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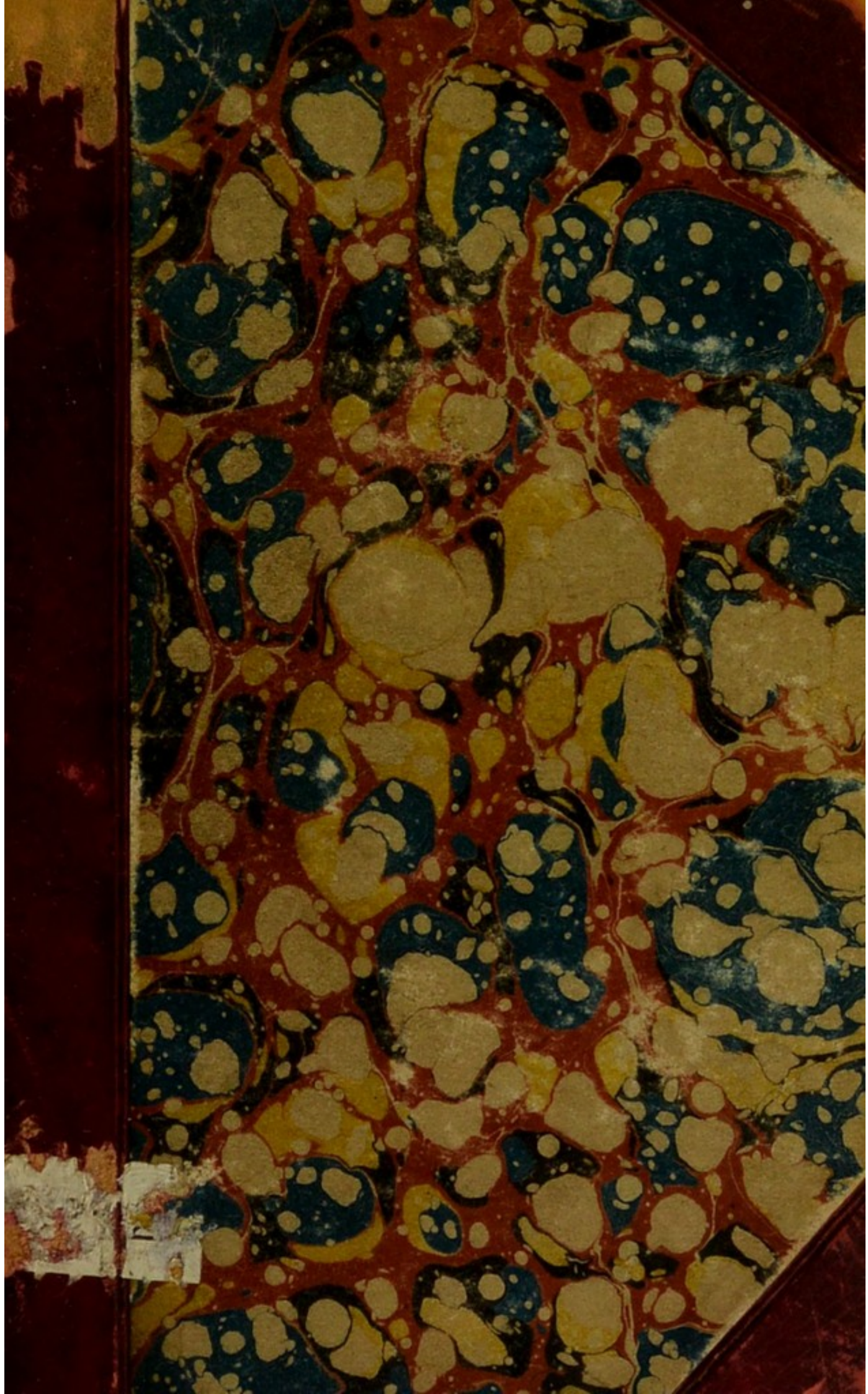
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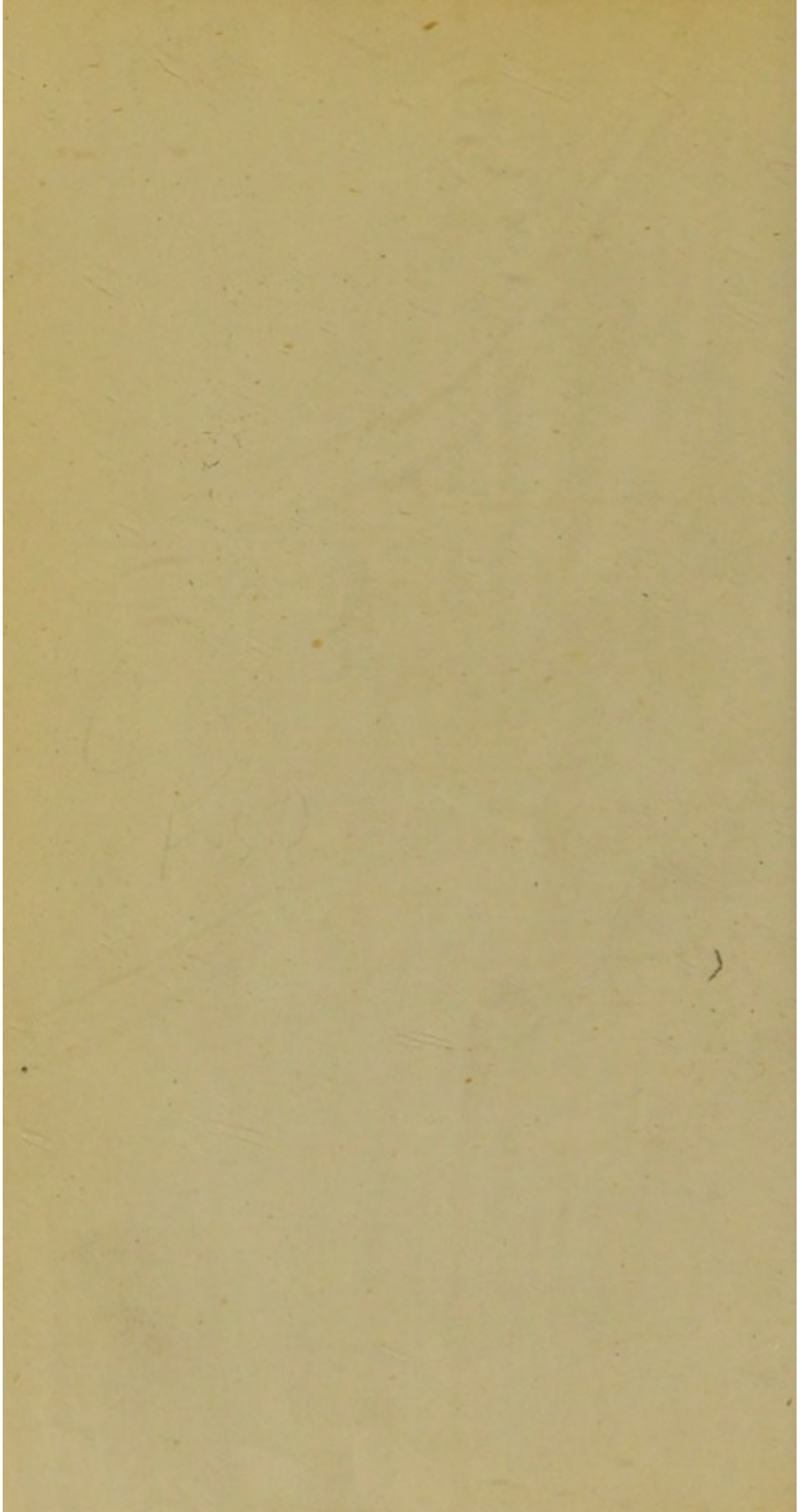
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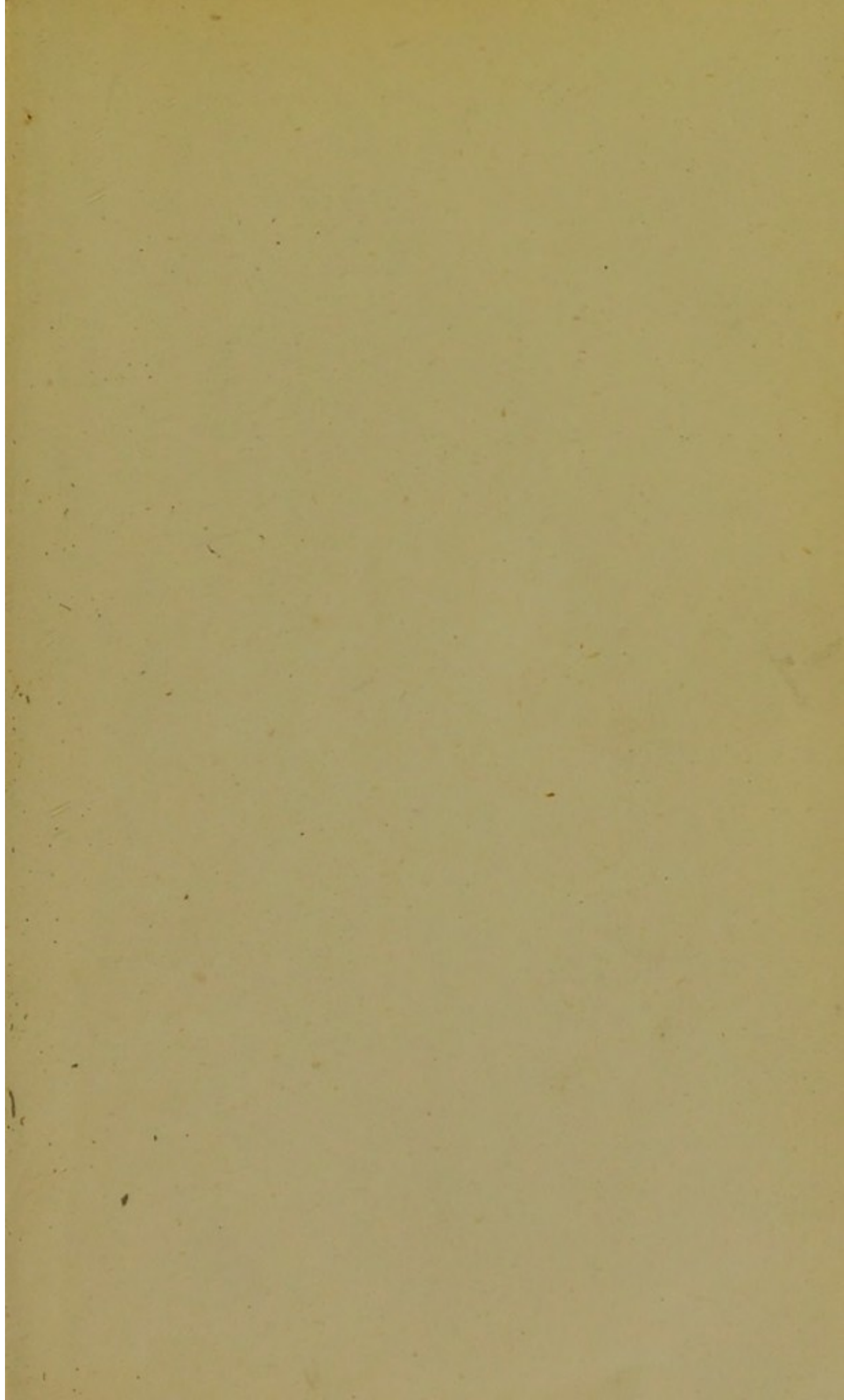


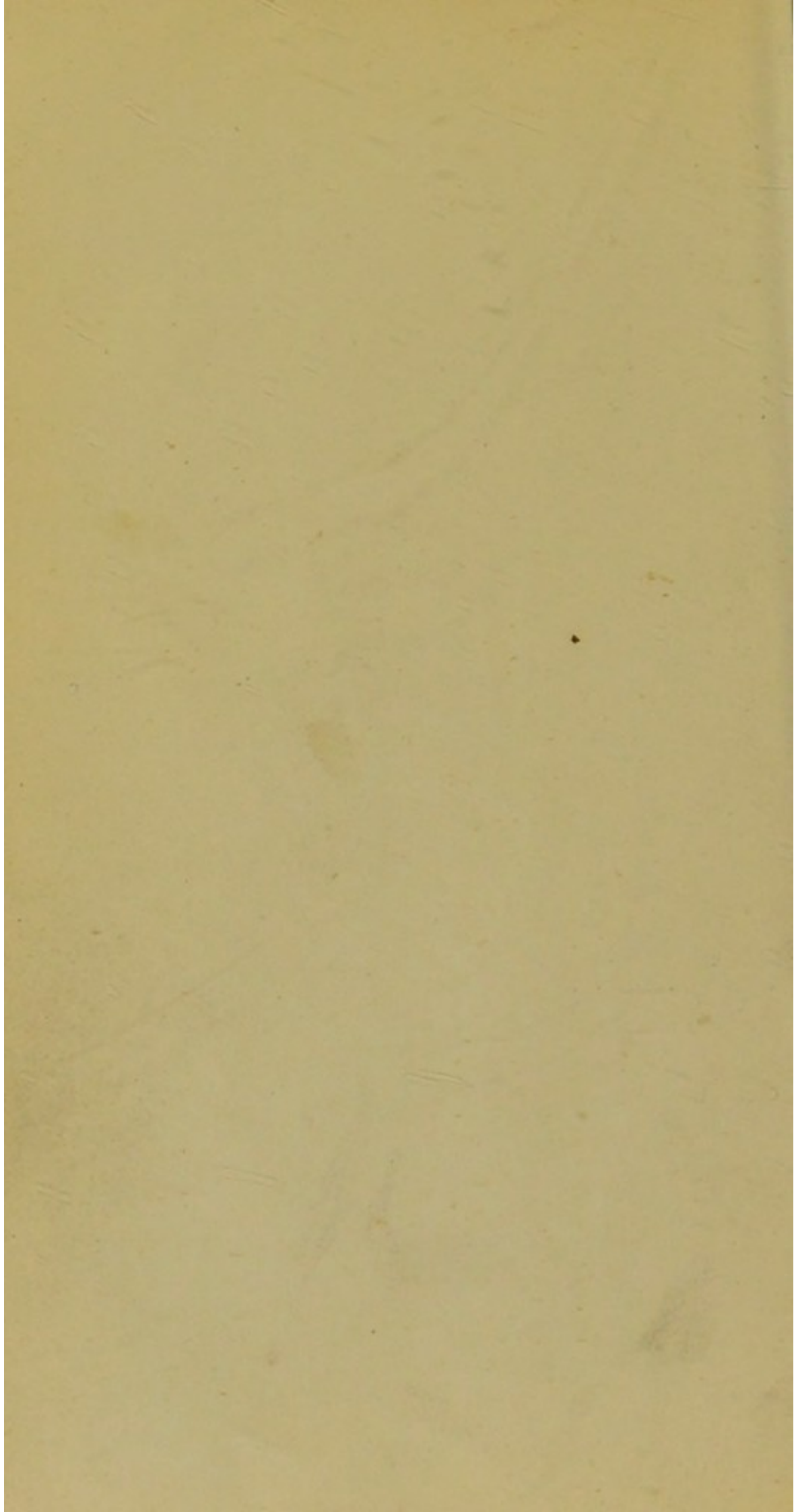
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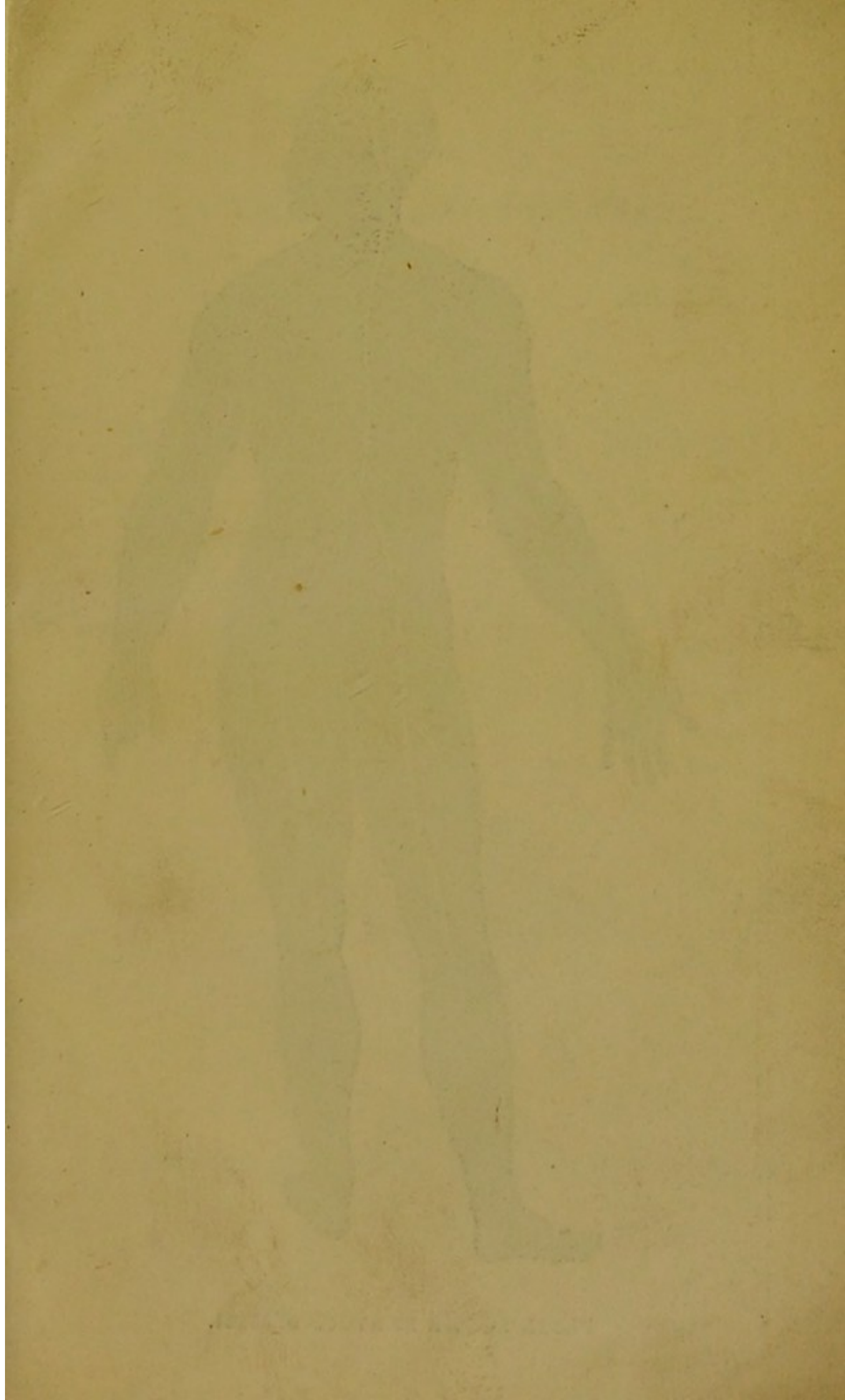




