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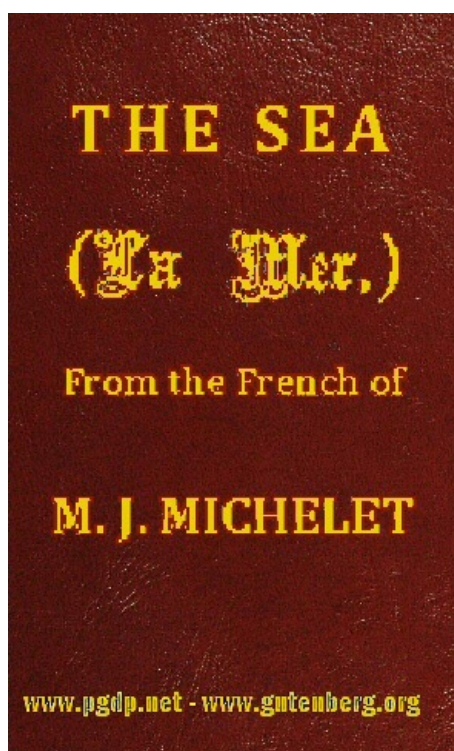
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THE SEA.

UNIFORM WITH THIS VOLUME,

And by the same Author.

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THE INSECT (L'INSÈCTE) Its Life, Loves and Labors. (*In press.*)
THE BIRD (L'OISEAU.) Its Life, Loves, and Labors. (*In press.*)

THE SEA

(La Mer.)

From the French of

M. J. MICHELET,

*Of the Faculty of Letters, Author of "A History of France,"
"Love," "Woman," "The Child," "The Insect,"
"The Bird," "Women of the French Revolution,"
etc., etc., etc.*

TRANSLATED FROM THE LATEST PARIS EDITION.



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EXTRACT FROM THE LONDON ATHENÆUM, FEB. 9. 1861.

'The Sea' is another of M. Michelet's dreamy volumes,—half science, half fancy, with a blending in both of sensuous suggestion. M. Michelet takes the seas of the world in his hands, manipulates them, invokes their monsters, assembles all their finny droves, gossips with the sirens, sails among the Hyperborean waters with Behemoth, and is on intimate terms with Tennyson's little shell-king, who lives in a palace with doors of diamond, and wears a rainbow frill, for the admiration of the nations that dwell in his dim, sunken wildernesses. * * * * He discourses upon marine terrors and beauties, and tells the reader, as a sublime Peter Parley might, that the salt of all the seas, if piled upon America, would spread over the continent a solid, cliff-edged mass, 4,500 feet high. There are chapters on Sands, Cliffs and Beaches; on Waves; on the anatomy of the Sea itself, which resembles "a gigantic animal arrested in the earliest stage of its organization;" on Tempests; on the sympathy between Air and Water; on the Fecundity of the Sea, which, were it not self-devouring, would putrefy, according to M. Michelet into one solid mass of herring; on Fish of every species, and especially on Pearls. The Queens of the East, he says, dislike the gleams of the diamond. They will allow nothing to touch their skins except pearls. A necklace and two bracelets of pearls constitute the perfection of ornament. The pearls silently say to the woman, "Love us! hush!" In the North, too, dainty Countesses love their pearls, —wearing them beneath their clothes by night and by day, concealing them, caressing them, only now and then exposing them. So do the Odaliskes of Asia prize the soft linen vestment that just covers their limbs, never taking it off until worn out, which says little for Oriental baths.

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BOOK FIRST.

A GLANCE UPON THE SEAS.

CHAPTER I.

THE SEA AS SEEN FROM THE SHORE.

A gallant Dutch seaman, a cool and stern observer, who has passed his whole life at sea, frankly tells us that his feeling on first seeing the ocean was *fear*. For all terrestrial animals, water is the non-respirable element, the ever heaving but inevitably asphyxiating enemy; the fatal and eternal barrier between the two worlds. We need not, all things being considered, be at all surprised, if that immense mass of waters which we call the sea, dark and inscrutable in its immense depths, ever and always impresses the human mind with a vague and resistless awe.

The imaginative Orientals see it only and call it only, as, the *Night of the Depths*. In all the antique tongues, from India to Ireland, the synonymous or analogous name of the sea is either *Night* or the *Desert*.

Ah! With what a great and a hallowed and a hallowing, with what an at once soothing and subduing melancholy it is that, evening after evening, we see the Sun, that great world's joy, that brilliant, life-quickening, and light-giving Sun of all that lives, fade, sink, die—though so surely to rise and live again! Ah! as that glorious light departs, how tenderly do we think of the human loves that have died from us—of the hour when we, also, shall thus depart from human ken, lost, for the time, to this world—to shine more gloriously in that other world, now dark, distant, unknown, but certain.

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Descend to even a slight depth in the sea, and the beauty and brilliancy of the upper light are lost; you enter into a persistent twilight, and misty and half-lurid haze; a little lower, and even that sinister and eldritch twilight is lost, and all around you is Night, showing nothing, but suggesting everything that darkness,—handmaiden of terrible Fancy—can suggest. Above, below, beneath, all around, darkness, utter darkness, save when, from time to time, the swift and gracefully terrible motion of some passing monster of the deep makes "darkness visible" for a brief moment—and, then, that passing gleam leaves you in darkness more dense, more utter, more terrible, than ever. Immense in its extent, enormous in its depth, that mass of waters which covers the greater part of our globe seems, in truth, a great world of shadows and of gloom. And it is that which, above all, at once fascinates and intimidates us. Darkness and Fear! Twin sisters, they! In the early day, the at once timid and unreasoning Childhood of our race, men imagined that where no Light was, neither could there be Life; that in the unfathomed depths, there was a black, lifeless, soundless, Chaos; above, nought but water and gloom,—beneath, sand, and shells, the bones of the wrecked mariner, the rich wares of the far off, ruined, and vainly bewailing merchant;—those sad treasures of "that ever-receiving and never-restoring treasury—the Sea."

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The waters of the sea afford us no encouragement by their transparency. Look not there for the seductive, brightly sparkling, and ever-smiling nymph of the fountain. Opaque, heavy, mighty, merciless, your sea is a liquid Polyphemus, a blind giant that cares not, reasons not, feels not—but hits a terribly hard blow. Trust yourself upon that vast and ever-heaving bosom, bold swimmer, and marvellously will you be upheld; the mighty thing that upholds you dominates you, too; you are a mere weak child, upheld, indeed, for the instant by a giant-hand—in another moment that giant-hand may smite you with a giant's fatal force.

Her anchor once tripped, who can tell whither the good ship may be urged by some sudden wind, or some unsuspected but irresistible current? Thus it was that our northern fishermen, not only without their intention, but even in spite of it, discovered polar America, and supped full of the horrors of funereal Greenland. Not a nation upon the earth but has its tales and traditions of the sea. Homer and the *Arabian Nights*, have handed down to us a goodly number of those frightful legends, of shoals and tempests and of calms no less murderous than tempests,—those calms during which the hardiest sailor agonizes, moans, loses all courage and all hope in the tortures of the hours, days, haply even weeks, when, with cracked lip and blood-shotten eye, he has around him, heaving upward and sinking downward, but never progressing a cable's length,

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"Water, water, everywhere,
But not a drop to drink."

Thrilling and saddening legends have all our old writers handed down to us of the Anthropophagi, those loathsome man-eaters, and of the Leviathan, the Kraken, the great sea-serpent, &c. The name given to the great African desert—*The Abode of Terror*,—may very justly be transferred to the sea. The boldest sailors, Phœnicians and Carthaginians, the conquering Arabs who aspired to encircle and grasp the whole world, seduced by what they heard of the Hesperides and the land of gold, sailed out of the Mediterranean to the wide ocean, but soon were glad to seek their port again. The gloomy line eternally covered with clouds and mist which they found keeping their stern watch before the equator, intimidated them. They lay to; they hesitated; from man to man ran the murmur "*It is the Sea of Darkness*—and, then, back went they to port and, there told to wondering landsmen what wonders they had seen, and what horrors they had imagined." Woe to him who shall persist in his sacrilegious espionage of that dread region! On one of those weird and far isles stands a sternly-threatening Colossus, whose sempiternal menace is—"Thus far thou hast come—farther thou shalt not go!"

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Childish as we may think those terrors of the long by-gone ages they really were much the same as the emotions which we may any day see evinced by an inland-born novice who for the first time looks upon the sea. And not merely man, but all animals, experience the same surprise, the same shock, when suddenly brought face to face with the mighty water-world. Even at ebb tide, when the water so gently and so lovingly caresses, as it leaves, that shore to which it shall so boisterously return, your horse quite evidently likes it not; he shudders, balks, snorts,—and

very often bolts from it at the very top of his speed. Your dog recoils, howls, and, after his own canine fashion, returns insult for insult to the waves that annoy and terrify him; he never concludes a real peace with the element which to him seems less doubtful than positively hostile. A certain traveller tells us that the Kamtschatkan dogs, accustomed as they are to the sight of the sea, are nevertheless irritated and alarmed by it. During the long nights immense troops of them howl back to the howling waves that break, in their furious might, upon the iron-bound shores of the northern ocean.

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The natural introduction, the portico, the ante-room, of the Ocean, which prepares us thoroughly to appreciate its vast and melancholy extent, is to be found in the dreary course of the rivers of north-western France, the vast sands of the South, or the sad and rarely trodden *Landes* of Brittany. All who approach the sea by any of those routes are greatly impressed by that intermediate region. All along the rivers, there is a seemingly infinite chaos of roots and stumps, of willows and the like water-loving vegetation, and the waters becoming more and more brackish, at length become absolutely salt—the veritable sea-water. In the *Landes*, on the other hand, as we approach the sea, we have a preliminary and preparatory sea of low-growing and coarse shrubs, broom, and bushes. Proceed a league or two, and you see sickly and drooping trees which seem, after their manner, to tell you how much they suffer from the blighting breath of their near neighbor, and great tyrant, the Sea. Evidently, if they were not held there by their great strong roots they would fly to some climate more genial and some soil more generous; they turn every branch from the sea and towards the earth, as though they were a routed host, disorganized, panic-stricken, and prepared to seek safety in flight. Fixed to the soil, they bend themselves eastward, twisting, writhing, mutely agonized at every new assault of the storm-winds from the seaward. Still nearer to the Sea, the trunk of the tree is slender, its stature dwarfish, and its few poor branches spread themselves confusedly to the horizon. On the shore, on the very margin and boundary line between land and Sea, where the crushed shells rise in a fine and pungent dust, the trees are invaded, covered, choked up with it; their pores are closed, they inhale no air, they are stifled; still living as to form, they are mere petrified trees, spectral trees, melancholy shadows which have not even the privilege of departing,—sad prisoners—even in death! Long before we are face to face with the Sea, we can hear and imagine that grand and terrible entity. At first, we hear only a dull, uniform, and distant moaning, which grows louder and louder still, until its majestic roar silences, or covers, all meaner sounds. Very soon we perceive that that roar is not monotonous, but has its alternating notes; its full, rich, mellow tenor, and its round, deep, majestic bass. The pendulum of the clock oscillates less regularly than that alternating moan and roar of the Ocean in its grand unrest. And this latter, let me repeat it, has *not* the monotony of the pendulum, for in "what those wild waves are saying," we feel, or fancy that we feel the thrilling intonations of life. And in fact, at high flood, when wave rears its crest upon wave, immense, electric, there mingles with the tumultuous roaring of the fiercely rushing waters, the sound of the shells and pebbles, and the thousand things animate as well as inanimate that they carry with them in their shoreward rush. When the ebb comes, a soft murmur tells us that, together with the sands, the sea carries back into her depths all with which for a few brief hours the shore had been adorned or enriched.

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And how many other voices hath the mighty sea! Even when least agitated, how her wailings and her deep sighs contrast with the dull dead silence of the deserted shore, which seems to expect, in mute terror, the threatening of that mighty mass which so recently laved it with a gentle and caressing wavelet. And will she not speedily fulfil her threat? I know not, and will not anticipate. I will not, just now, at least, speak of those terrible concerts in which, haply, she ere long will take the principal part; of her duets with the rocks, of the basses, those muttered thunders which she utters in the deep caverns of the rocky shore, or of those strange, wild, weird, shrieking tones in which we seem to recognize the "*Help, spare, save me!*" of some tortured or fearfully imperilled humanity. No; let us, for the present, contemplate her in her calmer moods; when she is strong, indeed, but not violent.

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CHAPTER II.

THE BEACH, THE SANDS, AND THE IRON-BOUND COAST.

We need not be at all surprised if childhood and ignorance are astounded, *astonied*, when they first find themselves face to face with that vast and mysterious Sphinx of the Great Master's sculpture, the Ocean. Why, in fact, should we be astonished by their gaze of mingled awe, admiration and bewilderment, when we ourselves, despite our early culture and life-long experience, see so much in the great Riddle of that great Sphinx which we cannot even hope to explain?

What is the real extent of the ocean? That it is greater than that of the earth is about as much as, conscientiously, we can at all positively affirm. On the entire surface of our globe, water is the Generality—land the Exception. But what is their relative proportion? That, water covers four-fifths of the globe is probable, though, some say a third or a fourth. It is difficult, not to say impossible, to answer the question precisely. A bold explorer discovers a polar land, lays it down, latitude and longitude, with scientific precision; in the very next year an equally bold and no less scientific adventurer seeks it in vain; and in all latitudes immense shoals and lovely Coral islands form in the dark depths, rise to the surface, and disappear, just as suddenly and unaccountably

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as they arose.

The real depth of the sea is still less known to us than its extent; we are only at the mere commencement of our early, few, and imperfect soundings.

The daring little liberties which we take with the surface of the invincible element, and the confidence with which we go hither and thither upon its unsounded depths, have really nothing to say against the grand and well-founded pride of the Ocean, impenetrable as she is as to her secrets, ever moving yet unchangeable, a reality, yet, in all but a few of her phenomena, as unreal to us as the spectres of our actual dreaming. That those mighty depths contain a whole world, a marvellously great and diversified world, of life, love, war, and reproduction of all sorts and sizes, we must imagine and may already with confidence affirm; but we have only, and barely, touched upon the threshold of that world. We are in such a hurry to leave that strange and hostile element! If we need the Ocean, see ye, my brothers, the Ocean in no wise needs us. Nature, fresh from the hand of Deity, scorns the too prying gaze and the too shallow judgment of finite but presumptuous man.

That very element which we term fluid, shifting, capricious, suffers, in reality, no change; on the contrary it is a very perfect model of regularity. The really and constantly changing creature is Man. His body of this year will have evaporated by this time next year, for, according to Berzoliuſ, four-fifths of our frame are water, which at every instant we yield to the ever craving atmosphere. Fragile and fleeting creature as Man is, he has indeed good reason for reflection and for humility when he finds himself in presence of the great unchanging, and, humanly speaking, unchangeable, powers of nature, just, and grand, glorious, as is his hope, his belief, his *certainty* of a spiritual immortality. Despite that delightful hope, that confident belief, that sustaining certainty, Man yet is necessarily and terribly saddened by the smiting and strange suddenness with which he hourly sees the thread of man's life forever broken. The Sea seems to exult over our fleeting tenure of a life of which we cannot anticipate, far less command, one added moment. Whenever we approach her, she seems to murmur from her dark, inscrutable depths, unchangeable as His will who made them—"Mortal! to-morrow you shall pass away, but I, I am, and ever shall be, unchanged, unchangeable, mighty and mysterious. The earth will not only receive your bones but will soon convert them into kindred and indistinguishable earth, but I, ever and always, shall remain, main, the same majestic and indifferent entity, the great perfectly balanced Life, daily harmonising myself with the harmonious and majestic life of the bright far worlds that shine above and around you." A stern and a scorning rebuke that is which is given to our poor human pride when, twice in our every mortal day the sea tears from our vexed shores the stony spoils which twice in every day she scornfully and terribly hurls back again. To any imagination but that of the trained and veteran seaman, the fierce rush of the rising tide infallibly suggests the likeness of a fierce and deadly combat; but when the child, or the Savage, observes that the fury of the sea has its inevitable limits, the terror of the child or Savage is turned—true coward-fashion—into an unreasoning compound of hate and rage, and he as fiercely, as impotently, pelts the terrible waves with the very pebbles which without effort, without consciousness, she has cast, heaps upon heaps, by ship loads, at every vast beat of her semi-diurnal pulse! Foaming, roaring, threatening, the waves rush shoreward; the boy observes that though they may kiss, they cannot, at his safe stand-point, submerge his delicate little feet, returns laughter for their roarings, petty pebbles for their impotent threats.

I saw a battle of this sort at Havre, in July, 1831. A little boy whom I took thither felt his young courage aroused and his young pride stung, by the loud challenges and fierce threats of the incoming tide, and he returned scorn for threat, feebly-thrown pebble for surging and mighty wave. Greatly, aye, laughably unequal was the strife between that small, white, delicate and feeble hand of the young mortal, and the vast and terrible force which cared not about it, feared it not, felt it not, knew it not. *Laughably*, said I? Ah! no inclination towards laughter remains with us when we reflect upon the fleeting existence, the ephemeral and impotent fragility of our best beloved, our fellows, our Maker's favored, erring, vain-glorious, and, in the last issue, utterly helpless Humanity, when in presence of that tireless and inscrutable Eternity to which we may at any moment be recalled! Such was one of my earliest glances at the Ocean; such the gloomy meditations, only too truly and too sternly realized, that were suggested to me by that combat between the fierce Sea upon which I look so often, and the glad and laughing, and buoyant child upon whom, alas! I shall look, lovingly and anxiously, no more.

CHAPTER III.

THE BEACH, THE SANDS, AND THE IRON-BOUND COAST, CONTINUED.

Look upon the Ocean where and when you may, you everywhere and always shall find her the same grand and terrible teacher of that hardest of all the lessons man has to learn,—man's insignificance. Take your stand upon some bold headland, from which with earnest and well trained eye, you can sweep the entire horizon; or, wander, with shortened ken, in the sandy desert;—go whithersoever you will, where old Ocean shall lash the shore, and everywhere and always, I repeat, you shall find Ocean the same—mighty and terrible. True it is, that our finite and dim gaze cannot discern the, humanly speaking, *Infinity* of the Ocean; but we feel, we instinctively comprehend, that Infinity, and the impression made by that instructive

comprehension is even deeper than could be made by Ocean visibly to our material eye, tangibly to our poor human hand.

Such, so deep, so permanent, was the impression made upon me by that wild tumultuous scene on the scourged-shore where Granville—dear old Granville!—keeps neutral watch between Normandy and Brittany. The wealthy, kindly and hearty, though bluff, and somewhat vulgar Normandy with its vast outspread of orchard and meadow suddenly disappears, and, by Granville and by the frowning Saint Michel we pass all at once into quite another world. For Granville, though Norman as to race, is thoroughly Breton as to aspect. Sternly, solidly, invincibly, the great Rock rears his defiant front, and looks down in a quite insolent contempt upon the wild surges that incessantly assault, but never harm, that passionless and mutely mocking Titan. Let the wild winds, unpent from their northern caverns, sweep the rugged coast; borne on the cross-currents from the angry West, let the wind sweep all things else clear from its path and this stern unconquerable rock ever and alway saith "thus far shalt thou come, but no farther. Strengthened though you are by your mad trans-Atlantic leap of a thousand leagues, against me your fury shall be spent in vain."

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I loved that odd and somewhat dull little town, which owes its support to the distant and most perilous fishery. Every family there, feels that it is supported by a dread game in which human life is at stake; and this feeling produces a certain harmonious gravity in the aspect and tone of the dwellers hereabout, and of all their surroundings. A touching and a hallowing melancholy, that, of which I have often felt the influence, when, walking on the already darkening shore or gazing from the upper town that crowns the great rock, I have seen the sun sink below the far and misty horizon, harshly streaked by alternate rays of luridness and gloom, and not pausing to tint the sky with those glowing and fantastic brilliances which in other climes delight us. Here it is already autumn in August, and twilight scarcely exists. Scarcely has the sun set, when the shrewd winds freshen, and the dark green waves sweep on with added force; below, you see a few spectral forms hurrying along in their dark cloaks, and from afar you hear the melancholy bleatings of the sheep already benighted on their scanty pasturage.

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The very small upper town rears its northern front sharply and boldly above the very edge of a cold dark abyss, facing the great sea, and swept by an eternal blast. This part of the place consists of only poor houses, and in one of them I found my quarters with a poor man, a maker of those pretty shell pictures for which the place is famous. Ascending by a ladder, rather than a staircase, into a dark little room, I looked out upon the strange wild scene, as strange and tragic, as wild and impressive, as that which had presented itself, when, also from a window, I had caught my first view of the great glacier of the Swiss Grindelwald. The glacier had shown an enormous monster of peaked icebergs which seemed crashing down upon me; and this vexed sea of Granville seemed an army of monstrous waves all rushing together to the attack.

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My host here, though far from old, was feeble and suffering, and, as I examined his shell work and talked with him, I perceived that his mind was somewhat shaken. Poor fellow; upon that shore his only brother had perished, and from that moment the sea appeared to him an intelligent and persistent enemy. In the winter it beat his windows with snow or with icy winds, and kept him sleepless and peaceless during the long and dreary nights, and in the summer it brought him the vivid lightnings and the far resounding thunders. At the high tides it was still worse; the spray then beat upon his very windows, and he felt doubtful if some day he would not be drowned even on his own hearth. But he had not the means of finding a more secure shelter, and perhaps he was unconsciously retained there by we know not what strange fascination. He had not resolution to break altogether with that terrible foe, for which he had a certain respect, as well as a great awe. He seldom spoke of it by name; like the Icelander who, when at sea, does not name the *Ourque*, lest she should hear, and appear. I fancy that even now I can see his pale face, as, pointing to the wave-beaten beach, he said—"That terrifies me!"

Was he a lunatic? Not at all. He spoke quite sensibly, and was in reality interesting and even distinguished. A nervous being, too delicately organized for such a scene as that in which he was placed.

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But the sea can madden, and often does. Livingstone brought from Africa a bold and intelligent man who had hunted and killed Lions, but had never seen the Sea. When taken on board ship, the novel sight was too much for his brain, he became frantic, and threw himself headlong into the heaving deep, which at once terrified and fascinated him. On the other hand, so attached do some men become to the sea, that they can never quit it. I have seen old pilots, compelled by infirmity to abandon their office, fret themselves into imbecility.

On the very summit of Saint Michael you are shown what they call *Maniac's Shelf*; and I know no place better fitted to make one mad than that giddy height. All around a vast stretch of white sand, solitary ever, and ever treacherous. It is neither land nor water; it is neither sea water nor fresh, though streams are constantly flowing beneath. Rarely, and but for brief moments, a boat can cross there, and if you cross when the water is out you risk being swallowed in. I can state that with full authority, for I nearly lost my life there. A very light vehicle in which I ventured there, and the horse that drew it, disappeared in too, and only by a perfect miracle I escaped on foot, feeling myself sinking at every step. At length, however, I reached the Rock, that gigantic Abbey, Fortress and Prison, that frowning sublimity, so well worthy of the scene which it so sternly dominates. This is no place for a detailed description of such a monument. On a huge block of granite, that Titanic pile rises and rises still, rock upon rock, age upon age, and still dungeon above dungeon. At the foot, the *in pace* of the Monks; higher up, the iron cage made by

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Louis XI.; higher still, that of Louis XIV.; higher still, the prison of our own day. And all this in a whirlwind, a perpetual tempest; a Sepulchre without the Sepulchre's peace.

