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Sea Sickness.

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Sea Voyages.

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An Essay

by

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Surgeon, S.S. "Finnessia"

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# Preface.

The aim of the present papers is to collect and analyze the facts which have come under my notice, during voyages to the East & West; to put on record the lessons my sea life has taught me; and to add my share small though it be, to the general knowledge of a subject which has not received so much attention from ship surgeons as it deserves.

While many theories have been advanced as to the probable cause of sea sickness and on the strength of these theories many remedies have been suggested; the subject of the effects of the sea on the human body in health and in disease has not been much written on.

In the Merchant Marine alone there are several hundred regularly qualified surgeons engaged - in the Atlantic service alone over a hundred - & if each was making careful observations and giving the results, much would be done to clear away what is mere superstition, and add to our knowledge of the action and uses of what is undoubtedly, rightly used, a great Therapeutic agent which has been the means of prolonging many a useful life, but which alas! has too often indiscriminately used been the means of bringing to a fatal termination far from home and friends cases which would have been far better left alone.

We find little or no notice taken of sea sickness in our text books on the Principles & Practice of Medicine, but when we consider how much suffering it occasions to so many thousand travellers, it may be deemed worthy of a not unimportant place in an essay on Sea Voyages.

# Sea Sickness

A disturbance of Organic Function met with at sea, caused by the motion of the ship, in which the leading manifestations are nausea and vomiting.

morbid Anatomy.

There is only one recorded P.M.!! in death during sea-sickness in which the spinal cord and brain were examined. It is not as a rule fatal and the few deaths which have occurred have been on short passages, as from England to Ireland & Copenhagen to England. In these, death was generally ascribed to Syncope, and when a P.M. was held heart disease was present.

While a Chinaman was sea-sick and in the act of vomiting a piece of iron falling from aloft struck him on the head and killing him instantly. A post mortem examination was held four hours afterwards, when, leaving out of consideration that his head had been pierced by the piece of iron, all his organs were found to be in a healthy condition, except the spinal cord the vessels of which were gorged with blood throughout its entire length; similar in appearance to <sup>that of</sup> an epileptic patient who died suddenly during the Status and on whom the same doctor made a post-mortem examination.

The writer in Quain's dictionary has had one autopsy in a case of seasickness in which the patient died suddenly. The appearances presented were those of ordinary syncope, there was no organic disease present. The brain was not examined.

Dr Crochley Clapham Lancet 2 vol 1875 page 276.



### Causation.

Many theories have been advanced as to the causation of sea sickness, and on what organ the cause principally acts is still a matter of dispute. The symptoms are those of both nervous and gastric disturbance and are of such a character as regards both brain and stomach as might well result from the primary disturbance of the function of either.

M. Semanas of Lyons in 1850 published a volume of 414 pages, in which he endeavoured to prove that sea sickness was due to a kind of maritime intoxication, arising from a miasma generated in the holds of the ship. He classed it with yellow fever, Cholera, the Plague &c and advised that Quinine be administered. Up to that time ship fever was in some cases almost as deadly as these terrible scourges and it is probable he confused the two.

Hippocrates said *Declarat autem navigatio quod motus corpora turbat*, seeming to imply that the cause lay in the motion of the floating viscera caused by the rising and falling of the ship. The theory that the jumbling up of the contents of the Abdomen is the cause has had many advocates.

In an essay on seasickness published in 1812. Dr. Kerendrew brought it forward, and some time afterwards Basse read before the Academy of Toulon a paper, in which he adopted Kerendrew's theory. Dr. Joubard of Brussels thought sea sickness was due to the rising and falling of the intestines, irritating the diaphragm & causing retching and vomiting; whilst they compress the liver forcing bile into the stomach which rejects it immediately.

Dr. Bennet draws attention to the way in which water in a basin

splashes about from side to side with the motion of the ship, and thinks that in the same way, the viscera are rocked about. While in the erect posture at one moment all the movable contents of the body, solid and liquid, are thrown one way - towards the feet, the next they are thrown with violence upwards and on the diaphragm and the liver, bound down firmly under the ribs so that it cannot get out of the way. And this continued pounding excites and stimulates the liver so that huge quantities of bile are thrown out into the stomach, and into the intestines, which should never receive it unless during digestion; and this occasions the sickness and vomiting.

It med journal  
d. 1880 p 507.

Except after urgent vomiting the stomach contains fluid and gas with or without a certain amount of semi-fluid matter. Physiologically its contents are moved slowly in a circular manner from left to right along the greater curvature, & vice versa along the lesser, except when the cardiac end opens for the entrance, or the pyloric to permit the expulsion of some of the food, and Dr. Ben Whittle<sup>2</sup> thinks that the turbulent action of the sea, interrupting the normal slow and circular motion, and substituting for it a rapid jumbling up and down of the contents of the stomach, causes the contents of the stomach to become nothing more or less than a foreign body, whose presence he thinks readily accounts for all the distressing symptoms which occur in an attack of sea sickness.

Dr. Chapman<sup>2</sup>.

Considers that the proximate cause is an undue amount of blood in the nervous centres along the back and especially in those segments of the cord related to the stomach, and those muscles concerned in vomiting. This hyperaemia being caused in three ways:-

- (1) Through the Brain.
- (2) Through the ligaments of the spinal cord.
- (3) Through the Abdominal & Pelvic viscera.

The shaking of the viscera gives rise to a number of abnormal impressions which are transmitted to the spinal cord and influence it in the same manner that direct concussions do.

When the amount of blood in the spinal cord is by any means increased, all the nerves emanating from it partake of the increased activity of the cord itself, & convey from the centre to the periphery of the nervous system, an abnormally large number of exciting impressions. And those parts of the body not under voluntary control are thrown into a state of confusion by the rapidly transmitted impulses coming from the nerve centres.

The amount of blood in the brain is increased by its movements within the skull, being thrown upwards against the roof of the cranium and at the same time drawing up the Ligamentum Divericulum in ~~descent~~; and against the base, in descent; then being flattened and pressing on the cord. From these slight concussions, he believes the headache to arise. By this means a great deal more blood comes into the brain, and cerebral irritation is induced. In cases of extreme cerebral sensitiveness, exciting impressions are transmitted through the Medulla Oblongata to the whole spinal cord, which acting as irritants, increase the flow of blood in the whole spinal axis.

The nerves emanating from the cord, which convey its impressions directly or indirectly to the stomach and other viscera, excite them to preternatural action either primarily & directly, ~~and~~ secondarily & indirectly. These being excited throw back their impressions on the cord and are again from it reflected to them, and thus we have sea-sickness. It may be excited by cerebral disturbance and through the cord and sympathetic ganglia and also the Medulla and the Pneumogastric (efferent).

(1) Spinal Movements: by the jerking on the ligaments by which the spinal cord is suspended producing irritation and increase of vascularity

6  
3. By Visceral Movements.

The viscera are shaken and brought into concussion with one another.

These movements and shocks and the vibrations caused by the continually changing position of the contents of the hollow viscera produce an abundance of abnormal impressions upon the nerves transmitted to the various organs, which are conveyed through the medium of the complex visceral nerves & sympathetic ganglia to the spinal cord, and possibly medulla oblongata, and an excessive reflex action of these organs is produced; and hence the transmission of a preternatural amount of impulses to the stomach, bowels, and all the viscera, as well as the thoracic and abdominal muscles.

The deadly pallor, cold sweat, physical weakness, mental prostration, headache, and indifference from mere weakness to one of such vital ~~depression~~ as to imperil life itself, all show that an inadequate amount of blood is passing through the capillaries. The efferent nerves of the sympathetic receiving impressions in abnormal number and intensity from the Brain and Abdominal viscera, convey them to the ganglionic centres, which reflect them through the vaso-motor or ganglionic efferent nerves in the form of impulses transmitted to the arteries and produce their contraction.

Another well known mechanical theory is that which Dr Hallaston, suggested early in the Century; which has received considerable attention and support, being revived and advocated more particularly by Sir Jas Alderson in "Observations on sea sickness & on some of the means of relieving it," who considers that it is supported by physiological observations, pointing out that injury or pressure on the Brain is almost invariably followed by vomiting.

Dr. H. Collinson explains the action produced on the brain by reference to the barometer. If carried out to the sea in a calm the mercury will rest at the same height as if steady on shore, but when the ship falls by the subsidence of the waves the mercury is seen to rise perceptibly in the tube containing it. In the same way if you carry a mountain barometer the mere act of walking is sufficient to cause concussion of the Mercury against the top of the tube. He considers that the action of the blood at the moment of descent of the vessel is the same as the Mercury at the top of the barometer & that there is actual pressure or even a blow which by frequent repetition causes nausea & vomiting.

The scientific explanation being that the mercury has its own inertia and is not part of the tube, & in the fall the rigid tube as it were slides over the surface of the Mercury which remains stationary, and so we have the concussion. The blood is a fluid contained in tubes and when in the descent of the ship the approximately rigid bloodvessels are carried down the blood, having its own inertia, in the same way as the mercury, is driven with force against the top of the tubes, into the brain, which becomes crowded with blood.

The heart's action and the elastic recoil would be in the ascent of the ship, to a certain extent neutralised by the vis inertia of the blood column. The blood pressure on the brain would be greater at the beginning of descent and least at the beginning of the ascent as the blood column would continue falling after the body had commenced its ascent, and vice versa.

The vomiting thus produced is of a peculiar character very different from that produced by a disordered stomach; it occurs in a spasmodic manner and violent retching remains after the contents of the stomach have been ejected. The continued retching seems to indicate the repeated action of the increased pressure.

It is at the beginning of the descent that the most miserable feeling is felt, and at that moment the tendency is to take a deep breath during which the chest is dilated for the reception of air and its vessels become more open to admit blood, so that the return of blood from the head is at that moment more free than at any other period of complete respiration whilst on expiration the ingress of blood is obstructed.

During rapid operation, as in waltzing the pressure of the blood on the brain is from centrifugal force along with the rapid movements of objects before the eyes. In swinging it is in the descent that the discomfort is felt.

Sir J. Aldison points out that of all the causes which act sympathetically to cause vomiting affections of the head are the most common. In the Transactions of the Roy. Med. Soc vol. xiv p 339 Sir S. Brodie in treating of Concussion says "Sickness and vomiting are early symptoms. The effect on the brain according to this theory is of the character of a slight concussion & it is in the less severe forms of concussion that sickness and vomiting occurs as it requires a certain excitability of the Brain to induce the act of vomiting; it must not be destroyed by extreme pressure

Dr Fordyce Baker<sup>(1)</sup>

Med Record. 5th Sept 1869. Ascribes the symptoms of sea sickness to the sudden and recurring changes of the relation of the fluids to the solids of the body & the nervous disturbances which result from these changes. The alternate movements of ascent and descent produce alternations of afflux, and delay in the arrival of the blood in the different organs of the body, which disturbs their functions and those of the brain especially, with results analagous to the nausea & vomiting which some persons experience after resection. He considers that the blood by its fluidity yields more easily to the influence of descent & less easily than the solids to the ascending impulses.

Dr Bennett<sup>(1)</sup> also thinks that it is due to the blood being irregularly banged about by the motion of the vessel in a rough sea

Dr. Rochlitz, an Austrian Physician, in an essay on Sea sickness, considers  
 the malady no sickness at all, it being a state of body arising from an  
 derangement of certain organic functions. That there are only two pathognomonic  
 symptoms: nausea and spasm of certain sphincters; that vomiting is not character-  
 istic and that the nausea arises from the contraction of the oesophageal, Anal,  
 & vesical sphincters.

The first effect of the ships motion is to put the abdominal muscles in a state  
 of more or less contraction. As these contract the cavity they enclose becomes smaller  
 and their contents under the pressure will seek for their natural outlets.

Nausea is more complex in its explanation. It is a specific sensation of the Pneumo-  
 gastric nerve just as the sensation of appetite & satiation are supposed to be.

It is caused chiefly by vertigo or that disturbed state of our consciousness,  
 during which we are unable to form a correct idea of our bodys equilibrium,  
 and are impressed by the notion that we are about to fall. Vertigo, perhaps,  
 is always produced through indistinct vision, and itself may be the result of a  
 deficient accomodation; of a sudden anaemic or hyperaemic state of the bulb  
 of the eye; or of the sense of unsteadiness arising from the rolling of the ship.

The attempt under the latter predicament to balance the body is, owing to  
 mental agitation, made wrongly and hastily. Instead of using the muscles of the  
 lower extremity only - the natural supports of the body balance, other muscles  
 are brought into action: first the abdominal muscles, likely, because they are close  
 at hand, and as they contract nausea is felt on account of impending

vomiting. Another source of vomiting is the sensation of the regular  
 displacement of the <sup>intestines</sup> abdominal ~~self~~ and their contents as will happen during  
 swinging. Peri- and anti-peristaltic movements being set up in the bowels  
 & the latter extending to the stomach will force up some of the contents  
 into the mouth.



Hubert May 50 years ago recognised sea sickness as the result of irritat:  
ion of the passive sense of motion

D. Stocks.

thinks that in the Pneumogastric we have the key to the whole causation.

The prime nerve of organic life, it governs the heart, the lungs, the stomach.  
If any powerful stimulus occurs to the mind it acts on the heart & lungs,  
if to the senses, on the stomach principally. We see this in the disgust  
and vomiting following on an unpleasant sight, taste, or smell.

Stimuli differ in quantity and quality, in degree and kind. Moderate  
stimulus of the nerve increases digestion; increased stimulus causes all the  
symptoms of dyspepsia. The nervous centres excited by the sensory impress:  
ions become at last so irritable that the introduction of any thing into  
the stomach either from within or from without is resisted and vomiting  
occurs. This goes on until sooner or later by force of habit the body becomes  
accustomed to the new sensation.

Some sensations are pleasing and agreeable, others painful & disagreeable  
& these differ in persons and times. We have a passive side of motion  
combined with the fifth sense, of touch, which has its pleasant as well as its  
painful side.

Another point which he considers important in the causation is the lung  
vacuum caused by the fall of the viscera in the descent of the ship. The conditions  
in sea-sickness are almost identical in effect and cause as in Mal de  
Montagnes, as described by M. Pherson (Brit & Foreign Rev. Feb 1887 page 279) - a certain  
rarefaction of the air in the chest, a partial vacuum being produced when the  
viscera falls causing the feeling of giddiness, which is more felt in the upright  
posture. The feeling is allayed by taking a deep breath, by smirking, a belt &c.  
This partial vacuum causes the irritable condition of the nervous system. It has  
an effect on the pneumogastric (pulmonic branch) having an inhibitory effect on the  
heart and stomach. If the nerve is cut or pressed on we have the same effect.



There is an indirect effect on the same nerve through the medium of the nerves of feeling or common sensation; sometimes through the agency of other senses, the cause in each case being eccentric & peripheral.

B. Johnson

Times  
al 10<sup>th</sup> 1881  
page 381.  
Also considers the Pneumogastric the cause, the motion of the stomach acting on its internal coat, and so irritating the Pneumogastric nerve. The irritation acting on the distal extremities of the nerve producing certain symptoms referable to the brain; and we have vomiting attributed to the motor influence of the nerve & giddiness, pallor & sometimes complete syncope.

Med Jour.  
Nov 81.  
page 388.  
Another writer (A.M.W.) thinks the inhibitory action of the vagus causes all the symptoms, partly inhibiting the heart and partly causing dilatation of the abdominal vessels & so withdrawing blood from the brain to the abdominal viscera. The phenomena of sea sickness being produced by all motions which imitate the sensations we have when giddy or sick from some cause having its seat in the body. The sensation of the floor sinking beneath the feet, the rising and falling of the walls of the room and their spinning round are specially connected with giddiness & nausea and these are the motions which most readily produce the phenomena of sea sickness. It is not necessary that there should be any descent of the body to produce nausea. Sea sickness is a case of the association of the senses. We associate the sensation that the walls of the room are moving with the sensation of sickness, & when the walls of the room actually move the sensation of sickness is produced.

B. Mayo

Med Jour.  
Ch. 23-1872.  
Thinks that the cause lies in the Solar Plexus, over whose seat and not in the brain lies the focus of discomfort. No such sensation follows concussion of the brain.

B. Munn

Oct 17-1881  
-1837

Recognises two causes:- 1) The automatic and voluntary acting muscles of the Abdomen are unable to fulfil the duty of pressing and supporting the contained abdominal organs, due to the irregularity of motion. They are therefore allowed more play, & stretching on their mesentery produce nerve shock and paralysis specially those branches of the sympathetic which are connected with the small intestines, those ~~motor~~ branches which control the calibre of the blood vessels, and so we have vascular dilatation. The extra blood being extracted from the general circulation other areas become anæmic and their tone lowered, so we have the pallor, depression and tendency to syncope.

Comiting may arise from irritation of the periphery of the nerves of the stomach and intestines due to the hyperæmia, or to the anæmic and disturbed circulation of the Brain & Spinal Cord.

B. Marshall Hall

Oct 1849  
-507

Thought that all the symptoms pointed to the Medulla Oblongata as being the part of the nervous system chiefly or primarily affected. The intellect remaining clear showed that the cerebrum was unaffected.

B. Irwin

Oct 1849  
-507

Recognises sea sickness as a complex condition in which many organs are involved acting and reacting one on another in various ways but in the beginning when first the ordinary conditions of life are disturbed there is some one unanswering the pressure upon which has set the whole of the machinery into confusion.

Foremost among the physiological discoveries of the last century is the knowledge that we have distinct from, but in close alliance with the other senses, a sense of Equilibrium which appears to be more or less connected with the Cerebellum, Optic lobes, and possibly with other parts of the nervous organism, its prime seat being the semi-circular canals of the inner ear, which may be considered for practical purposes as "the organs of Equilibration"

Sea sickness or motion sickness is essentially a disturbance of this function, and it is essential that the motion be backwards, downwards, or oscillating, & that it be continued for some time. A combination of these conditions being the most effective, specially if there be added an element of irregularity or uncertainty.

Motion produces sickness by disturbing

- (1) The Endolymph in the semicircular canals.
- (2) The viscera in the Abdomen.
- (3) Possibly the Brain and the Arachnoid fluid at its base.

(1) The endolymph being subject to physical laws follows the motion of the head in those canals whose plane corresponds most nearly to the direction of that motion. When the motion is suddenly reversed by the semi-circular motion of the ship, or altered in direction by a new wave striking her on another point, the endolymph continues to move on in the original direction till stopped by friction. This causes undue pressure in one or more of the Ampullae, by which wrong impressions are conveyed to the sensorium, and coordination, giddiness &c are the result. The otoliths are washed about by the motion of the fluid. The Cilia and terminal nerve filaments are irritated & abused, and when this process is continued in operation for a certain time, a condition is set up which represents the true Pathological explanation of the ordinary form of sea sickness: Irritative Hyperaemia of the semicircular canals

That sea sickness is least felt when lying down with the head low and to the low is explained by the fact that the Ampullae are placed on the anterior extremities, so that when the head is thrown back the endolymph + otoliths gravitate towards the least sensitive part, and disturbance of them will not have the same tendency to alter pressure or produce irritation within the ampullae.

This also accounts for the backward movements being so distressing, and in part for the unpleasantness of the descent.

In Meniere's disease, head symptoms are always present, from a queer sensation about the head, to vertigo & Cephalgia more or less acute. The falling type in Meniere's disease frequently merges into a condition resembling a sensation of "being rocked by the waves" or "in a ship on a stormy ocean". We may regard sea sickness from his point of view as a mild semi physiological prototype of the Non-Cochlear part of Meniere's disease. The one is "a vertigo in which of translation, in which a strong subjective sensation of a translation movement of the whole body" (Charcot) is induced by an abnormal condition of the semi-circular canals, in the other, real objective translation movements of the whole body induce an abnormal condition of the Semi-circular Canals.

Sea sickness he divides into 2 classes:-

- (1) Neural or labyrinthine vomiting - commonest in ocean steamers.
- (2) Labyrintho-musculo-visceral vomiting due to mechanical disturbance of the viscera permitted by incoordinate muscular action the result of faulty labyrinthine impressions. The motion causes the shaking up at the same time of the endoliths and of the viscera causing the one to send out wrong impressions to the abdominal muscles just at the time when proper support is required.

It is possible that certain equilibrating impressions may be formed in the viscera themselves, in the Pacinian Corpuscles, but these being at variance with those from the main centre of equilibration will only add to the general confusion. This is commonest in very rough seas.

- (3) Stomachical vomiting (a) Primary or (b) Secondary. depending on
  - (a) The nature and continuance of the motion & constitutional tendency of the individual.
  - (b) Caused by mechanical disturbance of the usually semi fluid contents of the stomach, relieved immediately by vomiting. (c) The stomach is irritated and abused as in class 2 and takes on an abnormal action on its own accord. Everything swallowed is rejected for days or even weeks together & life may be threatened from exhaustion.

Such are the leading theories which have been advanced at various times in regard to the causation of sea-sickness, the stomach, the solar plexus, the pneumogastric nerve; the Semi circular canals (movement of endolymph & otoliths in); the Spinal cord, and the brain; being held as the primary cause.

remote cause  
vertical  
movement.  
chief.

Regarding the remote cause, the vertical movement of the body is the chief instrument in its production. Into every movement of the ship at sea the up and downward motions enter and each movement of which the person is sensible, may have its effect in producing sickness. The motion will vary (1) according to the direction of the waves, & (2) their size in relation to the vessel. The place of least motion in every case is the centre of the ship.

In a roll or pitching motion, the vessel moves on its transverse axis & therefore the nearer the axis the least motion; in rolling, moving on its antero-posterior axis theoretically, but in practice always combined with a certain amount of pitching more or less, we have a motion at the ends of the vessel which is not only greater than but not which there enters a complex or wriggling motion scarcely felt near the center of the vessel.

It is on this account probably that the rolling generally causes more to succumb than a quite pitching, and which when exaggerated, as in small steamers or ships in choppy seas, or heavy seas on the bow in larger vessels, makes even those accustomed to sea life uncomfortable.

As regards posture the vertical produces it more readily and a certain amount of relief is in most cases derived from the horizontal. But as even in the horizontal sickness is produced, too much stress cannot be laid on posture.

That sea sickness is not such a simple matter to explain as would appear at first sight is evident. It is a disturbance, to bring about which many elements enter. There is no one cause but many. The sole cause cannot be as O'Glen Whittle supposes, the contents of the stomach being

jumbled up and down, and becoming like a foreign body. The stomach is a most accomodating organ, as a seat at the head of the dinner table in the saloon of an ocean steamer would soon convince one, and the most indigestible articles can be piled in on the top of one another, which for variety could compare favorably with a Bazaar lucky bag, without apparently causing the slightest inconvenience. But supposing that the food did act as a foreign body, not only would it be incapable of producing the train of symptoms, but if it could, immediately on vomiting relief would be experienced, which except in very few cases does not or only partially occur.

That food on the stomach, specially food which is indigestible, & which would in a person of bilious temperament be apt ordinarily to cause vomiting, is also at sea a cause of sickness, I grant; That even in some cases which would otherwise escape, the partaking of certain articles of diet may, on sea as on land, be the primary cause of sickness, which once set a going goes through the whole train of symptoms of mal-de-mer, from personal experience I believe; but to set it down as the cause in every case is very far wide of the mark. Were it so then an empty stomach would be the best preventive and a sure remedy, which it is not. After sickness has commenced and when the stomach has lost all power of digesting, food then only adds to the general discomfort.

The mechanical theories have much on their side but how can they explain the numbers of cases of sickness which occur when there is scarcely a ripple on the water, and when but for the throbb of the screw in a steamer, or the water rushing past the bulwarks, one could scarcely suppose they were not on terra-firma. In the Atlantic with its long swell causing an easy roll from side to side, it is difficult to imagine internal organs getting knocked about; more particularly in the horizontal posture, and specially with a belt over the abdomen, yet sickness occurs in spite of all precautions.

The same objections hold good to the theories of the banging about of the blood; to Hollaston's theory; to the movement of the cerebro-spinal fluid causing variations at different parts; and also to the Concussions of the brain and stretching on the ligaments of the cord as described by Chapman.

Hollaston's theory is a very ingenious one, as also is Chapman's, but both fail in throwing any light on sickness arising from the simple onward motion. For all these theories it is necessary if they are to hold good that there should be a rough sea, and several motions combined in one. The motion must be sharp and sudden. There comes in the question also why the jumbling of carts, cabs, omnibuses, the jolting of which though uncomfortable, does not cause nausea as a rule. We have nausea arising more readily in gentle oscillating motions. It may be answered that the body is already accustomed to these motions so that they cease to affect it, just as through time the body becomes accustomed to the motion of the ship.

In a rough sea all these causes may have an effect:-

The movement of the blood within the vessels causing the different organs to be irregularly supplied with blood.

In the erect posture the fall of the intestines with the descent of the ship causing a partial vacuum to be made, increased if at the same time an expiration is made during which the diaphragm rises. Pressure being for the moment removed from the Solar Plexus & Splanchnic nerves to be followed immediately by increased pressure. This causing <sup>at</sup> increased action, and then arrest, so that all rhythm is lost, and confusing impressions are sent out in all directions.