PLATE I.—THE NERVOUS SYSTEM.

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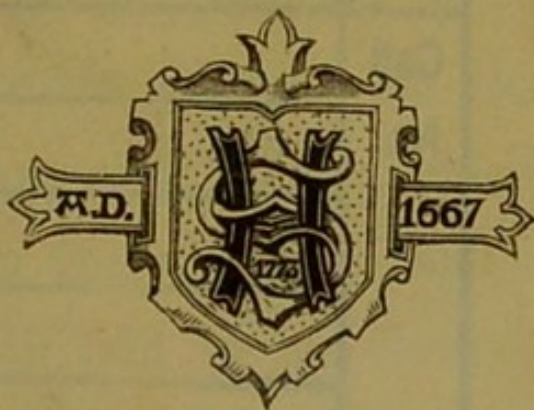
PRACTICAL TREATISE

ON

SEA-BATHING AND SEA-AIR,

BY

GEORGE HARTWIG, M.D.



LONDON :

SAMUEL HIGHLEY, JUN., FLEET STREET.

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1853.

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PREFACE.

The Author of this little work having practised during the last eight years in Ostend, which is annually visited by thousands of patients from all parts of Europe, for the purpose of sea-bathing, has had many opportunities of observing the effects of this powerful remedy, and of learning how it is to be used. Thus qualified, he ventures to appear before the public with the results of his experience, and feels confident, that although many faults of style and composition may justly be laid to his charge, he has at least not failed in the most essential point; and that no bather, who follows his directions, will regret having done so.

Ostend, 14th July, 1853.

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INTRODUCTION.

SUMMARY DESCRIPTION OF THE NERVOUS SYSTEM AND THE
DIGESTIVE AND RESPIRATORY ORGANS.

As the effects of sea-bathing and sea-air upon the human frame would be but very imperfectly understood without some knowledge of the structure and functions of the nervous system, and of its intimate connexion with the organs which are instrumental in forming, distributing, and cleansing the blood, from which all solid parts derive their nutrition, we deem it necessary to preface our little work with some preliminary notice on this subject, which being in itself of a nature to interest every reflecting mind, will, we hope, not prove unacceptable to our readers; particularly as we do not intend to task their patience with the dry details of a minute ana-

tomical description, but merely propose giving them a general idea of the mode in which those important functions are carried on, and of their mutual dependance on each other. Even a few pages will suffice to convince them, that to look for wonders we need not sound the heavens or dive into the depths of ocean, bearing as we do in ourselves the most signal proofs of the omnipotence and wisdom of our Creator.

The nervous system is composed of two principal groups: the one comprising the brain, the spinal-marrow, and the nerves, which are under the immediate influence of these central organs; the other, the numerous ramifications and ganglions of the great sympathetic nerve: the first presiding over the animal and intellectual, the second over the vegetative, functions.

The spinal-marrow (fig. I. *c*)—with which, as it is a less complicate organ than the brain, we will begin our description—is enclosed in

twenty-four separate bones or vertebræ, fitting on each other like rings, and firmly united by strong ligaments or cartilages, thus forming the spine, a column in whose structure, solidity and flexibility are most admirably combined, which affords the spinal-marrow every security against pressure and violence, and at the same time follows like a reed the slightest impulse of the will. Truly the very outworks of the citadel are magnificent !

The spinal-marrow, thus carefully protected, is composed of two anterior and two posterior chords, and thirty nerves (*e, i, k, l*) issue from it on each side of the body, each of them having two roots from the corresponding anterior and posterior chords. These two roots are originally separated, but soon unite to form one nerve, which, as it proceeds, divides and sub-divides itself into branches,—

———“small by degrees and beautifully less.”

In this manner the sixty spinal nerves are freely distributed over the skin and muscles

of the trunk, and of the upper and lower extremities. It had long been known that when a spinal nerve is cut through, the part to which it proceeds is instantly deprived of sensibility and motion; but Sir Charles Bell was the first to discover that sensibility exclusively depends upon the posterior roots—motion upon the anterior ones: that if, for instance, the posterior roots of the nerves of the arm are cut through, the arm entirely loses its sensibility, but can still be moved by the will; whereas if the anterior roots are divided, the part retains its sensibility, but becomes paralyzed as to motion. The experiment seems so simple, that we might well wonder at its having been made so late, if we did not remember that all great discoveries appear extremely easy, when once genius has pointed out the way.

Our great physiologist having thus made the most important advance in physiological science since Harvey discovered the circula-

tion of the blood, it was next found that each nerve is composed of a great number of separate microscopic fibres, running parallel, but having no internal communication whatever with each other, after they have once issued from the spinal-marrow. They, however, do not originate here, but proceed onwards to the brain, the only seat of sensibility and of will; for, if the spinal-marrow of an animal be cut through, all parts which receive their nerves from below the incision become entirely insensible and paralyzed, while those parts whose nerves have retained an uninterrupted communication with the brain, remain unchanged. Hence it might seem as if the spinal-marrow were only the trunk or aggregate of the sixty nerves which issue from it; but it possesses still other properties, for the nervous fibres, which are completely independent of each other after they have once left it, have the power of communicating their impressions to each other—of reacting one

upon the other—while they are still embedded in its chords.

The functions of the sensitive and motive fibres are completely distinct; the former conveying with electric rapidity impressions or sensations to the brain; the latter bearing with equal velocity its commands to the muscles, and bidding them contract or expand. A sensitive fibre is unable to produce motion, a motive fibre is incapable of feeling. When a sensitive fibre is strongly irritated, it conveys to the brain a sensation of pain; when a motive fibre is stimulated, it forces the muscle to which it proceeds to contract, but without producing any sensation in the brain. When a nerve composed of fibres of both descriptions is irritated, it produces at once pain and muscular contraction.

The brain, which may well be called the masterpiece of creation, as no other object is endowed with powers so wonderful, is divided into the cerebrum (*a*), the cerebellum (*b*), and

the medulla oblongata, the two former being each of them composed of two perfectly equal hemispheres. Twelve nerves issue from each side of the brain, some of which promote motion, while others are the conductors of the different kinds of sensations produced by light, sound, smell, taste, and feeling. With the exception of the olfactory and optic nerves, they all of them issue from the medulla oblongata, and its processes to the cerebrum and cerebellum, and here also all the spinal nerves originate. The medulla oblongata is the seat of sensibility and volition: here the innumerable sensitive and motive fibres unite as in a focus, and are each of them separately represented; to this point all impressions converge, and here the intellect plays upon the motive fibres as upon the chords of a harp, and determines endless varieties of motion.

The experiments made by the French physiologist Flourens, fully prove that the medulla oblongata is the seat of volition, and of sen-

sibility. For animals whose cerebrum was entirely removed, although in a comatose state, were still found capable of voluntary motion; being placed on their backs they rose; birds thrown into the air endeavoured to fly. After the cerebellum had been removed, the animals equally retained volition, they merely lost the power of executing and co-ordinating their intended motions. After an animal has lost its hemispheres all memory ceases, it does not reflect but still it feels. Cuvier rightly compares such animals to a sleeping person, who also seeks a more convenient position in his sleep, and thus gives signs of feeling. The sensations of a healthy, animated being must be distinguished from the attention devoted to them, and from the power of forming ideas from them, which are faculties of the cerebrum. Both the cerebrum and the cerebellum are insensible. The medulla oblongata is also the source of all respiratory motions. All other parts of the nervous system can be separated

from the body without death immediately ensuing, but as soon as this most vital part is touched, breathing ceases, and life becomes immediately extinct. The cerebrum is endowed with still nobler functions, for it is the vehicle of the mind, or rather the medium through which the mind is communicated; the seat of that mysterious connection between the body and the soul, which no human intellect will ever fathom. This is fully proved by comparative anatomy and the history of wounds; for the former teaches us, that as the intellectual faculties expand from the lower to the higher animals, their cerebrum is likewise found to increase in size and development; and we all know how the least injury to the brain immediately disturbs or suspends the operations of the mind.

Besides the voluntary motions, there are others, such as the beating of the heart, over which we have no control. In health we do not feel the contractions of our stomach, or

the pulsations of our arteries. With one word, the functions of nutrition or vegetation, the functions of those organs which convert food into blood, and make it circulate through innumerable channels, are removed from the sphere of our perception and independent of our will. But they are not so of nervous influence, as they are all under the dominion of the great sympathetic nerve, which although receiving many sensitive and motive roots from the spinal-marrow and the brain, and thus communicating with these great central organs, is composed of a number of small distinct nervous masses, called ganglions, which are disseminated over the head, neck, thorax, and abdomen, and from which innumerable nervous fibres issue forth, that accompany the arteries in their course, and branching out with them, direct the processes of vegetation throughout the whole body.

We thus see that the nervous system, in which as it were the supreme government of

all our organs and all our functions resides, is divided into distinct provinces, each endowed with peculiar powers. But all these distinct provinces are intimately connected, so that when an impression has been made upon any one of them in particular, it is speedily communicated to the others; and this communication does not take place in the nerves themselves, but in the central organs—brain, spinal-marrow, sympathetic ganglions—most likely through the medium of the gray substance, in which the white nervous fibres are there imbedded.

Whenever a nerve or a nervous organ is but moderately excited or stimulated, to all appearances the impression that has been made upon it does not proceed very far, but where the excitement is violent it spreads over a wide circle, and sometimes over all the provinces of the nervous system. Thus excessive joy, being an intense stimulation of the cerebrum, moves, as is well known, to

tears, makes the heart beat tumultuously, quickens the pulse, accelerates the respiration, and causes the whole frame to tremble.

In robust and vigorous constitutions impressions are not so easily transmitted from one set of nerves to another, each nerve having greater powers of resistance ; but where the body is very weak, a slight degree of moral or physical excitement will spread far and wide.

The different provinces of the nervous system are very rarely of equal strength in the same individual ; nay, the equilibrium is, perhaps, never perfect, so that an impression which leaves many nerves untouched, will cause uncommon excitement in others, and this accounts for the endless variety of symptoms which one and the same cause produces in different individuals.

After this brief and necessarily very imperfect survey of the functions of the nervous system, we will now attempt to delineate the series of processes that supply it with the

blood from which it derives its nutrition. This fluid is continually consumed by vital action, it must, therefore, be constantly replenished, and for this purpose a certain supply of food is requisite, which has to undergo the action of the digestive and respiratory organs before it is finally converted into perfect and vitalised blood.

The minute mechanical division of the food by mastication is the first step towards digestion. While the teeth are busy grinding and triturating it, and the tongue is actively employed in repeatedly thrusting it between their rows, the salivary glands (six in number; two parotid, two sub-maxillary, two sub-lingual, fig. II., 1) mix up with it a quantity of saliva, a fluid which has the property of taking up a large amount of atmospheric air, whose presence greatly facilitates the digestive process. The saliva also contains a chemical re-agent capable of dissolving the starch, which forms so considerable an ingre-

dient of our vegetable food, and thus renders it fit to be absorbed and conveyed into the circulation.

We see from this that the habit of ejecting saliva is not only disgusting, but also very injurious to health, as it squanders so valuable a digestive agent; and how highly important it is well to masticate one's food, which otherwise comes unprepared into the stomach, and must necessarily cause a more difficult and tardy digestion.

The morsel next passes through the pharynx and œsophagus (2, 3) into the stomach (4), where it is acted upon both in a chemical and in a mechanical way. For the coats of that organ secrete during digestion a peculiar, transparent, inodorous, acidulated fluid,—the gastric juice,—which is a powerful solvent of all azotised nutrimentary matters, such as muscular fibre, albumen, casëin, and converts the food into an homogeneous mass called *chyme*.

It was formerly believed that the process of digestion was a mere mechanical act, and that the great occupation of the stomach was to reduce the aliments into a pulp by pressure or friction.

This was first proved to be an error by Spalanzani, the illustrious physiologist of Modena. He introduced into the gizzard of birds hollow tubes filled with food, but perforated with small holes, so as effectually to prevent all mechanical action, while at the same time they admitted the gastric juice, and found that the solid aliments were as well digested as under ordinary circumstances; he next made crows and other birds swallow small pieces of sponge tied to a string, and withdrew them in a few minutes, after they had imbibed the juice of the stomach. He thus procured a quantity of the gastric fluid, which he mixed in small vases with minutely divided food, and found that after a few hours it was as completely con-

verted into chyme as if its digestion had taken place in the stomach itself.

Many subsequent experiments made on man have completely confirmed the accuracy of Spalanzani's observations, so that the gastric juice is undoubtedly the principal cause of the alterations which food undergoes while in the stomach; but at the same time the vermicular contractions of that organ during the process of digestion, set its contents into motion, so that new layers of food, moving along the coats of the stomach, are continually brought into contact with newly-secreted gastric juice, until the entire mass is completely mixed up with it.

