tion of the great need, in this disease, even after having passed its most trying ordeal, of being very careful as to exposure for a week or more after having been discharged.

My ninth loss, case 481, was a long, lean lank Florida cracker. He was half fed, half clothed, and stayed—for he never lived in the proper sense of that word—in a cold, open, one roomed house, which was not plastered, in fact, the natives here seldom go to the trouble and expense of plastering the interior of their homes. There were six others sick in this room; he had no bed nor bedding, but lay upon the floor with his ordinary scant cotton clothing on. There was no fire in the house, nor was there a stove nor fire place wherein one could be made. The cooking was done in iron pots in the back yard by an old dried up specimen of possible humanity having some resemblance to a woman. She was smoking a strong pipe, and was, with the two pots, surrounded by dogs and children. Grits, bacon, and coffee sweetened with "long sweet"—as the natives call Florida syrup—was all they had to eat. I gave them a mattress, blankets, and a liberal supply of food from our commissary, but neither these nor medicines did any good, for he died on the third day with black vomit.

My tenth loss, case 514, had long passed middle life. He had just been on a spree, from which he had hardly sobered up when he was taken with yellow fever. He and John Barleycorn were great personal friends—too great, in fact, to successfully combat Bronze John; for it is a notorious certainty that the tippling class of patients have seldom withstood the ravages of this disease during this epidemic. He had been sick three days when I first saw him. He was frightened, fearing he had yellow fever, for too well he knew that many who imbibed alcoholics had already died. His pulse was 70, temperature 102½ F., enlarged white furred tongue, eyes and skin yellow, bowels constipated, urine scanty, highly albuminous and of a dark brown color. His stomach was in a wretched condition and would retain nothing; hence, no medicine acted to retard the progress of his case to a fatal issue with black vomit. This patient in his mad frenzy grabbed a butcher's knife from an adjoining table and rushed at his nurse, but fell dead upon the floor. He did not reach her with the knife, but as she fled he covered the whole back part of her dress with his black vomit.

My eleventh loss, case 516, was an Italian woman. She could not speak English, nor could I speak Italian. No interpreter was to be had. Her husband and I tried pantomime for directions as to the giving of medicines and proper nursing. We failed. She chewed up my thermometer, and died with black vomit.

To show the portability of yellow fever germs I will cite the case of Mr. S. J. Dugan. He is an intelligent Arab-native of Jerusalem, Palestine—who had spent two winters in Florida. He left Jacksonville, May 20, 1888. Was ten days en route to Lawrence, Mass., there he remained three weeks. Then he went to New Hampshire, remained one week, and on July 1, 1888, arrived at his summer home, Block Island. He was then in excellent health. On July 2, 1888, he opened a lot of shells, alligators, and other Florida curiosities, which had been sent him by rail from Jacksonville, Fla. On July 6, 1888, he was taken sick with a genuine case of yellow fever. He says he had black vomit for four days, and in conversa-

tion April 14, 1889, he gave me all the usual symptoms of yellow fever, besides, that was the diagnosis of the Portuguese physician who attended him at Block Island. His physician had been conversant with yellow fever in South America, and also in Mexico, hence there can be no doubt that the boxes of curios shipped from Jacksonville, carried the disease to Block Island.

There is a peculiarity about the contagiousness of yellow fever which is unique. People living at Pablo, and in the country, came to Jacksonville with impunity, if they did not enter town during, or remain in after the dew period. This was from 9 A.M., to 4 P.M. As an exemption case, I will cite the last case of the epidemic, my 594th. During over two months he came to Jacksonville every day from his dairy farm five miles distant. He came at 9 A.M., left before 4 P.M., except one night he did not get out of the city until 8 P.M. Two days subsequently he had an attack of yellow fever—from which luckily he recovered.

43 Julia Street.

THE NERVOUS ELEMENT IN THE VOMITING OF PREGNANCY.

Read before the Chicago Medical Society.

BY L. HARRISON METTLER, A.M., M.D.,
OF CHICAGO, ILL.

