

of the following foods: Proprietary or cereal foods, condensed milk, peptonized milk, sterilized milk, any of the cereals (as barley water), or milk too much diluted with water. Of these causes it seems pretty safe to say that the sterilization processes enjoined by many physicians and adopted by the laity as a tribute to bacteria, in the preparation of these various foods, is responsible to a great extent for the conditions which follow. From observations made in cases which have developed in infants it has been found that the scorbutic symptoms will begin to manifest themselves in from six to eight weeks after the institution of the improper diet. As in scurvy of the adult the exact etiological factor is still undetermined, but it would seem that fresh milk when ingested possesses antiscorbutic properties not unlike those possessed by the vegetable elements when administered to adults.

Clinical Symptoms.—An infant fed on artificial food, and especially on sterilized cow's milk (brought to 212° F.), will begin to show, after six weeks or more of this diet, the general signs of systemic disturbance, pallor, restlessness, disinclination to be moved. This is followed by particular evidences of pain in the lower limbs, usually localized in the femur, and in an increasing immobilization of the legs as the disease progresses. The pains grow more intense, the knees are drawn up, held motionless, or rotated outward and fixed, simulating paralysis. It will be seen that there is a cylindrical swelling of the lower end of the diaphysis of the femur, due to hemorrhagic suffusions into the subperiosteal space, either in one or in both thighs, and as a result in advanced cases this condition is often accompanied by fractures of the bone underneath. Swelling and softening of the gums presents the typical scorbutic feature almost synchronously with the above condition, but this manifestation is not usually seen in infants in whom some of the teeth have not erupted, and this gingival symptom is usually most pronounced about the incisors or about the teeth that may have pierced through. The condition of the gums is the same as in adult scurvy, with this exception: If teeth are in the upper jaw and not in the lower, the latter will not show the spongy and bleeding and ulcerated condition surrounding teeth that are present in the former. This symptom is usually followed by another characteristic scorbutic sign—subcutaneous hemorrhagic suffusions showing purpuric spots and coalesced macules of greater or less size and the appearance of multiple tumefactions of the deeper tissues. The picture is not so different from that of the adult disease, viz., the ashen hue, the foul breath, the circles about the eyes, the swollen, tender joints, and the listless mental condition. There is no temperature characteristic of the disease unless it be subnormal. Examination of the blood affords no more satisfactory results than in adult scorbutus. Hemorrhages into the cavities of the body occur. Diarrhea is more frequent than constipation.

Diagnosis.—From the description above given the recognition of this disease in a developed case should not be difficult. It may be confounded in the early stages with rheumatism, rachitis, purpura, acute anterior poliomyelitis, infantile paralysis, and possibly syphilis. The first named may offer the greatest field for error. In rheumatism the joint itself is affected; while in scurvy the tissues about the joints, especially the knee, are involved. In scorbutic hemorrhages the blood escapes practically always into the diaphysis of the long bones. With proper protection of the femur the knee-joint can be moved without discomfort in scurvy. The differentiation from purpura is made in the same way as it is in scurvy of the adult type. In purpura the maculations are more evenly distributed over the entire surface, in scurvy the lower limbs are mostly affected. In infantile paralysis and poliomyelitis the immobility of the limbs is due to palsy of the muscles, while the failure of movement in scurvy is because of pain. The disease may be distinguished from rachitis by the absence of the rosary and by the typical skeletal signs of that disease. The characteristic scorbutic signs in the gums

should always enable the observer to exclude rachitis from the problem. Dietetic treatment will usually settle a diagnosis in a few days. Other diseases to be borne in mind are hæmophilia, erythema nodosum, leukæmia, and local periostitis.

Pathology.—The special lesions found post mortem are those relating to the hemorrhages occurring in the course of the disease, but differ in no way from those observed in the adult type. Up to the present time no characteristic signs have been found which add to our knowledge of the pathology of the disease.

Treatment.—Being a preventable disease it has its prophylaxis as well as its cure. The first relates to the use of proper food. If a child must be given artificial alimentation, it is necessary that it have the nearest succedaneum to human milk that can be readily procured. This to a certain extent involves the whole question of infant feeding, which cannot here be considered. This much may be said, that cow's milk is the best substitute because the cheapest and most easily procured, as well as because it contains all the necessary elements. The proportions of the constituents differ from those of human milk, but a scientific effort to "follow nature" has not been productive of happy results. Properly diluted with water and raised to a moderate degree of heat, not over 170° F., for ten or fifteen minutes, cow's milk is the most available and natural food for infancy. This heat will effectually dispose of all bacteria that need give cause for anxiety. The "pasteurization" of milk renders it truly a sterile product—a dead liquid—in which either the antiscorbutic properties are rendered inert or the low proportion of proteids favors the characteristic signs of scurvy. The effect, upon milk, of heat sufficient to sterilize it, is not entirely understood. It is a delicate complex form of protoplasm, and the effects which "pasteurization" produces upon the caseinogen, nucleins, and the calcium salts by which their combinations are disturbed, have undoubtedly to do with their efficiency as antiscorbutic agencies. This much has been learned by practical experience and points the way to the preventive treatment of the disease.