During the first period of digestion, the pylorus (5), or the opening which leads from the stomach into the intestines, remains closed, but as soon as chymification is in progress, its resistance gives way, and the contractions of the stomach gradually and progressively force the chyme to pass

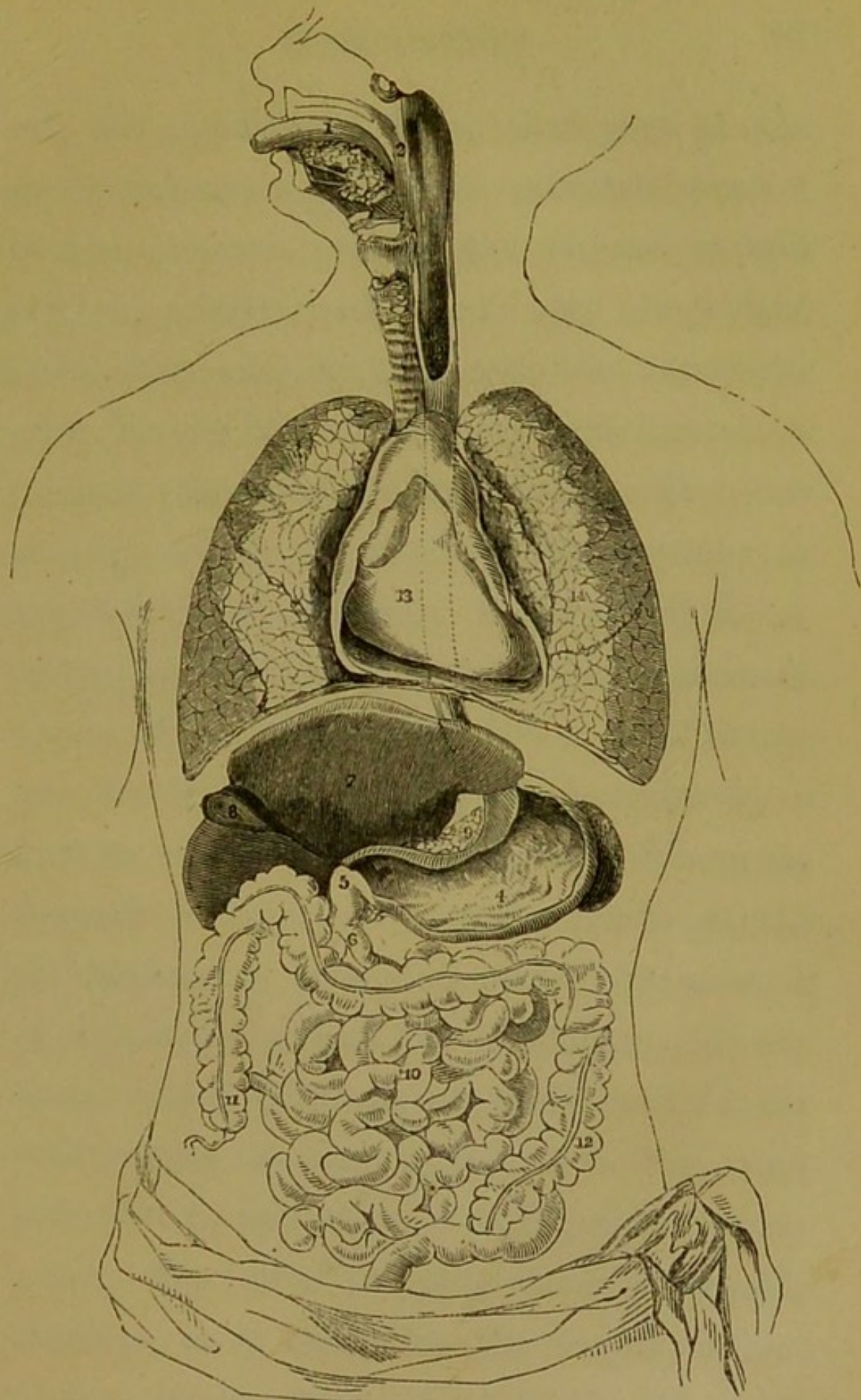
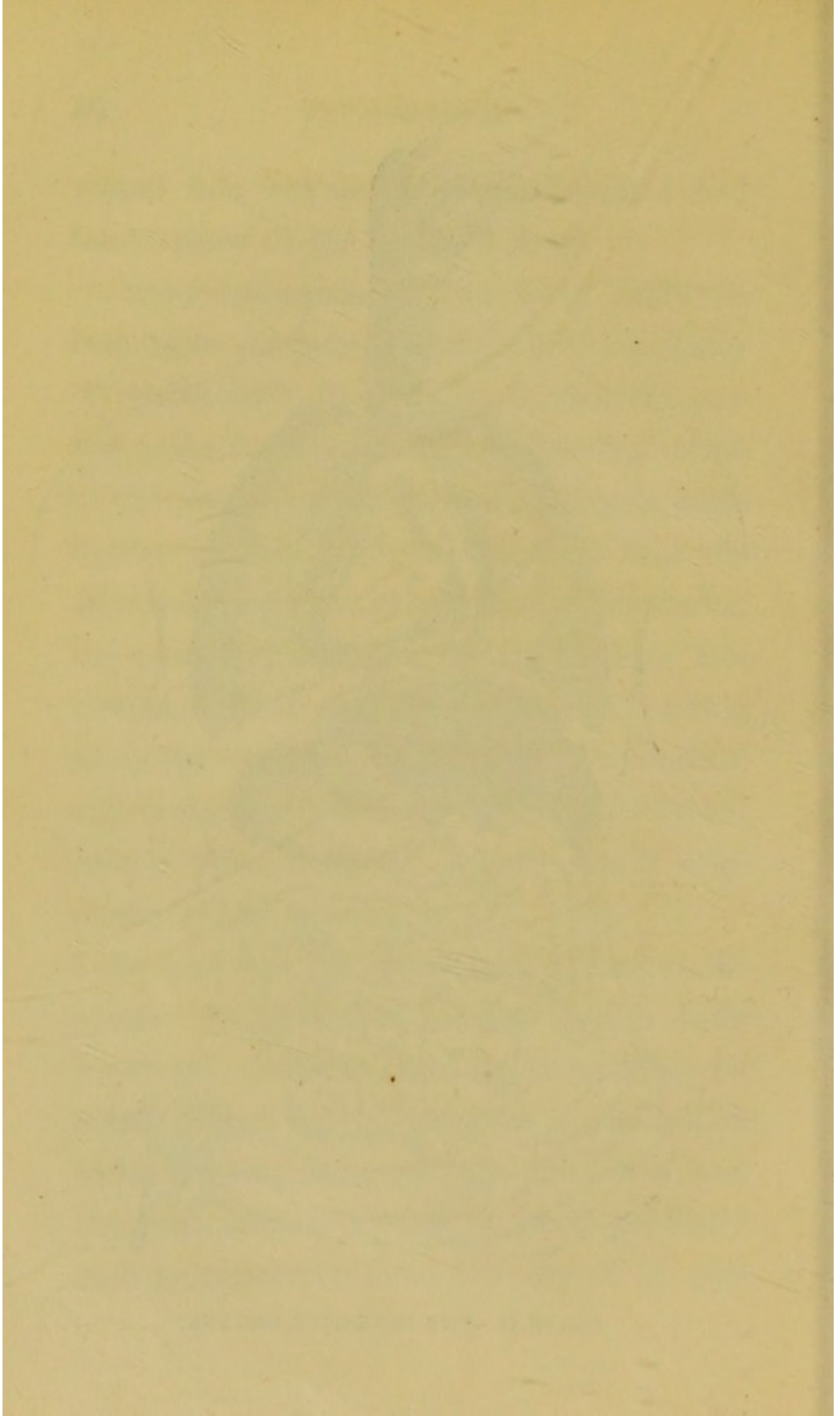


PLATE II.—THE DIGESTIVE ORGANS.



into the duodenum (6), or that part of the small intestines which is situated nearest to the stomach. Here the chyme is still further mixed with two very important fluids, the bile, or gall, and the pancreatic juice, besides the mucus which facilitates its progress through the intestines. The bile or gall, which we need hardly describe as a yellow and extremely bitter fluid, is secreted by the liver (7), the most voluminous viscus of the body, and flows from thence into the gall-bladder (8), which opens by a duct or canal into the intestine. When the stomach is empty the gall remains in the gall-bladder as in a store-room, but as soon as chyme passes into the duodenum, the stimulus which it effects on the mouth of the duct causes the gall to flow into the intestine, and to mix with it as it gradually proceeds. The use of the bile, which is strongly alkaline, is to neutralise the excess of acid of the chyme, and to saponify the oily mat-

ters which had not been changed by the action of the gastric juice. The pancreatic juice, which has great analogy with saliva, is secreted by the pancreas (9), a large gland situated behind the stomach, and likewise flows into the intestine while the aliments are passing through it. It materially assists digestion by finally dissolving the starch or fecula which had not yet been decomposed by the saliva.

While thus the *chyme*, being forced along by the vermicular contractions which it provokes, advances further and further into the intestinal canal (10), where the solvents contained in the bile, and in the gastric and pancreatic juices continue their action, the lymphatic vessels, which line the mucous membrane of the digestive tube, are at the same time continually busy in extracting the fluid nutrimentary matters from the excrementitious residue, and conveying the *chyle*, as the absorbed liquid is now called, into the

thoracic duct, whence it flows into the current of the circulation of the blood.

Even in the cœcum (11), and still lower down in the colon (12), absorption of nutrimetary matter still continues, and it certainly is an admirable provision of nature, which always goes economically to work, and allows no waste whatever, that the intestines, although comparatively occupying a small space, extend to a length equal to six or seven times that of the entire body, and thus give the lymphatic vessels full time to exhaust as it were, all the nutriment which the food contains. The thoracic duct opens into the subclavian vein; so that the chyle, which during its passage through that canal had gradually changed its milk-white colour into a rosy tint, flows along with the current of venous blood into the heart (13). Unfortunately our limits do not allow us minutely to describe the admirable mechanism of that organ; we shall, therefore, merely state, that

it is divided into four separate compartments: two auricles, and two ventricles; all of them being provided with valves, that do not allow the blood, which has entered them on one side, to return by the same opening, but force it to flow onwards through another. Thus the chyle, flowing along with the venous torrent into the right auricle, is driven thence into the right ventricle, which, by contracting, impels it through the pulmonary artery into the lungs (14). Here it meanders in innumerable capillary vessels along the coats of the minute pulmonary cells, where it is exposed to the action of the atmospheric air, and is thus at length formed into perfect and vitalized blood.

Having undergone this change, it returns through the pulmonary veins to the left auricle of the heart, flows into the left ventricle, and is thence impelled into the great aortic artery, which, extending its branches throughout the whole body, supplies every

organ with its due proportion of vitalized oxygenated blood.

While it is flowing through the capillary veins of the organs and tissues, and restoring their wasted parts, many worn-out particles mix with it, so that in this state it is no longer fit for nutrition, and requires to be again refreshed in the lungs, which it reaches through the medium of the veins, in the way we have already described. Thus a conversion of arterial into venous, and of venous into arterial blood, perpetually takes place in our bodies, and requires the unremitting exertions of the heart and lungs. It may here still be remarked, that both auricles contract at the same time, and are instantly followed by the simultaneous contraction of both ventricles. In the same moment that three or four ounces of blood are impelled by the latter into the pulmonary and aortic arteries; three or four ounces of blood flow from the *hollow* and pulmonary veins into the auricles, and so on

in an uninterrupted stream. The quantity of blood contained in the body is valued at about thirty pounds in adults, and each contraction of the ventricles, impels about two ounces of vitalized or oxygenated blood into the aortic artery. As the heart of a middle-aged adult contracts about seventy times in a minute, the whole mass of our blood passes through the aorta in little less than four minutes, or in other words, each particle of blood requires only that short space of time for its double transformation. The lungs, although they exhale carbonic acid, and supply the blood with oxygen, do not suffice to purify it of all the effete particles, which the wear and tear of the vital process continually mixes with it; other organs besides are constantly employed in secreting worn-out matters, and conveying them out of the body; such as the skin, the kidneys, and the liver.

All these truly wonderful processes by which blood is made, distributed, and purified, are

completely under the influence of nervous power, and can only be adequately performed as long as the nerves of the digestive, circulating, and respiratory organs are endued with healthy energy.

In their turn, the functions of the nervous system can only be properly fulfilled as long as it derives adequate nourishment from a sufficient supply of oxygenated blood. When the circulation in its tissue is languid, its energies will of course be diminished, and where the quality of the blood is bad, being either impure or too watery, or too rich in plastic parts, the nervous functions will also necessarily be impeded, for how can healthy action be kept up in organs which are fed from an unhealthy source?

Thus we see that our health mainly rests as well upon the integrity of the nervous functions, as upon a good condition of the blood, and how mutually dependant the solids and fluids are upon each other. All

our organs and functions form in fact one continuous chain, and at whatever point disease may originate, whether in the blood or in the solids, it does not confine its effects to one or the other of them, but soon makes itself felt throughout the whole economy.

We will now proceed to show how the sea-bath, while rousing the energies of the nervous system, improves at the same time the blood, and thus gradually effects that complete harmony between all parts of the body which essentially constitutes health.

CHAPTER I.

THE MODE OF ACTION AND THE EFFECTS OF SEA-BATHING
UPON THE HUMAN FRAME.

SEA-BATHING on the British coast—for its action is very different in the tepid waters of a warmer climate—owes its efficacy to the combined influences of cold, of the saline particles which enter into the composition of sea-water, and of the shock produced by the impulsion of the waves. In order fully to understand its effects, we must therefore endeavour to form a just estimate of the power of each one of these agents individually.

The first impression produced on the body of the bather by the cool temperature of the sea, which rarely even in the heat of summer exceeds 67 degrees, consists in a more or less

unpleasant sensation of cold and shivering; the respiration is spasmodically accelerated; the skin contracts; the blood is driven to the inner parts; the pulse becomes small and frequent. These primary symptoms of depression, which appear with greater force the slower one enters into the water, the lower its temperature, and the less the weakened body is able to resist external impressions, owe their origin to the hostile effect of cold, which tends to diminish vital action by withdrawing from the body the warmth which is necessary to its existence. But the living body possesses the faculty of reacting against all sudden changes which disturb the harmonious play of its functions. The depression momentarily caused by the contact of the cold is therefore soon succeeded by symptoms of an opposite character. The blood which had accumulated in the inner organs, returns again to the surface with accelerated flow; the unpleasant sensation of cold is followed

by an agreeable feeling of warmth; the contracted pulse beats vigorously; the oppression on the breast, the spasmodic respiration, the palpitation of the heart,—all disappear.

If the bather leaves the water while this salutary reaction is in its full vigour, or more generally speaking after a short bath, he will find by experience that increased vital action will continue for some time afterwards, and plainly show itself by a heightened feeling of strength, a greater vivacity in his motions, a more genial flow of his spirits, and an increased appetite. But if he continues to remain in the water so long as to allow the cold once more to gain the mastery, then the primary symptoms of depression will reappear; but this time, as can easily be imagined, with an increased intensity, so that a feeling of cold, weakness, and indisposition often prevails for hours after a bath thus injudiciously protracted, which, instead of strengthening, undoubtedly debilitates the frame.

The invigorating influence of cold shows itself in the common river-bath as well as in the waters of the sea ; but in the latter it is very considerably heightened by the saline particles with which sea-water abounds, and by the shock of the waves. Of the stimulating power of the latter, he only can have an adequate idea who has himself felt the difference between bathing in a calm or in an agitated sea. The mighty impulse, dashing against the body, rouses with electrical rapidity all the energies of the frame, and promotes in an astonishing degree the rapidity and strength of the reaction, which follows upon the first impression of the cold. Every time that a strong wave touches the bather, it seems to pour new warmth, new vigour into his veins, and not unfrequently raises his spirits to boyish exclamations of delight. No wonder that he complains when Ocean is at rest. The salts, finally, which are contained in sea-water in a proportion of about one

thirty-third part of its entire weight, produce a stimulating effect upon the skin, and determine a more copious flow of blood to that organ: assisting the reaction provoked by the cold, and at the same time shortening and diminishing its primary depressing effect. It is owing to their presence that one can agreeably bathe in the sea at a much lower temperature than in sweet water. Reaction, even in vigorous natures, is generally slow in making its appearance in a river; in the sea, even where its surface is unruffled with a wave, it is almost instantaneous, and much more powerful. The agreeable glow, the light burning of the skin, which lasts for hours after bathing in the sea, and which is never felt either so intensely or so long after immersion in sweet water, likewise proves how greatly the saline qualities of the sea contribute to its effects. We are not of opinion that during the short duration of a cold sea-bath, absorption of saline particles

through the skin takes place in any notable degree.

