

during the last six months; the teeth and the tonsils were normal. The patient had a psychosis, but was not a parietic. Tabes dorsalis was diagnosed; a positive mental diagnosis was not made.<sup>16</sup> Dr. Kolmer submitted the following report on the spinal fluid, June 14, 1916: Clear, 90 cells per cubic millimeter; 92 per cent. small lymphocytes; protein reactions strongly positive: Noguchi, +++; Nonne, Phase I, +++; glucose content, normal. Wassermann reaction (dose 0.8 c.c.), ++++, with the three antigens used above; Lange colloidal gold test: typical, parietic curve.<sup>17</sup>

June 6, there was redness on the right side of the forehead. June 8, vesicles were well marked. The outer border of the rash extended upward from the outer end of the eyebrow; the inner border was at the midline. The rash included the upper lid, and the nose to the *ala*; the conjunctiva was reddened, but contained no vesicles. The rash extended backward to slightly beyond the parietal eminence. The blood count was normal. There was a slight rise of temperature a few days later due to secondary infection. June 21, the eruption had well disappeared, except for scabs along the eyebrow.

At present, on the forehead, upper lid and the bridge of the nose, the areas which were formerly the bases of the vesicles show loss of pigment. Neither in these whitish areas nor in the normal appearing skin can any disturbances of sensation be demonstrated.

#### CONCLUSIONS

Of three patients having an attack of herpes zoster, two were parietics and one a tabetic. The cases of herpes zoster were of the symptomatic variety, that is, due to involvement of the ganglions in the pathologic processes of the disease from which the patients were suffering. The nature of the ganglionic changes is in all probability specific, that is, due to spirochetes or toxins.

Thirty-Fourth and Pine Streets.

16. The patient's mental condition may have been dependent on syphilitic changes or alcoholism. On admission, dementia, though present, was not very apparent; it has since progressed, but is not extreme. There is nothing, however, in the clinical symptoms, which suggests paresis.

17. Solomon, Koefod and Welles state that a typical parietic curve may occur not only in patients who do not have paresis, but also in patients who do not even have syphilis. I have seen two nonparietics with typical parietic curves. In one of these at least, the question of paresis sine paresi does not enter (Solomon, H. C.; Koefod, H. O., and Welles, E. S.: Diagnostic Value of Lange's Gold Sol Test, Boston Med. and Surg. Jour., 1915, 173, 956-960. Solomon, H. C., and Welles, E. S.: Varieties of the Gold Sol Test (Lange) in Several Loci of the Cerebrospinal Fluid System, *ibid.*, 1915, 172, 625-629). A parietic curve is reported in a child suffering from poliomyelitis, with a positive Wassermann in the spinal fluid (Felton, L. D., and Maxey, K. F.: The Colloidal Gold Reaction of the Cerebrospinal Fluid in Acute Poliomyelitis, *THE JOURNAL A. M. A.*, March 10, 1917, p. 752). These observations show that the parietic curve occurs occasionally in conditions other than paresis. All of our consulting psychiatrists have agreed that the patient described above is not a parietic.

**Milk Distribution a Public Utility.**—A joint commission of Pennsylvania, Maryland and Delaware appointed to study the milk question with reference to price, distribution, etc., headed by Prof. Clyde L. King of the University of Pennsylvania, recommends (*Survey*, February 24), that milk distribution shall be recognized as a public utility. The recommendations extend to both production and distribution, and include suggestions for increased state and municipal supervision, as well as an attempt to harmonize the interests of producers, dealers and consumers. Recognition of milk distribution as a public utility implies the keeping of accounts by dairymen and dealers in a form prescribed by the state, the state examination of accounts, the licensing of all dealers, as at present; the licensing of testers in receiving stations, and the standardization of prices. Seasonal inequality of production has been an obstacle to the maintenance of uniform price to producers, which makes the financial success of the dairy business uncertain. This, it is suggested, can be overcome to some extent by the storage of milk in the form of butter, cheese and condensed milk, and the stimulation of new uses at times of greatest yield. The competition of milk with other food products and the matter of freight rates complicate the milk supply problem.

## A CASE OF BROWN-SÉQUARD PARALYSIS\*

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Until recently, many workers, following Brown-Séquard, held that impressions of pain and temperature pass upward through the gray matter, while those of touch and sense of position ascend through the dorsal columns. Petré,<sup>1</sup> from a collection of reports of a large number of cases, concluded that impressions of pain and temperature pass through the opposite lateral column, and of the muscle sense through the homolateral dorsal column, while two paths are open to touch, one through the uncrossed exogenous fibers of the dorsal column, and another in the opposite lateral column.