The curative treatment is upon the same order as that of the adult type—the restoration of the food that the infant has been deprived of, viz., fresh milk in properly diluted form. This milk may be given in alternation with a teaspoonful or two of orange juice every hour throughout the day. Raw beef juice, salted, may be used for a change, and barley water can afford a satisfactory alternative. But the main reliance must be upon fresh milk fed with due consideration to the condition of the infant's digestive apparatus. All other forms of treatment are symptomatic and need not be detailed. As in the adult type the most desperate cases, so far as may be judged from external signs, recover rapidly when proper food is furnished.

Charles E. Banks.

SEASICKNESS, or NAUPATHIA (*ναῦς*, a ship; *πάθος*, sickness. French, *Mal de mer*; German, *Seekrankheit*; Dutch, *Zeeziekte*; Spanish, *Mareo*; Italian, *Male di mare*), is the name applied to a definite syndrome group that occurs usually in persons on board a vessel at sea—but also occasionally when the subject is in a rapidly moving railway or trolley car, on the back of a camel, in a balloon, an elevator, a swing, a merry-go-round, etc.—and of which nausea and vomiting are the most marked phenomena. It is said that not more than five per cent. of human beings are entirely exempt from it; but while I have no statistics to offer, this proportion seems to me much understated. The same individual may differ in his susceptibility at different times. As a rule, those who make frequent voyages become acclimated; but some persons are always sick on board ship, even in smooth weather. As a rule, weather and the motion of the ship make considerable difference in the number of sick persons on a vessel, and in the severity of the attack in the individual. Age has some influence upon resistance. Very young children are rarely affected, and children below the age of puberty are not nearly so

susceptible as adults. Lower animals differ in their susceptibility to seasickness; dogs, horses, cows, sheep, and chickens have been affected; but hogs, ducks, and geese are said to escape, as a rule. The attack varies in both degree and duration, according to the idiosyncrasy and the physical condition of the individual. Merely uncomfortable sensations may be experienced, or the condition may be one of mental and physical collapse.

Seasickness is not in itself dangerous to life—very few deaths having been recorded—nor, on the other hand, is it beneficial, as is sometimes stated.

SYMPTOMATOLOGY.—Definite symptoms are presented by this affection. Abnormal increase of appetite may be the first sign, but anorexia—even active disgust for food—is more common. Headache is the rule, and is in many cases attended with a sense of fullness or congestion. It is often most intense, and usually constrictive, over the forehead or temples; sometimes the severity is greatest on the top or in the back of the head. Usually there are pain and a feeling as of pressure in the eyeballs. Often there is pain in the back of the neck. Soreness in the back and neuralgic pain in the extremities may also be present. Nausea and vomiting are, as a rule, most obstinate. Their onset may be preceded by general chilliness with pallor of the face and lips. Ptyalism occurs at times, and there may be a foul taste in the mouth. Constipation ordinarily accompanies the general disturbances; diarrhoea is less frequent. Chilliness and flashes of heat are sometimes complained of. Mental depression, despondency, and even despair are frequently observed. In addition there may be complete loss of will power and of the faculty of concentration. The pulse presents a diminished resistance, being small, feeble, and easily compressed. The skin is pale, cold, clammy, and often moist. The urine is diminished in quantity.

CAUSATION.—Numerous theories have been advanced as to the cause of seasickness. All writers agree, however, that the complaint is aggravated by the physical and mental fatigue caused by the preparations for the voyage, by the emotional excitement of parting, by previous imprudences in diet, by constipation, and by want of proper food. The cause of naupathia is believed by some to lie in disorders of certain senses. It is given as visual disturbance caused by the constant mobility of surrounding objects; irritation of the semicircular canals caused by the frequent and varied movements of the ship, and confusion of the muscular sense, or a disturbance of the feeling of the relation of the body to surrounding objects, caused by the unstable conditions prevailing on board a vessel.

Irwin regards seasickness—or motion seasickness, as he calls it—as a disturbance of a supplementary special sense whose function is to determine the position of the head in space and to govern and direct the æstheticokinetic mechanism by which is maintained the equilibrium of the body. He holds that motion produces sickness by disturbing (a) the endolymph in the semicircular canals, (b) the viscera in the abdomen, and possibly (c) the brain and the subarachnoid at its base. The true primary cause of seasickness he believes to be irritative hyperæmia of the semicircular canals. By some the stomach has been regarded as the seat of the trouble. The view taken is that by the shaking of the contents of the stomach digestion is stopped and fermentation sets in, the undigested fermented food being thrown off by an effort of nature. According to this theory the headache, depression, and vertigo are due partly to the absorption of bile, or of some or many toxic products of metabolism or of fermentation, into the circulation, and partly to irritation of the pneumogastric nerve terminals. Some suppose that the play of the diaphragm and abdominal organs, caused by the movements of the ship, induce spasms and convulsions of the stomach. Another theory attributes the symptoms to a severe intramolecular shaking and irritation produced in the cells of particular organs by rapid movements arising from sudden change of direction of motion. The

direct mechanical effects produced on the nervous tissues by the movements of the ship are given by many as the cause of seasickness. These include repeated slight concussions of the brain produced by its being shaken up and down in its bony case; a centrifugal jarring of the brain as a result of motion along the two arcs of a circle described by the axis lines of a ship; shocks inflicted upon the brain and spinal cord by the violent flux and reflux of the cerebro-spinal fluid, induced by the movement of the vessel.