Mr. President and Fellow-Members:

In presenting this paper I do not hope to advance any radically new ideas, but rather to emphasize certain facts in regard to the nervous element in the vomiting of pregnancy which seem to have been indifferently considered throughout the voluminous literature upon the subject. It is surprising, as well as unfortunate, that so many physicians look upon the vomiting of pregnancy as a trifling matter. One writer says "that although the morning sickness sometimes persists during the whole period of pregnancy, it remains endurable, causing the patient annoyance rather than injury. The digestive functions remain more or less normal, and the vitality of the patient is not essentially impaired." Such has not been the result of my own observation. The distress alone, in even the mildest cases, is a constant tax upon the woman's nerves, and as a result she is less able to endure parturition than she otherwise would have been. After careful inquiry I find that women who suffer from much morning sickness have, as a rule, tedious or otherwise troublesome labors. I have even observed in multiparæ that at one time they will have much nausea and vomiting, followed by difficult labor, while at another time they will be quite free from the vomiting, and will pass through the succeeding labor with comparative ease. I confess that I have never had the simplest case of morning sickness that did not give me a certain amount of anxiety. Not only do I fear its becoming uncontrollable at almost any time, but I anticipate a confinement more or less troublesome, in proportion to the amount and duration of the nausea and vomiting. Remembering how readily the mild forms sometimes assume the pernicious type, and how frequently fatal the latter appear to be, it would seem that this indifference to the subject is entirely inexcusable.

As an illustration of the contradictory state in which our knowledge of the vomiting of pregnancy

still remains, the writer just referred to describes the benign and malignant characters of the affection in almost the same paragraph, and then asserts that "even the graver forms of this disease yield, as a rule, to rational treatment, unless they are complicated by serious pathological conditions which of themselves render recovery impossible. Pregnancy may aggravate such cases, and perhaps hasten death, but it must be admitted that there exists no causative relation between gestation and the lethal issue." I am at a loss to understand why such cases are denominated the vomiting of pregnancy any more than the vomiting of chronic lead poisoning or of brain tumor should be so called if these happened to complicate the pregnant state.

Gueniot declares,¹ rather dogmatically, that "one thing is positively known and incontestable, namely, that the pregnancy is the prime cause of the incoercible vomiting, since without it the vomiting does not occur," and that according to his own "observation, as well as study of the cases reported up to the present time, the most frequent cause is a morbid or abnormal state of the uterus." Then, as a kind of proof to this assertion, he cites a case that he saw "a dozen years ago" in which the cervix, strongly flexed, was crushed down by the weight of the superincumbent body upon the floor of the perineum. The relief of this state of affairs resulted, of course, in the disappearance of the vomiting. Again I question whether such a case ought properly to be considered an example of the vomiting of pregnancy. The pregnancy had about as much to do with the development of the vomiting as sitting upon damp ground has to do with the production of the vomiting which usually accompanies the resultant dysmenorrhœa. Let us be precise in our distinctions and not credit normal physiological processes with symptoms that belong to gross pathological lesions.

Certain authorities, notably the American System of Obstetrics, go so far as even to apply the adjective *physiological* to the vomiting of pregnancy. Now, vomiting is never a physiological process in man—a statement in which I am supported by Flint, in the last edition of his *Human Physiology*. The fact that it occurs in some pregnant women and not in others; that temperament, nationality, and climate manifest an extraordinary influence upon it, and that it not only accompanies pregnancy, but many very dissimilar affections of other organs and parts of the body, seems to my mind to protest most vehemently against its ever being called a physiological phenomenon. It is emphatically pathological, and the failure to regard it so will occasionally end to the disaster of the patient, and at all times to its incomplete scientific investigation.

