. The continuous fever, the absence of indications of septic infection, and the general appearance of the patient led me to advise the free exhibition of quinine, and immediately the temperature fell to normal. For the next three weeks the drug was given daily, and less than thirty grains failed to prevent temporary excursions of temperature.

On October 8th, 1895, I was called in consultation to see Mrs. D. Dr. W. S. Dixon, who had charge of the case, kindly furnished me with the following history: October 2d patient had a chill, followed by the usual symptoms of malarial fever, the temperature running up to 105°. On October 6th the temperature was normal and remained so for twenty-four hours. "Labor then took place, and was remarkable only for its brevity. . . . The day after childbirth the fever returned, preceded by slight rigor. I do not remember the date you saw the patient, but temperature was still very high and the malady more resembled a remittent fever." At the time of my visit the fever was 105°. A careful local examination failing to show any cause for the condition, Dr. Dixon, at my suggestion, had a specimen of her blood examined the same afternoon, and the presence of the plasmodium was detected. Quinia in full doses brought the temperature to normal the next day. Two hundred and thirty-five grains were given during the succeeding week, and the patient made a rapid convalescence.

On June 21st, 1896, I was called in consultation by Dr. H. J. Crosson to see a woman whom he had delivered five days before, and I am indebted to him for the following notes. Her early life had been spent in a malarious section of the city and she had suffered from chills and fever. In the summer of 1895 Dr. Crosson had attended her for an attack of intermittent fever of the tertian type. She had given birth to three children. On June 16th, 1896, she was taken in labor at the eighth month of pregnancy. The first stage was tedious, lasting twenty-four hours, and the birth was terminated by forceps at the outlet. Fever developed on June 18th, and vaginal and uterine douches were administered. On June 22d I curetted

the uterus with negative result. On the 23d and 24th local antiseptic treatment failed to influence the fever. Suspecting a malarial complication, quinine was ordered and the temperature was reduced to normal in four days. Dr. Crosson reports that "the amount of quinine given was about forty grains daily for two weeks, and at no time did she seem profoundly cinchonized."

During the last month I have had under my care three cases of puerperal malarial fever. One occurred at Columbia Hospital and the temperature reached  $104^{\circ}$  the day after labor. Full doses of quinine brought it down to normal after the third day, and convalescence was uninterrupted.

The second case was briefly as follows: Mrs. S., primipara, was confined September 10th, 1896. The patient had passed the summer in Virginia, near Leesburg, and several members of the household have suffered from malaria. She herself had periodical headaches, which were cured by quinine. During the last month of pregnancy she suffered from edema of hands and feet, shortness of breath, and palpitation due to cardiac weakness. The urinary analysis had been, and continued to be, satisfactory. Rest was enjoined, stair-climbing proscribed, and strophanthus administered. Her labor progressed satisfactorily, child in L. O. A. position, until the head reached the perineum. Voluntary expulsive efforts produced cardiac distress in spite of the careful administration of ether. The pulse became intermittent and breathing labored. Fearing serious heart exhaustion, the labor was terminated by forceps. Patient did well until the twelfth day. That morning the temperature was normal; in the evening it was  $100.4^{\circ}$ . A purgative was ordered, diet restricted to liquids, and vaginal douches ordered of carbolic acid solution. The next day, September 22d, temperature at 9 A.M.  $101.2^{\circ}$ ; 6 P.M.,  $102^{\circ}$ . Local examination failed to disclose any condition to account for the fever. Involution had progressed nicely and the discharges were normal. Nevertheless, fearing the existence of sepsis, two intrauterine douches of carbolic acid solution were given, and the return fluid came away clear. September 23d: 9 A.M., temperature  $100.4^{\circ}$ ; another intrauterine douche given with negative result. At 6 P.M. temperature reached  $103.6^{\circ}$  in the axilla. Blood examination negative. Quinine administered with the following effect: At 11 P.M., temperature  $103.8^{\circ}$ , twelve grains quinine; at 3 A.M.,  $101.8^{\circ}$ , twelve grains quinine; at 7 A.M.,  $100.4^{\circ}$ , twelve grains quinine; at 1 P.M.,  $99.2^{\circ}$ , twelve grains quinine;

at 7 P.M., 98°, twelve grains quinine. Sixty grains of quinine were administered in twenty hours. Cardiac stimulants were necessary to counteract the depressing action of the drug. Eight-grain doses three times a day were ordered, but proved insufficient, as the fever returned the next evening. It reached 101°, and another blood examination made at this time revealed the malarial organism in embryonic form. Eight grains every four hours prevented a recurrence of fever, and the patient made a good convalescence.