Is it the fault of the sea, if this beach is treacherous? Not at all. There, as elsewhere, the Sea arrives strong and loud, indeed, but in all frankness and loyalty. The real fault is in the land, apparently solid, but undermined by numberless streams of fresh water which converts that seemingly solid beach into a treacherous and devouring quagmire. And especially is the fault in the ignorance and negligence of man. In the long dark ages when man invented the legend and the pilgrimage of the Archangel who vanquished the Devil, the Devil took possession of that deserted plain. The sea is quite innocent in the matter. Far, indeed, from doing harm, the sea upon its madly bounding waves brings in a nourishing and fecundating salt more precious than the fat slime of the Nile, enriching the once hideous marshes of Dol into the lovely gardens of our own day. The Sea is a somewhat violent mother, no doubt;—but a mother still. Abounding in fish, she lavishes upon the opposite Cancale, and upon many another bank, millions, thousands of millions, of oysters, whose crushed shells give beauty, and verdure, and flowers, and fruit. We must enter into a right understanding with the Sea, and not be led away by the false notions which its barren beach or its own more violent phenomena—often only the disguises of very real and very great benefits—may suggest to us.

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CHAPTER IV.

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THE BEACH, THE SANDS, AND THE IRON-BOUND COAST, CONTINUED.

The headlands, the sandy beaches, the bold capes and the low shores, command various, but ever useful, views of the great sea, stern and wild at the first glance, but divine and friendly, as we come to know it better. The advantage of the headlands is that at the foot of one of those giant rock-walls we more entirely than elsewhere appreciate the breathing and bounding pulse of the sea. Insensible, imperceptible, on the Mediterranean, that pulse is very distinct on the ocean. The Ocean breathes and pulsates, even as you and I do; it compels me to calculate my days and hours, and to look up to Heaven. It reminds me alike of myself and of the world. Let me seat myself upon some such shore, that, for instance, of Antifer, whence I may look out upon that vast expanse. The sea which, but a moment ago, seemed dead, has suddenly shuddered and become tremulous—first symptom of the great approaching movement. The tide has heaved past Cherbourg and Barfleur, and turned sharply and violently round the lighthouse; its divided waters lave Calvados, rush upon Havre and come to me at Étretat, at Fécamp, at Dieppe, to hurl themselves into the canal despite the strong Northern currents. It is for me to watch its hour. Its height, almost indifferent to the sandhills, is here, at the foot of the headland, alike worthy of your attention and powerful to command it. This long rock-wall of thirty leagues has but few stairways. Its narrow inlets, which form our smaller havens, occur at rare and great distances. And at low water we can with inquiring gaze inspect and question the strata above strata, gigantically and regularly superposed, which, as so many Titanic registers, tell us the history of accumulated ages of growth and decay, of life and death. From that great open book of time every year tears away a page. We have before us a piece of an hourly perishing, hourly renewing, world, which the sea from beneath is hourly devouring, and the torrents and the tempests, the frosts and the thaws from above, are hourly, and still more destructively, attacking. Wearing, crushing, beating, pulverising, wave, and wind, and storm and Time, that great *Edax rerum*, that unsparing and untiring Moth of the Universe, are, even as we gaze, converting the one vast rocky mass into the rounded and petty pebble. It is this rough work which makes this coast, so richly fertile on the land side, a real maritime desert on the seaward. A few, very few, sea plants survive the eternal crushing and grinding of the ever crushed and ever crushing pebbles driven hither and thither by every wave that every wind scourges into motion. The molluscæ, and even the very fish shun this vexed shore. Great contrast that between an inland country so genial, and such a stern, rugged, threatening and inhospitable coast.

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It is only to be seen thoroughly when looked down upon from the bold headland. Below, the hard necessity of toiling over the beach, the sand yielding, and the pebbles round, hard, and rolling, makes the task of traversing this narrow beach a real and violent gymnastic exercise. No; let us keep to the heights where splendid villas, noble woods, the waving harvests, the delicious gardens which even to the very edge of the great rocky wall, look down upon that magnificent channel which separates the two shores of the two great empires of the world.

The land and the sea! What more! Both, here, have a great charm; nevertheless, he who loves the sea for her own sake, he who is her friend, her lover, will rather seek her in some less varied scene. To be really intimate with her, the great sandy beaches, provided, always, that they be not too soft, are far more convenient. They allow of such infinite strolls! They suffer us so well to build up our air castles, and to meditate upon so many things; they allow us to hold such familiar and deep conference with that never silent sea! Never do I complain of those vast and free arenas in which others find themselves so ill at ease. When there, I am never less lonely than when alone. I come, I go, I feel that ever present sea. It is there, ever there, the sublime companion; and if haply that companion be in gentle mood, I venture to speak, and the great companion does not disdain to speak to me again. How many things have we not said to each other in those quiet wastes, when the crowd is away, on the limitless sands of Scheveningen, Ostend, Royan, and Saint Georges. There it is that in long interviews we can establish some

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intimacy with the Sea, acquire some familiarity with its great speech.

When from the towers of Amsterdam the Zuyderzee looks muddy, and when at the dykes of Scheveningen the leaden waves seem ready to overleap the earthy mound, the Sea wears its least pleasing aspect; yet I confess that this combat between land and water attracts me forcibly—this great invention, this mighty effort, this triumph of man's skill and man's labor, over the fiercest force of inanimate nature.

And this sea also pleases me by the treasures of fecund life which I know to abound in its dark depths. It is one of the most populous in the world. On the night of St. John, when the fishery opens, you may see another sea arise from the depths—the Sea of Herrings. You will imagine that the boundless plain of waters will prove too limited for this great living upburst, this triumphant revelation of the boundless fecundity of Nature. Such was my first impression of this sea, and when I saw the pictures in which genius has so well marked its profound character, Ruysdaël's gloomy *Estacade* beyond any other painting in the Louvre has always irresistibly attracted me. Why? In the ruddy tints of those phosphorescent waters, I feel not the cold of the North Sea, but the fermentation, the stream, the rushing energy of life.

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Nevertheless, were I asked what coast the most grandly and powerfully impresses me, I should answer, that of Brittany, especially those wild and sublime headlands of granite which terminate the old world at that bold point which dominates the Atlantic and defies the western storm winds. Nowhere have I better felt than there, those lofty and ennobling melancholies which are the best impressions of the sea.

But I must explain, here. There are different melancholies; there is a melancholy of the weak, and a melancholy of the strong,—the melancholy of the too sensitive souls who weep only for themselves, and that of the disinterested hearts, which cheerfully accept their own lot, and find nature ever blessing and blessed, but feel the evils of society, and in melancholy itself find strength for action, means for creating good or mitigating evil. Ah! what need we have, we of the working brain, often to strengthen our souls in that mood which we may call *heroic melancholy*.

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When, some thirty years since, I paid a visit to this country, I could not account for the potent attraction that it had for me. At the foundation of this attractive potency of Brittany, is its great harmony. Elsewhere, we feel, though we cannot explain it to ourselves, a certain discordance between the race and the soil. The very beautiful Norman race, in those districts in which it is most unmixed, and where it retains the peculiar, ruddy complexion of the true Scandinavian, has not the slightest apparent affinity with the territory upon which it has intruded itself. In Brittany, on the contrary, on the most ancient geological formation on our globe, on that soil of granite and of flint, lives a race solid as that granite, sharp as that flint, a sturdy and antique race. Just as much as Normandy progresses, Brittany retrogrades. Witty, lively, and too imaginative, the impossible, the utterly absurd, are ever welcome to her. But, if wrong on many points, she is great upon a most important one; she has character; often you may think her erroneous, but never can you deem her common-place.

If we would for a time emerge from that wretched common-place, that deadly liveliness, that horrible waking dream "of stupid starers and of loud huzzas," let us seat ourselves on one of the impending and commanding peaks that overlook the bay of Douarnenez,—the stern, bold headland, for instance, of Penmark. Or, if the wind blow too strongly there for our frame, effeminated by the late hours, the bad atmosphere, and the hateful habits, and still more hateful passions, of the thronged city, let us take a quiet sail among the lower isles of the Morbihan, where the soft warm tide is lazy, and all but soundless. Where Brittany is mild, Brittany is surpassingly mild. Sailing among her islands and on her gentler tides, you might fancy yourself on Lethe; but, on the other hand, when Brittany is aroused, Brittany, take my word for it, is terribly strong and terribly in earnest!

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In 1831 I felt only the sadness of that coast, not its more than compensating inspiration; I was yet to learn the real character of that sea. It is in the most solitary little creeks, pierced in between the wildest and most rugged looking rocks, that you will find her truly gay, joyous, buoyant, abounding in glad and vigorous life. Those rocks seem to you to be covered by you know not what greyish ashy asperities—look a little more closely and you perceive that that layer of seeming dust is a little world of living creatures, left there high and dry by the ebb of the sea, to be revived and fed again next tide. There, too, you see our little stone workers, hosts upon hosts of those sea hedge-hogs or urchins, which M. Cailland has so intelligently watched and so admirably described. All this swarming though minute world chooses and feels just contrariwise to our choice and our feeling. Beautiful Normandy terrifies them; the hard pebbles of the beach would crush them, and they love not, either, the crumbling limestone that overhangs the more smiling shore, for they care not to build where at any moment building and foundation may sink into the depths forever. They love and affect only the solid rocks of Brittany. Let us take a lesson from them, and trust only to truth and not to mere appearance. The marine life shuns precisely those enchanting shores whose vegetable life is the most abounding and the most brilliant. They are rich, but rich only in fossils; very curious are they to the geologist, but they yield to him only the bones of the dead. The stern granite, on the contrary, looks down upon the sea swarming with its piscine life, and supports upon its massive breast the humble, but none the less interesting little molluscæ whose laborious life makes the serious charm, the great moral of the sea.

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And yet amidst all that teeming life there is a deep silence; that infinite population is ever and inevitably silent. Its life is self-concentrated, its labors unmarked, uncheered, by a sound; it has

no connection with you or me—to us, that life is only another aspect of Death. A great and a dead solitude, says some feminine heart; it alarms, it saddens me.

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Wrong! All here is lovable and friendly. These little creatures speak not to the world, but they all the time are hard at work for it. They yield themselves up to the sublime voice of their sublime parent, the Ocean, that speaks for them; by his great utterance, they speak, confidingly, and by proxy.

Between the silent earth and the mute tribes of the sea, a great, strong, grave, and sympathetic dialogue is constantly carried on—the harmonious agreement with the *Great I AM*, with himself and his great work—that great eternal conflict which, everywhere and always, is LOVE.

CHAPTER V.

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THE FIERY AND THE WATERY CIRCLE—THE CURRENTS OF THE SEA.

Scarcely has the earth cast one glance upon herself ere she not merely compares herself to the Heavens above, but vaunts her own superiority. Geology, the mere infant, hurls a Titanic cry against her elder sister, Astronomy, that haughty and splendid queen of all the sciences. "Our mountains," exclaims Geology, "are not *cast confusedly hither and thither like those stars in the sky*; our mountains form systems in which are found the elements of a general and orderly arrangement of which the celestial constellations present no trace." Such is the bold and impassioned phrase which is uttered by a man as modest as he is illustrious,—M. Elias de Beaumont. Doubtless, we have not yet developed the order, which, yet, we may not doubt is great, which prevails in the seeming confusion of the Milky Way, but the more obvious regularity of the surface of the globe, the result of the revolutions in its unfathomed and unfathomable depths, preserve still, and ever will preserve, for the most ingenious science, many clouds and many mysteries. The forms of that great mountain, upheaved from the mighty mass of waters, which we call the Earth, shows many arrangements which, while they are sufficiently symmetrical, are still not reducible to what would seem a perfect system. The dry and elevated portions show themselves more or less as the waters leave them bare. It is the limiting line of the sea which, in reality, traces out the form of continent and of island; it is by the Sea that we commence all true understanding of Geography.

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Let us note another fact, which has been discovered only within a few years past. The Earth presents us with some seemingly antagonistic features. The New World, for instance, stretches from north to south, the Old World from east to west; the sea, on the contrary, exhibits a great harmony, an exact correspondence between the two hemispheres. It is in the fluid portion of our world, that portion which we have deemed to be so capricious, that the greatest regularity exists. That which this globe of ours presents of the most rigidly regular, the most symmetrical, is just that which appears to be most utterly free, most entirely the mere sport of unrestricted motion. No doubt, the vertebræ and the bones of that vast creature have peculiarities which we, as yet, are not qualified to comprehend. But its living movements which cause the ocean currents, convert salt water into fresh water, which anon is converted to vapor to return again to the salt water, that admirable mechanism is as perfect and systematic as the sanguineous circulation of the superior animals; as perfect a resemblance as possible to the constant transformation of your own venous and arterial blood.

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The world would wear quite another aspect, were we to class its regions, not by *chains of mountains* but by *maritime basins*.

Southern Spain, resembles Morocco, more than Navarre; Provence, resembles Algeria, rather than Dauphiny; Senegambia, the Amazon, rather than the Red Sea; and the great valley of the Amazon, is more like to the moist regions of Africa than it is to its arid neighbors, Peru, Chili, &c.

The symmetry of the Atlantic is still more striking in its under-currents and the winds and breezes that sweep over it. Their action potently helps to create these analogies, and to form what we may call the *fraternity of the shores*.

The principle of Geographical unity, will be more and more sought for in the *maritime basin*, where the waters and the winds, faithful intermediaries, create the relation, the assimilation, of the opposite shores. Far less can we ask this illustration of Geographical unity from the mountains, where two slopes frequently present to you, under the same latitude, both a Flora and a population absolutely different; on the one slope, eternal summer, on the other, eternal winter, according to the aspect of each. The mountain rarely gives unity of country; far more frequently, duality, discordance, actual diversity.

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This striking state of the case was first pointed out by Borg. de Saint Vincent, and has since, in a thousand instances, been confirmed by the discoveries of Maury.

In the immense valley of the sea, beneath the double mountain of the two continents, there are, strictly speaking, only two basins:—

1. *The basin of the Atlantic*;

2. *The great basin of the Indian Ocean, and the Pacific.*

We cannot give the name of basin to the indeterminate cincture of the great Austral Ocean, which has no boundary save that on the north it is touched by the Indian Ocean, the Coraline and the Pacific.

The Austral Ocean alone exceeds in extent all other seas together, and covers almost one-half of the entire globe. Apparently, the depth of that sea is in proportion to its extent. While recent soundings of the Atlantic give a result of 10,000 to 12,000 feet, Ross and Denham found in the Southern Ocean from 14,000 to 46,000 feet. Here, too, we may note the mass of the Antarctic ice, infinitely more vast than the Arctic. We shall not be very wide of the truth, if we say that the southern hemisphere is the world of waters, the northern the world of land. [44]

He who sails from Europe to cross the Atlantic, having been fortunate enough to get clear of our ports in which he too frequently is imprisoned by the westerly wind, and having cleared the variable zone of our capricious seas, speedily gets into the fine climate and constant serenity which the N. E. breezes, the genial trade-winds, spread over sea and sky. Above and around, everything favors him, everything smiles upon him, but, as he approaches the Line, the inspiring breezes cease to breathe balmily upon him, and the air is almost suffocating. He enters the circle of those calms which prevail under the Equator, and present unchangeably their barrier between our northern trade-winds and those of the south. Heavy mists and clouds are all above and around him, and the tropical rains descend in mighty torrents. Bitterly the seaman complains of those gloomy and deluging clouds, but only for their gloomy screen what scathing beams would descend upon the poor dizzy heads, and be reflected in smiting power from the bright, broad mirror of the Atlantic? *But* for those torrents which fall upon the other face of our globe, the Indian Ocean and the sea of Coral, what would be their fermentation in the craters of their antique volcanoes! That dark mass of blackest clouds, once the terror of the navigator and the obstacle to navigation, that sudden and dense night extended over those broad waters form precisely the safeguard, the protecting facility which softens our passage and enables us, sailing southward still, to meet again the bright sun, the clear sky, and the balmy mildness of the regular winds. [45]

Quite naturally, quite inevitably, the heats of the Line raise the waters in masses of vapor, and form that dark band, so threatening in appearance, but in reality so beneficent.

The observer who from some other planet could look upon our world would see around her a ring of clouds not unlike the belt of Saturn. Did he seek the purpose and the use of that ring, he might, in reply, be told—"It is the regulator which, by turns absorbing and giving forth, equalizes the evaporation and fall of the waters, distributes the rains and dews, modifies the heat of each country, interchanges the vapors of the two worlds, and borrows from the southern world the rivers and streams of our northern world." Marvellous co-partnership and mutual reaction! South America, from the respiration of its vast forests, condensed into clouds, fraternally nourishes the flowers and fruits of our Europe. The air which revives and inspirits us, is the tribute paid by the hundred isles of Asia, exhaled by the great vegetation of Java or Ceylon, and entrusted to the great cloud-messenger that turns with the world and sheds life and freshness upon it. [46]

Place yourself in imagination upon one of the many islands of the Pacific and look to the southward. Behind New Holland you will perceive that the southern ocean touches with its circular wave the two extreme points of the old and the new continents. No land in that antarctic world; not one of those little islands or of those pretended Polar lands which discoverers have marked only to behold their disappearance, and which probably have been but so many icebergs. Water, still water; water without end.

From the same post of observation on which I have, in imagination, placed you, in contrast with the great circle of antarctic waters, look eastward, towards the arctic hemisphere, and you may discern what Ritter terms the circle of fire. To speak more precisely, it is an opened ring, formed by the volcanoes commencing at the Cordilleras, passing by the heights of Asia, to the innumerable basaltic isles of the eastern ocean. The first volcanoes, those of America, present, for a length of a thousand leagues a succession of sixty gigantic Beacons whose constant eruptions command the abrupt coast and the distant waters. The others, from New Zealand to the North of the Philippines, number eighty still burning, and a countless host that are extinct. Steering northward, from Japan to Kamschatka, fifty flaming craters dispense their ruddy lights far away to the gloomy seas of the Arctic. In the whole, there is a circle of three hundred active volcanoes around the eastern world. [47]

On the other front of the globe, our Atlantic Ocean presented a similar appearance, prior to the revolutions which extinguished most of the volcanoes of Europe and annihilated the continent of the Atlantis. Humboldt believes that that great ruin, only too strongly attested by tradition, was only too real. I may venture to add that the existence of that continent was in logical concordance with the general symmetry of the world, for that face of the globe was thus harmonized with the other. There rose, with the volcano of Teneriffe, which alone remains of them, and with our extinct volcanoes of Auvergne, of the Rhine, &c., those which were to destroy Atlantis. Altogether, they formed the counterpoise of the volcanoes of the Antilles, and other American craters.

From these burning or extinct volcanoes of India and the Antilles, of the Cuban and the Javanese seas proceed two enormous streams of hot water, which are to warm the north, and which we may fitly term the aortæ of the world. They are provided, beside or beneath, with their

two counter currents which, flowing from the north, bring cold water to compensate the flow of hot water and preserve the balance. To the two streams of hot water which are extremely salt, the cold currents administer a mass of fresher water which returns to the equator, the great electric furnace, where it is heated and made salt.

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These streams of hot water, narrow at first, some twenty leagues in breadth, long preserve their force and their identity, but by degrees they grow weaker as they widen ultimately to about a thousand leagues. Maury estimates that the hot water stream which flows from the Antilles in a northerly course towards us displaces and modifies a fourth part of the waters of the Atlantic. These great features in the life of the seas, noticed only recently, were, however, as visible as the continents themselves. Our great Atlantic and her sister, the Indian artery, proclaim themselves by their color. In each case it is a great blue torrent which traverses the green waters; so darkly blue is this torrent, that the Japanese call theirs the *black river*. Ours is very clearly seen, as it leaps boilingly from the Gulf of Mexico, between Cuba and Florida, and flows west, salt, and distinguishable between its two green walls. In vain does the Ocean press upon it, on either side, it still flows on, unbroken. By I know not what intrinsic density, or molecular attraction, these blue waters are so firmly held together, that, rather than admit the green water, they rear their centre into an arch, and they thus slope to the right and to the left, so that anything thrown into them rolls off into the ocean. Rapid and strong, this Gulf stream at first flows towards the north, along the shores of the United States; but, on reaching the great bank of Newfoundland, its right arm sweeps off to the eastward, while the left arm, as an under current, hastens to create, towards the Pole, the recently discovered open sea where all else around is fast frozen. The right arm spreading out, and proportionately weakened, at length reaches Europe, touches Ireland and England, which again divide the waters previously divided at Newfoundland. Weaker and weaker, it yet carries a little warmth to Norway, and carries American woods to that poor Iceland which, but for them, would die frozen beneath the very fires of her volcano.

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The Indian and the American streams have this in common, that, starting from the Line, from the electric centre of the globe, they carry with them immense powers of creation and agitation. On the one hand they seem the deep and teeming womb of a whole world of living creatures; on the other hand, they are the centre and the vehicle of tempests, whirlwinds, and water spouts. So much nursing gentleness and so much destroying fury; have we not here a great contradiction? No, it proves only that the fury disturbs only the exterior and not any considerable depths. The weakest creatures, shelled atomies, the microscopic medusæ, fluid creatures that a mere touch dissolves, availing themselves of the same current, sail, in all safety, though the tempest is loud and fierce right above them. Few of them reach our shores; they are met at Newfoundland by the cold stream from the Pole, which slays them by myriads. Newfoundland is the very bone-house of these frost-stricken voyagers. The lightest remain in suspension, even after death; but at length sink, like snowy showers to the depths, where they deposit those banks of shells which extend from Ireland to America.

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Murray calls the Indian and American streams of hot water, *the two Milky Ways of the sea*.

So similar in color, heat, direction, and describing precisely the same curve, they yet have not the same destiny. The American, at the very outset, enters an inclement sea, the Atlantic, which, open to the North, bears down the floating army of icebergs from the Pole, and it thus early parts with much of its heat. The Indian stream, on the contrary, first circulating among the isles, reaches a closed sea well protected from the North, and thus for a long time preserves its original heat, electric and creative, and traces upon our globe an enormous train of life.

Its centre is the apogee of terrestrial energy, in vegetable treasures, in monsters, in spices, in poisons. From the secondary currents which it gives off, and which flow towards the North, results another world, that of the Sea of Coral. There, says Maury, over a space as large as the four continents the polypes are industriously building thousands of islands, shoals, and reefs, which are gradually studding and dividing that sea; shoals which at present are the annoyance and the dread of the mariner, but which will at length rise to the surface, join together to form a continent, which, some day—who knows? may be the refuge of the human race, when flood, or fire, or earthquake, leave it no other shelter.

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John Reynaud in his fine article in the *Encyclopedie*, remarks that our world is not solitary. The infinitely complicated curve which it describes represents the forces, the various influences, which act upon her, and bear testimony to her connection and communication with the great luminaries of the Heavens.

That connection and communication are especially visible with the Sun and Moon; the latter, though the servant of earth, has none the less power over her. As the flowers of the earth turn their heads sunward, so does the flower-bearing earth aspire towards him. In her most movable portion, her immense fluid mass, she raises herself and gives visible token of feeling his attraction. She rises as far as she can and swelling her bosom twice a day gives, at least, a sigh to the friendly stars.

Does not our earth feel the attraction of yet other globes? Are her tides ruled only by the sun and moon? All the learned world say it, all seamen believe it; thence terrible errors resulting in shipwrecks. At the dangerous shallows of Saint Malo the error amounted to eighteen feet. It was in 1839 that Chazallan, who nearly lost his life through these errors, began to discover and calculate the secondary, but considerable undulations which, under various influences, modify the general tide. Stars less dominant than the sun and moon have, doubtless, their share in producing the alternate rise and fall of the waters of our globe. But under what law do they

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produce this effect? Chazallan tells us;—"the undulation of the tide in a port *follows the law of vibrating chords.*" A serious and suggestive sentence, that, which leads us to comprehend that the mutual relations of the stars are the mathematical relations of the celestial music, as antiquity affirmed.