Having thus briefly described the agencies to whose combined influence the sea-bath owes its paramount rank among all strengthening remedies, we will now point out the changes which it operates in the human frame.

It is evident that its first effect is powerfully to stimulate the numerous sensitive nerves of the skin; but these, as we have explained in the introduction, instantaneously convey the profound impression they have received to the spinal-marrow and the brain, and these central organs in their turn carry it onwards through all the ramifications of the nervous system. All our organs being under the supreme influence and direction of the nerves, every part of the body must, therefore, be excited and stimulated by the sea-bath, as when a bell is struck the vibration extends over every particle of the metal.

Hence we see how erroneous it would be to ascribe all the benefits of sea-bathing to its local action on the skin, since its immediate consequence is nothing less than a general stimulation of the whole nervous system, or rather through its mediation, of all the organs which constitute the human body. But every stimulation of an organ which does not exceed its powers, causes an increased flow of blood to the part, promotes circulation in its tissue, favours its nutrition, and finally increases its strength, as we plainly see by the invigorating effects of practice and exercise; when, therefore, the whole body, or some particular organ has been weakened, so that the blood no longer circulates with sufficient activity in the enfeebled frame, which being badly nourished, is, of course, incapable of vigorous exertion: the sea-bath necessarily tends to remove this debility, by stimulating nutrition in every organ, and consequently improving its functions.

While these changes are going on in the solid parts, those which are effected in the composition of the blood are no less remarkable and important; for the secreting organs necessarily partake of the general stimulation; the cutaneous transpiration augments; the urine becomes more saturated; the liver pours out a greater quantity of bile; a more active respiration consumes a greater quantity of carbon, so that in consequence of this increased activity the blood gradually purifies itself of a mass of worn-out particles, which the body tolerated as long as it was in a languid state, but which, being now awakened to greater energy, it casts off as an intolerable load. At the same time the more active vegetation, which prevails in all parts of the body, necessarily increases the want of food; the appetite improves; digestion becomes more vigorous; so that the blood grows gradually richer in plastic nutritious parts—in fibrine, albumen and globules

—and at length completely harmonizes with the wants of a more vigorous vital process. Thus, the sea-bath making the solid parts capable of attracting a greater quantity of blood, and the blood more capable of nourishing, acts at the same time upon the chief elements of life, and assists one through the other to climb the steps which lead to the sanctuary of health.

Next to its strengthening influence, its alterative action must not be overlooked, for it is the necessary consequence of a more energetic vegetation gradually to remove every vitiated or useless particle from the composition of the body. Thus we see under the influence of sea-bathing, swollen, and even indurated glands, scrofulous tumours, and cutaneous eruptions melt and disappear.

By merely considering it as an excellent, and in many cases unequalled, tonic, we should therefore not yet form an adequate idea of its extensive powers, for it may be deserv-

edly employed as a resolvent, alterative, and depurative remedy, wherever the consequences of an increased stimulation of the body are not to be apprehended.

CHAPTER II.

THE DISEASES AGAINST WHICH SEA-BATHING IS PARTICULARLY EFFICACIOUS: SCROFULA, RICKETS, NERVOUS DEBILITY, NERVOUS COMPLAINTS, DYSPEPSIA, WEAKNESS OF THE SKIN, TORPIDITY AND PARALYSIS, PASSIVE HÆMORRHAGIES, LOCAL WEAKNESSES.

DEBILITY, which is the chief and fundamental character of all the diseases for which sea-bathing is found to be one of the best remedies, shows an immense variety of symptoms, according to the different parts which it affects, and to the age, sex, constitution, and temperament of the sufferers. In children it frequently appears under the form of scrofula, which is either an hereditary complaint, or the result of a faulty physical education. Scrofulous children are distinguished by a peculiar habit of body, which plainly shows

the origin of all their evils to be weakness. They are either irritable subjects with a delicate thin skin, which allows the blood-vessels to be seen under it, and thus gives rise to a delusive appearance of health, or of a phlegmatic nature, with pale, bloated faces, a thick upper lip, a swollen nose, and an enlarged abdomen. Their blood is watery, containing less fibrine than healthy blood, and consequently affording the solid parts an imperfect nutrition; their membranes are relaxed; their muscles are soft and without energy. Their circulation being feeble and languid, they are deficient in animal warmth, and but little able to bear the vicissitudes of a cold and moist climate. This peculiarly unfavourable state of body, where weakness of the solid parts is united with a faulty composition of the blood, disposes them to a variety of most serious local diseases, characterised by excessive obstinacy, such as chronic inflammations and tumours of the joints, which

frequently maim them for life ; inflammations of the eyes, which not unfrequently cause blindness ; ulcers and eruptions, cold abscesses, curvature of the spine ; caries of the bones and disorganizations of the glands.

The principles on which the treatment of scrofula reposes are, 1st. to make better blood ; 2nd., to strengthen the solids ; 3rd., to give vigorous action to the circulation ; and for all these purposes there surely exists no better remedy than sea-bathing ; for it not only improves the vegetation of the solids, but at the same time effects a salutary change in the composition of the blood, and gives vigour to the circulation, thus attacking the disease on all sides, and fulfilling all indications at once.

A sea-bathing cure repeated during several consecutive years, and properly supported in the meantime by a strict observance of all the rules which an enlightened physical education prescribes, changes by degrees the

whole constitution, makes children, originally scrofulous, grow up strong and healthy, and thus enables them to escape the dangers which otherwise might have made them miserable for life or shortened their existence. Cold sea-bathing, however, does not agree with all cases of scrofula, and its use would be highly injurious where the patient is in an irritable state, and suffering from inflammation of a more acute nature, with a tendency to suppuration; but wherever this irritable, inflammatory habit does not exist, it is able to cure the most inveterate forms of the disease, such as enlargement of the mesenteric glands, accompanied with obstinate diarrhoea and infiltration of the lower extremities, white tumours, caries of the spine, considerable enlargements of the absorbent glands of the neck, &c.

In many cases it will be found necessary to begin the cure with warm sea-baths, or even to confine oneself during one or two

seasons to their exclusive use, in others the douche-bath, or the internal use of sea-water may be advantageously employed during a course of sea-bathing. The judicious union of these different means, and their proper adaptation to the individual case, evidently require great skill and attention ; so that it would be the height of imprudence to let children bathe without taking the advice of an experienced practitioner.

A similar constitution to that we have just described, gives rise to the rickets, which by some authors, are considered as a variety of scrofula. The softening, and consequent inability of the bones to bear the weight of the body, and to withstand muscular action, causes the most dreadful deformities, which, when once fully developed, can frequently be no longer remedied, but as long as the disease is still in its first stage, sea-bathing is able to cure it radically, and entirely to obviate its disastrous consequences. But

here also great care will be necessary in using this energetic remedy, as rickety children have very little power of reaction. In the beginning of their cure they should therefore be bathed every other day in a warm or tepid salt-water bath; whose temperature may gradually be diminished, so as to prepare them for cold bathing. If the latter, although used with the greatest precaution, is found not to agree with them, taking away their appetite, provoking cough, diarrhœa, restlessness, and ill-humour, it must be immediately suspended, or even deferred till the next season.

That sea-bathing, which so powerfully rouses the energies of the nervous system, and secures its vigour on the solid basis of an improved nutrition, should prove itself to be a most excellent remedy against almost every form of nervous disease, from simple nervous debility or irritable weakness, to epilepsy and inveterate hysteria, cannot be a matter of surprise.

Irritable weakness of the nerves is a very common complaint, displaying a great variety of symptoms, which are differently grouped in each individual case, according to the nervous provinces most affected with debility. The intelligence is frequently quick and lively, but incapable of fixing its attention for any length of time on one subject; energy is found wanting in all its functions. The spirits are very unequal, but generally more inclined to melancholy. The patient loves solitude, sighs and weeps without any cause, and wishes for death, though fortune smiles upon him. Slight affronts and vexations make a deeper impression upon his mind than is consonant with his age or sex, and while a trifle casts him down, a trifle again makes him as immoderately joyful. He is easily led away by the whim of the moment, and is completely under the government of his caprices. He is subject to a variety of disagreeable sensations, which are unknown

to stronger nerves. His slumbers are light and uneasy; he frequently changes his position, and his lively dreams are attended with gesticulations and talking. Changes of temperature affect him very much. His pulse is small and frequent; his movements are quick, but without energy; and fast walking soon takes away his breath. The blood is unequally distributed; while the head glows, the feet are cold. He cannot support hunger long without feeling completely exhausted, and stimulating food heats him very much. His appetite is soon satisfied, and speedily loses itself if the accustomed time for meals is suffered to go by. Impressions of all kinds extend more easily from one nervous province to another; the mind is affected by slight bodily changes; and trifling emotions quickly disturb the functions of the body.

This irritable state of the nerves, which although it may not yet have assumed any

definite form of disease, is frequently quite sufficient to embitter or lessen the enjoyment of life, finds a most decided antagonist in sea-bathing, which by increasing the tone of the nervous system, at once removes a host of disagreeable sensations or little weaknesses. It is true, that where nervous irritability is constitutional or hereditary, nothing in the world will entirely cure it, but at any rate sea-bathing will be found more efficacious than any other remedy to alleviate many of its symptoms, and prevent it from gaining ground or assuming a worse character.

Neuralgic pains may arise in all sensitive nerves, but in no part of the human body are they of more frequent occurrence than in the skin, owing to the vast number of sensitive fibres possessed by this organ, and to its being exposed to so many causes of disturbance. Neuralgic pains sometimes depend upon affections of distant organs, requiring a different treatment; or upon

incurable disorganizations, but generally they are nothing else than an exaggeration of irritable weakness in a particular nerve, and in these cases, sea-bathing is recommended as one of the most appropriate remedies by the best authorities; amongst others, by Professor Romberg of Berlin, in his classical works on the diseases of the nerves. Tic-douloureux, ischias nervosa, cramps in the stomach, nervous colics, painful menstruation, and nervous headaches, have frequently been cured by sea-bathing.

Excessive irritable weakness of the motive nerves does not reveal itself by pain, but by increased and disordinate motions, by spasms. Thus in St. Vitus' dance, the arms and legs and muscles of the face, are in a perpetual agitation, and the will has lost all control over them. Children of a weak and irritable constitution, between nine and fifteen, are most liable to this complaint, for which no remedy is found to answer better than

repeated immersions in cold water, and particularly in the sea.

Weakness of digestion, as it is one of the commonest forms under which nervous irritability appears, is also one of the most troublesome. Where the muscular system in general is deficient in energy, owing either to a diminution of nervous power, or to a faulty state of the blood, as in chlorosis for instance, where iron is wanting in its composition, the muscular fibres of the stomach frequently participate in the general weakness. But we have seen in the introduction that the contractions of the stomach play a great part in the digestive process, by thoroughly mixing the food with the gastric juice; when, therefore, the muscular fibres are in a weakened or irritable state, a meal which is either less easily digestible, or more copious than is consonant with the diminished energy of the stomach, very readily provokes a tardy and difficult digestion, accompanied with that

long train of disagreeable symptoms that attend upon dyspepsia.

Another great cause of a weak digestion lies in the altered condition of the gastric juice, and this may proceed as well from irritable weakness of the ganglionic nerves, as from a faulty composition of the blood. The secretion of the gastric juice depends upon nervous influence; mental emotions suddenly stop it, and this is the reason why they are so apt to produce indigestion when they take place during our meals. It therefore stands to reason, that when the nerves of the stomach are deficient in their natural energy, the qualities of the gastric juice must also be impaired, and digestion consequently suffer. And when the composition of the blood deviates from the standard of health, as in chlorosis, or in persons who have suffered great losses of that fluid, so that it is become watery, and deficient in globules and plastic parts, then also the gastric juice will be found

wanting in quality or in quantity, and unless great care be taken, dyspeptic symptoms will very easily ensue. Now it is evident that sea-bathing is able completely to correct both the muscular debility and the impoverished state of the blood, which are at the bottom of so many cases of dyspepsia; and thus it frequently effects radical cures of this complaint, where all internal remedies have only afforded palliative relief, or have proved totally ineffectual.

It frequently happens, that after a serious illness a prolonged weakness of the body, or of particular organs and functions, remains behind. Thus, after a nervous fever we often see weakness of the memory, deafness, giddiness, swimming in the head, pains in the limbs, weakness of digestion, persist for a length of time. Inflammations of important organs although cured, are succeeded by great debility of the part. After serious attacks on the constitution, as after poisonings and cholera,

it has often the greatest difficulty to recover, and would undoubtedly sink if means were not resorted to, to rouse it to more energetic action. Rheumatic and arthritical complaints are not unfrequently followed by permanent weakness or lameness of the affected part. After a violent sprain or dislocation, the debilitated limb is unable to perform its functions with the same energy as before the accident took place. All these are cases where the patient may expect the greatest benefit from sea-bathing. A great many disorders arise from weakness of the skin, which, besides being the principal seat of feeling, is also one of the chief organs of secretion; for a healthy adult loses daily by imperceptible transpiration no less than two pounds weight, which is a greater quantity than is evacuated either by the kidneys, the liver, or the lungs. Transpiration may be either insufficient or too abundant, and in both cases the health must suffer; for, in the first, many effete matters

will remain in the circulation, and vitiate the blood ; and, in the second, the body is weakened by a considerable loss of humours. Want of cleanliness by closing the pores of the skin, and too warm a clothing by relaxing its tissue, are frequent causes of these functional defects. Keeping the skin too warm has also the further evil consequence of making it extremely liable to catch cold, so that the slightest change of temperature suffices to disturb its functions, and to cause by reaction illnesses in inward parts, thus provoking habitual catarrhs, sore throats, croup, bronchitis, rheumatism, erysipelas, diarrhoea, colic, spasms, neuralgic pains, and a variety of other complaints too long to enumerate.

Since therefore an impaired activity of the skin is so fertile a cause of disorders, it is evident that by strengthening its tissue, and thus improving its functions, we must cut off the source of a great many illnesses ; and where can we possibly find a better means

for that purpose than sea-bathing? which, besides acting on the skin, as upon all other organs, through the medium of the nervous system, stimulates it in a direct and immediate way. The very sea-air has a strengthening influence on the skin; for the saline particles which it contains act like a gentle stimulant upon that organ, and improve its nutrition.

General or partial weakness of the nerves not always shows itself in increased irritability, but also in diminished action, in torpidity. Thus many persons suffer from constipation, owing to an inactivity of the intestinal nerves, which causes a great many disagreeable symptoms, such as want of appetite, heaviness of the head, giddiness and lassitude. The use of the sea-bath radically cures this complaint where all other remedies had failed, and thus affords the most convincing proofs that its exciting and stimulating action extends as powerfully over the vegetative func-

tions, as over those parts which are under the immediate dominion of the spinal and cerebral nerves. Paralysis is often the result of organic diseases, and here the sea-bath would be either injurious or useless; but it is also frequently the highest degree of torpid weakness, and in these cases benefit may be expected from its use; for all remedies that suddenly stimulate the skin in a considerable degree, make, by irradiation and reflexion, a powerful impression on the spinal-marrow and the brain, and are able to waken the dormant energies of any part of these central organs.

Sea-bathing is also found to be an excellent remedy where females have been considerably weakened by great and repeated losses of blood; and also where, in consequence of general languor and debility, the catamenia are not sufficiently active. In consequence of hereditary disposition, of a sedentary way of life, of excesses in eating and drinking, or of

the abuse of purgative medicines, the blood frequently stagnates in the abdominal organs, and thus gives rise to a great variety of disorders. For the originally affected parts are not the only sufferers; being swollen and distended, they also hinder the activity of neighbouring organs. The digestive process suffers either in the stomach or in some lower part of the intestinal tube, according to the seat of the stagnation, and the mixture of the blood soon becomes faulty, as the first important act of its formation is disturbed. Thus most cases of arthritis, hæmorrhoids, and gravel, originate in abdominal stagnation. And as the nerves, which preside over digestion, are also in a suffering state, they react on the central organs, and may thus give rise to most severe nervous complaints, such as profound hypochondria and melancholy. In many cases of this description, where the evil is as yet only in its first stadium, sea-bathing will be found an excellent remedy, as it promotes a more

equal distribution of blood over the whole economy, and strengthens the tone of the relaxed vessels ; and where in more deeply-rooted cases the use of resolvents and deobstruents is required, it will frequently be found of very great service as an after-cure.