The heart receives wild inhibitory messages causing irregularity and pallor. The different secretions are at one time poured out abundantly, and the next arrested; the peristaltic action of the bowels is confused, & sometimes reversed, so that the bile finds its way into the stomach. The movement of the viscera on one another and on the sympathetic ganglia; and of the intestines on the liver.



add to the general confusion; to the interference with the heart's action; the supply of blood to the brain; and the pouring out of bile.

The Pneumogastric nerve is also involved. The vertigo may be caused by the movement of endolymph in the semicircular canals, but we should expect that the symptoms would disappear on lying down.

Certainly in the Causation sensory impressions have a powerful effect. The movement of objects before the eyes has much to do at first. If a person who is not sick hangs over the bulwarks looking at the sea, as it apparently rushes past, if susceptible he soon becomes giddy and sick. If he gets his gaze off the moving objects, he soon gets better again. A man may walk forward towards the bow with comfort but as soon as he turns his back on it discomfort ensues. A smell, a sound, the sight of another person sick may be all that is required to set the sickness agoing.

Another important element in the Causation is fear and imagination. Many people come on board quite sure they will be sick and would be disappointed if they were not. The sight of others sick will often make a person up till that time well, give way. The closeness of the cabins, want of fresh air, has a decided effect.

### Symptoms and Progress.

The symptoms of sea sickness vary with the individual in severity & duration. The commonest symptom is nausea. The person may be walking about the deck, when suddenly he becomes pale, has a feeling of goneness over the epigastric um, & giddiness nausea and vomiting quickly follow. The pallor is a very marked feature and is often observed before the person feels sick. It is like the pallor in epilepsy before a fit; or the pallor in shock, strangury or a blow on the abdomen, a deadly pallor and is in the first instance unaccompanied by giddiness.

The vomiting is not like ordinary vomiting in gastric disturbance; nor is it altogether like the ordinary vomiting of cerebral disturbance.

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T paper 18.

In cerebral vomiting according to Romberg the position of the head has much to do with it, being arrested in the horizontal, recurring and being frequently repeated in the erect posture: & easily induced by movements of the head, by shaking, stooping, swinging, or sudden rising. So also in the vomiting of sea sickness. It is the getting on the clothes, the stooping for that pin or the tying of a shoe lace which is the hard part; then the light breakfast which the patient was so sure was already comfortably settled, comes up in its entirety and she sinks back exhausted and discouraged on her bed again. (2) The prevailing presence of premonitory nausea - so also in sea sickness.

(3) The peculiar character of the act of vomiting - the contents of the stomach are ejected without fatigue or retching as the milk is rejected by babes at the breast. It is far otherwise in vomiting in sea sickness; the retching is the worst part of it. In some few cases the first vomit comes away suddenly and easily but not generally. The vomiting often comes on very suddenly though, and the contents of the stomach are ejected with great force.

(4) The Complication - in cerebral vomiting - with other phenomena. The most frequent of which are: Pain in the head. Constipation. Irregularity of the cardiac and radial pulse which is increased subsequent to as well as during the act of vomiting. These are all prominent symptoms accompanying the vomiting in sea sickness. The irregularity of the pulse is a very common symptom and is increased just before the act of vomiting, as well. The vomited matter is at first the contents of the stomach, then an acid fluid mixed with bile and urea, till at last there is only retching - painful contractions and sometimes hiccup. Sometimes the fluid is very watery. Any fluid or food which is given is immediately vomited up again or remains for a time giving more discomfort. The amount of watery fluid ejected is often astonishing and seemingly far greater in amount than what is swallowed. By ejecting off fluids altogether allowing only a little cordis to wash the mouth this

this can be verified. Generally the vomited matter is full of bile, very dark in colour, and after severe retching not infrequently streaked with blood.

lache

Headache is a very constant symptom. Many of those who are not affected otherwise suffer for a day or two from headache more or less severe. The headache is sometimes very distressing; at first it is frontal with pain in & over the eyes, but after much retching has its seat on the top of the head. After the sickness is over there is generally very severe headache remaining for a day or so.

oation

Constipation is a very constant symptom and not very easy to deal with. It generally takes a much larger dose of purgative medicine to give relief <sup>at sea</sup> than on shore, and the milder laxatives as senna & powder are of little service. Calomel & Jalap and in some extreme cases Croton oil being required. A form which answers well is the big Lina C. or Black Draught which often clears away the remaining sickness.

hea.

It is sometimes met with generally at the commencement of the sickness, and in cases where a hearty meal has been taken perhaps 20 or 3 hours before starting. It may be the only symptom along with more or less headache.

modie

ure or

ion of urine

Spasmodic stricture has not been so far as I have noticed, been mentioned as an accompaniment, but I have had 7 cases of it & many cases of retention of urine in the female, in some cases going as far as to cause overflow. Of the 7 cases 5 were young men, 2 middle aged. None of them had ever had the slightest difficulty in passing urine at any previous time, nor was there any enlargement of the prostate, or a history of drinking. All were very sick, and passing the catheter had a great effect on them. Hot turp. or morphia suppositories were of no service and the catheter was required in every case.

Women may be very sick and unable to get up to pass water, and the urine accumulating and dilating the bladder finally causes loss of power of contracting. A woman does not care either to get up before a lot of strangers and the water closets are so far away that she cannot get to them in her sick condition. Retention of urine seems also to be often associated with irregular menstrual flow, or menorrhagia. In many of the cases the woman was also menstruating at the same time, though it was not her proper time and in three there was menorrhagia. As irregularity of the menstrual function is one of the commonest concomitants of sea life it is difficult to say what connection there may be between the two, the fact is only mentioned as observed.

There might be said to be, clinically, two forms of sea sickness

(1) In which the symptoms are those of fever generally

(2) The torpid form.

(1) In the first there is considerable fever. The pulse is soft & quick.

The skin hot, generally moist. There is severe tension headache.

Thirst is unquenchable, but as soon as swallowed fluid is rejected.

The urine is scanty, of high sp. g. & red. There is constant retching and vomiting specially of a bilious character.

The tongue - there is a peculiarity about the tongue in sea sickness - it is moist flabby and perfectly white and smooth. The bowels are highly constipated. There is thorough listlessness & mental depression.

All they want is to be left alone - or thrown overboard.

(2) In the second form of sea sickness - the torpid form. The head becomes more affected. There is constant nausea, but no loss of appetite. Food seems rather to relieve for a little while & then is vomited. The pulse is slow and weak. The urine generally scanty but sometimes passed in quantity & clear or yellowish white or milky. The skin is dry. There is a tendency to sleep all the time.

Disgust of the sense of smell, sight & hearing ~~often~~ prevails during & often precedes sickness. Smells which ordinarily are received with indifference or pleasure become intolerable; sounds of every kind, of music or even of the voice cannot be tolerated, and the sight of food or objects passing before the eyes bring on or aggravate the sickness.

Other things being equal sea sickness is more especially a morning sickness. Many persons feel a little squeamish in the morning and unable to face breakfast who as the day wears on feel all right. And unless a rougher sea get up during the day those who are really sick feel worse in the morning & better towards evening.

There are conditions under which individuals are more apt to suffer from sea sickness :-

After long and fatiguing journeys, coming on board in an exhausted or worn out condition; or passing a sleepless night before embarking.

This is specially noticed among American passengers who often come long journeys by rail before embarking, and who suffer more generally than our home people. It has been asserted by St Deard that Americans suffer more anyway than Britons, which may be so considering the dyspeptic condition in which many of them are from their persistent disregard of all laws of health in regard to diet.

Persons of a bilious constitution - generally suffer more acutely.

People who have been drinking hard before coming on board nearly always suffer very severely. Many, specially among the steerage passengers, have, in bidding farewell to their friends before leaving, been eating and drinking far more than was good for them, and are therefore in good condition for paying a heavy tribute to Neptune. Delirium Tremens more or less acute is by no means uncommon on board; the delirium tremens of sea sickness I consider analagous to the head symptoms which form so prominent a part in the serious illnesses of the inebriate.

These cases generally show a suicidal tendency and have to be carefully watched. Coming from Calcutta I have seen no less than 4 cases (out of 46 passengers) occurring between that port and Madras - 4 days - and each of them tried to get over the side. In the month of May we lost a young man over board who had been ordered to be kept locked up in the hospital, but escaping made his way to the rail, climbed over and dropped into the sea. A woman during this present passage August. suffering from Deberium tremens was caught just as she was preparing to spring over.

Pregnancy. Where the morning sickness is increased and if left alone they hardly ever get over it, and become greatly exhausted. There is always more or less danger of Abortion specially if this has happened previously. Before the treatment of this form was understood by me & abortions occurred; within the past year several cases have threatened but none actually took place.

Sex. has its influence. Women suffering more and longer than men.

Of course there are exceptions it being no uncommon thing to see a little wiry, lively American woman keeping about all the time, while her big husband suffers badly.

Age. Children and old people often escape or it does not last so long. Children may be sick after every meal and as soon as they have vomited feel all right. When the old are very sick specially with heart disease as a emphysema there is always danger, and the effects of the sickness may be lasting.

Some of my worst cases have been among children and the very old.

Whenever children are very long sick it is always as well to bear in mind the possibility of worms, for which I always treat them now and have several times been correct in my supposition. My attention was drawn to this by the case of a boy five years of age who suffered most severely from the feverish form for several days.

His temperature rose to 103°, his pulse to 120: Lungs and heart were free of disease. The tongue became brown, and with the exception of Diarrhea, the symptoms were

those of Typhoid Fever. Medicine had no effect on him, as soon as swallowed it was rejected. Suctions were given, his lower bowel cleared out, and his strength supported by enemata. At last bearing in mind a case of persistent vomiting which occurred in private practice while on shore in which a girl had after 7 days of severe vomiting, vomited a round worm, the boy was given a jugful of hot water and in the vomiting he brought up two round worms. After this his sickness quickly left him, all the symptoms disappeared, and at the end of the voyage he was running around as smartly as any of them. Owing to the abnormal peristaltic movement the worms had passed into the stomach & there set up the disturbance.

In elderly people head symptoms are generally the most prominent. The sometimes pass into a dazed condition without much retching or nausea more a sort of stupor than anything else. And here they lie in their berths and close away all day. In one case mentioned lately it seems that the gentleman had once gone for a two months voyage in a sailing ship & from the time of leaving, till port was reached again, he was all the time in a stupor - but on landing was none the worse of it.

Stout and Flabby persons suffer more than the spare and wiry; and good spirits, fearlessness, and a determination to keep well, <sup>have much to do</sup> with preventing or shortening an attack.

Babies may be out-of-sorts for the first-day or so but even then it is generally due to the condition of the mother. Their power of reasoning is very limited and those causes which act through the senses can have no effect on them.

Babies can do with an immense amount of tossing about, being rocked in cradles, moved up & down and every way slowly or quickly without apparent discomfort. If the mechanical theories are correct why do babies not get sick in their nurses arms or in their cradles?

Mothers nursing often become unable to nurse their children, the secretion of milk being either stopped or interfered with.

Consumptives or people who are very weak seem less liable to sea sickness. There is not a voyage passes without some consumption coming through my hands yet I have never seen one in whom the disease had made any progress suffer acutely. Haemorrhage rarely occurs at sea, and it does not occur during the early part of the voyage, but, in returning to the north, towards the latter part a statement which is supported by most observers among them Dr Fales of Stuttgart (Practitioner Vol VII page 186.).

It is generally held that the duration of sea sickness, some people are never sick, in good or bad weather, and different individuals suffer much more than others.

The duration is generally about 3 days, unless in very stormy weather, but always on bad weather coming on a certain number are laid down again. One attack by no means insures against further or subsequent attacks, though subsequent attacks during the same voyage are generally less severe than the first. Some never get over the sickness at all as long as the voyage lasts if the weather is anything bad. A lady who had just crossed from New York to Glasgow in February of 1886, embarked with us for Liverpool, for Bombay, and with the exception of 2 days in the Mediterranean, and 4 in the Red sea, she was sick all the way; though the sea was by no means rough. Still she was able 24 hours after landing to undertake a journey by rail and Bullock cart of 4 1/2 days duration which she stood well. Being only a few months married, pregnancy might have something to do with the long continued sickness.

As a rule at the end of 3-5 days recovery, rapid and complete, takes place. Headache & great thirst remains for one or at most two days. The appetite becomes voracious and the patient feels himself, as he often expresses it, a new man, able to enjoy and receive benefit from his sea-life. Sometimes however exhaustion continues and becomes gradual; emaciation increases, and the wonder is that a fatal result does not



ense, but somehow when things are just at their worst improvement begins. Even after being sick the whole way most cases as soon as they get ashore get well at once and pick up rapidly. In a few cases however it takes a good time before they recover. It has been asserted that sea-sickness must always be harmful, this I can scarcely believe. From many cases observed, I think that it often does good; that not only does the appetite but assimilation improve afterwards - I refer to those cases where sickness lasts ~~part~~ part of the way and to the improvement afterwards on shore.

Sometimes however some catarrh of the stomach or digestive weakness remains for a time, and in elderly people with heart disease permanent injury may result. The exhaustion in some cases becomes extreme.

It is not a fatal disease, the deaths which have occurred being most in short passages between England & Ireland or the Continent.

Animals suffer from sea sickness as well as man - a proof that posture has not everything to do with the causation. Dogs get sick and very constipated. The ship's cow get sick and the milk fails. Horses get sick & become greatly afraid in rough weather and losing heart not infrequently succumb.



## Treatment.

There is probably no functional derangement which has so completely baffled the best efforts of therapeutical science. The remedies which have been proposed and vaunted as specifics are innumerable, but after a partial trial few of them have ~~not~~<sup>gained</sup> any lasting reputation.

Treatment may be divided into preventive and immediate,  
1. Preventive.

A form of treatment which emanating from America has attracted some considerable attention not only in that country but in this, is that recommended by Dr. Beard in "a treatise on sea sickness"; for which he claims that the results are brilliant and successful. It consists in the giving of 3 doses of Sod. Bromide three times daily for several days before embarking and continuing it in smaller doses during the voyage. The bromide must be given in doses sufficient to produce lightness of the head, and steadiness of the limbs or he does not guarantee a successful result. Of this I have had considerable experience, and being so loudly praised and strongly recommended - even though only by its author - devoted a good deal of attention to the results of this form of treatment. That it is successful in some cases is undoubted - but so is every remedy from hot water to Amyl Nitrite, from ice to the spine to blistering behind the ears. A certain number of persons would never be sick even in a rough sea, many others would not be sick in a quiet, and in what ever experiments are made with any remedy, this has always to be borne in mind, and it is always very difficult to tell in what cases the successful result is due to the action of the remedy, the insusceptibility of the individual or the smoothness of the ocean, with the consequent diminution of motion.

Dr. Beard has never seen any failures; any ship surgeon of any experience on the Atlantic could tell of numbers who had followed his instructions to the letter, who were not only sick, but worse than the others, or sick after every other person had recovered.

Several cases have come under my notice where acute of a severe form has developed; others where semi idioey for the time being resulted; while others have managed to keep themselves in a sort of stupor all the way only to find themselves prostrated on shore by what might be termed a bilious fever which kept them prostrate for days, in one instance for over two weeks. As these are mostly tourists whose time is limited and who have a certain and large amount of ground to cover before returning, the loss of even a few days is a serious matter to them.

There are some cases where it does surely, do good, but that small percentage does not by any means warrant us, as has been strongly urged, to employ such heroic treatment in every case.

2. Cocaine hydrochlorate also in a very few cases seems to prevent sea sickness.
3. An old fashioned form of treatment is the giving of a strong purge immediately before or for a day or two before embarking. In some cases this also is good but in others very harmful. If the person is constipated and requires a purge by all means give him it. If naturally his liver is sluggish and his bowels torpid have them freely moved. Undoubtedly, ~~constipation~~ constipation, while an almost constant symptom of sea sickness, is also in itself a fruitful cause. But care must ~~not~~ be taken not to go too far or the person may be so weakened that the sickness takes a firm hold on him. This may seem contrary to the already expressed opinion that the weakly suffers less than the robust in many cases, but still it is a well observed fact. The rule to follow is - if the person is in good condition as regards his evacuations leave him alone, else you only weaken him and make his ~~after~~ constipation only the worse to deal with; if constipated naturally, or out of sorts as the result of the excitement and irregular habits of the indulged in, on the eve of departure for a foreign country then a mild purge is of great value. A laxative dose of Friedrichshall for a few mornings previous to departure would often save much suffering afterwards.

The application of a firm bandage or Belt has been advocated since the beginning of the century, more recently by Dr. Hastings<sup>1</sup> and Dr. Umn  
 ed Times the latter of whom devised a special belt with air cells which could be filled  
 24 8/1867 at pleasure; and were the theories correct which lay the whole causation on the  
 anced movement of the viscera on one another; the dragging on and consequent  
 22 1/1868 hyperaemia of the mesentery; the pounding of the intestines on the liver; or of  
 the viscera in the solar plexus. It should be in every case a good prescriptive.  
 In many cases it is a great benefit, giving the wearer a sense of comfort and  
 firmness. Any one who has experienced the severe retching of sea sickness  
 will admit the benefit to be derived from support of the stomach during  
 the act of vomiting. This and another class of remedies such as strong  
 Coffee, Brandy and other stimulants may be all that is required in  
 a short passage in a rough sea, as across the channel but are  
 insufficient to prevent sickness in voyages of any length.

The Spinal Ice Bag: was first recommended by Dr. Chapman in  
 accordance with his theory and he and others met with very gratifying  
 al Ice results from its use. I have only seen it tried in one case. A lady who  
 24 1/1868 invariably had suffered from severe sickness on previous voyages crossed  
 the Atlantic last November. Advised to try the ice bag she brought one with  
 her and during a stormy passage, had the satisfaction of being free  
 of sickness the whole way across. With her case before me I would be  
 much inclined to give it further trial and believe that it would  
 do good in many cases. There are too many disadvantages connected  
 with it to make it a popular form of treatment. For one thing it is not  
 practicable enough at sea you are not dealing with one but scores of  
 sick folks; and again, while many people hate the sickness, they hate the  
 idea of an ice bag to their spine still more. The price also puts it  
 outside the reach of many.

## Immediate Remedies.

Dr. Le Comte's method. - Arch de med navale. November 1868 -  
and recommended also by Dr. Divinelle (N.Y. Record Jan 1879). consists in the  
employment of Faradisation. The skin is moistened with Sol Anopica Sulph  
4-6 per cent's solution. The negative pole as a flat disc is placed over the  
pyloric end of the stomach; a sponge with the positive pole is passed for  
three or four minutes from the Cardiac towards the Pyloric end & passing  
occasionally downwards. He claims that it always gave great relief and  
was followed by refreshing sleep.

Amyl Nitrite was first recommended by Dr. Crochley Clapham in the Lancet  
(2 vol 1875 page 276). supposing sea sickness to be similar in character to  
epilepsy. He gave 3minims on a handkerchief holding it close to the  
nose so as to administer it without too free admixture of air. Acting  
he considered by freeing the circulation and relieving the hyperaemia of  
the cord. It has had many advocates among them Dr. Polter Lancet Aug 16/75.  
Dr. Dingle May 3<sup>rd</sup> 1879. and Dr. Aiford Lancet May 10 1879 the latter  
considering it the only remedy from which he had seen any good results  
during two years voyaging to the Cape.

It is a very useful remedy and sometimes acts like a charm, other  
times it fails utterly. The same may be said of Hig Estomac; with both  
I have seen surprising results.

The dose required is at times larger than Dr. Clapham found  
sufficient. Stout flabby men require moderate doses, while thin wiry  
men require large. If it is going to do good it will do so immediately. Relief is  
generally speedy and the nausea & sickness quickly become lessened. The chilly  
sweat gives place to a warm glow, and a sense of comfort supervenes; the patient soon  
falls asleep to awake with the sickness gone.

Caution must be taken in its administration: specially in delicate women or men with any suspicion of fatty heart. No one would think of administering it where there were rigid arteries; in diseased cerebral arteries rapid and extreme dilatation might cause rupture.

It is best in every case to allow a vomit first, and give hypodermic so that the patient may fall asleep afterwards.

It is of no use in cases where the liver is at fault but in nervous cases, specially in women it is a fairly successful remedy.

### In Morphia Hypodermically Injected

We have another most valuable remedy. There is one class of patients in which this very seldom fails, and it is one of the few in which perfect faith can be placed. My first experience in its use was in the case of a lady in the ~~4~~ 4th month of pregnancy who had for 3 days been very sick - the stomach not only refusing food, but the retching coming on with every movement on the patient's part. In addition to this, severe pain in the back and lower part of the abdomen was set in, and as she had aborted during the ~~4~~ 4th month of her last pregnancy, she became alarmed and sent for me. The bowels had already been cleared by an enema, so now a morphia suppository was inserted, and 6 gr of Morphia Sulph. with 1/2 gr of Camph. Sulph. injected hypodermically, over the stomach. In a short time she fell asleep and awoke next morning free of pain and free of sickness, and was able to be up every day afterwards. Since that time I have seen many similar cases, some less and some more marked. Four cases I have seen in which there was already discharge; in which no medicine could be retained by the stomach, & which otherwise would have gone on to abortion, where this method was thoroughly successful. One case in particular was interesting as the woman had miscarried 4 times in succession always about the ~~3~~ 3rd month and had never had a child alive.

She was very sick and pain began the second night out, soon followed by discharge. On examination the os was found to be dilated sufficiently to admit the point of the finger and the membranes could be felt inside. By the same treatment a successful result was obtained & I had the satisfaction of learning that 6 months afterwards she was delivered of a healthy child.

It is well to have the bowels cleared out if possible and it seems better to inject over the <sup>in ocular cases</sup> Epigastricum. I always use the tablets with 2-4 morphine sulph and 1/2 gr Atrop Sulph and generally find once sufficient, though it may be necessary to repeat it.

Another useful remedy is Chloral more especially in combination with Bromide of Potas or Soda ~~in combination~~. It brings on refreshing sleep which is in many cases all that is required. In the beginning of the sickness it is of little use but about the 3<sup>rd</sup> day it comes in very well. I give it in 15 gr doses with 30 grains of Bromide at night for adults. 3 grains with 5 grains of Bromide for children: A very useful combination is

R Chloral hydrat.

Sod Brom. aa gr  $\sqrt{V}$

℞. Cam. Indica gr ʒ. The Camis Indica being given in pill along with the draught.

For the headache if the bowels are cleared nothing beats Camis Indica. It may be said of this as of every other remedy given by mouth that it is of little use in the first stages of sea-sickness. At that time the stomach generally rejects the medicine as soon as, or soon after being swallowed and if it is retained for some time, the stomach being incapable of absorption, the remedy has no effect. I have seen medicines rejected hours after being swallowed, and have felt the smell of chloroform as powerful there as if it had just been taken. This accounts for the poor results from medicines administered by the mouth at first, after sickness has commenced.

It is at the end of two or 3 days when the most acute stage has passed and when the stomach now raw and irritable continues contracting spasmodically that remedies are of use and among these Chloral with the Bromide takes a first place. Bromo Soda I have just been trying with good results.

### Cocaine.

Introduced as it is on the high authority of Prof. Manassie (Berl. Clin. Woch. Aug. 31<sup>st</sup> 1885), and further advocated by Dr. Wicherkiwicz (Lancet Sept 5, 85), has been a failure in my hands. Coming so highly recommended I have given it extensive and repeated trials. Beginning in some cases before leaving port in doses administered 3 times daily. In a few cases the sickness has been kept off at the time, but after a few days found that not only had it paralyzed the terminal nerves, but digestion also, and that the food had simply been swallowed to come up again when the effect of the Anæsthetic had passed off. It is administered in capsules containing 5-8 minims of a 5% solution.

The Carbonates. Are very useful in some cases where the condition of the liver has a good deal to do with the sickness.

Opials. by the mouth are not of much service as a rule, though at times a full dose of Chlorodyne with 10 minims of Tinct. Belladonna acts well. Tinct. Opii as emenna is very useful, but sea sickness is not considered a serious enough trouble in most cases to make people submit to such <sup>modes of</sup> treatment, unless when much exhausted, and then we have better remedies. While the stomach is sick we must remember that the lower bowel is not and that it might be made a valuable medium for the absorption of medicines.

In this connection I may mention that in the early part of this year we had a lady passenger suffering from severe sciatica, who for over a year had been constantly treated by hypodermic injections of Morphine, & small emetics of Tr. Opii. For some time she had been trying to break off what had become a habit with her, and to assist her in that endeavour had been ordered the



sea voyage, and was now merely using the enemata. The passage was very stormy and every other lady was sick for days but from the first she was able to take part in every meal and improved greatly on the voyage.

Pure Chloroform is not of much service, and from other Chlor I have not seen much good. Hydrocyanic Acid is useless except in the after treatment of the sub acute gastritis. Belladonna with Camphor, spr Chlor & Brandy make a good combination in the stage of exhaustion. Citrate of Magnesia is very useful specially in the pregnant. The vomited matter is often very highly acid and the administration of an effervescent alkali is very grateful and palatable. The effervescent Brown Soda is also useful.

