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THE WIDESPREAD INFLUENCE  
OF THE  
Cerebro-Spinal Centres over the Ganglionic Plexuses.

By HENRY FRASER CAMPBELL, M. D., Ex-President Georgia Medical  
Association, etc., Augusta, Ga.

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I. SYNCOPE AND NAUSEA PRODUCED BY DRY-CUPPING THE SPINE.—I find no-where the report of an observation which has become quite familiar to myself—viz., the nausea and fainting which are found to result from the application of cups over the dorsal region of the spinal cord. I will state the following cases as briefly as possible, for the single fact of *syncope* is the only one which, in the present connection, I propose to consider :

CASE I.—S. J., a young man—a lawyer—aged 29 years. Habit robust, and of good general health ; complained of intercostal neuralgia. On examination, I found tenderness on pressure over the 3d, 4th and 6th dorsal vertebræ. I determined on dry-cupping of this region. He was placed astride the seat of a chair, with his chest resting on the back. Two cups were applied with moderate force to the surface over the spine between the scapulæ. Mr. J. was not impressed with any nervous dread of the application. He was in high spirits, and had just been laughing at his own remark, "This is the first operation that was ever performed in my presence which I was unable to see." At this moment, he became very pale and livid ; his eyes turned upward, the facial mus-

cles began to jerk, and he became entirely unconscious. He would have fallen from the chair, but I immediately seized him, removed the cups, and laid him gently upon the floor. He remained in this unconscious state for some five or six minutes, when he gradually recovered, and was led away to his bed. He continued to feel nauseated and faint during the entire afternoon; did not rise from his bed, but on the following day was in his usual condition of health and spirits.

CASE II.—M. J., a Jewish merchant, aged about 40 years, very robust and plethoric, with black hair, and full, round, red face, complained of oppression in breathing. There was no indication, on auscultation, of either cardiac or pulmonary lesion. Regarding the symptoms as the result of spinal irritation, I applied several large cups with considerable force to the spine between the shoulders. This patient was also astride an ordinary chair, with his chest resting on the back of the chair. His wife and sister were present, and he was talking rather jocosely about the ludicrous position I had placed him in for the operation. No mental impression could be suspected in his case. The two or three cups had been applied but a few minutes when his countenance underwent a most extraordinary change. His usually florid and brunette complexion became livid—almost green; his eyes rolled in the sockets; his hold upon the back of the chair became relaxed, and he would have fallen, had I not caught him and eased him gradually to the floor. He was unconscious for a moment or two, but soon recovered. He was nauseated, but did not vomit. It being near bedtime, he undressed and went to bed. In the morning there were no remains of any unpleasant result of the cupping.

CASE III.—A. M., a young man, aged 26, teacher of a county school in a healthy region. General health excellent; habits good. He complained of "pain in the side." My nephew and colleague, Dr. A. Sibley Campbell, decided to apply dry cups to the vertebræ corresponding to the intercostal pain. Two large cups were applied with a moderate degree of pressure to the dorsal vertebræ between the shoulders. The patient was in the position above described—sitting upright with back exposed. The cups had been drawing but a few minutes when symptoms of fainting began, and before he could be lifted to the couch he had become entirely unconscious. But a few moments in the horizontal position was sufficient to recover him. After remaining a short time in the office, he went out into the street and attended to his business without any return of unpleasant sensations.



CASE IV.—B. W., a young man, aged 23, a brick-mason and plasterer by trade; spare in habit, general health good; temperate and very active. This patient complained of fullness in the epigastrium, and was troubled with belching and flatulence, and often symptoms of a dyspeptic nature. Two large cups were applied to the dorsal spine between the shoulders while he was in the sitting posture. The drawing had been continued not over five minutes, when he said he felt sick. The cups were instantly removed with the view of laying him upon a couch near by. This proved to be impossible, so rapid was the syncope; and without extricating him from the chair of which he was astride, I turned him over to one side that he might lie horizontally upon the floor. The loss of consciousness was but momentary, but he recovered with some little confusion as to length of time and how he came to be lying on the floor. After taking a glass of water, he, in a short time, walked home, telling me afterwards that he had continued to feel quite well.

