

ing in bed, and tenderness over upper dorsal vertebræ, increased by pressure. The bowels were constipated. Calomel and colocynth pills, nitro-hydrochloric acid, good diet and rest, were successful in affording relief.

On the 21st of August, I was again sent for to examine an abscess by the side of the anus, which had a fine fringe of hæmorrhoids. Suspecting its true nature, and knowing the bowels had been well opened the previous day, I at once laid open the abscess, from which about half an ounce of offensive pus escaped. I introduced my armed blunt probe, tied the silk, and completed the operation before my patient knew what was the matter with her. The internal opening was about three inches up the rectum, and between it and the anus I could feel a large pulsating vessel. I kept her in bed, and under the influence of acetate of ammonia and opium for a few days. The ligature came away on September the 4th; no bad symptom was set up, and she has been in capital health ever since.

CASE II. Mrs. S., a thin, exsanguine woman, who had foolishly been suckling her child for the protracted period of two years, sent for me on the 18th of December, 1857, in consequence of the bursting of an abscess about an inch and a half from the anus, and the discharge of some very stinking matter. Pus had escaped from the bowel for three weeks. Nine months previously she had had a fall against the edge of a stone step, which caused pain at the coccyx. The armed, blunt-pointed probe was passed up the sinus to the bowel, about three inches above the sphincter, but no opening could be found, though the probe traversed between the coats of the intestine. A sharp-pointed probe was then pushed through the bowel, brought down, and the ligature tied. She was kept in bed under the influence of acetate of ammonia and opium for a few days; but little disturbance of the natural functions supervened. The ligature came away on January the 8th, and good diet, with gentle exercise, soon established health.

CASE III. Mr. Sharp, resident surgeon to our dispensary, requested me to operate on him for fistula *in ano* in August last. He had a fistula, the inferior opening of which was about an inch from the anus, and the superior opening two inches and a half up the gut. I passed the armed blunt-pointed probe in the manner previously described, and included in the ligature a large pile. The operation was performed in my surgery, and Mr. Sharp afterwards walked home, a distance of some five hundred yards. On the next day, he went to see some of his near patients, and continued to discharge the greater part of his duties without intermission. The ligature came away on the 6th of September, after which he got much stouter than he had been for some time. Mr. Sharp is a married man, and has passed his fortieth summer; his health has been deteriorating for a considerable time, and he is a martyr to gout and bronchitis; moreover, he is a cripple from early hip-disease, and has a tumour forming in the long head of the biceps of his right thigh. A more unfavourable case could not easily occur, and for such a patient few surgeons would have recommended the knife. As far as the fistula was concerned, the treatment by ligature in this case was all that could be desired.

Mr. Sharp expresses himself as being much pleased with my manner of proceeding, and has recommended his father to come under my care, the old gentleman having long tolerated a fundamental nuisance, the surgeon's knife abhorring.

PATHOLOGICAL CONTRIBUTIONS TO MEDICAL JURISPRUDENCE.

By WILLIAM BOYD MUSHET, M.B. Lond., late Resident Physician at St. Marylebone Infirmary.

III.—SOPOR LAPSING INTO COMA. EXTENSIVE DISEASE OF KIDNEYS. (INGESTION OF OPIUM?).

A. D., aged 64, a washerwoman, was admitted into the Marylebone Infirmary about 10 P.M. on January 19th, 1857. She was cold, pale, and haggard; and I was informed that she had had a fit a short time previously. There was sopor, but not actual coma, as she answered as to her name, when roused, but said nothing further. The pulse was 100, full, but weak and compressible. The respirations were 11—12, noisy, gasping, with loud rales. The pupils were contracted, and insensible to light. The arcus was very strongly marked. There was considerable œdema of the feet and legs. The mouth was drawn; but there was no paralysis or convulsion of the limbs. The

rattle over the chest prevented the state of the thoracic organs from being accurately determined. The prognosis was evidently very unfavourable; as active measures could not be resorted to, on account of the prostration. She was ordered to be wrapped in blankets, to have hot bottles applied to the feet; and a blister to the nape; and to have a drop of croton oil and beef-tea.

On the following morning, she was completely comatose. The pupils were contracted; the surface warm; the mouth drawn to the left side. The face was somewhat livid. The heart's action was weak and rapid; the pulse almost imperceptible. The respirations were 18 in a minute. The bowels had not been opened. About a quart of urine was drawn off; which, contrary to my injunctions, was thrown away. She could not swallow, and was evidently sinking. She died in the evening about 6 P.M., twenty-two hours after admission.

NECROPSY sixty-six hours after death. There were no external marks. œdema of the legs and feet was present. Rigor mortis was tolerably well marked. The pupils were moderately dilated.

Head. The scalp and calvarium were natural. The dura mater was injected. There was some subarachnoid effusion, and two or three ounces of fluid at the base. The arachnoid was opaque at spots. The large veins of the pia mater were prominent. The brain-substance was healthy; but the vascular points were more marked and numerous than usual. About the central parts of the brain, the substance appeared a little softer than in health. There was no clot, nor injury to the skull. Serum was found in the lateral ventricles. The vessels at the base were extensively atheromatous.