### Stimulants

are worse than useless at first; the system is full of bile and alcohol only increases it; when it comes to exhaustion the case is different, and for this, and also to allay the great thirst - 3ij doses of Brandy, or effervescent citrate of Magnesia, or tablespoonfuls of Ice Champagne (provided it is good), with the same, or soda water, given frequently has a good effect.

Ice must be used very sparingly. Nothing creates more discomfort than sucking or swallowing much ice. In small quantities it may anæsthesize the stomach to a certain extent, but taken ad lib it becomes dry & bye like red hot iron in the stomach creating a great burning sensation.

It is of great importance for successful treatment that the Constipation be overcome and the best means of doing so is by the use of the enema syringe. Undoubtedly it is used far too sparingly and more frequent use would often bring much relief. The Constipation is so obstinate that full enemata are required.



Administering purgatives by the mouth being in the early stages unless we have in the interim a very useful means of treatment. After the Constipation is overcome, the inhalation of Amyl Nitrite, the hypodermic injection of Morphia, or the administration of Chloral Hydrate, as the case may be will often make the patient at least comfortable, if it does not altogether free him from sickness.

There is no specific for sea sickness. Every case must be treated on its own merits; experience can be the only guide as to when to give one thing, and when another. There are very few cases for which something cannot be done and failure with one remedy must not discourage or deter from trying another.

At first lying on the back or right side as is felt best with the head low, is not only the most comfortable but generally the only possible position. As regards position of state room and direction of berth; as there is least motion there, those nearest the centre of the vessel, and as rolling is more met with than pitching in steamers, berths fore and aft in which the whole body is moved up & down at once not the feet up one minute & the head the next as when athwart ships, are the best.

After the first sickness is over it is well to get on deck & get exposed to the fresh air which is one of nature's best remedies for sea sickness as well as other troubles; and ladies especially, who are unwilling to undergo the trying ordeal of dressing must be coaxed, and in some cases if necessary, carried from their berths to the deck. The close air of the state rooms has an undoubted effect in causing and prolonging the sickness.

Food.

Some as soon as they have vomited crave for food which they reject again as soon as digestion commences, but generally the appetite is lost & food must be pressed on them.

If no food is taken the stomach simply contracts powerfully on itself, causing by and by a certain amount of congestion, as seen in the streaks of blood in the vomited matter, and it is well that some food should be swallowed.

Chewing hard biscuits is not to be recommended, the small hard pieces swallowed besides not being enough to fill the stomach, at the same time only increase the irritation.

Soup and fluids merely get sour on the stomach, add to the general discomfort and are generally rejected soon after being swallowed; meat and such like food is thought of only with disgust; so we have to fall back on an 'intermediate' form of food, and of that class nothing can compare with well made Gruel which is often the only thing which will be retained by the stomach. For a change Arrowroot or Blane Manna do very well. Sead Chicken jelly or concentrated beef tea are good. When the

mess about Curry is well borne, if nicely made.

The patients call for "something tart" as kippered or red herring, haddock or other forms of dried fish. The tolerance of fats is surprising in some instances, and a slice of fat pork - an old sailor remedy for sea sickness is not a mere matter of fiction after all.

Many seem to eat better when pickles are added to their food, and some American passengers are content with, and even seem the better of a few pickles eaten by themselves. The benefit derived may be due to the flatulence, arising from the amount of gas formed from their indigestion, causing tightness, which, as in the application of the binder or belt, is so useful sometimes.

For the drink, Ginger ale is as well borne as any fluid. Lemon squash does well with some, leading with others. In exhaustion sherry wine or peptonised milk is very good. Small quantities only of any thing should be taken at a time, and taken frequently.

Sea sickness is most demoralising and with women specially moral treatment is necessary. If people only set their minds on getting well, and fight against it they get over it much easier. In good weather specially, instead of lying brooding in a stuffy state room, it is far better to be on deck, where, in the fresh air and bright sunshine, with people all around, they can more easily forget that there is anything wrong with them.

The stage of exhaustion sometimes requires careful watching and stimulation, and nutrient enemata may be required.

Afterwards if recovery is not complete the acids are very useful in toning up the stomach, or if not well borne and the pain continues, Bismuth, Hydrocyanic acid dil. and belladonna are of great use.

## II Sea voyages.

From the earliest times sea voyages have been recommended as a means of treating certain diseases.

In the works of Aretaeus' Book 1<sup>st</sup> chap 8 under the head of the treatment of phthisis: ΚΕΦΗ ΘΕΡΑΠΕΙΑ ΦΘΙΣΙΟΣ we find sea voyages recommended in the treatment of that disease:—

καὶ γὰρ, εἰ εὐτυχοῖη ὁ νοσῶν ἐν θαλάσῃ γίγνεται ἂν ἀνώρη καὶ βροτῇ. καὶ γὰρ τὴ ξηρὸν ἐς τὰ ἔλκεια ξυμ-διδωσι ἄλμη.

"and if the patient have it fortunately, as his command, gestation and living on the sea will be beneficial. For sea water contributes something dessicant to the ulcers". For long the truth thus discovered by the old physicians and even the beneficial action on the body of sea water, was lost sight of.

It was in England, and towards the middle of last century that the sea was again recognised as the mighty sanitary agent the world now acknowledges it to be. At that time Western Europe was heavily scourged with scrophula which appeared and worked havoc among all classes, the rich as well as the poor.

Dwellers on the sea board barked and washed their sores in the sea water, drank of it, and applied sea weed as poultices.

It was observed that much benefit was derived from this treatment, and slow as the profession was at that time to give up preconceived notions, and enter on new forms of treatment, the results were so evident that at last it was recognised. In 1812 Dr. LeFrancois of Duppe published a treatise on the virtues of sea water employed internally and externally, & through his exertions his native town was raised into a health resort; and throughout the journals of the first part of the century, we find its use repeatedly advocated in the treatment of Scroph.

But while the virtues of sea water and residence on the sea board were thus recognised as therapeutic agents, it is only of more recent years that sea voyages have come prominently into notice as a means of treating disease and specially consumption:

- In investigating the value of the ocean as a health resort we have to notice
- (1) What are the conditions under which the individual finds himself at sea?
  - (2) Is the life of the sailor - as an individual whose home is upon the waters - a healthy one?
  - (3) What are the advantages of a sea voyage? what are the peculiar conditions which render the ocean of value as a health resort?
  - (4) What ailments and diseases are most commonly met with at sea? what cases derive benefit, and vice versa.

(1). What are the conditions under which the individual finds himself at sea. The ship is his dwelling house and his world for the time being. Here he eats, sleeps, takes exercise, in fact lives, uninfluenced by what is going on in any other part of the globe.

There is first to consider the sanitary condition of the ship.

Placed on the antiseptic surface of the ocean, the conditions are most favorable for avoiding all sources of contamination from imperfect drainage or a faulty subsoil. The waste pipes from water closets &c. have only a very short distance to run into the sea & if carefully looked to should give no trouble. But even in good ships things are not satisfactory, and too often a most disagreeable odour pervades the neighbourhood of the lavatories. In steamers, where the waste water from the hand basins runs away into pipes discharging into the sea, during the early part of the voyage the basins are often used for vomiting, and even for urinating into, and the flush of water not being sufficient, part lodges

about the corners and recesses, and decomposing gives rise to smells.

It is also an every voyage occurrence to find towels, thrown in by thoughtless people, stuck in the traps of the water closets, and remaining for days unnoticed, till an overflow or the suspicion of a dead rat around, causes the matter to be investigated, (and) <sup>when</sup> the pipe is found blocked.

No ship or steamer is watertight, there are always places around some rivets or between some plates where water oozes through; this collecting in the bilges at the bottom along with any water from the deck or engine room, forms the bilge water, another source of contamination when allowed to become stagnant. In steamers the bilges are regularly washed out by the steam pumps; in ships where hand labour is necessary that is not so easily done.

In the old days of sailing ships (wooden) the bilges got very foul, and coupled with the bad ventilation made life on board even dangerous. Even 50 years ago a sea voyage was an enterprise requiring more than ordinary courage. Up to that time all space which could not be used for merchandise was temporarily arranged for stowage of passengers. The tween decks were never more than 5 feet high, and in this two tiers of berths were erected. The only ventilation was through the hatches, and these had to be closed in bad weather. Bad as was the condition of the passengers on the main deck, those on the lower deck must have been much worse, as any air they received must first have filtered through the vitiated atmosphere of the deck above. The storages were crowded with passengers, who ~~even~~ though they were able and willing, had often not the means of exercising cleanliness; and many were sea sick besides. The emanations and exhalations from the bodies of the individuals thus confined, as well as the miasma of a damp hold, created an atmosphere which was poison to those who breathed it, and engendered what was

known as ship fever in a more or less violent degree.

One per cent was a common, even 20% a not infrequent death rate. Of 3000 Palanquines forwarded in 1710 by the English government to New York 470 died on the passage and 250 immediately after their arrival, of ship fever.

The Rev. Dr. Kruiz, in an oration delivered before the German Society of Philadelphia in 1788, stated that of 900 persons shipped in one vessel in that year from Amsterdam to that port, 400 had died on the way.

As late as 1847, Medical Statistics estimated that not less than 25,000 emigrants died of ship fever.

Within the last 40 years great progress has been made towards lessening the evils which formerly prevailed, and made sea voyages a danger instead of a benefit; but still there remains much to be done. Some ships are much better in every way than others, and it is the duty of the medical adviser to know what is the condition of the ship in which he sends his invalid ere he gives consent to his going.

Ventilation

in the best of ships is still inferior. In good weather it is all right, but in bad when every port hole is closed; skylight and hatches battered down, it is far from being sufficient; and that is just the time - when patients can't go on deck - that pure air below is most essential. There are many obstacles in the way of good ventilation under such circumstances, but they are not insurmountable, and a method could easily be devised by drawing off the foul air, of regulating the supply of fresh air at pleasure; and if the same attention was paid to the invention of devices as on shore, bad ventilation would soon become a thing of the past.



## Light

Another important element, is still very insufficient in the steerage, and even in the cabins, of most ships, and often depends on a daylight placed at intervals on the deck.

## Air.

A most important factor in the sea climate is the air.

As compared with the air on land, its main differences are that it contains more oxygen and ozone, more moisture, relatively as well as absolute, and less  $\text{CO}_2$ . At the sea level the atmospheric pressure is at its greatest so that each volume contains a greater proportion of oxygen than at higher levels.

It is of course considerably influenced by the evaporation which is constantly going on from the surrounding sea, from which it is supposed to derive certain saline particles and hold them in suspension, the amount being increased when the wind throws up the sea in the form of sprays, and this is supposed to have a healing effect on the lungs.

When sprays are flying everything gets covered with salt, which is felt on the lips and mustache and seen on the clothes and must also be inhaled then.

The chief peculiarities are the purity of the air, and the equality of the temperature. The air ~~for~~ passes over the surface of the aseptic ocean and no matter how vile it be when it leaves the shore it soon becomes purified.

On the sea are no drains; no decaying vegetation; no smoke or fog; a complete absence of all animal or vegetable emanations which can breed disease. It is more equable than the air on shore in the same latitudes; is cooler in summer; warmer in winter; the heat of the day and of the warmer climates is lessened; and of

the night and colder climates raised.

But while the air on deck is of the purest character, that in the cabins is too often as we have already noticed not of the best.

Water

The water is obtained from two sources

(1) That obtained on shore and carried in Iron Tanks, which is generally of a good quality. It keeps well in the tanks and the admixture with rust from the sides while deteriorating its quality as a tea or coffee making water - precipitating the tannin - does not harm, so far as drinking is concerned. The tanks require however to be cleaned out on every available opportunity.

(2) Condensed. All first class ships, as well as steamers, carry a condensing boiler, and so long as the filters are clean the water is of the purest character; & the admixture of a lime stone with the charcoal, and a pinch of salt afterwards makes it very palatable.

Food

In first class lines, in the saloon, this is all that could be desired; in most large steamers there are Refrigerators in which meat, vegetables & fruit can be kept in a state of good preservation, and the table is supplied with a choice variety of every meal. On sailing ships, live stock - sheep, fowls, ducks, and so forth, are carried so that there is fresh meat every day. Besides there are always corned and preserved meats and canned fruits. Some ships carry a cow but most have to depend on condensed milk which however one gets accustomed. It is much to be preferred to milk which has been kept on ice for a week, or from a cow which is suffering, with the others from sea-sickness, or

the effects of heat.

In the stowage, the food is good and substantial, but not at all suited to the capricious appetite of the invalid. There is no place for an invalid on board steamer or sailing ship but the 1<sup>st</sup> Cabin.

But even in the saloon, after a short time, the cooking becomes monotonous, there is a want in it somewhere, of that something which makes even the plainest fare at home so palatable. The sea chef has a habit of cooking everything greasy and heavy, and there is an absence often of these little delicacies which help to tempt the fastidious appetite of the invalid. How one longs towards the end of an extended voyage for such a simple meal as a cup of tea, with fresh bread and butter, and egg, such as one gets at home.

### Sleeping Accommodation.

Here we have one of the greatest drawbacks to life at sea for the invalid. Space on board ship is a very valuable commodity, and that allotted to every passenger is necessarily small. His cabin is never more than 6 by 8 feet, which he must probably have to share with another <sup>or others.</sup> The narrow berths can never take the place of a good bedstead. It is so constructed as to be open at the top, and communicating on one side with the next cabin; on the other with the passage, and on the 3<sup>rd</sup> in ships with the saloon, or in steamers with an alley-way; so that there may be as free ventilation as possible. The cabins too often get stuffy even in good weather, and in bad, the night is enough to undo all the good the day has done. In the stowages, & intermediate or 2<sup>nd</sup> cabins things are worse, being more crowded together. They breathe again and again the same air which is now known to be one of the worst things for a Consumptive.

2) Is the life of the Sailor - as an individual whose home is upon the waters - a healthy one?

Popular opinion answers in the affirmative, but experience rather questions the soundness of the answer.

In all trades we meet with healthy and robust men, and so it is at sea, but looking over a ship's crew, specially in a first-class steamer or ship, we see only a part of the truth. They are all in a fair state of health or they would not be there. Crews are shipped every voyage and a mate is not going to choose, where there is so much choice, any whom he considers unsuitable or unfit for work. In many ships also they have to go through a medical inspection before the commencement of the voyage, and in all emigrant ships and steamers have to pass before the Medical officer & surveyor of the Board of Trade. So that we may say we have in a newly shipped crew the best sample that is to be obtained at the time.

And is this sample such as strike one very favorably in regard to the whole? Among them are a few robust well made men but also a good sprinkling of stunted and by no means powerful individuals.

One thing strikes you, that you so rarely see an old man among them, unless it be a quartermaster, many of whom are old men of war's men.

The sailor is well known for his spending proclivities while on shore, and it is not accumulated wealth which enables him to leave the sea while in his prime; his life unfit him for following many occupations on shore, so it must either be because he is unfit for his work or like Tom Bowling "has gone aloft."

His work is of the most trying description and is characterised more than anything else by great irregularity. In good weather he has little to do, in bad his work is both arduous and dangerous. Exposed to all kinds of weather at all hours of the day and night; now working under a broiling sun; again, drenched with rain or sea water reefing a sail in a bitter wind, or working among the rigging when waves and sprays are dashing high; and, in the depths of winter, the smallest wave is thickly crated with ice.

His food is rough as his life: on long voyages beef, pork & fish of an inferior quality, steeped in brine till all its sustaining properties have been extracted, and it has become hard and indigestible; and biscuits, also hard and with too little water in them to be readily assimilated; with occasionally fresh bread, often sour as vinegar, constitute the larger portion of his daily bill of fare.

His sleeping accommodation, in the forecabin, dark and low and often damp; generally overcrowded & the berths close together, the air already foul made worse so by the fumes of two acco smokes.

It is not this atmosphere that he has to turn from the pure air of the deck, and try to seek repose, if not called for an emergency, during the four hours of his watch below.

Irregular as is his life at sea, it is not so on shore, where from the moment he sets foot on terra firma, he is the prey of land sharks and crimps.

The majority of these men have had venereal disease at one time or other in their life. The prevalence of which among them is strikingly evidenced upon one by a walk through an institution such as the European Hospital of Calcutta, where over nearly every bed the card bears, under "seaman", the words "Gonorrhoea", "Chancres", or "Syphilis".

10

Hubert May 50 years ago recognised sea sickness as the result of irritation of the passive sense of motion.

D. Stocker.

thinks that in the Pneumogastric we have the key to the whole causation.

The prime nerve of organic life, it governs the heart, the lungs, the stomach &c. If any powerful stimulus occurs to the mind it acts on the heart & lungs; if to the senses, on the stomach principally. We see this in the disgust and vomiting following on an unpleasant sight, taste, or smell.

Stimuli differ in quantity and quality, in degree and kind. Moderate stimulus of the nerve increases digestion; increased stimulus causes all the symptoms of dyspepsia. The nervous centres excited by the sensory impressions become at last so irritable that the introduction of any thing into the stomach either from within or from without is resisted and vomiting occurs. This goes on until sooner or later by force of habit the body becomes accustomed to the new sensation.

Some sensations are pleasing and agreeable, others painful & disagreeable & these differ in persons and times. We have a passive side of motion combined with the fifth sense, of touch, which has its pleasant as well as its painful side.

Another point which he considers important in the causation is the lung vacuum caused by the fall of the viscera in the descent of the ship. The conditions in sea-sickness are almost identical in effect and cause as in Mal de Montagne, as described by McPherson (Brit & Foreign Rev. Feb 1887 page 279) - a certain rarefaction of the air in the chest, a partial vacuum being produced when the viscera falls causing the feeling of giddiness, which is more felt in the upright posture. The feeling is allayed by taking a deep breath, by smoking, a belt &c.

This partial vacuum causes the irritable condition of the nervous system. It has an effect on the pneumogastric (pulmonic branch), having an inhibitory effect on the heart and stomach. If the nerve is cut or pressed on we have the same effect.

11

There is an indirect effect on the same nerve through the medium of the nerves of feeling or common sensation; sometimes through the agency of other senses, the cause in each case being eccentric or peripheral.

B. Johnson

Times  
2 10<sup>th</sup> 1881  
24 381.  
Also considers the Pneumogastric the cause, the motion of the stomach acting on its internal coat, and so irritating the Pneumogastric nerve. The irritation acting on the distal extremities of the nerve producing certain symptoms referable to the brain; and we have vomiting attributed to the motor influence of the nerve & giddiness, pallor & sometimes complete syncope.

Med Journ.  
20 81.  
44 888.  
Another writer (A.W.) thinks the inhibitory action of the vagus causes all the symptoms, partly inhibiting the heart and partly causing dilatation of the abdominal vessels & so withdrawing blood from the brain to the abdominal viscera. The phenomena of sea sickness being produced by all motions which imitate the sensations we have when giddy or sick from some cause having its seat in the body. The sensation of the floor sinking beneath the feet, the rising and falling of the walls of the room and their spinning round are specially connected with giddiness & nausea and these are the motions which most readily produce the phenomena of sea sickness. It is not necessary that there should be any descent of the body to produce nausea. Sea sickness is a case of the association of the senses. We associate the sensation that the walls of the room are moving with the sensation of sickness, & when the walls of the room actually move the sensation of sickness is produced.

B. Mayo

Med Journ.  
23<sup>rd</sup> 1872.  
Thinks that the cause lies in the Solar Plexus, over whose seat and not in the brain lies the focus of discomfort. No such sensation follows concussion of the brain.



D. Munn

at  
17-1881.  
1037.

Recognises two causes:- 1) The automatic and voluntary acting muscles of the abdomen are unable to fulfil the duty of pressing and supporting the contained abdominal organs, due to the irregularity of action. They are therefore allowed more play, & stretching on their mesentery produce nerve shock and paralysis specially those branches of the sympathetic which are connected with the small intestines, those ~~vascular~~ branches which control the calibre of the blood vessels, and so we have vascular dilatation. The extra blood being extracted from the general circulation other areas become anæmic and their tone lowered, so we have the pallor, depression and tendency to syncope.

Comiting may arise from irritation of the periphery of the nerves of the stomach and intestines due to the hyperæmia, or to the anæmic and disturbed circulation of the Brain & Spinal Cord.

D. Marshall Hall

at 1849  
27  
507

Thought that all the symptoms pointed to the Medulla Oblongata as being the part of the nervous system chiefly or primarily affected. The intellect remaining clear showed that the cerebrum was unaffected.

D. Irwin

at  
126<sup>th</sup> 1871

Recognises sea sickness as a complex condition in which many organs are involved acting and reacting one on another in various ways but in the beginning when first the ordinary conditions of life are disturbed there is some one unanswering the pressure upon which has set the whole of the machinery into confusion.

Foremost among the physiological discoveries of the last century is the knowledge that we have distinct from, but in close alliance with the other senses, a sense of Equilibrium which appears to be more or less connected with the Cerebellum, Optic lobes, and possibly with other parts of the nervous organism, its prime seat being the semicircular canals of the inner ear, which may be considered for practical purposes as "the organs of Equilibration"

Sea sickness or motion sickness is essentially a disturbance of this function, and it is essential that the motion be backwards, downwards, or oscillating, & that it be continued for some time. A combination of these conditions being the most effective, especially if there be added an element of irregularity or uncertainty.

Motion produces sickness by disturbing

- (1) The Endolymph in the semicircular canals.
- (2) The viscera in the Abdomen.
- (3) Possibly the Brain and the Arachnoid fluid at its base.

(1) The endolymph being subject to physical laws follows the motion of the head in those canals whose plane corresponds most nearly to the direction of that motion. When the motion is suddenly reversed by the semi-rhythmical motion of the ship, or altered in direction by a new wave striking her on another point, the endolymph continues to move on in the original direction till stopped by friction. This causes undue pressure in one or more of the Ampullae, by which wrong impressions are conveyed to the sensorium, and co-ordination, giddiness &c are the result. The otoliths are washed about by the motion of the fluid. The Cilia and terminal nerve filaments are irritated & abused, and when this process is continued in operation for a certain time, a condition is set up which represents the true Pathological explanation of the ordinary form of sea sickness: Irritative Hyperaemia of the semicircular canals

That sea sickness is least felt when lying down with the head low and to the low is explained by the fact that the Ampullae are placed on the anterior extremities, so that when the head is thrown back the endolymph + otoliths gravitate towards the least sensitive part, and disturbance of them will not have the same tendency to alter pressure or produce irritation within the Ampullae.

This also accounts for the backward movements being so distressing, and in part for the unpleasantness of the descent.

In Meniere's Disease, head symptoms are always present, from a queer sensation about the head, to vertigo & Cephalgia, more or less acute. The falling type in Meniere's Disease frequently merges into a condition resembling a sensation of "being rocked by the waves" or "in a ship on a stormy ocean". We may regard sea sickness from his point of view as a mild semi physiological prototype of the Non-Cochlear part of Meniere's disease. The one is "a vertigo ~~in which~~ of translation, in which a strong subjective sensation of a translation movement of the whole body" (Charcot) is induced by an abnormal condition of the semi-circular canals, in the other, real objective translation movements of the whole body induce an abnormal condition of the Semi-circular Canals.

Sea sickness he divides into 2 classes:-

- (1) Neural or labyrinthine vomiting - commonest in ocean steamers.
- (2) Labyrintho-musculo-visceral vomiting due to mechanical disturbance of the viscera permitted by incoordinate muscular action the result of faulty labyrinthine impressions. The motion causes the shaking up at the same time of the endoliths and of the viscera causing the one to send out wrong impressions to the abdominal muscles just at the time when proper support is required.

It is possible that certain equilibrating impressions may be formed in the viscera themselves, in the Pacinian Corpuscles, but these being at variance with those from the main centre of equilibration will only add to the general confusion. This is commonest in very rough seas.

- (3) Stomachical vomiting (a) Primary or (b) Secondary. depending on
  - (a) The nature and continuance of the motion & constitutional tendency of the individual.
  - (b) Caused by mechanical disturbance of the usually semi fluid contents of the stomach, relieved immediately by vomiting. (c) The stomach is irritated and abused as in class 2 and takes on an abnormal action on its own accord. Everything swallowed is rejected for days or even weeks together & life may be threatened from exhaustion.

Such are the leading theories which have been advanced at various times in regard to the causation of sea-sickness, - the stomach, the solar plexus, the pneumogastric nerve; the semi-circular canals (movement of endolymph & otoliths in); the spinal cord, and the brain; being held as the primary cause.

vertical  
movement  
chief.

Regarding the remote cause, the vertical movement of the body is the chief instrument in its production. Into every movement of the ship at sea the up and downward motions enter and each movement of which the person is sensible, may have its effect in producing sickness. The motion will vary (1) according to the direction of the waves, & (2) their size in relation to the vessel. The place of least motion in every case is the centre of the ship.

In a rolling motion (pitching motion, the vessel moves on its transverse axis & therefore the nearer the axis the least motion; in rolling, moving on its antero-posterior axis theoretically, but in practice always combined with a certain amount of pitching more or less, we have a motion at the ends of the vessel which is not only greater than but not which there enters a complex or wriggling motion scarcely felt near the center of the vessel.

