Original Articles.

ABSTRACT OF A REMARKABLE CASE OF SLOW PULSE, EXTENDING OVER A PERIOD OF NEARLY TWO YEARS.¹

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G. W. P., white, male, carpenter by trade, aged fifty-four years. Father died of cystitis (enlarged prostate?) at age of seventy-five years. Mother died of cancer at age of forty-five. Has himself always been healthy. Almost never lost time from his work on account of sickness. The only illness he remembers was neuralgia of the stomach, fourteen years ago. Has received no injuries, except a fall when nineteen years old (fell on his feet; distance fifteen feet; suffered no bad consequences); and ten years ago a piece of brick fell on his head, cutting the scalp, but causing no serious injury.

Never had any form of venereal disease. Has always been temperate as to use of alcoholic stimulants, but not so as to use of tobacco, smoking a pipe almost constantly when opportunity offered.

I have been his family physician for sixteen years. During this time was never called upon to attend him personally until the present illness began.

December 13, 1887, he had been building a house down in Maryland in a malarial locality, when he began to have "weak spells"; and finally, upon lifting heavy weights on several occasions, he fainted. Becoming alarmed, he returned home; and I was sent for.

At this time I could find no well-defined disease. He was weak and depressed; tongue clean; no fever; mind clear; pulse, 36. As far as I can learn, there had previously been nothing abnormal about his pulse, urine normal. Bowels constipated. Examination of the heart discovered no organic disease. The systole was full and strong; the diastole greatly prolonged. Between the dates of December 13, 1887, and January 20, 1888, the pulse ranged from 22 to 76. During this time he had frequent attacks of syncope. He had been ordered to stay in bed; but as he became better, he got up and started down stairs. Was seized with fainting attacks; during one of which he fell down stairs; during another, fell out of a chair, remaining unconscious about a minute.

After January 20, 1888, when pulse had risen to 76, he had no more fainting-spells, but continued to convalesce slowly; and in March was able to resume work. He was cautioned about over-exertion, and specially not to use tobacco; which last caution, however, was not observed. He continued to work at intervals during the summer, until October, 1888, when he had a relapse, coming on with the same symptoms as the previous attack. The clinical record from October 2, 1888, to April 15, 1889, is given in detail: during this period the pulse ranged from 15 to 44 per minute. The fainting attacks continued throughout this time, and were sometimes very severe.

By April 15, 1889, he had improved so that he could sit up and go round the house, and out for short walks. No attempt was made to work.

About August 1, 1889, began to have a return of the old symptoms. For a week had had frequent fainting-spells with partial unconsciousness and dyspnea. Pulse down to 12 and 15 during spells. Once

fell down stairs. Between dates of August 5th and September 18th, the pulse ranged from 12 to 38 per minute, and from August 10th to August 15th it did not rise above 14 per minute. The temperature during this time was sub-normal, between 94.5° and 97°.

He improved after August 15th so as to be able to sit up, and September 18th was well enough to present himself for examination before the meeting of the Association of American Physicians at the Army Medical Museum.

The "spells" referred to in the report of this case are described as follows: They come on suddenly without warning, often without apparent cause, sometimes following exertion. He faints, losing consciousness. He describes the sensation as one of utter helplessness as they attack him, and as he comes to himself when they pass off. They last from a few seconds to half an hour.

The breathing is gasping and slow as in dying, and consciousness returns with a long-drawn breath. Face and hands become first pale and then dark purplish. There is no pain, but great exhaustion. Says, himself, they are due to "stoppage of the heart." Has great confidence in the bromide of ammonium, which he thinks controls the attacks.

During the time his pulse was slowest, — from 12 to 16, — these spells were recurring almost constantly; and his wife described the condition as being "terrible." She worked over him faithfully with whiskey and camphor internally, mustard and rubbing externally, and nitrate of amyl by inhalation, but thought many times that he was dead — with the black face, gasping respiration and pulse that seemed at times to entirely stop. She had learned to count the pulse, and she was certain that during the spells it was often much slower than I have recorded.

The treatment of the case from the first has been rest in bed, tonics, stimulants, electricity and bromide of ammonium, together with supporting diet. The tonics used were strychnia, quinine and iron, with belladonna, in the following prescription:

R Strychnine	0.04
Ext. bellad.	0.20
Ferri pyrophos.	3.00
Quin. hydrochlo.	3.00

In twenty capsules, one three times a day.

These capsules were taken nearly constantly while he was under observation. The stimulants used were whiskey, camphor and coffee. Digitalis was tried, but made him distinctly worse. Nitro-glycerine seemed to help for a few doses, but later caused distress. Convallaria and strophanthus were tried with a like result. The form of electricity employed was the Faradic current — one electrode over the heart, and the other at the back of the neck. It seemed to be of decided benefit.

The drug, however, which appeared to give most relief, was bromide of ammonium given in doses of one gramme (1.00) three times a day, and extra doses when paroxysms threatened. He appreciates the relief from this medicine so much that he is not satisfied to be without it.

The most interesting question in this case turns on its pathology. What is the cause of the retarded action of the heart? I can but believe that it is a condition of rare occurrence, although in looking up the literature of the subject, I have found a large number of cases reported under the title of "Slow

¹ Abstract of a paper read before the Association of American Physicians, Washington, D. C., September 19, 1889.

Pulse," some of which correspond in many particulars with the one here presented.