Chest. The heart weighed sixteen ounces; it was surrounded by fat. There was hypertrophy of the left ventricle; and the aortic orifice was narrowed from binding down of one of the semilunar valves. The mitral aperture was also constricted, although the valve appeared healthy. It admitted but one finger well. The aorta was dilated above the valves. The valves on the right side were healthy. The right auricle contained a partially decolorised clot, extending into the ventricle, and interlacing with its fleshy projections. Very little blood was found on the left side of the heart. The coronary arteries were atheromatous. No fluid was found in the pericardium. The lungs were healthy. Tenacious yellow mucus was present in the trachea, bronchi, and their divisions. There was some serous effusion into the right pleura; no adhesions. The left lung was slightly adherent to the costal pleura by recent exudation; and there was effusion into the left side of the chest of some ounces of turbid serum, holding in suspension flocculi of lymph.

Abdomen. The liver was healthy, but pale. The spleen was small, firm. The stomach contained some ounces of greenish fluid, without peculiar smell, and much mucus. Its internal surface appeared healthy. The gall-bladder was distended with dark oily bile. The right kidney weighed three ounces; it was small, hard, shrunken, granular, lobulated, and pale. The capsule separated with difficulty. The left kidney weighed a little over two ounces; it presented the same characters to greater extent. There was much fat around the viscera. No fluid was found in the peritoneum. The other organs were natural.

REMARKS. In the foregoing case, the pallor of the patient, the œdema of the lower extremities, the precession of a fit, with the lethargy, merging into coma, which succeeded, suggested the notion of uræmia from renal disease. The condition of the kidneys, secondary pleuritis, etc., disclosed on inspection, attested the correctness of the conclusion. But it was ascertained, at the investigation, that the woman had drunk, shortly before the fit, something from a bottle, which she afterwards threw away.

The fragment of a bottle was handed to me, and on testing the dried sediment at the bottom with distilled water and tincture of iron, a very evident red colour was produced (meconate of iron?). Distilled water alone, similarly treated, assumed merely a pale straw colour.

We are consequently compelled to inquire—Did this woman take poison? This is a grave consideration (although all suspicion of homicide was in this instance fortunately discarded), as it illustrates how individuals affected by more or less remotely mortal disease, may become the victims of criminal intent, and the effects of the poison administered be masked or modified by the preexistence of certain morbid states, and death therefore attributed to the agency of the former.

Admitting the ingestion of opium—was such a quantity taken as is usually sufficient to cause death; or was its action more

energetic, on account of the predisposition of the patient, from the associated toxæmia? The symptoms accorded equally with uræmic and narcotic poisoning; but, when no special treatment is adopted, the latter, I believe, seldom proves fatal after eighteen hours? Candour, however, demands the admission, that, whether the woman sank from disease alone, or the combined effects of disease and poison, must ever remain an equivocal question.

ON INHIBITORY INFLUENCE.

By C. HANDFIELD JONES, M.B., F.R.S., Physician to St. Mary's Hospital.

In the *Proceedings of the Royal Society*, p. 367, No. 33, there is an highly interesting communication from Mr. Joseph Lister respecting "the functions of the visceral nerves, with special reference to the so called inhibitory system." He takes up Pflüger's view, "that there is a certain set of nerve fibres whose sole function is to arrest or diminish action," and examines it fully with repeated testing by experiment. The result to which he arrives, as given at the end of his paper, is, that it may be regarded "as a fundamental truth not yet explained, that one and the same afferent nerve may, according as it is operating mildly or energetically, either exalt or depress the functions of the nervous centre upon which it acts. It is, I believe, upon this that all inhibitory influence depends, and I suspect that the principle will be found to admit of a very general application in physiology." Mr. Lister also foresees the bearing of this principle on pathology, and notices its probable concernment in the excitement of inflammation through the medium of the nervous system at a distance from the irritated part.

I am strongly inclined to believe that these views will prove to be of first rate importance in pathology, and will be found applicable to a multitude of common instances. However, I cannot but think that the principle, as propounded by Mr. Lister, requires some modification. What this is I will presently state, but will first detail some experiments illustrative of inhibitory influence.

The transmission of an interrupted current of galvanism through the lower dorsal region of the spine, when of a certain strength, caused complete relaxation and quiescence of the small intestines which had previously been in active motion, while the muscles of the limbs were thrown into spasmodic action, but on the discontinuance of the galvanism, the previous intestinal movement returned. A weaker current being now passed, the result was, that the action of the intestines was markedly increased. Violent struggling of the animal had the same effect as the strong electric current in producing a quiescent state of the intestines. This, as Mr. Lister remarks, goes to prove "that the inhibitory influence is certainly sometimes exerted in the natural actions of the animal, and is not merely the result of artificial stimulation." The following quotation from Bernard's *Leçons, système nerveux*, tom. ii, p. 392, shows the production of analogous phenomena in the cardiac and respiratory actions. "In a hound, the two nervi vagi were exposed, raised on a loop of thread, and galvanised both at once without cutting them. During the galvanisation, the contraction of the heart and the respiration were arrested, and the eyes became prominent, showing that there is, at the same time, centripetal and centrifugal action in the vagus. In another dog, the vagus being divided in the middle of the neck, the upper end and the lower were successively galvanised. The galvanisation of the lower end stopped the heart, and allowed the respiration to go on. The galvanisation of the upper end stopped the respiration, and let the circulation go on.*"