Pregnancy, on the other hand, is a physiological process, and if normal in a normally healthy woman is hardly conceivable as the cause *per se* of so forlorn a condition as is the frequent vomiting. A normal physiological process ought rationally never to produce a pathological state. The usual absence of vomiting of pregnancy amongst barbarous women, and amongst races and nationalities possessing strong physical constitutions, tends to confirm this. From such a rigid standpoint, then, we must cease to believe that pregnancy is the prime source, though we may still regard it as the inciting cause when certain pathological conditions are present. We must look

elsewhere for the real cause than merely at the developing ovum within the uterus, and in doing so we must look for and expect to find some lesion, organic or functional, if you please, but one decidedly of a pathological character. I do not consider this a mere quibble about terms, but as a necessary and unavoidable hypothesis for the further study and right understanding of this much confused subject.

It would be time wasted to attempt to enumerate all the etiological reasons that have been given by different writers for the vomiting of pregnancy. In a kind of despair at ever finding any one cause for so variable and uncertain an affection, most authors have come to the conclusion that it is the result of many causes operating together. Perhaps that is the safest view to adopt in accordance with our present knowledge, but it ought not thereby to limit further investigation, for undoubtedly there is a cause which is preëminent above all others, and which is common to a greater or less degree to all cases alike. It seems to me that that is to be found in the nervous system.

Consider for a moment the explanations given by some of the authorities, and note how they bear upon this hypothesis. The oldest view is that the morning sickness of pregnancy is purely and simply a reflex phenomenon. This is most plausible, as many other affections of the genital organs, as well as of other parts of the body, give rise to sympathetic vomiting. A modification of this old view is that lately proposed by Dr. James Oliver² to suit the modern theory of evolution. He infers a hereditary interaction between the centers that preside over nutrition and procreation. This has been transmitted from primordial ancestors in which self-preservation, represented by the two elementary functions of self-nutrition and propagation of the species, is the chief end of existence. This is certainly ingenious, but quite unnecessary to explain so common a phenomenon as reflex action. The argument, however, points most decidedly to a nervous cause of the trouble, and it needs only to be added that the weaker or more irritable the reflex centers the more violent and uncontrollable will be the vomiting. According to this explanation, however, the vomiting is not essentially the vomiting of pregnancy, any more than the vomiting which accompanies biliary or renal calculi, cerebral or medullary diseases, intestinal obstruction, certain mental emotions, and perverted sensibilities is the normal physiological accompaniment of these affections. It is a nervous vomiting simply, and a coincident symptom of pregnancy, indicating an abnormal state of the nervous system, incapable of resisting the strain exerted upon it by a normal process. Nay, more, just as the above-named diseases cause vomiting by reason of an underlying pathological condition, so *vice versa* it would seem that the so-called vomiting of pregnancy must after all be the result of some concealed lesion.

Dr. Blume,³ of Allegheny, reiterates this view when he says that the vomiting of pregnancy "is almost universally accepted to be a reflex neurosis originating in the uterus and dependent either upon pregnancy alone, or upon coexistent pathological conditions." Such a conception of the etiology does not seem to me broad enough. Would the healthy nervous system, in the absence of any uterine or gastrointestinal lesions, cause vomiting with the pregnancy

² British Medical Journal, 1887.

³ Journal of American Medical Association, August 22, 1891.

¹ Bulletin de L'Academie de Medecine, Sept. 17, 1889.

of one woman and not with that of another? Is it reasonable to suppose that a normal physiological process like pregnancy should, under the same conditions, give rise to severe vomiting in a woman with some of her pregnancies and not with others? The morning sickness is undoubtedly a reflex neurosis, dependent sometimes upon a gross discoverable lesion, but more often not. We must conclude, therefore, that in this latter class of cases the principal source of the trouble resides somewhere within the nervous apparatus.

To say that the relief universally afforded by the induction of abortion is proof positive of the uterine origin of the disease, irrespective of the nervous system, is fallacious reasoning. In the first place, abortion does not always give relief. Flaischlen⁴ reports five cases of pernicious vomiting, in which induced abortion gave prompt relief in two of the cases, while two died in spite of this procedure. In the second place, abortion affords relief much as the amputation of a limb would for a painful neuroma. It is a most heroic and rarely needed therapeutic measure. It proves nothing in regard to the etiology of the trouble, since it is too overwhelming in its effects for us to derive any delicate inferences from.