It is on this account probably that the rolling, generally causes more to succumb than a quiet pitching, and which when exaggerated, as in small steamers or ships in choppy seas, or heavy seas on the bow in larger vessels, makes men those accustomed to sea life uncomfortable.

As regards posture the vertical produces it more readily and a certain amount of relief is in most cases derived from the horizontal. But as even in the horizontal, sickness is produced, too much stress cannot be laid on posture.

That sea sickness is not such a simple matter to explain as would appear at first sight, is evident. It is a disturbance, to bring about which many elements enter. There is no one cause but many. The sole cause cannot be as Dr. Glen Whittle supposes, the contents of the stomach being

jumbled up and down, and becoming like a foreign body. The stomach is a most accomodating organ, as a seat at the head of the dinner table in the saloon of an ocean steamer would soon convince, and the most indigestible articles can be piled in on the top of one another, which for variety could compare favorably with a Bazaar lucky bag, without apparently causing the slightest inconvenience. But supposing that the food did act as a foreign body, not only would it be incapable of producing the train of symptoms, but if it could, immediately on vomiting relief would be experienced, which except in very few cases does not or only partially occur.

That food on the stomach, specially food which is indigestible, & which would in a person of bilious temperament be apt ordinarily to cause vomiting, is also at sea a cause of sickness, I grant; That even in some cases which would otherwise escape, the partaking of certain articles of diet may, on sea as on land, be the primary cause of sickness, which once set a-going goes through the whole train of symptoms of mal-de-mer, from personal experience I believe; but to set it down as the cause in every case is very far wide of the mark. Were it so then an empty stomach would be the best preventive and a sure remedy, which it is not. After sickness has commenced and when the stomach has lost all power of digesting, food then only adds to the general discomfort.

The mechanical theories have much on their side but how can they explain the numbers of cases of sickness which occur when there is scarcely a ripple on the water, and when but for the throbb of the screw in a steamer, or the water rushing past the bulwarks, one could scarcely suppose they were not on terra-firma. In the Atlantic with its long swell causing an easy roll from side to side, it is difficult to imagine internal organs getting knocked about; more particularly in the horizontal posture, and specially with a belt over the abdomen, yet sickness occurs in spite of all precautions.

The same objections hold good to the theories of the banging about of the blood; to Hollaston's theory; to the movement of the cerebro-spinal fluid causing variations at different parts; and also to the Concussions of the brain and stretching on the ligaments of the cord as described by Chapman.

Hollaston's theory is a very ingenious one, as also is Chapman's, but both fail in throwing any light on sickness arising from the simple onward motion. For all these theories it is necessary if they are to hold good that there should be a rough sea, and several motions combined in one. The motion must be sharp and sudden. There comes in the question also why the jumbling of carts, cabs, omnibuses, the jolting of which though uncomfortable, does not cause nausea as a rule. We have nausea arising more readily in gentle oscillating motions. It may be answered that the body is already accustomed to these motions so that they cease to affect it, just as through time the body becomes accustomed to the motion of the ship.

In a rough sea all these causes may have an effect:-

The movement of the blood within the vessels causing the different organs to be irregularly supplied with blood.

In the erect posture the fall of the intestines with the descent of the ship causing a partial vacuum to be made, increased if at the same time an expiration is made during which the diaphragm rises. Pressure being for the moment removed from the Solar Plexus & Splanchnic nerves to be followed immediately by increased pressure. This causing ~~it~~ increased action, and then arrest, so that all rhythm is lost, and confusing impressions are sent out in all directions.

The heart receives wild inhibitory messages causing irregularity and pallor. The different secretions are at one time poured out abundantly, and the next arrested; the peristaltic action of the bowels is confused, sometimes reversed, so that the bile finds its way into the stomach. The movement of the viscera on one another and on the sympathetic ganglia; and of the intestines on the liver

add to the general confusion; to the interference with the heart's action; the supply of blood to the brain; and the pouring out of bile.

The Pneumogastric nerve is also involved. The vertigo may be caused by the movement of endolymph in the semicircular canals, but we should expect that the symptoms would disappear on lying down.

Certainly in the Causation sensory impressions have a powerful effect. The movement of objects before the eyes has much to do at first. If a person who is not sick hangs over the bulwarks looking at the sea, as it apparently rushes past, if susceptible he soon becomes giddy and sick. If he gets his gaze off the moving objects, he soon gets better again. A man may walk forward towards the bow with comfort but as soon as he turns his back on it discomfort ensues. A smell, a sound, the sight of another person sick may be all that is required to set the sickness agoing.

Another important element in the Causation is fear and imagination. Many people come on board quite sure they will be sick and would be disappointed if they were not. The sight of others sick will often make a person up till that time well, give way. The closeness of the cabins, want of fresh air, has a decided effect.

### Symptoms and Progress.

The symptoms of sea sickness vary with the individual in severity & duration. The commonest symptom is nausea. The person may be walking about the deck, when suddenly he becomes pale, has a feeling of goneness over the epigastric um, & giddiness nausea and vomiting quickly follow. The pallor is a very marked feature and is often observed before the person feels sick. It is like the pallor in epilepsy before a fit; or the pallor in shock, strangury or a blow on the abdomen, a deadly pallor and is in the first instance unaccompanied by giddiness.

The vomiting is not like ordinary vomiting in gastric disturbance; nor is it altogether like the ordinary vomiting of cerebral disturbance.



of the system  
1891.

In cerebral vomiting according to Romberg, the position of the head has much to do with it, being arrested in the horizontal, recurring and being frequently repeated in the erect posture; & easily induced by movements of the head, by shaking, stooping, swinging, or sudden rising. So also in the vomiting of sea sickness. It is the getting on the clothes, the stooping for that pin or the tying of a shoe lace which is the hard part; then the light breakfast which the patient was so sure was already comfortably settled, comes up in its entirety and she sinks back exhausted and discouraged on her bed again. (2) The prevailing presence of premonitory nausea - so also in sea sickness.

(3) The peculiar character of the act of vomiting - the contents of the stomach are ejected without fatigue or retching as the milk is rejected by babes at the breast. It is far otherwise in vomiting in sea sickness; the retching is the worst part of it. In some few cases the first vomit comes away suddenly and easily, but not generally. The vomiting often comes on very suddenly though, and the contents of the stomach are ejected with great force.

(4) The Complication - in cerebral vomiting - with other phenomena. The most frequent of which are: Pain in the head. Constipation. Irregularity of the cardiac and radial pulse which is increased subsequent to as well as during the act of vomiting. These are all prominent symptoms accompanying the vomiting in sea sickness. The irregularity of the pulse is a very common symptom and is increased just before the act of vomiting as well. The vomited matter is at first the contents of the stomach, then an acid fluid mixed with bile and mucus, till at last there is only retching - painful contractions and sometimes hiccup. Sometimes the fluid is very watery. Any fluid or food which is given is immediately vomited up again or remains for a time giving more discomfort. The amount of watery fluid ejected is often astonishing and seemingly far greater in amount than what is swallowed. By getting off fluids altogether allowing only a little Candy to wash the mouth this

this can be verified. Generally, the vomited matter is full of bile, very dark in colour, and after severe retching not infrequently streaked with blood.

Headache is a very constant symptom. Many of those who are not affected otherwise suffer for a day or two from headache more or less severe. The headache is sometimes very distressing. At first it is frontal with pain in & over the eyes, but after much retching has its seat on the top of the head. After the sickness is over there is generally very severe headache remaining for a day or so.

Constipation is a very constant symptom and not very easy to deal with. It generally takes a much larger dose of purgative medicine to give relief <sup>abroad</sup> than on shore, and the milder laxatives as senna, & rhubarb are of little service. Calomel & Jalap and in some extreme cases Croton oil being required. A form which answers well is the big Linnæ O, or Black Draught which often clears away the remaining sickness.

It is sometimes met with generally at the commencement of the sickness, and in cases where a hearty meal has been taken perhaps 20 or 3 hours before starting. It may be the only symptom along with more or less headache.

Spasmodic stricture has not been so far as I have noticed, been mentioned as an accompaniment, but I have had 7 cases of it & many cases of retention of urine in the female, in some cases going as far as to cause overflow. Of the 7 cases 5 were young men, 2 middle aged. None of them had ever had the slightest difficulty in passing urine at any previous time, nor was there any enlargement of the prostate, or a history of drinking. All were very sick, and passing the catheter had a great effect on them. Hot baths or morphia suppositories were of no service and the catheter was required in every case.

Women may be very sick and unable to get up to pass water, and the urine accumulating and dilating the bladder finally causes loss of power of contracting. A woman does not care either to get up before a lot of strangers and the water closets, are so far away that she cannot get to them in her sick condition. Retention of urine seems also to be often associated with irregular menstrual flow, or menorrhagia in many of the cases the woman was also menstruating at the same time, though it was not her proper time and in three there was menorrhagia. As irregularity of the menstrual function is one of the commonest concomitants of sea life it is difficult to say what connection there may be between the two, the fact is only mentioned as observed.

There might be said to be, clinically, two forms of sea sickness

- (1) In which the symptoms are those of fever generally
- (2) The torpid form.

(1) In the first there is considerable fever. The pulse is soft & quick. The skin hot, generally moist. There is severe tension headache. Thirst is unquenchable, but as soon as swallowed fluid is rejected. The urine is scanty, of high sp. G. & red. There is constant retching and vomiting especially of a bilious character.

The tongue - there is a peculiarity about the tongue in sea sickness - it is moist flabby and perfectly white and smooth. The bowels are highly constipated. There is thorough listlessness & mental depression.

All they want is to be left alone - or thrown overboard.

- (2) In the second form of sea sickness - the torpid form. The head becomes more affected. There is constant nausea, but no loss of appetite. Food seems rather to relieve for a little while & then is vomited. The pulse is slow and weak. The urine generally scanty but sometimes passed in quantity & clear or yellowish white or milky. The skin is dry. There is a tendency to sleep all the time.

It is just of the sense of smell, sight & hearing ~~often~~ prevails during & often precedes sickness. Smells which ordinarily are received with indifference or pleasure become intolerable; sounds of every kind, of music or even of the voice cannot be tolerated, and the sight of food or objects passing before the eyes bring on or aggravate the sickness.

Other things being equal sea sickness is more especially a morning sickness. Many persons feel a little squeamish in the morning and unable to face breakfast who as the day wears on feel all right. And unless a rougher sea get up during the day those who are really sick feel worse in the morning & better towards evening.

There are conditions under which individuals are more apt to suffer from sea sickness:-

After long and fatiguing journeys, coming on board in an exhausted or worn out condition; or passing a sleepless night before embarking.

This is specially noticed among American passengers who often come long journeys by rail before embarking, and who suffer more generally than our home people. It has been asserted by St Beard that Americans suffer more anyway than Britons, which may be so considering the dyspeptic condition in which many of them are from their persistent disregard of all laws of health in regard to diet.

Persons of a bilious constitution - generally suffer more acutely.

People who have been drinking hard before coming on board nearly always suffer very severely. Many, specially among the steerage passengers, have in bidding farewell to their friends before leaving, been eating and drinking far more than was good for them, and are therefore in good condition for paying a heavy tribute to Neptune. Delirium tremens more or less acute is by no means uncommon on board; the delirium tremens of sea sickness I consider analogous to the head symptoms which form so prominent a part in the serious illnesses of the inebriate.

These cases generally show a suicidal tendency and have to be carefully watched. Coming from Calcutta I have seen no less than 4 cases (out of 46 passengers) occurring between that port and Madras - 4 days - and each of them tried to get over the side. In the month of May we lost a young man over board who had been ordered to be kept locked up in the hospital, but escaping made his way to the rail, climbed over and dropped into the sea. A woman during this present passage August. suffering from Deberium Tremens was caught just as she was preparing to spring over.

Pregnancy. Where the morning sickness is increased and if left alone they hardly ever get over it, and become greatly exhausted. There is always more or less danger of Abortion specially if this has happened previously.

Before the treatment of this form was understood by me 8 abortions occurred; within the past year several cases have threatened but none actually took place.

Sex. has its influence. Women suffering more and longer than men.

Of course there are exceptions it being no uncommon thing to see a little wiry, lively American woman keeping about all the time, while her big husband suffers badly.

Age. Children and old people often escape or it does not last long. Children may be sick after every meal and as soon as they have vomited feel all right. When the old are very sick specially with heart disease as a emphysema there is always danger, and the effects of the sickness may be lasting.

Some of my worst cases have been among children and the very old.

Whenever children are very long sick it is always as well to bear in mind the possibility of worms, for which I always treat them now and have several times been correct in my supposition. My attention was drawn to this by the case of a boy five years of age who suffered most severely from the feverish form for several days.

His temperature rose to 103°, his pulse to 120: Lungs and heart were free of disease. The tongue became brown, and with the exception of Diarrhea, the symptoms were

those of Typhoid Fever. Medicine had no effect on him, as soon as swallowed it was rejected. Suctions were given, his lower bowel cleared out and his strength supported by enemata. At last bearing in mind a case of persistent vomiting which occurred in private practice while on shore, in which a girl had after 7 days of severe vomiting, vomited a round worm, the boy was given a jugful of hot water and in the vomiting he brought up two round worms. After this his sickness quickly left him, all the symptoms disappeared, and at the end of the voyage he was running around as smartly as any of them. Owing to the abnormal peristaltic movement the worms had passed into the stomach & there set up the disturbance.

In elderly people head symptoms are generally the most prominent. They sometimes pass into a dazed condition without much retching or nausea more a sort of stupor than anything else. And here they lie in their berths and doze away all day. In one case met with lately it seems that the gentleman had once gone for a two months voyage in a sailing ship & from the time of leaving, till port was reached again, he was all the time in a stupor - but on landing was none the worse of it.

Stout and Flabby persons suffer more than the spare and wiry, and good spirits, fearlessness, and a determination to keep well, <sup>have much to do!</sup> with preventing or shortening an attack.

Babies may be out of sorts for the first day or so but even then it is generally due to the condition of the mother. Their power of reasoning is very limited and those causes which act through the senses can have no effect on them.

Babies can do with an immense amount of tossing about, being rocked in cradles, moved up & down and every way slowly or quickly without apparent discomfort. If the mechanical theories are correct why do babies not get sick in their nurses arms or in their cradles?

Mothers nursing often become unable to nurse their children, the secretion of milk being either stopped or interfered with.

Consumptives or people who are very weak seem less liable to sea sickness. There is not a voyage passes without some consumptive coming through my hands yet I have never seen one in whom the disease had made any progress suffer acutely. Haemorrhage rarely occurs at sea, and it does not occur during the early part of the voyage, but, in moving to the south, towards the latter part a statement which is supported by most observers among them Dr. Faler of St. Quarts (Practitioner Vol VII page 186.).

Duration I discerned as much to do with the duration of sea sickness, some people are never sick in good or bad weather, and different individuals suffer much more than others.

The duration is generally about 3 days, unless in very stormy weather; but always on bad weather coming on a certain number are laid down again. One attack by no means ensures a gainst further or subsequent attacks, though subsequent attacks during the same voyage are generally less severe than the first. Some never get over the sickness at all as long as the voyage lasts if the weather is anything bad. A lady who had just crossed from New York to Glasgow in February of 1886, embarked with us for Liverpool, for Bombay, and with the exception of 2 days in the Mediterranean, and 4 in the Red sea, she was sick all the way, though the sea was by no means rough. Still she was able 24 hours after landing to undertake a journey by rail and Bullock cart of 4 1/2 days duration which she stood well. Being only a few months married, pregnancy might have something to do with the long continued sickness.

As a rule at the end of 3-5 days recovery, rapid and complete, takes place. Headache & great thirst remains for one or at most two days. The appetite becomes voracious and the patient feels himself, as he often expresses it, a new man, able to enjoy and receive benefit from his sea-life. Sometimes however exhaustion continues and becomes gradual; emaciation increases, and the wonder is that a fatal result does not



more, but somehow when things are just at their worst improvement begins. Even after being sick the whole way most cases as soon as they get ashore get well at once and pick up rapidly. In a few cases however it takes a good time before they recover. It has been asserted that sea-sickness must always be harmful, this I can scarcely believe. From many cases observed, I think that it often does good; that not only does the appetite but assimilation improve afterwards - I refer to those cases where sickness lasts ~~part~~ of the way and to the improvement afterwards on shore.

Sometimes however semi catarrh of the stomach or digestive weakness remains for a time, and in elderly people with heart disease permanent injury may result. The exhaustion in some cases becomes extreme.

It is not a fatal disease, the deaths which have occurred being mostly in short passages between England & Ireland or the Continent.

Animals suffer from sea sickness as well as man - a proof that posture has not everything to do with the causation. Dogs get sick and very constipated. The ship's cow get sick and the milk fails. Horses get sick & become greatly afraid in rough weather and losing heart not infrequently succumb.

## Treatment.

There is probably no functional derangement which has so completely baffled the best efforts of therapeutical science. The remedies which have been proposed and vaunted as specifics are innumerable, but after a fair trial few of them have ~~gained~~ <sup>gained</sup> any lasting reputation.

Treatment may be divided into preventive and immediate

### 1. Preventive.

A form of treatment which emanating from America has attracted some considerable attention not only in that country but in this, is that recommended by Dr. George Beard in "a treatise on sea-sickness"; for which he claims that the results are brilliant and successful. It consists in the giving of 3 doses of - Sod. Bromide three times daily for several days before embarking and continuing it in smaller doses during the voyage. The bromide must be given in doses sufficient to produce lightness of the head, and steadiness of the limbs or he does not guarantee a successful result. Of this I have had considerable experience, and coming so loudly praised and strongly recommended - even though only by its author - devoted a good deal of attention to the results of this form of treatment. That it is successful in some cases is undoubted - but so is every remedy from hot water to Amyg. Trubi. from ice to the spine to blistering behind the ears. A certain number of persons would never be sick even in a rough sea, many others would not be sick in a quiet, and in what: ever experiments are made with any remedy this has always to be borne in mind, and it is always very difficult to tell in what cases the successful result is due to the action of the remedy, the insusceptibility of the individual or the smoothness of the ocean, with the consequent diminution of motion.

Dr. Beard has never seen any failures; any ship surgeon of any experience on the Atlantic could tell of numbers who had followed his instructions to the letter, who were not only sick, but worse than the others, or sick after every other person had recovered.

Several cases have come under my notice where acute of a severe form has developed; others where semi idioy for the time being resulted, while others have managed to keep themselves in a sort of stupor all the way only to find themselves prostrate on shore by what might be termed a bilious fever which kept them prostrate for days, in one instance for over two weeks. As these are mostly tourists whose time is limited and who have a certain and large amount of ground to cover before returning, the loss of even a few days is a serious matter to them.

There are some cases where it does surely do good, but that small percentage does not by any means warrant us, as has been strongly urged, to employ such heroic treatment in every case.

2. Cocaine Hydrochlorate also in a very few cases seems to prevent sea sickness.

3. An old fashioned form of treatment is the giving of a strong purge immediately before or for a day or two before embarking. In some cases this also is good but in others very harmful. If the person is constipated and requires a purge by all means give him it. If naturally his liver is sluggish and his bowels torpid have them freely moved. Undoubtedly, ~~constipation~~ constipation, while an almost constant symptom of sea sickness, is also in itself a fruitful cause. But care must ~~not~~ be taken not to go too far or the person may be so weakened that the sickness takes a firm hold on him. This may seem contrary to the already expressed opinion that the weakly suffer less than the robust in many cases, but still it is a well observed fact. The rule to follow is - if the person is in good condition as regards his evacuations leave him alone, else for only weaken him and make his ~~after~~ constipation only the worse to deal with; if constipated naturally, or out of sorts as the result of the excitement and irregular habits of the undisciplined in, on the eve of departure for a foreign country then a mild purge is of great value. A laxative dose of Friedrichshall for a few mornings previous to departure would often save much suffering afterwards.

The application of a firm bandage or Belt has been advocated since  
 the beginning of the century, more recently by Dr. Hastings<sup>C</sup> and Dr. Umn  
 the latter of whom devised a special belt with air cells which could be filled  
 at pleasure; and were the theories correct which lay the whole causation on the  
 movement of the viscera on one another; the dragging on and consequent  
 hyperaemia of the mesentery; the pounding of the intestines on the liver; or of  
 the viscera on the solar plexus; it should be in every case a sure preventive.  
 In many cases it is a great benefit, giving the wearer a sense of comfort and  
 firmness. Anyone who has experienced the severe retching of sea sickness  
 will admit the benefit to be derived from support of the stomach during  
 the act of vomiting. This and another class of remedies such as strong  
 Coffee, Brandy and other stimulants may be all that is required in  
 a short passage in a rough sea, as across the channel but are  
 insufficient to prevent sickness in voyages of any length.

The Spinal Ice Bag: was first recommended by Dr. Chapman in  
 accordance with his theory, and he and others met with very gratifying  
 results from its use. I have only seen it tried in one case. A lady who  
 invariably had suffered from severe sickness on previous voyages crossed  
 the Atlantic last November. Advised to try the ice bag she brought one with  
 her, and during a stormy passage, had the satisfaction of being free  
 of sickness the whole way across. With her case before me I would be  
 much inclined to give it further trial and believe that it would  
 do good in many cases. There are too many disadvantages connected  
 with it to make it a popular form of treatment. For one thing it is not  
 practicable enough, at sea you are not dealing with one but scores of  
 sick folks; and again, while many people hate the sickness, they hate the  
 idea of an ice bag to their spine still more. The price also puts it  
 outside the reach of many.

## Immediate Remedies.

Dr. Le Comte's method. - Arch de med navale. November 1868 -  
and recommended also by Dr. Binelle (N.Y. Record Jan 1879). consists in the  
employment of Faradisation. The skin is moistened with sol. Aropia Sulph  
4-6 percent solution. The negative pole as a flat disc is placed over the  
pyloric end of the stomach; a sponge with the positive pole is passed for  
three or four minutes from the Cardiac towards the Pyloric end & passing  
occasionally downwards. He claims that it always gave great relief and  
was followed by refreshing sleep.

Amph Nitrite was first recommended by Dr. Crochley Clapham in the Lancet  
(2 vol 1875 page 276), supposing sea sickness to be similar in character to  
epilepsy. He gave it in a handkerchief holding it close to the  
nose so as to administer it without too free admixture of air. Acting  
he considered by freeing the circulation and relieving the hyperaemia of  
the cord. It has had many advocates among them Dr. Potter Lancet Aug 16/75.  
Dr. Dingle (May 3<sup>rd</sup> 1879) and Dr. Ayford (Lancet May 10 1879) the latter  
considering it the only remedy from which he had seen any good results  
during two years voyaging to the Cape.

It is a very useful remedy and sometimes acts like a charm, other  
times it fails utterly. The same may be said of Hig Esterin; with both  
I have seen surprising results.

The dose required is at times larger than Dr. Clapham found  
sufficient. Stout flabby men require moderate doses, while thin wavy  
men require large. If it is going to do good it will do so immediately. Relief is  
generally speedy and the nausea & sinking quickly become lessened. The chilly  
sweat gives place to a warm glow, and a sense of comfort supervenes; the patient soon  
falls asleep to awake with the sickness gone.

Caution must be taken in its administration: specially in delicate women or men with any suspicion of fatty heart. No one would think of administering it where there were rigid arteries; in diseased cerebral arteries rapid and extreme dilatation might cause rupture.

It is best in every case to allow a vomit first, and give lying so that the patient may fall asleep afterwards.

It is of no use in cases where the liver is at fault but in nervous cases specially in women it is a fairly successful remedy.

### In Morphia Hypodermically Injected

We have another most valuable remedy. There is one class of patients in which this very seldom fails, and it is one of the few in which perfect faith can be placed. My first experience in its use was in the case of a lady in the 4<sup>th</sup> month of Pregnancy who had for 3 days been very sick: the stomach not only refusing food, but the retching coming on with every movement on the patient's part. In addition to this, severe pains in the back and lower part of the abdomen now set in, and as she had aborted during the 4<sup>th</sup> month of her last pregnancy, she became alarmed and sent for me. The bowels had already been cleared by an enema, so now a Morphia suppository was inserted, and 5grs of Morphia Sulph. with 100grs of Amp Sulph. injected hypodermically, over the stomach. In a short time she fell asleep and awoke next morning free of pain and free of sickness, and was able to be up every day afterwards. Since that time I have seen many similar cases, some less and some more marked. Four cases I have seen in which there was already discharge; in which no medicine could be retained by the stomach, & which otherwise would have gone on to abortion, where this method was thoroughly successful. One case in particular was interesting as the woman had miscarried 4 times in succession always about the 3<sup>rd</sup> month and had never had a child alive.

She was very sick and pains began the second night out, soon followed by discharge. On examination the os was found to be dilated sufficiently to admit the point of the finger and the membranes could be felt inside. By the same treatment a successful result was obtained & I had the satisfaction of learning that 6 months afterwards she was delivered of a healthy child.

It is well to have the bowels cleared out if possible and it seems better to inject over the <sup>in particular cases</sup> Epigastrium. I always use the tablets with 2-4 morphine ~~but~~ and too of Atrop Sulph and generally find once sufficient, though it may be necessary to repeat it.