Beard believed naupathia to be a functional disturbance of the central nervous system, the cause being purely physical or mechanical—a series of mild concussions—the agitation of the nervous system by the movements of the ship. Other theories ascribe the cause to effects produced on the nervous system by disturbances of the circulatory apparatus. It has been supposed that the irregular variations of barometric pressure produced by the rising and falling of the waves cause oscillations of the column of blood within the larger vessels. Seasickness has been attributed also to sudden and recurring changes of the relations of the fluids to the solids of the body, both of which obey the law of gravity when the body is subjected to alternate movements of ascent and descent; the blood, however, descending more rapidly and ascending more slowly than the solids. Pollarin believed the condition due to the lessening of the ascending force of the blood in the aorta and in the arteries springing from it, caused by the movements of the body and resulting in anæmia of the brain. Wallaston, on the other hand, ascribed it to cerebral congestion. Chapman held that the proximate cause of seasickness consists in an undue amount of blood in the nervous centres along the back, and especially in those segments of the spinal cord related to the stomach and the muscles concerned in vomiting. Skinner believes that the motions of the ship cause movements, slight or considerable, and repeated displacements, collisions, and stretching of various organs of the body, especially of the abdominal organs, and unequal and alternate increase and lessening of pressure exerted by the column of blood on the walls of the arteries and veins. This starts a reflex nervous act, an inhibitory influence, causing a paresis of the cardio-accelerator and vaso-constrictor centres. Thus are brought about enfeeblement of the heart's action and frequently a diminution in the number of cardiac pulsations, and a consecutive loss of vascular tone with relaxation of the walls of vessels of medium calibre. This results in a general lowering of the arterial blood pressure, which is the cause of naupathia, giving rise to anæmia of the medulla, anæmia of the brain, anæmia of the skin, diminution of the blood pressure in the kidneys, and the diminution or the absence of action of the sympathetic nervous system upon the unstriated fibres of the intestine and of the arteries, and also upon the intracardiac nerve ganglia. A vicious cycle is thus established.

Gihon considers seasickness a neurosis, and says that while the onset of mild attacks may determine a temporary increase of blood in the cerebrum, it is certain that the lessened arterial tension due to the vaso-motor disturbance later deprives the nerve cells of their proper stimulus, and the consequent anæmia of these centres results in weakness of the heart and dilatation of the vessels. Even miasmatic intoxication has been made responsible for seasickness (Lemonas).

The theory that seems to me the most plausible is that which attributes to *rupture of labyrinthine compensation* the principal phenomena; thus partially allying the condition to mountain-sickness and aeronauts' sickness, in which this factor plays a subsidiary part. *Concussion of nerve elements* probably adds to the sum-total of disturbances; while *auto-intoxication* is added as a result of the failure of digestion and derangement of metabolism. *Lowered vascular tone* is both a symptom and a cause of other symptoms. Psychopathy (morbid suggestion) is not to be excluded entirely, but is not in itself a sufficient explanation.

PROPHYLAXIS AND TREATMENT.—Different forms of treatment—physical, physiologic, and medicinal—have been recommended, in accordance with the various theories as to the cause of naupathia. The exciting cause in every case being the motion of the vessel, a stateroom should be selected near the centre of the vessel, away from the engines. An inside room is said by many to be preferable, but in my opinion the lack of ventilation more than counterbalances its supposed advantages. As prophylactic measures, it is advised that all preparations be concluded at least twenty-four hours before embarking, so that the system may not be exhausted by overwork and want of sleep, and that as hearty a meal as possible be eaten before going on board. Those especially liable to seasickness are told to go to bed before the vessel gets under weigh, having previously arranged within easy access such things as may be needed for the first day or two; to eat regularly and heartily, but without raising the head for at least one or two days; to take a mild laxative on the first night out and to keep the bowels open; and, after being able to go on deck and to the table, not to rise in the morning without first eating something. If the sea should become unusually rough, they are to go to bed before getting sick. Some have advocated a spare and dry diet, one full meal being indulged in, and soup, pastry, milk puddings, and sweets being avoided. I have seen good results apparently due to the following prophylactic régime: (1) A calomel purge followed by a saline, one week before sailing, and again two days before sailing. (2) A saline irrigation followed by complete rest, the morning before sailing. (3) Saline laxatives or enemas daily for the first few days on board. (4) Spending all the time possible on deck. Those very susceptible should maintain a reclining posture in a steamer chair, but out of the direct sunlight. Those but slightly affected should try to move around from time to time, walking a little more each day. (5) Taking for the first day or two light, easily digested food at short intervals. (6) Sponging or bathing daily with cold water, or with hot water preceded by cooling of the head and neck and followed by a cold friction rub or shower. (7) Taking minute doses of picrotoxin (gr. $\frac{1}{100}$ hourly) for ten hours daily during the week preceding the voyage, and for two or three days at sea. I should now advise instead epinephrin (commercially known as suprarenalin) in doses of from gr. $\frac{1}{4}$ to gr. $\frac{1}{5}$, absorbed from the tongue. For this purpose a fraction of a grain of sugar of milk may be added, and either powders or tablet triturates be dispensed.