The earth, by great and secondary tides, speaks to the planets, her sisters. Do they reply to her? We must think so. From their fluid elements they also must rise, sensible to the rise of the waters of the earth. The mutual attraction, the tendency of each star to emerge from egotism, must cause sublime dialogues to be heard in the skies. Unfortunately the human ear can hear but the least part of them. There is another point to be considered. It is not at the very moment of the passing of the influential planet that the sea yields to its influence. She is in no such servile haste to obey; she must have time to feel and obey the attraction. She has to call the idle waters to herself, to vanquish their inert force, to attract, to draw to her the most distant. The rotation of the world, too, so terribly rapid, is incessantly displacing the points subjected to the attractive power. To this we must add that the great army of waves in its combined motion has to encounter all the opposition of natural obstacles,—islands, capes, straits, the various curvings of shores, and the no less potent obstacles of winds, currents, and the rapid descent of mountain torrents, swelled by the melted snows;—these, and a thousand other unforeseen accidents occur, to alter the regular movement into terrible strife. The ocean yields not. The display of strength which is made by broad and swift rivers cannot intimidate him. The waters, that the rivers pour down upon him, he heaps them up into mountainous masses and drives them back so violently that he seems bent on forcing them to the summits of the mountains from whence they have descended.

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Obstacles thus numerous and various cause apparent tidal irregularities, which at once impress and confuse our minds. None of those irregularities is more surprising than the difference of their time between two quite closely neighboring ports. One Havre tide, for instance, equals two of Dieppe,—as is mentioned by Chazallon, Baude, &c. It is greatly to the honor of human genius to have subjected phenomena so complex to even proximately accurate calculation and positive laws.

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But beneath these exterior movements, the sea has others within; those under currents by which she is traversed in various directions and at varying depths. Superposed at different depths, or flowing laterally in opposite directions, hot currents in one direction, cold counter currents in another, they, between them, keep up the circulation of the sea, the exchange of salt and fresh waters, and the alternating pulsation which is the result. The hot *pulse-beat* is from the line to the pole; the cold, from the pole to the line. Shall we be warranted in saying, as it has sometimes been said, that these currents so distinct and unmingling, may be strictly compared to the vessels, veins and arteries, of the superior animals? Strictly speaking, we cannot so compare them; but they have considerable resemblance to the less determinate circulation which materialists have lately discovered in some inferior creatures, as molluscs and annelides. That *lacunary* circulation supplies the want of, and at the same time prepares, the *vascular*; the blood flows in currents before it has precise channels.

Such is the sea. She resembles a vast animal that has stopped short at the first degree of organization. Who has developed the currents, those regular fluctuation of the abysses into which we never descend? Who has taught us the geography of those dark waters? Those that live within or float upon those waters;—animals and vegetables. We shall see how the huge whale and the minute shelled atomies, how even the woods of America, floating to bleak Iceland, have concurred in revealing the flow of hot water from the Antilles to Europe, and the counter current of cold meeting it at Newfoundland, passing it beside or below, and thus getting its ices melted into immense fogs.

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A vast cloud of red animalcules, carried by a tempest from Orinoco to France, explained the great aerial current of the Southwest which brings to our Europe the rains that have their birth place in the far Cordilleras of South America.

But for the constant change of waters which is made by the currents in the depths of the sea, she would, in parts, be filled up with salt, sands, animal and vegetable remains and the like detritus. It would be another case of the Dead Sea, which, for want of movement, has its banks loaded with salt, its vegetation incrustated with salt, and the very winds that cross its surface, burning, withering, breathing only of famine and of death.

All the scattered observations upon currents of the air and of the water, the seasons, the winds and the tempests, were long confined to the memory of the fishermen and sailors, and too frequently died with them. Meteorology, that guide of navigation, for want of being systematized and centralized seemed vain, and was even denied rank and usefulness as a science. The illustrious M. Biot, demanded a strict account of the little that she had yet done. However, upon the two opposite shores of Europe and America, persevering men founded that neglected and denied science upon the basis of observation.

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The latest and most celebrated of these observers, Maury the American, courageously undertook what a whole administration had recoiled from, viz., to extract from and arrange the contents of I know not what multitude of log books, those often confused and ill-kept records of the sea captains. These extracts, reduced into tables under regular heads, gave, in the result, rules and generalities. A congress of seamen assembled at Bruxelles decided that the observations, henceforth to be logged with more care, shall be sent from all parts to the observatory at Washington. A noble compliment, that, paid by Europe to young America and her patient and ingenious Maury, the learned poet of the sea. He has not only summed up and

exemplified her laws; he has done much more, for, by the force of heart and by the love of nature as much as by positive results, he has carried the whole world with him. His charts and his first work, of which a hundred and fifty thousand copies were printed, are liberally distributed to sailors of all nations by the United States government. A number of eminent men in France and in Holland, Tricot, Jullien, Margole, Zurcher, and others, have made themselves the interpreters, the eloquent missionaries, of this apostle of the sea.

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Why is it that in this matter America, so young, has outstripped Europe, so old? It is precisely because she is young, and burning with a desire to be in close connection with the whole globe. Upon her superb continent and in the midst of so many states, she yet deems herself solitary. So far from her European brother, she looks towards that centre of civilization as the earth looks toward the sun, and whatever seems to draw her into closer and more familiar connection with the grand old world, thrills her in every nerve. We have abundant proof of that from the joy, the intoxication, the perfect frenzy with which she hailed the completion of the submarine telegraph which joined the two distant shores, and promised that they should communicate within the brief space of minutes, in such wise that the two worlds should have but one thought.

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CHAPTER VI.

TEMPESTS.

It is with a very real and masterly genius that Maury has demonstrated the harmony that exists between air and water. As is the maritime ocean, so is the aërial ocean. Their alternating movements and the exchange of their elements are precisely analogous. The aërial ocean distributes heat over the world and making dryness or humidity. The latter, the air draws from the seas, from the infinity of the central ocean, and especially at the tropics, the great boilers of the universal cauldron. Dryness, on the contrary, the air acquires as it sweeps over the arid deserts, the great continents, and the glaciers (those true intermediate poles of the globe), which draw out its last drop of moisture from it. The heating at the equator and the cooling again at the pole, alternating the weight and lightness of the vapors, cause them to cross each other in horizontal currents and counter currents; while under the line the heat which lightens the vapors creates perpendicular currents, ascending from sea to sky. Previous to dispersing they hover in this misty region, forming, as it were, a ring of clouds around the globe.

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Here, then, we have pulsations both maritime and aërial, different from the pulse of the tide. This latter was external, impressed by other planets upon ours, but this pulse of various currents is inherent in the earth, it is her own veritable life.

To my taste, one of the finest things in Maury's book, is what he says of salt: "The most obvious agent in producing maritime circulation, heat, would not alone suffice; there is another and a no less important agent, nay, an even more important—it is salt."

So abundant is salt in the sea that if it could be cast on shore it would form a mountain 4,500 feet thick.

Though the saltness of the sea does not vary very greatly, it yet, is augmented or diminished somewhat, according to locality, currents and proximity to the equator or to the poles. As it is more or less salted, the sea is lighter or heavier, and more or less mobile. This continued, with its variations, causes the water to run more or less swiftly, that is to say, *causes currents*, so like the horizontal currents in the bosom of the sea and the vertical currents from the sea of water upward to the sea of air.

A French writer, M. Lartique, has ingeniously corrected some deficiencies and inexactitudes in M. Maury's great work "Maritime Annals." But the American author had anticipated criticism by frankly pointing out where and why he thought his work and his science incomplete. On some points distinctly confining himself to hypothesis, at times he shows himself uncertain, and anxious. His frank and candid book quite plainly reveals the mental struggle which the author undergoes between *biblical literalism* and the modern sentiment the *sympathy of nature*. The former makes the sea a thing, created by God at once, a machine turning under his hand, while the latter sees in the sea a living force, almost a person, in which the Loving Soul of the World, is creating still, and ever will create.

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It is curious to observe, how, by degrees, as it were by irresistible proclivity, Maury approaches this latter view. As far as possible he explains himself mechanically, by weight, heat, density, &c. But this does not suffice, and for certain cases he adds a certain molecular attraction or a certain magnetic action. But even this does not suffice, and then he has recourse to the physiological laws which govern life. He attributes to the sea a pulse, veins, arteries, and even a heart. Are these mere forms of style, simple comparisons? Not so; he has in him—and it is one source of his strength—an imperious, an irresistible feeling of the personality of the sea. Before him the sea was to most seamen a thing; to him it is a person, a violent and terrible mistress whom we must adore, but must also subdue.

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He loves, he deeply loves the sea; but on the other hand, he every moment thinks it necessary to restrain his enthusiasm and to keep within bounds. Like Levammerdam, Baunet and many

other illustrious men at once philosophical and religious, he seems to fear that in explaining nature too completely by her own phenomena we show disrespect to Nature's God. Surely, a very ill founded timidity. The more we exhibit the universality of life,—the more we confess our adoration of the great soul of the universe. Where would be the danger were it proven that the sea in her constant aspiration towards organized existence is the most energetic form of the Eternal Desire which formerly evoked this globe and still creates in it?

This salt sea, like blood, which has its circulation, its pulse, and its heart (for so Maury terms the equator) in which its two bloods are exchanged, is it quite sure that an entity that has all these is a mere thing, an inorganic element?

Look at a great clock, or a steam engine which imitates almost exactly the movement of the vital forces. Is that a freak of nature? Should we not far rather imagine that in these masses there is a mixture of animality?

One immense fact that he exhibits, but only secondarily, and as it were in a mere side view, is that the infinite life of the ocean, the myriads upon myriads of beings which it at every moment makes and destroys, absorb its various salts to form their flesh, their shells, &c., &c. They thus, by depriving the water of its salt, render it lighter, and, by so much, aid in producing currents. In the potent laboratories of animal organization, as those of the Indian ocean and the Coraline, that force, elsewhere less remarkable, appears as what it really is—immense.

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"Each of these imperceptibles," says Maury, "changes the equilibrium of the ocean, they harmonize and compensate it." But is this saying enough? Should they not be the grand moving powers which have created the currents of the sea, put the immense machine into motion?

Who knows whether this vital *circulus* of the marine animality is not the starting point of all physical *circulus*? If animalized sea does not give the eternal impulse to the animalizable sea—not organized, indeed, as yet, but aspiring to be so, and already fermenting with approaching life?

CHAPTER VII.

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TEMPESTS.

There are occasional commotions of the sea, which Maury, in his forcible way, calls "the Sea's spasms." He especially alludes to the sudden movements which appear to proceed from below, and which in the Asiatic seas are often equivalent to a genuine tempest. These sudden outbursts are attributed to various causes, as: 1st, the violent collision of two tides or currents; 2nd, the sudden superabundance of rain water on the sea's surface; 3rd, the breaking up and sudden melting of the icebergs, &c. To these causes, some authors add the hypothesis of electric movements and volcanic submarine heavings.

It seems probable, however, that the depths of the great mass of the waters are quite peaceable; were it otherwise, the sea would be unfitted for her office of nursing-mother to her myriads upon myriads of living beings. If these occasional commotions, so violent at the surface, were equally so at the bottom of the sea, what could preserve the nurslings of that great nursery where a whole world of delicate creatures more fragile even than those of our earth, are cradled in and nourished by its waters? The myriad-life of the Ocean assures us that these violent commotions cannot be common in its depths.

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Naturally, the great sea is of great general regularity; subject to great periodical and uniform movements. Tempests are the occasional and transient violences into which the sea is lashed by the winds, by electric power, or by certain violent crises of evaporation. They are the mere accidents which reveal themselves on the surface, but tell us nothing about the real, the mysterious personality of the sea. It would be sad reasoning were we to judge of a human temperament by the ravings of a brain-fevered man; and by what better right do we judge the sea on account of the momentary and merely superficial movements which probably do not make themselves felt to the depth of a very few hundred feet? Everywhere that the sea is very deep, we may fairly assume that she is constantly calm, ever producing, ever nourishing, her quite literally countless brood. She takes no note of those petty accidents which occur only at the surface. The mighty hosts of her children that live, as we cannot too often repeat, in the depths of her peaceful night, and rise at the most only once a year within the influence of light and storm must love their great, calm, prolific mother as Harmony itself.

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But these surface-disturbances of the great mother Ocean have too serious a bearing upon the life of man, to allow of his sparing any pains towards obtaining a thorough comprehension of them. And to obtain that comprehension is no easy matter; in making the necessary observations, the boldest of us is a little apt to lose his cool presence of mind. Even the most serious descriptions give only vague and general features, scarcely anything of the marked individuality which makes every tempest a thing of originality, a thing *sui generis*, the unforeseen result of a thousand unknown circumstances, potent in their influence, but obscure far beyond our power of search. He who safely gazes from his safe watch-tower on the shore, may, no doubt, see more clearly, as he is not distracted by his own danger. But for that very reason, he cannot so well

appreciate the tempest in its grand and terrible entirety, as he can who is in the very centre of its rage and of its power, and looks in every direction upon that terrible panorama!

We mere landsmen are indebted to the bold navigators for at least the courtesy of giving what old Chaucer calls "faith and full credence" to what they tell us about what they have actually seen and suffered. It seems to me that there is exceedingly bad taste in that sceptical levity which men of the study, those stay-at-home travellers occasionally exhibit in their criticisms of what seamen tell us, for instance, about the height of the waves. They laugh at the seaman who tells us of waves a hundred feet in height. Engineers affect to be able to measure the tempest, and to assure us that twenty feet is the utmost height of a wave. On the other hand, an excellent observer assures us, on the testimony of his own sight, that standing in safety on the shore, observing calmly, and in absence of all distraction, he has seen waves that would overtop the towers of Notre Dame, and the heights of Montmartre. It is abundantly evident that these opposing witnesses speak of two totally different things; and hence their flat contradiction. If we speak of the lower bed of the tempest, of those long bowling waves which even in their fury preserve a certain regularity, probably the calculation of the engineers is pretty exact. With their rounded crests alternating with depressed valleys, it is likely enough that their utmost height does not greatly exceed twenty or five-and-twenty feet. But your chopping sea, where cross wave furiously hurls itself against cross wave, rises far higher. In their fierce collision they hurl each other to a quite prodigious height, and fall with a crushing weight, assailed by which the stoutest craft would open her seams, and go bodily down into the dark depths of the angry sea. Nothing so heavy as sea water, in those mighty shocks, those enormous falls of which sailors truthfully speak, and of which none but those who have witnessed them, can calculate the tremendous greatness and power.

On a certain day, not of tempest but of emotion, when old Ocean indulged only in wild and graceful gaities, I was tranquilly seated upon a beautiful headland of some eighty feet in height, and I enjoyed myself in watching the waves as upon a line of a quarter of a league they rushed in as if to assail my rocky seat, the green crest of each wave rounding and rearing, wave urging wave as though in actual and intelligent racing. Now and then a sea would strike so that my very headland seemed to tremble, and burst as with a thunder clap at my very feet. Advancing, retiring, returning, breaking, the wildly sportive waves were for a long time quite admirably regular in their movements. But on a sudden this regularity was at an end. Some wild cross wave from the west suddenly struck my great regular and hitherto well behaved wave from the south. Such was the crash that in an instant the very sky above me was darkened by the blinding spray; and on my lofty promontory I was covered, not with the many colored and fleeting mist, but with a huge, dark, massive wave, which fell on me, heavy, crushing, and thoroughly saturating. Ah! Just then I should very much have liked the company of those very learned Academicians and ultra positive Engineers, who are so well posted up in the combats of the Ocean, and so very certain that the utmost height of a wave is just twenty feet! No; tranquilly seated in our studies we should *not* lightly question the veracity of so many bold, hardy, and resolved men, who have looked Death in the face too often to be guilty of the childish vanity of exaggerating the dangers which they have often braved—and are ready to brave again. Nor should we ever oppose the calm narratives of ordinary navigators on the great and well known courses to the animated and often thrilling pictures occasionally presented to us by the bold discoverers who seek the very reefs and shoals which the common herd of sailors so carefully avoid. Cook, Peron, Durville—discoverers such as these incurred very real dangers in the then unfrequented Australian and Coraline seas, compelled as they were to dare the continually shifting sand bank, and the conflicting currents which raise such frightful commotions in the narrow channels.

"Without tempest, with only rollers to deal with, and with a moderate wind right abaft, a cross wave will give your craft such a shock, that the ship's bell will strike, and if these big rollers with their sweeping motion, continue for any time, your masts will go by the board, your seams will open—you will be a wreck." So says the experienced Durville—gallant sailor, if ever there was one. And he tells us that he has himself seen waves from eighty to a hundred feet high. "These waves," he says, "only boarded us with their mere crests, or the craft must have been swamped. As it was she staggered, and then for an instant stood still, as though too terrified to understand what was the matter. The men upon the deck were for moments completely submerged. For four long hours that night this horrible chaos endured; and those hours seemed an eternity to turn one's hair grey. Such are the southern tempests, so terrible that even ashore the natives have a presentiment of their approach, and shelter themselves in caves."

However exact and interesting these descriptions may be, I do not care to copy them; still less would I be bold enough to invent descriptions of what I have not seen. I will only speak briefly about tempests which I have seen, and which have, as I believe, taught me the different characteristics of the Ocean and the Mediterranean.

During half a year that I passed at about two leagues from Genoa, on the prettiest shore in the world, at Nervi, I had in that sheltered spot but one little sudden tempest, but while it lasted it raged with a quite wonderful fury. As I could not, quite so well as I wished, watch it from my window, I went out and along the narrow lanes that separate the palaces, I ventured down, not indeed, to the beach, for in reality, there is none worthy the name, but to a ledge of black, volcanic rock, which forms the shore, a narrow path, often not exceeding three feet in width, and as often overhanging the sea at varying heights of from thirty up to sixty feet. One could not see far out; the spray continually raised by the whirlwind, drew the curtain too closely to allow of one's seeing far, or seeing much, but all that was to be seen was sufficiently frightful. The

raggedness, the salient and cutting angles, of this iron-bound coast, compelled the tempest to make incredible efforts, to take tremendous leaps, as, foaming and howling, it broke upon the pitiless rocks. The tumult was absurd, mad; there was nothing connected, nothing regular; discordant thunders were mingled or followed by sharp shrill shrieks, like those of the steam engine; piercing shrieks, against which one only in vain tried to stop his ears. Stunned by this wild scene, which assailed sight and hearing at once, I steadied myself against a projecting wall of rock, and thus comparatively sheltered, I was better able to study the grandly furious strife. Short and chopping were the waves, and the fiercest of the strife was on this side where the sea broke on the ragged, yet sharply pointed rocks, as they rose boldly above, and ran out far beneath the waves, in long, shelving, reefs. The eye, as well as the ear was vexed, for a blinding snow was falling, its dazzling whiteness heightened by contrast with the dark waves into which it fell.

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On the whole, I felt that the Sea had less to do than the land in rendering the scene terrible; it is exactly the contrary on the Ocean.

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CHAPTER VIII.

THE STORM OF OCTOBER, 1859.

The storm, which of all storms, I had the best opportunity of observing, was that which swept in fury over the west of France, from the 24th of October 1859, to the 31st of the same month, the implacable and indefatigable storm, which, with but few and very short intervals, raged furiously for six days and six nights, and strewed our whole western coasts with wrecks. Both before and after that storm, the barometer indicated great disturbances, and the telegraphic communications were cut off by the breaking of the wires, or the magnetic falsifications. Very hot seasons had preceded this tempest, but it brought us a succession of very different weather; rainy, and cold. Even 1860, up to the very day on which I write these lines, is marked by heavy rain storms, and cold winds from the west, and south, which seem to bring us all the rains of the Atlantic, and of the great South Sea.

I watched this tempest from a spot so smiling and peaceful that tempest was the last thing that one would anticipate there. I speak of the little port of Saint George, near Royan, just at the entrance of the Gironde. I had passed an exceedingly quiet five months there, meditating what I should say on the subject which I had treated upon in 1859; that subject at once so serious and so delicate. The place and the book are alike filled with memories very agreeable to me. Could I have written that book in any other place? I know not; but one thing is quite certain: the wild perfume of that country; its aspect, at once staid and gentle, and the vivifying odors of its Brooms, that pungent and agreeable shrub of the Landes, had much to do with that book, and will ever be associated with it in my thought.

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The people of the place are well matched with its aspect and its nature. No vulgarity, no coarseness, among them. The farming population are grave in manner, and moral in speech and conduct, and the seagoing population, consists, for the most part, of pilots, a little band of Protestants, escaped from persecution. All around, too, there is an honesty so primitive that locks and bolts are absolutely unknown there. Noise and violence are utterly out of the question among people who are modest and reserved, as seamen seldom are, and who have a quiet and retiring tact not always to be found among a far more pretentious and highly placed people. Though well known to and well respected by them, I yet enjoyed all the solitude which study and labor demanded. I was all the more interested in these people and their perils. Without speaking to them, I daily and hourly watched them in their heroic labors, and heartily wished them both safety and success. I was suspicious of the weather, and looking upon the dangerous channel, I often asked myself whether the sea, so long gentle and lovely, would not, sooner or later, show us quite another countenance.

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This really dangerous place has nothing sad or threatening in its aspect. Every morning, from my window, I could watch the white sails, slightly ruddied by the morning beams, of quite a fleet of small coasters, that only waited for a wind to leave the little port. At this port, the Gironde is fully nine miles wide. With some of the solemnity of the great rivers of America, it combines the gaiety of Bourdeaux. Royan is a pleasure place, a bathing town which is resorted to by all Gascony. Its bay, and the adjoining one of St. George, are gratuitously regaled with the wild pranks of the porpoises, that boldly venture into the river, and into the very midst of the bathers, leaping, at once heavily and gracefully, six feet, and more, above the surface of the water. It would seem that they are profoundly convinced of the fact, that no one thereabout is addicted to fishing; that at that point of great daring and great labor, where from hour to hour all hands may be called upon to succor some imperilled vessel, folks will scarcely care to slay the poor Porpoise, for his oil.

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To this gaiety of the waters, add the especially harmonious beauty of the two shores, as the abounding vineyards of Medoc look across to the varied culture of the fertile fields of Saintonge. The sky, here, has not the fixed, and sometimes rather monotonous beauty of the Mediterranean, but, on the contrary, is very changeable. From the mingling waters of sea and river, rise variegated mists, which cast back upon the watery mirror, strange gleamings of gorgeous

coloring, red, blue, deepest orange, and most delicately pale green. Fantastic shapes, "a moment seen, then gone for ever," "appearing only to depart, and seen only to be regretted," adorn the entrance to the Ocean with strange monuments of bold colonnades, sublime bridges, and, occasionally, triumphal arches.

The two crescent-shaped shores of Royan and Saint Georges, with their fine sands afford to the most delicate feet a delightful promenade of which one does not easily grow tired, tempted, and regaled as we are by the perfume of the pines which so enliven the downs with their young verdure. The fine promontories which overlook these shores, and the sandy inland downs send near and far their healthful perfumes. That which predominates on the downs has a something of medicinal, a mingled odor, which seems to concentrate all the sun and the warmth of the sands. The inland heaths furnish the more pungent odors which stir the brain and cheer the heart; thyme, and wild thyme, and marjoram, and sage which our fathers held sacred for its many virtues, and peppermint, and, above all, the little wild violet, exhale a mingled odor surpassing all the spicy odors of the far East.