Another useful remedy is Chloral more especially in combination with Bromide of Potash or Soda ~~in combination~~. It brings on refreshing sleep which is in many cases all that is required. In the beginning of the sickness it is of little use but about the 3<sup>rd</sup> day it comes in very well. I give it in 15 gr doses with 30 grains of Bromide at night for adults 3 grains with 5 grains of Bromide for children: A very useful combination is

R Chloral hydrat.  
Sod Brom. aa gr XV

℞. Cam. Indica gr 4. The Cambrs Indica being given in pill along with the draught.

For the headache if the bowels are cleared nothing beats Cambrs Indica. It may be said of this as of every other remedy given by mouth that it is of little use in the first stages of sea-sickness. At that time the stomach generally rejects the medicine as soon as, or soon after being swallowed and if it is retained for some time, the stomach being incapable of absorption the remedy has no effect. I have seen medicines rejected hours after being swallowed, and have felt the smell of chloroform as powerful then as if it had just been taken. This accounts for the poor results from medicines administered by the mouth at first, after sickness has commenced.



It is at the end of two or 3 days when the most acute stage has passed and when the stomach now raw and irritable continues contracting spasmodically that remedies are of use, and among these Chloral with the Bromide takes a first place. Bromo Soda I have just been trying with good results.

### Cocaine.

Introduced as it is on the high authority of Prof. Manassie (Berl. Clin. Woch. Aug. 31<sup>st</sup> 1885), and further advocated by Dr. Wicherkiwicz (Lancet Sept 5, 85), has been a failure in my hands. Coming so highly recommended I have given it extensive and repeated trial. Requiring in some cases before leaving port in doses administered 3 times daily. In a few cases the sickness has been kept off at the time, but after a few days found that not only had it paralyzed the terminal nerves, but digestion also, and that the food had simply been swallowed to come up again when the effect of the Anæsthetic had passed off. It is administered in capsules containing 5-8 minims of a 5% solution.

The Carbonates. Are very useful in some cases where the condition of the liver has a good deal to do with the sickness.

Opials. by the mouth are not of much service as a rule, though at times a full dose of Chlorodyne with 10 minims of Tinct. Belladonna acts well. Tine. Opii as enema is very useful, but sea sickness is not considered a serious enough trouble in most cases to make people submit to such <sup>modes of</sup> treatment, unless when much exhausted, and then we have better remedies. While the stomach is sick we must remember that the lower bowel is not and that it might be made a valuable medium for the absorption of medicines.

In this connection I may mention that in the early part of this year we had a lady passenger suffering from severe sciatica, who for over a year had been constantly treated by hypodermic injections of Morphine, & small enemata of Tine. Opii. For some time she had been trying to break off what had become a habit with her, and to assist her in that endeavour had been ordered the

sea voyage, and was now merely using the enemata. The passage was very stormy and every other lady was sick for days but from the first she was able to take part in every meal and improved greatly on the voyage.

Pure Chloroform is not of much service, and from other Chlor I have not seen much good. Hydrocyanic Acid is useless except in the after treatment of the sub acute gastritis. Belladonna with Camphor, sprs Chlor & Brandy make a good combination in the stage of exhaustion. Citrate of Magnesia is very useful specially in the pregnant. The vomited matter is often very highly acid and the administration of an effervescent alkali is very grateful and palatable. The effervescent Potash Soda is also useful.

Stimulants

are worse than useless at first; the system is full of bile and alcohol only increases it; when it comes to exhaustion the case is different, and for this, and also to allay the great thirst - 3ii doses of Brandy in effervescent citrate of Magnesia, or tablespoonfuls of Ice Champagne (provided it is good), with the same, or soda water, given frequently has a good effect.

Ice must be used very sparingly. Nothing creates more discomfort than sucking or swallowing much ice. In small quantities it may anæsthesize the stomach to a certain extent, but taken ad lib it becomes dry & bye bye like red hot iron in the stomach creating a great burning sensation.

It is of great importance for successful treatment that the Constipation be overcome and the best means of doing so is by the use of the enema syringe. Undoubtedly it is used far too sparingly; by and more frequent use would often bring much relief. The Constipation is so obstinate that full enemata are required.

Administering purgatives by the mouth being in the early stages unless we have in the evening a very useful means of treatment. After the Constipation is overcome, the inhalation of Amyl Nitrite, the hypodermic injection of Morphia, or the administration of Chloral + Bromide, as the case may be will often make the patient at least comfortable, if it does not altogether free him from sickness.

There is no specific for sea sickness. Every case must be treated on its own merits; experience can be the only guide as to when to give one thing, and when another. There are very few cases for which something cannot be done and failure with one remedy must not discourage or deter from trying another.

At first lying on the back or right side as is felt best with the head low, is not only the most comfortable but generally the only possible position. As regards position of state room and direction of berth; as there is least motion there, those nearest the centre of the vessel, and as rolling is more met with than pitching in staterooms, berths fore and aft in which the whole body is moved up & down at once not the feet up one minute & the head the next as when athwart ships, are the best.

After the first sickness is over it is well to get on deck & get exposed to the fresh air which is one of nature's best remedies for sea sickness as well as other troubles; and ladies especially, who are unwilling to undergo the trying ordeal of dressing must be coaxed, and in some cases if necessary, carried from their berths to the deck. The close air of the state rooms has an undoubted effect in causing and prolonging the sickness.

Food.

Some as soon as they have vomited crave for food which they reject again as soon as digestion commences, but generally the appetite is lost & food must be pressed on them.

If no food is taken the stomach simply contracts powerfully on itself, causing by and by a certain amount of congestion, as seen in the streaks of blood in the vomited matter, and it is well that some food should be swallowed.

Chewing hard biscuits is not to be recommended, the small hard pieces swallowed besides not being enough to fill the stomach, at the same time only increase the irritation.

Soup and fluids merely get sour on the stomach, add to the general discomfort, and are generally rejected soon after being swallowed; meat and such like food is thought of only with disgust; so we have to fall back on an "intermediate" form of food, and of that class nothing can compare with well made gruel which is often the only thing which will be retained by the stomach. For a change Arrowroot or Blane Manna do very well. Tea, Chicken jelly or concentrated beef tea are good. When the

so about Curry is well borne, if nicely made.

The patient's call for "something tasty" as kippered or red herring, haddock or other forms of dried fish. The tolerance of fats is surprising in some instances and a slice of fat pork - an old sailor remedy for sea sickness is not a mere matter of fiction after all.

Many seem to eat better when pickles are added to their food, and some American passengers are content with, and even seem the better of a few pickles eaten by themselves. The benefit derived may be due to the flatulence, arising from the amount of gas formed from this indigestion, causing tightness, which, as in the application of the binder or belt, is so useful sometimes.

For the thirst, Sugar ale is as well borne as any fluid. Lemon squash does well with some, badly with others. In exhaustion sherry wine or peptonised milk is very good. Small quantities only of any thing should be taken at a time, and taken frequently.

Sea sickness is most demoralizing and with women specially moral treatment is necessary. If people only set their minds on getting well, and fight against it they get over it much easier. In good weather specially, instead of lying brooding in the stuffy state room, it is far better to be on deck, where, in the fresh air and bright sunshine, with people all around, they can more easily forget that there is anything wrong with them.

The stage of exhaustion sometimes requires careful watching and stimulation, and intestinal enemata may be required.

Afterwards if recovery is not complete the acids are very useful in toning up the stomach, or if not well borne and the pain continues, Bismuth, Hydrocyanic acid dil. and belladonna are of great use.

## II Sea voyages.

From the earliest times sea voyages have been recommended as a means of treating certain diseases.

and In the works of Aretæus" Book 1<sup>st</sup> chap 8 under the head of the treatment  
how of phthisis: Κεφη θεραπεία φθίσιος we find sea voyages recommended in the treatment of that disease:—

καὶ γὰρ, εἰ εὐτυχῶς ὁ ηθροῦς ἐν θαλάσῃ γίγνηται ἀναχώρη  
καίροισι. καὶ γὰρ τὸ ξηρὸν ἐς τὰ ἔλκεα ξυνοδιδωσὶ ἀλμυρῆ.

"and if the patient have it fortunately, as his command, gratation and living on the sea will be beneficial. For sea water contributes some thing dessicant to the ulcers". For long the truth thus discovered by the old physicians and even the beneficial action on the body of sea water, was lost sight of.

It was in England, and towards the middle of last century that the sea was again recognised as the mighty sanitary agent the world now acknowledges it to be. At that time Western Europe was heavily scourged with scrophula which appeared and worked havoc among all classes, the rich as well as the poor.

Dwellers on the sea board barked and washed their sores in the sea water, drank of it, and applied sea weed as poultices.

It was observed that much benefit was derived from this treatment, and slow as the profession was at that time to give up preconceived notions, and enter on new forms of treatment, the results were so evident that at last it was recognised. In 1812 Dr. Le François of Duppe published a treatise on the virtues of sea water employed internally and externally, & through his exertions his native town was raised into a health resort; and throughout the journals of the first part of the century, we find its use repeatedly advocated in the treatment of Scroph.

But while the virtues of sea water and residence on the sea board were thus recognised as Therapeutic agents, it is only of more recent years that sea voyages have come prominently into notice as a means of treating disease and specially consumption:

- In investigating the value of the ocean as a health resort we have to notice
- (1) What are the conditions under which the individual finds himself at sea?
  - (2) Is the life of the sailor - as an individual whose home is upon the waters - a healthy one
  - (3) What are the advantages of a sea voyage? what are the peculiar conditions which render the ocean of value as a health resort?
  - (4) What ailments and diseases are most commonly met with at sea? what cases derive benefit, and vice versa.

(1). What are the conditions under which the individual finds himself at sea. The ship is his dwelling house and his world for the time being. Here he eats, sleeps, takes exercise, in fact lives, uninfluenced by what is going on in any other part of the globe.

There is first to consider the sanitary condition of the ship.

Placed on the antiseptic surface of the ocean, the conditions are most favorable for avoiding all sources of contamination from imperfect drainage or a faulty subsoil. The waste pipes from water closets &c. have only a very short distance to run into the sea & if carefully looked to should give no trouble. But even in good ships things are not satisfactory, and too often a most disagreeable odour pervades the neighbourhood of the lavatories. In steamers, where the waste water from the hand basins runs away into pipes discharging into the sea, during the early part of the voyage the basins are often used for vomiting, and even for urinating into, and the flush of water not being sufficient, part lodges



about the corners and recesses, and decomposing gases rise to smells.

It is also an every voyage occurrence to find towels, thrown in by thoughtless people, stuck in the traps of the water closets, and remaining for days unnoticed, till an overflow or the suspicion of a dead rat around, causes the matter to be investigated, <sup>when</sup> (and) the pipe is found blocked.

No ship or steamer is watertight, there are always places around some rivets or between some plates where water seeps through; this collecting in the bilges at the bottom along with any water from the deck or engine room, forms the bilge water, another source of contamination when allowed to become stagnant. In steamers the bilges are regularly washed out by the steam pumps; in ships where hand labour is necessary that is not so easily done.

In the old days of sailing ships (wooden) the bilges got very foul, and coupled with the bad ventilation made life on board even dangerous. Even 50 years ago a sea voyage was an enterprise requiring more than ordinary courage. Up to that time all space which could not be used for merchandise was temporarily arranged for storage passengers. The tween decks were never more than 5 feet high, and in this two tiers of berths were erected. The only ventilation was through the hatches, and these had to be closed in bad weather. Bad as was the condition of the passengers on the main deck, those on the lower deck must have been much worse, as any air they received must first have filtered through the vitiated atmosphere of the deck above. The storages were crowded with passengers, who ~~even~~ though they were able and willing, had of the use of the means of exercising cleanliness; and many were sea sick besides. The emanations and exhalations from the bodies of the individuals thus confined, as well as the miasma of a damp hold, created an atmosphere which was poison to those who breathed it, and endangered what was

known as ship fever in a more or less violent degree.

Ten per cent was a common, even 50% a not infrequent death rate. Of 5000 Palatinos forwarded in 1710 by the English government to New York 470 died on the passage and 250 immediately after their arrival, of ship fever.

The Rev D. Kruiz, in an oration delivered before the German Society of Philadelphia in 1788, stated that of 900 persons shipped in one vessel in that year from Amsterdam to that port, 400 had died on the way.

As late as 1847, Medical Statistics estimated that not less than 25,000 emigrants died of ship fever.

Within the last 40 years great progress has been made towards lessening the evils which formerly prevailed, and made sea voyages a danger instead of a benefit; but still there remains much to be done. Some ships are much better in every way than others, and it is the duty of the medical adviser to know what is the condition of the ship in which he sends his invalid ere he gives consent to his going.

### Ventilation

in the best of ships is still inferior. In good weather it is all right, but in bad when every port hole is closed; skylight and hatches battened down, it is far from being sufficient; and that is just the time - when patients can't go on deck - that pure air below is most essential. There are many obstacles in the way of good ventilation under such circumstances, but they are not insurmountable, and a method could easily be devised by drawing off the foul air, of regulating the supply of fresh air at pleasure; and if the same attention was paid to the invention of devices as on shore, bad ventilation would soon become a thing of the past.

# Light

Another important element, is still very insufficient in the steerage, and even in the cabins, of most ships, and often depends on a deadlight placed at intervals on the deck.

## Air.

A most important factor in the sea climate is the air. As compared with the air on land. its main differences are that it contains more oxygen and ozone, more moisture, relatively as well as absolute, and less CO<sub>2</sub>. At the sea level the atmosphere pressure is at its greatest so that each volume contains a greater proportion of oxygen than at higher levels.

It is of course considerably influenced by the evaporation which is constantly going on from the surrounding sea, from which it is supposed to derive certain saline particles and hold them in suspension, the amount being increased when the wind throws up the sea in the form of sprays, and this is supposed to have a healing effect on the lungs.

When sprays are flying everything gets covered with salt, which is felt on the lips and moustache and seen on the clothes and must also be inhaled then.

The chief peculiarities are the purity of the air, and the equality of the temperature. The air ~~the~~ passes over the surface of the aseptic ocean and no matter how vile it be when it leaves the shore it soon becomes purified.

On the sea are no drains; no decaying vegetation; no smoke or fog; a complete absence of all animal or vegetable emanations which can breed disease. It is more equable than the air on shore in the same latitudes; is cooler in summer, warmer in winter; the heat of the day and of the warmer climates is lessened; and

the light and colder climates raised.

But while the air on deck is of the purest character, that in the cabins is to often as we have already noticed not of the best.

Water

The water is obtained from two sources

1) That obtained on shore and carried in Iron Tanks, which is generally of a good quality. It keeps well in the tanks and the admixture with rust from the sides while deteriorating its quality as a tea or coffee making water - precipitating the tannin - does not harm, so far as drinking is concerned. The tanks require however to be cleaned out on every available opportunity.

2) Condensed. All first class ships, as well as steamers, carry a condensing boiler, and so long as the filters are clean the water is of the purest character; & the admixture of a lime stone with the charcoal, and a pinch of salt afterwards makes it very palatable.

Food

In first class lines, in the saloon, this is all that could be desired; in most large steamers there are Refrigerators in which meat, vegetables & fruit can be kept in a state of good preservation, and the table is supplied with a choice variety of every meal. On sailing ships, live stock, - sheep, fowls, ducks and so forth, are carried so that there is fresh meat every day. Besides there are always corned and preserved meats and canned fruits. Some ships carry a cow, but most have to depend on Condensed Milk which however one gets accustomed. It is much to be preferred to milk which has been kept on ice for a week, or from a cow which is suffering, with the others from sea-sickness, or

the effects of heat.

In the stérage, the food is good and substantial, but not at all suited to the capricious appetite of the invalid. There is no place for an invalid on board steamer or sailing ship but the 1<sup>st</sup> cabin.

But even in the saloon, after a short time, the cooking becomes monotonous, there is a want in it somewhere, of that something which makes even the plainest fare at home so palatable. The sea chef has a habit of cooking everything greasy and heavy, and there is an absence often of these little delicacies which help to tempt the fastidious appetite of the invalid. How one longs towards the end of an extended voyage for such a simple meal as a cup of tea, with fresh bread and butter, and egg, such as one gets at home.

### Sleeping Accommodation.

Here we have one of the greatest drawbacks to life at sea for the invalid. Space on board ship is a very valuable commodity, and that allotted to every passenger is necessarily small. His cabin is never more than 6 by 8 feet, which he must probably have to share with another <sup>or others.</sup> The narrow berths can never take the place of a good bedstead. It is so constructed as to be open at the top, and communicating on one side with the next cabin; on the other with the passage, and on the 3<sup>rd</sup> in ships with the saloon, or in steamers with an alley-way; so that there may be as free ventilation as possible. The cabins too often get stuffy even in good weather, and in bad, the night is enough to undo all the good the day has done. In the stérage, & intermediate or 2<sup>nd</sup> cabins things are worse, being more crowded together. They breathe again and again the same air which is now known to be one of the worst things for a Consumptive.

2) Is the life of the Sailor - as an individual whose home is upon the waters - a healthy one?

Popular opinion answers in the affirmative, but experience rather questions the soundness of the answer.

In all trades we meet with healthy and robust men, and so it is at sea, but looking over a ship's crew, specially in a first-class steamer or ship, we see only a part of the truth. They are all in a fair state of health or they would not be there. Crews are shipped every voyage and a mate is not going to choose, where there is so much choice, any whom he considers unsuitable or unfit for work. In many ships also they have to go through a medical inspection before the commencement of the voyage, and in all emigrant ships and steamers have to pass before the medical officer & surveyor of the Board of Trade. So that we may say we have in a newly shipped crew the best sample that is to be obtained at the time.

And is this sample such as strike one very favorably in regard to the whole? Among them are a few robust well made men but also a good sprinkling of stunted and by no means powerful individuals.

One thing strikes you, that you so rarely see an old man among them, unless it be a quartermaster, many of whom are old men of war.

The sailor is well known for his spending proclivities while on shore, and it is not accumulated wealth which enables him to leave the sea while in his prime; his life unfit him for following many occupations on shore, so it must either be because he is unfit for his work or like Tom Bowling "has gone aloft."

His work is of the most trying description and is characterised more than anything else by great irregularity. In good weather he has little to do, in bad his work is both arduous and dangerous. Exposed to all kinds of weather at all hours of the day and night; now working under a broiling sun; again, drenched with rain or sea water reefing a sail in a bitter wind, or working among the rigging when waves and sprays are dashing high; and, in the depths of winter, the smallest wave is thickly coated with ice.

His food is rough as his life: on long voyages beef, pork & fish of an inferior quality, stowed in bins etc. all its sustaining properties have been exhausted, and it has become hard and indigestible; and biscuits, also hard and with too little water in them to be readily assimilated; with occasionally fresh bread, of the sort as vinegar, constitute the larger portion of his daily bill of fare.

His sleeping accommodation, in the fore-castle, dark and low and often damp; generally overcrowded & the berths close together. The air already, on board, is so by the fumes of tobacco smoke.

It is into this atmosphere that he has to turn from the pure air of the deck, and try to seek repose, if not called for an emergency, during the four hours of his watch below.

Irregular as is his life at sea, it is more so on shore; where from the moment he sets foot on terra firma, he is the prey of Land sharks and crimps.

The majority of these men have had venereal disease at one time or other in their life. The prevalence of which among them is strikingly enforced upon one by a walk through an institution such as the European Hospital of Calcutta, where over nearly every bed the card bears, under "seaman", the words "Gonorrhoea", "Chancres", or "Syphilis".



11

In spite of all these drawbacks old sailors will tell you that as far as their experience goes, the life is a healthy one. That the reason there are so few old men among them is that they have got worse on shore; and all declare that their health is much better at sea than at home, where if they are detained for any length of time they suffer from increased dyspepsia.

That a sailor's life, can be led for any length of time at all without any disease, except such as are of their own contracting, attacking them; is strong evidence in favour of the great value therapeutically of the ocean.

But while there may be some cause for doubt as to the healthiness of the seaman's life we cannot from that condemn life at sea or assert that under no circumstances is it healthy. The sailor's health can be no criterion of that of the passenger and specially of the seaman, as compared with the disease passenger.

The process of the sailor's lunacy and its rupture is well known. The former has been supposed to be associated with epilepsy, though Dr. Faer thinks it due to the jerking on the ropes at the moment the chest is full of air, the pulse being short and sharp at certain parts of their shanty songs. The dementia caused by the leaning over the yards, with their legs apart; and also probably by their method of pulling on the ropes.

There is one class on whom sea life has a peculiar effect - Firemen. The information derived from conversation with all engineers with whom I have come in contact, as well as from my own personal experience, goes to show that no matter how good these men may be when they come to sea & that they are men who throw out of work in dull times have come to sea as a last resource, no matter how high their mental character they in a very short time become demoralised and stupid.

Whether the effect is due to working away down in the black hole among the coals and dust; or stripped to the waist standing before the hot fires smelting or coals, and their brains getting affected, is hard to say; but it is an effect not noticed among miners or furnacemen on shore, who work so much longer time daily than firemen, who work two watches of 4 hours duration out of every 24.

In endeavouring to arrive at a correct idea of the mortality and sickness among seamen we meet with many difficulties. As already mentioned only those who seem to be healthy are chosen for a voyage; of those who are left on shore, no one can say what becomes of them. Among the body of picked men comprising a crew if any become so ill as to become unfit for work, except on ships carrying a surgeon, they are left in the hospital at the first port touched at from which if they recover they are sent home by Government, but if they die nothing further is probably heard of them.

Again the majority of seamen are sailing on ships which do not carry a surgeon; and if serious disease breaks out or accident befall them, for treatment they depend on the more or less uncertain skill of the Captain and the death rate might in this way be varied.

There are always a great number lost at sea every year which while it increases the mortality list can scarcely be said to be a factor in the question as to the health of the life of the sailor.

Statistics in the mercantile marine being so unreliable we have to turn to the Navy reports; but here again the men are living under very different conditions. The man of war's man's life is a much more regular one on the whole - his hours, his work, his exercise is more regular; he is not exposed to the same vicissitudes of weather as the ordinary sailor; his food is better, and his habits on shore are not so licentious.

In the one case his labour is looked upon as being the interest of so much money paid him as wages; in the other he is looked upon as one whose health and physique, it is of great importance, should be kept up so that he is well clothed, well fed, well housed, & his command on shore well looked after. From the Navy reports then we have a better chance of forming an idea of what a sailor's life would be under, or under, favourable circumstances.

It is instructive as bearing on the question of how much improved sanitation at sea would improve the health of the sailor to revert to some of the older reports.

Thus we find Sir Lane in 1788 comparing the loss of life from disease & from the enemy in three years and six months in the fleet with which he was connected.

Died of Disease 8200.

Killed in battle 648

Died of wounds 500.

+ 848. while 3000 were lost at sea.

Since then so much improvement has been made in all classes of the marine service that the mortality has been greatly reduced. Still we find St. Lynch in the Indian Medical Gazette (Dec 1884) recording the mortality of seamen in Calcutta as 35-61 per 1000.

While among soldiers it was never more than 10 per 1000.

The death rate in 1779 was 123, in 1811-31, in 1836-13, in 1874-94 in 1883-5.88 per 1000 men employed.

In 1874 the mortality including injuries was

1196.6 per 1000

29.18 " " being invalided

In the Army.

1036

37.3 " " being invalided

In 1883.

The average strength of the force afloat was +3,350

Cases of disease and injury 1091 per 1000

to deaths from all causes 5.88 " "

Invaliding 38.75. " "

Subducting deaths from injury &

accidents leaves rate from disease 4.06 " " from force afloat at home and abroad. varying from

.94 on the Australian Station to 6.77 on China, West &

East Indian stations.

While among the Royal Marines at head quarters:

Disease and injury at the rate of 1.48 per 1000.

Deaths 5.68 " "

Invaliding 66.05.

Mean daily sick. 63.50 as against 24.24 the

lowest ratio afloat (on the S.E. coast of America, & 57.28, the highest on China Station,

If the deaths by violence in each case be deducted we have

Mortality of Marines 5.32.

Against 4.14 in service afloat.

which reports favorably for the better health of those afloat especially when we consider how in the latter case much of the sickness and mortality arises from their location in very unhealthy stations.

In regard to Phthisis

In 1830-36. the death rate was 7.2 per 1000 of the deaths, and 1.7 per 1000 of the force. while <sup>among</sup> the English land population the rate was 3 per 1000.

In 1874 of the total cases of sickness phthisis was the cause in 4.1 per 1000 or 3.4 per 1000 of actual strength.

In England the mortality from Phthisis has been steadily decreasing since 1859. The rate in 1838-41 was 172 in every 1000 deaths from all

causes, in 5858-59 it was only 11.3%. But in contrasting the deaths from phthisis at sea and on land we have to consider, if we would get any idea of the proportion, the age at which sailors go to sea.

On land infant mortality at that time would constitute 50% of the deaths, and if we consider the mortality between the ages of 15 and 49 years we find that the death rate at similar ages is 16 times as great as at sea.

