are but feebly represented by the muscular layers of the human stomach. But it is by the action of its muscles that attrition, which has been shown to hasten so remarkably the solution of substances soluble in water, proportionately hastens reduction of the morsels of food.

The whole intestinal tube is provided with muscular fibres, by which its proper motions are accomplished. In the intestines, there are two layers, a longitudinal and a circular layer, which cross each other at right angles. But, in the stomach, there are three planes of fibres, and their arrangement is different. The external or longitudinal layer is continuous with the same structure of the oesophagus, and radiates over the cardiac end of the stomach. The fibres of this layer are most numerous on the lesser curvature. Other longitudinal fibres seem to have an independent origin in the middle of the stomach, and these converge in the direction of the pylorus. Beneath, and in contact with the longitudinal, is the thicker circular layer. It increases in substance from the cardiac to the pyloric end, and at the latter is developed into a valve-like structure. Between the circular layer and the mucous membrane, lies the oblique layer. The fibres of this layer pass obliquely from the cardia in such a way that, by their decussation from opposite sides of the stomach, its middle and greater extremity are embraced. By this arrangement of fibres, a very efficient apparatus for performing various movements is provided. These movements are well known, and have even been witnessed in the human subject. But the vast importance of their impairment, as a factor in causing dyspepsia, has been neglected. Dr. Beaumont has graphically described what he saw of these movements in the well-known case of St. Martin. He says that, as soon as a morsel of food dropped into the stomach, it commenced a series of revolutions from right to left, that is to say, round the greater curvature to the pylorus, and thence by the lesser curvature to the point of departure to commence a fresh revolution. The entire circuit was made in from one to three minutes; the morsels soon began to lose in substance, and, as reduction proceeded, the movements became quicker.

If this systematic agitation of the contents of the stomach be kept clearly before the mind, its importance to digestion will be realised. The solution of a salt at rest in water, is, as we have seen, comparatively very slow; and if the surface of the morsels of food be not duly agitated, so that the gastric juice may come into contact with fresh surfaces as solution proceeds, the formation of chyme will be greatly impeded.

Here we see the correlation of the functional disturbances of gastric digestion; for such an arrest of solution would be the same in effect as if the solvent fluid were defective either in quality or in quantity. But, as already said, the symptoms caused by impaired movements are less acute than those caused by imperfect secretion. In the one case, extension of time is often only required for the completion of digestion; while in the other, the absolute defect in solution implies a higher degree of gastric suffering. Notwithstanding his unequalled opportunities for seeing the stomach in action, Dr. Beaumont did not grasp the idea that a failure of the gastric movements must be a cause of dyspepsia. The reason of this was, perhaps, that St. Martin's stomach, owing to the fistulous opening, was never distended by gas; and, as we shall presently see, flatulence is the most prominent symptom of the condition under consideration.

In ordinary cases, whenever the contractile movements of the stomach are considerably lessened, flatulent distension soon follows. There are two reasons for this; first, the food lies passive, or nearly so, in the lowest parts of the stomach, where it is so slowly reduced that common fermentation takes place; second, the relaxed organ fills with the gases evolved, and also probably with gases regurgitated from the small intestine. It will now be easily understood why, in this form of dyspepsia, flatulence is a leading symptom, and also why it becomes a valuable aid in diagnosis.

The predominance of particular symptoms in cases of dyspepsia forms a practical mode of dividing the disease. Out of 460 cases of which I have preserved notes, in which this division was adopted, flatulence was found to be the leading feature in 179 cases, against 281 in which other symptoms were more prominent. In many of the latter, flatulence, although present, was regarded by the patient as less urgent than some other symptom, such as pain or acidity, etc.; but the flatulent class was found to be by far most numerous.

A great evil arising from flatulence is, that frequent distention of the stomach, by stretching its muscular fibres, impairs their tonicity more and more. The evil is thus propagated in a circle, because, while relaxation in the first instance is the cause of flatulence, this, in its turn, becomes a cause of relaxation.