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It seems to me that on these heaths the birds sing more beautifully than elsewhere. Never have I heard elsewhere such a lark as I listened to in July on the promontory of Vallière, as she rose higher and higher, her dark wings gilded and glinting in the rays of the fast setting sun. Her notes coming from a height of probably a thousand feet were as sweet as they must needs have been powerful. It was to her humble nest, to her upward gazing and listening nestlings that she evidently sang her "wood notes wild," her song at once so rustic and so sublime, in which one might fancy that she translated into harmony that glorious sunlight in which she hovered, and called to her nestlings—"Come up hither my little ones, come!"

Out of all these, perfumes and song, soft air, and sea made mild by the waters of the beautiful river, proceeded an infinitely agreeable, though not very brilliant harmony. The moon shone with a softened light, the stars were quite visible, but not very bright, and the atmosphere so mild and pleasant, that it would have been voluptuous, that whole scene and its accessories had there not mingled with all a something, which made one reflect, and substituted active thought for luxuriously idle reverie.

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And why so? Do those shifting sands, those many colored and varying hues of the downs, and that crumbling and fossiliferous limestone remind you of the eternal change, that one only rule which here on earth has no exception? Or, is it the silent but undying memory of the persecuted Protestants? It is also, and in still greater power, the solemnity of the roadstead, the frequency of wrecks, the near neighborhood of the most terrible of seas, by which the interior becomes so serious, so suggestive of great and solemn thought.

A great mystery is being enacted here, a treaty, a marriage infinitely more important than any human and royal nuptials; a marriage of interest between ill matched spouses. The lady of the waters of the south-west, swelled and quickened by Tarn and Dordogne and by those fierce brethren the torrents of the Pyrenees, hastens, that amiable and sovereign Gironde, to present herself to her giant spouse, old Ocean, here, more than elsewhere, stern and repulsive. The mud banks of the Charente and the long line of sands which, for fifty leagues, oppose him, put him in bad humor; and when he cannot hurtle fiercely against Bayonne and Saint Jean de Luz, he pitilessly assaults the poor Gironde. Her outlet is not like that of the Seine, between sheltering shores; she falls at once into the presence of the open and limitless ocean. Generally, he repels her; she recoils to the right and to the left, and seeks shelter in the marshes of Saintonge, or among the Medoc vineyards to whose vines she imparts the cool and sober qualities of her own waters.

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And now imagine the boldness of the men who throw themselves headlong into the strife between two such spouses; who go in the frail boat to the aid of the timorous craft who wait at the mouth of the pass afraid to venture in. Such is the boldness of my pilots here; a boldness at once so modest, so heroic, so glorious, could it but be fully described.

It is easy to understand that the old monarch of shipwrecks, the antique treasurer and guardian of so much submerged wealth bears no great good will towards the bold ones who venture to dispute with him his prey. If he sometimes allows them to succeed, sometimes also he avenges himself upon them—more malignantly delighted to drown one pilot than to wreck two ships.

But for sometime past no such accident had been spoken of. The exceedingly hot summer of 1859, produced only one wreck in this neighborhood; but I knew not what agitation even then foretold greater disasters. September came, then October, and the brilliant crowd of visitors, loving the sea only when it is calm and smiling, already took its departure. I still remained, partly kept there by my unfinished work, partly by the strange attraction which that season of the year has for me.

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In October we had strange eccentric winds, such as seldom blow there; a burning storm-wind from the East, that quarter usually so peaceable. The nights were occasionally very hot, even more so in October than in August; sleepless, agitated, nervous nights; nights to quicken the pulse to the fever pace, and without apparent cause to render one excited and peevish.

One day as we sat among the pines, beaten by the wind though somewhat sheltered by the downs, we heard a young voice, singularly clear, piercing, resonant, and, so to speak, metallic. It was the voice of a very young girl, small in figure, but austere in countenance. She was walking

with her mother and singing snatches of an old ballad. We invited her to sit down and sing us the whole of it. This old ballad, this rustic little poem admirably expressed the double spirit of the country. Saintonge is, in the first place, essentially rustic and home-loving, with none of the wild adventurous impulses of the Basques. And yet in spite of her sedentary tastes Saintonge turns sailor and goes forth into not unfrequent dangers. And why? The old ballad explains:

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The lovely daughter of a king while washing, like Nausica of the Odyssey, loses her ring in the sea; a young lover dives in search of it, and is drowned. She weeps his loss so bitterly that she is changed into the rosemary of the shore, at once so bitter and so odorous. This ballad, heard in that pine wood already shuddering and moaning at the threatening storm, touched and delighted me, but at the same time strengthened my secret presentiments.

Whenever I went to Royan, I might calculate upon being overtaken, unsheltered, in a storm, before I could accomplish that short journey of only a few hours. It pressed upon me in the vineyards of Saint George and the heathy table land of the promontory which I first ascended; and it pressed upon me more heavily still as I traversed the great semi-circular shore of Royan. Even now, in October, the heath exhaled all its perfumes of wild flowers and shrubs, and their perfumes seemed to me more pungent now than ever. On the still unvexed shore, the wind, warmly and gently fanned my cheek, and the no less gentle sea in murmuring ripples strove to kiss my feet. But for both caressing wind and gently murmuring wave, I was too well prepared, too suspicious, to be deceived by them. By way of prelude to the great change, after so many beautiful and almost effeminating evenings, suddenly, in the very middle of the night, burst forth a frightful gale of wind. Again and again this occurred, but especially on the night of the 26th. On that night I felt sure that some great damage must needs be done. Our pilots had gone out on their generous and perilous errand. During those long fluctuations of the equinoctial weather they had hesitated somewhat, delayed some little, then they grew impatient of delay, duty and business called to them aloud, and they resolved to put out, at the risk of some sudden and ruinous gust. I felt that there would be some such; I whispered to myself, "some one perishes now." And too truly was it so.

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From a pilot boat, which, in face of the bad weather, put out to rescue a vessel imperilled in the pass, an unfortunate man was swept from the deck, and the boat, herself in utmost peril was unable to lie-to for him. He left three young children and a pregnant wife. What rendered this calamity especially to be regretted, was the fact that this excellent young man, with the generous affection so common among sailors, had married a poor girl rendered incapable of earning her bread by an accident which had mutilated her hands. Alas! How much was she to be pitied, helpless, pregnant, burdened with a young family—and thus suddenly widowed!

A subscription was made for her, and I went to Royan, with my mite towards it. A pilot whom I met there, spoke to me, with real grief and emotion, of the sad accident. "Ah, Sir," said he, "such is our hard profession; it is precisely when wind and sea are most angry, and most threatening, that it is especially incumbent upon us to go forth." The marine commissioner, who keeps the register of the living and the dead of that little community, and who, better than any one else, knows the history and the circumstances of every family there, appeared to me to be exceedingly saddened and anxious. It was plain that he thought, as I did, that this was only the beginning of calamity.

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I resumed my journey along the shore, and in the course of it, I had the opportunity to notice and study the dark zone of clouds which hemmed me in on every side, to the extent of, I should judge, not less than eight or ten leagues. On my left was Saintonge, expectant, dull, passive; on my right, Medoc, from which I was separated by the river, lay in a gloomy and misty stillness. Behind me, coming from the west and brooding over the Ocean, was a whole world of cloud and mist, but in my face, and opposing that world of cloud, blew the fresh land-breeze. Sweeping down the course of the Gironde, it seemed that the funereal pall that rose above the Ocean, might be repulsed and dispelled. Still uncertain, I looked behind me to the shoal of Cordovan, from which, pale, fantastic, weird, its tower rose like some spectre that said—"Woe, woe, woe!"

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I was not mistaken. I saw quite plainly that the land-breeze not only would be conquered, but that it would be compelled to become the help-mate of its seeming foe. That land-breeze blew quite low over the Gironde, swept away from before it all dwarfish obstacles, but still hovered beneath the high pitched and inky clouds that swept in from the Ocean, and formed for those clouds, as it were, a slippery inclined plane over which they would glide only the more easily and the more swiftly. In a brief space all was still from the landward, every breath died away beneath the thick grey mists; and, unopposed, the upper winds swept the ominous storm-clouds shoreward.

When I reached the vineyards of Vallière, near St. George, hosts of people were busily at work, striving to improve the brief time during which they could hope to labor. The first heavy drops of rain came down, solid and smiting as so much molten lead, and in another instant, one was right glad to find a sheltering roof.

I had seen my full share of tempests. I had read my full share of descriptions of them; and I was prepared to expect anything and everything from their fury and from their power. But nothing that I had either seen or read, had prepared me for the effects of *this* tempest, so fierce, so long-enduring, so implacable in its unceasing and uniform fury. When, from time to time, we have a pause, even the slightest mitigation, even a change, however slight, in the Tempest's moods and manifestations, our over-distended senses also relax, recuperate, prepare themselves for the next assault. But in this case, night after night, day after day, for six weary and wearying

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nights and days, the storm-fiend never winked an eye or spared a blow. Fierce, strong, angry, implacable; still the storm-fiend raged, untiring, and unsparing. On mine honor, see ye! it was something to daunt the boldest, to suggest despair to the most hopeful. No thunder, no crashing combat of the positive and negative storm-clouds, no loud and animating crash of the meeting and contending waves. All around was one dark, leaden, sinister, ominous, and mysterious pall of cloud and mist, all above us one black sky, terminated in the horizon by a sickly and leaden line brooding over a slowly heaving and mighty mass of leaden looking sea;—so slowly and monotonously heaving that one almost wished for the coming storm-blast to rouse them into a fierce fury, less terrible, less oppressive, than their horribly oppressive monotony. No poetry of a great terror could oppress one like this most prosaic and dark monotony. Still, still and ever, came from the deep bosom of the coming storm the same terribly monotonous—"Woe, woe! Alas, alas, alas!" Our abode was close upon the shore. We were no mere spectators of that scene; we were in it, of it, sharers, actors, thrilled actors in that sublime scene. Every now and then the wild sea came within twenty feet of us; at every rush, she made our very hearth stone quiver beneath our feet. Happily, the ever-rising and terrible sou' west wind struck our windows only obliquely, or we should have been drowned as we gazed, so vast was the torrent, nay the deluge, which every blast bore upon its mighty bosom, alike from the clouds above, and from the vexed and upheaving Ocean below. In haste, and with no small difficulty, we fastened the shutters, and lighted lamps, that we might at least look coming fate in the face. In those apartments which looked out upon the landward, the noise and the perturbation were no jot or tittle inferior. I wrote on, curious to ascertain whether this wild outburst of nature could in reality oppress and fetter a free intellect, and I thus kept my intellect active, agile, cool, thoroughly in self-command. I wrote, I noted, I compared, I drew mine own conclusions. At length, worn out solely by fatigue, and abstinence, and the want of

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"Tired Nature's sweet restorer, balmy sleep,"

I felt myself deprived of that which I believe to be one of the most important of the writer's powers, the quick, sure, delicate sense of rhythm; I felt that my sentences became inharmonious. That sense of rhythm was the first cord in my being to snap, broken, inharmonious, over-strained, —ruined.

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The mighty howling of the Tempest had but one variation, in the weird and strange tones of the winds that pitilessly yet mournfully assailed us. The house in which I was seated was directly in their path; and they therefore assaulted it in utmost fury and apparently on every side at once. Now it was the strong, stern blow of the master, impatient to enter his own house; anon some strong hand tried to dash open the shutters; and again came shrill shrieks down the wide chimneys, wailing for the master's exclusion, fiercely threatening, if we did not admit him, and, at length, furious and mighty attempts to force an entry by dislodging the very roof from its rafters. And all these sounds were occasionally dominated by the sad, deep, melancholy, *Heu, heu! Alas, alas! Woe, woe, and Desolation*. So immense, so potent, so terrible was that *Heu, heu!* of chorusing wind and sky, that even the voice of the bold storm-blast seemed to us, in comparison, secondary and mild. At length, the wind managed to clear a way for the rain; our house—I had almost said our craft—began to leak; the roof, opening its seams here and there, admitted the rain in torrents.

Still worse, the fury of the Tempest, by a desperate effort, loosened one of the hinges of a shutter, which still remained closed, but from that moment shook, creaked, shrieked, in the most dismal fashion that you can imagine. To make it fast I had to open the window, and that moment that I did so, though sheltered by the shutter, I felt myself in the very centre of the whirlwind, half-deafened by the frightful force of a sound equal to that of a cannon fired close to one's ear. Through the cracks of the shutter I perceived what gave me a clear notion of the tremendous power that was raging landward, skyward, seaward, horizontally, upward, and downward. The waves, meeting and battling, smote each other so fiercely that they could not descend again. Gust after gust from beneath them, carried them landward; mighty and vast as they were, they were borne landward as though so many feathers, by the upheaving force of those mighty blasts.

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How would it have been, if, shutters and windows being driven in, our poor room had *shipped* one of those vast billows which the storm-wind thus hurled upon the adjacent heaths? We were, in fact, exposed to the strange chance of being shipwrecked on the land. Our house, so close to the shore, might at any moment have its roof or even its upper story carried right away by wind and wave. The villagers often told us that that was, in fact, their nightly thought and their nightly terror, and they advised us to seek a more inland shelter. But we still comforted ourselves with the thought that the longer this tempest had lasted, the sooner it must come to an end; and, to the undoubtedly reasonable advice thus given to us, our reply was, still, "To-morrow, to-morrow."

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The overland news that came to us, told of nothing but wrecks, still wrecks. Close by us, on the 30th of October, a vessel from the South Sea, with a crew of thirty hands, foundered, with a loss of all hands and her rich cargo—and this at the very entrance of the roadstead. After having passed through so many storms and calms, after having safely weathered so many rocks and shoals, she had arrived within sight, within hail, almost within touch of a little beach of fine sand, the fine-weather bathing place of delicate and timid women. Well! That seemingly gentle little sandy beach, upheaved into a huge and impassable sandbar—was the grave of the good ship, which ran upon it with frightful force, and was crushed, shivered into small pieces—converted from a "thing of life," into a mutilated corpse. What became of the crew? Not a trace of them has ever been found; they were probably swept, vainly struggling, from the deck, and swallowed up by the sands.

This tragical event very naturally led us to suspect that many similar ones had occurred, elsewhere, and nothing was thought of or talked of but probable calamities. But the sea seemed by no means at the end of her work. We on shore had had quite enough of it. Not so our enraged sea. I saw our pilots, sheltering themselves behind a rocky wall from south-west, keep an anxious look-out seaward, and shake their heads in ominous doubt of what was even yet to come. Happily for them, no craft made her appearance in the offing—or they were there to risk, most probably to lose, their lives. And I, also, looked anxiously out upon that sea, on which I looked no less in hate than in anxiety. True, I was in no real danger, but for that very reason I was all the more despairingly the victim of *ennui*. That sea had a look at once hideous and terrible; her vagaries were as absurd as her strength was irresistible. Nothing there reminded one of the fanciful descriptions of the poets. By a strange contrast, the more I felt myself depressed, and as it were, lifeless, the more vigorously and vehemently did she seem to feel and manifest her life; as though, galvanized by her own furious motion, she had become animated by some strange, fantastic soul. In the general rage, each wave seemed animated by its own special and sentient rage; in the whole uniformity, (paradoxical as it may seem, it, yet, is quite true) there was, as it were some diabolical swarming. Was all this attributable to my worn brain and wearied eyes? Or were the reality and the impression alike true? Those waves reminded me of some terrible *mob*, some horrid rabblement, not of men, but of howling dogs, a myriad of howling and eager dogs, wolves—maddened and furious dogs and wolves. Dogs and wolves, do I say? Let me rather say, a dread concourse of nameless, and detestable, and spectral beasts, eyeless and earless, but with hugely yawning jaws, foaming and eager for blood, blood, still more blood!

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Monsters! what more do ye require? Are ye not surfeited with wrecked ships and slain men? Do we not from all sides hear of your horrid triumphs? What more, I ask, do ye demand? And the horrid phantoms answer—"Thy death, universal Death, the destruction of the Earth, a return to black Night and ancient Chaos."

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CHAPTER IX.

THE BEACONS.

Impetuous is the channel where her strait receives the full rush of the North sea, and very turbulent is the sea of Brittany, rushing over basaltic shoals in swift and furious rapids. But the gulf of Gascony, from Cordouan to Biarritz, is just one long maritime contradiction, one enigma of mighty strifes. As she goes to the southward, she suddenly becomes extraordinarily deep, as though her waters sank, on the instant into some vast and fathomless abyss. Passing over that sudden and immense depth, the onward wave under the impulse of the terrible pressure leaps upward to a height and onward with a velocity unequalled by any other of our seas. The great surge from the north-west is the motive-power of this huge liquid machinery; from a little more north it threatens to crush Saint-Jean-de-Luz; farther west it repels the Gironde, and crowns with her terrible billows the luckless Cordouan.

That poor Cordouan, that respectable martyr of the seas and victim of the tempests, is only too little known. I believe it is the oldest of all the European beacons. At all events, only one, the celebrated Genoese lantern, can rival it in antiquity. But there is a vast difference between them. The Genoese, crowning a fort and solidly seated upon solid rock, looks smilingly, almost scornfully, down upon the impotently furious storms. But Cordouan is upon a shoal which the water never wholly leaves. And, in truth, he was a bold man who conceived the notion of erecting a beacon here, amidst the waters; what say I? in the eternal wave-combat between such a river and such a sea. From one or the other, it, at every instant, receives tremendous blows. Yes, even the Gironde urged on the one hand by the winds, and on the other by the rude torrents from the Pyrenees, assails this stern calm guardian, as though it were responsible for the assailing and repelling fury of the ocean.

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Yet, Cordouan is the only saving and consoling light that gleams over this stormy sea. Run before the north wind, and miss Cordouan, and verily, my storm-tossed brother, you are in very real danger; you, likely enough, will fail to sight Arcachon. This sea, most stormy among seas, is also the darkest. At night, storm-driven upon that sea, there is no guiding mark, if you miss the beneficent light.

During our whole six months stay upon this coast, our usual contemplation, I had almost said, our almost sole companion, was the beacon of Cordouan. We felt that this guardian of the sea, this constant watchman over the strait became less a mere building than an actually living and intelligent *person*. Standing erect over the vast western horizon, it shows itself under a hundred various aspects. Now it is gilded, glorified by the setting sun; anon, pale and indistinct amidst the shifting mists, it tells us nothing of good augury. At evening, when suddenly it flashes its ruddy and glowing light athwart the heaving waters, it looks like some zealous inspector impressed and anxious in its conscious and deep responsibility. Whatever happens from the seaward, our Cordouan is held responsible for it. Throwing his ruddy beams into the gloom of the tempest, he, the preserver, is held to be the cause of that which he only, and savingly, exhibits. Thus, only too often, it is that genius is accused of evoking the evils which it exposes only that it may reform them. We, also, were ourselves thus unjust towards Cordouan. Was he late in displaying his guiding light? How ready we were to exclaim: "Cordouan, Cordouan, pale phantom, can you show

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yourself only to conjure up the storm, and the storm fiend?"

And yet I believe, quite firmly, that to Cordouan thirty of our fellows owed their lives in the great storm of October. Their vessel was a total wreck, but they escaped with their lives.

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It is much that we can see our shipwrecking, to go down in full light, knowing exactly where we are, what are our perils, and what chances we have of evading or overcoming them. "Great God! If we must perish, give us to perish in the broad, bright light of day!"

When the ship of which I speak, driven by the strong surge from the open sea, reached this shore in the deep night, there were a thousand chances to one against her making her way into the Gironde. On her starboard the bright point of the Grave warned her off from Medoc; on her larboard the little beacon of Saint-Palais showed her the dangerous rock of the Grand'Caute on the Saintonge side; and between those fixed white lights, high over the central shoal flashed the ruddy Cordouan, showing from moment to moment the only safe channel.

By a desperate effort she got through, but only, and barely; wind, wave, and current conspired to drive her on Saint-Palais. The saving light showed the much harrassed, but still undaunted crew, where only lay their chance of safety from the driving sea behind and the terrible sands in front. Fearing, yet daring, they leaped, fell, I know not how or where, and were saved, bruised, fainting,—but still living.

Who can even imagine how many ships and how many men are saved by these beneficent beacons? Light, suddenly dispelling the dense shadows of those horrible nights when the bravest lose their courage and their presence of mind, not only points the path, but clears the head and strengthens the heart. It is a great moral support to be able to say in some mortal peril, "Again! Again! Haul away my brothers, be bold! Though wind and wave are both against us, we are not alone. See, yonder! Humanity is still watching over us, and guiding us from yonder lofty tower!"

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The seamen of the old times, ever hugging the shore, and anxiously marking every headland, were still more in need than we are of the friendly beacon light. The Etruscans, we are told, first kept the night-fires burning upon their sacred stones; the beacon was at once an altar, a temple, a column, and a watch tower. The Celts, too, had their round towers which were beacons also; the most important of them were built on precisely those points where the friendly light could most widely flash over the dark waters; and the Romans lit up watch fires from height to height and promontory to promontory along their whole shores of the Mediterranean.

The great terror of the Northern sea kings, and the perilled and trembling life of the dark middle age, put out all those guiding and saving lights. The people cared not to favor the inroad of the sea rover; the sea was an object of dread, almost of hatred. Every ship was an enemy, and, if it ran aground, was deemed lawful as well as unpitied prey. The pillage of a wreck was the gain of the noble; the *noble* and the *wrecker* were one! The Count de Leon, made wealthy by the fatal shoal upon his County's shore, said of that murderous rock, that it was "a precious stone, far more precious than any that glitters in a kingly crown."

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Even in our own time, innocently, the poor fishermen have, again and again, by those fires which they have kindled upon the beach, seduced our poor seamen into shipwreck and death. The very beacons themselves have, not seldom, played the bad part of the false hearted wrecker, alluring, only to betray; so easy is it to mistake one light for another. Now and then, that mistake, so readily made, leads to very horrible consequences.

It was France, who, at the close of her great wars, took the lead in making the lighthouse the great saviour of the benighted and well nigh wrecked seamen. Provided with that great refracting lamp of Fresnel, (a lantern equal to four thousand common ones, and throwing its ruddy gleam over a dozen, or so, of leagues), it can cast, that good modern beacon, its directing and saving light, hither and thither so that strait and shoal are made visible and safe in the deep midnight as in the full broad glow of the bright noon. To the sailor, who steers by the stars, this invention gave him, as it were, a new heaven and added constellations. Planets, fixed stars, all were created anew for him, and in those newly invented constellations there was even an improvement upon the celestial lights, in the variety of color, intensity and duration, of their glow and of their flashing. To some, we gave the calm, fixed, pale and steady gleaming which sufficed for the tranquil night and the comparatively safe sea; to others, the revolving and flashing, and fierce and ruddy glow that shone to every point of the compass. These latter, like the phosphoric creatures of the deep, palpitate and flash fitfully, now gleaming and anon paling, now leaping into dazzling glow, and anon dying into deepest darkness. In the darkest and most tempestuous nights, they are ever restless as Ocean's self, and seem to give him back motion for motion, and gleam for gleam to the lurid and fitful lightnings.

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Let us remember that in 1826, and even as late as 1830, our seas were still terrible in their drear darkness. In all Europe there were but few lighthouses; in Africa, there was but the single one on the Cape, and, in all vast Asia there were only those of Bombay, Calcutta, and Madras, while the whole vast extent of South America displayed not even one. Since the latter date all nations following, imitating, even rivaling, France, have said, on every bold headland that overlooks every dangerous shoal and strait have said "Let there be light!" and every where the friendly light, gleams tranquilly, or fitfully flashes.