It is usually advised that the horizontal position be assumed. Various physical expedients have been tried to lessen the motion of the vessel but without success. The twin ferry-steamer, the *Catalis-Douere*, the Bessemer suspended saloon, swinging state-rooms, swinging berths and bunks, and the always upright easy-chair, *fauteville-de-mer* of Dr. Neveu-Derotrie, have all proved failures. Various preparatory exercises to be practised by those intending to go to sea have been suggested. Swinging, turning around upon one foot, the use of rocking-horses, oscillating planks, gyratory chairs, and the like, have been advised. Dr. Hewitt devised a mirror, so hung as to swing on its oblique axis over a swinging platform provided with a seat and movable at will up and down, from side to side, backward or forward, or in a combination of these movements. The person contemplating a voyage was advised to use this contrivance daily for some time before tempting the winds and waves. Various expedients based on the visual theory are recommended. Thus, patients are instructed to keep their eyes closed or covered; to wear smoked glasses or blue or red glasses; or to fix their eyes on some object away from the vessel. The wearing of red spectacles has been advocated on the theory that the effect of the color on the blood-vessels of the brain would be to send the blood to the brain, relieving a cerebral anemia. To lessen the irritation of the semicircular canals, Dr. Minor suggests dropping cocaine in the ear. To keep the intestines quiet, to support the abdomen exhausted by incessant retching

and vomiting, to determine the flow of blood to the head, or to provide a substitute for the stimulus and distention of food, abdominal compression by means of a bandage, handkerchief, towel, or napkin has been advised and is really useful. If the abdomen be hollow, a soft folded blanket may be fitted into the depression. Inflating the lungs and holding the breath as long as possible have been suggested as a means of fixing the diaphragm. Hovent, indeed, advocates systematic inhalation and exhalation against pressure by means of my pneumatic resistance valves. In my own person the experiment was unsuccessful.

The *dietetic management* usually recommended after the onset of seasickness is that a moderate amount of easily digested food be taken at short intervals. Beard says that one should keep something in the stomach all the time, if possible. Thin soups, broths, and gruels usually may be given. Junket, matzoon, kumyss, clam juice, beef juice, curry, preparations of blood, and predigested preparations of milk, beef, peptones, and the like can often be taken in small quantities, even after nausea and vomiting have occurred. Many experienced ship surgeons advise against the exclusive or excessive use of liquid food and prescribe solids or semi-solids; they believe that liquids encourage vomiting. Some writers recommend mulled wine, grog, Curaçoa, eau de menthe, iced dry champagne, cider, and brandy. Acid or effervescing drinks, such as seltzer, ginger ale, and sweetened water, with the addition of lemon juice or a little citric or tartaric acid, are often refreshing when taken in moderation. Draughts of ice-cold water, or pieces of ice held in the mouth, may give comfort. Coffee and tea as hot as possible, and in small doses, are sometimes soothing and invigorating.

As *curative agents* various forms of counter-irritation have been employed, the commonest being a mustard leaf over the epigastrium. Electricity has been applied, chiefly as faradization of the epigastric and hypochondriac regions, in some instances combined with the painting of the parts with a solution of atropine sulphate for cataphoretic effect. Chapman advocated the application of an ice-bag to the spine, believing that thus he could lower the temperature of the spinal region. Baruch, however, asserts that cold applied to the surface of the body, instead of penetrating deeply, calls into action the heat-regulating machinery of the body for the purpose of resisting the invasion of cold into the interior. The success Chapman met with may have been due to stimulation of the spinal centres with increase of vascular tone. The spinal coil would probably be more comfortable than an ice-bag and more easily arranged. If the benefit lie in the elevation of depreciated nerve tone, the best hyriatic application would appear to be the douche. The Winternitz combination compress, so efficacious in cases of obstinate vomiting, should be of service in seasickness, though it will rarely be available. It consists of a stimulating cool trunk compress enclosing an epigastric coil through which circulates water at a temperature of from 122° to 132° F. The cold wet compress at first produces an anæmic condition of the skin beneath, with contraction of the cutaneous vessels and irritation of the peripheral nerves. Reaction quickly follows with tonic dilatation of the vessels, the part covered by the coil becoming hyperæmic. Dr. Edward Miller, in 1814, recommended the warm bath alone, or alternating with the cold bath, friction of the skin with oil and camphor, or dry friction with powder of mustard.

Various *drugs* and classes of drugs have been employed to meet certain supposed indications. Laxative treatment is usually recommended, and should be commenced as early as two weeks previous to the night before the contemplated journey. Podophyllin, aloes, rhubarb, and the salines have been used. Drastic cathartics, however, should not be administered. Various sedatives, analgesics, and hypnotics have been employed. Bromides (ammonium, potassium, sodium, strontium) are often given in doses of from ten to thirty grains three times a day. Beard advocated mild bromization and prescribed large doses

of sodium bromide for three or four days before starting, keeping this up while at sea, until there is well-grounded reason to believe that all danger is over. Chloral hydrate, in doses of five or ten grains, has been used alone or in combination with the bromides. Chloroform is sometimes employed. Charteris prescribes "chlorobrom," a solution of chloralamid and potassium bromide, for three nights in hypnotic dose—a tablespoonful for women and a half for men, or a teaspoonful every ten minutes until the full dose has been given. Nelken gave half a grain of morphine twice a day. Cannabis indica, in doses of half a grain, has been employed. Antipyrin has been given in doses of from five to fifteen grains. Chloralamid, chlorodyne, paraldehyde, sulphonal, and the like, have also been used. Personally, I have seen benefit only from the bromides—of which strontium is the best—and morphine when needed.