In this, as in the three preceding cases, there could not be entertained the suspicion that there was any mental impression or dread in regard to cupping as an operation. B. W. had a remarkably "strong head" in resisting influences that ordinarily produce giddiness. As a pastime, he was seen to stand erect on the shoulders of the marble statue surmounting the shaft of the Confederate monument in this city—a most vertiginous feat for most persons even to witness!

CASE V.—H. A. C., a lawyer, aged about 35 years. This gentleman was pale and delicate—somewhat emaciated; had suffered with intercostal neuralgia, loss of appetite and constipation. Though not confined to bed, he was decidedly out of health. Two large cups were applied to the lower cervical and upper dorsal region while the patient was in the sitting posture. The cups, after drawing, had been re-applied lower down between the shoulders. Apprehending syncope, I had asked him, more than once, if he felt like lying down. He was amused at the suggestion, but in the very act of refusing to take the couch, he suddenly became pale and said, "I had better lie down—I feel badly." I assisted him to the couch, and he recovered in a short time without accomplishing complete syncope. In less than half an hour, he insisted on going home, as he felt fully as well, and even better, than when he came to be cupped.

Besides the above five cases, there were perhaps two or



more others, about the incidents of which I cannot now be accurate. It is, however, unnecessary to prolong the detail of instances in which the effect of syncope has followed dry-cupping in the region referred to, and in the position of the patient above described. So confident am I that this experiment, should it be repeated under exactly the same circumstances by others, in any considerable number of cases, will be followed, one or more times, by similar results—and that probably it has already been observed—I am almost tempted to make a *prediction* to that effect. Somebody will find it out before very long.

Dry-cupping, as a therapeutic agent in a great variety of neuroses, has been much used in my private practice, and strongly urged in my clinical lectures for years. It is probably due to its frequent application, and to the position of the patient in which it is made by me, that so large a number of these unusual facts have transpired under my observation.

It will be observed, that among the cases here reported—nor has there ever occurred any such to me—there is not one instance in which a female subject was affected with syncope. There may be other causes for this difference of results, but I have attributed it principally to the fact, that I seldom, or never, apply cups to women in any other than the recumbent posture. Otherwise their application is troublesome; whereas, in the case of men, the position I have described is extremely convenient. On account of the frequency of fainting, this position is now almost entirely abandoned both by Dr. Sibley Campbell and myself in cases of men as well as of women.

I have purposely restricted the above enumeration, so far, to cases in which the cardiac plexuses appeared to be principally impressed. Below I also furnish a brief report of a few other cases in which impressions made upon the spinal centres were, in an analogous manner, reflected upon the ganglionic or secretory plexuses of the stomach and other viscera of the abdominal and pelvic cavities:

II. CASES ILLUSTRATING THE INFLUENCE OF SPINAL CENTRES OVER GASTRIC AND MESENTERIC GANGLIONIC PLEXUSES.—The cases heretofore presented may be said to illustrate the path-



ogenic effect of spinal impressions upon the heart through the cardiac plexuses. The two or three, now to be briefly reported, as strongly demonstrate that sometimes a most important therapeutic result may be attained through similar avenues of reflex action.

*Perverted Gastric Secretion Corrected by a Blister to the Dorsal Spine.*—CASE VI.—January, 1849, P. McC., aged about 22 years, Irish laborer on Augusta canal, without any previous symptoms of disease, was suddenly seized with gastric flatulence and the eructation of surprising volumes of gaseous matter by the mouth. I was called to him at midnight, and was told he had been awakened by painful distension of the stomach, and on sitting up began to discharge the gas by rapidly repeated "belchings." This had continued without cessation for some hours. The patient was greatly alarmed, and willing to submit to any treatment proposed. Various carminatives, as peppermint, chloric ether, etc., failing to modify the symptoms, a hot water emetic was administered. It acted well, emptying the stomach of the undigested matters of an ordinary supper, but without arresting the production and rapid discharge of gas. After trying, during several hours, the various expedients ordinarily used in such cases, a mustard plaster was applied to the spine between the shoulders. This afforded relief for a few moments, when the belching returned, but with less frequency and diminished volumes of gas.