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Just here I should like you to make with me the circumnavigation of our seas from Dunkirk to Biarritz, and to take a survey of our lighthouses. But, it would occupy us too long. Calais, with her four lights of different colors, throws out her friendly warnings and hospitable imitations even to

distant Dover; and the noble gulf of the Seine, between Heve and Barfleur, lights the American seaman on his otherwise perilous passage to Havre and thence to the very home, the very heart of France.

And the good heart of France goes to her very threshold to welcome the coming and sea borne guest; lighting up, as, with an admirable skill and hospitality she does, every bold point of Brittany. At the outpost of Brest, at Saint Matthew, at Penmark, at the isle of Fen, every headland has its warning and guiding light, now flashing, now darkening, from minute to minute, or from second to second, and saying by sudden flash or momentary gloom, "Seamen! Beware! Luff it is! give that rock a wide berth! Keep off that shoal! Port! Hard aport!—Weather,—it is! Midship helm! So! Steady! Safe you are,—at your moorings!"

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And observe, all these watch towers over the perilous deep, often built as they are among the breakers, and as it were in the very bosom of the tempest, solve for art the difficult problem of absolute solidity or seemingly treacherous and unsafe foundation. Many of them are quite enormously high. The architecture of the middle ages, about which so much is as boastfully as untruly said and sung, never ventured to build so high, save on condition of giving their edifices clumsy buttresses and of clamping with clumsy and costly clamps of iron, the peaked summits of their towers. A glance at the much boasted, though really anything but artistic steeple of Strasbourg, will convince you of this. Our modern builders resort to no such rude expedients. The Héaux beacon, recently erected by M. Reynaud on the dangerous shoal of the Épées de Tréguier, displays all the sublime simplicity of some gigantic ocean tree. It has no buttresses, and it needs none; its foundation is sunk boldly and bodily into the living rock; from its base of sixty feet, it rears its tall column of twenty-four feet in diameter, and each of its huge granites is, neatly as firmly, dovetailed into the other, so neatly, so closely, so firmly, that cement is a sheer superfluity; and so solidly is all built that from base to summit the tall tower is solid as, nay, we may almost venture to say, more solid than, the old rock from which science, and art, and perseverance and what the American so graphically calls *pluck* have hewn each separate stone. Your wild wave knows not where to find a rent in the armor of this tall ocean-espying giant. She may smite, she may rage, but her blows will not harm, her rage will be spent in vain; from that rounded and great mass the giant blow glances harmlessly off; the mightiest thunder strokes of the ever enraged and ever baffled ocean have only succeeded in giving to this grand edifice a far slighter inclination than that of the purposely inclined "leaning tower" of Pisa.

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Behold, then, instead of those sad bastions which, in the olden day, overlooked and threatened old ocean, like those with which Spain threatened the Moor, our modern civilization erects peaceful towers of most benevolent and beneficent hospitality; beautiful and noble monuments, often sublime as they appeal to art, always touching as they appeal to sentiment; those towers which, flashing forth their ruddy or gleaming with their silvery fires, make upon the confines of our living, swarming, and much imperilled earth, a new firmament, saving, and guiding, blessing and blessed, as the firmament above us. When no star shines upon us from that firmament above, the seaman hails this art-created light as the star of brotherhood;

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"Bids its ruddy lustre hail
And scorns to strike his timorous sail."

Pleasant it is to seat oneself below one of these noble beacons, those friendly fires, those true and welcoming homes of the storm tried mariner. Even the most modern of them is a venerable thing to all who, for one moment, reflect how many lives the most modern of them has already saved. With even the most modern, many a touching memory, many a wild and beautiful, and no less authentic story is connected. Two generations, merely, are enough to make your beacon already ancient, linked with old memories, consecrated, honorable, hallowed. Often, oh often does the mother say to her little ones—"Behold! That friendly beacon saved your grandfather; but for it you would never have been born."

And how often does our brave beacon receive the loving, and tender, and pure visits of the anxious wife or brother who watches for the return of the far husband or son! In the darkening evening, and even far into the dark night, the one or the other gazes anxiously up to the lofty tower, wishing, begging, imploring, for the first gleaming of the blessed and blessing light that shall guide the absent one safely back into port.

Oh! Very justly did the men of the old day, confound these honored stones with the altars of the man guiding and man saving gods; to the heart that weeps, and hopes, and prays and battles amidst the howlings of the tempest, see ye! they are still one and the same; they are still the saving guides, the very altars of the saving and the guiding Deity. For, in very truth, what are man's best works, but the realization of the Almighty will and the great directing mercy?

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BOOK SECOND.

THE GENESIS OF THE SEA.

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FECUNDITY.

Five minutes after midnight of St. John's—24th to 25th of June, commences the great Herring Fishery, in the North Seas. Phosphoric lights gleam and flash upon the waters, and from deck to deck is heard the hearty hail, "Look out, there! The *Herring lightning!*" And a real, and a vast lightning that is, as from the depths that vast mass of life springs upward in eager quest of heat, light, and dalliance. The soft, pale, silvery light of the Moon is well pleasing to that timorous host; a beacon to guide them to their great banquet of Love. Upward they spring, one and all; not one idler or straggler remains behind. Gregariousness is the fixed rule, the indefeasible law of that race; you never see them but in shoals. In shoals they lie buried in the vast dark depths, and in shoals they come to the surface to take their summer part in the universal joy, to see the light, to revel—and to die. Packed, squeezed, crushed, layer on layer, it seems that they never can be close enough, they swim in such compact masses that the Dutch fishermen compare them to their own Dykes—afloat! Between Scotland, Holland and Norway, one might fancy that an immense island had suddenly risen, and that a whole continent was about to arise. One division detaches itself eastward, and chokes up the Baltic sound. In some of the narrower straits you actually cannot row, so dense and solid is the mass of fish. Millions, tens of millions, tens of thousands of millions;—who can even guess at the number of those hosts upon hosts? It is on record that on one occasion, near Havre, one fisherman, on one morning, found in his nets no fewer than eight hundred thousand; and in Scotland, the mighty mass of eleven thousand barrels was taken in a single night!

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They come as a blinded and doomed prey; no amount of destruction can discourage them. Constantly preyed upon alike by fish and by men, they still come on in myriad shoals. And no marvel either; for they love and multiply, even as they move. Kill them as fast as we may, they just as fast reproduce; their vast, deep columns, even as they float along, give themselves wholly up to the great work of reproduction. The wave of the sea and the electric wave impel that whole vast mass at every instant. No weariness, no satiety, no weakness, not even a pause, take one where you will and it either has just propagated, is propagating, or is about to propagate. In that vast polygamous host, pleasure is an adventure and love a navigation. Over every league of its passage it pours out its torrents of fecundity.

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At some two or three fathoms deep the water is completely discolored by the incredible abundance of the Herring-spawn; and at sunrise, far as the eye can reach, you may see the water whitened with the marvellous abundance of the thick, fat, viscuous billows in which life is fermenting into new life. Over hundreds of square leagues it seems as though a volcano of teeming and fecund milk had burst forth and overwhelmed the sea.

Full of life as it is at the surface, the Sea would be actually choked up with it but for the fierce and eager union of all sorts of destructions. Let us remember that each Herring has forty, fifty, or even seventy thousand eggs. But for the thinning process, each of them giving the average increase of fifty thousand, and as each of these in its turn giving the same average increase, a very few generations would suffice to solidify the Ocean into a stagnant and putrid mass, and make our whole globe a desert. Here we see the imperative necessity to Life, of life's twin sister, Death; in their immense strife there is harmony; destruction is the handmaiden of preservation.

In the universal war carried on against the doomed race, it is the fierce giants of the deep that prevent the mass from dispersing, and drive it in dense shoals to our shores. The whale, and the other cetaceæ, plunge into the living mass, swallow down whole tons, and drive shoreward the still vast, the seemingly undiminished, host. And at the shore commences quite another and more vast destruction. In the first place, the smallest of fish devour the spawn of the Herring, swallowing, like any human spendthrift, the great future for the small present. And for the present, for the full-grown Herring, nature has provided a very efficiently gluttonous foe, dull-eyed, huge appetited, eager, insatiable,—the whole tribe of fish-devouring fish, Cod, Whiting, &c. The Whiting gloats, devours, crams itself so with Herring that it becomes one luscious mass of fat. The Cod similarly stuffs itself with Whittings, and becomes fat, fecund, overflowing with fecundity—with a really threatening superabundance of fecundity. Just consider! What we have seen of the fecundity of the Herring is a mere nothing when compared to the fecundity of the Cod, which not seldom has nine millions of eggs! A cod weighing fifty pounds has fourteen pounds of eggs; and its breeding season is nine months of every year. This is the creature that, unchecked, would soon solidify the Ocean and destroy the world. And accordingly we cry "Help! To arms! Launch ships and away, to check this too vigorous fecundity." England alone sends some twenty or thirty thousand seamen to the Cod Fisheries. And how many are sent from America, from France, from Holland—from everywhere? The Cod alone has caused the foundation of whole towns—of whole colonies! The catching and curing of the Cod form an art, and that art has its own idiom—the *patois* of the Cod fishery.

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But what could man do against the enormous fecundity of the cod? Nature knows well that our petty efforts of fleets and fisheries would be insufficient and that the Cod would conquer us; and nature evokes another and a more efficient destroyer of the superfluous life that would produce universal death. Down from its spawning bed in the river, thin, famishing, eager, fierce with hunger, comes the Sturgeon, that great devourer. Real rapture it is to the famishing glutton to find, on his return to the sea, ready fattened for him, the succulent and unctuous Cod, the concentrated substance of whole shoals of Herrings! This great devourer of the cod, though less

fecund than its prey, *is* fecund, producing fifteen hundred thousand eggs. The danger reappears. The Herring threatened with its terrible fecundity, the Cod threatened, the sturgeon threatens still. Nature, therefore, produced a creature superb in destroying, almost powerless to reproduce, a monster at once terrible and serviceable that could cut through this otherwise invincible and ruinous fecundity, an omnivorous monster, huge of jaw and constant in appetite, ready for all prey, living or dead, the great, the perfectionated, the matchless devourer—the Shark.

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But these furious devourers are anticipatively kept down; mighty in destroying, they are very slow in reproducing. The Sturgeon, as we have seen is less prolific than the Cod, and the Shark is actually sterile, if compared to any other fish. Not like them does it overspread and discolor the sea. Viviparous, it sends forth its rare youngling, fierce, fully armed, savage and terrible.

In her dark and teeming depths, the Sea can smile in scorn at the destroyers to which she gives birth, well knowing, as the great proud fertile Sea does, that no might of destruction can surpass her might of reproduction. Her chief wealth, her most vast and countless produce, defies all the fury of the devourers, is inaccessible to their attacks. I speak of the infinite world of living atoms, of the microscopic atomies that live and love, enjoy, struggle, suffer and die from the surface to the utmost depths of the sea. It has been affirmed that, in the absence of solar light, life, also, must be absent; yet the darkest depths of the sea are studded with sea stars, living, moving, microscopic infusoriæ and molluscs. The dark crab, the phosphorescent seaworm, and a thousand strange and nameless creatures swarm in those uttermost depths and rise only now and then, describing long lines of variegated light upon the heaving surface. In its semi-transparent density, the sea has its own lucidity, its own glowing gleam, like that which fish, living or dead, reflect. The Sea! glorious Sea, hath her own lights, her own Sun, Moon, and Stars.

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Gaze inquisitively and intelligently on a mere salt well and you at once perceive how prolific the ocean depths must be; that seeming deposit of dead and inert matter hath its real life; it is a mass of infusoriæ, microscopic, but organized and sentient. All voyagers on the wide Ocean concur in telling us that in their far wanderings they still and ever traverse living waters. Freynel saw millions of square yards covered by a crimson glow—that glow, consisting of living animalculæ so minute that a myriad is packed into every square inch. In the bay of Bengal, in 1854, Captain Kingman sailed for thirty miles through one vast white blotch which made the sea look like a great snow field. Not a cloud above, but one unbroken leaden grey, in strange contrast with the brilliant whiteness beneath. Look closely and you see that that seeming snow is gelatinous; bring your microscope into play and you see that that seeming jelly is a mass of living, moving, phosphoric animalculæ, flashing forth strange and marvellous lights.

Peron, too, tells us that for thirty leagues his good ship ploughed her way through what seemed a sort of greyish dust; examined with the microscope, this seeming dust was seen to be the eggs of some unknown species, covering and concealing the waters over all that immense space.

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Even along the desolate shores of Greenland, where we vainly fancy that prolific nature must needs expire, the sea is enormously populous. Through waves two hundred miles by fifteen you sail through deep brown waters, colored by microscopic medusæ, of which, de Schleiden tells us, more than a hundred and ten thousand live and love, battle, and die in every cubic foot. These productive and nourishing waters are supersaturated with all sorts of fatty atoms adapted to the delicate nature of the fish which lazily drink in the nourishment provided for them by the fertile and generous common mother. Do they know what they thus swallow? Scarcely. Its minute but abounding nurture, its nourishing mother's-milk, comes to it without its care, and is received without its gratitude. Our great fatality, our sad calamity, fierce and terrible hunger, is known only on the land. Exertion and want of food are unknown in the great world of waters. There, life must glide away like a glad dream. What can the creature there do with his strength? All use of it is superfluous, impossible;—all save only one; all strength, all energy, are reserved for the great work of love.

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The one great law, the one great work of the seas, is to increase and multiply. Love fills up the whole of its fecund depths, and is wealthiest in reproduction among those which are so small that to our unassisted eye they are invisible, unknown as though they were non-existent. We have spoken of mere atomies; but are there, in reality, any such? When we imagine that we have got the lowest, the utterly indivisible, we have but to examine with more earnest and penetrating gaze and we see that this seemingly frail atomy still loves, still reproduces itself in miniature. At the very lowest stages of life you find all the forms of life and reproduction.

Such is the Sea, such the great *Female of the Globe*, whose ceaseless yearning, whose permanent conception, whose production and reproduction, never end.

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CHAPTER II.

THE MILKY SEA.

The water of the Sea, even the purest, examined when you are far away from land, and from all possible admixture, is somewhat viscid; take some between your fingers, and you find it

somewhat ropy and tenacious. Chemical analysis has not yet explained this peculiarity; there is in that an organic substance which Chemistry touches only to destroy, taking from it all that it has of special, and violently reducing it back to general elements.

The marine plants and animals are covered with this substance, whose mucousness gives them the appearance of a coating of jelly, now fixed, anon trembling, and always semi-transparent. And nothing more than this contributes to the fanciful illusions presented to us by the world of waters. Its reflections are irregular, often strangely variegated, as, for instance, on the scales of fish and on the molluscæ, which seem to owe to it the exquisite beauty of their pearly shells. [115]

It is that which most attracts and enchains the interest of the child when he first sees a fish. I was very young when I first saw one, but I still remember how vividly I felt the impression. That creature with variously colored lights flashing from its silvery scales, threw me into an astonishment, a fascination, a rapture, which no words can describe. I endeavored to catch it, but found that it could no more be held than the water which glided through my small weak hand. That fish seemed to me to be identical with the element in which it swam, and gave me a confused idea of animated, organized and surpassingly beautiful water.

A long time after, in my maturity, I was scarcely less impressed when on a sea beach I saw, I know not what of shining and transparent substance, through which I could clearly see the sand and pebbles. Colorless as crystal, slightly, very slightly solid, tremulous when ever so slightly touched, it seemed to me as to the ancients and to Réaumur, that which Réaumur so graphically named it—*gelatinised water*.

Still more forcibly do we feel this impression when we discover in the early stage of their formation the yellowish white threads in which the sea makes her first outlines of the fuci and algæ which are to harden and darken to the strength and color of hides and leather. But when quite young, in their viscuous state, and in their elasticity, they have the consistence of a solidified wave, all the stronger because it is soft. What we now know of the generation and the complex organization of the inferior creatures, animal or vegetable, contradicts the explanation of Réaumur and the ancients. But all this does not forbid us to return to the question which was first put by Borg. de Saint Vincent; viz: What is the *mucus* of the Sea? That viscuousness which water in general presents? Is it not the universal element of life? [116]

Much engaged with these and the like reflections, I called upon an illustrious chemist, a man at once positive and sound, an innovator no less prudent than bold, and I abruptly asked him this plain question—"What, in your opinion, is that whitish, viscuous matter which we find in sea water?" "Nothing else than life," was his reply, then retracting, or rather explaining his somewhat too simple and too absolute dictum, he added, "I should rather say a half organized and wholly organizable matter. In certain waters it is a dense mass of infusoriæ, in others a matter which is not yet, but which is to become infusoriæ. In fact, we have yet to begin, at all seriously, the study of this matter."

This was spoken on the 17th of May, 1860.

On leaving our great Chemist, I went to a Physiologist, whose opinion has no less weight with me, and to him I put the same question. His reply was very long and very beautiful. In substance it ran thus: "We know in reality no more about the composition of water than we know about that of blood. What we best know and can most safely affirm about the *mucus* of sea water, is that it is at once an Alpha and an Omega, a beginning and an end. Is it the result of the numberless deaths which furnish forth materials for new lives? No doubt, that is the general law; but in the case of the sea, that world of rapid absorption, the majority of the creatures there are absorbed while in full life; they do not slowly linger on towards death, as we on land do. The sea is a very pure element; war and death purvey to it. But life, without arriving at its final dissolution, is incessantly approaching it, exuding and exhaling all that is superfluous. With us, the animals of the earth, the epidermis, through its millions of pores, wastes the body at every instant; we suffer, as it were, a partial death at every breath we draw. Now this partial death, this vast exudation, in the case of the marine world, fills that vast world of waters with a gelatinous wealth of which the young world has the instant benefit. It finds in suspension the oily superabundance of this common exudation, the still living atoms and liquids which have not had time to die. All this does not fall back into the inorganic, but enters quickly into new organisms. Of all the theories on the subject, this seems the most reasonable; rejecting this theory, we plunge into a sea of extreme difficulties." [117]

These ideas of the most enlightened and earnest thinkers of the present day, are not irreconcilable with those which, nearly thirty years ago were promulgated by Geoffrey Saint Hilaire, upon that general *mucus* in which nature seems to find all life. He calls it "the *animalisable* substance, the raw material of organic bodies. Not a creature, whether animal or vegetable, but both absorbs and produces it from the earliest to the latest breath; indeed, the weaker the creature, the more abundant that is." [118]

This remark suggests a broad and bright light upon the life of the seas. Their tenants seem, for the most part, fœtuses in the gelatinous stage, which absorb and produce the mucous substance, permeate and saturate with it all the waters, and give to them the fecund and nourishing powers of a vast womb, in whose depths an infinite succession of generations, perpetually float, as in warm milk.

Let us make ourselves present in this divine work. Let us take a drop from the sea; in it we

shall be able to espy the very process of the primitive creation. Nature's God is ever consistent; he does not work in one fashion to-day, and in another to-morrow. This drop of water, I doubt not, will tell us in its transformations, the tale of the Universe. Let us be patient, and observe. Who can foresee or guess the history of this drop of water? Which will it first produce, the vegetable-animal, or the animal-vegetable? Will this drop be the infusoriæ, the primitive *monad*, which, vibrating, shall shortly become *vibrion*, and ascending step by step, from rank to rank, polypus, coral, or pearl, may perchance in ten thousand years reach the dignity of insect? Will it produce the vegetable thread, so slight and silken that one would scarcely discern it, and yet already is no less than the first born hair, amorous and sensitive, which is so well known as *Venus's hair*? This is no fable—it is true natural history. This hair, of double nature, at once animal and vegetable, is, in fact, the commencement of life.

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Look quite down into the depths of a vessel of water; at first you discover nothing; patience for a few moments and you perceive drops, atomies, that are moving. Bring a good glass into the service, and you see a whole cloud of these atomies. Are they gelatinous or fleecy? Under the microscope this seeming fleece becomes a group of filaments, of finest and silkiest threads; a thousand times finer, it is believed, than the finest hair that adorns the head of woman. You are now looking upon the first timid attempt of life that is struggling to achieve organization. These confervæ, these hair-weeds, are to be found wherever there is stagnant water, whether fresh or salt. They are the commencement of that double series of the primary vegetation of the sea which became terrestrial when the earth emerged from the watery depths. Once above and beyond the waters, they become the vast, the numberless Fungus-family; in the water, they are the hair-weeds, the many-formed and many-named Algæ.

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This is the primitive, the indispensable element of organized vitality, and we find it even where we should, at the first glance deem it to be impossible. Even in the dark depths of the ferruginous waters, supersaturated with iron; even in the all but boiling hot springs, you find this mucus, this abounding mass of little creatures, moving, writhing, agitated ever, which to your first glance, seem only so many lifeless specks. You need not greatly care into what class our finite and dim science consigns them. If Candolle honors them with the title of animals, if Dujardin, on the other hand, degrades them into the low rank of the lowest vegetation—let us not stay to heed these mere names. Such as they are, all that they ask is that they may live and that their humble existence may open up the long series of beings which, but for them, would never be. These atomies, whether we call them living or dead, or passing from life to death, or vigorously struggling from death into organic life, are self-supporting, independently struggling, and ever taking and giving from and to the maternal waters, the life creating and the life supporting gelatine.

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It really is without any approach, even, to probability, that they show us, as specimens of the first creation, the primitive organization, the fossil imprints, more or less complex, whether of animal or vegetable—of the Trilobites, for instance, already furnished with the superior organs—eyes, &c.,—or gigantic vegetation, widely branched and richly foliaged. It is beyond all computation more probable that these were preceded and heralded, and prepared, by species far more simple, but of such yielding and destructible matter that it could make no impress, leave no mark behind. How can we expect that those gelatinous, those almost liquid creatures should *not* "die and make no sign" when we see that the hard shells are ground into very dust? In the South Seas we see fish with teeth so sharp, at once, and of such iron strength that they browse on the tough coral, even as the timid sheep browses on the tender grass-blades. Oh! Depend upon it, generation after generation of the soft gelatinous germs of life have breathed before nature put forth its robust Trilobite and its imperishable ferns.

Let us be just to these conservæ; let us restore to them their pretty obvious right to eldership in this glad and various world of ours. Be they animal or be they vegetable, or do they vibrate and struggle between both—let us at least do them justice, let us speak about them all that is evidently true.

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Upon them, and at their expense, arose the immense, the really marvellous marine Flora.

At that starting point I will not hesitate to express my tender sympathy. For three very sound and sufficient reasons I love and I bless that vast vegetation; small or large, that vegetation has three lovely qualities:—

Firstly, how innocent are all its members. Not one of them all is poisonous. Vainly in the whole marine vegetation shall you search for one poisonous plant. Seek in every sea, and in every latitude, you will find the vegetation wholesome, genial, a blessing and a mercy.

Those innocent plants ask for nothing more than to nourish or to heal animality. Many of them, the Laminaires, for instance, contain a luscious sugar; and others, as, for instance, the Corsican or Irish Moss, have a health-restoring bitter; and all, without exception, contain a concentrated and most nourishing mucilage, not a few of them saviours to the weak, worn, perishing lungs of presumptuous and ungrateful man. Where we now exhibit iodide, the English formerly used nothing but a confection of that same Corsican, or Irish, Moss.

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The third characteristic of that vegetation is its marvellous amorousness. We cannot doubt that if we pay the slightest attention to its strange hymeneal metamorphoses, here is the striving to be, beyond being, to be potent beyond power. We see it in the fire flies and the like small things, and we see it no less, if we will only look for it, in the sea weeds which, at the consecrated moment, seem to quit their merely vegetable life and leap into animality.

Where do these wonders commence? Where are these first sketches of animality made? Where are we to look for the primitive scene of organization?