In obstruction of the pyloric orifice, we sometimes see gastric distension reach its extreme limits, owing to retention of the ingesta and the consequent evolution of gas. In such cases, the stomach is virtually

paralysed, and vomiting is effected, not by its proper muscles, but by means of the abdominal muscles. The gastric contents gush from the mouth with little apparent effort. The well-known experiment of Magendie, in which a dog was caused to vomit after the stomach had been replaced by a bladder, proved that vomiting may be effected independently of the proper gastric muscles.

More rarely, cases of extreme gastric dilatation without pyloric obstruction occur. Some of these are instances of true paralysis of the stomach from lesions of the nervous centres. Dr. Habershon has pointed out that extreme dilatation of the stomach may be due to inflammation affecting its muscular coat.

The origin and connections of the pneumogastric nerves with the cerebro-spinal centres, as well as with the solar plexus, afford a key to a great number of results. They show how it is that purely mental impressions, such as are caused by bad news or fright, or impressions of the special senses, such as from disagreeable sights or smells, may disturb digestion, or even cause vomiting. In all such instances, the sudden formation of flatus, by which the antecedent occurrence of gastric relaxation may be surely inferred, is the most constant symptom.

There is no need to discuss here the difficult question of the sudden production of flatulence in these and other cases, or what gases compose it. The sequence of facts is alone necessary for the argument. One point only, on account of its bearings on the contractile state of the stomach, claims attention. A plausible explanation of the sudden development of gastric flatus was given by the late Dr. Brinton, as follows. He asserted that the gases of the stomach were at times subjected to so much pressure, that their volume was much diminished, and that sudden relaxation of the stomach, by removing pressure, allowed expansion of these gases, by which an immediate distention of the organ was produced. I have disproved this supposition by experimentally showing that no such pressure can ever exist in the stomach, by the removal of which such expansion of gases could take place.

Extreme dilatation of the stomach implies that its peristaltic movements are in abeyance. Soft and semi-liquid food can alone be taken, and this is either rejected in part daily, or at longer intervals, when the accumulated mass has fermented; and then, in addition to the common yeast-plant, *sarcinae ventriculi* are developed. But, since paresis of the gastric muscles exists in every degree, so must impairment of the gastric movements exist in the same degree.

[To be concluded.]

MEDICINE IN PERSIA.

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[Communicated by Dr. HORACE DOBELL.]

THE system of medicine in vogue in Persia is a pure empiricism. Diseases and remedies are divided into two classes, *hot* and *cold*; a hot disorder being treated by the administration of cold remedies, and *vice versa*.

Diagnosis is not attempted; and if the ailment do not give way under the one class of drugs, the native practitioner simply tries the other. When the patient has obtained his prescription, he, after repeating a prayer, opens his Koran haphazard; and looking at the first passage to his right, or at some other part of the page that is previously decided on, he determines whether he shall act on it or not. Should the omen prove favourable, he swallows the dose, however large (a quart is a common quantity) or nauseous, in perfect faith, having previously fixed on a fortunate hour. This important point is settled by the astrologer, who is much consulted in this country, no important affair being undertaken without his advice, or commenced save at the particular moment that he may choose as fortunate. Prior to calling in the medical attendant, a list of the principal practitioners is gone through, and each one is tried with an omen as described, from the Koran, till he whose name coincides with some especially lucky verse is selected.

Charms written by dervishes (wanderers vowed to a mendicant life), and either the writing washed off into water and swallowed, or the whole taken as a pill, or some form of prayer or incantation, are common; also propitiatory sacrifices, and, in case of the rich, money given to the poor, or to holy men. If the disorder prove obstinate, the bystanders each prescribe a remedy more or less ludicrous; and, save in the case of the very rich, or until the patient is *in extremis*, the European practitioner is seldom called in.