Certain so-called neuro-muscular agents have proved useful. According to Skinner, they increase the activity of the nerve cell and of the unstriated muscular fibre, as well as that of the striated, and thus cause an elevation of the arterial blood pressure. The theory is of dubious worth, but the practice is useful. Cocaine, caffeine, strong black coffee, thin and strong infusion of black tea constitute this group. I have seen much good from fluid extract of erythroxyton coca and from wine of coca. Other remedies that act in a similar manner are theobromine, guaranine, kolaine, and preparations of kola. Strychnine and atropine have been used. Skinner employed them simultaneously in order to raise the blood pressure by acting upon the nervous centres and the unstriated muscle fibres. On account of the frequent vomiting in seasickness he preferred the hypodermic method of administration, giving to an adult from 0.5 mgm. to 1 mgm. of atropine, and 1 mgm. of strychnine, dissolved in mint water. This he repeated in two hours if the patient was not well, and even again two hours later. He never exceeded three injections in one day. Amyl nitrite has been lauded by some writers. I have seen benefit from strychnine arsenate, 0.5 mgm. (gr. $\frac{1}{100}$) hourly by the mouth, and also from picrotoxin—which acts like a combination of strychnine and belladonna—in about the same dose. Crude adrenal preparations have failed in my hands, but it is probable that epinephrin absorbed from the tongue may be useful in many cases.

Agents used for their supposed effect on the stomach are dilute chloroform, hydrocyanic acid, tincture of iodine in drop doses, cerium oxalate, cocaine, sodium bicarbonate in doses of ten to twenty grains, creosote in drop doses given every hour, eucalyptus rostrata, the digestive ferments, the dilute mineral acids, Worcestershire sauce in teaspoonful doses, and preparations of Peruvian bark, calumbo, and quassia. The older writers gave emetics on the advent of vomiting, using infusion of chamomile, peppermint or ginger, or even sea-water. Lemonas recommended quinine to combat the hypothetical miasmatic intoxication. I have seen no recommendation of specific serum—neither of an antitoxin from an acclimated human being or lower animal, nor of an artificial combination of chemical salts!

As a rule, if patients keep on deck, keep their bowels clean, do not overeat, sponge or bathe daily with cold water—or with hot water, if preceded by cooling of the head and neck and followed by a friction or by a shower or general douche of cold water—and are subjected to cheerful rather than to depressing suggestion, they will recover quickly without medicines. I have seen attacks cut short by a calomel purge followed by thorough saline irrigation of the bowel.
Solomon Solis Cohen.

SEAL, GOLDEN. See *Hydrastis*.

SEA VOYAGES.—Therapeutically sea voyages may be divided into three groups:

1. A voyage *incidental* to a change of residence or climate, or to a business or pleasure trip. Voyages of this class are usually, though not always, short, and apart

from perils or discomforts of the particular voyage, need to be studied only from the viewpoint of possible counterindications in the special case of a weak or delicate person, or one who has borne previous sea trips badly, or of an invalid affected with some lesion rendering the voyage hazardous. Such counterindications will be mentioned in the general discussion.

2. A voyage undertaken as a *restorative measure* in the case of an individual patient. Voyages of this class are to be studied from all possible viewpoints, meteorologic, geographic, climatic, epidemiologic, therapeutic. The time of year, the special trip, the ship, the disease, the patient and his companions, must be given careful consideration, and indications and counterindications weighed against each other. Thus, voyages around Cape Horn in the winter of the southern hemisphere are to be avoided for invalids; and similar questions of route and season are always to be examined in detail. In this article space will not permit more than casual allusion to a few special voyages.

3. A voyage forming *part of a scheme* of climatic or other treatment. Voyages of this class stand midway between the other classes, and certain discomforts or other counterindications, not otherwise permissible, may be outweighed by the benefits expected from the measures to which it is a necessary introduction.

Ocean Climate.—The climate of the open sea possesses characteristics not to be found elsewhere: a peculiar equability of temperature due to absorption of thermal rays and surface evaporation in the day, and to convection with surface heating and diminished radiation at night; an abundance of light; a favorable degree of relative atmospheric humidity (the mean being 73.5 per cent.); and freedom of the air from dust, microbes, and other impurities. It is not necessary to call upon the presence of chemical factors in the atmosphere, ozone, iodine, or salines, to explain its beneficial influence; yet independently of chemical analysis the sense of smell finds an agreeable quality in the sea air, which doubtless indicates properties acting in an equally acceptable manner upon all nervous tissues, and possibly upon all cells. The breezes are always refreshing, and except in certain regions of latitude or current the midday temperature seldom exceeds 85° F., and is usually very much less. When the temperature is high upon the sea it is less distressing than an equal degree of heat upon the land; thus, at the tropics it is rarely oppressive even in the absence of wind. Similarly cold is often better borne at sea than on land, though from a therapeutic viewpoint extremes of either heat or cold should be avoided. Against these qualities the depressing and distressing effects of storms—to say nothing of their dangers—must be taken into account.