The experiment performed by Weber, several years ago, of slowing or arresting the action of the heart by passing a galvanic current through the medulla oblongata, is quite to the same effect as the preceding. From the circumstance that direct irritation of an intestine lying relaxed under inhibiting influence, produces local contraction not propagated to the adjacent parts, Mr. Lister concludes that "the inhibitory influence does not operate directly upon the muscular tissue, but upon the nervous apparatus by which its contractions are, under ordinary circumstances, elicited."

* Previous experiments, however, show that the arrest of the respiration in these cases occurred from the violent stimulus keeping the inspiratory muscles tonically contracted, so that expiration could not take place. This I had overlooked, until the proof came into my hands.

Taking now as our basis the above cited experiments, I proceed to refer to various pathological facts which seem to me to receive explanation from the above views, and to confirm and modify them in their turn.

1. It is known (*vide Graves's Lectures*, p. 695,) that exposure to a blast of cold wind for some time has produced amaurosis, which was cured not by depletion or mercury, but by stimulation of the skin of the face and temples.

2. Paralysis of the portio dura, from like exposure, is still more common. This has been attributed to effusion of lymph taking place around the facial nerve in the bony canal it traverses; but the supervention of the paralysis, as in some cases cited by Romberg from J. Frank (vol. ii, p. 282), is often too sudden to warrant our accepting this explanation as generally true. In a case alluded to by Dr. Graves, the two paralytes coexisted, vision and motor power were both impaired from exposure of one side of the face to cold.

3. Irritation of the bowels, as from worms, may cause amaurosis or deafness; or from enteritis, paralysis of the lower limbs.

4. M. Brown-Séquard cites several instances in which a neuralgia of a sensory nerve, to all appearance, produced paralysis of a motor.

5. Dr. Copland, article *Paralysis*, p. 21, mentions a case of "general palsy of the powers of voluntary motion immediately after prolonged exposure to cold and wet. The functions of the brain were unaffected, . . . and no evidence of inflammatory action, or of congestion in the spine could be detected." Sensibility of the surface was retained, and command over the sphincters. "He was treated at first on the supposition of either serous effusion or vascular congestion having taken place in the spinal canal, but without receiving any benefit. He ultimately quite recovered by having frequent recourse to warm baths containing stimulating substances."

6. Dr. Graves quotes a case from Dr. Hutton in his *Lecture on Paraplegia*, pp. 407, 408, in which a man had incomplete paraplegia after exposure to cold, wet, and fatigue, as well as a very close stricture. The latter was dilated, and "a very remarkable amendment took place in his back and lower extremities in a very few days after the first introduction of the instrument, in fact, it was almost sudden. Warm baths, friction to his limbs, etc., completed his cure." Dr. Graves comments thus: "you at once perceive the extreme importance of this case; it bears directly on the question before us, and proves that urethral irritation may, as well as inflammation of the kidneys, give rise to paraplegia." He had previously referred to Mr. Stanley's cases of paraplegia from renal disease which have evidently the same import.

7. The same eminent authority says (*vide p. 407*), that he has recently met with a number of cases in which paraplegia was evidently brought on by exposure to cold and wet; and quotes a communication by Mr. Hunt to Mr. Stanley, to show that the same paralysis may result from uterine disease.

8. In his tenth Lecture, Dr. Brown-Séquard has the following remarks: "The sudden death which sometimes occurs when very cold water is drunk in a warm day, or in cases of a blow on the abdomen, of a sudden perforation of the stomach or intestine, of a wound of some abdominal viscus (without a notable hæmorrhage), etc., seems to be due to a reflex stopping of the heart's action. I have made a great many experiments which show positively that a sudden excitation of the abdominal sympathetic nerve kills, or diminishes the movements of the heart by a reflex action. The excitation goes up to the spinal cord chiefly along the great splanchnic nerve, and ascends the spinal cord until the place of origin of the par vagum, and through this pair of nerves it comes to the heart. This is proved by the fact, that a section of either the par vagum, or the spinal cord, or the splanchnic nerves, allows any kind of irritation to be made on the abdominal sympathetic without a stopping taking place in the heart. In some animals the influence of the irritation of the sympathetic in the abdomen is much more marked than in others; it is so, probably, in men. I have seen a gentleman drop down pulseless, in the most complete syncope, from a pain in the abdomen." In two experiments which I recently performed on cats, injecting half a drachm of citric acid dissolved in water into the peritoneum, death ensued very speedily, and the heart was found uncontracted, with its ventricular cavities full of dark blood on both sides. There was no other morbid appearance. I am, of course, aware of Dr. Gull's interesting observations of the state of the spinal cord in paralysis from renal disease, but I do not think his view is generally applicable. In one case of paralysis from exposure to cold and wet, where death oc-