Purging, principally by means of calomel, is the almost universal commencement of treatment; for the Persian, like the sailor, thinks little of medicine unless it be heroic. This is followed by bleeding to at

least twelve or eighteen ounces; this latter is generally repeated several times. The hakim now leaves his patient very much to nature, prescribing merely *placebos*, such as syrup of violets, or sugar-candy and water; and, as the Persian has a strong constitution, he often survives, the credit of the physician being in direct proportion to the violence and novelty of the remedies he has employed.

Besides the hot and cold classes of disease, an additional distinction is made into those of *harâret* (heat and inflammation) and *rootobut* (humidity). Bleeding and purging are the remedies for the former, but carried to such excess that they generally terminate the case; while large doses of quinine and powerful aromatics administered in wine, with warm infusions, are given for the latter.

The diet is carefully attended to, and particular things are forbidden, not so much for any harm they might do, but to give the hakim a scape-goat should his treatment fail.

The surgery of Persia is in a still lower condition; and this is owing partly to the inferior status of the *jerrah*, or surgeon, who is generally either a barber or a farrier; and partly to the great objection that the Persian has to all operations which result in mutilation; for amputation of the arms, feet, or hands is the common punishment of theft, and the mutilated person is considered infamous. Hence it is rare that a Persian of the lower class will consent to them, while the upper ranks of society are, of course, less liable to require these operations.

When amputation is performed by a native, the primitive methods observed in Europe before the invention of the ligature are in use. The limb is struck off by repeated blows of a mallet on a chopper or short sword, or, in the case of a finger or toe, a razor, and then dipped into pitch or oil which is boiling. Lithotomy is frequently performed above the pubes, and is always fatal.

Chloroform is unknown, save by legend, and is called "spirit of insensibility", and is supposed to be possessed of the marvellous properties attributed to the "benj" of the "Arabian Nights". The administration of it is attended with danger, the medical officer to the residency at Bushire having narrowly escaped a pistol-shot from a tribesman on seeing his relative apparently put to death by the unknown drug.

The bone-setter is in better repute than the surgeon, and enjoys considerable popularity. He always informs the patient that his limb is either fractured or dislocated; and even should the injury be merely a bruise or sprain, he wraps it up in bandages smeared with yolk of egg; or, should he have diagnosed a fracture, with bitumen (*mûm yai*), which latter is supposed to possess almost miraculous properties; and he keeps the limb in a state of perfect rest so long as the patient will pay for his visits. The results of this are limbs of various degrees of shortness and curvature, ankyloses, etc.; but, by this mode of treatment, the bone-setter has the credit with the simple of working extraordinary cures, and I have been gravely shown supposed united fractures of the femur and humerus after five days' bandaging. Splints are quite unknown, while compound fractures generally result in gangrene and death, though at times they are brought to what is considered a *successful* termination by the spontaneous separation by mortification of the distal extremity of the limb, leaving an useless stump.

During illness, the chances of recovery of the patient are diminished by his being surrounded by numbers of friends and acquaintances, who smoke noisy water-pipes, and continually drink tea and converse, never leaving him, day or night, until he is either dead or convalescent. These friends consult with the patient, if he be in a state to do so, on the expediency of following his physician's treatment, and nothing is administered without the approval of a majority of the bystanders. As the disorder increases in intensity, so do the friends, neighbours, and passers-by, increase in number, till, at the decease of the patient, it is no uncommon thing to find eighty people in the room, and two or three hundred in the house.

Midwifery is in the hands of the Jewesses and old women. The patient is placed in a crouching position, sitting on her heels, with her feet raised from the ground by means of two bricks, while a handful of wood-ashes is sprinkled on the floor. The midwife and another woman proceed to knead (*masser*) the belly and loins, and the patient is on no account permitted to lie down. The successful termination of the labour is supposed to be the result of gravitation. Should there be any presentation of an extremity, or of the cord, the midwife simply drags at it till something gives way. Of course, from this practice, the most frightful results ensue, rupture of the womb being a common thing. The patient generally goes to the hot bath the sixth day after delivery, and resumes her ordinary avocations. She suckles her child, with the idea of avoiding pregnancy, sometimes as long as three years.

