resort to it. The mother beats up one drachm of the medicine together with the yolks of two eggs; and of this mixture one-sixth or one-eighth part is given two or three times a-day, until the system is brought under the influence of the remedy. This treatment may be undergone many times during the year; and I firmly believe that it has the power of warding off many bruises and much external bleeding.

Attention to diet becomes important in the management of these cases. Fresh meat, or a good extract thereof, pure milk, and eggs should be partaken of freely; ordinary vegetables in moderation; ripe fruit somewhat in excess. Among beverages, wine is useful during convalescence, and ale and porter as articles of diet. I confess a fondness for spruce beer, which probably contains some of the terebinthinate constituents of the fir, and thus combines in a pleasant form food and medicine.

In this short and necessarily imperfect history much has been omitted, and I have forbore to enlarge upon the trials and troubles which the constant attendance upon such cases entails upon doctor and parent. I have ventured to publish it, partly as a slight contribution to a hitherto overlooked subject, and partly for the sake of giving comfort and encouragement to any to whose lot it may fall to have to contend with the troublesome affection.

REMARKS ON THE PATHOLOGY AND TREATMENT OF SEA-SICKNESS.

By FREDERICK POLLARD, M.D.Lond.,
Medical Registrar of St. Thomas's Hospital.

THE frequency with which sea-sickness occurs, and its striking characters, have given rise to many speculations as to the essential cause of the affection.

Dr. Copland says, the primary effect of the motion of the vessel is to produce depression of the semilunar and allied ganglia, which results in vomiting. Dr. Chambers thinks that the principal cause of the sickness is the relaxation of the oesophageal sphincter by the vibration. The majority of writers, however, consider that the phenomena are mainly due to disorder of the central nervous system. Thus, Dr. Hooper, in his *Medical Dictionary*, says that sea-sickness seems to arise from a depressing effect on the brain, produced by the motion of the ship; and that the only remedy which is of any use is lying perfectly still with the head low, by which an increased quantity of blood is thrown on the brain.

The opposite view to this, viz., that increase of blood in the brain is the cause of sea-sickness, was ably supported in the interesting paper of Sir J. Alderson on this subject, which appeared in a recent number of the *BRITISH MEDICAL JOURNAL*. There is something at first sight very tempting in the ingenious analogy drawn between the blood in its vessels and the mercury in the tube of a barometer. A little consideration, however, will show that the illustration is not so accurate as it might, *prima facie*, appear to be.

The theory referred to is that, as the ship sinks in the water, the barometric tube falls more quickly than the mercury that it contains, so that the latter tends to impinge on the upper part of the tube; and it is argued that, in like manner, as the body descends, the blood falls less quickly than its containing vessels, and so tends to produce pressure on the brain; these successive impulses causing the vomiting. "When the rigid tube falls," says Sir J. Alderson, "the mercury, having its own inertia, and not being attached to, or a part of, the tube, remains stationary, at least for a time; thus the tube is pushed down upon or over the mercury." Now this might, perhaps, happen if the barometer were actually pushed down suddenly, because in that case the pressure would be applied to the tube, and not to the mercury, which would simply fall by its own weight. But in the case of a barometer merely allowed to fall, the glass and the mercury begin to move under the action of gravity at precisely the same moment; and so far from the mercury having a tendency to lag behind, its greater specific gravity tends to make it fall more quickly than the tube, the result being that it carries the tube down at a greater rate than that at which the latter would fall if it were empty. At sea, the falling of the ship is due to the action of gravity. There would be no tendency, therefore, for the mercury in the barometer or the blood in the body to commence falling later than the tubes which contain them. They would all begin to move at the same instant.

It is, nevertheless, a fact that the action of the waves does cause the mercury in an ordinary barometer to oscillate when the sea is rough. As already shown, the mere falling and rising of the ship would not account for this. It is the sudden striking of the ship by the waves

which in rough weather jerks the mercury up in the tube; and in order to reduce this to a minimum, certain ingenious modifications have been introduced in the construction of marine barometers; moreover, they are suspended from a ball and socket joint, so as always to maintain a vertical direction; otherwise, the mercury would become tilted with the various movements of the ship, and an erroneous impression that it rose and fell might be acquired.