Finding several of the spinous processes in the lower cervical and upper dorsal regions tender on pressure, and encouraged by the effect of the sinapism, a blister was applied over this region. On my return next day, the attendants reported that "the belching had continued until the blister began to draw, when it ceased, and there had been no return." This patient was under observation for some months afterwards, and had during that time no recurrence of unpleasant symptoms.

CASE VII.—August, 1865, J. P. F., a planter, aged 48 years, had been under the care of a homœopathic physician for some five or six weeks—as reported, "with dyspepsia." I found him half-dressed and walking about the room, and in great distress; said he had been "belching," as I saw him then, "for some six weeks or more." The eructations were incessant—the gas odorless, so far as I could perceive. He said he "brought up nothing but wind," though he took some food several times during the day. The belching in-



terfered with his sleep, as he could not lie down without the greatest discomfort. He was very much alarmed at his condition. The rapidity of the eructations reminded one of the barkings of a dog, and interrupted greatly the account he attempted to give of his case. Remembering the effect of the blister in the only similar case I had ever witnessed previously, I examined the cervical and upper dorsal regions, and finding tenderness, applied dry-cups, with considerable force, from the 3d cervical to the 8th dorsal vertebra. The effect was magical. On the application of the first cup, which was over the third dorsal spine, the patient proclaimed himself better, and the belching had entirely ceased before the removal of the cups. He besought me to come and cup him the next day, fearing a return of the disease. I told him his spine would not bear the repetition of such a cupping under four or five days, when I promised to return. Before that time, he sent from his plantation a messenger, informing me that my visit was unnecessary, as "he had not belched once" since the application of the cups. Ten days afterwards, this gentleman sent for me in great distress; all his symptoms had suddenly returned. I found that he had been extremely imprudent in his diet. He had taken, just previous to the recurrence of the attack, more than a pint of rich chocolate. He was now eructating as constantly as before. The cups were immediately applied as before, and the belching disappeared at once. This patient has been under my observation constantly since for over 12 years; and though he has purchased a case of instruments of his own, and applies dry-cups between the shoulders on all occasions to others, I am certain he has not required the use of them for himself from any return of his old affection.

*Remarks.*—From the observation of the above two cases, I seldom conduct the treatment of cases of dyspepsia or indigestion—especially where gastric flatulence in any degree presents itself as a symptom—without advising dry-cupping, or some other spinal revulsives, as an important element of the treatment. The result has been highly satisfactory in a large number of cases.

III. MESENTERIC PLEXUSES—OBSTINATE CONSTIPATION AND SYMPTOMS RESEMBLING ILEUS RELIEVED BY DRY-CUPPING THE SPINE.—CASE VIII.—J. M., merchant, aged 36, regular and temperate habits, except in using tobacco, had been subject for years to serious attacks of "cramp colic," attended sometimes by nausea, and always by obstinate constipation, with



alarming pain and distress. In these attacks, there was never any passage of gas from the rectum, but frequently large quantities would be evacuated by the mouth—but not in any comparison to the two preceding cases. To be brief, I will say that in the two last attacks of the above character in J. M., after failure of relief from purgatives, O'Beirne's tube and multitudes of ordinary enemata, freely dry-cupping the spine between the shoulders and in the lumbar region was followed by relief of pain, spasm, eructation and constipation so promptly that it would be illogical to attribute the result, in the same degree, to any other agent used during the attacks.

In addition to the above, I have on record many cases equally striking—cases of relief from aberrated action in the kidney secretion, in menstruation, and in ovarian activity. They all illustrate spinal control over the renal and hypogastric plexuses, and that spinal revulsives in such cases act therapeutically. But I am unwilling, at this time, to prolong the consideration of a subject already clearly demonstrated, and perhaps more or less familiar to many.