We could still add a number of diseases in which sea-bathing proves its efficacy, but as those we have already mentioned suffice to give the general reader an idea of the great range of its utility, we will not tire his patience with any further details on a subject which is one of more particular interest to the disciples of Hippocrates.

CHAPTER III.

THE ABUSE OF SEA-BATHING.

SEA-BATHING is undoubtedly one of the most powerful remedies, and when we consider the important changes it brings about in the economy, how profoundly it stimulates vegetation, and how completely it alters the mixture of the blood, there can be no doubt that when employed in the wrong place, its consequences must be as pernicious as they otherwise prove beneficial. It is, in truth, a double-edged sword, wounding the patient where it does not touch the disease. Thousands are indebted to it for a vigorous health unknown to them before; many a weak reed has been converted through its agency into a strong tree capable to brave the storm;

it has cured many a painful malady: but it has also, in many cases, shortened the thread of life; for where such multitudes cast themselves into the briny flood without any previous advice, and as much in the dark about the state of their own bodies as they are about the powers of the sea-bath, it would be very fortunate, indeed, if they all belonged to a class likely to be benefited by its use.

Real plethora, or fulness of habit, which shows itself by a strong and full pulse, resisting the pressure of the finger, by the distention of the veins, by an intense redness of the skin, by an active production of animal warmth, and great muscular strength, and which is often accompanied with indolence of the animal and intellectual functions, does not agree with sea-bathing, even where it as yet only exists as a morbid disposition, and an unequal distribution of blood has not yet taken place. For it is evident that a

state of body which requires evacuations and a spare, cooling, antiphlogistic diet, would but ill harmonize with so stimulating a remedy. Its use would be still more improper where active congestions to the brain, the lungs, or the heart, have already been observed, or where they are favoured by a peculiar formation of the body, such as shortness of the neck or deformities of the spine. For passive congestions, on the contrary, which are rather of a venous nature, and the result of the weakened vitality of an organ, sea-bathing is, in many cases, an excellent remedy, as it not only fortifies the debilitated part, but also tends to equalize the distribution of blood throughout the whole economy. Such cases, however, always require the greatest attention, as otherwise congestions are very apt to take place during the cure. Organic defects in important organs, such as hypertrophies, indurations, softenings, cancerous and fungous degenerations, internal and ex-

ternal aneurisms, and chronic inflammations, expressly forbid the use of sea-bathing, which is a fountain of life for all who suffer merely from debility, but whose waters are a poison to those whose organs are already materially affected. Individuals with a weak breast must be particularly careful to use the bath with moderation, and to take advice before having recourse to it. Sea-bathing is far too stimulating a remedy for very young children, who are by nature so extremely susceptible of all outward impressions. Before the second year is accomplished, warm sea-baths are by far preferable to cold, particularly before the process of dentition has terminated, for here every excitement of the circulation is to be carefully avoided, as it would undoubtedly increase the tendency of the blood to the head, which is so frequently the cause of fatal convulsions. At a later period, when children are exceedingly frightened at the sight of the water, they should

not be absolutely forced to bathe in the sea, for fear and terror may have such an effect upon their tender frames as even to cause violent nervous attacks. At all events it must be evident that a forced bath like this is much more likely to do harm than good.

There are many reasons why aged individuals should only bathe with the greatest circumspection. At an advanced period of life, the disposition to diseases of the brain, such as congestions, apoplexy, softening of that organ, is so very great, that all influences that tend to accelerate the circulation and to excite the nervous system, must be studiously avoided. Organic diseases very often exist in a latent state when man is already far on his way into the vale of years, and only remain unperceived, because, as long as a quiet, regular, and prudent way of living is pursued, the diseased organ is not called upon for any great exertion, and the whole body has gradually conformed to

its diminished action, but as soon as any extraordinary excitement takes place, the conditions cease under which a tolerable degree of health was maintained, and then the evil, awakened from its slumber, easily triumphs over the slight resistance which can be offered to it by the effete organisation. That in all such cases, which are by no means common, sea-bathing must be a poison, certainly requires no further comment.

When the weakness of the patient is so great that a proper reaction will not take place after the bath, though every precaution has been taken to insure it, and cold, shivering, trembling, a feeling of excessive fatigue and illness persist for hours afterwards, it must either be entirely given up, or temporarily suspended, until the body has acquired greater powers of resistance through the means of warm sea-bathing, and the invigorating influence of sea-air. Cases of intense sensibility, where the cold sea-bath

produces fainting, uncommon anxiety, palpitations of the heart, neuralgic pains, and spasms likewise forbid its continuance.

Opinions are divided as to the question whether it ought to be allowed during pregnancy. Where abortions have already taken place, and the constitution is very irritable and nervous, the commotion produced by the shock of strong waves or by a very cold bath would undoubtedly be dangerous, but experience teaches us, that in many cases the prudent use of sea-bathing, has been of great service both to mother and child, and that by strengthening the constitution, it is an excellent means for preventing the danger of premature confinement.

During the menstrual period, bathing must be discontinued, as its sudden suppression, or the increased loss of blood might lead to the most dangerous consequences.

CHAPTER IV.

THE SLIGHT INDISPOSITIONS WHICH FREQUENTLY TAKE PLACE DURING A SEA-BATHING CURE.

THE more active vital process which develops itself in all organs during the course of a sea-bathing cure, necessarily produces a great variety of symptoms, which are very different in different constitutions, and not seldom assume the character of slight indispositions.

Thus, the skin being exposed to the immediate stimulus of the salt water, frequently exhibits symptoms of irritation, particularly where it is very fine, white, and sensitive. A prurient sensation will often be felt, after the first bath, over a great part of the body, which increases in the warmth, so that the

night's rest is often disturbed by it; at the same time there appears, particularly on the breast and back, either a simple redness of the skin (erythema), or a miliary eruption, consisting of small, light red, strongly itching papulæ, collected in groups or disseminated. After a few days, the skin having become accustomed to the stimulus of the salt water, these slight symptoms of irritation generally disappear, and it is not necessary to interrupt the bath on their account; but sometimes more violent symptoms of cutaneous irritation will make their appearance, such as erysipelas, with considerable swelling of the affected parts; nettle-rash; painful boils in different parts of the body, so that in these cases the bath must be discontinued for a few days, and the irritation of the skin appeased by emollient and cooling applications, lukewarm baths, cooling medicines, and the observance of a severe diet.

There are individuals on whom even the saline particles contained in the sea-air produce so irritating an effect, that their lips become swollen and cracked, and the skin of their faces peels off as after an eruption of scarlatina. To prevent this inconvenience, the face must be repeatedly sponged with fresh water, and lip salve, or some slightly astringent lotion, such as Goulard's water, be applied, and care be taken at the same time to protect it from the rays of the sun.

While thus some bathers have a great deal to suffer from the unaccustomed influence of sea-water, or even sea-air, a great many others, particularly persons with dark hair and a dark thick skin, show no signs whatever of cutaneous irritation.

The hair frequently falls out in greater quantities while bathing, which is not seldom alarming to ladies, who fear the loss may be irreparable. The use of a water-tight bathing cap is considered as an excellent defence

against this imaginary danger; but in this case the remedy is certainly worse than the evil, as it not unfrequently causes head-ache and congestion; while, after the lapse of a few weeks, the hair having been freely exposed to the ocean, grows more luxuriantly than it ever did before. This is the natural consequence of the improved vitality of the scalp, so that the contact of sea-water, far from injuring the growth of the hair, ought rather to be considered as an excellent means for its promotion.

The digestive process is very frequently disturbed during the use of sea-bathing. This is sometimes owing to the increase of the appetite, which easily leads to over-indulgence, but more particularly to the circumstance that the digestive organs of weakened, irritable, and nervous individuals are as much excited as all other parts of the body by sea-bathing, and consequently as easily fatigued. For it must be evident, that when an organ is al-

ready powerfully stimulated, it will not be able to support the same degree of stimulus as when in a state of previous rest.

This is the reason why, during the first weeks of a sea-bathing cure, stimuli of all descriptions will be found to produce a greater effect than under ordinary circumstances. A quantity of wine, which can be taken at home without any perceptible consequences, now causes considerable excitement. The least intellectual exertion tires the brain; letter-writing, the reading of a serious book, which demands a greater attention, becomes irksome, even to those who make of literature their usual delight.

These symptoms only cease when the body has become more accustomed to the stimulus of sea-bathing, and when the organs, strengthened by its use, are enabled to bear a greater amount of excitement; and thus the digestive functions, though ultimately improved and invigorated by sea-bathing, are very

easily deranged, particularly at the beginning of the cure. Constipation frequently takes place after the first baths, and must in no case be allowed to continue longer than a day; its speedy removal being the more necessary where it causes symptoms of congestion to the head and upper parts of the body.

In other cases diarrhœa makes its appearance, and requires neither medicine nor an interruption of bathing, as long as the appetite remains good, and no other inconvenience is caused by it. But where symptoms of a spoiled stomach occur, such as want of appetite or aversion to food, a bad taste, a furred tongue, eructations, either with the taste of the aliment, acid or foetid, heart-burning, head-ache, general lassitude, the bath must be suspended, and means taken speedily to remove the impurities.

Sometimes very irritable individuals are seized with vomiting immediately after quitting the bath; or, even before entering it, the

turning of the machine produces all the signs of sea-sickness. This is generally nothing but a nervous symptom which entirely ceases after a few trials.

Irregularities of the menses are of frequent occurrence during a course of sea-bathing, sometimes appearing before the usual time, at others retarding, and often lasting longer than usual. It is indeed by no means surprising, that where the economy is exposed to an unusual influence, which so energetically stimulates and modifies its vital action, changes in this respect should take place. These irregularities ought, therefore, not to cause any alarm, as they naturally result from the momentary impression of the bath, which, by strengthening the constitution, is ultimately found to be so excellent a remedy for many disturbances of that important function.

Prolonged and often repeated excitement naturally produces fatigue : no wonder, therefore, that the sea-bath, which so powerfully

stimulates the nervous system, and gives so vigorous an action to the circulation, frequently causes a great degree of lassitude, so that many bathers complain that they are the whole day sleepy, and that every movement is a toil. Their fatigue is frequently still further aggravated by want of sleep; for the stimulating effects of the bath often disturb those hours which are generally spent in blissful oblivion. Thus restlessness is a very common symptom during a course of sea-bathing, which, when it does not last too long, or is not accompanied with other signs of nervousness, does not require its suspension. It, however, always denotes a considerable state of excitement, and forbids all stimulants, that would still further disturb the night's rest, as, sitting up late in company, a copious supper, the use of spirituous liquors, and so forth.

Head-ache not rarely occurs during the sea-bathing cure. Sometimes it is of a congestive nature, and then principally appears in ple-

thoric individuals, generally occupying the fore-head or back part of the head, and being accompanied with giddiness, drowsiness, and a sensation of general fatigue.

In other cases it is nervous, and appears along with other nervous and spasmodic symptoms, particularly in weak, delicate individuals. Sometimes it makes its appearance while the patient is in the water, and disappears after a short continuance; but in other cases it is uncommonly obstinate and painful, so that it obliges him to give up bathing altogether.

Fainting also not unfrequently takes place, either in the water or after the patient has left the bath. Weak and nervous females, are very liable to it. It may be caused either by fear, or by having bathed on an empty stomach, or by having remained too long in the water. Such individuals must avoid all fatigue, and will do well to take a small quantity of wine, or eat a morsel of bread,

before they bathe. In other cases, where fainting was caused by mental emotion, it appears no more as soon as the patient has become accustomed to the sea

Besides all these slight indispositions, which prudence and moderation will in a great measure mitigate, or entirely prevent, and which as they are mostly the natural effects of bathing, need cause no apprehension whatever, symptoms of a more alarming nature will now and then occur; but here bathing was either an improper remedy, as in those cases we have already summarily described in the preceding pages, or else the patient had grossly neglected the rules and precautions which must necessarily be observed while bathing, and which will be found detailed in the seventh chapter of this work.

CHAPTER V.

THE SALUBRITY OF THE SEA-AIR.

WHAT a contrast between the polluted atmosphere of cities and the pure sea-air! We breathe it with delight, as though we were taking a deep draught of some delicious wine, and feel that the soft breeze, which it is so agreeable to inhale, conveys health and vigour on its balmy wings. That here we are not mistaken; that in this instance our sensations do not deceive us, is fully borne out by the experience of centuries. Small islands and peninsulas have ever been the cradles of a green, old age. Men live longer in England than in Germany; longer in the isles of Greece than in Asia Minor; longer in Japan than in China. Scotland, Denmark, and Norway,

countries that not only possess very extensive coasts in proportion to their size, but are moreover deeply indented with numerous friths, that carry far inland the influence of the bracing sea-atmosphere, furnish us with many instances of extreme longevity. But we need not go to distant countries, or compare numerous tables of mortality for proofs of a fact which we can so easily ascertain by personal observation. The robust frames and vigorous health of mariners, and of all who habitually breathe sea-air, must strike even the most inattentive visitor to the coast.

How many pale, languid, and sickly children, in whom all energy seems extinct, are yearly brought to the margin of the ocean? and as day after day they play on the beach we soon see a most remarkable change come over them. The ruddy glow of health gradually overspreads their sallow cheeks; their appetite and digestion improves; their muscles

become firmer; their step more elastic; and their former listlessness is succeeded by such an exuberance of mirth and spirits, that after a few weeks one hardly knows them to be the same.

Effects such as these could not fail to attract the attention of physicians ever since medicine began to be practised as an art, particularly as the first dawn of science arose on the isles and along the coast of the Mediterranean. Twenty centuries ago the wealthy Romans used to spend a few months on the delightful shores of Campania, to restore, by the invigorating sea-breeze, the tone of their languid frames, enervated by excessive luxury. The Emperor Augustus, whom his physician, Musa, had cured of a dangerous illness, against which all other remedies had failed, by cold bathing and a cold regimen, ever after made annual maritime excursions round Cape Misenum, for the benefit of his health; and his successor, Tiberius, who had paid so great an

attention to the rules which preserve it, that he pronounced every man to be grossly ignorant, that after thirty still required to consult a doctor on that subject, did not fix upon the small island of Caprea for his permanent residence without having well calculated the effect which the sea-air would probably have on the prolongation of his existence. It was thus that Augustus attained the age of seventy-six, and Tiberius that of seventy-eight years, a long period for men whose shoulders were burthened with the government of the world.

The sea-air proves itself particularly salutary in diseases of the respiratory organs. Wherever pulmonary consumption looms in the distance, there is, perhaps, no remedy which holds out a fairer prospect for warding off that most insidious foe. Pliny, Celsus, Boerhaave, Cullen, Sydenham, with one word all ancient and modern authors of note that have given to the world their experi-

ence on that treacherous and inexorable malady, agree with one accord in recommending sea-voyages as the best preservative against it. Many a chronic catarrh or bronchitis has been cured by sea-air, which by stimulating the action of the skin diminishes the excessive secretion of the mucous membrane of the bronchi, and raises at the same time the energy of the lungs by affording them their natural stimulus in its purest, and, consequently, most congenial state. This sufficiently explains why catarrhal affections are uncommonly rare during long sea-passages, and gradually increase in violence and frequency as we advance into the interior of continents.

James Floyer, who towards the end of the seventeenth century wrote the first treatise on asthma, and as he suffered himself from that complaint, may consequently rank as a double authority, particularly recommends sea-air in all cases of this kind; and it is a

well-known fact that many an asthmatical patient can only find relief while on the sea-side.

We will now proceed to investigate the peculiar qualities to which sea-air owes its remarkable salubrity.