M. Jules Richard in a prize essay on 'The influence of sea voyages and of hot climates on the progress of Pulmonary Consumption' published in 1858. declares that they exert an unfavorable influence on the progress of the disease. The progress he says is often accelerated; the disease is more common among the sea than the land crew, & that among all engaged in the service, officers and men, consumption is of equal intensity in port hospitals, squadrons, & at the different stations; that with rare exceptions its progress on board ship is much more rapid than on shore; that it can only do good where you can choose your locality & that no one with a phthisical tendency should enter the navy.

But the tendency of opinion is that however injurious the effect of sea life on the sailor, phthisis is not a disease to which he is prone. M. Garnier showed that in the seamen's hospitals of France the deaths for a number of years were 9.4 per cent of the total, while in the places where the hospitals were situated the proportion among the population was over 20 per cent of the total deaths. Very good evidence of itself of the comparative freedom from phthisis of the sailor.

During the whole of the time I have been at sea only one case of Phthisis in a sailor has come under my notice. It was of a most consumptive family, all but one of his brothers & sisters being all having died of that disease in youth, or when entering on

manhood or womanhood.

Two years previously he had been shipwrecked and endured great hardships, from the effects of which he very slowly recovered, and shortly afterwards he had hæmoptysis.

When he came under my care he had just come off the Indian to the Atlantic route at the beginning of summer, and was employed at light work as main deckman.

Dulness was perceptible at the apices of both lungs, specially of the right, he had slight cough and expectoration. Had been losing flesh, during the last three months, and there was slight fever.

Under the bracing influence of the Atlantic breezes he became much stronger, his fever left him and he recovered lost weight. In the Autumn, under my advice he exchanged into the New Zealand trade and last time he wrote me, four months ago, he was continuing well. This was a case which would not have been generally considered a favorable one to send to sea; the previous hæmoptysis; the presence of disease in both lungs; and the fever; being contra indications but had he stayed on shore the probabilities are that the disease would soon have made rapid progress.

If we have been unable to show that life as lived by the sailor is on the whole a healthy one, we have also seen what are the main causes in bringing about a negative result and go on next to enquire.

(3) What then are the advantages of sea voyages. What are the peculiar conditions which render the ocean of value as a health resort.

There is

(1) Change of scene and enforced rest.

Everything in the life is new; the cooking, sleeping, accommodation; the society; the interests and occupations. There is necessarily less facilities for tiring oneself out, and so strength is conserved.

There is also rest of mind. The business man is away from all letters, telegrams and newspapers and if he is a sensible man will give no thought to the things he has left behind, but look on his present position as a sure means of restoring him to health and activity again, and realize that though valuable time is passing in seeming idleness, he is sowing seed which will bring forth the fullest of harvest; is making an investment which will bring him in the highest of returns - a sound mind in a sound body.

Setting out with that idea, the more one becomes imbued with it, the more hope is there of ultimate good and improvement.

The regularity of the habits also, the rising, taking meals, and retiring at night, has also some effect.

(2) The Air.

On deck we have seen he breaths the purest of air - none so pure, unless that at the tops of mountains thousands of feet high.

The relatively large amount of moisture and the high barometric pressure combined with its equality gives it a relaxing or sedative effect.



Evaporation from the skin in such an atmosphere would be less than in a dry, the secretions would become more fluid and expectoration more easily got up.

The capability allows the invalid getting more into the open air without risk of catching cold, or suffering from exposure to the sun to the same extent as in similar latitudes on shore.

The general unwholesomeness of the berths, and the closeness of the saloons, may be in one sense a benefit, as no one will stay below longer than he can help, and is thus forced to be on deck during the greater part of the day.

There always seems to be more sun at sea and when it shines it does so so much clearer than on land.

There is the tonic effect of the sea breezes, the hardening and bracing effect of which is a most important element.

No one who has faced a breeze on the deck of ship or steamer could fail to realize its invigorating effect. While the moist air, increased barometric pressure and equable temperature have all a combined sedative effect, and when combined with a high temperature produce lassitude; the sea breeze tones up the system. This effect is produced by increasing the evaporation from the body, and cooling the body also by the direct abstraction of heat. The reflex action causes a greater production of body heat, a greater combustion in the tissues. Playing on the head and surface of the body it also gives a tone to the nervous system, by stimulating the peripheral nerves.

So that we have the two effects, sedative and tonic, at once, of great importance in the treatment of Consumption. The cough is lessened, the expectoration becomes more fluid, the nervous system is stimulated, the circulation is increased, the red corpuscles are multiplied. Appetite, digestion

"Messrs Malassery & Picard find the red corpuscles to be increased 5% by residence at the seashore."

and assimilation are improved and the patient gains in body weight & in spirits

4) The motion of the ship

must have some influence. That it has an influence on the peristaltic action of the intestines is well known, constipation being almost general at sea, irrespective of diet. One of the most important elements is

5) The Constant Change of Climate.

During the voyage to Australia or New Zealand for instance through what a variety of climates the patient passes. The wind varying from dead calm, to the strong breeze or gale. Now chilly, again warm. The moisture and the temperature ever varying. All have their effect and the embolic effect is hardening.

Becoming accustomed to continual changes, he becomes more able to resist them, and it is due to this effect that the Consumptive is ever able again to return to his home without the risk of breaking down.

(H) What are the ailments and diseases met with at sea. A resume of over two years practice.

By far the commonest trouble met with an almost invariable one, is Constipation. This is met with independent of diet and among people who have never suffered from it previously.

In the first few days of sea sickness when next to nothing is eaten and everything vomited, it is not to be wondered at, but all through the voyage it is the same.

In character it is very obstinate, often resisting ordinary treatment. Cases in which it has been so prolonged as to give rise to anxiety must have come under the notice of every ship surgeon.

The first time my attention was seriously drawn to it was in the case of a young lady on a passage out to Calcutta. When called to see her it was found that for 19 days she had had no evacuation of her bowels, and as we were then in the Red sea in a tolerable heat, it was beginning to affect her. Previous to calling on me she had had from the stewardess over a dozen Blue & Stoe pills, and an unknown quantity of Friar salt & Sudley Powders.

A large enema was at once administered but without the slightest effect. Fifteen grains of Calomel with Jalap & Ginger only gripped and sickened her; and Castor & Briton oil had no better result.

To complicate matters menstruation two weeks delayed now came on. Her Ayah, a bon shampooer, then under my direction treaded the abdomen well, and having obtained permission, the lower part of the bowel filled with hardened feces was scraped out with the finger and a spoon; and on the injection of another copious enema, an evacuation resulted on the evening of the 30th day. Her case had assumed all the features of obstruction and vomiting had begun ere the last method was permitted.

To cross the Atlantic (10 or 11 days) without a warning of frequent occurrence, and in longer voyages I have often seen 14, & sometimes 16 days, elapse.

Diarrhea.

Is also very common specially among firemen. It is often due to drinking too much cold, specially ice water, when warm & sweating. Fresh meat may get a little tainted, or even at times a copper pot over clean may cause it. Water from a dirty copper nearly poisoned an officer and myself last Autumn.

As a rule the Diarrhea is not obstinate. Cramps & Diarrhea are common on Thursday & Sunday nights on Steamers, all hands & Passengers having served out to them on these days what is known as Plum Pudding.

Disorders of Digestion.

Many times arising from the Constipation are also very frequent.

People tend to eat too much at sea and take too little exercise to work it off. Among sailors, firemen, cooks and stewards it is not alone owing to the food they eat, but often to the drinks they indulge in when ashore.

Rheumatic Affections

Of Rheumatic Fever I have only had three cases.

The first was the Chief Officer of another Steamer, whom we picked up at Gibraltar. He had then been ill for a week and under <sup>the</sup> treatment of a Spanish physician at Valencia previous to being removed to Gibraltar. When he came on board, ankles, knees & wrists were much swollen & he had great pain in his hips. Temperature was 103°, pulse 104. He was at once put on Salicylate of Soda which did not seem to have its usual effect, so blistering as recommended by Dr. Lushman was tried, with excellent results. As soon as the small blisters rose, the pain left the joints, and though for a time

It flew from one joint to another, still in a course of days his condition was very much relieved. The passage through the Bay of Biscay was stormy, and we knocked about a good deal.

The month was January and when we reached London - a 7 day run - there were several degrees of frost. While lying in London there were not the same facilities for heating the cabin, which got very cold at night. Still he had no relapse and when Glasgow was reached, 14 days from Gibraltar, ~~he~~ was able to walk ashore to a cab, and made a good recovery after getting home.

Very other cases occurred: one in the Indian Trade, the other in the Atlantic. The first a Lascar took ill soon after leaving the Channel, but recovered quickly under the Salicylic treatment, after getting into more genial weather. The second a sailor who had had several previous attacks, the last of which had debilitated him in hospital for 8 weeks. In his case blistering was also tried with good results, both in relieving the pain and diminishing the fever; and he was able to go ashore 16 days after the commencement of his illness though he was treated in the month of December.

These cases were interesting to me as showing that Rheumatism is not more difficult to treat at sea than on shore, though the means of treatment in the one case are so much more limited than in the other. At sea one has, both as regards variety, only a very limited supply of drugs at command and the best has to be made of them. If serious cases fall on ones hand at the tail end of a long voyage, the choice of remedies may be much smaller, and therefore a form of treatment such as blistering, so easily done by the Pic Spaspartum becomes of value, the more so when its effects are good, and its application attended with no inconvenience to the patient. The pain in the joints is so severe that that of the blister is never felt; and the

addition of Camphor seems to take away the risk of strangury. Rheumatic affections are by no means so common at sea as would be expected. Passengers as well as sailors often get damp with rain, spray, or even fog; are often sitting where the wind is blowing on some part of the body more than another; and with boots carelessly left open, beds and rooms are apt to be saturated with water in bad weather; still Rheumatism is not common and while we no doubt come across muscular Rheumatism occasionally it is not such a trouble as always figures in our reports even in winter time.

From too free eating and too little exercise uric acid is very commonly seen in excess in the urine, and when in excess in the blood gives rise to pains in the muscles or around the joints which might be mistaken for rheumatic. Another cause of pains in sailors, setting aside gonorrhoeal Rheumatism of which I have only seen one case, is Syphilis which also must not be confused with Rheumatism.

of Trumbags. I have met with 2 cases.

One an old gentleman of 80 years of age; the other an Irish gentleman but while severe enough while it lasted both said it was not so severe and of shorter duration than previous attacks. Now on the other hand who were habitually attacked in damp weather on shore have been afraid of it coming on, but escaped during bad weather at sea. The one case occurred going to, the other returning from America.

Stratgia

2 cases one already noted in the treatment of sea sickness by emmata of morphia.

The other an old gentleman of 60 who had been under treatment in Caran for three months previous to coming on board, getting hypodermic injections of morphia twice daily.

The first two nights the Uentphia (concerned with Anopia) brought on such severe vomiting that it had to be discontinued, and small blisters were tried with success, bromide of sodium being given at night to let him sleep.

He was able to sit up on the 7th day and walked ashore unassisted in New York on the ninth, free of pain. The temperature was much higher and the air drier than that he had left in Ireland.

### Chronic Rheumatism

One case. A lady going out to India who had suffered for years. The disease, complicated with heart affection, had reduced her considerably and she did not seem a fit subject for undertaking a long sea voyage to a hot country; but as soon as we were into the Mediterranean she improved daily and was much better than she had been for years when she landed in Bombay 30 days after leaving home. She intended coming home again when the hot weather set in.

### Contagious Diseases.

On board steamers where a large number of emigrants are carried as well as on emigrant ships, what are known as "hospitals" are provided in accordance with the requirements of the Passenger Act; which are placed at the disposal of the Surgeon in case of sickness; when not required they are to be, or at any rate are used, as the Captain sees fit.

On the Transatlantic Steamer, on which I have served as Medical officer for the last 18 months, there are two hospitals on the deck, forward at the bow, under what is known as the forecabin heads; and three others in different staterooms.

The deck hospitals are supposed to be specially reserved



244

for any infectious cases which may occur during the voyage, and contain one, 4 beds; the other, two.

One is next door to the male W.C., a separate closet, the waste pipe from which runs under the hospital floor.

The only ventilation when the port is closed, and from their situation if there are any sprays flying the ports must be closed, is by an aperture in the door which is further closed by an iron blind.



To make matters worse, the whole of the space forward here, being covered over by the deck is itself always close, and contains besides the hospital, on the same side the male W.C., & the lamp room; on the opposite side, the W.C.s for the crew, & 2<sup>nd</sup> Cabin passengers; the entrances to the seamen's & firemen's quarters; the paint room, and several stores; while the space between is filled with old ropes, sails, and other stores; besides being used as the Carpenter's workshop. So that when the port is closed the ventilation in the hospital is almost nil or worse.

What then would be the consequence if such a serious disease as Typhus fever or Smallpox should break out in bad weather!

The poison exhaled from lungs and skin, becoming concentrated, must act most powerfully both in keeping up the disease in the individual, & on any one who has to come in contact with the patient. Placed where they are, any infection has the best chance of spreading through the whole length and breadth of the ship, and setting up a general epidemic.

It is a well known fact that the less fresh air is allowed around a fever patient, the more dangerous for the patient, and the more the contagium multiplies; and here at sea, in the midst of

the purest air, where such a thing should be impossible, the germ finds, so to speak, its happiest hunting ground.

If ventilation were impossible there might be some remedy, but the problem of how to let in air without water, has been solved, by drawing off the foul air, which makes the ingress of fresh air a necessity.

The other hospitals are simply rooms boarded off from the general storerooms, & ventilated from them by communicating at the top.

Turning again to the Navy report for 1883 we find a striking example of the effect of bad ventilation in ships, on the progress & spread of infectious diseases.

On the China station there was an outbreak of Continued Fever of which there were 307 cases. These occurred chiefly among the relief crews of the "Curaçoa" & "Victor Dumas" while being conveyed from India to China in the "Shalia" and appear to have been due to overcrowding, defective sanitation in the shape of foul bilges and a want of due attention to cleanliness.

The connection between the disease and defective ventilation being supported by the fact, that 217 men on the lower deck furnished 61 cases, while 215 men on the main deck, with free supply of air, furnished only 28 cases: At Hong Kong the ventilation was improved and on a return voyage with a reduced number of men there was no prevalence of disease in the ship.

On the other hand the report for 1884 shows the value of proper attention to ventilation and means of isolation. On the home station 34 cases of measles are returned, of which 23 occurred in the training ships, generally in boys returning from leave; or contracted in the ports where the ships are stationed. There was nothing in the form of

an epidemic, the cases having been at once isolated, and effectual precautions taken against infection."

In like manner with scarlet fever of which 20 cases occurred, "each case appears to have been contracted singly during absence from the ship, and no secondary infection on board took place.

There were 29 cases and 8 deaths of enteric fever recorded; no case "could be ascribed" to defective sanitation on board ship; nor was there any spread of the disease on board from secondary infection. The infectious diseases which have occurred on board under my care are

1) Measles. The first case was in an Indian voyage, when 10 days from port one child sickened followed next day by another of the same family. It was not clear where the infection had been contracted unless in the train coming from London.

Neither case was very bad or complicated. We were in hot weather all the time but that did not seem to have a bad effect. The slight bronchitis soon passed away and they made a good recovery.

The cabin in which they were sleeping was thoroughly disinfected and the whole of the cabins painted out.

Two days after getting into port, first the 3<sup>rd</sup> officer, and then a Steward took ill & were sent to Hospital.

Since then, cases have occurred to different times, but only on one occasion has the disease spread among any of the other passengers and in that one case it is doubtful if infection had not occurred before coming on board.

In April of this year, on the night of sailing from New York, I was called in to see the maid of a saloon passenger an Irish woman of 36 whom I found covered with the rash and suffering much from bronchitis. The bronchitis was so bad that she could not be moved

forward to the Hospital so she was placed in a room at the stern, which was kept disinfected. Her case went on favorably, and she was able to go ashore at Mobile on the 10<sup>th</sup> day, on a raw spring morning. She had no relapse and was at her work a few days after she got home.

On the 6<sup>th</sup> day after leaving New York the little girl, 3 years old, of which this woman had had charge, sickened, and on the 9<sup>th</sup> day the rash appeared. At 3 o'clock the following morning she was put ashore with the others at Mobile, and passed through a severe attack afterwards at home. There were 36 other passengers in the Saloon with all of whom I have communicated since but none of them have suffered from the disease.

### 2. Scarlet Fever

One case. Made a good recovery, without complications.

### III. Whooping Cough.

Of this trouble there have been during the past 18 months no less than 22 cases. At one time, late last Autumn, there were no less than 10 on board at once all from the same part of the County and belonging to 4 families, one of the cases being the mother.

These cases we separate as well as we can, and I have never seen or heard afterwards of it spreading. The staterooms are not such times disinfected every morning by Jeyes powder - a carbolic acid mixture, which keeps down infection.

Generally in a few days the attacks become less frequent & in 16 of the cases the 10 days run and advent into the warmer temperature completely cured them.

Last voyage (September) there were two cases crossing from America one of whom on the 7<sup>th</sup> day was entirely free, the other on land day had only an attack occasionally of much less severity than

those she had when coming on board at first. These two children had been ill all summer.

All the other cases were greatly benefited though coughing occasionally.

### Dysphoid Fever.

2 cases. Both occurred in Indian Voyages.

One - a purser - took ill in the Red sea in the month of July.

The temperature then was very high and for the first few days he suffered greatly from the heat. His own temperature - of which I quite the record was marked by great irregularity. The diarrhoea was very profuse and a good deal of hæmorrhage with it occasionally.

There was slight Bronchitis. Large doses of Quinine were given as he had before suffered from Malaria. For days he lay delirious but after the 16<sup>th</sup> day he began to improve. From Port Said we ran to Marseilles where we lay for 6 days and from there came round to Glasgow which we reached 10 days afterwards 26 days after he took ill. Improvement which began as soon as we left Marseilles advanced rapidly after passing Gibraltar, and on our arrival at Glasgow much against my advice, took on himself all the work of paying off the ship. Still he had no relapse.

The other was in the case of a sailor who took ill on the way home from Bombay, 6 days after leaving port. This was a mild attack and ran an ordinary course without any complication.

In these cases one feels the limited resources for treatment at sea, in the way of diet more particularly. On shore we depend almost entirely on fresh milk - such a thing is not to be had at sea. We had fortunately a good supply of Condensed Milk which was made down very weak, but even then in the pursers case seemed to do harm till it was given peptonised.

Meat juice prepared by the lemon squeezer - an excellent method of extracting all the juice - is very valuable. The meat is first broiled & then put into the squeezer, all the juice is pressed out, & a little salt added. Chicken Jelly can be made and, if much diarrhea, isinglass added to it.

### Cholera.

Two cases occurred on board, and one even treated there, but as both occurred in harbours they do not come under the head of cases treated at sea.

The first an apprentice, after being ashore in Calcutta & drinking some native lemonade and indulging too freely in fruit was seized with severe cramps, diarrhoea of rice water character and vomiting. He was immediately transferred to the European Hospital where his case was diagnosed as Cholera. He recovered in the Hospital.

All the mats and cloths in his room were steeped in Carbolic lotion and burned, & the whole of the room scrubbed out with Carbolic lotion and painted. There was no further outbreak. The second case occurred in Bombay in the case of the Captain, who was seized in a similar way one night, but could give no reason for the attack unless that he had drunk some water ashore. Dr Sidney Smith was at once sent for, and the case developed into a regular typical one, from which after a tedious convalescence recovery eventually took place. In this case was seen the value of the sea air in the treatment of convalescence - as soon as we were two days out from port he improved wonderfully, every day showing a marked advance on the one previous.

Turning once more to the Navy report for 1884 we find that 5 cases of Cholera occurred; believed like the enteric fever cases, to have been the result of drinking lemonade. "The exceedingly dangerous character of the aerated waters of China & Japan ought to be constantly kept in view on the station, and their consumption prevented as much as possible, and the same may be said for native made waters in India. The idea of the native is that any kind of water may be used either in the manufacture of drinks, or for diluting milk, and there is always more or less diarrhea in part from that cause.

6. Cholerae Diarrhea,

Specially occurring among the black foremen in hot weather, numerous cases are recorded in my journals. Some of the cases were very severe and seemed as if they would prove fatal, but somehow just as all hope was about lost, they began to rally.

These men, both lascars & firemen are accustomed to a diet which tends to Constipation consisting mainly of rice, dahl, and curry of dried fish. Preserved meats they dare not touch and only such fresh meat as has been killed by one of their own crew.

As a rule, a small Indian sheep of about the same weight and with about as much flesh on it as a half grown goat is killed one or in rare cases twice a week and distributed among 100 or more men. They are also forbidden the use of alcohol.

It is probably on this account that their sicknesses with prostration are so easily treated; they yield so readily to stimulation, either by concentrated foods, or alcohol, that their strength can be kept up when the otherwise strong full blooded man would succumb.

A peculiarity of these black seamen is their endurance of pain. This I have noticed repeatedly and among all my operations have always found them bear the severest pain such as opening these abscesses



or amputating fingers, without Chloroform, without flinching

It has been remarked by some one that a people reared on a farinaceous diet as the scotch on oatmeal, bear pain better than a race with whom animal food forms the staple article of diet and in the case of the bascar we have corroborative evidence of that theory.

Dysentery.

Another disease of hot countries has fallen under my notice on 8 occasions: 7 on Indian on on the Atlantic voyage.

Two cases of chronic disease had resisted all treatment on shore but in both cases improvement set in about the same time: the middle of the red sea and both landed in England well. One was a missionary the other a district magistrate.

The other 6 all yielded to large doses of Ipecacuan, and were all caused by too free indulgence in fruit, or drinking liquors on shore at ports we had called at. The case on the Atlantic came on the day we left New York, in July of this year, when the disease was very prevalent in the Eastern States, members of this same man's family having already suffered from it when he left.

Erysipelas.

3 Cases. (1) A lady who had been laid up for some time with Erysipelas in the leg, which was not better when she came on board. She 10 days passed without much improvement, but she was only a few days ashore when it disappeared. The change from America to the old country had probably much to do with the good result.

(2) The husband of the latter who was in the same cabin brushed his leg slightly by coming in contact with a boy and next day an erysipelatois blush appeared around the bruise, with a tendency

is spread up the leg, and attended with pain and heat. His temperature rose above  $100^{\circ}$  & his pulse to 96. Under treatment his symptoms disappeared and he went ashore apparently well.

However two weeks afterwards he again bruised the same spot in a similar way, erysipelas set in, and he died in 10 days.

His widow returned with us & had not then, nor has she since during 12 months had an attack, the first time for years that more than 2 or 3 months have passed without one. Her health is greatly improved and from being almost a constant invalid she is now able to take her place as the active head of her family. Much of her improvement she ascribes to the influence of the voyage back & forward.

(3). The other case occurred in my own person & was treated by a Glasgow physician who was a passenger at the time. Starting over the thumb it spread rapidly up the whole length of the arm when became red, swollen & painful. At the end of 6 days it began to subside the fever diminished and a few days at home made matters all right again.

### Cellulitis and Thecal Abscess

are not uncommon specially among black seamen and firemen. During this summer alone on the Atlantic I have opened 12 abscesses. 5 Thecal; 3 on the forearm over the radius; 1 in an unhealthy boy under the mamma, right side; one behind the scrotum; one the result of a hair being pulled out at the side of the scrotum.

## Diseases of the Skin

But largely among the cases in sea practice.

Exposure to the sun at sea causes redness of the skin, in some cases considerable swelling; sometimes the eyelids become so much swollen that they cannot be opened. The skin at other times becomes blistered more or less severely and peels off in patches, and sometimes the blisters fill up with pus, the face assuming a serious aspect.

In hot weather, as might be expected eruptions from the excessive perspiration, are common. Of these the commonest and most troublesome is prickly heat (*E. Solare. Hebra*) which gives rise in children as well as adults to great suffering and discomfort at times. ~~at times~~ It may be more or less severe, sometimes covering the whole body from the brow to the feet. One poor man landed in New York in July on whose skin it would have been difficult to find as much skin free from the rash as lay the point of the finger on.

Acne. also is common.

Acne is supposed by some to be caused mechanically by the closure of the ducts of the sebaceous glands by the carbon and dust in the air of cities, certainly such is not the cause here, and more particularly at the beginning of a voyage a good deal of it is seen. I have not had a bad case come on board during any of the long voyages but have seen several on the Atlantic and of six very carefully observed cases, 4 got decidedly worse by the end of the first week, the other two did not seem to be affected one way or another. It may be mentioned that these 4 occurring in the early months of Summer were steerage passengers occupying specially opened staterooms near the boilers where the temperature was never under 70° & generally above 80° causing very free perspiration.

The others were (1) a saloon female passenger (2) An officers boy.

Impetigo. 2 cases only.

One was greatly benefited by the passage, in the other case the disease only developed during the passage.

Boils.

Are not uncommon and generally severe.

Several cases have occurred in saloon passengers on both American and Indian Routes. Appearing generally some time after we have been to sea, and most probably due in great part to overfeeding, over-  
and a want of exercise combined with constipation.

When they appear they are very troublesome and have tended in several instances to take on a Carbuncular form.

