from increased warmth, the vessels on the surface were relaxed. A comparison of the pulsations of each trace points to the greater rapidity of the circulation under influences which facilitate the passage of the blood.

The force of the pulse is indicated by the height of the pulsations. The greater the elevation of the lever, the greater the energy of the pulse-beat; and we may say that, in many cases, the strength of the ventricular contraction is expressed by the force of the pulse. This law, however, has many exceptions; and we find that the altitude of the pulse-trace depends on several other conditions.

1. The volume of the artery influences much the amplitude of the trace. This can be well seen in traces collected from old persons. In senile changes, the volume of the vessels is increased considerably, and the trace betrays great fulness. Marey believes this to be due, not solely to the hypertrophy of the ventricle which exists in the old, but also to the dilatation of the artery. (Vide trace, Fig. 5.)

2. The state of arterial tension modifies greatly the force of the pulse; and, as the tension is dependent on the state of the capillary circulation, it may be said that in most cases "the force of the pulse is not in relation with the energy of the ventricular systole, but that it is regulated by the state of the circulation in the ultimate ramifications of the vascular system." (Marey, op. cit., p. 236.) By means of the manometer, in a great number of experiments, this law has been found to hold good; a feeble state of arterial tension giving to the finger and the instrument the sensation of increased amplitude. Marey, by means of the following diagrams (Figs. 10 and 11), illustrates this very well.

![Figure 10](image1.png)

The first shows the form of pulsation in a state of feeble tension; the second, under a state of strong tension. The difference in the amplitude of the traces is very distinct. In the state of feeble tension, or easy passage of the blood onwards, the lever falls quickly to the point of least tension, and is elevated considerably at each pulsation. In the case of difficult passage of the blood through the capillaries, and consequently of great arterial tension, the lever descends slowly by a line convex upwards; and, long before it has reached a minimum tension equal to that in the former case, the lever is raised slightly by the next pulsation. While the lines of the maxima of arterial tension are the same in both cases, the lines of the minima are very different. On this depends the amplitude of the pulse-trace.

3. The duration of the interval which separates the pulsations has also a distinct influence on the amplitude of the trace. This is due to the fact that, during a long interval, the blood flowing continually onward lessens the pressure in the ves-
by a gradual defervescence (leysis), not by a sudden crisis, as in typhus. In mild cases, the fever lasts from three to four weeks; in severe, from four and a half to ten weeks.

Typhoid fever is not present, if, on the evening of the first or second day of the disease, the temperature be 104 deg.; if the evening temperature does not rise to 103.5 deg., but on the fourth and sixth days; if, in the second half of the first week, the evening temperature decrease considerably; lastly, if, between the eighth and eleventh days, the temperature be below 103 deg.

As an illustration of the truth of the first proposition, I give the succeeding case. A woman, in a ward of the hospital, had just entered on a fever, in which there were two cases of typhoid fever, had one evening an attack of rigors. Her temperature was 102 deg.; on the morning of the next day, 103 deg.; in the evening, 105 deg. The symptoms in all other respects resembled those of ineipant typhoid. The woman was much alarmed, for a patient had just died of typhoid fever.

The existence of a temperature of 105 deg. in the evening of the second day enabled her to be assured that she was not threatened with that disease. This prognosis was proved to be correct by the symptoms developing shortly into those of erysipelas.

The next case is an example of the value of the second proposition. A woman, aged 21, was admitted on January 15th, 1866, with symptoms of impending typhoid. The attack began with rigors on the evening of the 11th. She had great abdominal tenderness, a hot dry skin, pains in the limbs, muscular tremors, and one or two suspicious spocks on the skin of the chest. Nevertheless, because the temperature did not on any evening rise to 103 deg., and a marked decrease of temperature occurred on the evening of the 18th, the disease was pronounced not to be typhoid. On the 20th, she was quite well.

The next case illustrates the last proposition. A man, aged 40, living in a locality in which typhoid had lately been rife, who had had rigors, followed by diarrhoea and pains in the limbs, a week previous to his admission, was found to have a typhoid tongue, frontal headache, diarrhoea, and numerous spocks on his abdomen and chest, very closely resembling the eruption peculiar to typhoid fever. On the tenth evening of the disease, his temperature was 104.8 deg. This fit of rigors foreshadowed an attack of typhoid.

The effect of hemorrhage in reducing the temperature was seen in the case of a woman with typhoid fever, whose temperature fell suddenly from a high degree to 98 deg. This led to an inquiry after intestinal hemorrhage; and it was discovered that she had lost a considerable quantity of blood from the intestines, which accident the nurse omitted to mention until she was questioned.