Lunacy is not common. Idiots and harmless lunatics, being looked upon as persons of peculiar sanctity, are allowed to wander about unmolested; while the unfortunates suffering from acute mania are confined

in dark cellars, manacled, starved, and beaten, till death soon terminates their sufferings.

Vaccination is not in favour; inoculation, or the direct communication of the disorder by placing the patient in the same bed with one suffering from small-pox of the most virulent type, is the method pursued.

There are no medical schools; but, as a rule, some slight smattering of the methods of treatment I have noticed, if methods they can be called, is picked up by a son inheriting his father's practice, or a servant that of his master. Anatomy is quite unknown, and no such thing as a necropsy is ever permitted. The only works consulted are those of Hippocrates, Avicenna (called Abou Senna), and a few Arabic works of great antiquity. The social status of the *hakim*, or physician, is good; but the surgeon is generally of the same position as the barber. This latter enjoys the monopoly of dentistry, phlebotomy, and the actual cautery; he also cups and performs the operation of circumcision, and often is a bone-setter, while he generally pretends to a special knowledge of diseases of the eye, and the treatment of venereal disorders, and drives a brisk trade in supposed aphrodisiacs and abortives.

CLINICAL MEMORANDA.

SUICIDAL BULLET-WOUND OF SKULL: RECOVERY.

THE following case is interesting from a psychological as well as from a surgical point of view.

B. L., aged 40, a travelling agent for a large wholesale English house, an accomplished linguist, of cultivated manners, and a German by birth and parentage, was brought into hospital on the morning of November 19th, suffering from a gunshot wound in the forehead. He had been travelling in the tropics for the last six or seven years, but never suffered any of the diseases incidental to those climates. He had always been temperate, and as regular in his living as in his line of life it had been possible. His father committed suicide. He had always been a nervous man, and lately, on account of the unfavourable state of trade in South America, had become more so. Four or five days before admission, he applied to a medical man for advice on account of insomnia, and was prescribed a mixture of chloral, morphia, and bromide of sodium, and advised to leave business for some days. There was nothing peculiar in his manner, except an anxiety and nervousness quite attributable to his insomnia, which had already lasted seven or eight days. After taking the sedatives mentioned, he slept and got relief.

During the afternoon of the 18th, he accidentally heard mentioned a suicide in the case of a man who had been a debtor to his (B. L.'s) firm. He noted in his pocket-book the name, age, date, etc., and retired. At his hotel, the same evening, after dining as usual by himself, he wrote a letter to an acquaintance, begging him to look after his affairs, and intimating that, as his "brain was tottering, he must die, and that he had left £100 for his funeral and other expenses". At about 10.30 p.m., the report of firearms was heard in the hotel and search made for its origin; but B. L.'s room was not searched, as a waiter stated that he had seen him lately go out, and his door was left locked. It was supposed that the discharge had taken place on the roof or in the next house, and (it being a noise sufficiently common in the streets) no further notice was taken of it. At about 12.30 A.M., a similar report was heard; the night-porter thought it was in the court-yard or garden, and took but little notice.

At about 9 A.M., on forcing the door, the occupant was found standing in his shirt, covered with blood, on a box in the corner of the room "gibbering". When they attempted to place him in bed, he became furiously maniacal. A medical man was called in, who, after examining the wound and removing a piece of brain-substance "nearly of the size of a pigeon's egg", recommended his removal to hospital. On admission, his condition was that of acute mania. In his forehead was a ragged wound about two inches and a half in length, between the eyebrows, having a direction somewhat obliquely upwards and outwards, from right to left. The cavity of the wound was filled with brain-substance, and a probe by its own weight glided into the wound for a distance of three inches and a half in a direction almost directly backwards, but was not felt to come into contact with any foreign body. The wound was cleansed, and a light dressing of lint dipped in a one-to-sixty solution of carbolic acid applied. Over this, and covering the forehead, was placed an icebag. A subcutaneous injection of fifteen grains of chloral was given, and the violent delirium gave way to sleep in something less than a quarter of an hour. When he awoke about two hours