Factors Other than Climatic.—The prolonged mental rest and the complete change of surroundings incident to a sea trip of moderate length are factors of no mean value in the sum total of restorative effects. On the other hand, in very long voyages, the monotony may become wearisome, and this contingency must be provided against. Ship, time of year, proposed voyage, and cost may not always correspond to desire. Light and air, while abundant and pure on deck, are not always so in the cabins. The food may not be suited to the needs of invalids, and the absence of fresh milk, fresh fruits, fresh vegetables, is often a serious drawback. Some individuals are peculiarly susceptible to seasickness, and others suffer with deranged metabolism during the greater part of the trip. Women generally feel the discomforts of life on shipboard more than men do, and can seldom be advised to take prolonged voyages. It is necessary in every case to exercise great care in the selection of ship, master, and route, to inspect the sleeping cabins and general accommodations, and to be sure that the dietetic arrangements are good. Other things being equal, well-equipped sailing vessels are to be preferred to steamers for therapeutic voyages. There should always be a trustworthy ship's doctor, and in many cases the invalid must be accompanied by a special attendant or a physi-

cian. When the patient owns a seagoing yacht, most difficulties vanish; and Sir H. Weber has suggested ships, specially built and equipped as ocean sanatoriums, to be sent on well-selected voyages according to season.

In the consideration of *seasickness*, the general precautions necessary to therapeutic voyages were considered. Here it may be emphasized in repetition that the pure air of the deck is preferable to the stuffy atmosphere of the cabins; that exercise is necessary; that exposure to the sun is usually beneficial; that the skin should be cared for by regular and systematic baths, frictions, etc. In addition to the care necessary in choosing vessel and cabin, the provision of congenial companionship and of sources of intellectual interest as the inclination to mental activity returns, demands attention.

Indications.—Short voyages of from five to twenty days are useful chiefly to give mental and physical rest and recreation, and to prevent relapse or other accident after convalescence from depressing affections, as influenza. Voyages of moderate length, twenty to sixty days, are sometimes followed by strikingly good results in cases needing more prolonged rest, as in breakdowns from overwork, irritable conditions of the nervous system, even actual neurasthenia when the patient has good resisting power. In certain cases of asthma, in the conditions termed "scrofulous," in chronic tendencies to "catching cold," in suspected or actual pulmonary tuberculosis, such voyages are often beneficial.

In chronic catarhal conditions of the upper air passages, in chronic rheumatic states, and sometimes in chronic rheumatoid arthritis, voyages to warm climates, as a winter trip to Mediterranean or Caribbean waters, may be advised. Hay fever has been reported to have been observed at sea, but the occurrence is so rare that its possibility may be disregarded and the general tonic effect of the ocean climate upon those susceptible to this affliction is highly desirable. Some chronic forms of diabetes mellitus in middle-aged or elderly patients are ameliorated by ocean trips, especially those to warm climates in the winter.

Prolonged voyages, three months or more, are to be advised only when the patient is known to be a good sailor, is not too severely ill or too weak to undergo some discomforts, and has a fair degree of resisting power, as well as good digestive and eliminative functions.

The special trips of three and four months to north European waters in the summer and to Mediterranean and Oriental waters in the winter, made by well-equipped vessels and including in their itinerary stops at various important ports are, however, to be classed therapeutically with voyages of moderate duration, and are especially to be commended to convalescents and those needing rest and recreation. Long voyages on the open sea, as to Australia, for example, are to be advised chiefly for those who enjoy the sea, for dipsomaniacs and drug slaves, and in cases of pulmonary tuberculosis. It is especially in suitable cases of pulmonary tuberculosis that well-chosen voyages are to be urged, sometimes as a means of recovery, sometimes as a means of palliation and of prolonging life. Some patients can "rough it" on sea and land with benefit; others must be carefully protected. The stage of disease, too, and the general characteristics of the patient make considerable difference. Hence general rules cannot be laid down. Certain main factors, however, may be presented. In febrile cases the temperature usually subsides after a few days upon the sea. In cases which show much general tendency to recovery, but in which limited areas of persistent activity remain, the local processes diminish and finally cease under the influence of the aseptic sea air and the general stimulation of nutritive processes. In cases of erethic temperament, unsuitable for mountain cures, especially those with a tendency to excessive cardiac action at altitudes, the sea exerts a beneficial sedative influence. No other measure is of equal value in early cases in robust males, especially in young men infected by chance, or when weakened by overwork, worry, or acute disease. In quiescent cases of a more advanced stage the

general health and hence the local conditions are usually much improved. In certain far advanced cases with extensive softening and persistent fever, a voyage in equable waters—say upon the Pacific, as from San Francisco to Japan and return by way of Hawaii—has been known to mitigate symptoms and to prolong life. Sometimes such patients can even benefit by excursions into cooler regions, as to Alaska, Iceland, or Spitzbergen. When patients are to be sent to a special land climate, as from Europe to Colorado, or from America to the Alps, or from either to Australia or South Africa, the sea trip may be made a special feature of the cure; and, similarly, sea trips may be directed to well-chosen objective points, invigorative or protective as may be, where the patients may remain for a time before coming home.