As to the *instrumentalities* of reflex secretory action in the above cases, it is unnecessary at the present day to enter into elaborate discussion. It will, however, be pertinent to the explication of some of the observed results to call attention to the fact, that the spinal elements entering into connection with the great splanchnic nerve and celiac ganglion *take their origin in the four or five lower cervical and four upper dorsal vertebrae*; and we have, perhaps, in this a satisfactory explanation of the directness of the results as affecting this portion of the spinal cord and the viscera herein shown to be impressed through the ganglionic plexuses.

To discuss further than this at present the *rationale* of the phenomena exhibited in the foregoing cases, would occupy more space than can be granted to a single paper. The profound and widespread influence exerted on the ganglionic plexuses by impressions made through the spinal centres, both in the production and in the removal of diseased conditions, is a subject of importance to the pathologist and to the practitioner. I have not had occasion to discuss the subject recently, but would refer those who wish to pursue the investigation of the phenomena concerned in the present cases to



writings of Sir Benjamin Brodie\* on the influence of the brain over the heart; of John Reid† on influence of the pneumogastric and sympathetic nerve; of Brown-Sequard‡ on the medulla oblongata, and to my own paper in the *Transactions of the American Medical Association*, "The Law of Excito-Secretory Action as Applied to the Heart in Malarial Fever,"§ Vol. XI, 1858, p. 635. In a future paper I hope to consider more particularly, but briefly, some of the therapeutic relations of the reflex ganglionic influences involved in some cases to be hereafter reported.

**INFLUENCE OF SPINAL CENTRES OVER THE CUTANEOUS CAPILLARY CIRCULATION—REFLEX VASO-MOTOR ACTION.**—The one or two cases now to be briefly mentioned, though closely allied in some of their phenomena to those above reported, cannot be presented as illustrative of spinal influence over plexuses. Yet there is a general recognition of ganglionic instrumentality among neuro-physiologists in the perturbations in the cutaneous capillaries under certain sections and irritations of the cord, as illustrated in the experiments of M. Claude Bernard (1852-3) and of Dr. Brown-Sequard, by whom they were repeated and considerably extended. Since the microscopical observations of Jocabowitsch (1857), resulting in the demonstration of the "intermediate ganglionic cells" in the spinal cord with fibres uniting them both to the sensory and motor elements of this centre, we may the better interpret phenomena such as are herein presented independently of either ganglia or sympathetic filaments.

**CASE IX.**—H. L., aged about 30 years, became the subject of "boils" in the month of February, 1858. This furuncular inflammation appeared on the back; and the abscesses, not more than three or four at a time, were located on the dorsal and lumbar regions, and were of the most painful

\**Physiological Researches*, London, 1857, p. 2.

†*Anatomical, Physiological and Pathological Researches*, p. 170, 1837.

‡*Physiology and Pathology*, New York, 1853, p. 40.

§Also *Southern Medical and Surgical Journal*, June, 1850, "The Influence of Denitition in Producing Disease," and *Transactions of the American Medical Association*, Vol. X, p. 465, 1857, prize essay, "On the Physiological and Pathological Relations of the Excito-Secretory System of Nerves." Also M. Claude Bernard, "On the Sympathetic Nerve in Reflex Phenomena," *Gazette Medicale*, Paris, 1853, and *Experimental Physiology*, Paris, 1854, 1855. And Dr. Marshall Hall, "The Excito-Secretory System of Nerves," see *London Lancet*, March, 1857. Also, M. Charcot's *Lectures on Diseases of the Nervous System*, delivered at La Salpêtrière. Henry C. Lea. Philadelphia. 1879.



character. These "crops of boils" had continued to recur for several months, at intervals of two or three weeks. At the time of my examination, which was in the fourth or fifth relapse, four boils were observed on the left side below the scapula, and occupied a region between the fifth and eighth ribs near the centre of the shafts of these bones, and at distances ranging from four to six inches from the spinous processes of the vertebræ. They were all very nearly in the same stage of progress. Each had an intensely red and inflamed areola very tender to the touch, while the boil itself was acutely tender. The surrounding skin was of normal color and apparently healthy, presenting no tenderness in any part. When the surface between the affected spots and the spinal ridge was pressed upon there was no tenderness felt or manifested. Turning my attention now to the *spinous processes*—examining by pressure from above downward—no tenderness was complained of till I arrived at the first dorsal vertebra. This was exquisitely sensitive to pressure, but in none of the spines, either above or below, till I arrived at the last dorsal vertebra, was there any obvious tenderness. This was only slightly tender on pressure.