Carbolic acid pure or with equal parts of glycerine has been the only treatment successful in my hands.

wa - Nettlerash.

is another troublesome affection to treat, and when shall form part of the bill of fare so often, it is not wonderful that it is frequently seen.

In one case the sea itself seemed to be the cause. In the case of a young man who came as interpreter. We were only 24 hours out at sea when he came for treatment. He had had an attack once previously when crossing from Lark to Kaulough. Under treatment it seemed to disappear but as soon as the medicine was stopped it came back again. While in New York he was free but as soon as we got to sea again it reappeared. At the end of the voyage he was transferred to another steamer & I lost sight of him. It would have been interesting to watch the case and see whether after becoming accustomed to sea life, he

would have got rid of it.

## Eczema

As is well known sea air has as a rule a very harmful effect in this disease.

D. S. Gascoine. Surg Brit Hospital for Skin, London. on an article on "The effect of the Atmosphere in skin disease" (Med Times June 1873). after mentioning that there is a predisposition causing no doubt from experience among the profession in London against sending patients to the sea side when suffering from Eczema or other skin complaints. gives cases in which the sea side always brought on Eczema and also cases where it only went away at the sea side.

One of them a teacher after one day at the sea side, suffered from E. Capitis with copious flori + fungic effects which kept him an invalid for months afterwards.

Professor McCall Anderson (Lancet March 19, 1870 page 401 & also in "Diseases of the skin") says that sea air and sea water are very apt to prove prejudicial in the subjects of skin affections, with the exception perhaps of those laboring under strumous disease. And in his text book on diseases of the skin, bears testimony to the injurious effect of sea air in Eczema.

The writer on Sea voyages in Quain's Dictionary gives his experience of five, out of 6 cases, in which the disease got worse. My own experience of 2 cases, mostly occurring in children (E. Capitis) has been, that with one exception, the disease got worse. The exception being in a case of chronic Eczema of the hand which seemed to improve on the voyage.

In one case, seen afterwards by Prof McCall Anderson, the patient, a lady, by profession a painter on China, had suffered for

some time from *Scabies* on the back of the hands and wrists. A few days after leaving New York, small spots began to come out on the face and when we reached Glasgow her face was well covered. Under treatment in Glasgow she improved greatly and when 3 months afterwards she came back with us the disease was almost gone. But a few days after getting to sea it broke out afresh as bad as ever, in spite of the fact that she kept below the whole time ~~her~~ face being constantly smeared with the ointment (Lanolin pur). On resuming treatment on reaching home she again improved and this time rapidly her general health being greatly better for her trip. In her case there was a decided stromous element. Another case was that of an apprentice on the Indian Voyagers.

His mother said that when a child he had *Scabies Capitis* but had always been free of any skin eruption since.

A week after leaving Liverpool, when nearing Gibraltar, he first consulted me for a papular rash behind his right ear which soon spread over the side of his face, assuming all the characters of *Scabies* with profuse discharge. Treatment had little effect on it and his whole face became covered. The voyage lasted three months out and home, and at its termination I had to advise him to leave the sea, as he only seemed to get worse.

Chilblains are common in winter.

*Scabies*: In India a form of *Scabies* which seems less severe than the ordinary form, in its symptoms, is a common affection among the natives, and is by the native nurses. Next Ayahs communicated to European children. Of this form 4 cases have come under my notice, the itch being in all, confined to the hands.

and while not so easily treated as scabies generally did not show the same tendency to spread, & yielded to the ordinary remedies in time. Their nature and the prevalence of these cases was pointed out to me by Surg Major O'Brien of Delhi who was a passenger at the time. In the Atlantic trade I have only seen ~~two~~ cases but probably many have escaped my notice. These were among German & Polish Jews.

Crab lice.

Occur very often. Which is not wonderful seeing what a large number of passengers we carry, many of whom have come long journeys and slept on many different beds ere coming on board.

They are generally located on the seats of water closets, and spread sometimes through many passengers before it is noticed. Orders are given to wash the seats daily with carbolic fluid, but that is sometimes neglected or such a thing would never occur.

Ringworm. Is a common affection among the Iceland and Norwegian passengers, specially among the children. But is as easily treated at sea as on shore. and in ordinary cases they generally land in New York much better than when they left Glasgow.

Among internal parasitic cases of thread and round worms are frequent, a case of tape worm occurred in one of the butchers.



### Tonsillitis and simple inflammation of the throat.

are common troubles also, some cases occurring every voyage. There is a tendency to supuration, which advances rapidly and on evacuation the invalescence is also as rapid. Simple Catarrhs do not last long. If the tonsillitis is looked to in time it is also easily cut short.

*From* Toothache. Many people suffer, and that not so much in cold as when we get into hot weather. Then the number of teeth extracted is considerable, and at the root is generally found a small bag of pus, which is the cause in most of the cases, so that external applications are worse than useless.

Inflammation of the gums, & a tendency to gumboils occur frequently.

### Diseases of the Nervous System.

On insanity the sea seems to have some effect.

The tendency to Delirium Tremens has been already alluded to but it is also a remarkable fact that when uncomplicated with sea sickness alcohol is well borne.

It is when the man has gone through a course of hard drinking previous to coming on board that Delirium Tremens with suicidal tendencies manifests itself.

Others have found melancholia benefited by sea voyages. On 4 occasions I have seen it develop at sea. One case was a Polish Jew who finally hung himself. For a couple of days he had been dull and desponding, and on the morning on which we hoped to reach port, he got up early, fastened a rope to the bottom of a ventilator put a large firm loop in the other end ~~put~~ his head through, knelt down and leant forward.

At daylight he was noticed, and when I saw him he was in the same position as when he died. He was a man of 5ft 8, and the upper end of the rope was attached 5 1/2 feet from the ground, so that his was a most determined case of suicide.

The other cases were Irish girls, 2 coming to, & one from New York. and in all three assumed a religious form. These cases also have to be watched or they go overboard. They hang over the rail and watch the water rushing past which seems to attract them.

3 cases from other Steamers have been sent back with us and they did not seem to improve any

of Mania. One case of Puerperal mania. A lady had been ill for 6 months and was sent home for treatment from India. All the way she was quiet but full of fancies. The day we landed in London she was able to recognise a friend who had come down to the steamer with a London physician and very soon afterwards regained her reason.

Another case an old gentleman was sent out with us to Port Said to get a steamer there up the Syrian Coast & round the Mediterranean, he also seemed to improve, but afterwards got worse.

One case in a man on the Atlantic seemed to improve, but we had to keep strict watch on him or he would have gone overboard.

Epilepsy

One case a Steward, improved considerably during 8 months. From taking the seizures at least once a fortnight he had an intermission of two months when he left.

But it is very common for epileptics to have a seizure during the first 3 days on board, being produced probably by the extra excitement they have had before leaving home, and the change in diet & whole

mode of life.

One man had a seizure during the excitement caused by a man jumping overboard. Seizures occurred in New York on the dock on a hot morning; one case a young lad of 20 years of age gave the history of his illness: he had walked from one town to another a distance of 30 miles in one day under a broiling sun with no protection for his head, but a foretast cap. When near the end of his journey he was seized with an Epileptic fit and lay unconscious for two hours. After that time he took them frequently during the next 3 months, but had been free for over a month when he came on board. The first night out he had a seizure followed by another the following day and one two days after. He had never had so many in such a short time before. For the remainder of the voyage (10 days) he was well. The lad was in this case addicted to self abuse.

An elderly lady of 55 years, crossing outwards in July last, had two seizures; the first on the night of leaving, the second the third day out. She had only had three previous attacks the first 18 months before, and over six months had elapsed since her last.

A girl 16 years of age on the homeward voyage of June had a seizure the night after leaving New York which was followed by numerous seizures daily. The second day she had a number in succession, one after the other, and at that time and twice afterwards Chloroform had to be administered. Her first attack took place in February last after a fright from attempted outrage which formed the basis of a criminal trial in Derry early in the year, and she had been free till April when she was sent out on an Allan liner to an Uncle in Philadelphia, and then as on her homeward voyage she had been very ill. She was never seasick.

either time:

In Philadelphia the heat was too great for her and as the fits were getting more severe and her health suffering she was sent home again. Since her return to Perry her health has been greatly improved, and as far as she knows, when last I heard from her, has only had one fit since.

Epileptics must be careful in the tropics.

### Asthenia.

Several cases have seemed to get worse at sea. Probably the fear which takes possession of timid people when any sea gets up, or extra noise is heard during the night, is the cause. Hysterical fits are very common in bad weather when there are many passengers.

### Sleeplessness. Insomnia Nervous Irritability.

Most people after becoming accustomed to the motion and the noise enjoy a good sleep at sea, although they may not do any work, nor even take any exercise during the day. But on the other hand cases are not rare of people losing their sound sleep at sea without any apparent cause. It is the same with residences at the sea side, some people never sleep so well, others cannot sleep, and it is not necessarily the nervous who do not sleep.

Sea life is generally supposed to have a soothing effect on the nervous system and a man whose brain is overworked or worried by troubles often derives benefit from it; but that he do so he must find pleasure in his surroundings and in the society of his fellow passengers, as well as have no fears for his personal safety.

As a proof of the soothing or blunting effect on the brain of sea life it may be mentioned that it is one of the hardest things possible to settle down to study regularly at sea. It requires some very strong inducement to do so, and even then it is felt that mental work is

only forced, and the result must necessarily follow that it is of a poor order. It has been truly remarked that very few brilliant ideas have had their birth on the ocean, and students of all professions bear testimony to the blunting effect of sea life on their mental powers.

Of insomnia and mental irritability 3 cases have come under my care.

- (1) An American lady.
- (2) A Professor of Columbia College.
- (3) A Student of Glasgow University.

Grief was the cause in the first, over study & worry in the second. All had been suffering for some time, and in each case their sufferings were intensified on board. In the case of the professor every noise jurred on him and he had no rest by day or night.

In each case any sleep obtained was by means of Hyoscyamus & Camphor India. The two Americans landed here in a worse state than when they left home. Each went to a quiet spot on the Clyde, the lady to Arran, the professor to the Kyle of Bute. The first returned after being ashore 9 days, was as bad as ever on the way home, but was not a week in America ere she felt the benefit of the change, & 3 months afterwards wrote to tell me that for years she had not felt so well, that the nervousness had left her & she could sleep as well as ever she did.

The Professor remained in this country a few weeks & on his return was able to resume his work and studies - cured.

The 3rd case also seemed the worse of his voyage, but 3 months stay in the states & Canada in early summer, set him all right again. With these cases before me I can scarcely recommend long sea voyages for insomnia, specially on a steamer. The sufferings of these people specially the Professor were extreme. The throbbing of the eardrums, the talking

of the passengers, & the noise of the steamer all operate upon them and add to their discomfort.

## Sunstroke and Heat Apoplexy.

due to the direct rays of the sun, ~~are~~ more liable to occur on land than at sea, and are more seen of course in the Indian than Atlantic voyages.

My first experience of it, was in the Mediterranean nearing Port Said. The whole ship being covered with awnings renders less liable to occur. This case occurred from the effects of exposure during boat muster in an officer who had his head very insufficiently protected by an ordinary uniform cap. The attack was slight and passed off in a few days.

Coming up the Red sea in the month of June no less than three men died from the effects of heat.

One was a saloon passenger, a thick necked plethoric gentleman with enlarged liver and spleen and all the ills entailed on hard drinking in India, homeward bound.

The temperature ranged from  $84^{\circ}$ - $92^{\circ}$  all the way up the Red Sea, but even a less temperature has seemed as great in other parts of the world. On the day in question it did not rise above  $90^{\circ}$ . The gentleman was sitting reading on the poop under the chloride awning when he was seen to drop his book & fall off his seat, and when called to see him he was dead.

Next day a Steward was carrying a case of empty bottles forward from the saloon, and when passing from the deck into the alley way his head was subjected for what could only be one or two seconds at most to the direct rays of the sun. He lifted his foot to step over into the passage and fell back insensible. He only breathed for a few minutes during which time Quinine was injected hypodermically.



The heat in the stokehole was between  $120^{\circ}$  +  $130^{\circ}$  all that time and several of the firemen dropped at their work, were carried on deck and water dashed over them. These men were after carried up, quite exhausted, with the sweat pouring off them, and with all the appearance of a drowned rat laid out on one of the hatches, where a few buckets of cold water, if water at  $70^{\circ}$  to  $80^{\circ}$  can be called cold, was thrown over them and Lunine administered; which treatment seemed to answer well.

One fireman was too far gone, and evidently died of heat apoplexy. He had suffered some time before from palpitation - so his mate said - and most probably a heart affection had some share in the fatal result.

In the Atlantic during the excessive heat of this past summer we have had several cases of slight sunstroke, with sickness, fever & severe headache, and tendency to drowsiness. One man dropped dead the day after landing who had suffered slightly on the way. In the Indian Service, where as already stated the ship is covered with awnings, it is common for passengers to complain of slight symptoms & severe headache even when the heat is not excessive.

The sea is sometimes for days as smooth as glass and forms as good a surface almost for <sup>the</sup> reflexion of the rays, and the glare has much to do with the production of this modified sunstroke. The entrance to the brain through the eye is a comparatively easy one and people are apt to forget that, protecting every part of the head but neglecting the eyes. Preserves should always be worn.

#### Neuralgia.

Irrespective of pain in the nerves arising from causes or disease at the roots of the teeth neuralgia does not occur very often at sea.

One case in which a lady had been laid up for three months, a great part of the time confined to bed and whose body was greatly run down with the long continued pain deserves notice.

The first few days she was very sick, and with the neuralgia combined was very miserable. As the pain seemed to radiate from the teeth, I advised the extraction of one of them but she had had two drawn previously without any relief. At last she consented and on extraction an alveolar abscess was evacuated. Now six months afterwards the same lady is returning with no perfectly well. The influence of the sea seems in the direction of forming pus and from the fact of the pain getting so intense & constant with tenderness on pressing on the tooth I considered that supuration might have formed here.

### Disorders of the Menstrual Function.

The sea has a great effect on menstruation.

#### Ammenorrhoea

is the prevailing disorder in long voyages to the East.

In a paper read before the Obstetrical Society of London on "Midwifery in the East". Dr Jackson gave his experience that after long sea voyages women suffered from Ammenorrhoea and arrived in a plethoric condition. And Dr Sykes Smith, at the same meeting, observed that the common effect of voyages to India, & other long voyages was to produce Ammenorrhoea. That the influence of the sea on menstruation was very marked. That Dysmenorrhoea especially membranous was relieved.

In four cases among passengers to the East I have met with Ammenorrhoea. And 3 stewardesses, who had been in the trade for periods varying from six to 30 months, had suffered from

Ammenorrhoea all the time, and when they changed on to the Atlantic service, were not two months till menstruation was again established. One case a woman of 45, had been on the Atlantic for some <sup>(6)</sup> years; was irregular towards the end of that time, & when she changed into the Indian service the menses ceased altogether. On her return at the beginning of this summer to the Atlantic after 2 years sailing to the East, she had a slight flow during the second voyage and again six weeks afterwards; for the last time.

While Ammenorrhoea prevails on the Eastern voyage, Dysmenorrhoea and Menorrhagia are common in the Atlantic trade.

It is a very common thing for the menses to be hastened by a few days or even weeks.

Several times I have tried to get some idea of the frequency, but obviously that is a matter of no small difficulty, though an intelligent Stewardess can give much assistance.

In May out of 40 women who had come under treatment for one thing and another, women who were neither pregnant nor suckling, it was found that 31 had menstruated, since coming on board. Six of these at their regular time. Three had menstruated last a week before coming on board. One 10 days before. The rest were in advance of their usual time, periods varying from 14 to 2 days. All those six had more profuse discharge than usual.

Two of the others came <sup>to me</sup> on account of Menorrhagia. The worst of the others had an increased flow. Twelve suffered more or less from pain. Again in August out of 57 women in the second cabin. The majority were similarly affected during the first five days out. A Glasgow lady, aged 52, crossed in April of this year, the third day out I was called to attend her for menorrhagia.

Her Statement was interesting as bearing on this point. Having a home on both sides, she had crossed the Atlantic 14 times, and though most regular at other times—unless when pregnant or nursing, she had never known what the slightest irregularity was—even though her regular period might only have passed a few days, or even on one occasion one day previous to coming on board, it was sure to return during the first few days at sea.

She was never sea sick, so that the cause did not lie there. Previous to this occasion she had had a slight haemorrhage 6 months before, and this time it was so profuse as to require active interference.

M. L. Comial (Arch de Med Navale, Nov 1868) observes that the menses are usually hastened by some days, and even weeks, and my own experience goes to show that the majority of women suffer from one or other form of disorder or irregular menstruation at sea, and that it is often independent of sea sickness.

### Abortion

As stated in part 1 of this paper, is apt to occur during sea sickness, and it has been there shown how it can usually be obviated.

M. L. Comial had only 5 cases in 38 crossings, a fortunate experience. A medical friend had as many in one crossing in rough weather. Four Pregnancies terminated in Confinement, 2 at least considered that they were in advance of their time. None of the cases presented any difference from such cases on land.

Of course the means of attending on them is very poor and to deliver with forceps in a rough sea and a low berth is no easy matter, nor devoid of danger. They all recovered without any

Complication, though 2 of them had to be sent ashore - one 14 hours the other 36 hours after delivery.

Venereal Diseases.

Are common among the sailors, but are more seen in long than in short voyages. In the latter we are never long out of port and as they have an idea that they will be dismissed with a bad character or even logged if it is known, they do not come so often for treatment.

In long voyages there are always some cases, and even in the Atlantic, cases frequently crop up, specially among the firemen. Among passengers on both routes several cases of Gonorrhoea have been noticed. In most of the cases the statement was made that the disease had been cured for periods varying from 2-6 weeks before coming on board, and that they had given no occasion for its return. From my experience I should be inclined to think that a Gonorrhoea recently cured has a tendency to return at sea, but on its return it is quite as easily treated as on shore, so long as they keep to a prescribed diet. Probably the nature of the food has a good deal to do with it, so much salt & preserved foods entering into the ordinary diet of the steerage passenger, but several of these cases were saloon passengers where there is an abundant supply of fresh provisions of all descriptions.

There have only been 8 cases (among passengers) which developed for the first time on board, all of which were treated early by injection and did well.

As regards Syphilis

One case of soft chancre with Bubo, in a Russian, proved very troublesome and among the firemen 6 other cases are recorded, all cured at sea.

## Hard Chaulere

One case in an engineer. The chaulere had been present for nearly two years when he first came to me about a fresh Gonorrhoea. Under treatment he got rid of both his troubles before the end of the three months voyage.

## Secondary Symptoms.

I have only been noticed Stripes. One in Indian and twice on the Atlantic Service. All left my care before a cure was effected.

## Tertiary Symptoms

Crop up very often, as might be expected, among the crew.

Two passengers on homeward Indian Voyages seemed to receive much benefit from the voyage.

## Stricture of the Urethra.

In some cases becomes worse at sea, requiring treatment. Men in the habit of having a catheter passed occasionally generally require the operation at sea.

Of Spasmodic Stricture and retention of Urine which are not uncommon in sea sickness mention has been already made. (Part I page 10).

## Diabetes.

One case. A gentleman going out to Egypt to pass the winter.

He was passing large quantities of urine loaded with sugar. When we got into the Mediterranean his sufferings became a good deal alleviated; he perspired very freely, as we neared Port Said, his skin lost its harshness and by the time we got through the Canal to Suez the quantity of urine was sensibly diminished.

Dr. Kirk Murray in an article on the influence of warm climates in the Cure of Diabetes" remarking that in warm climates where the skin is moist and constantly relaxed, the disease is rare, advocates sea voyages to

- to warm countries, and gives cases of patients sent to the West Indies:-
- (1) was very sick, perspired freely with evident diminution in the quantity of the urine, and recovered completely in the warm country.
  - (2) A gentleman aged 25. passed 16-20 pints daily. Under the perspiration induced by the Naurea and sea sickness the urine was diminished to nearly the natural quantity, and 3 months after landing he was nearly recovered.

Vesical Catarrh.

One case coming from India was much benefitted by the voyage.

Gall Stones & Renal Calculus.

We would expect that as a consequence of the disturbance caused by sea-sickness, the passage of Calculi, where they already exist, would be apt to be induced, and three cases of Gall stones & 1 of renal calculus are noted in my journals. Two of the cases had passed Gall stones previously, and one, a lady, had suffered in a similar manner on a previous passage across the Atlantic. The case of Renal Calculus occurred in the case of a gentleman who on two previous occasions had suffered in a similar manner and passed blood and grit in his urine.

Cirrhosis of the Liver & Ascitis.

One case in particular occurred in the Indian Voyages. A gentleman aged 45, proprietor of a hotel in Calcutta had suffered more or less for several years but for the last six months had been under constant medical treatment and was sent home as a last resource. He was carried on board in a helpless condition and it was never thought from the first that he would survive the voyage.

He was tapped 3 times in as many weeks before Suez was reached. Passing up the Red Sea he suffered very much from the heat.



but after Port Said was passed there was considerable improvement observed. The Ascitis did not proceed so rapidly and he did not require tapping during the remaining 16 days.

His appetite improved and he was able to sit up for a little while each day. On landing in England he was able to walk a little way with assistance. Six months afterwards I again saw him, when he was much better. The liver dulness had even increased, and the Ascitis gave him very little trouble. On the voyage home he did not require to be tapped, and was able to attend to his business on reaching Calcutta. The last I heard of him - a few months ago, he was still superintending his business. So certain was everyone, his family included, that he would never survive that his wife had already made arrangements for a successor when his unexpected return threw things into confusion.

Ulcer of the Stomach, with Haematemesis induced by sea-sickness. 2 cases.

One case a young woman had suffered for 12 months from pain after eating and 3 months before had had Haematemesis. When called to see her, the 2<sup>nd</sup> day out from land, she had vomited a great quantity of blood and was very weak.

Medicine and a course of peptonised *Trinemata* were given, and she had no recurrence of the vomiting. On the 3<sup>rd</sup> day afterwards peptonised diet was given by the month and on this she was kept till we landed in New York.

Four months afterwards she crossed again and then told me that the whole time she had been in America she had never suffered from pain or discomfort, and while

careful still of her diet considered that she could digest anything. The bloom of health had taken the place of the former pallor, ~~that~~ flesh had returned to her body, and no one would have known her to be the same person.

The other case was a weakly Anæmic girl of 19 years of age returning from America; who also had suffered for several months, from pain after eating. She was very sea sick and during the retching vomited a quantity of blood nearly filling the small basin. She was treated in a similar manner to the last case but had a recurrence of the hæmæmesis next morning as bad as the first. After this she had no further attacks.

She went ashore at Havre greatly improved, promised to send me word how she was progressing, but seeing she neglected to do so the strong probabilities are that she continued to improve.

In cases, such as Anæmia, which improve so much at sea, and which I always try to keep ~~water~~ of, the people imagine that the Medical treatment which they have received on board has had something to do with the result, and invariably I find that if they are not getting on well on shore they are sure to let me know and <sup>write</sup> asking "if it would be too much to ask for the prescription for that medicine they had on board which did them so much good". Mineral wells can be bottled and sent to the remotest parts of the globe, a sea voyage can only be experienced.

Exposed to so many changes of climate, and forgetting at times to dress accordingly it would be expected that colds would be frequent at sea.

But these very changes of climate help to harden & mire the body against being taken manvares by any sudden change in temperature or in the wind. There is something in the sea climate which makes even the ordinary passenger not so liable to "catch cold". An instance of common occurrence will illustrate this.

On our last outward trip, the day of embarkation was a wet & stormy one, and over 700 stowage and second cabin passengers travelled from Glasgow to the Tail of the Bank on a tender which was only partly covered over, that part being specially reserved for second cabin passengers. The majority of the passengers, men, women & children of all ages came on board drenched, few of them changed their clothes, and not only were they themselves wet, but their beds which they have to provide were likewise saturated.

On these beds, in an unheated stowage, with in many cases very insufficient covering, they had to lie for the night, and what was the result? One case of chill in a woman, and the aggravation of a previous cold in a child.

On the other hand many persons coming on board suffering from catarrhs receive benefit from the voyage, beginning to improve after we are a few days at sea.

Many sailors and officers suffer from Catarrh on waking land, which they cannot get rid of the whole time they are on shore, but the discomfort ceases as soon as they are clear of the land again. My personal experience for some time was that every time we got home I suffered from Coryza which went away

### Pneumonia.

One case in the Indian Service - a steward coming home had been sleeping with his port hole open, after sweating heavily; the night came down chilly and next day he was feverish. At Liverpool 10 days afterwards he was put ashore and sent to hospital where he lay for 3 weeks.

### Plurisy

2 cases. Both in mid-ocean. Both limited; and yielded to treatment.

Phthisis cases will be analyzed under the next section.

as soon as we were right out to sea again.

The time that colds are most frequent on the Atlantic is in the later months of Autumn and early part of winter.

In America more particularly the <sup>great</sup> heat of summer and genial warmth of Autumn has left ~~the~~ system relaxed; and coming to sea in these months when disagreeable wet weather with cold winds are apt to prevail, chest troubles are more liable to be set up.