Dr. Blume relates an instance of the death of a fœtus in utero with immediate cessation of the vomiting, and the delivery of the dead fœtus four months later. He says that there was a double laceration of the cervix, ectropion, and a partially cured endometritis, and yet the vomiting ceased immediately upon the death of the fœtus. He infers, therefore, that the influence of the growing ovum and the stretching of the uterine fibers must have been the cause of the vomiting. I fail to see the force of the argument. It is a familiar fact that the vomiting of gestation often terminates abruptly without there being any satisfactory explanation, other than some sudden and profound impression made upon the nervous system. Such freaksome phenomena are chiefly characteristic of the neuroses; and such cases as the above are too rare and too uncertain to establish any corollaries upon.

Again the same author, like many others, accounts for the greater frequency of the affection in primigravidae to the "greater resistance of the vaginal uterus," a fact much more difficult to prove, and less frequently true, than the fact that in primigravidae the nervous system is always more or less overwrought, because of the young wife's lack of experience, dread of parturition, and sudden change from a non-bearing to a child-bearing woman.

Gueniot⁵ divides the causes of the vomiting of pregnancy into those of the uterus, the nervous system, and the stomach. He then briefly delineates the particular lesions found in each. In connection with the uterus he notes that the morning sickness is often associated with flexions of the neck and body, tumors, inflammatory and ulcerative conditions of the cervix, hyperæsthesia of the genital tract, chronic and subacute inflammation of the uterine parietes and appendages, disease of the ovum itself, and not unfrequently the absence of all evidences of uterine trouble. This is a formidable array of causes to originate so common, so uniform, and regular a trouble as the vomiting of pregnancy. As eccentric irritants, we can conceive how occasionally these vari-

ous lesions, when complicated with pregnancy, may give rise to pernicious vomiting; but when we remember how often women, both pregnant and non-pregnant, suffer from these troubles, yet experience no morning sickness, or, at least, a very mild form of it; and again, when we remember that when these causes are present the vomiting bears no direct proportion in its severity to the severity of the lesions, we feel obliged to look elsewhere for the real source of the trouble, and to regard these merely as possible and occasional exciting causes.

For the relief of the vomiting Gueniot very justly recommends the usual gynecological treatment of these lesions. The question naturally suggests itself here, however, if these had been treated and cured prior to the pregnancy, would the patient have been free from morning sickness during her next gestation? Many reported cases seem to indicate a negative answer; the one previously related from the experience of Dr. Blume is an instance in point. Women who are perfectly free from all uterine disease, as well as women who have been cured of the same are occasionally the victims of most pernicious vomiting. Hence, we must eliminate lesions of the uterus and its appendages from among the true causes of the essential vomiting of pregnancy. How shall we account, then, for the relief which commonly follows the treatment of these lesions? First by the removal of the complication, and secondly by the impression made upon the nervous system. Gueniot himself recommends in the non-operative treatment of the uterine lesions to which he attributes the uncontrollable vomiting, such drugs as belladonna, cocaine, and morphine. Dilatation of the cervix might justly be classed under the same therapeutic head, for it acts upon the nerves much as it does in the relief of vaginismus. The treatment for the vomiting of pregnancy then, when it is associated with uterine lesions, is, after the removal of these complications, largely a treatment of the nervous system; but these cases are only a small part of those affected with the morning sickness.