Formerly these things were hotly disputed; in our own day there seems to be a certain agreement in the learned world of Europe. I can find the reply to these questions in many recognized and authorized volumes, but I prefer to borrow it from an Essay recently crowned by the Academy of Sciences, and, consequently, shielded by its high, unquestionable authority.

Living creatures are found in the hot waters of eighty, even up to ninety, degrees. It is when the cooled globe gets down to that temperature that life becomes possible. The water has then absorbed, at least in part, that terrible element of death—carbonic acid gas. It becomes possible to breathe.

All the seas were at first like those parts of the great Pacific Ocean, which are comparatively shallow, and are studded with small, low islets. These islets are extinct craters of by-gone volcanoes; the seaman knows them only by the summits which the slow but steadfast toil of the coral insect has upheaved from the depths. But the depths between these volcanoes are probably themselves no less volcanic, and must have been, for the first essays of primitive creation, so many receptacles of life. [124]

Popular tradition has, for ages past, attributed to volcanoes the guardianship of buried treasures, which from time to time give out to our upper world the gold that lies buried in the depths.—Poetic fiction, which yet has its firm foundation in fact. The volcanic regions have within themselves the treasure of our globe, potent virtues of fecundity. It is they that most largely dower the otherwise sterile earth; from the dust of their lavas, from their still warm ashes, life springs, expands, glows, and creates new life. We recognize the wealth of Vesuvius, and of Etna in the long offshoots that they send far into the Sea, and we know what a lovely paradise is formed under the Himalayas, by the volcanic circle of the vale of Cachemire. And the same thing is repeated in the lovely isles of the far South Sea.

Even under the least favorable circumstances, the vicinity of volcanoes, and the warm currents which are their concomitants, create and preserve animal life, even in the most desolate and dreary places. Amidst all the freezing horrors of the Antarctic pole, not far from the volcanic Erebus, Captain James Ross found living coral insects at the depth of a thousand fathoms below the surface of the frozen sea. [125]

In the early ages of our world, innumerable volcanoes exerted a submarine action far more powerful than they exhibit now. Their clefts and their intermediate valleys allowed the marine mucus to accumulate in places, and to be electrified into life by the warm currents. No doubt the *mucus* affected those parts, fixed itself there and worked and fermented to the utmost of its young power. Its leaven was the attraction of the substance for itself. The creative elements, originally dissolved in the sea formed combinations, leagues, I had well nigh written marriages. First appeared, merely elementary lives—death following almost inseparably, indistinguishably, upon young life; and other lives following close upon, and nourished by, those wrecks and spoils, had firmer hold on life, became preparatory beings, slow but sure creators, which, thenceforth, began beneath the waters that eternal labor which, even in our own day and beneath our own scrutiny, they still continue.

The sea nourishing them all, gives to each that which best suits it. Each draws from that great nursing-mother, in its own fashion, and for its own especial behoof, that which it most needs, must have, to make it what we see of naked, or of shelled, of seeming vegetable, or of fierce, vigorous, and pugnacious life. And whether in life or in death, whether building actively or passively decomposing, they clothe the sad nudity of the virgin rocks, those daughters of the volcanic fires from which flaming and sterile, they were hurled from the planetary nucleus. [126]

Quartz, basalt, porphyry, and semi-vitrified flints, each and all receive from these minute laborers a new, a more graceful, and a more fecund garb; from the fecund maternal milk (for such we must call the *mucus* of the Sea) they absorb and restore, and thus build up, and secure, and fructify, and beautify, this, our habitable earth. It is from these more favoring localities that have arisen our primal species.

These works must have been commenced among the volcanic isles and islets, in the depths of their Archipelagoes, in those sinuous windings, those peaceful labyrinths where the tides enter timidly and gently, warm and sheltered cradles for the newly-born.

But the bolder strength of the fully-expanded flower, is to be sought for in, for instance, the vast depths of the Indian Gulfs. There, the Sea is veritably a great artist. There she gives to the earth its most adorable forms, lively, loving, and lovable. With her assiduous caresses she rounds or slopes the shore, and gives it those maternal outlines, and I had almost said the visible tenderness of that feminine bosom on which the pleased child finds so softly safe a shelter, such warmth, such saving warmth, and rest. [127]

CHAPTER III.

THE ATOM.

From the bottom of his nets a fisherman one day gave me three almost dying creatures, a sea hedge-hog, a sea star, and another star, a pretty ophiure, which still moved and soon lost its delicate arms. I gave them some sea water, but forgot them for two days, and when I again saw them, all were dead. On the surface of the water a thick gelatinous film had formed. I took an atom of this on the point of a needle; that atom, when placed under the microscope, showed me the following scene. A whirling crowd of short, thick, strongly built animals—*Kolpodes*—rushed to and fro as though intoxicated with their sense of life, delighted, I may say, that they were born and keeping their birthday with a perfectly bacchanalian joy, while microscopic eels—*Vibrions*—swam less than vibrated to spring forward.

Wearied with the contemplation of such movement, the eye, however, soon remarked, that all was not in motion, there were some vibrions yet stiff and still, and there were some intertwined in heaps which had not yet detached themselves and which looked as though expecting the moment of their deliverance. [129]

In that living fermentation of still motionless creatures, the disorderly *Kolpodes* rushed and raged, hither and thither, regaling and fattening themselves at will.

And this grand spectacle was displayed within the compass of an atom of film taken on the point of a needle! How many such scenes would be enacted in the whole of the gelatinous film which had so promptly formed on the surface of the water containing three dead creatures! The time had been wonderfully put to profit. In two days the dead had made a world; for three animals that I had lost I had gained millions, abounding in youth, absorbed in a real fury of new life!

That infinite world of life which every where surrounds us was almost unknown until lately. Swammerdam and others, who formerly recognized it, were stopped at their first step; and it was as lately as the year 1830, that the magician Uhrenberg looked, revealed, and classified it. He studied the figure of these invisibles, their organization, their manners; he saw them absorb, digest, chase, and fiercely battle. Their generation remained a mystery to him. What is the nature of their amours? *Have* they any amours? For creatures so elementary, would nature go to the expense of a complicated generation? Or do they spring up spontaneously, and, in vulgar phrase, "like mushrooms?" [130]

A great question! at which more than one naturalist smiles and shakes his head. One is so certain of having solved the great mystery of the world and secured, laid down, once and forever, the true laws of life! It is for Nature to obey! When, a hundred years ago, Réaumur was told that the female silk worm could produce alone and without the male, he denied it in the brief phrase—"Out of nothing, nothing comes." But the fact, often denied but always proved, is now thoroughly established and admitted, not only as to the silk worm, but as to the bee, certain butterflies, and still other creatures.

In all times, in every nation, both the learned and unlearned have said, "Out of death cometh life." It was especially supposed that the imperceptible animalculæ immediately sprang up from the wrecks of death. Even Harvey, who first laid down the law of generation, did not venture to contradict that ancient belief, for though he said every body comes from the egg, he immediately added—*or from the dissolved body of a preceding life.*

It is precisely the theory which has been so brilliantly revived by the experiments of M. Ponchet. He has established the fact that from the remains of the infusoriæ and other creatures, there proceeds a fecund jelly, the "prolific membrane" from which spring, not new beings, indeed, but the germs, the eggs from which new creatures will spring. [131]

We live in an age of miracles. This is not to astonish us. Any one would formerly have been laughed at who had ventured to say that some animals, disobedient to the general laws of nature, take the liberty to breathe through their paws. The noble labors of Milne Edwards have brought this to light. And Cuvier and Blainville had observed, it is said, that other creatures, destitute of the regular organs of circulation, supply their place by the intestines, but those great naturalists deemed the fact so enormous and so incredible, that they did not venture to publish it. It is now perfectly established by Milne Edwards, M. de Quatrefages, &c.

Whatever may be thought of their birth, our atoms, when once born, present a world infinitely and admirably varied. All forms of life are there honorably represented. If they know themselves, they must consider that they compose among themselves a harmony so complete as to leave but little to desire.

They are not dispersed species, created apart; they clearly form a kingdom in which the various species have organized a great division of the vital labor. They have collective beings like our polypus or coral insect, engaged in the servitude of a common life; and they have their minute molluscs which already display their minute and delicate shells; they have their swiftly swimming fish and whirling insects, proud crustaceæ, miniatures of the future crabs, armed, like them, to the teeth; warrior, atoms that chase and devour inoffensive atoms. [132]

And all this in an enormous and marvellous abundance, which shows the comparative poverty of our visible world. Without speaking of those *Rhizopodes* which have made their part of the Apennines and the Cordilleras,—the *Foramineferes*, alone, that numerous tribe of shelled atoms, amount, according to Charles d'Orbigny, to two thousand species. They are contemporary with every age of the earth; they present themselves at all the various depths of our thirty crises of the globe; sometimes varying a little in form, but always existing as species; identical witnesses of

the life of the earth. In the present day the cold current from the south pole which the point of America cuts in two, sends forty species towards La Plata and forty towards Chili. But the great scene of their creation and organization appears to be the warm stream of the sea which flows from the Antilles. The northern currents kill them. The great paternal torrent drifts myriads of their dead to Newfoundland in our ocean, whose bottom is paved with them.

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When the illustrious godfather of the atoms, Ehrenberg, baptised them and introduced them to the scientific world, he was accused of being too favorable to them, and of exaggerating the character of those little creatures. He declared them to be a complicated and elevated organization. So liberally did he endow them, that he gave them a hundred and twenty stomachs. The visible world became jealous of these invisibles, and, by a violent reaction, Dujardin reduced them to the lowest degree of simplicity. The asserted organs he treated as mere appearances; but, as he could not deny their obvious and great powers of absorption, he granted them the gift of being able to improvise stomachs proportioned to what they had to swallow. M. Pouchet does not coincide with this opinion, but rather inclines to that of Ehrenberg.

What is incontestable and admirable in these atoms is the vigor of movement.

Many have all the appearance of a precocious individuality. They do not long remain subject to the communistic life led by their immediate superiors, the true Polypes. Very many of these invisibles are individuals at the first leap; that is to say, that, at the first moment of their existence, they can come and go alone and at their own will; true citizens of the world whose movements depend only upon themselves.

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Whatever can be seen or imagined of various modes of locomotion in the visible world, is equalled, even surpassed, among these invisibles. The impetuous whirl of a potent star, of a sun which attracts around him, as his planets, the weaker one which he meets, the more irregular course of the eccentric comet, the graceful undulation of the slender one in the water or upon the land, the rocking barque that veers right round in an instant, the rush of the swift shark and the slow crawl of the wretched sloth—all and every movement, clumsy or graceful, slow or swift, is to be found in the various species of atoms. And with what a marvellous simplicity of machinery! Here you see one, a mere thread, advancing, twisting, a veritable elastic cork-screw; there you see one that for oar and rudder has only an undulating tail or a pair of little vibrating eye-lashes. The beautiful little polypus-worms, like flowers in a vase, anchor together upon an isle—a little plant, or a miniature crab, and then separate and cast off by detaching their delicate peduncle.

What is even more surprising than the organs of motion, is what we may term the expression, the attitudes, the original signs of character and temper. You may recognize here the apathetic, there the vivacious and fantastic, some all alert for war, and others, as it would seem, fretful and agitated without any apparent cause. Again, you will occasionally see a whole crowd of remarkably quiet and peaceable atoms suddenly dispersed and knocked over by some scapegrace atom, conscious of superior strength, and spoiling for a fight.

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A prodigious comedy is that of our atoms! They seem to be satirically rehearsing the various farces which are played in our own noble and serious world, of atoms of larger growth!

At the head of the infusoriæ, we must make respectful mention of the majestic giants, the highest type of motion and of strength, slow, but terrible and great.

Take some moss from a roof, steep it for a few hours in water, then place it under the microscopic inspection, and you behold a vast, a mighty animal, the elephant or the whale of the invisibles, moving with a youthful grace which those large animals do not always display. Respect this king of all the atoms, this rotifer, so called because on either side of his head he has a wheel; these wheels are his organs of locomotion, like the paddle-wheels of a steamship, or perhaps they also serve him as his arms of chase to catch his small game, the inferior and peaceable atoms! All fly, all yield to the rotifer, save one; one atom only fears nothing, yields nothing, but trusts to his superior weapons. He is a monster, but he is provided with superior senses. He has two great gleaming, purplish eyes. He is slow, but he can see, and he is admirably armed. To his strong paws he adds strong, sharp talons, which serve him to hold on with, and, at need, to serve him in the fight.

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Potent initial essays of Nature, that with such small expenditure of matter, can create in such majestic fashion! Sublime first note of the sublime overture. These,—of what consequence is mere size?—have a colossal power of absorption and of movement, far beyond that which will be given to the enormous animals that are classed so much higher in the animal scale.

The oyster fixed upon its rock, the crawling slug, are to the rotifers creatures as disproportioned as man to the Alps or Cordilleras—so disproportioned that one cannot compare them by glance, hardly by reflection and calculation. Yet among those animal mountains, where will you find the vivacity, the ardor of vitality, displayed by the rotifer? What a fall we have as we ascend! Our atoms are too vivacious, dazzlingly agile, and these gigantic beasts are smitten with paralysis. What if the rotifer could conceive, for instance, the superb, the colossal starred sponge, which one may see in the Museum at Paris? It is to the rotifer what this globe, with its twenty-seven thousand miles of circumference is to man. Well! If the rotifer could compare himself to the huge sponge, rely upon it that the rotifer would move his wheels in utmost excitement, and exclaim—"I am great."

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Ah! Rotifer, rotifer! we should despise no one, and nothing.

I am well convinced of your advantages and your superiority. But who knows if the captive and slumbering life which you, for instance, despise in the oyster or the snail, or the slug, be not in truth a progress? Your wild vertiginous movement, and vivacity, by no means secure a passage towards higher destinies; for that passage, nature prefers a motion of less enchantment. She enters the dark sepulchre of that melancholy communism in which element reckons but for little; she teaches how to dominate individual anxieties and ambitions, and to concentrate substances for the benefit of superior lives.

She sleeps there, for a time, like the *Sleeping Beauty in the Wood*. But sleep, captivity, enchantment, be it what it may, it is not Death. In the sponge, seemingly so dead, what life there is! It moves not, breathes not, has no organs of circulation, or of sense,—and yet it lives. How know we that, do you ask? Twice in every year the sponge reproduces. She lives after her fashion, and even more richly than many others. At the proper day, small spheres leave the mother sponge, armed with minute fins, which enable them for a short time to float about in full liberty, but soon coming to anchor, they remain there, growing, reproducing, till the sponge-hunter carries them to the habitations of man, to the service of the greater enslaver, man, the civilized.

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Thus, in the apparent absence of senses, and of all organization, in that mysterious enigma, at the doubtful threshold of life, generation opens up to us the visible world by which we are to ascend. As yet there is nothing, and in the bosom of that nothingness maternity already appears. As with the fabled gods of antique and mysterious Egypt, as with that old Isis and Osiris, who begat before their birth, here, also, Love exists before Being.

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CHAPTER IV.

BLOOD-FLOWER.

At the heart of the globe, in the warm waters of the Line, and upon their volcanic bottoms, the sea so superabounds in life that it seems impossible for it to balance its multitudinous creations. Overpassing purely vegetable life, its earliest products are organized, sensitive, living.

But these animals adorn themselves with a singular splendor of botanic beauty, the splendid liveries of an eccentric and most luxuriant Flora. Far as the eye can reach, you see what, judging from the forms and colors, you take for flowers, and shrubs, and plants. But those plants have their movements, those shrubs are irritable, those flowers shrink and shudder with an incipient sensitiveness which promises, perception and *will*.

Charming oscillation, fascinating motion, most graceful equivoque! On the confines of the two kingdoms of animal and vegetable life, Mind, under those faëry oscillations gives token of its first awakening, its dawn, its morning twilight, to be followed by a glorious and glowing noon. Those brilliant colors, those pearly and enamelled flashings, tell at once of the past night and the thought of the dawning day.

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Thought! may we venture to call it so? No, it is still a Dream, which by degrees will clear up into Thought.

Already, in the north of Africa, over the other side of the Cape, the vegetable kingdom, which reigns alone in the temperate zone, sees itself rivalled, surpassed. The great enchantment progresses, increases, as we near the Equator. On the land,—tree, shrub, flower, weed, are proud and gorgeous, flaming in every bright color, delicate in every soft shade, and beneath the waters' slime and the ruddy corals. Beside parterres, that display rainbow beauties of every color and every tint, commence the stone plants; the madrepores, whose branches (should we not rather say their hands and fingers?) flourish in a rose-tinted snow; like peach or apple blossoms. Seven hundred leagues on either side of the Equator, you sail through this faëry land of magical illusion and wondrous beauty.

There are doubtful creatures, the Corallines, for instance, that are claimed by all the three kingdoms. They tend towards the animal, they tend towards the mineral, and, finally, are assigned to the vegetable. Perchance they form the real point at which Life obscurely and mysteriously rises from the slumber of the stone, without utterly quitting that rude starting-point, as if to remind us, so high placed and so haughty, of the right of even the humble mineral to rise into animation, and of the deep and eternal aspiration that lies buried, but busy, in the bosom of Nature.

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"The fields and forests of our dry land," says Darwin, "appear sterile and empty, if we compare them with those of the sea." And, in fact, all who traverse the marvellous transparent Indian seas are thrilled, stirred, startled, by the phantasmagoria that flashes up from their far clear depths. Especially surprising is the interchange between animal and vegetable life of their especial and characteristic appearances. The soft impressible gelatinous plants, with rounded organs, that are neither precisely leaves nor precisely stalks, the delicacy of their animal curves—those Hogarthian "lines of beauty," seem to ask us to believe that they are veritable animals, while the real animals, on the other hand, in form, in color, in all, seem to do their utmost to be mistaken for vegetables. Each kingdom skilfully imitates the other. These have the solidity, the quasi

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permanence, of the tree; the others alternately expand and fade like the evanescent flower. Thus the sea Anemone opens as a roseate and pearly flower, or as a granite star with deep blue eyes; but when her corollæ have given forth an Anemone daughter, you see the fair mother droop, fade, die.

Far otherwise variable, that Proteus of the waters, the Halcyon, takes every form and every color. Now plant, now flower, it spreads itself out into a fanlike beauty, becomes a bushy hedge, or rounds itself into a graceful bouquet. But all this is so ephemeral, so fugitive, so timid, so shrinking, that at the slightest touch of the softest breath it disappears, and returns on the instant into the womb of the common mother. In these slight and fugitive forms you at once recognize the twin sisters of the sensitive plants of our earth; closing up, as they close at the first breath of evening.

When you gaze down upon a coral reef, you see the depths carpeted, many colored flowers with fungi, masses of snowy brilliancy; every hill, every valley, of the great deep, is variegated with a thousand forms, and a thousand colors, from the ruddy and outstretched branches of the coral, to the deep, rich, velvety green of the Cariophylles or violets, which seek their food by the gentle motion of the richly golden stamens. Above this lower world, as if to shade them from the too glowing kiss of the ardent sun, waves a whole forest of giant and dwarf trees and shrubs, and from tree to tree feathery spirals stretch and interlace like the loving and embracing tendrils of the vine, but finer in tendril and infinitely more splendid in their variegated and contrasting, yet singularly harmonizing colors.

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This glorious sight inspires, yet agitates us; it is a dream, a vertigo; that Fay of the shifting mirage, the Sea, adding to these colors her own prismatic tints, fading, reappearing, now here, now gone, a capricious and fitful inconstancy, a hesitation, a doubt. Have we really seen it, this lovely scene? No, it was not so. Was it an entity, or a delusion? Yes, yes, it must be real, there are certainly very real beings there, for I see whole hosts of them lodged there and sporting there. The molluscs confide in that reality, for there you can see their pearly shells reflecting lights, now flashing and brilliant, and anon of a most tender delicacy; and the crab, too, believes in it, for see how he hastens on his sidelong path. Strange fish, vast and curious monsters of the deep, move hither and thither in their many colored vesture of purple and gold, and deep azure and delicate pink; and that delicate star, the Ophiure agitates his delicate and elegant arms.

In this phantasmagoria the arborescent Madrepore more gravely displays his less brilliant colors. His beauty is chiefly that of form.

But the chief attraction of the aspect of this vast community is in its entirety; the individual is humble, but the republic is imposing. Here you have the strong assemblage of aloes and cactus; there you have the superbly branching antlers of the Deer; and anon, you see the vast stretch of the vigorous branches of the giant cedar stretching at first horizontally, but tending to advance upward and upward still.

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Those forms at present despoiled of the thousands and tens of thousands of living flowers, which should cover and enliven them have, perhaps, in that stern nudity an additional attraction for the mind. I love to look upon the trees in winter, when their bared boughs tell us and show us what they really are. And thus it is with the Madrepores. In their present nudity, when from pictures they have become statues, it seems as though they were about to reveal to us the whole secret of the minute populations of which they are at once the creation and the monument. Many of them seem to write to us in strange characters, to speak to us in strange tones. Their interlacings evidently have a something to tell us, could we but understand them. But who shall be their interpreter; who shall give us the keynote to their harmony, mysterious harmony—but Harmony doubtless?

How much less significant is the Bee architecture in its cold, severe, geometry! That is the produce of life, but here we look upon life itself. The stone was not simply the base and shelter of this people; it was itself a previous people, an anterior generation, which, gradually overtopped by the younger, assumed its present consistence. And all the movements of that first community are still strikingly visible, as details of another Herculaneum, or Pompeii. But here everything is accomplished without catastrophe, without violence, by orderly and natural progress; all testifies to serenity and peace.

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Every sculptor will here admire the forms of a marvellous art which has achieved such infinite variety of forms, improving upon all arts of ornamentation. But we have to reflect upon something far beyond mere form. The arborescent variety on which the activity of these laborious tribes has been so wonderfully employed, is the effort of a thought, of a captive liberty, seeking the guiding thread in the deep and mazy labyrinth, and timidly feeling its way upward towards the light, and gently and gracefully working out its emancipation from communist life.

I have in my possession two of these little trees differing from each other, but of like species. No vegetable is comparable to them. One, purely white as the most immaculate alabaster, has an inexhaustible wealth of buds, and blossoms and flowers, on every one of its many spreading branches. The other, less white and less spreading, has also its whole world upon its branches. Exquisitely beautiful are they both; alike yet unlike, twins of innocence and fraternity. Oh who shall explain to us the mystery of the infant soul that created these faëry things! We feel that it must be at work, captive and yet free; captive in a captivity so beloved that though still tending upward towards freedom, it yet cares not fully to achieve it.

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The arts have not yet seized upon those wonders from which the world has derived so much benefit. The beautiful statue of Nature (at the entrance of the Jardin des Plantes) should have been surrounded by them; Nature should only be exhibited as she ever lives, amidst faëry triumphs, enthroning her on a mountain of her own beauties. Her first born, the Madrepores, would have furnished the lower strata with their meanders, their stars and their alabaster branches; while above, their sisters, with their bodies and their fine hair would have made a living bed, softly to embrace with caressing love the divine Mother in her dream of eternal maternity.

Painting has succeeded in these things no better than sculpture. Her animated flowers have neither the expression nor the true, pure, delicate coloring of the animated flowers, of the nature of which our colored engravings give but a poor and mechanical idea, altogether destitute of the unctuous softness, suppleness, and warm emotion of the flowers of the fields, the woods, the gardens, or animated flowers of the seas. Enamels, even attempted as by Palissy, are too hard and cold; admirable for reptiles and the scales of fish, they are too glaring to resemble these tender and soft creatures that have not even a skin. The little exterior lungs of the annelides, the slight net work in which certain of the Polypes float, the sensitive and ever-moving hairs which support the Medusæ, are objects not merely delicate to sight, but affecting to imagination. They are of every shade, fine and vague, yet warm; as though a balmy breath had become visible. You see an ever-varying, ever-moving rainbow that delights your eye; but for them it is a very serious matter, the creating of that marvellous rainbow, of various forms and colors; it is their blood and their weak life converted into changing hues and tints, and lights and shades. Take care! Do not stifle that little floating soul, which mutely, but oh how eloquently, tells you its secret in those varying and palpitating colors.