Range of Temperature in Traumatic Erysipelas. In all of the cases of traumatic erysipelas which I have observed thermonometrically, the attack began with a fit of rigors more or less severe. The fastigium, or highest point of the temperature, was attained in a short time. The fall, or defervescence of temperature, nearly coincident with the decline of the eruption, and accompanied in the majority of the cases by sweating, was rapid. In some of the cases, relapse occurred.

If the temperature remain high for any considerable number of hours after the disappearance of the eruption, some secondary complication—abscess, pneumonia, pleurisy, pericarditis, or pyemia—has undoubtedly supervened.

Case I. On February 8th, 1866, the operation for ectropion was performed on a man aged 33. At 3.30 P.M. on Feb. 9th, he had an attack of rigors. At 4.10 P.M., his temperature was 103.6 deg.; pulse 120; respiration 20. There was slight redness round the wound. At 6.5 P.M., the temperature was 104 deg.; pulse 100; respiration 24. He was then sweating. Feb. 10th, 9 A.M. Temperature 100.9 deg.; pulse 84; respiration 26. The temperature continued to fall. At 6 P.M., the temperature was 102 deg.; pulse 100. Feb. 11th, 9 A.M. Temperature 100.8 deg.; pulse 84; respiration 24. The erysipelas was gone. 6 P.M. Temperature 101 deg.; pulse 84; respiration 24. Feb. 12th, A.M. Temperature 99.8 deg.; pulse 72; respiration 20. There was no relapse.

Case II. This case was one of the many of the last in March. On February 16th, 1866, he had rigors at 1 P.M. At 5.50 P.M., the temperature was 103.8 deg.; pulse 68; respiration 20. There was a slight erysipelas-like bluish on the leg, and angina faucium. 8.46 P.M. Temperature 102.6 deg.; pulse 90; respiration 20. He was then sweating. Feb. 17th, 12.30 A.M. Temperature 101.2 deg.; pulse 64; respiration 20. 6 A.M. Temperature 99.5 deg.; pulse 48; respiration 20. 9.30 A.M. Temperature 99 deg.; pulse 64; respiration 24. The erysipelas had nearly disappeared. 6 P.M. Temperature 99 deg.; pulse 68; respiration 24. Feb. 18th, 6 P.M. Temperature 99.8 deg.; pulse 58; respiration 24. Feb. 19th. The patient had a fit of rigors, which subsided at evening. At 6 P.M., the temperature was 103.4 deg.; pulse 80; respiration 24.

The usefulness of the thermometer in the diagnosis of pyrexia is well shown in this case; for, although the temperature on February 19th, P.M., was 105.4 deg., yet the pulse was only 80, the respiration also 24, and the skin was objectively cool.

Case III. A woman, aged 49, was operated on for cancer of the breast on January 22nd, 1866. The wound being nearly healed, she had, at 4 A.M. on February 12th, an attack of rigors. At 9 A.M., the temperature was 103 deg.; pulse 120; and there was an erysipelas bluish around the wound. At 10.30 A.M., she had another attack of rigors. 11.35 A.M. Temperature 105.4 deg.; pulse 120; respiration 24. 6 P.M. Temperature 105 deg.; pulse 108; respiration 120. Feb. 13th, 9 A.M. Temperature 102.6 deg.; pulse 120; respiration 20. The erysipelas was extending. 6 P.M. Temperature 104.6 deg.; pulse 108; respiration 24. Feb. 14th, 6 P.M. Temperature 104 deg.; pulse 120; respiration 24. The erysipelas was subsiding. Feb. 16th, 6 P.M. Temperature 104 deg.; pulse 120; respiration 24. This erysipelas was nearly gone. She had no cough; no pain in the chest. There was dulness at the base of the left lung; no crepitation. The respiration-sound was rather feeble. Feb. 17th, 9 A.M. Temperature 103 deg.; pulse 120; respiration 28. There was dulness over the left lung as high as the inferior angle of the scapula; no crepitation.

In this case, the fact that the temperature remained, on February 16th, at so high a degree after the subsidence of the erysipelas eruption, led to the diagnosis of the secondary complication; for no other signs of the lung-disease save the continuance of the high temperature existed. There was no cough; 130 per day, was the best; the respiration were not accelerated; the pulse was feeble, so that its rapidity might have been due to weakness; and, lastly, the skin felt abnormally cool.

Erratum. In Dr. Gibson’s paper published in last week’s JOURNAL, page 240, column 2, line 28 from bottom, for “covered near the bulb”, read “curved near the bulb".