Atmospherical air consists, as is well-known, of twenty-one parts oxygen gas and seventy-nine parts nitrogen in one hundred parts, and this proportion is found to be everywhere the same, on the highest mountains and in the deepest valleys, on the sea and in the interior of continents; but as air, owing to the pressure of the superincumbent atmosphere increases in density the nearer we approach the level of the sea, it is evident that we here inhale at every breath a greater proportion of air, and consequently of oxygen, than if we were raised a few hundred feet higher. Oxygen is that component part of air, which being inspired by the lungs, unites with the carbon of our food, and thus form-

ing the carbonic acid gas, which we exhale, disengages the animal warmth which is necessary to our existence. Now it is evident that the more carbon we consume, the greater quantity of food we must require to make up for the loss. Thus, the greater density of sea-air causing a more rapid consumption of carbon, cannot fail to increase the appetite and stimulate the vegetative processes that are silently, but constantly, working a change within us. At the same time the air on our coasts is in a continual agitation, a circumstance by which cutaneous transpiration is very much promoted. This will be easily understood if we picture to ourselves our skin as a membrane saturated with fluids, which continually evaporate through its porous surface and fill the surrounding air with aqueous vapours. The more the air is already impregnated with moisture, and the less it is disturbed; the less also will it be inclined to receive a fresh supply of humidity; but an

agitated atmosphere constantly renews the stratum of air which is in immediate contact with our bodies, and dissipates the vapours as quickly as they form. While thus the agitated sea-air increases and favours our cutaneous transpiration, by means of which so many noxious humours are carried off, which otherwise would clog the wheels of our machine, it undoubtedly greatly contributes to the cleansing of our blood and to the promotion of a healthy vegetation.

In the interior of the country the air is subject to greater variations of dryness and humidity, while the sea air is more equally moist; but a moist air irritates far less the lungs than a dry atmosphere, particularly if the latter is agitated by winds; and thus the humidity of the sea-air beneficially tempers the stimulating properties, which are owing to its greater density and constant agitation. The temperature on the coast is likewise more equal than it is farther inland.

During the heat of a summer's day the evaporation constantly going on on the surface of the sea, cools the sheet of air immediately above it, which taking the place of the lighter air, warmed by the contact of the soil, is felt on shore as the delightful sea-breeze. After sunset, on the contrary, the surface of the sea does not so rapidly cool as that of the land ; and thus, according to the physical law by which all neighbouring bodies tend to equalize their temperature, imparts warmth to the air in its vicinity. For this same reason, the winter on the coast is generally milder than it is in the interior. But this greater uniformity of temperature is very conducive to health and longevity, for we all know how many fatal diseases are caused by a rapid fall and rise of the thermometer.

The pernicious influence of an air saturated with animal or vegetable miasms is too well-established a fact to need any further observation, for it has been proved over and

over again, that not only is mortality greater in large towns than in the country, but that it also augments in the same proportion as the population is more crowded in narrow streets and alleys, and as drainage and ventilation are defective. Now, nothing can be more unlike this vitiated atmosphere than the pure sea-air, which must, therefore, infallibly be as salubrious as the former is detrimental to health.

Among the many noxious or deleterious substances mixed up with air, carbonic acid, a transparent, colourless gas, composed of oxygen and carbon, deserves a particular notice. It is the produce of every combustion, and is exhaled by all animals *constantly*, by all plants *after sunset*. It is so universally spread over the atmospheric ocean, that the air is nowhere entirely free from it; but still it is found in greater quantity over land, where it is perpetually produced from so many sources, than over the sea, by whose agitated

surface it is, on the contrary, continually absorbed. Carbonic acid is a poisonous gas, and although the free atmosphere generally contains only so small a quantity mixed up with it, that it would be an exaggeration to ascribe a considerable influence to its presence, still, it must be allowed that sea-air, which contains less of it than any other air we know of, is thereby entitled to the praise of a peculiar purity.

While the sea-air is thus free from many pernicious substances, with which it is elsewhere tainted, it contains others of a very different nature, which are esteemed as powerful remedies against many diseases; for every wind that wafts over the ocean carries along with it numberless saline particles, which we can easily taste on our lips while wandering on the shore. But even in the calmest weather, the evaporation of the sea constantly imparts salt and free muriatic acid to the atmosphere, as the great Ber-

zelius, among others, has clearly proved in his "Annals of Chemistry," and as is now no longer doubted by any one conversant with that science. These saline and acid particles are undoubtedly one of the causes why one is not so apt to catch cold on the coast, for by constantly stimulating the skin they prevent its transpiration from being easily checked. They also stimulate the mucous membrane of the respiratory organs, and thus tend to correct its relaxation. Inhaled with the atmosphere they purify the blood.

Iodine and bromine have also been discovered in sea-air, and however minute their quantity may be, their influence must not be overlooked, as it is felt at every breath and is thus uninterruptedly active: for

"Gutta cavat lapidem, non vi sed saepe cadendo."

The peculiar salubrity of sea-air must also partly be ascribed to its electrical properties, for Pouillet found that when a saline solution

evaporates, electricity is constantly developed “But electricity,” says Humboldt, “has a manifold connection with all the phenomena of the distribution of warmth, of the pressure of the atmosphere, and its perturbations. It has a great power over the whole animal and vegetable world, not only through meteorological processes, but through its direct influence over the nerves and the circulation of fluids.” (Kosmos.)

Thus the sea-air has many valuable properties by which it is distinguished from land-air,—generally a greater density, and, consequently, a greater quantity of oxygen in the same volume; constant agitation; a more equal temperature and moisture; a greater purity; an admixture of saline particles; a peculiar electrical state:—and the united influence of all these characteristics is quite sufficient to account for its eminent salubrity.

We have no doubt that the better the

peculiar nature of sea-air becomes known, the greater recourse will be had to it for the benefit of mankind. Schools and institutions should have their seat near the seashore, for here the health of youth may be strengthened without any impediment to the acquisition of useful knowledge, and the soul at the same time widened by the contemplation of nature's grandest scenes. Sanatoriums, asylums, and many hospitals for chronic diseases, would here have the best situation, for surely where so many salutary agencies can be had without any cost, a wise economy prescribes them to be used.

CHAPTER VI.

THE INFLUENCE OF THE SEA AND ITS PHENOMENA
ON THE MIND.

HAPPY is the sojourner on the coast, who has a taste for the beauties of nature, who while wandering on the shore not merely inhales the refreshing breeze, but finds at the same time in the contemplation of the sea, a never-failing source of enjoyment and reflection.

The change of ebb and flood, always the same and yet always new; the murmuring of the waves which *was* long before man was born, and *will be* long after all the nations that at present rule the earth have passed into obscurity; the boundless plain of waters, and the no less boundless horizon above them; the wonderful phosphorescence

of the sea illumining the night with magic fires; all these are aspects and phenomena that forcibly strike his imagination, and raise his mind above the petty vexations of the moment, by the soothing and elevating ideas they inspire.

But we all know what an empire the soul exerts over the body! that as melancholy and grief slacken our pulse, destroy our appetite and make all our movements languid; so also a joyful exuberance of spirits gives elasticity to our step, and colour to our cheeks. The impressions which a visit to the coast makes on the feeling and reflecting mind (and insensible indeed must he be for whom scenes like these have no language), are therefore by no means to be overlooked among the strengthening influences of sea-bathing.

For if the shock of the waves by invigorating our body, improves, at the same time, the weakened energies of our mind, there can be no doubt, that the great and beautiful

phenomena which Nature displays to us on the coast, act through the mind on our bodily health and assist in restoring it.

We are therefore of opinion, that by calling the attention of our readers to the wonders of the deep, and lingering with them a little while on the shore, we do not deviate too far from our subject, for surely the better we become acquainted with the nature of the phenomena, which are here exhibited to our view, the deeper must be the impression they make upon our minds.

Thus the regular succession of ebb and flood may, perhaps, fail to strike the careless observer, but what a train of ideas does it not awaken in him who reflects on its causes and effects ! As he witnesses the rise and fall of the waters, his thoughts at once fly to the celestial bodies, from whose power of attraction the phenomenon proceeds, and he is reminded by a beautiful example, of the great law of universal gravity which governs

the movements of worlds. But soon a feeling of gratitude mingles with his admiration, when he further reflects how man is directly benefitted by its effects; how the tides forcing the rivers to remount against their sources, waft richly laden fleets into ports far distant from the sea, and cause the stately city to rise, where but for them, scarce a humble village would have stood.

Thoughts such as these cannot fail to have a salutary influence on the mind of the patient as he walks along the margin of the sea. The sea-plants, shells, and animals he gathers on the shore are likewise a source of never-failing interest. The beauty of many, and the strange forms of others, so different from all that he has been accustomed to see, attract his attention and give him an enlarged idea of the boundless variety of nature.

If he has the eye of an artist, the sea is rich in attractions of another description. The effects of light and shade as they play

upon the bosom of the waters and tinge the clouds fantastically grouped; the sunbeam glancing upon some distant sail; the gracefully curling waves dissolving in milk-white foam, and racing along the coast; sometimes all the colours of the rainbow, and then again one uniform grey; calm succeeding agitation, and the storm raising mountain-billows where, an hour before, the sea was placid as a lake; all these varieties and changes, which continually present new pictures to his view, will delightfully occupy many an hour.

But the sea is not only rich in magnificent aspects during the day-time, it frequently exhibits its most wonderful scenes long after the sun has disappeared behind the horizon. Especially in warm evenings towards the close of summer, a brilliant phosphoric light is emitted from the waves as they break along the shore, or else it streams forth whenever a breeze sweeps over the surface or a boat divides the waters. Beautiful as is the phosphorescence of

the ocean, our wonder increases when we are informed that all seas are illumined with it, and that each of the countless luminous points scattered through the wide expanse, proceeds from the vital energy of an organized being. Almost all the lower marine animals, the jelly-fishes or *Acalephæ*, and a host of microscopic *Infusoria* have the property of emitting light, but the one most common on our shores is a minute jelly-fish, or Medusa (*Noctiluca miliaris*), about the size of a pin's head, which particularly in calm, warm weather, comes to the surface of the water, and lines the coast in countless myriads. If one fills a glass with phosphorescent seawater and lets it stand, one will find on the following morning a number of small bodies floating on the surface that are almost entirely transparent and colourless, with the exception of a small milk-white spot. Viewed under a microscope, they appear as globular animals with a little cavity or in-

dentation, from which springs a thread-like tentaculum, slowly moving backwards and forwards. That this little creature is the cause of the brilliant phenomenon which struck us with astonishment and wonder can very easily be proved, for when phosphorescent water is passed through a filtrum, it loses altogether the property of shining in the dark, while the Noctilucae collected on the filtrum continue to emit light when slightly agitated. When a bottle containing Noctilucae is gently shaken, one sees in the dark, small luminous points descend and reascend in the liquid, in the same way as during day-time, under similar circumstances, the small globules are seen to move about.

Thus the Noctiluca affords us a beautiful example of the great effects which nature produces by the immense multiplication of creatures individually insignificant. But it is not the only object that may serve to give us an idea of the innumerable swarms

of animated beings that people the ocean. For miles and miles along the shore, the strand is covered with minute fragments of shells, which the rolling of the surf gradually pulverizes and the winds scatter away. All these were once the coats of living animals, and not a day passes that new masses of them are not cast ashore, which in their turn disappear.

CHAPTER VII.

GENERAL DIRECTIONS FOR SEA-BATHING.

THE good effects of sea-bathing entirely depend upon its being duly proportioned to the powers of the individual; and the proof that the just medium has been observed, is found in the character of the reaction which it calls forth. An agreeable feeling of warmth and refreshment after leaving the water is a sign that a strengthening effect has been produced; but where, after bathing, symptoms of congestion show themselves, such as headache, oppression on the breast, attended with general excitement, or where the body cannot for some time recover its warmth, and nervous symptoms, such as shivering, spasmodic rapidity of the pulse, and a feeling of great

weakness and lassitude make their appearance ; there the system either reacts too violently, or not in a sufficient degree, and in both cases the bath will not have produced a salutary result. Every circumstance which might bring about one or the other of these two extremes is, therefore, carefully to be avoided ; and all rules or directions for sea-bathing will be found to have a reference to this one fundamental principle.

As long as the patient still feels fatigued or any way indisposed from his journey, he should not think of bathing. The day after his arrival ought to be devoted to rest ; frequently even he will do well to wait for a few days before he bathes, for the bracing sea-air has always a powerful effect upon nervous and debilitated organizations ; in the beginning it frequently excites and disturbs them, and their first bath will be much more likely to agree with them after their sensi-

tive frame has become better accustomed to the change of air.

Where the patient is very irritable or weak, or unaccustomed to cold-bathing, so that too violent an effect might be apprehended from the first immersions, or where the weather is unpropitious on his arrival, it will be advisable for him to take two or three preparatory warm sea-water baths, the temperature of which may be daily diminished by a few degrees, so as gradually to pave the way for bathing in the open sea. In many cases the body must be prepared for bathing by aperient medicines, particularly where there is a congestive tendency to the head or breast, or where the patient is any way full-blooded, or where the excretions are obstructed.

Before entering the sea, care must be taken that the body be neither overheated with exercise, nor suffering from the effects of cold. It is evident that where the system is already excited, sudden immersion in cold sea-water

must inevitably cause too violent an impression, to which our nature is always adverse, particularly when its energies have been impaired; while, on the other hand, reaction takes place with greater difficulty when the circulation has previously been depressed by the prolonged influence of a low temperature. For this reason delicate patients, besides using sufficiently warm clothing, will do well to take some little exercise before bathing, so as to produce an agreeable warmth over the whole body without overheating it; they must, also, not allow too long a time to elapse while undressing for the bath, and particularly not hesitate too long before entering it.

Some previous exercise is particularly advisable for children and individuals with soft and relaxed fibres, whose appearance denotes a great torpidity of constitution. When children are immersed in the water, after absolute rest, or being already chilled from exposure to cold; they are brought out again pale and

shivering, and without that liveliness which generally gives their features so amiable an expression.

When the patient is incapable of taking exercise, he must be well rubbed for a few minutes with a flesh brush, or frictions must be made over the whole body with a piece of flannel, particularly over the back, the breast, and the pit of the stomach.

All strong emotions, whether of an exciting or depressing nature, are as much as possible to be avoided before bathing: the former, such as anger and joy, produce the same effect on the circulation as violent bodily exertion, accelerating the respiration and causing the pulse to beat with greater rapidity and violence; while the latter, such as sorrow and grief, retard circulation and thus counteract the reaction, without which the sea-bath would be of no avail, or worse than useless. For this reason children ought never to be bathed while under the influence of

excessive fear:—they must be coaxed, not forced, into the water.

It is a rule of the highest importance, never to bathe with a full stomach. If, even in ordinary life, all mental or bodily exertion, soon after a somewhat copious repast, is found to be prejudicial, it may easily be imagined how much the process of digestion must be disturbed by so violent an action as that of sea-bathing, which has a tendency to divert to the skin the blood, which, while the stomach is in full activity, collects in greater quantity round that organ, and serves to secrete the gastric juice. Indigestion is almost the least evil to be apprehended, for, if we consider that during digestion there is also more or less a determination of blood to the head, we cannot be surprised that sudden death from apoplexy has sometimes been the fatal result of bathing under such circumstances. Three hours at least must therefore elapse after dinner, and two after a good

breakfast, before bathing can be thought of. The next thing we have to consider, is the proper time for bathing. Early in the morning all external influences make a greater impression upon our body ; the air and water are generally colder ; a bath before breakfast must therefore have a stronger effect than one taken at a later hour ; but, at the same time, it requires a greater strength in the bather. Many patients are too weak to stand exertion on an empty stomach, and will find it much more advantageous to bathe a few hours after breakfast, when their system, having acquired more power, will be better able to react. Children particularly ought never to bathe before ten or eleven in the morning, nor in cold and tempestuous weather. Weak, irritable, and timid individuals, particularly such as are disposed to fainting, loss of breath, cramps, congestions, hysterical and nervous attacks, should never bathe without being attended by a guide.