Counterindications.—Grave lesions of the heart and blood-vessels interdict any ocean trip; nor should a longer voyage than the week between Europe and America be permitted in the great majority of cases of far advanced tuberculosis, chronic gastro-intestinal disorders, cholelithiasis, or chronic diseases of the abdominal viscera. Gouty patients may suffer more severely at sea than on land; neuralgias are often aggravated; hemorrhoids may become troublesome. Among other conditions necessitating caution, or even the prohibition of a voyage, are a marked tendency to hæmoptysis, great general weakness, special liability to seasickness or loss of appetite, epilepsies, maniacal tendencies, periodic insanity, suicidal inclinations, marine photophobia, and marine insomnia.

Solomon Solis Cohen.

SEBORRHŒA.—DEFINITION.—For the purposes of this article seborrhœa may be defined as a functional disorder of the glands of the skin, characterized by the production of an excessive amount of fatty material, normal or abnormal in quality, which manifests itself upon the skin as an oily coating, scales, or crusts.

HISTORY.—The investigations of recent years have done much to determine the true limitations of this disease. Many points, however, remain unsettled, especially in the domain of etiology and pathology, and it is very probable that the future will render possible a definition of greater precision. The process of evolution of the present-day conception of seborrhœa is of interest, as showing the gradual differentiation of species from genus. The old Greek and Roman observers—Hippocrates, Galen, Celsus, Actuarius, and others—recognized the occurrence of falling of the hair; and by the Greeks the expression *πιτυρίασις*, *pitryiasis* (that which is winnowed, *i.e.*, husks, bran), was used to designate a condition of the skin and scalp characterized by the formation of scales. This was, in the light of our present knowledge, a very broad application of the term, and probably included, among other morbid states, that disease which we know to-day as *seborrhœa sicca*. The name *porrigo* was given by the Roman writers, notably Celsus, to pathological conditions of the skin attended by scale formation. It was not, however, until the latter part of the eighteenth century that any suggestion of a differentiation of the general class into specific types was made. Plenck, in 1783, described, quite concisely, a condition very similar to, if not identical with, our *seborrhœa sicca*, and stated that the flaky material was to be regarded as a product of the sebaceous glands of the scalp. His view was not generally accepted by his contemporaries; the term *pitryiasis* continued to be used in its comprehensive sense—including practically all squamous conditions—until well into the nineteenth century. A few investigators, however, seemed to have followed Plenck in the endeavor toward scientific differentiation. The terms *Teigne* (or *Tinea*) *amiantacée* and *T. furfuracée* were applied by Mahon to conditions apparently seborrhœic. Brett noted the occurrence of oily, scaling lesions upon parts of the body not covered with hair, and coined therefore the expression *acné sebacée*.

The terms *sécrétions morbides des follicules sebacées* and *flux sébacé* were used by Rayer in 1827, referring to morbid conditions of the sebaceous glands. In Hebra's time

and during the period immediately preceding him, dermatologists were still seeking a better separation of *seborrhœa* from the general class *pitryiasis*, with varying success. Fuchs, in 1840, it is said by Sabouraud, was the first to make use of the term *seborrhœa*.

In more recent years, largely as a result of the work of Unna, those cases formerly regarded as seborrhœa, in which an inflammatory process is present, have been set apart in a class by themselves, under the caption *eczema seborrhœicum* (which see). Unna himself would draw the line more closely, and would include in the class mentioned practically all types of *seborrhœa sicca*, since, he believes, inflammation is always present in these. His conception is not unanimously accepted in its entirety by dermatologists. The exclusion of the inflammatory process from seborrhœas, and their limitation strictly to functional disturbance, has greatly narrowed the field; it has imposed an added burden upon the diagnostician: that of determining where functional disorder ceases and organic change begins.

SYMPTOMATOLOGY.—The classification of seborrhœic conditions clinically is not a settled one, especially as regards minor distinctions. For practical purposes, however, two general types may be considered: *seborrhœa oleosa* and *seborrhœa sicca*. These have been variously designated by authors; the former has been called *steatrrhœa*, *seatorrhœa*, *seborrhœgia*, *sebaceous flux*, *acné sebacée fluente*, *hyperidrosis oleosa* (Unna); the latter, *pitryiasis simplex*, *seborrhœa furfuracea seu psoriasisformis*, *erythema capitis*, *acné sebacée sèche*, *eczema seborrhœicum squamosum* (Unna).

Seborrhœa oleosa may affect both the hairy and the non-hairy parts of the body. It most commonly appears upon the face and scalp, but it may occur on the chest, back, pubes, genitals, and in the axillæ. Obviously, in these latter regions it is seen much less frequently by the physician. When the scalp is involved the hairs are covered with an excess of oil; they are greasy to the touch; tend to mat together into bunches and strands, and in the uncleanly an offensive, rancid odor may be present. The scalp itself is generally pallid and cool, and is covered with an oily secretion; when the head is bald this gives the skin a shining, though sometimes muddy appearance. Itching is either absent or of a very mild grade; redness is not commonly present; when these are found to any pronounced degree, it is a fair presumption that some irritating factor has entered in to modify the classical type. Neglected cases of this type of seborrhœa affecting the scalp generally result in a severe alopecia.