In his second class of causes, Gueniot discusses the reflex centres of the nervous apparatus. It is to be regretted, he says, that physiology has not yet settled upon the particular location of the vomiting centre within the medulla; but that is not an important desideratum so long as we know approximately where to make the appropriate topical applications. According to some the reflex trouble is all in one spot, somewhere beneath the calamus scriptorius. Others believe that the fault is in the pelvic plexus of the ganglionic nerves. A few think the whole spinal cord is the hypersensitive area, while still others attribute the hyperæsthesia solely to the terminal nerves within the uterus. A writer for the *Lancet* says that during twenty years he has never failed to check completely all forms of the vomiting of pregnancy by a single vesication over the fourth and fifth dorsal vertebræ. The whole question as to the nervous seat of the trouble seems deluged with confusion. The variety of therapeutic measures employed to suppress this nervous reflex indicates the same sort of complexity. The internal administration of chloral and the bromides, the hypodermatic use of morphine, ice bags, and blisters, the ether spray, and the electric current have all been tried with variable success. One woman was completely relieved of an incoercible vomiting by a simple vaginal exam-

⁴ Zeitschrift für Geburtshilfe und Gynäkologie, Band xx., Heft 1.

⁵ Loc. cit.

ination. She imagined that the ovum had been removed from the uterus, and though nothing had actually been done, when she recovered from the anæsthesia, there was no further return of the nausea. In the words of the writer for the *Annual of the Medical Sciences*, of 1888, "the result in this case led Chazan to the very probable hypothesis that in many cases of the disease it is dependent upon a general malady of the nervous system or upon psychical disorders, and not the result of an anomaly of the genital organs. The hypothesis embodies more truth than many of those which have been suggested in explanation of the obstinate vomiting of pregnancy and suggests that regard for the general condition of these patients is all important, and that frequently a profound mental impression may be more efficient than any of the alleged specifics for the disorder."

Gueniot's third class of causes, those of the alimentary canal, are commonly enough encountered and are so reasonable as to need but a passing word. Gastric ulcer, gastritis, chronic gastric catarrh, neuralgia of the stomach and constipation are so generally accompanied with vomiting that the advent of pregnancy along with any one of them, is scarcely ground enough for denominating the sickness the *vomiting of pregnancy*. The association of the vomiting and pregnancy may have been a mere coincidence, or the alimentary lesion may have been merely an eccentric irritant to an already disordered nervous system. These lesions, like those of the uterus, are far too varied in character, too dissimilar in different patients and too unfrequent to be assigned as important causes for the frequent, uniform and singularly physiological-like phenomenon of the essential vomiting of pregnancy. Like the uterine lesions they need treatment, of course, as complications. The remedies usually employed by the mouth, and as a rule, they are very few in number, exercise a sedative or stimulative action upon the terminal nervous apparatus of the stomach, and through it upon the general central system. Gueniot substitutes alkaline for all acid drinks, applies fly blisters to the epigastrium and administers laxatives freely.

In connection with these uterine and gastric causes, permit me to quote a very pertinent remark of Horrocks. He says "where there has been no post-mortem examination in a fatal case of vomiting, I do not think that one is entitled to say that pregnancy caused the fatal vomiting. It may have been the cause and the only cause, or it may have been an aggravation of some other cause, or it may have had nothing to do with it. Skepticism as to the alleged frequency of this disorder, in the present state of our knowledge is accordingly eminently in order."

In an exhaustive paper on the subject Horwitz, of St. Petersburg, adopts the term "*vomitus gravidarum perniciosus*," and draws a sharp distinction between this form of the trouble, which he says usually occurs between the tenth and eleventh weeks, and the mild morning sickness, which commonly makes its appearance in the early part of the pregnancy. Gueniot on the other hand asserts that "there is no difference between the ordinary morning sickness and uncontrollable vomiting, but a difference of degree."

I believe that it is in the uncontrollable cases generally that some complicating lesion, such as those enumerated, will be found, but I do not feel that we are warranted in calling such cases the *vomiting of pregnancy*, as we do those where no cause can be dis-

cerned save the simple aggravation of a perverted nervous system by gestation.