### Bronchitis.

One case in a Lascar in the Bay of Biscay. Another a lady in the Indian voyage, and 12 cases on the Atlantic.

The Atlantic has been crossed at all seasons of the year with an average of 800 passengers outwards and 160 homewards & with 120 of a crew, so that 12 cases is a very small proportion. None of these were complicated or serious and all were able to go ashore at the end of the 10 days. Most of them have been children of stowage passengers, and had had attacks previously. They all yielded readily to treatment.

It is not the sea in such cases that we dread, it is when we come near land, specially Britain, that we generally find the patient full back.

### Asthma.

One case of Bronchitic Asthma crossing in June improved very much. One case of Nervous Asthma on the outward Indian voyage also improved. but 4 cases on the Atlantic were much worse during the voyage, and it was only on deck that they could exist at all. As soon as they went down to the main deck an attack came on.

What then are the cases which receive benefit at sea?

(1) The man whose General Health has become impaired by too close application to work or business, & who is suffering from disordered digestion & inaptitude for business, or mental exertion; the student who has drawn too largely on his reserve brain power, at the expense of his nervous system, and in consequence of all his organic functions; the man or woman on whom the cares of the world have fallen too heavily; to all of whom rest, mentally & physically, is an imperative necessity, and change of scene and of all the habits is required; to such the sea offers a means of recovery which seldom fails to do good.

The merchant is away out of reach of all business, of letters of telegrams and newspapers; the busy and tired professional man is out of reach of his patients and clients; the man about town is away from his club and boon companions and has a chance of working off the effects of late dinners, and perhaps bad habits; the student cannot study if he would; and in the change of scene, of habits, and close intercourse with fellow men, the heart trouble is like to be forgotten; and the bowed down spirit, in the exhilarating atmosphere, to take on a brighter tone.

(2) Young men or women who have for a time been suffering from an ill defined sense of lassitude, with perhaps nervousness, and a heart given to palpitation. Whose digestion is at fault, appetite poor and assimilation bad. Who are losing flesh and becoming pale; but in whom on examination no trace of disease can be found. Such cases are met with often at sea and the effect of sea life upon them is almost invariably beneficial. Even the short voyage to America and back is very valuable in its results.



If the improvement does not appear while on board, they are not long on land before they begin to pick up. Instances of such cases could be multiplied, one now on board may be given as an example.

Formerly a medical student, he had to give up his studies on account of weakness, with indigestion and nervous palpitation. He joined us as assistant store keeper, and now, though only his third voyage, he is not only always ready for his food, but is able to take any thing; is much stronger; does not suffer from the palpitation and hopes to be able to resume his studies at the commencement of the winter session.

But the good effect of the sea in such cases only lasts for a certain time; that is to say, that improvement only advances to a certain point and either becomes stationary, or even sometimes becomes retrogressive. It is better not to stay too long at sea; if they leave while yet the stimulating effect is present, the good obtained would be in many cases much greater.

Cases of Anæmia. Idiopathic or from loss of blood.

Nearly always improve. It is to be remembered however that there are idiosyncrasies as regards the sea the same as regards every other remedy. There are undoubtedly some on whom the sea climate has an injurious effect. The stimulus of the sea air increases tissue change, and there must be a certain power of responding to the increased stimulus. There must be increase in the ingestion of food, and of the excretion of the products of the tissue change, otherwise the effects are injurious.

There are many people on land, and every family doctor, must have met with such cases, who are always worse or out of



sorts at the coast, who are sleepless or hysterical it may be; the sea air is as they express it, too strong for them. Such cases should not come to sea, otherwise their symptoms will only get worse.

Otherwise as already mentioned Malassez & Picard have shown that the red blood corpuscles are increased  $\frac{1}{3}$  at sea.

In Anæmia from loss of blood the sea seems specially beneficial.

(4) General Debility from any cause, convalescence from Acute Diseases; the after effects of Pleurisy or Pneumonia; from Syphilis specially where a malarious element is combined which greatly aggravates the disease.

#### (5) Cases of Climatic Disease.

The Indian passenger coming on board pale and anæmic with pampered appetite and bad digestion, very soon, under the bracing influence of the sea climate, begins to eat better, & suffer less discomfort afterwards; and when the Bay of Biscay has been passed and the White Cliffs of Old England come in sight, a bloom and freshness appears on the cheek, which has not been there for many a day. The lassitude is gone and in its place come buoyant spirits, and exercise becomes no longer a task but an enjoyment.

More serious cases have come on board scarcely able to walk; thoroughly debilitated; spleen and liver enlarged; appetite only excited by the strongest Condiments. By the end of the first week improvement begins; appetite and digestion improve; and sound sleep such as they have not had for years is now enjoyed. The Red sea interrupts recovery, but once through it and into the genial breezes of the Mediterranean, rapid progress is made, and as regards health also he is in a new world.

at the end of the 4 or 5 weeks.

Four cases I have seen carried on board expecting that they would not last the voyage home, who were ready to find fault with everything before many weeks had passed, and landed in England no longer invalids.

Sir Joseph Fayrer K.C.S.I. in Fothergill's Handbook of Treatment page 579. says that change of air is needed for Europeans in India after all attacks of disease which have amounted to more than mere passing derangements of the bowels or stomach, or slight attacks of fever or trivial ailments. This change of air is obtained in three ways: (1) The hills (2) The sea (3) To Europe. The complete change to Europe is the most important & it is often very necessary. In speaking of a sea voyage, which may be to China, Singapore, Andaman Islands, the Cape of Good Hope, or even Madras or some place on the coast; a few days on board a pilot vessel or light ship at the sand heads or a run down the river in a steam tug just to meet the sea air and return, he says while they are only prelude to the change to Europe the benefit which they confer is often very great, & often if taken in time serve to stave off or prevent the necessity of some more radical change: After attacks of fever, hepatic congestion, bowel complaints, nervous irritability, the result of heat overwork & imperfect action of the liver, an absence of this kind say for a fortnight in a steamer crossing the Bay of Bengal will often restore health, while in less severe cases a run down to the Sand heads or a trip to Madras & back will suffice. The fact is that by medical treatment with all it implies, a patient may be got over the worst part of his trouble and be restored to a certain amount of convalescence, but can be got no further.

It seems he has been getting on in a direct line, but ultimately he gets into a species of circle and makes no progress, and then it is that the sea trip does so much good and enables the invalid to return to his work. Send him for a week to sea and he comes back strong & healthy with colour in his cheeks and vigour in his frame.

(6) Cases of Nervous disease - where there is no organic lesion.

(7) Some cases of Chronic Brain disease.

Predisposed cases are apt to develop insanity. These cases should not be sent where high temperatures or rough seas are likely to be met with.

The absence of excitement, regular habits and the sedative influence of the sea climate, and the <sup>inward</sup> motion of the ship, tend to quieten the nervous system; as we have seen in the tendency there is to sleep at sea.

(8) Scrophulous Cases.

Diseases of the Bones, Joints or Glands. The earlier and more chronic cases do best.

These cases derive very great benefit from sea air and sea voyages more so than from any other form of treatment.

The same may be said of rickets, the bones firm up & the pale face and weakly body give place to a healthy countenance and firm frame. Even as a last resource great benefit would be found in sea voyages for both Scrophula and Rickets.

## (9) Diseases of the Chest.

Persons who are very liable to catch cold with every change generally get braced up at sea so as to be able to stand any change.

Asthmatic people unless their Asthma is of Bronchitic character seldom derive any benefit.

### Phthisis.

It is in the treatment of Consumption that the sea has become so much prized as a health resort.

What are the cases which benefit from sea voyages?

If the case is early; if the disease is quiescent; if there is no, or only very slight, fever; if the patient is able to bear a certain amount of fatigue; if there is no complication as Diarrhea, serious gastric disorder, or laryngeal irritation; if he can accommodate himself to being among strangers and can put up with the inconveniences of sea life.

Hæmoptysis does not other things being favorable preclude a sea voyage. The severe retching of sea sickness might bring on hæmorrhage; fortunately consumptives are of ten either exempt from, or retching is not a prominent feature in their seasickness. A form of sea sickness also which is easily checked. I do not think that the depressing effect of sickness; the nausea in itself is a predisposing cause to hæmorrhage and we know how great is its effect in ordinary practice in relieving irritation of the bronchial tubes.

The influence of the warm climate and the motion on board of the ship is allowed to lessen a tendency to hæmorrhage.

Out of over 60 patients who have crossed at one time or another in all weathers and at all seasons, I have only seen two cases of Haemorrhage, while 9 of them being certain knowledge had had haemorrhage at previous times. The first case was a purser in the advanced stage of Phthisis, who ten years previously had suffered from several severe attacks of Haemoptysis, after which he went to sea on the Indian route, in which service he had been up till the October of 1885, when through some trouble he lost his ship, and had been ashore the whole of the severe winter, when in February 1886 he went out with us as a passenger to Gibraltar to join another steamer there. In December he had had an attack of Bronchitis and had not been well since, but was now in high spirits at the thought of starting for the East again.

The passage through the Bay was rough but he was not in the least sick. On the 3<sup>rd</sup> night I was called to see him when he had had a very severe Haemorrhage. From this he rallied, and on the following day on examination both lungs were found to be affected; the left in its whole extent with a cavity in the apex; while dulness and crepitant rales were heard over the right apex. At Gibraltar he was left ashore on the 7<sup>th</sup> day out, and next night in the hospital there he had another severe haemorrhage, and was found dead in the morning. It is from sea sickness and the heat of the tropics we are warned as being most dangerous in these cases; but in this case neither element had any place in the causation of the Haemorrhage. He had been as bad once before, and was aware of the existence of the cavity, 14 years previously; when a distinguished consultant had

that for all practical purposes his left lung was useless, but as long as he was at sea he was free from any symptoms and undoubtedly it was his long residence on shore which had set the fire ablaze again and hastened his end.

The other case of Haemoptysis occurred in a junior engineer who had come to sea for his health having had haemoptysis several times on shore. Six months after he came to sea he began to notice blood in his sputum and on several occasions had had slight haemorrhages. Both his lungs were affected and as his work was evidently <sup>not</sup> agreeing with him he had to leave, and died 3 months afterwards, the disease making very rapid progress on shore.

Marine engineering is not the sort of work for a Consumptive there is too little pure air in the stoke hole and what does come is necessarily in the form of draught. It is always hot there and coming up sweating into the cool air is the reverse of beneficial to an irritable lung.

Of the other seven in whom Haemoptysis had manifested itself six were in the first stage of the disease with slight dulness and a rale to be heard occasionally over some part, or in two cases both lungs. All of these cases improved on the voyage or voyages. Two of them crossed 3 times in succession merely for the sake of the voyages, standing temperatures of from  $46^{\circ}$  off the banks of Unfoundedland, among ice, to  $94^{\circ}$ - $96^{\circ}$  in the shade in New York, without the slightest tendency to Haemorrhage.

The other case was a gentleman (American) of 36 who had been sent across by an American Physician on account of what he considered some liver cirrhosis with Haematemesis. His liver was of normal dimensions, but both lungs were extensively diseased and he had



Severe cough and profuse expectoration.

His temperature 102°8 at first gradually fell to 100°5°. The cough improved and expectoration lessened.

After a stay of 10 weeks in Killybegs during which he became much worse he returned with us at the end of July. His temperature again was high at first but fell with his pulse towards the end of the voyage & he considered that he felt much better while at sea. On inquiry I find that he is now laid up altogether and gradually sinking. In cases of evident disease with or without softening tubercle and no great fever and no great prostration and exhaustion after the slightest exertion few remedies are better than a sea voyage. In cases of discrete limited tubercle following at times on pneumonia or Bronchitis change of air and scene may do much good; where there is diffused deposit in one lung without much dulness, with pretty large chest and only moderate emaciation; & chronic single cavity with retraction of the walls accomplished or proceeding is favorable for removal to any bracing locality and do well with a sea voyage.

Cases of Advanced Phthisis. specially where the disease is at the time active can scarcely ever expect any benefit from sea voyages unless very short ones. There is scarcely a homeward trip but we have at least 2 consumptives returning, generally young Irish girls whose health has broken down under the strains of climate, but who have stayed on in their situations as long as they could. These come in all stages but for the time being they seem to improve. If very advanced, and <sup>where</sup> the disease is active, they may seem to improve for a short time; but towards the last few days of the voyage they break down, the temperature goes up again & there is always the fear of Diarrhea or some such complication setting in, and as soon as the



home they sink rapidly.

Out of the 60 who have come under my notice there has been one death.

The patient was a young man who had been in bad health for over 12 months during which he had been under treatment. He had to be carried on board and laid in his berth. Next day he was up, dressed, and came in to all the meals and as it was warm lay out on deck a good part of the day. He seemed to improve on till the 6<sup>th</sup> day when his temperature rose to 102.5 + his appetite which had been almost ravenous failed him altogether.

During that night he had diarrhea. Next day he was up but was kept lying on one of the couches; towards night he began to get drowsy and while asleep to talk. On the following morning it was evident that his end was near, and at night he died within 500 miles of land.

On long voyages consumptives in the advanced stage may seem for a time to get better may eat ravenously and exultulate themselves that they are improving daily, while they are only laying up for themselves future trouble in biliousness and diarrhea, when the hot weather is reached, and then they sink rapidly.

As pointed out by Dr. Thoroogood "it would be as rational to send a typhoid patient out for a change as to send a patient in whom acute phthisis is developing, with high temperature and quick pulse on a long & fatiguing journey."

No climate will restore lost lungs and in acute febrile phthisis the risks necessary on travel are of such a kind as to keep up that febrile excitement of the system the subduing of which is so all important a point in the treatment of the case.

If the medical adviser would keep himself free of the charge which the ship surgeons not infrequently hear made, that the patient has merely been sent away because nothing more could be done for him on shore, it is imperative that he exercises the greatest care in the selection of his cases; that he sends him to the proper climate, and that he weighs well in his mind all the pros & cons of a sea voyage: the sickness; the inconveniences of sea life; as well as the chances in the country to which the invalid is going.

He should raise the inquiry earnestly in his mind whether he ought to be advised to leave home, and if there is any doubt rather let him remain where he is.

It is a serious responsibility to take on oneself to remove a patient, at great expense to his purse and constitution he dreads leaving, and his friends equally grieve over his departure. At home he is receiving every attention to make him comfortable, at sea he is at the mercy of strangers.

Before an opinion is given the case should be studied either personally, or through his regular attendant, for a period of weeks. You want to know not the existence or the extent so much of the disease; not so much the mere presence or amount of tubercle but the rate at which the disease is progressing; whether it is in active progress or attended with febrile enormities or not. All these questions have to be studied.

If you are convinced that the case can be ascertained to be in a state of comparative pause, such as to lead to a belief that he is able to bear the journey & settle down in a new home, the 1<sup>st</sup> part of the problem is solved, but not all. Unless he is an enterprising young man with plenty of pluck & no one he cares for at home, or a man who has been on

for a winter before, he should not be allowed to go alone. Then, unless he is merely coming back again, you have to consider the country to which he is going, and the likelihood of him being able to obtain home comforts as well as earn if need be a living.

Can anything be more pitiable than to see a poor consumptive far advanced it may be in his disease, land in a far off country, away from home and friends, with no one to care for him; and though he might have the strength, unable to earn the money to keep him alive. Again his health breaks down, the disease makes rapid progress, and he is thrown on the charity of strangers to comfort his last days, and finally provide for him a grave.

Having determined that the patient is to go to sea, the question next raises ~~itself~~ where is he to go? and how is he to prepare himself for his journey?

It has been the custom to send phthisical patients round the Cape to Australia or New Zealand.

The best time for departure is at the end of Autumn before the cold rainy weather of November comes on.

As to the choice between sailing ships and steamers, much can be said in favour of both. While the wooden ship has a temperature of its own, not being so easily influenced by the surrounding medium as the iron ship or steamer, and therefore warmer in cold, and cooler in hot weather, there is the serious disadvantage of fonder bilges in which more fermentation takes place.

Steamers go faster and the changes are too rapid for an invalid; while on the other hand sailing ships depend on whatever

wind is blowing, and are liable to be detained in what is often the most trying part of the passage - the Equatorial calms or doldrums. On board large steamers again, room is valuable; the calms are smaller, and in busy seasons contain several occupants. An invalid should have a cabin to himself, and more room and <sup>better</sup> sleeping accommodation will still be obtained on good sailing vessels than on steamers, and the largest to be found should be chosen.

The voyages are shorter, and more passengers are carried on steamers; the means of obtaining and preserving fresh food are better; and the journey is not so apt to become unprofitable. In cold weather the saloons and staterooms can be comfortably heated while in most ships dependance is placed on lamps. Taking the voyage to Australia for example. A few days after leaving England warm weather is reached and if going by the Suez canal there is the heat of the red sea to pass through, then the hot weather of the tropics, followed by the heat and moisture of the Equatorial calms. As the vessel arrives near the southern limit of its navigation the temperature becomes cold. Australia being reached in from 30-45 days, during the Australian summer. All these extreme changes in such a short time are necessarily very trying to those who are really ill & often do more harm than the sea air can do good.

The voyage to Australia or New Zealand round the Cape in a sailing ship is the favorite invalid route.

Here also in a few days after leaving England, the cold bleak summer atmosphere of the 50° of latitude is left behind, and he steadily approaches the warmer degrees with their bright clear atmosphere, and often their weeks together of almost unbroken sunshine. The sudden changes

are left behind, he is in a mild equable climate soothing to his lungs and lessening the liability to Bronchitis and other acute exacerbations. As time goes on the weather becomes warmer but the heat is not oppressive till the Goldrums are reached - 5°N to 10°S - and when this is passed the South East Trade winds with their grand bracing climate are entered, and as the weather gets colder flesh is put on, and the tonic effect of the voyage is now experienced. In a voyage to Australia of which I have the temperature chart. leaving in November, at starting the temperature was 46° F, 34 days out 84°, 2 days later on the line 82° F, 60 days out 50°, 70 days 69°, 80 days 52° and the remaining 10 days from 60°-70°.

I give a chart of temperatures of a voyage to New Zealand in which it will be seen that the highest temperature was experienced in Lat 6°5' North; 83°5'; the lowest 47° in Lat 46°30' Long 117.28, and that the greatest variation in 24 hours was 6°.

The West Indies is not a place to send Consumptives. There is too much Malaria about these parts, unless residence is taken among the hills, nor is it restful enough. It is though good enough for any one who merely wants a voyage & to pass the winter away from England.

South America has many fine climates, but they do not offer much comfort on land. In Peru on one side, Buon Ayres & Monte Video on the other fine climates are to be found the latter the cooler and freer from fever perhaps and if there is a chance of a situation the voyage is good enough. The voyage to Rio is a Capital one, but there are often epidemics of Yellow fever there. In the cool works - our summer the average temperature is 73.5°.

An excellent voyage, but little known is round the Horn to San Francisco with its magnificent climate.

For short voyages a run to Gibraltar, Madeira or some part of the Mediterranean, or a weeks voyage round the Mediterranean or across the North Atlantic in Autumn to the States or Canada, going by Quebec and returning by New York will combine pleasure and instruction with benefit to health. There are some Consumptives to whom the Northern latitudes are much more beneficial than the warmer ones and a season in a whaler is of benefit to them.

A voyage which combines many advantages, and but little taken advantage of, is that to our Indian Empire. For the man or woman who only requires rest and change of scene, no voyage can compare with it; but it must be taken in the cooler months, and affords prospects of health, recreation, bodily renovation, mental repose & intellectual & artistic delight, such as no Autumn holiday can equal or equal. Having the great advantage of affording a period of rest & holiday in climates of great winter <sup>pleasantness</sup> ~~business~~ and mildness just at the time when England is apt to be wrapped in fog, deluged with cold rain or abounding in frost or suffocated with Carbon. The line of voyage runs through temperate zones of equable climate and with clear sky. The steamers are well equipped & found to have every comfort.

Leaving England, a couple of days takes him out of the fogs, wet, din & fatigues of City life, and its inclement weather. In 4 or 5 days the first land is sighted - Cape Finis Terrae - then passing down the Coast in sight of Lisbon Rock, Capes St Vincent & Trafalgar to Gibraltar. The blue Mediterranean tempt him to idleness as it leaves the shores of Spain & Africa, & speaks of a source of inspiration, & of kinds of beauty which are shut out from the town dweller. At Gibraltar or Malta he feels the heat of a



sun which has long since deserted the British Isles & the oriental garb of the population, the tropical fruits & vegetation, the language of the people afford the basis of visions which outstrip fully the realisation of his dreams which await him on Eastern Soil.

At Port Said there is time for a ramashou, then he passes through the Suez canal with its monotony varied by Kantara - the highway to Jerusalem where probably an arab Caravan of Men, women & children in costume, & Camels & mules, is waiting to cross, the lake, Ismalia; the strange birds along the banks; & the beautiful mirages. The Red sea with its numerous islands and a heat which is bearable at that ~~is bearable~~ season, past Perim & in to Aden, then if going to Calcutta skirting the African coast as far as Cape Guardafui, & on from there all to Ceylon calling Colombo, "a perfect Eden upon earth", up to Madras & then up the Hooghly to Calcutta, which is reached in 35 to 37 days. If time allows a fortnight can be spent crossing by Bawares, Delhi & Lucknow to Bombay; and then home in 26-28 days. The worst months of winter are thus passed in a magnificent climate. Everything is new, the people, their habits, their religion as well as their comely. If he elects to remain in Egypt, Ismalia Cairo Thebes & the Nile are all within the limits of a two months holiday.

Taken merely as a vacation it is a profanation to compare such a holiday with two months passed at a pretty water place in England, France or Germany. Spent among the scenes which have been the theatre of the world's earliest history; or of the struggles which have made England famous among the nations; among the monuments which



are the record of past greatness and are the highest types of grandeur and beauty.

How is the patient to prepare himself for his journey?

Already hints have been given as to the kind of vessel to travel by. An invalid should have a cabin by himself in a ship which does not carry emigrants. The position should be as near the centre as possible and on the port side going out, as on that side the prevailing winds, North East & South East trades-blow.

He will have to furnish his cabin himself in a sailing ship. He should have a spring mattress & hair mattress above for his bunk. A folding chair for sitting on in his berth & lying in on deck. A sponge bath & if convenient a small chest of drawers and any other little things to make it comfortable & homelike as curtains &c. A few bottles & drinkables will not be out of place, such as Beef & treacle, Malt extract, Lemons & any medicines of a special nature to which he has been accustomed.

Clothing.

He must be provided with clothing for body, head & feet to suit all climates through which he has to pass. Warm for the earliest & later part of his journey, light for the warm weather.

On no account should he discard woollens at any part of the voyage. In cold weather he will find them necessary, in hot the best means of keeping himself comfortable and keeping off chills & diarrhea. He should then wear a band of flannel over his stomach as it seems to be through the stomach in hot countries that chills come.

Regime

On board he must exercise the strictest regime.

On the voyage to New Zealand of which the Temperature Analysis is given <sup>(consumptions)</sup> of 1000 passengers started. All reached New Zealand alive but only two are alive now. Four suffered from profuse diarrhea in the tropics the result of indiscretions. One died immediately after

launching; another a few weeks after. Two on a return voyage.

The other 4 died on their return to England (within a year).

One of the survivors is settled out in New Zealand and doing well. Another is a purser on a steamer. These two, & these only, put themselves under the surgeons care and followed his advice to the letter. Rose early, bathed, had some exercise on deck, breakfasted, got light work on the ship to employ their odd time till lunch, after which they lay down for a time, dined and kept on the deck till the cabin was cool. There were worse cases on board but both had cavities and were given up before they left home.

If too weak for such active life, a light repast before rising will do much good.

He must not indulge too freely in meat or drink; or as already stated he will injure himself. He must be on the deck as much as possible. ~~And~~ take as much exercise as he can. He should bat or at least have a rubdown every day.

His mind should be kept employed and any light task in which he can take an interest will help to pass the time away. Above all he must have an earnest belief in the therapeutic value of the sea voyage, keep in as good spirits as possible, ever remembering that any discomfort here are well worth putting up with for the benefit he is to receive. Making friends with his fellow passengers, and the officers, he will find in them a source of instruction & amusement; will learn much of the country to which he is going and gain great encouragement from the recital of numerous instances where patients who were far worse than him, not only got over the voyage but are now prominent citizens in the new country.

In concluding this paper on a great subject I cannot but feel how incompletely it has been dealt with. Many questions such as the Physiological effects of the sea in health as seen in long voyages: such as the lowering of the temperature and rate of the pulse; the increase in cold weather of the urine & at all times of the increase of Urea from increased body waste; or of the tendency to excess of uric acid in sailors; all of which attention ~~has~~ been paid, have been left untouched as they would have lengthened a paper which has already outgrown original intentions.

As it is to its salutary influence, under Providence, that I have recovered from what at one time was considered an incurable disease, the sea has a more than ordinary interest to me, and now at the termination of my voyaging, and return to ordinary life and practice, I leave behind me pleasantest recollections, and in spite of all that is said of monotony, am able to say that unless for necessities, I have never passed an hour of ennui at sea.