Upon the face, the parts most involved are the nose (especially the alæ nasi), the adjacent parts of the cheeks, the chin, and the forehead. The unusual flux of fatty material gives the face a yellowish, oily appearance; in addition, a dirty, "smudgy" quality is imparted, owing to the ready adherence of dust and soot particles to the greasy surface. The orifices of the sebaceous glands are large, and are generally filled with a visible, yellowish-white plug. Upon pressure these are discharged upon the skin surface, and oily material exudes from the patulous ducts. Some redness may be present, more frequently about the alæ nasi, but usually the skin is cool and without inflammatory changes. Should these appear the condition can no longer be considered a simple seborrhœa.

The domain of *seborrhœa sicca* is disputed territory. Inasmuch as the questions concern largely the matter of classification, the writer will seek to give that symptomatology which has been accepted by the majority of dermatologists of the present time.

The most frequent type of *seborrhœa sicca* is seen upon the scalp in the condition commonly known as "dandruff." It is here characterized by the formation of fine, pulverant or flaky, and slightly oily scales, grayish- or yellowish-white in color, about and between the hairs. They may be scanty, requiring the use of the nail or a blunt toothpick to demonstrate their presence; or so abundant, especially upon the vertex and the regions im-

mediately anterior thereto, as constantly to shower the patient's shoulders with a flaky dust. Underneath the scales the scalp is pale, dry, and non-inflammatory. The hair appears to be deprived of its natural unguent, loses its lustre, becomes dry, thin, and atrophic, and eventually falls, the resulting alopecia being generally symmetrical and permanent. The subjective symptoms in mild cases are absent or very slight; if the scale formation is profuse there may be considerable itching and burning. This leads frequently to a modification of the clinical picture. The constant trauma from scratching in neurotic individuals who have neglected treatment soon induces a dermatitis, which, combined with already existing conditions, produces a type approaching *eczema seborrhœicum*. In these cases excoriated areas may be seen, usually small, upon which are formed yellowish, moist, friable crusts, distinctly greasy; beneath, a reddened, slightly exuding base may be found. The crusts, when removed, are quickly renewed; subjective itching and burning are quite pronounced.

Conditions similar to the characteristic *seborrhœa sicca* of the scalp are not uncommonly found in the eyebrows, eyelashes, mustache, and beard; it is more rarely seen in the pubic region. Upon non-hairy portions of the face, *e.g.*, the nose and adjacent parts of the cheeks, a continuous desquamation sometimes occurs; the scale is thin, grayish-white, and greasy; the skin is usually reddened and hyperemic. The relation of this condition to *rosacea* is very close. However, upon non-hairy portions of the body the crusting forms are more commonly seen. These are best exemplified along the edge of the scalp, about the ears, upon the nose and adjacent folds, between the shoulders, and in the sternal region. The secretion over the diseased areas forms crusts, which are yellowish, greasy, friable, and often rather bulky; the skin beneath is pale or, more often, reddened slightly. If a crust be removed with care, prolongations may be seen extending from the under surface into the gaping sebaceous openings. The crusting forms frequently exhibit a serpiginous border, slightly raised, and somewhat more reddened than the central portions. The periphery, too, bears a bulkier crust, while the centre is either clearing or entirely free from scales. This form is best seen upon the chest, the back, and along the frontal hair border. The terms "flower-leaf" and "petaloid" have been used to designate the type.

Seborrhœa may occur upon the genitalia. In the male it is manifested by the formation of quantities of white, cheese-like, glandular secretion, and epithelial débris about the posterior portion of the glans, the corona glandis, and the sulcus behind the latter. In the normal and cleanly individual functional hyperactivity of the glands of these parts is practically without symptoms; but in the filthy, from want of proper ablutions, and in the phimosed, from the anatomical conditions present, the retention of this secretion leads to various reflex nervous disturbances, and very frequently sets up a severe local inflammation. In the female, the secretion forms about the clitoris and the folds of the labia minora. If the individual be cleanly, there are no symptoms; in neglected young children and in the uncleanly, a vulvovaginitis may develop.

A form of crusting *seborrhœa sicca* occurring in infants is called *crusta lactea*, "milk crust." Imperfect removal of the vernix caseosa from the head is the probable cause, though it is stated that the condition may arise after perfect cleansing of the new-born child. The crusts may cover nearly all the scalp or be confined to a small area. As to physical character, they are variable: they may be bulky or thin, moist or dry, tough or friable, and present a color dependent upon the complexion and surroundings of the child. Generally they are greasy and rather adherent; the surface beneath is reddened and moist. It is probable that these cases should be regarded as instances of *eczema seborrhœicum*, since they present the picture of a dermatitis planted upon a seborrhœic base.

Kaposi, under the caption *ichthyosis sebacea*, has described a condition of the skin in infants which he re-