The last case which was recently under my care is of particular interest as bearing upon the subject of diagnosis, since it was apparently one of mixed infection—that is, of septic and malarial poisoning combined. Mrs. B. was six months advanced in her first pregnancy when she commenced to discharge, without cause, what later proved to be liquor amnii. Uterine action not coming on, she was kept in bed with the hope that she was suffering from endometritis decidua catarrhalis. On the eighth day, however, labor pains set in. Examination revealed the following condition: Liquor amnii evacuated and the uterus tightly contracted on its contents; the fetus presenting by its left shoulder, head in left iliac fossa and extremities in front; the cervix not effaced, and dilatation only sufficient to insert one finger. Labor pains continued during the day with little effect. At 7 P.M. about four inches of the funis had escaped into the vagina and its pulsations were feeble. At 10 o'clock the patient was etherized, the cervix dilated manually as large as a silver dollar, and the cord was replaced. The edge of the placenta was detected low down on the left side. The uterus was contracted so firmly on the fetus I was unable at this time to produce version. The pains were much increased until 3 A.M., when they ceased. Anesthesia was again induced, and dilatation had now progressed so that I readily succeeded in bringing down a foot. The labor was terminated by uterine action and the placenta promptly expelled. Patient did well until the third day, when her temperature went up to 103°. The lochia were very free and of a sero-sanguineous character, with decided odor of putrefaction. Lacerations at the cervix and fourchette were cauterized with equal parts of iodine and carbolic acid, and intrauterine and vaginal douches of antiseptic solutions were commenced at once and kept up regularly for eight days. The local condition began promptly to improve; the return fluid bringing fewer shreds, the odor of the lochia disappeared in two or three days, and it

changed to a mucu-purulent and then mucous discharge. At first the fever improved with the improvement of the local condition, coming down in a few days to  $99.4^{\circ}$ . Finally, when the septic endometritis seemed entirely overcome, the fever pursued an erratic course, running between  $99\frac{1}{2}^{\circ}$  and  $102\frac{1}{2}^{\circ}$ . Chilly sensations were felt, and on the evening of the tenth day a distinct rigor occurred, followed by high fever and sweat in quick succession. There was no indication of pus formation or any condition to account for the paroxysm. Quinine was given and the temperature promptly fell to normal, and patient recovered without further delay. An effort was made to obtain a blood examination, but the specimens were unsatisfactory.

The reasons for considering that septic and malarial poisoning coexisted were: The difficulties of the labor and the necessary interference were such as to invite sepsis, although every precaution was exercised to prevent it. The fever, fetid lochia, and endometritis pointed to the existence of infection. By prompt and vigorous antiseptic treatment the local condition was corrected, as evidenced by the subsidence of fetid lochia and disappearance of shreds from the return fluid during irrigation. At first the temperature fell with the improvement of the local condition; then, without apparent cause, chilly sensations and erratic temperature rises were manifested. Finally a distinct paroxysm of chill, fever, and sweat occurred. That these latter symptoms were not due to extended infection or pus formation is proved by the immediate cessation of all symptoms and entire recovery of the patient after the administration of quinine.