Head and Thompson<sup>2</sup> confirmed these conclusions and showed that the ability to recognize the simultaneous contact of two compass points depends on impulses traveling through the homolateral dorsal column. Head and Holmes<sup>3</sup> found that the appreciation of weight and recognition of size and shape are frequently lost on the paralyzed side, and concluded that the impulses which subserve these functions ascend uncrossed through the dorsal columns. Egger<sup>4</sup> has shown that the sense of vibration of a tuning fork depends on the integrity of the dorsal columns.

Recently Petré,<sup>5</sup> from a review of ninety-four cases of stab wounds of the spinal cord, has concluded that fibers for pain and temperature sense have their course near the lateral column of the cord. For touch two pathways are present: first, in the posterior columns in the long exogenous fibers and, second, in the "crossed lateral columns somewhere along with pain and the temperature sense. The fibers for muscle sense do not run in a crossed tract; they run in two columns, one in the homolateral posterior columns and the other in the lateral cerebellar bundle. They run medially to the fibers for pain and temperature and laterally to the pyramidal tract.

From the notes of forty-five cases of spinal injuries of warfare in which the Brown-Séquard syndrome occurred, Holmes<sup>6</sup> found that the upper limit of anesthesia to the different forms of sensation varied, and that as a rule the upper border of the contralateral loss did not correspond to the segmental level of the injury. In the middorsal region, the crossing of pain and thermal impulses is complete in one segment. Thermal impressions cross less rapidly than those of pain, and touch requires two segments for decussation. In the upper dorsal segments, pain and temperature cross in two and frequently in three segments. At the fourth cervical segment the decussation of pain requires from five to six segments, and that of thermal impressions from four to five.

Holmes concludes that the fibers which convey impression from the lower spinal roots are probably placed lateral to those which have later reached the contralateral side.

\* Read before the Chicago Neurological Society, Dec. 21, 1916.

1. Petré: *Skandin. Archiv. f. Physiol.*, 1902, 13, 9.

2. Head and Thompson: *Brain*, 1906, 29, 537.

3. Head and Holmes: *Brain*, 1911, 34, 102.

4. Egger: *Rev. neurol.*, 1902, 10, 549.

5. Petré: *Neurol. Centralbl.*, Jan. 2, 1916.

6. Holmes: *Brit. Med. Jour.*, Dec. 11, 1915, p. 855.

## REPORT OF CASE

Oct. 1, 1916, a man, aged 27, whose previous history has no bearing on the present condition, and in whom the Wassermann reaction was negative on the blood serum, was stabbed in the left groin, the left buttock, and in the back of the neck. The wound in the neck extended from the fifth to the seventh cervical vertebrae. The right leg was immediately paralyzed. For three days the patient complained of severe shooting pains in both

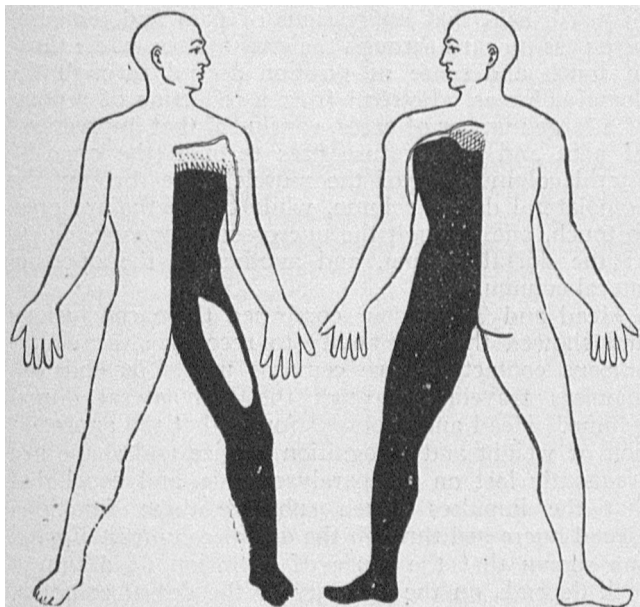


Fig. 1.—Sensory chart, obtained Oct. 23, 1916. In this and the accompanying illustration, oblique solid lines indicate areas of thermal anesthesia; oblique broken lines, diminished temperature sense; vertical solid lines, diminished pain sense; solid black areas, loss of pain and temperature sense; within the area bounded by the double line is found a diminution in the acuteness with which pain and temperature are appreciated; the blank space over the left leg represents a loss of sensation in all its forms.

arms. He was unable to move the right leg for four days, then movements of the thigh and leg returned, and on the sixth day he was able to get out of bed, and more or less rapidly regained all function except dorsal flexion of the foot and extension of the toes. He remained in the hospital until October 18, and was examined five days later.