The first impression of the cold is always more or less disagreeable, particularly to a beginner; but as delay and hesitation not only increase its unpleasantness, but are serious obstacles to a proper reaction taking place, it must be overcome as soon as possible. Where the bather cannot summon sufficient resolution to make a few steps forwards, after previously throwing some water over his forehead and breast, and then boldly to plunge or to turn his back to the first advancing wave, which will immediately change the primary disagreeable chill into a most pleasing sensation of warmth and refreshment, the best plan is to allow himself to be carried into the water to a sufficient depth, and then to be suddenly immersed, or else to have a pail of sea-water poured over head and shoulders, while standing at the foot of the machine.

Every visitor to the sea-coast must have observed bathers, who incapable of a little

resolution, scarcely venture to leave the shore, and stand shivering in the breeze, enjoying all the time a cold foot-bath; for an operation thus badly managed cannot possibly be called sea-bathing. That patients such as these, instead of feeling a refreshing glow on leaving the water, complain of a universal chill, from which they with difficulty recover, and eventually return to their homes, without having derived any benefit from the sea, can surely be no matter of surprise to those who have been witnesses to their proceedings.

A favourable result can, evidently, only be acquired by following a very different plan, by plunging repeatedly under the water, by allowing the waves to strike against the back and shoulders, by moving about in the water. It must, however, be remarked, that the exertions of the bather are to be regulated by his strength, that while a vigorous and healthy man, may swim for a long time

without any evil consequences; fatigue is studiously to be avoided by the patient who comes to the coast in quest of health.

In many cases it will be found useful to rub the suffering part while in the water, and to expose it more particularly to the shock of the waves: it would, however, be dangerous to let them strike against parts which cannot well stand a strong concussion, such as the pit of the stomach or the breast. If allowed to strike the head with any degree of violence, headache, giddiness, congestion, will be the consequence. Ladies will do well not to use a bathing-cap, particularly where the skin of the head requires strengthening; for instance, in cases of nervous and rheumatic headache, and tic-douloureux. The fear that the hair might be injured by the contact of sea-water is perfectly groundless, for, as we have already mentioned, the strengthening sea-bath promotes its growth, and is in fact an excellent

remedy in all cases where loss of hair is a consequence of general or local weakness. On the other hand, a cap may become very injurious by being too tightly bound, and thus impeding the circulation, or by keeping the head too warm, particularly where plunging or frequently dashing water over it is neglected. It is evident that when the lower part of the body stands in cold water, while the upper part is wrapped in an air-tight cap, the blood must necessarily fly to the latter; thus easily causing headache, giddiness, and other symptoms of congestion.

How long one is to remain in the bath is a question of the very highest importance. As a general rule one should always leave the water while the glow or reaction, following upon the first impression of the cold, is still in its full vigour. In this case an agreeable feeling of warmth will last during the whole day; while by continuing in the sea so long as to allow the cold to overpower the reaction,

one will find it very difficult to restore the temperature of the body, and have to contend for hours together with disagreeable sensations, if not worse. Thus, our feelings tell us plainly that in the first case we have improved our strength, while in the second we have wasted by overtaking it. Even a strong and healthy individual will undoubtedly feel better after a short bath of five to ten minutes duration ; but the patient, who must studiously avoid fatigue, as his weakened energies cannot so easily repair its consequences, must take particular care to regulate his stay in the water according to his powers of reaction, and never exceed the limits recommended to him by his medical adviser. Thus sometimes, particularly in the beginning of a cure, one or two immersions will be found sufficient, until his growing vigour gradually learns to support a bath of longer duration, or it will be advantageous to bathe only every other day.

A lower temperature of the sea and air, strong waves, or a sharp wind, increase, of course, the power of the sea-bath, so that under these circumstances weak and irritable patients must either bathe a shorter time than usual or not at all.

As reaction must be by all means encouraged, it is necessary to dry oneself well after leaving the water, to dress quickly, and to protect oneself with sufficiently warm clothing against the cool sea-breeze. For the same reason some exercise must be taken after the bath, just enough for the purpose of keeping up and promoting the reaction without causing fatigue, and if, even then, it will not sufficiently develop itself, some port wine, sherry, or beef tea, will be found very useful for assisting it.

CHAPTER VIII.

THE REGIMEN TO BE FOLLOWED WHILE USING THE SEA-BATH.

THE mere use of the sea-bath would be of no great avail to the patient, if he did not at the same time follow a regimen calculated in every respect to assist its good effects.

The invigorating influence of sea-air is scarcely second to that of sea-bathing itself; he will, therefore, consider every hour as lost that he is condemned to spend within doors, and make the beach his head-quarters, hastening to it early in the morning, and reluctantly leaving it with the setting sun. While sitting near the margin of the sea and listening to the murmur of the rising flood, which has so soothing an influence on irritated nerves, he will feel himself inhaling health

with every breath, and repairing without effort the ravages which disease or over excitement have made in his constitution.

Want of exercise is the fertile source of many disorders. A sedentary life weakens the whole body, makes the nerves irritable, retards the circulation of the blood, and causes it to stagnate in the relaxed veins, particularly of the abdominal organs. Digestion consequently suffers; the secretions, so necessary to health, are diminished, and the mixture of the blood becomes vitiated, producing in its turn a variety of maladies; we are thus able to trace, step by step, the evil consequences of a want of exercise up to incurable organic complaints. A degree of exercise proportionate to the vigour of the body is, on the contrary, a most powerful means, not only of preserving health, but frequently also of restoring it without the use of any internal medicine whatsoever. The sea-bather will therefore not content himself with inhaling

as often and as long as he can the healthful sea-breeze, but at the same time take as much exercise as his strength permits; not forgetting however that like all good things, it may become injurious by excess, or when taken at an improper time. While the strong and healthy man can walk for hours together along the beach, the valetudinarian must always bear in mind that his energies are but weak, and that over exertion is sure to retard him on his way to health; he will, therefore, content himself with short walks, which he may several times repeat during the course of the day, and devote with great advantage many hours to the less fatiguing use of passive exercise.

Daily rides along the strand are in almost all cases very favourable to health, and will materially assist the effects of sea-bathing, particularly in hypochondriac and hæmorrhoidal affections, and where the circulation in the viscera of the abdomen is languid or

obstructed. Riding is not only useful through the gentle concussion of the abdominal organs which it produces, promoting thereby the circulation of the blood in these parts, but also by occupying the attention of the patient, particularly if he is a novice in the equestrian art, and diverting his thoughts from the eternal contemplation of his wretched state of health. This remedy was so highly thought of by the illustrious Sydenham, that he deemed it as efficacious against hypochondria as bark is against the intermittent fever.

Boating is another very salutary mode of enjoying passive exercise. The sea-air is nowhere purer than on the bosom of Ocean itself, a few feet above its surface, and the moral impression of the unaccustomed undulating motion upon nervous patients, must also be taken into account. Sometimes seasickness disturbs, it is true, the pleasure which boating otherwise so highly affords; but the cases where it might be injurious are uncom-

monly rare, while those where it positively assists the action of sea-bathing, by stimulating the nerves of the stomach, or rather the entire ganglionic system, are very frequent.

Besides taking great care never to overtask the strength, some other rules are still to be observed with regard to exercise. Thus, delicate and nervous patients ought never to use it, immediately before dinner, as even a slight fatigue is apt to weaken the appetite; and should always rest for an hour at least after dinner, as any exertion, while digestion is in full activity, necessarily disturbs it. They must not walk out early in the morning, before having breakfast; as in all cases of debility, exertion made on an empty stomach causes great fatigue. The best time for exercise is undoubtedly an hour after breakfast or lunch, or two hours after dinner. In warm and dry weather children ought to play on the beach during the greater part of the day, care being taken that they do not over-

heat themselves, and that proper intervals of rest be observed. When moist or cold weather, or a bleak wind prevails, they must be kept within doors, and play in a large airy chamber. The choice of apartments is very important. There is nothing so injurious to children as being crowded in small or ill-ventilated rooms. Inhaling such noxious air is more fatal to them than to adults, inasmuch as the lungs are of a more delicate texture, the inspirations more frequent, and the animal economy more liable to derangement. The bed-room windows should therefore be kept open the whole of the day.

Great attention must be paid to the clothing while on the coast. The mornings and evenings are generally cooler than in the interior of the country, and the perpetual agitation of the atmosphere easily produces a sensation of chill, by increasing evaporation on the surface of the skin. Thus, without adopting too warm a clothing, which is the

more unnecessary where the skin has already been hardened, by bathing, against atmospheric impressions, one must not go too lightly clad, and have a mantle or a shawl near at hand to throw over in case of necessity.

The air must always make an agreeable impression upon the patient; as soon as it produces a chill, it would be injurious to him, if he passively submitted to its effects for any length of time. Woollen stuffs are very much to be recommended, the closeness or lightness of their tissue being proportionate to the warmth of the weather; for as they are bad conductors of heat, they are better able to preserve an equal temperature of the skin. The great occupation of children that are brought to the sea-shore for the benefit of their health, is playing on the strand, where they generally find great amusement in throwing up little fortifications, which the next flood destroys. As they are here at work like daily labourers, and an excellent

work it is, repaying itself with a rich harvest of strength and spirits;—great elegance of dress would be completely out of season; all that is required of it being a convenient width, so as to give free room to every motion, and sufficient protection against the changes of temperature, without being so warm as to produce a debilitating perspiration.

The great object of sea-bathing is to strengthen and fortify the constitution, and this can only be attained by using at the same time a strengthening diet. For sea-bathing in itself is only a means to that end, it fortifies only by giving a more vigorous impulse to the vegetative functions, and thus increasing the *real* want of nutritious food, which being converted into blood of a better quality, improves the condition of the solid parts. Thus a most important link would be wanting in the chain which leads to health, if the food of the patient were not sufficiently nourishing. But at the same time great care

must be taken to avoid every excess in eating or in drinking. As sea-bathing and the bracing sea-air generally give an unaccustomed zest to the appetite, one is but too easily led to over-indulgence, which necessarily spoils the stomach, and prevents the progress of the cure. It should also be remembered, that the whole body is more or less excited and fatigued while using the sea-bath, particularly during the first weeks, and that the powers of digestion, far from being increased in the same ratio as the appetite, require even more than ordinary attention. Thus, all food, which is not easy of digestion—all made-up dishes and ragouts—all heavy paste and fresh bread must be carefully avoided. A plain dinner, consisting of roast or boiled meat, with vegetables, will afford all the nourishment that is required, without tempting the patient, by a greater variety, to indulge too freely in the pleasures of the table.

Scrofulous children should breakfast between eight and nine, and take an egg or a little meat at this meal. They should have a sandwich about twelve or one o'clock, and meat with their dinner at three. Some good beer, or a glass of wine, should be allowed, which will assist digestion by stimulating the secretion of the gastric juice. Their meals must be taken at regular hours, and no sweetmeats or cakes given to them during the intervals. They should also be taught to eat slowly, and properly to masticate their food.

Late hours and evening parties do not agree with sea-bathing. For it stands to reason, that after spending the greater part of the day in the open air, and taking plenty of exercise besides bathing, one must feel the necessity of repose sooner than usual; and that as the sea-bath rouses the whole economy, and frequently causes restlessness, everything must be avoided which might still

further stimulate the system. The patient will therefore do well to devote the latter part of the day to tranquil enjoyments, and to retire to rest an hour before the usual time. Sleep soon after any of the meals is not to be encouraged; but many nervous and debilitated patients feel after their bath an irresistible longing after repose, and when they find, by experience, that a little slumber refreshes them, there is no reason why they should not indulge in it. When the head is found to be heavy after sleep, it is a sign that it is injurious, and it must then be abstained from for the future.

The cares and anxieties of business, as well as all mental exertion, must be as much as possible banished during sea-bathing. For the brain partakes of the general excitement, and is consequently less able to bear fatigue than in the usual course of life. Pleasant conversation, or some light amusing reading

will be found to assist the cure ; but anything like intellectual toil would be positively injurious, and prevent the nervous system from repairing its energies.

CHAPTER IX.

THE WARM SEA-WATER BATH.

THE warm sea-water bath is either used as an exclusive cure, or preparatively to the cold sea-bath, which it resembles with regard to its tonic and stimulating properties, although the means by which it produces its effects are widely different. For here, instead of the united influence of a low temperature and the shock of powerful waves, which speedily provoke a mighty reaction, and rouse vitality in every part of the body, we find the active agencies of warmth joined to the stimulus of salt, and to the absorption of saline particles. The warm temperature of the bath immediately causes a more copious flow of blood to the skin and outer parts, which in this case

is not followed, as after the common warm bath, by a sensation of weakness, languor, and chill, but by an agreeable burning in the skin, and a feeling of increased vigour. These strengthening effects are owing to the stimulating properties of the salt, which undoubtedly plays a greater part in the warm bath than in the cold, as the higher temperature of the water immediately excites the vitality of the skin in a considerable degree, and thus increases its susceptibility for other impressions.

As warmth dilates the skin, it also favours absorption, which here therefore takes place in a much greater measure than in the cold bath. The saline particles thus received into the blood, have a powerful effect upon the vegetative process, by promoting the activity of the lymphatic vessels, so that next to the strengthening effect of the warm sea-bath, its resolvent properties must not be overlooked.

The use of the warm sea-bath improves the

nutrition of the skin, increases the firmness of its tissue, and gives greater strength and activity to its functions, enabling it better to withstand changes of temperature, and not only curing a great many cutaneous diseases, but proving also an excellent remedy for a number of internal complaints, which are either caused or aggravated by the inadequate performance of the functions of the skin. At the same time, the mucous membranes of the respiratory and digestive organs likewise acquire a greater firmness, so that many diseases which had been caused by their relaxation or weakness, speedily assume a better character, and are eventually cured.

Thus, bronchial catarrhs of a chronic nature, or serous and mucous diarrhoeas in scrofulous children and delicate females, which are either caused or aggravated by moral emotions, by changes of temperature, by cold and moisture, diminish and cease under the influence of the warm bath.

It is an excellent remedy for scrofula. Many irritable and scrofulous children, suffering from want of appetite and weakness of digestion, acquire after a few baths a better appetite and a greater power to digest substantial and nourishing food. They increase in strength and volume; serous infiltrations of the face and limbs; habitual swellings of the lips, the nostrils, and joints disappear.

All these facts sufficiently prove that the action of the warm sea-water bath, although not near so energetic as that of the cold bath, is of an analogous nature; and that in all cases of debility and languor of the vegetative process, where a strengthening effect is required, but where a violent excitement of the whole system does not seem desirable, it is a far preferable remedy.

In elderly individuals its use is frequently productive of the best results, particularly against weakness of the digestive organs, of the skin, of the mucous membranes, or of the

whole body; where the constitution has been shaken by strong emotions or a severe surgical operation, or weakened by a sedentary life, a long illness, or a painful convalescence. At this age warm sea-water baths are found to be efficacious against many diseases, for which warm sulphurous springs are also an appropriate remedy, and with which cold bathing does frequently not agree; such as neuralgic affections, rheumatisms, particularly where the latter have a tendency to attack the respiratory and digestive organs. Their use is also very much to be recommended to all patients whose nerves are too irritable to oppose a sufficient resistance to the spasm, which is the first effect of an immersion in cold water, or who are too weak to bear any great loss of animal warmth, and find great difficulty in repairing it; for children who have not yet completed their second year, who habitually cough, who, in consequence of original or acquired weakness, are very de-

ficient in reactive power, who have a livid colour, soft flesh, and meagre extremities : for nervous and hysterical females who are terrified at the idea of bathing in the open sea, and cannot summon sufficient resolution for that purpose ; for individuals, on whom the cold bath unexpectedly makes so violent an impression, that its repetition would be dangerous.

The temperature of the warm sea-bath must generally not exceed 87° to 89° , as the united stimulus of the saline particles and a high degree of warmth is apt to produce symptoms of over excitement, such as headache, restlessness, nervous irritability. Aged and very torpid individuals may, however, indulge in a bath which is two or three degrees warmer. In many cases it will be advisable to use the precaution of applying during the bath, a sponge or a napkin dipped in cold water to the forehead, to prevent symptoms of cerebral congestion. When used

preparatively to bathing in the open air, the temperature of the warm-bath must be gradually diminished, so that when the first, for instance, has been taken at 89° , the second may be lowered to 86° , and the third to 83° or 82° . While in the bath, colder water may also be poured over the back.