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The colors do not long survive, and their creators, the Madrepores, themselves survive only in their base, which has been called inorganic, but which in reality is condensed and solidified life.

Women, who have a more delicate and penetrating sense of the beautiful than we have, do not thus mistake; they have, at the least, confusedly divined that one of these trees, the coral, is a living thing, and thence the just favor in which they hold it. Vainly did science tell them that coral was mere stone, and then that it was a plant, they knew quite differently.

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"Madame, why is it that you prefer this tree of a dubious red, to all the precious stones?"

"Monsieur, it suits my complexion. Rubies are too vivid, they make me look pale, while this, somewhat duller, rather more favorably contrasts fairness."

The lady is quite right; the coral and the lady are related. In the coral, as in the lip and the cheek of the lady, it is iron, according to Vowel, which makes the one red and the others roseate.

"But, Madame, these brilliant stones have an incomparable polish, and dazzling lustre."

"Yes, but the coral has something of the softness and even the warmth of the skin. As soon as I put it on, it seems to become a part of myself."

"But Madame, there are much finer reds than that of your coral necklace."

"Doctor, leave me this, I love it. Why? That I know not; or if there is a reason, that which will do as well as any, is that its Eastern and true name is 'the Blood-Flower.'"

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CHAPTER V.

THE WORLD MAKERS.

Our Museum of Natural History, within its too narrow limits, contains a faëry palace in every part of which we see the genius of metamorphoses of Lamarck and Geoffroy. In the dark lower hall the Madrepores serve as the base of the more and more living world that rises, stage above stage, above. Higher up the superior creatures of the sea display their energy of organization, and prepare the life of the terrestrials, and above these, Mammiferæ, over which the lovely birds spread their wings and almost seem to be still singing! The multitude of visitors pass quickly and with small show of interest from the Madrepores, those elder born of the globe, and hasten to the light and to the presence of things of brightest beauty, mother of pearl, the richly painted wings of butterflies, and the plumage of birds. I, who stop longer below, often find myself quite alone in that dark little gallery.

I love that solemn crypt of the great scientific Church. There I best can feel the sacred soul, the still present spirit of our great masters, their great, their sublime effort, and the immortal audacity of our voyagers and travellers, the intrepid collectors of such a wealth of whatever is beautiful or instructive. Wherever their bones may lie they themselves are still present in the Museum by the treasures which they have bequeathed, treasures which some of them have paid for with their lives.

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On the 15th of last October, having remained in that crypt somewhat late, I had some difficulty in reading the label on some Madrepores—that label bore the name of "Lamarck."

A sudden warmth, a religious glow, thrilled through my heart and brain.

"Lamarck!" Great name, and already antique! It is as though among the tombs of Saint Denis we should suddenly read the name of Clovis. The glory, the strifes, the royal triumphs, of his successor, have obscured somewhat the name of that blind Homer of the Museum, who, with the instinct of genius created, organized, and named the previously almost unknown class of Invertebrates; a class, nay, a whole world, a vast abyss of soft half organized life still destitute of vertebræ; that bony centralization and essential support of personality. These are all the more interesting because they are obviously the earliest of all—those humble and so long neglected tribes. Réaumur placed the Crocodiles among the insects. The proud Buffon deigned not to know even the names of humble Invertebrates, he excluded them altogether from the Olympus at Versailles which he erected to Nature. These great populations, so obscure, so confused, which, nevertheless, prepared everything and abound every where, remained exiled from the world of science until the coming of Lamarck. It was precisely the elders that were thus excluded, elders so numerous that to exclude them was, in some sort, to close the eyes and bar the gate against nature herself. [151]

The genius of the Metamorphoses was emancipated by botany and chemistry. It was a bold but most precious thing to take Lamarck, from the Botany in which he had passed his life, and remove him to the vast world of animality. That ardent genius, trained in miracles by the transformations of plants, and full of faith in the unity of life, next drew the animals, and that vast animal, the Globe, from the state of petrification in which they so long had lain. Half blind, he intrepidly treated a thousand things which the clear sighted scarcely dared to approach. At least, he infused his fire into them, and Geoffroy, Cuvier and Blainville found them warm and living.

"All is living, or has been," said Lamarck; "everything is life, either present or past." Great revolutionary effort, that, against inert matter; effort proceeding even to suppress and banish the inorganic! No longer any actual death. That which has lived may sleep; and yet preserve latent life, the capacity to revive. Who is really dead? No one. What? Nothing. [152]

This dictum, so novel, and so bold, swelled the sails of our scientific age with a strong and a favoring gale; it has urged on enquiries, such as but for it we should never have dreamed of making. History, or Natural History, we demand of every thing, who are you—and every where the answer is, "*I am Life*," and, thus, Death retreats before the bold advance and eagle glance of science, and Mind moves onward still, conquering and to conquer.

Among these resuscitations, I first note my Madrepores, taking the interest of life, though previously scorned, or unnoticed, as dead stone. When Lamarck collected and explained them at the Museum, they were detected in the mystery of their activity, in their immense creations, and they exemplified how a world is made. That once known, it was at once suspected that if the earth makes the animal, the animal also makes the earth; and that each aids the other in the office of creation.

Animality is every where, filling every thing and peopling every thing. We find the remains or the imprint of it even in the minerals, as the statuary marble and alabaster, which have passed through the crucible of the most destructive fires. At every advance, in our knowledge of the existing, we discover an enormous past of animal life. As soon as our improvements in Optics enabled us to discover and to watch the Infusoriæ, we beheld them making mountains and paving the ocean. The hard silex is a mass of animalcules, the sponge is an animated silex. Our limestones are all animals; Paris is built with infusoriæ, a part of Germany rests upon a newly buried bed of coral. Infusoriæ, coral, shells, chalk and lime. They are constantly taking from the Ocean, but the fish, which devour the coral, restore it as chalk, and restore it to the waters whence it came. Thus the Coral Sea in its labor of production, of upheaving, in its constructions incessantly augmented or diminished, built, ruined, and rebuilt, is an immense fabric of limestone which is continually oscillating between its two lives;—the *acting* life of the day—the other life that *will act* to-morrow. [153]

Foster quite justly decides that these circular islands are the craters of volcanoes, raised up by the polypes. He has been contradicted, but wrongly so. Upon no other hypothesis can we account for this identity of figure. There is always the same ring of about a hundred paces in diameter, very low, beaten on the outside by the waves, but enclosing a tranquil basin. A few plants of three or four species, here and there, crown the basin with verdure. The water is of the most beautiful green. The enclosing ring is of white sand, the residue of dissolved coral, contrasting with the blue of the Ocean. Beneath the salt water, our little laborers are at work, the stronger and bolder at the breakers, the weaker and more timid on the smoother sides. [154]

This is not a very varied world. But wait. The winds and the currents are constantly at work to enrich it; come a good tempest, and all the neighboring isles will be laid under contribution to enrich this rising one. And in this is one of the most magnificent functions of the Tempest; the greater, the wilder, and the more sweeping, the more fecund it is. A water-spout passes over an island; the torrent that it produces carries with it slime, rubbish, plants, living or dead, and even whole forests, which the waves carry to the neighboring isles, raising, and at the same time enriching, their soil.

A great messenger of life, and one of the most transportable, is the solid cocoanut. Not only does it travel well, but, when thrown upon shoal or rock, if it find only a little poor white sand, which would support nothing else, the cocoanut contents itself there, finds brackish water not a jot less agreeable than the freshest; germinates, thrives, grows into a robust cocoa tree. A tree

being thus planted, fresh water comes, falling leaves create earth, other trees follow, and at length we see the noble palm grove, which arrests the vapors, which at length form a rivulet or river, which, flowing from the center of the isle, make an opening of fresh water in the cincture of white sand, and thus keep the polypes, inhabitants only of salt water, at a respectful distance.

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Of the rapidity with which the Polypes do their work, we have some curious proofs. In forty days' harboring at Rio Janeiro, boats were wholly destroyed; in a strait near Australia, there were formerly only twenty-six islets; there are already a hundred and fifty—well recognized: and the English admiralty believes that there are even more; and in twenty years hence the whole strait, forty leagues in length, will be so completely blocked up as to be unnavigable.

The eastern shoal of Australia is three hundred and sixty leagues, (one hundred and twenty-seven without any interruption,) and that of New Caledonia one hundred and forty-five leagues; the single shoal of the Maldives is almost five hundred miles long, and groups of isles in the Pacific are four hundred leagues long, by a hundred and fifty wide. To all this work of the Polypes, we must add, that the banks of the isle of France, and the shallows of the Red Sea, are continually rising. Tunis and its environs present a wholly animal world; and the rocks present forms so strange, and colors so splendid, that the spectator is amazed and dazzled. You see them in a space of several leagues of shallow sea water—probably not averaging more than a foot of depth, working calmly, but perseveringly at their business of creating.

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Their first intelligent observer was Forster, companion of Cook, who found them at work, caught them in the very fact of their great conspiracy to make, noiselessly and marvellously, whole chains of islands, to be by degrees converted into a continent.

All this passed before his eyes, as it might have done in the first days of the world. From the submarine depths, the central fire throws up a dome or cone, which opens, and its lava forms a circular crater. But the volcanic strength becomes exhausted, and the cooling lava becomes covered with a living jelly, an animal multitude, whose perpetual exudation of mucus continually raises the circle higher and higher, to low water mark; no higher, or they would be dry; no lower, because they would lack the light. If they have no special organ with which to perceive the light, it circumfuses, penetrates, permeates their whole being. The glowing sun of the tropics, which traverses right through their transparent little frames, seems to have for them all the irresistible attraction of magnetism. When the tide ebbs and leaves them uncovered, they, nevertheless, remain open, and drink in the vivid light.

Dumont d'Urville, who so often coasted among their little isles, says:—"It is a real pain to see, so near by the peace of that interior basin, and to see all around shallow waters, beneath which are the shelving rocks, tenanted by the coral insects, in perfect security, while we are enduring all the shocks of a raging tempest." But this amiable community and its edifice are a shoal, a terrible lee shore, scarcely hidden by the shallow waters; touch upon that shoal and you will be crushed. Trust not to anchors among those peaked and jagged rocks; your cables, however good, would soon wear and snap. The seaman's anxiety is extreme, in those long nights when the Southern surges drive him among these shoals, at once so rugged and yet as cutting as razors.

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To such accusations as these, our innocent shoal-makers reply—"Time—give us only time, and these rocks will become hospitable, tenanted, fruitful. These banks, joined on to their neighboring banks, will no longer have these terrible threatenings for the seaman. We are preparing a spare world to replace your old one should it perish. Ingrates! Come some great and overwhelming catastrophe to your old world, if, as some one among you has said, the sea turns from one pole to the other in every ten thousand years, and you perchance will bless us, and hail with joy these southern isles which we are making, this huge southern continent that we are preparing. Confess, now, that if, unhappily, ships do occasionally perish on these shoals, our work here, nevertheless, is useful, and good, and great. Our improvised world may not unjustly be proud. To say nothing about the beauty of its triumphant colors, before which those of your earth grow pale; to say nothing about the graceful curves and circles on which we pride ourselves,—how many are the problems, which, insolvable to you, find their solution among us! The division of labor, a charming variety combined with a great regularity, a geometrical order, softened and made graceful and gracious by a rising liberty—where, among you men, will you find these so combined as from the beginning we have combined them among us? Our incessant labor in relieving the sea-water of its salts, creates those currents which give it life and healthful power. We are the very spirits of the Sea, giving, as we do, her motion."

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"And the sea is not ungrateful; she nourishes us at fixed periods; and not less punctually comes the glowing sun to caress us and dower us with brilliant colors. We are the beloved, the favored workers of the Deity, entrusted by him with the first rude sketches and outlines of his worlds, and all our juniors upon this globe, need us, and are indebted to us. Our friend the Cocoa tree, that inaugurates terrestrial life upon our isle, could not do so but from our dust. In its far back origin, vegetable life is our liberal gift, and, made rich by us, it nourishes the superior creation."

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"But what need of other animals? We are within our own circle complete, harmonious and sufficing; with us the circle of creation might be closed. For as God crowns his isle on his old volcano of fire, he has created a volcano of life, and expansion of that living paradise. He has created all that he needs, and now He may repose."

Not yet, not yet. A creation must rise above yours, a thing which you do not fear. That rival is not the tempest, you would brave it; nor the fresh water, you would build beside it. It is not even

the earth, which by degrees is invading your constructions. What, then, is that other power? In yourself, in Polypes, there is an ambition to cease to be one. In your Republic there is a certain creature who in constant anxiety and yearning, repeats that the perfection of this vegetating existence is not real life. It constantly dreams of a freer and more expanded life, navigating hither and thither, penetrating and viewing the unknown world even at the hazard of shipwreck;—that thing is—the Soul.

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CHAPTER VI.

DAUGHTER OF THE SEAS.

I passed the early part of 1858 in the pleasant little town of Hyères which, from afar, gazes down on the sea, the islets and the peninsula by which its coast is sheltered. The sea, seen from this distance, is even more potently seductive than when one is on its very shore. The paths leading to it, whether we pass between gardens with their hedges of jasmin and myrtle, or, ascending some little, pass through the olive grounds and a little wood of pines and laurels, are exceedingly tempting. The wood by no means hinders us from catching, now and then, a glance of the bright sea. The place is, by no means unjustly, called Fair-Coast. Often in the fine days of its gentle winters we met there a most interesting invalid, a young foreign princess who had come thither from a distance of five hundred leagues, in the hope of adding some span to her fading and failing life. That life, short as it was, had been a hard and sad one. Scarcely had she become a glad wife when she found herself rudely threatened by Death. And now she dragged on from day to day of suffering, supported and most tenderly treated by him who lived only for her and hoped not to survive her. If wishes and prayers could have preserved her she would still live; for all prayed for her, especially the poor. But spring came, and bloomed and ended, and on one of those April days whose genial influence revives every thing we saw the two shadows pass, pale as the wandering Elysian spectres of Virgil.

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Sad at heart with sympathy, we reached the gulf. Between the bold rocks, the pools left by the sea contained some little creatures that had not been able to accompany the retreating tide. Some shelled creatures were there, self-concentrated and suffering from want of water, and amongst them, unshelled, unsheltered, lay the living parasol, that for some, anything, rather than good reason, we call the *Medusa*. Why has that name of terror been given to a creature so charming? Never before had my attention been attracted to those wrecked beauties, which we so often see high and dry upon the sea shore at low ebb tide. This especial one was small, not larger than my hand, but singularly beautiful, in its delicate colors, passing so lightly from tint to tint. It was of an opal whiteness, into which passed, as in a light cloud, a crown of the most delicate lilac. The wind had turned it over, so that its lilac filaments floated above, while the umbrella, that is to say, its proper body, lay upon the rock. Much bruised in that tender body, it was also wounded and mutilated in its fine filaments, or hairs, which are its sensitive organs of respiration, absorption, and even love. And the whole creature thus thrown upside down was receiving in full force the rays of the Provençal sun, severe in its first awakening and rendered still more severe by the dryness of the occasional gusts of the south-westerly winds, the *Mistral* of our Provençal coasts. The transparent creature was thus doubly pierced, doubly tormented, accustomed as it was to the caressing sea, and unprovided with the resisting epidermis of land animals.

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Close to her dried up lagune were other lagunes still full of water, and communicating with the sea. Within a few paces of her, then, was safety, but for her who had no organs of locomotion, excepting her undulating hairs, it was impossible to traverse even that petty distance, and it seemed that remaining under that fierce sun and exposed to the arid blasts of that wind she very speedily must faint, die, and be actually dissolved.

Nothing more ephemeral, more delicate than these daughters of the sea. Some of them are so fluid that they dissolve and disappear as soon as taken from the sea. Such is that slight band of azure called the *Girdle of Venus*. The *Medusa*, a little more solid has all the more trouble in dying. Was she dying or already dead? I do not readily believe in death, and believing that she still lived I resolved to convey her to a lagune of salt water. To say the truth I felt some repugnance to touching her. The delicious creature with her visible innocence, and rainbow of tender colors, looked like a trembling jelly which must slip from one's touch or dissolve in one's grasp. However, I conquered this repugnance, slid my hand gently beneath her and as I turned her over her hairs fell down into their natural position, when used in swimming. I thus carried her to the water, where she sank without giving the slightest sign of life. I walked about the shore, but in about ten minutes returned to look after my *Medusa*. She was swimming under water, her hairs undulating gracefully beneath her; and slowly, but safely, she had left the rock far behind her.

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Poor creature, perhaps she got wrecked or stranded again, ere long, for it is impossible to navigate with weaker means or in a fashion more dangerous. The *Medusæ* fear the shore where so many hard substances hurt them, and in the open sea they are liable to be overturned at every gust of wind, in which case, their swimming-feathers being above instead of below their bodies, they are carried hither and thither, at random, upon the waves, as the prey of fish or the delight of birds who find sport and profit in seizing them.

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During a whole season which I spent on the banks of Gironde I saw them cast ashore to perish miserably by hundreds. On their arrival they were white and brilliant as crystal. Alas! How different was their aspect in the course of a couple of days. Very happily they sank beneath the sand and were lost to my pitying view.

They are the food of every thing marine, and have themselves scarce any aliment, none that we know of, but the, as yet, scarce organized atoms floating in the sea which they, etherialize, as we may say, and suck in without making them suffer. They have neither teeth nor weapons; no defence, excepting that some species, Forbes says not all, can secrete, when attacked, a liquid which stings somewhat like the nettle, but so faintly that Dicuquemare with impunity received some of it in his eye.

Here we have, indeed, a creature little provided and in great peril. She is superior already; she has senses, and, if we may judge from her contractions, a great sensibility to suffering. She cannot, like the Polypus, be divided and live. Divide him and you double his existence; divide her and she dies. Gelatinous as the polypus, the Medusa seems to be an embryon cast away too soon from the bosom of the common mother, torn from the solid base and the association to which the Polypus owes his safety, and launched into adventure. How has the imprudent creature set out? How, without sails, or oars, or helm, has she left her port? What is her point of departure? [165]

Ellis, as long ago as 1750, saw a little Medusa produced from the campanular polypus, and many later observers have ascertained that she is a kind of polypus that has left the society. To speak more simply, she is an escaped polypus.

And the learned M. Forbes who has so deeply studied them, very aptly asks, what is there astonishing in that? It only shows that to that extent the animal still obeys the vegetable law. From the tree, the collective being, proceeds the individual, the detached fruit which fruit will make another tree. A pear tree is a sort of vegetable polypus of which the pear, (the emancipated individual) can give us a pear tree.

In like manner, adds Forbes, as the leaf laden tree, stops in its development, contracts, and becomes an organ of love—i. e. a flower, the *Polypier*, contracting some of its polypes and transforming their contractions, forms the placenta, the eggs from which proceeds the young and graceful Medusa.

One would guess as much from her hesitating grace, that weakness at once so unarmed and so fearless, which embarks without instruments of navigation, and trusts too much to life. It is the first tender and touching adventure of the new soul going forth without defence from the security of the common life, to be itself, an individual acting and suffering on its own account—soft sketch of free nature; an embryon of liberty. [166]

To be oneself, oneself alone, in a little complete world, was a great temptation for all. A universal seduction! a beautiful folly, which causes all the effort and all the progress of the world, from our earth upward to the very stars. But in her first attempts the Medusa, seems especially unjustified. One would say that she was created on purpose to be drowned. Laden above, and ill-ballasted below, she is formed in conditions exactly opposite to those of her parent, the Physalie. This latter displays on the surface of the water, only a little balloon, an insubmersible membrane and below has infinitely long tentaculæ, of twenty feet or more, which steady her, sweep the waters, stupefy the fish, make prey of him. Light and careless, inflating her pearly balloon of blue or purple tints, she darts from her long hairy tentaculæ a subtle and murderous poison. Less formidable, the Velelles are no less secure. They have the form of *radeaux*, their minute organization is already somewhat solid, and they can steer and trim their oblique sail to every wind. The Porpites, that seem to be only a flower, a sea Margaret, have their own peculiar levity; even after death, they continue to float. It is the same with many other fantastic and almost aerial beings, garlands with golden bells or with rosebuds—such as the Physopheres, Stephanomie, &c., azure girdles of Venus. All these swim and float invincibly, fear only the shore, and sail boldly out on the open sea, and when it is ever so rough are perfectly safe there. So little do the Porpites and Velelles fear the sea, that, being able to rise at pleasure, they exert themselves to sink to the concealing depths when the weather is bad. [167]

Not such is our poor Medusa. Fearing the shore, she is also in danger at sea. She could sink into the depths at will, but the watery abyss is forbidden to her; she can live only on the surface, in the broad light and in full peril. She sees, she hears, and her sense of touch is very delicate, to her misfortune, too much so. She cannot guide herself; her most complicated organs overload and overbalance her.

And so we are tempted to believe that she must needs repent of so perilous a search after liberty; and desires to be back in the inferior state, the security of the common life. The polypier made the Medusa, she in turn makes the polypier, and returns to the life of community. But this vegetating state wearies her, and in the next generation she again emancipates herself and goes forth again to the perils of her vain navigation. Strange alternation, in which she floats incessantly; moving, she dreams of repose; in rest, she sighs for movement. [168]

These strange metamorphoses, which by turns raise and abase the undecided creature, keeping her alternating between two lives so different, are apparently the case of the inferior species, of the Medusa which have not been able to enter decidedly into the irrevocable career of emancipation. For the others, we can easily suppose that their charming varieties mark the interior progress of life, the degrees of development, the sports, the smiling graces of their new

liberty. This latter class, admirably artistic, won this so simple theme of a disk or parasol which floats, of a light lustre of crystal which reflects the sun's glowing and coloring lights, has made an infinity of variations, a deluge of little marvels.

All these beauties floating on the green mirror of the sea in their gay and delicate colors, and in the thousand attractions of an infantine and unconscious coquetry, have puzzled Science, which to class and to name them, has been obliged to call to its aid both the Queens of History and the Goddesses of Mythology. Here we have the waving Berenice, whose rich hair floats another and brighter flood upon the flood; there we have the little Orithya, the fair spouse of Eölus, who, at the breathing of her husband, displays her pure, white urn, uncertain, and scarcely supported by her fine hair, which she often entangles beneath, or the weeping Dionea, looking like an alabaster cup, from which, in crystalline streamlets, flow splendid tears. Such, when in Switzerland, I saw spreading themselves the wearied and idle cascades, which, having made too many turnings, seemed dropping with drowsiness and languor.

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In the great faëry of the illumination of the sea on stormy nights, the Medusa has her separate part. Bathed, like so many other beings, in the phosphoric fluid with which they are all penetrated, she returns it in her manner, with a peculiar charm.

How dark is the night at sea when we do not see that phosphoric gleam or a fitful flashing! How vast and formidable are those dark depths, on such gloomy nights. On land, the shadows are less dense and impenetrable, we see, if dimly, and make out forms, if imperfectly, so that we get so many directing marks. But at sea, how vast, unbroken, infinitely dense is the darkness of the dark nights. Nothing, still nothing; a thousand dangers to be imagined, but not one to be seen and avoided!