It seems then that it is the nervous system which is really at fault in the true, uncomplicated vomiting of pregnancy. In the majority of the reported cases the patient has been of a decidedly neurotic temperament, or else the victim of some particular form of nervous debility. My own experience confirms this. Excepting a few cases in which there was a complicating stomach or uterine disorder, I cannot recall one under my own observation in which the vomiting did not show a severity, more or less proportionate to the amount of nervous debility. As Ranney remarks,⁶ the *vomiting of pregnancy* is essentially a nervous vomiting and is comparable to that which accompanies chlorosis, hysteria, and gastrodynia. "It is not to be confounded with that of local diseases of the stomach or of the alimentary canal, since the symptom depends purely and exclusively upon some abnormal condition of the nerves, rather than upon pathological changes in the stomach or intestine."

So decidedly neurotic in its origin is this form of vomiting that Flint speaks of a chronic variety of dyspepsia frequently occurring in young girls, due to a vitiated nervous system, that is hard to differentiate at times from the vomiting of pregnancy.

The group of remedies possessing the endorsement of the highest authorities, and found more frequently to relieve the morning sickness, are the nerve tonics and sedatives. Opium, chloral, the bromides, nuxvomica, belladonna, cocaine, arsenic, external application of heat and cold, vesication and electricity are more commonly employed than anything else. In very many cases the vomiting does not return after the withdrawal of the remedy, a fact which proves that the nervous system had been somehow profoundly affected, and that the vomiting was therefore not due solely to a uterine or gastro-intestinal lesion.

There is normally a double force exercised by the nervous elements. One is a kind of objective force, and is seen in all the ordinary manifestations of nervous activity. The other is more of a subjective force, and is indicated in the popular phrase, "power of self-control." When there is perfect equilibrium between these two forces so that the individual is unconscious of discomfort, while to others he appears at perfect ease, the state in regard to the normal nervous system at least may be characterized as one of perfect health. Such perfect health, however, is rare under our modern civilization with its high nervous tension, caused by sharp competition and an excessively emotional mode of life. The delicately organized nervous system is the first to feel the strain, the normal equilibrium between its elaborating and resisting powers is disturbed, and the patient soon succumbs to a state of abnormal stupor or irritability. Neurasthenia is the modern term to describe this condition. It can scarcely be called a disease, and yet it is far from being a state of health. It is simply exhaustion, deterioration, lowered vitality. It indicates a need of tonic treatment, but treatment of the most diverse sort for different patients. When such a patient becomes pregnant, the whole nervous apparatus manifests an unusual sensitiveness to the physiological change, and together with a host of other symptoms, reveals it by an abnormal action of the alimentary canal. If, in addition to gestation,

⁶ Applied Anatomy of the Nervous System, Second Edition, p. 504.

there be any lesions of the uterus or stomach, the effect upon the debilitated nervous system will be all the more pronounced. This, it seems to me, is the true cause of the vomiting of pregnancy, and, at the same time, the true explanation why long standing troubles of the uterus and stomach give rise to an obstinate vomiting when the woman becomes pregnant, though previously they caused her not the slightest uneasiness.

This conception of the origin of the vomiting of pregnancy discountenances the notion of its being dependent upon any one centre in the medulla. The genital and nutritive centres may be closely united and there may indeed be a special vomiting nucleus. These may all, or each, be affected along with the whole of the nervous system, but both reason, and the results of treatment, argue that only in a small number of cases is the vomiting due solely to such centres, if at all. Indeed, the act of vomiting seems rather to be the result of a lack of proper coördination between widely separated parts of the nervous system. This is shown by its presence in so many, and such diverse states of disease. At times it is purely mental in its origin, at others it is distinctively due to some organic lesion. Even in health any unusual change of environment or abrupt alteration in the organism itself will cause more or less vertigo, with nausea and vomiting. Such cannot possibly be the result of a defect in one small spot of the cerebro-spinal axis, as I have already shown in a paper with report of a case of aural vertigo, read before the Philadelphia Neurological Society, and published together with the discussion in *The Journal of Nervous and Mental Disease*, for January, 1891.