Now, theoretically, we might imagine the blood as being jerked upwards against the brain by successive blows of the sea on the ship. But it is obvious that merely assuming the recumbent posture would not prevent this. There would be more probability in supposing that the brain itself might be jerked against the interior of the skull when the ship was violently struck; thus causing a series of small concussions, and adding something to the mental and bodily distress. But this will not explain the occurrence of sea-sickness in ordinary cases, when the ship rises and falls without violent concussions. For this an explanation other than a merely mechanical one must be found.

The most probable theory of sea-sickness is that held by Dr. Carpenter, Mr. Bain, and other writers, who consider that the mental and bodily prostration and the other symptoms arise from the continued action on the brain of a certain set of sensations, more particularly the sensation of want of support.

This feeling arising from the sudden loss of support, as when the footing or any prop that we lean upon suddenly gives way, is one of a most disagreeable kind. Should the accident have been perilous to life, as when the foot slips close to the edge of a precipice, or a rope cracks in Alpine climbing, a sickening feeling seizes the brain, the whole frame is agitated, and cold perspiration is felt all over.

The phenomena of sea-sickness appear to be due to the constant repetition of this feeling of loss of support, consequent on the pitching and rolling of the ship, more particularly the former. This explains the fact that the distress is most acute at the moment of the descent of the ship; whereas, when the part of the vessel in which the sufferer is placed rises beneath him, a comfortable sense of support is felt. It is well-known also that the distressing sensations may be to some extent warded off if a downward motion of the body be made at the time of ship's descent, and an upward motion when the vessel rises. In this way a kind of voluntary character is given to the sinking of the body, the nervous system is not taken so much unawares, so to speak, and thus the sensation of loss of support is less acutely felt. The feeling of want of support resides essentially in the muscular system; but the sensations of other senses contribute towards it. The sight of continually shifting lines and surfaces is an important factor; and on board steamer the constant vibration, the noise of the machinery, and evil smells of various kinds, are other items in the elements of causation.

That vision has something to do with the production of sea-sickness, is shown by the fact that closing the eyes will often keep off the sickness for a time; and in illustration of this point, we may refer to the general depression, faintness, and even nausea, which may be produced in susceptible persons by "doing" too many picture galleries in rapid succession, and this not dependent on the quality of the pictures themselves. That the vibration and noise may add to the general depression is shown by the painful effect produced on a person not used to it, by going into a large room of a cotton-factory, full of steam-looms at work. As regards smell, I can testify that going down into a hot cabin and sitting close to a reeking joint of boiled mutton, has nearly brought on sea-sickness, only warded off by a timely retreat into the upper air.

The constant unpleasant impressions, then, on all the senses, contribute something to the mental depression and the bodily disorder which constitute sea-sickness; though, no doubt, the main factor in its production is the continual feeling of want of support, suggested partly by the visual organs, but chiefly through the muscular system.

As regards treatment, since sea-sickness arises from certain impressions on the senses, the obvious indication is to render these sensations as feeble as possible. Application of the mind to an engrossing book will keep it off for a short period; and Dr. Chambers relates that his having to bind up a broken finger of one of the seamen relieved his own distress for the time. But the mind will speedily become alive to the sensations which force themselves on its attention. In order to lessen them as much as possible, the patient should preserve the recumbent posture, as near the centre of the ship as possible; he should lie on a thickly padded couch, so as to diminish the vibration. Fresh air should be admitted in order to remove bad smells. The eyes should be shaded, and as much noise as possible shut out. As regards drugs, the most rational suggestion is that of Dr. Döring, of Vienna, that a full dose of hydrate of chloral should be taken shortly before the vessel starts; and even in long voyages the repeated use of this medicine will ensure comfortable nights without the disagreeable after-effects of opium and chloroform.