He showed a weakness of the muscles of the right side of the body below the level of the fifth and sixth cervical segments; the groups represented by these levels were more markedly affected than those of the fifth alone, as the deltoid especially, and the pectoralis major, supinator longus and biceps were feeble, and the supraspinatus, teres minor, subscapularis and serratus magnus were probably not affected. The muscles representing the lower levels were still weaker, the greatest disability being in the extensor of the index finger, the opponens pollicis and the first dorsal interosseus. The motor disability was most marked in the lower extremity, where the dorsal flexors of the foot and extensors of the toes showed the greatest weakness. The right side of the abdominal wall was parietic. Ankle and knee clonus were present on the right side; the rectus jerk was greater on the right side. The deep reflexes in the upper extremities were equal and about normal, with the exception of the right scapulo-humeral, which was increased. A Babinski phenomenon was present on the right side. The right cremasteric and abdominal reflexes were absent. The sympathetic and organic reflexes and vasomotor functions apparently were normal on both sides. The pupils were normal. Sensation to touch was disturbed only over the area supplied by the anterior femoral cutaneous nerves of the left side. They had probably been severed by the stab wound in the groin. There was an analgesia of the left side below the level of the third dorsal segment. For a short distance above this, pain sense was diminished, and below the fourth cervical segment, although very slight pain stimuli were felt on the left side, the sensa-

tion which they awakened was more acute on the right side. Temperature sense was lost to a level slightly higher than the third dorsal, and for a small band above this was diminished. As with the temperature sense, as high as the level of the fourth cervical segment temperature stimuli were more acutely on the right than on the left side. The slightest stimulation, however, was correctly interpreted on the left side in this area. Over the arm only that portion represented by the second and third dorsal segment showed a similar condition as to pain and temperature. Joint and muscle sense were apparently normal, but slight pallesthesia was present on the right side. No difference in tactile space sense existed.

Since the time of examination an improvement has been noted in the motor functions; the same muscle groups, however, are affected and in similar proportions. The thermal anesthesia has retreated caudally so that the upper border is at the sixth dorsal level. Above this to the fifth dorsal either heat sense alone is lost, or heat and cold slightly diminished. Analgesia likewise has retreated caudally to a level lower than the thermal anesthesia, namely, the eighth dorsal segment. Up to the level of the sixth dorsal, pain sense is diminished. The same acuteness of sensation to heat and pain is present in the area of the right side as was noted at the first examination.

## COMMENT

This case is of particular interest because of several features:

1. The low level of the crossed sensory disturbance as compared to the direct motor injury illustrates the obliquity of the crossing of the sensory fibers, as pointed out by Gordon Holmes.
2. The caudal retreat of analgesia, and more slowly of thermal anesthesia, indicates a lamellar arrangement in which the fibers that convey impressions from the lower spinal roots are placed laterad to those that have later reached the contralateral side.

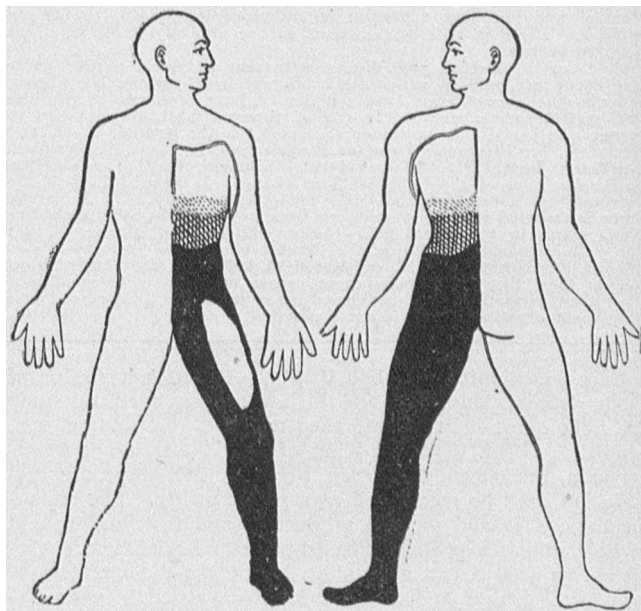


Fig. 2.—Sensory chart, obtained Dec. 20, 1916.

3. As the upper margin of the anesthesia to heat is slightly higher than that to cold, it is probable that the afferent impulses which subserve the latter decussate more slowly.

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**Actions, not Words.**—A slender acquaintance with the world must convince every man, that actions, not words, are the true criterion of the attachment of friends.—George Washington.