The duration of the warm sea-bath varies according to the individual case. Where a resolvent effect is particularly required, as in scrofulous children with enlarged glands or in torpid constitutions, it may be prolonged in adults to thirty or forty minutes, and in children to twenty or twenty-five minutes. But these should be the extreme limits, except in very rare cases, for no good effect can be expected from a longer continuance in the bath, but rather over excitement and consequent weakness.

For irritable constitutions, and where a strengthening effect is chiefly required, the bath must neither be of so high a tempera-

ture nor continued for so long a time. Twenty to twenty-five minutes in adults ; ten to fifteen minutes for children will be found quite sufficient to produce the desired effect.

Weak and irritable individuals, in whom the bath produces symptoms of excitement such as an unquiet sleep or nervousness, ought only to bathe every other day, and must particularly avoid taking their bath too warm, and remaining too long in it.

Some individuals whose skin is uncommonly irritable are almost as little able to support warm as cold sea-bathing ; in this case the salt water should be mixed with one fourth or one half fresh water, or emollient substances be added to it, such as starch, in the proportion of two pounds to the bath, or a decoction of four to six pounds of bran ; or gelatina, in the quantity which is judged necessary to blunt the stimulus of the salt.

The best time for taking a warm bath is about mid-day. On leaving it, one must

rest for a quarter or half an hour, but not by any means in the damp bathing-room, and then take some moderate exercise. The patient need not fear to catch cold so easily as after a common warm-bath; but his clothing must, of course, be appropriate to the weather, and sufficiently warm to entertain the reaction of the skin.

If the weather is cold and rainy, it will be advisable not to bathe, unless where there is convenient room to take exercise under cover.

The use of the warm bath requires the same precautions as that of the cold. All mental and bodily excitement must previously be avoided, and bathing on a full stomach would be equally injurious. The same care must be taken with regard to regimen; and as patients using the warm-bath are generally of a weaker constitution, or more advanced in years, all fatigue must be even more studiously avoided; while, at the same time,

whenever the weather is favourable the greater part of the day should be spent on the beach.

Patients using the warm bath must particularly avoid keeping late hours and remaining out of doors after sunset.

The number of baths which is necessary for a cure varies according to the different cases. Scrofulous children, who spend the whole summer on the coast, may take as many as forty or fifty with proper intervals of rest. For the purpose of strengthening, twenty to twenty-four are generally sufficient: three to four are enough in most cases as a preparation for the cold bath.

CHAPTER X.

THE DOUCHE BATH.

THE douche-bath consists, as is well-known, in a jet or column of water, striking certain parts of the body with more or less violence, according to the height from which it falls, or the strength with which it is impelled. It is either progressively directed against a greater surface of the body, or its action is confined to a small space, according to the more general or local effect which is required.

A strong douche-bath calls forth a very considerable reaction in the part on which it plays, and this is not confined to the skin, but extends to a greater depth beneath the surface. If the part was weakened or relaxed, its vitality is mightily roused by this

powerful stimulus, the blood circulates more freely through its tissue, and an improved nutrition is the result, through which at the same time the functions are restored to their healthy condition. Thus, in many cases of local debility and diseased vegetation,—such as indolent scrofulous tumours and exudations, obstinate swellings of the glands, arthritical concretions and contractions, atonic rheumatisms, weakness resulting from dislocation or a sprain, local nervous affections and paralysis, &c.,—the douche-bath is one of the most powerful remedies known. Cold douches on the head have already been recommended as far back as the first century of our era, by Celsus and Aretæus, against mental derangement, giddiness, weakness of the memory, and tendency to apoplexy.

The douche-bath is also an excellent remedy in many cases of general weakness. Scrofulous children, from three to twelve years old, show a considerable improvement

after having used it for two or three months, and its prolonged employment completely transforms their originally weak constitution.

Young persons suffering from chlorosis, which had withstood the use of iron and of all other pharmaceutical remedies, have frequently been radically cured by a five to six month's use of the douche-bath.

In cases of weakness from considerable losses of blood, and after prolonged and dangerous illnesses, the douche-bath, by rousing the energies of the nervous system and promoting circulation, increases the appetite and the powers of digestion, and thus paves the way for the improvement of the blood, both with regard to quantity and quality.

Thus its effects are analogous to those of sea-bathing, the shock of the waves being, in fact, an extensive douche-bath, which by striking a great part of the body at once, makes a powerful impression on the economy. The douche-bath may, therefore, in a great

many cases, but more particularly in local affections, where a considerable partial stimulus is desirable, be very advantageously used, conjointly with sea-bathing, either employing it alternately every other day, or even daily; or as a substitute, when the weather is rainy and boisterous, or the surface of the sea unruffled with a wave. The salt water douche-bath has a more powerful effect than where fresh water only is used; and on the coast its beneficial action finds a very important auxiliary in the pure and invigorating sea-bath.

It is a far too powerful remedy to be used without advice, as it may be productive of very disastrous effects when wrongly employed; its violence, duration, and temperature, must always be strictly regulated according to the reactive strength of the patient.

When too much prolonged, it produces a numbness and growing insensibility in the part, which may extend over the whole body

and cause a considerable general depression, frost, shivering, spasms, and fainting; or else it provokes a violent reaction and symptoms of excitement, which are equally prejudicial. As soon, therefore, as the skin begins to redden, and to show signs of an increased sensibility, and a prickling sensation is felt in the parts beneath it, the stream must be immediately stopped. Even strong people cannot stand its long duration, and least of all on the head. The greater the violence of the shock, and the thickness of the stream, the shorter of course the continuance of its action must be. The duration of the douche-bath for adults must generally not exceed fifteen minutes; for children, five to ten. It is used conjointly with cold and warm sea-baths; its temperature being analagous to that of the bath. Stimulation and expansion of the skin take place very soon where the warm douche-bath is used; the reaction appears later when the stream is

cold. Weak and delicate patients, must begin with the warm, and finish their cure with the cold, douche-bath.

When it is used against general weakness, it must be progressively extended over the whole body, but particularly directed along the spine. When a larger stream of water is made to fall perpendicularly upon the patient, he must hold his hands over his head to protect it from the shock; so that the stream first of all strikes the neck and back, and then by degrees the whole body. Sensitive patients must previously rub their forehead, breast, and pit of the stomach with water. Dry friction in different parts of the body will be found to facilitate reaction.

While the douche-bath is using, all changes of temperature, currents of air, and draughts, must be avoided.

Where it is intended to strike the arms, the lower extremities, or any swollen part, it must not be immediately directed upon it

but approach it by degrees, and play obliquely on its surface. This precaution must be particularly attended to where a joint is affected, for here the evil cannot be taken by storm, all that is required or tolerated, being a mild excitement of the vitality of the part, in order to assist or to provoke the healing efforts of nature.

After the douche-bath the patient must rest for some time, and refrain as much as possible from using the affected part. It must not be employed during digestion, or when the body is in a state of mental or physical excitement.

CHAPTER XI.

INTERNAL USE OF SEA-WATER.

THE waters of the ocean everywhere abound with salts, but their quantity is found to vary in different latitudes and seas. Thus, in the equatorial zone, the Atlantic contains more of them than in the Polar regions (as if Nature, by an admirable provision, had increased the proportion of salt where the waters are more liable to corruption); and while in the Mediterranean their quantity surpasses 4 per cent., it scarcely amounts to $3\frac{1}{2}$ along the British coast.

The principal salts found in sea-water are :

| | | |
|--------------------------------------|------|-----------|
| Muriate of soda (kitchen salt) about | 2·50 | per cent. |
| Muriate of magnesia . . . „ | 0·30 | „ |
| Sulphate of magnesia . . . „ | 0·30 | „ |

| | | | |
|----------------------------|-------|-------|-----------|
| Sulphate of lime | about | 0·15 | per cent. |
| Muriate of lime | „ | 0·15 | „ |
| | | <hr/> | |
| | | 3·40 | „ |

besides traces of carbonate of lime, carbonate of magnesia, protocarbonate of iron, phosphate of lime, hydrobromate and hydriodate of magnesia, and of a variety of other substances.

It contains also, particularly near the shore and at the surface, a slimy glutinous substance, produced by the innumerable tribes of plants and animals which inhabit the depths, or line the margin of the ocean. To this substance Deslandes and Fourcroy attribute, in a great measure, its disagreeable taste.

Atmospheric air, which is as necessary to the existence of marine animals as to that of the inhabitants of the land, and carbonic acid gas, are likewise found mixed with sea-water. As the salts which it contains in such abundance have strong medical properties, it is thus fully entitled to rank as a powerful mi-

neral water, and its internal use is found to be advantageous in a great many cases.

In small doses—morning and evening a wine-glass—it stimulates the mucous membrane of the stomach and digestive tube, and calls forth an increased secretion of mucus. Being introduced by absorption into the economy, it gradually diminishes the plasticity of the blood (salts having the property of dissolving albumen and fibrin), stimulates the lymphatic vessels and glands, and promotes the secretions of the liver, pancreas, and kidneys.

In consequence of these alterative, deobstruent, blood-cleansing, and blood-thinning effects, it proves a valuable remedy,—

1. In many cases of abdominal plethora or congestion, when the secretions are irregular and the blood is thickened ; as also of hæmorrhoids, jaundice, dyspepsia, hypochondria, and melancholy proceeding from this cause.

2. In scrofula, particularly where the lym-

phatic glands of the mesentery and other vegetative organs of the abdomen are swollen and obstructed, and where digestion suffers in consequence of languid secretion.

It agrees best with torpid constitutions and a full habit of body, and would be very injurious in all cases where there is already a deficiency or a watery mixture of the blood, or a liability to passive hæmorrhages, or where the system only requires to be strengthened, and does not stand in need of increased evacuations. Its prolonged use is apt to weaken the digestion, and ultimately to produce scorbutic symptoms. At all events, it ought never to be resorted to without proper advice.

In larger doses—two or three tumblers after short intervals—it acts as a cooling purgative, and brings forth a copious secretion along the whole intestinal canal, but without irritating the nerves or the blood-vessels, and without causing pain or heat.

It may consequently be used with advantage as an opening medicine, when constipation takes place during a course of sea-bathing, or where there is a tendency of blood to the head; but recourse must not be had to it where the digestive organs are weak, and in all cases where saline laxatives are counter-indicated.

For internal use sea-water must be fetched at some distance from the strand, and at a depth of several feet, as it will then have a less disagreeable taste, which may also be improved by adding it to milk, or mixing it with beef-tea. It may also be procured at a chemist's, filtered and saturated with carbonic acid. Children, in general, have no particular distaste for it, and soon learn to take it without compulsion.

In clysters it is a good remedy for ascarid-worms, with which children are frequently tormented. At first it should be mixed with one half fresh water, and the quantity of the

latter gradually diminished, until it is employed pure.

When used for injections, or applications in scrofulous diseases of the eye, care must be taken that no sand be mixed with it.

CHAPTER XII.

THE LENGTH OF THE CURE, AND THE BEST SEASON FOR BATHING IN DIFFERENT COMPLAINTS.—THE PROPER REGIMEN AFTER LEAVING THE COAST.

BEFORE answering the question how many baths the patient is to take, or how long he is to stay on the coast for the accomplishment of his cure, we will premise a few observations on the changes sea-bathing is expected to bring about in the disordered constitution.

In all cases for which it is an appropriate remedy, the energy of the whole nervous system, or of a part of it, is weakened, and at the same time, on account of the intimate connexion between solids and fluids, the composition of the blood is more or less deviating from the standard of health.

The diminished power of the nervous sys-

tem can only be restored by the improvement of its nutrition; for healthy activity cannot possibly exist without a good physical constitution of the organ from which it proceeds; and, again, an improvement of the nutrition can only be effected by means of a healthy, well-conditioned blood.

But sea-bathing, as we hope to have satisfactorily proved, leads to health by acting at the same time on the solids and the fluids, by strengthening the nutrition of the former, and improving the composition of the latter. Now it is evident that changes such as these can only be gradual—the silent work of time; and this alone would be sufficient to prove that it is impossible peremptorily to determine beforehand the number of baths which will be necessary for the desired effect.

The difficulty is still further increased, if we consider that bathing in calm weather, and when the water is warm, is not like bathing in the cold, and when the waves strike

with full force against the body; and that it must necessarily make a difference whether a serene sky favours exercise, and the day-long enjoyment of the bracing sea-air, or rain keeps one a prisoner within doors. Besides, where one patient favours his cure by a proper regimen, and takes care not to lose a single day, the other, by continually committing faults in his diet, does all he can to counteract its progress.

The physician who sees the patient on the spot, and witnesses the advances he makes towards health, is, therefore, the only competent judge of the necessary duration of his cure. Beforehand the time only can be determined which will *probably* suffice for effecting it.

Thus, wherever the disease has struck deep roots so as to have become habitual; where the constitution is very much weakened, and can evidently regain strength but very slowly; where great laxity of the fibres is joined with

vitiated humours and weak reaction, as in scrofula; there the patient will do well to remain during the whole summer on the coast; and, at all events, eight to ten weeks will be necessary to secure anything like a lasting effect. Frequently even, particularly in cases of congenital debility, the cure must be repeated during several consecutive years.

Where the patient was originally strong, and his complaint has not yet, from long continuance, become, as it were, part of his constitution, where a more energetic reaction may be anticipated, a shorter time will be sufficient; but even here it will be better to make a liberal allowance, and to fix upon five or six weeks as a minimum.

In cases, finally, of smaller importance, such as simple irritability of the nerves, brought on by mental exertion, or an irregular way of living, three or four weeks spent on the coast will answer the desired effect and restore the tone of the constitution. The

proper season for bathing differs in different complaints.

Where the nerves more particularly require to be strengthened, and the powers of reaction are not reduced to too low an ebb, a colder temperature of the bath, and the predominance of cooler sea-breezes, will be productive of greater benefit than if the patient chooses the warmer months of the year for his sojourn on the coast. In these cases, bathing may advantageously be begun as early as the month of May, or else September and October will be found extremely salutary. A cold-bath of 50° , or even less, steels the nerves uncommonly, and by making a more profound impression on the organs, produces an identical effect. As the shock of the waves is one of the most important strengthening influences which act upon the body in the bath, care must be taken to select a shore where the breakers are strong; and as a warm temperature has always a debili-

tating effect, those coasts are to be avoided where the climate is generally mild and soft.

In other cases, where the reactive powers of the patient are weak, and cold is not so well supported, as in elderly persons, delicate females and young children, in scrofula or rickets, where, playing and sitting for hours together on a beach warmed and enlivened by the sunbeam, is particularly beneficial; where a gradual improvement of the vegetation and nutrition of the solid parts is the principal aim in view; where the use of the warm sea-bath is preferable to that of the cold, the patient will derive greater advantage from the summer months and a milder climate, which allows him to continue for a longer time on the coast.

Sometimes a fashionable well-attended bathing place will be the one best adapted to the state of the patient; in other cases, a quiet, secluded spot, where his over-excited nerves may repose in the calm of retirement, will

be preferable. All these circumstances of time and place should be well weighed beforehand, as the success of the cure in some measure depends upon them.

The increased vital action which sea-bathing calls forth in our organs, does not cease, immediately after leaving the coast, but continues for a long time after to effect beneficial changes in the nutrition of the solids and the composition of the blood. Hence many patients, who had left the bath without having, as they thought, derived any benefit from it, only begin to perceive its good effects after weeks or even months have elapsed, when the changes to which sea-bathing gave the impulse have been finally completed by the slow hand of time. After the last bath has been taken, the patient must therefore by no means fancy that his cure is at an end, as very often it is merely in the beginning of its progress; and as his organization still remains for a longer or shorter period in a state of excite-

ment, he must pay more than ordinary attention to his regimen, lest he disturb the vital powers while they are more than commonly active in raising the standard of his health.

On this account it is very desirable that he should not at once plunge into the cares and fatigues of business after returning to his home, but rather devote a few weeks to tranquil repose, or at least only task his mind to a moderate degree ; and, for the same reason, every other kind of excitement must as much as possible be avoided, such as late hours, parties, &c.

By practising moderation in every respect, he may be sure that he is in the right way to reap as much benefit from his cure as he can possibly expect ; by pursuing the contrary course, he completely endangers its success.

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