The causes which produce slow pulse may be classified as follows:

(1) Diseases or injuries to the nerve centres, producing either irritation of the pneumogastric or paralysis of the sympathetic (accelerator) nerves of the heart.

(2) Disease or injury of the pneumogastric nerve, increasing its irritability.

(3) Disease or injury of the sympathetic nerves of the heart, paralyzing them.

(4) Disease of the cardiac ganglia, by which the influence of the pneumogastric preponderates.

(5) Disease of the heart muscle (degeneration), whereby it fails to respond to the normal stimulus.

(6) Action of poisons, as of lead or tobacco, either on nerve endings or on nerve centres.

In one case reported, the slow pulse may have been due to a poison generated in salt fish. In another, it was due to the poison of algid pernicious fever.

In the present case, it is difficult to say, even at this late stage, to which of these divisions it belongs. There are no symptoms to indicate any form of disease of the nerve centres. There is no evidence of disease of the nerves themselves. Nor have we been able to discover any organic heart disease that might account for the symptoms. We have left, then, only the action of certain poisons; and the question presents itself, whether, in some obscure way, the conditions here present may not be due to tobacco poisoning from excessive smoking. This appears to be the most plausible explanation.

Another possibility is malarial poisoning. When the attack came on, he was working in a very malarial district; and in the summer of 1888, he had intermittent fever, which was relieved by quinine. These considerations make it probable that we have a paralysis of the accelerator nerves, and not an irritation of the vagus.

The symptoms presented in the case are those due solely to defective circulation. The syncope attacks were the result of insufficient blood-supply in the brain, and, if long continued, must result in serious alterations of the nerve centres, as well as of other organs, more particularly of the heart itself, by interfering with its nutrition.

In many of the cases collected in connection with this report, the pathological appearances were a *result* of the slow pulse rather than a cause.

In looking up the literature, it was found more extensive than anticipated. Abstracts are given of fifty-five cases of slow pulse, of which the following is a brief analysis as to causes:

	Cases.
1. Fracture or dislocation of the cervical vertebra	9
2. Diseases of brain	9
3. Cerebral syphilis	2
4. Sunstroke	1
5. Ossification of aortic valves and coronary arteries	2
6. Starvation, exhaustion, loss of rest, convalescence	3
7. Epilepsy and epileptoid disease	0
8. Heart disease	6
9. Lead poisoning, poisoning by salt fish, pernicious fever	3
10. Nervous shock, cholera morbus	2
11. Not stated	9

—The regents of the new hospital at Ann Arbor, Mich., have received an offer of ten acres of land for a hospital site, from Mrs. Israel Hall.

ANALYSIS OF ONE HUNDRED AND EIGHT CASES OF TYPHOID FEVER.¹

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THESE comprise all that the writer has seen in six years, in private practice. During much of the time he was without professional neighbors, and hence saw all the cases occurring near him. It seems, therefore, that this series should present an especially fair average of the disease as it occurs on the Plains. The cases were partly in town and partly in country practice.

Of five years of age or under there were five cases.

Of five to ten years, fifteen cases.

Of ten to twenty years, thirty-two cases.

Of twenty to thirty years, thirty-eight cases.

Of thirty to forty years, fifteen cases.

Over forty years, three cases.

The oldest was fifty-five years of age; the youngest three years. These cases were equally divided between the sexes, fifty-four being male, fifty-four female. The total mortality, eight cases, gives a percentage of 7.4+. Of the ninety-three cases cared for by the writer alone, five died, a percentage of 5.37+. Of six cases under care of irregular practitioners during part of the sickness, two died, or 33+%. Nine were seen in the temporary absence of other physicians, or in consultation. These were necessarily grave cases, and one died, or 11+%. The two cases fatal under irregular care apparently would have recovered with any reasonable treatment, as in each case, as we shall see later, death occurred from an avoidable cause.

The mortality of 7.4+ % would go to substantiate the position assumed by the writer, that the disease is considerably milder on the Plains than in other parts of the country, notably the eastern and middle parts of the United States. Statistics from Murchison's tables and from various hospitals, give a general average of about 18 %, which, it seems, is ordinarily accepted as a fair statement of the mortality. So small a number of cases, is, however, manifestly more liable to error than larger ones are. Of the eight deaths, five were of males, three of females. Occurring in one household, there were in two instances, six cases of the disease; in two instances, three cases; in six instances, two cases. No instance of recurrence is noted, which would go to prove what is often not plainly set forth, that one attack seems to be often protective against others in future.

In regard to the ordinary signs: Rose-spots are noted in fifty-four cases, two of which were fatal. They were generally distributed over the body in two cases. In fifty-two cases they were not noted, four of these being fatal. They undoubtedly might have been found in many of these fifty-two cases if examined for at other times.

There were six cases of intestinal hæmorrhage, three fatal, three recovering. In one of the fatal cases hæmorrhages recurred almost daily for three weeks, accompanied by most extreme emaciation.

Affections of the lungs sufficiently serious to be called complications occurred in eleven cases, four of these being fatal. Two of the latter were cases of pneumonia. One case with hæmoptysis recovered. The others had the ordinary pulmonary congestion seen in severe cases of fever.

One woman was confined at term, without any seri-

¹ An abstract of a paper read before the Colorado State Medical Society, at its annual meeting, Denver, June 19, 1889.