On this subject let me quote Mills,⁷ who represents the most advanced school of physiologists. He says, "the vomiting centre is usually located in the medulla, and is represented as working in concert with the respiratory centre. But when we consider that there is usually an increased flow of saliva, and other phenomena involving additional central nervous influence, we see reason to believe in coördinated action implying the use of parts of the central nervous system not so closely connected anatomically as the respiratory and vomiting centres are assumed to be. Indeed, it does not seem probable that the doctrine of centres in its present form, especially with such precise limitations anatomically and physiologically, will continue to be maintained. We seem to have been overlooking the connection of parts, while occupied with defining their limits."

When this power of coördination is disturbed or weakened by a general nervous debility, vomiting will be excited by the most insignificant causes. This is the reason, I believe, that pregnancy, a normal physiological process, and a condition to which a healthy, well-developed woman is frequently and successively liable, during the best part of her life time, causes such distress, and such an unnatural pathological condition as the so-called vomiting of pregnancy.

In conclusion, let me reaffirm that the simple, uncomplicated vomiting of pregnancy is a nervous disease, a neurosis, if you please, dependent upon an aggravation of a debilitated nervous system. The vomiting due to gross uterine or gastro-intestinal lesions, complicating pregnancy, ought not, for the sake of scientific accuracy, be classed as the vomit-

ing of pregnancy. Such should be regarded as special diseases and so treated. By the adoption of such a strict criterion, much of the confusion now surrounding the whole subject will be cleared up by the segregation of that class of cases in which no discernable lesion is the cause of the vomiting, but in which it will be found that the nervous system is chiefly at fault and needs the appropriate general treatment.

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INTRACRANIAL CLOT FROM INJURY WITHOUT FRACTURE OF THE SKULL.

BY C. E. RUTH, M.D.,
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Case 1.—May 9, 1891, Dr. C. W. Battey requested me to see L. G., aged 5 years, in consultation with him. Four days previously she had fallen fifteen and a half feet, striking her head on a plank sidewalk. She was picked up unconscious, but remained so only for a few moments. Physicians who examined her immediately found no fracture, depressed bone, or other evidence of serious injury.

Since the fall she had had no opiate or sedative of any kind, yet had no pain, ate well, bowels open, and slept eighteen hours in twenty-four; answered questions correctly, but hesitatingly; protruded and retracted the tongue like a typhoid patient. Sensation and muscular coördination was perfect. Temperature 99½° F., pulse 72. There was great discoloration of all the palpebral and ocular tissues, with sufficient œdema to completely close the right eye and prevent inspection of the right pupil. Left pupil responded readily to light. The discoloration extended over a considerable part of the right temple. There was a small, flat circumscribed swelling over the left parietal bone, 1½-inch to the left of the bregma, and limited anteriorly by the fronto-parietal suture. The extravasation of blood into the ocular, palpebral, and temporal tissues was not due to direct contusion of the parts, but to laceration of vessels deeply placed in the orbital cavity, with possibly fracture of the horizontal portion of the frontal bone, due to transmission of force from the superior portion of the cranial vault. At least, such was my opinion, and the subsequent history proved its correctness, in part, at least. There was no solution of continuity in the integument, and I could find no disturbance in the normal relations of any osseous tissue. I diagnosed intracranial clot, and gave an unfavorable prognosis unless it could be removed, but was not certain whether it was located under the small parietal swelling, where I believed the impact occurred, or at the floor of the anterior frontal lobe on the right side. Deciding in favor of the former, I cut down on the enlargement and turned out a clot which had formed under the pericranium, and dissected it from the bone over a space as large as a silver dollar. Removing a disc ½-inch in diameter from the center of the pericranial denudation, directly over the course of the anterior branch of the middle meningeal artery, brought another clot into view.

This second clot was dark and grumous, 1½ of an inch in thickness in the middle, and about one inch in diameter. It had formed between the dura mater and parietal bone. The artery bifurcated just before reaching the lower edge of the trephine disc, and both branches had plainly grooved the bone. In the

⁷ Text-book of Animal Physiology by Wesley Mills. D. Appleton & Co., 1889, p. 340.