The differential diagnosis between puerperal malarial fever and puerperal septic fever is of vital importance. The vast majority of all fever cases following childbirth is of septic character, and the great danger lies in overlooking the true cause and losing valuable time by neglect of proper local treatment. The diagnosis of malarial fever appeals strongly to the conscience of the attending physician, and it is very comforting to him to reach that conclusion, since the public is so well informed at present that the occurrence of puerperal fever carries with it an unenviable sense of responsibility. The safest course to pursue is to treat all cases of fever during the early puerperium as septic until proved to be otherwise. If the diagnosis will prove to have been incorrect no harm will have resulted from careful antiseptic local treatment. In arriving at a diagnosis the previous history of the patient and the



history of her confinement will help to throw some light on the subject. If it be ascertained that the patient had resided in a malarious section, and particularly if investigation reveals that she has been subject to attacks of intermittent fever, the possibility of a malarial complication is increased. The cases I have met with of mild and severe types of the disease emphasize the value of this observation. Also the history of a normal confinement, conducted according to strict antiseptic rules, followed by fever, would tend to confirm the same diagnosis. On the other hand, a case presenting a negative history regarding malarial exposure and no evidence of previous attacks of the disease would assist in excluding that complication, and the likelihood of sepsis would be further increased if there were a history of difficult or instrumental delivery, of adherent placenta, or of the birth of a macerated fetus.

So much for the previous history of the case. Now, to come down to the main question at issue, let us imagine ourselves face to face with a woman recently delivered and having a fever continuous in character and of doubtful etiology. Carrying out the suggestion I have already made, we will at once begin to treat her under the supposition that she is septic. The diet will be regulated and the bowels unloaded. A careful local examination will be made with the view of discovering any lacerations that may permit the entrance of poison, and if found these will be cauterized. Bimanual examination will reveal the progress of involution, the state of mobility of the uterus, and the presence or absence of inflammatory exudates and adhesions. Supposing this information to be negative, we next examine the character of the lochial secretion. Finding this normal and free from odor, we accept at least the evidence of absence of putrefactive germs and decomposing débris. The condition of the interior of the uterus may be interrogated by the dull curette, followed by antiseptic irrigation and iodoform gauze packing. So far our information is entirely negative, and if active treatment be further demanded until the true character of the attack be ascertained, repeated intrauterine irrigation with hot antiseptic solutions should be carried out. Failure to produce any impression upon the fever would add still further to the negative evidence.

Some assistance in making a diagnosis may be obtained by the attention to the development and course of the febrile disturbance. Septic fever usually begins from the third to the fifth day. Malarial fever has no regular time for its appear-

ance. It may follow the physiological rise of temperature immediately after childbirth, it may commence in twenty-four or thirty-six hours later, or it may be postponed until the second week of the puerperium. In puerperal malarial fever the temperature quickly reaches a high point,  $104^{\circ}$  or  $105^{\circ}$ ; it is subject to remissions, but as a rule it pursues a higher range than septic fever.

A valuable diagnostic sign is the appearance of the patient. There is an absence of the peculiar pinched and anxious expression of the countenance which is so common in septic fever. The difference is marked even between a case of mild septic and one of severe malarial fever. Dr. Richard C. Norris considers a proportionately low pulse rate to the temperature rise as a valuable diagnostic sign of malarial fever complicating the puerperium. In fever due to sepsis the pulse rate is relatively higher. Sensitiveness of the uterus is not uncommon in puerperal malarial fever and does not point necessarily to local infection.

Of positive evidence the greatest importance should be placed in the blood examinations. This means of differentiating malarial from septic fever is one of the most gratifying triumphs of modern science. The service of a competent microscopist should always be secured, and it is better to withhold the exhibition of quinine until the specimen of blood has been obtained. Failure to discover the plasmodium in some of its forms should not be accepted as evidence of its absence until repeated examinations have been made.

In the absence of facilities for making blood examinations, valuable aid in arriving at a diagnosis may be obtained by the administration of quinine. To secure the specific action of the drug in these cases it is necessary to give it in full doses. Fifteen grains three times a day will sometimes fail to make any impression. In two of the cases reported in this paper the course of the disease was uninterrupted by quinine and terminated only by self-limitation. This occurred in one of the cases, although profound cinchonism was kept up and the patient suffered from deafness and distressing noises in the ears for months after recovery from the fever. It is well to prescribe occasional doses of calomel during the administration of quinine.

The prophylactic treatment of puerperal malarial poisoning, whether manifested during pregnancy by periodical neuralgia or intermittent fever, is most important. Quinine and arsenic should be administered throughout the remaining period of utero-gestation.

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