Having frequently observed that the pain of intercostal neuralgia was promptly relieved by revulsives to the corresponding vertebra, and wishing also to test the opinion that this tenderness in the spinous process had an *etiological relation* to the abscesses under examination, I applied a plaster of meal and mustard to the back of the neck, so as to cover the affected vertebra. In less than an hour the pain had entirely subsided, together with the exquisite tenderness of the inflamed parts, and the patient was able to wear his coat with apparent comfort. Witnessing such decided relief from the sinapism, it was determined to apply some revulsive which would be more permanent in its effects. This was, however, neglected until the occurrence of the second attack subsequent to the mustard plaster. The patient objecting to a blister, this portion of the spine was, during the height of this painful attack, subjected to a thorough dry-cupping. The relief from pain was *immediate*. The "crop of boils" went on to maturation with but little inconvenience to the patient, as when the mustard had been applied; and since then there has not been the slightest indication of a relapse, nor any tenderness of spine. The relief was permanent.\*

\*The above is condensed from the details of a case illustrating other points connected with the progress of furuncle, and will be found recorded in full in a former paper of the present writer. See *Transactions of American Medical Association*, Vol. XI, page 610, May, 1858.



In the case just given the spinal tenderness appeared to be related to a condition of tissues, corresponding to the distribution of nerves connected with the affected portion of the cord, which was highly inflammatory. There was active localized hyperæmia in the capillaries resulting in plastic exudation and ultimate suppuration. The last example now to be given, while it seems none the less to be connected with some abnormal condition of a section of the cord, will be found to illustrate a very different phase of capillary aberration—not abnormal activity, but stasis or “passive congestion.” The varied and peculiar phenomena of this case, were it apposite to detail them in this connection, would suggest several very fertile questions for investigation; but I restrict my consideration now only to the details which relate to the effect of centric change upon the capillary circulation.

CASE X.—D. L., a young man, aged about 20 years, was affected with general hyperæsthesia of a peculiar character affecting painfully the face and hands more particularly. He was intolerant of light, and the distress produced by noises around him was quite obvious. Accompanying this sensitive and excitable state of the nervous system, which had existed for several months previous to my examination, was the feature for the reason of which I refer to the case. *The circulation in the capillaries* of the hands and face, and in a much less marked degree in other portions of the cutaneous surface, was evidently greatly retarded. The lips, conjunctiva, entire face and neck, also the hands and finger nails, presented a congested or turgid appearance—being at times almost of a purplish hue. He did not complain of difficulty of respiration, nor was there any irregularity in the heart's action as manifested by the pulse. Examination of the vertebræ, in the cervical and upper dorsal regions, showed that the slightest pressure produced intense pain.

Regarding this unusual sensibility in the vertebræ as indicative of some abnormal condition of the cord influentially connected with the capillary paresis, as well as with the cutaneous sensibility, I advised a blister to the cervical and a portion of the dorsal region, and also efficient daily portions of quinine as an adjunct to the treatment.

This patient being distant from me on the railroad, he was not visited for an entire week. He was changed for the better far beyond my expectations. Besides the relief of the exalted tactile sensibility, the capillary congestion of the face



and hands had entirely disappeared ; he was somewhat paler than natural, but cheerful and happy at the change that had been so suddenly brought in his condition. He made a rapid and satisfactory recovery—no return of the congestion in any degree having afterwards been manifested.\*

As the foregoing cases have been presented solely with the view to any practical value they might possess, and not as “advances in physiology,” I forbear entering into the somewhat extended discussion which some of the more unusual phenomena might seem to invite.

In the present paper, I have purposely restricted myself to the consideration of such aberrations of function as are due to morbid conditions of the *spinal centres*. I hope hereafter to demonstrate that there is no aberration of function that can be thus *directly* produced, which may not be as markedly evoked through these same centres when acted upon by centripetal nerves under *peripheral* irritation.