We feel all this, even when living on the coast. It is a great gladness, an exciting pleasure, when, the air becoming electric, we see in the distance, a slight line of pale fire. What is it? We see it even at home, on the dead fish, the Herring, for instance. But, living in his great sea, he is still more luminous in the long trains that he leaves behind him. That phosphoric brilliancy is by no means the exclusive privilege of Death. Is it an effect of Heat? No, for you find it at both poles, in the Antarctic Seas, in the Siberian Seas, in ours—in all.

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It is the common electricity which the half-living waters throw off in stormy weather; the innocent and pacific lightning of which all marine creatures are then so many conductors. They inhale it, and they exhale it, and they restore it largely when they die. The sea gives it, and the sea takes it back again. Along the coasts and in the straits, the currents and the collisions, cause it to circulate the more powerfully, and each creature, according to its waters, takes more or less of it. Here, immense surfaces of peaceable infusoriæ appear, like a milky sea, of a mild, white light, which, when more animated, turns to the yellow of burning sulphur; there their conical lights pirouette upon their own bases, or roll in red balls. A great disc of fire (Pyrosome) commences with an opaline yellow, becomes for a moment greenish, then bursts into red and orange, and at last darkens down into blue. These changes occur with an approach to regularity that would indicate a natural function, the contraction and dilatation of some vast creature, breathing fire.

Then on the horizon, fiery serpents writhe and glide along an immense length—sometimes to the extent of twenty-five or thirty leagues. The Biphores and the Salpas, transparent alike to sea and sulphur, are the performers in this serpentine spectacle, an astonishing company which disport themselves in this frantic dance, and then separate. Separated, its free members produce free little ones, which, in their turn light up the horizon with their dancing and wild lights. Great fleets, more peaceful, float over the waves of lights. The Velleles, at night, light up their little craft. The Beroes are triumphant as flames. None more magical than those of our Medusæ. Is it in part a physical effect like that which gives their serpentine motion to the Salpas, injected with fire? Is it, as others think, and as some observations would lead us to believe, an act of aspiration? Is it a caprice, as with so many beings that throw out their sparkles and flashes of a vain and inconstant joy? No, the noble and beautiful Medusæ, such as the crowned Oceanique, and the lovely Idonea, seem to express gravest thoughts. Beneath them, their luminous hair, like some sombre watch-light, gives out mysterious lights of emerald and other colors, which, now flashing, anon growing pale, reveal a sentiment, and, I know not what of mystery; suggesting to us the spirit of the abyss, meditating its secrets; the soul that exists, or is to exist some day. Or should it not rather suggest to us some melancholy dream of an impossible destiny which is never to attain its end? Or an appeal to that rapture of love which alone consoles us here below?

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We know that on land our fire flies, by their fire give the signal of the bashful yet eager lover who thus betrays her retreat, and decoys her mate. Have the Medusæ this same sense? We know not; but thus much is certain, that they yield at once their flame and their life. The fecund sap, their generative virtue, escapes and diminishes at every gleam. If we desire the cruel pleasure of redoubling this brilliant faëry, we have only to expose them to warmth. Then they become excited, flash, and become beautiful, oh, so exquisitely beautiful—and then the scene is at an end. Flame, love, and life, all are at an end—all vanish for ever.

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CHAPTER VII.

THE STONE PICKER.

When the excellent Doctor Livingstone visited the poor Africans who have so much difficulty in defending themselves against the Lion and the slave merchant, the women, seeing him armed with all the protecting arts of Europe, invoked him as their friend and providence in these touching words—"Give us sleep!"

And such is the prayer which all beings in their own language address to Nature. All desire, and all dream of, security. We cannot doubt of that when we note the ingenious endeavors which are made to obtain it. Those efforts have given birth to the arts. Man has not invented one, which animals had not previously invented, under that strong and abiding instinct, the desire of safety.

They suffer, they fear, they desire to live. We must not assume that creatures little advanced, and as it were embryonic, have, therefore, but little sensibility. The very contrary is certain. In every embryo, that which first appears, is the nervous system, that is to say, the organ and capacity of feeling and of suffering. Pain is the spur by which the creature is urged to foresight and expedients. Pleasure serves the like purpose, and it is already observable even in those which seem the most cold. It has been observed that the snail, after the painful researches of his love, is singularly happy on meeting again the loved object. Both of them with a touching grace wave their swan-like necks, and bestow upon each other the most lively caresses. Who is it that tells us this? The rigid, the very exact Blainville.

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But alas! how largely and how widely is pain distributed! Who has not noted with pity the painful efforts of the shell-less mollusc, as he grovels along on his unguarded belly? Painful but faithful image of a foetus untimely torn from the mother by some cruel chance, and cast upon the ground naked and defenceless. The poor mollusc thickens and indurates his skin as well as he can, softens the asperities of his road, and renders it slippery. But at every contact with the ragged or pointed stones, his writhings and contractions only too plainly show how great is his sensibility to pain.

Notwithstanding all this, she loves, does that great Soul of Harmony which is the unity of the world; she loves all beings, and by alternations of pleasure and of pain, instructs them and compels them to ascend. But to ascend, to pass into a superior grade, they must first exhaust all that the lower one can furnish of trials more or less painful, of instinctive art, and of stimulants to invention. They must even have exaggerated their species, perceived its excesses, and, by contrast, be inspired with the craving and the need of an opposite one. Progress is thus made by a kind of oscillation between contrary qualities, which by turns are separated from life, and incarnated with it.

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Let us translate these divine things into human language, familiar, indeed, and little worthy of the grandeur of such things, but which will make them understood:

Nature, having long delighted to make, unmake, and remake the Medusæ, thus infinitely varying the theme of infant liberty, smote her forehead one morning, and said—"I have a new and a delicious idea. I forgot to secure the life of the poor creature. It can continue only by the infinity of number, the very excess of its fecundity. I must now have a creature at once better guarded and more prudent. It shall if need be, be timid, even to excess, but above all, it is my will that it shall survive."

These timid creatures, when they appeared, were of a prudence carried to its extremest limits. They shut themselves in, shunning even the light of day. To save themselves from the rude contact of sharp and ragged stones, they employed the universal means, a glutinous mucus from which they secreted an enveloping tube, which elongated in proportion to the length of their journey. A poor expedient, that, which kept these miners, the Tarets out of the light and out of the free air, and which compelled an enormous expenditure of their substance. Every step cost them enormously; a creature thus ruining itself that it may live, can only vegetate—poor, and incapable of progress.

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The next resource was not much better, temporarily to bury themselves, going below the sands at low water, and rising to the flood-tide; the resource of the Solen. A varying life that, fugitive twice a day, and consequently full of anxiety.

Among very inferior creatures a thing as yet obscure, which was in time to change the world, began to appear. The simple sea stars had in their fine rays a certain support, a sort of jointed carpentry, and on the outside some thorns, suckers, which could be thrust forward or withdrawn at will. An animal very humble, but timid and serious, seems to have profited by this coarse specimen. It said, I imagine, to Nature:

"I am quite without ambition. I do not ask for the brilliant gifts of the molluscs; I covet neither pearl nor mother of pearl, much less the brilliant colors, the gorgeous array which would discover and betray me; least of all do I envy your silly medusæ, with the fatal charm of their waving and fiery hair, which serves only to drown them, or give them a helpless prey to fish below or birds above. Oh, mother Nature, I ask but one thing, *to be*, to exist, to have life; to be one, self concentrated, and without compromising external appendages; to be strongly and solidly built, self centred, and of rounded figure, as that is the figure that is least easily taken hold of. I have but little desire to travel; sometimes to roll from high to low water will suffice me. Fastened to my rock, I will solve the problem which your future favorite, man, will vainly brood over, the problem of safety; *the strict exclusion of enemies, and the free admission of friends,*

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especially water, air, and light. I know that to achieve this, I must work hard and work long. Covered with movable thorns, I shall be avoided, I shall live a strictly retired life; and my name shall be oursin, little Bear, or sea hedge-hog."

How superior is that prudent animal to the Polypes, in their own stone, which they make from their own secretion, without hard labor, indeed, but also without affording them any safety; how superior, even to his superiors themselves, I mean to so many *molluscs*, who have more various senses, but are destitute of the unity of his vertebral provision, of his persevering labor, and of the skillful tools with which that very labor has provided him. [178]

The great marvel, however, of this poor rolling ball, which we might mistake for a thorny chestnut, is that he is at once *one and multiple, fixed and movable*, and consists of two thousand four hundred pieces, which separate at his will and pleasure.

Let us see his history of creation.

It was in a narrow creek of the Sea of Brittany, where there was no soft bed of polypes and of Algæ, such as the sea hedge-hogs of the Indian Sea enjoy, in addition to their exemption from labor. Our Breton, on the contrary, was in presence of great peril and difficulty; like Ulysses, in the Odyssey, who, cast ashore, and anon washed seaward again, endeavored to fasten himself to the rock, with his torn and bleeding fingers. Every ebb and flow of the tide was to our little Ulysses, as bad as a mighty tempest; but his iron will and potent desire made him cling so closely and lovingly to the rock, that he became fastened to it as though the air had been expelled from between them by the cupping glass. At the same time his strong thorns scratched and scratched, and endeavored to get a hold, and one of them subdivided and formed a triple and real anchor of safety in aid of the cupping glass, if this latter should fail to act quite perfectly on a by no means smooth surface.

After he had thus doubly secured himself to his rock, he gradually comprehended that he would be a great gainer if he could form a concavity in it, gradually dig himself out a hole, and thus form himself a snug nest, for the day of sickness or of age. For, in fact, one is not always young and strong. And how pleasant it would be, if, some day, the veteran oursin could relax somewhat of the effort necessitated by this constant holding on, this anchorage by day and night. [179]

So he worked and worked, to make a hollow; it was for dear life that he was working, and you may be sure that he never relaxed. Formed of detached pieces, he worked with five claws, which, always pushing together, united and formed an admirable pick. His pick of five teeth, of the finest enamel, is attached to a frame work, delicate, but very strong, and consisting of forty pieces, which work in a sort of sheath, playing in and out, in the most perfect and regular manner, with an elasticity preventing too violent shocks, and self-repairing, in case of any accident.

Rarely, in the softer stone, which he holds in contempt, but almost always in the solid rock, in the hardest granite, it is that this heroically laborious sculptor goes to work. The harder the rock, the firmer he feels himself secured. And, then, in fact, what does it matter about the length of the task? Time is of no consequence to him, centuries are before him; supposing that his tools and his life should end to-morrow, another would take his place and continue his work. During their life, they hold but little communication, these hermits; but in death a brotherhood exists, even for them, and the young survivor, who shall find the work half done, will bless the memory of the good workman who has preceded him. [180]

Do not fancy that he strikes, and strikes continually. He has an art, a labor-saving art of his own. When he has well attacked the layers of the rock, and well cleaned it, he tears away the asperities as with little pincers. A work of great patience, and one which requires long intervals, too, in order that the water may aid in doing the work upon the denuded parts. He then proceeds to the second layer, then to the next, and so on till the long, long labor is at length completed.

In this uniform life, however, there are occasional crises, even as in the life of the poor human laborer. The sea retires from certain shores; in the summer, this or that rock becomes quite insupportably hot; and our oursin must have two houses, one for summer, and one for winter. A great event, that, of moving from place to place, for a creature without feet and covered all over with points. M. Cailland had an opportunity of observing the conduct of the creature under those circumstances. The weak and movable scoops which play backward and forward, are by no means insensible though he protects them somewhat by covering them with a little soft gelatine. At length he steadies himself on his thorns, as on so many crutches, rolls his Diogenes' tub, and attains his port as he best may. Arrived there, he shuts himself up again, and in the little nest which he almost always finds partly made, he concentrates himself in the enjoyment of his solitary and thrice blessed security. Let a thousand enemies prowling without, let the storm-lashed wave moan or rage, all that is for his pleasure. Let the very rock tremble at the dash of the breakers; he well knows that he has nothing to fear, that it is only his kind nurse that is making all that noise; he is safe in his cradle, and with a glad good night, he sleeps. [181]

CHAPTER VIII.

SHELLS, MOTHER OF PEARL, AND PEARL.

The oursin has carried the genius of defence to its utmost limit. His cuirass, or, preferably, his fortress of pieces, is at once movable and resisting, yet sensitive, retractile, and capable of being repaired in case of accident; this fortress is fast-joined and anchored to the rock, and still farther lodged within a hollow of the rock, so that the enemy has no means of attacking the citadel;—it is a system of defence so perfect that it can never be surpassed. No shell is comparable to it; far less are any of the works of human industry.

The oursin is the completion of the starred and circular creatures; in him they have their highest and most triumphant development. The circle has few variations; it is the absolute form; in the globe of the oursin, at once so simple and so complicated, is the perfection and completion of the first world.

The beauty of the world next to come, will be the harmony of double forms, their equilibrium, the gracefulness of their oscillation. From the molluscs even up to man, every being in this next world is to be made up of two corresponding halves; in every animal is to be found (far better than *unity*) *Union*. [183]

The master piece of the oursin had gone even beyond what was needed; that miracle of defence had made him prisoner; he was not only shut in but buried; he had dug his own grave. His perfection of isolation had banished him, deprived him of all connections, and of all possibility of progress.

To have a regular ascent, we must commence from a very low stage, from the elementary embryo, which at the outset will have no other movement than that of the elements. The new creature is the mere serf of the planet; so completely so, that even in the egg, it turns as the earth turns, with its double turning on its own axis, and the general rotation.

Even when emancipated from the egg, growing up, become adult, it will still remain the embryo, the soft mollusc. It will vaguely represent the progress of the superior lives; it will be as the foetus, as the larvæ or nymph of the insect, in which, folded and hidden, there yet are the organs of the winged creature which is yet to come.

One trembles for a creature so weak; even the polypus though not less soft is less in danger. Having life equally in all its parts, wounds, even mutilations will not kill the polypus: wounded and mutilated he still lives on, apparently forgetful of the excised parts. But the centralised mollusc is far more vulnerable. What a door in his ease is open to death! [184]

The uncertain motion of the Medusa, which sometimes, perchance, may save her; the mollusc, at least at the outset, possesses but very slightly. All that is granted to him is his sloughing or exuding a gelatine matter, which walls him in, and replaces the cuirass of the oursin and the oursin's rock. The mollusc has the advantage of finding his defence within himself. Two valves form a house, light and fragile, indeed, so much so that those which float are transparent; in the case of those which are to be stationary, the mucus forms a filamentary anchoring cable, called the *hyssas*. It is formed exactly as silk is from an element originally quite gelatinous. The gigantic *Iridacne*, moors so fast by that cable, that the *Madrepores* mistake it for an islet, build upon it, envelope it, and strangle it.

Passive and motionless life. It has no other event than the periodical visit of the sun and light, and no other action but to absorb what comes, and to secrete the jelly which makes the house, and will by degrees do the rest. The attraction of the light, always in the same direction, centralizes the view; and behold the eye. The secretion fixed by a constant effort, becomes an appendage, an organ which lately was a cable, and which by and bye will become the foot, a shapeless and inarticulated mass, which will bend itself to anything. It is the fin of those that swim, the pick of those that burrow in the sand, and the foot of those who at first rather crawl than walk. Some species arch it so that they can make a clumsy essay at leaping. [185]

Poor tribe, terribly exposed, pursued by many enemies, tossed by the waves and bruised on the rocks. Those of them which do not succeed in building a house, seek a shelter in living beds; they find a tent with the polypes, or with the floating *Halcyons*. The pearl-bearing *Avicule*, tries to find a quiet life in the hollows of the sponge. The *Pholade*, tries in his stony retreat, to imitate the arts of the oursins, but with what inferiority! Instead of the admirable chisel of the oursin, which might be envied by our stone cutters, the *Pholade* has but a little rasp, and to dig out a shelter for her fragile shell, she wears out the shell itself.

With but a few exceptions, the moluscs know themselves the prey of everything, and are therefore the most timid of creatures. The Cone so well knows that he is sought after, that he dares not leave his shelter, and dies there, from fear of being killed. The *Volute* and the *Porcelain* drag slowly along their pretty houses, and conceal them as well as they can. The *Casque*, to get along with his palace, has only a little Chinese foot, so small and so useless that he scarcely attempts to walk. [186]

Such the life, such the dwelling; in no other species is there more complete identity between the inhabitant and the habitation; taken from his own substance, his house is but a continuation, a supplement of his own body; alike it even in form and tints. The architect, beneath the edifice, is himself its very foundation-stone.

A very simple thing it is for the sedentaries to remain sedentary. The oyster, regularly fed by the sea, has only to gape when he would dine, and sharply to close his shells, when he has any suspicion that he may become himself a dinner for some hungry neighbor. But for the travelling

mollusc the thing is more complicated. He can travel, but he cannot leave behind him his beloved house which he will need for defence as well as shelter; and it is precisely while on his journey, that he is most liable to be attacked. He must shelter, above all, the most delicate part of his being, the tree by which he breathes, and whose little roots nourish him. His head is of little consequence, often it is lost without the destruction of life; but if the viscera were left uncovered and wounded, he must die.

Thus, prudent and cuirassed he seeks his livelihood. Come nightfall, he asks himself whether he will be quite safe in a wide open lodging? Will not some inquisitives intrude a look—who knows—may not some one find the way in with claw and tooth as well as glance?

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The hermit reflects. He has but one instrument, his foot, from that he develops a very serviceable appendage with which he closes the aperture and behold him safe at home for the night. His great and permanent difficulty is this, to combine safety with connection with the outer world. He cannot, like the oursin, utterly isolate himself; without the aid of his instructors and nurses, light and air, he cannot strengthen his soft body and make his organs. He must acquire senses; he needs scent and hearing, those guides of the blind; he must acquire sight, and above all, he must be able to breathe freely. Great and imperative function, that! How little we think of it while it is easy; but what terrible pain and agitation if it become too difficult! Let our lungs become congested, let the larynx even be embarrassed for a single night and our agitation and anxiety are so extreme, so unendurable, that often, at all risks, we have every window thrown open. With the asthmatic, the anxiety and torture are so extreme that when they cannot breathe freely through the natural organ, they create a supplementary means. Air, air, air, or death!

Nature, when thus pressed, is terribly inventive. We not wonder if the poor sedentaries, stifling in their houses, have discovered a thousand means, invented a thousand sorts of pipes through which to admit the vital air. One admits air between plates around his feet, another by a sort of comb, another by a disc or buckler, and others by extending threads, some with pretty side plumes, and lastly, some have on their back a little tree, a pretty miniature aspen, which trembles continually and at every movement inhales or exhales a breath.

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Sometimes those most sensitive and important organs affect the most elegant and fanciful forms; we would say that they wish to plead, to melt, to secure mercy, taking every form and every color. These little children of the sea, the molluscs, in their infantine grace, in their rich variety of colors, are their ocean mother's eternal ornament and joy. Stern as she may be, she has but to look on them, and she must smile.

But a timid life is full of melancholy. One cannot doubt that she greatly suffers from her severe seclusion, that fairest of the fair, that queen beauty of the seas, the Haliotide. She has a foot, and could, if she chose, get along, though slowly; but she dares not. Ask her why, and she will reply: "I am afraid. The Crab is continually watching me, and a whole world of voracious fish are continually swimming over my head. My cruel admirer, man, punishes me for my beauty; pursuing me from the Indies to the Pole, and is now loading whole ships with me at golden California."

But the unfortunate, though unable to go out, has discovered a subtle means of procuring air and water; in her house, she has little windows, which communicate with her little lungs. Hunger at length compels her to risk something, and towards evening she crawls a little around, and feeds on some sea-weed, her sole nourishment.

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Here let us remark, that those marvellous shells, not only the Haliotide, but the Widow (black and white) and the Golden Mouth (of mingled pearly and gold color,) are poor herbivori, inoffensive, temperate, feeders. A living, and decisive refutation, that, of those who fancy that beauty is the daughter of Death, of blood, of murder, of a merely brutal accumulation of animal substance.

But to these, our beautiful shell-tenants, the merest modicum of subsistence suffices. Their chief aliment is the light which they drink in, by which they are permeated, by which they color and tint, with more than rainbow beauty, and variety of tint, their inner dwelling, in which they conceal and cherish their solitary love. Each of them is double, hermaphrodite; lover and loved, in one. As the palaces of the East are concealed by dark and repulsive outer walls, so, here, also, without, all is rude, within, all is of the most dazzling beauty; the hymeneal seclusion is lightened up by the gleaming and many-hued reflections of a little sea of mother of pearl, which, even when the house is closed to the outer light, create a *faëry*, a mysterious, and a most lovely twilight.

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It is a great consolation that when our poor prisoners cannot have the sun, they can at least have a moon of their own, a paradise of soft and trembling lights, ever changing, yet ever renewed, and giving to that sedentary life, that little variety which is absolutely needed by every creature.

The poor children who work in the mines, ask visitors, not for food, or sweetmeats, or money, or toys—all they ask for is the means of getting more light. And it is the same with our Ocean children, the Haliotides. Every day, blind though they be, they feel, and greedily welcome, the return of the light, receiving it, and contemplating it, with the whole of their transparent bodies; and when the light has departed, from without, they still preserve and nurse some portion of it within themselves. They watch, they wait, they hope for its return; their whole little soul consists of that hope, that watching, that eager desire, that incessant yearning. Who can doubt that the return of the glad light is as delightful to them as it is to us, nay, even more so than it is to us,

who have the manifold distractions of so busy and varied a life?

Their whole lives pass in thinking, wishing, divining, hoping, or regretting; their great lover, the Sun. Never seeing him, they yet, in their own fashion, certainly comprehend that that warmth, that glorious light comes to them from without, and from a great centre, powerful, fecund and beneficent. And they love that great deeply felt, though never seen, central light, which caresses them, fills them with joy, floods them with life. Had they the power, they no doubt would rush to seek his rays. And, at least, attached as they are to their abode, they, like the Brahmin at the door of the Pagoda, silently offer him up their homage, at once meditative and thrilling. First flower of instructive worship. Already they love and pray, who say the little word which the Holy prefers to all prayer—that *Oh!* that heart utterance, which contents and pleases Heaven. When the Indian utters it at sunrise, he well knows that all that innocent world of mother of pearl, pearl, and humblest shells, utters it with him, from the depths of the seas.

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I fully understand what the sight of the pearl suggests of feeling and fancy to the charmingly untutored heart, the woman heart, that dreams, and fancies, and is stirred by a sweet, and strange, and uncomprehended emotion. That pearl is not exactly a person, but neither, on the other hand, is it exactly a thing. What adorable whiteness; no, call it not mere whiteness, but *candor*, virginal candor; no, not virginal, but better still. For your young virgins, sweet and modest as they are, have always a slight dash of young tartness, and verdancy. No, the pearl's candor rather resembles that of the innocent young bride, so pure, yet so submissive to love.

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No ambition to shine. Our pearl softens, almost suppresses, its lights. At first, you see only a dull white; it is only when you have taken a second and a closer glance that you discover its mysterious iris, its exquisitely glancing and pure light.

Where lived it? Ask the deep Ocean. On what? Ask the sunbeams; like some clear spirit it lived on love and light.

Great mystery! But our beautiful pearl herself explains it. We cannot look upon her without feeling that this creature, at once so lovely and so meek, must for a long time have lived in quietude, waiting and waited for, willing nothing and doing nothing, but the will of the beloved one.

The son of the sea put his beautiful dream into his shell, the shell into the mother of pearl, and she into the pearl, which is but a concentration of herself.

But the pearl we are told only comes to her mother in consequence of some wound, some continued suffering, which withdraws or absorbs all vulgar life into that divine poetry.

I have been told that the great ladies of the East, more delicate and tasteful than our vulgar rich, shun the diamond and allow their soft skin to be touched only by the pearl. And in truth, the brilliancy of the diamond is not in accord with the light of love. A necklace and a pair of bracelets of fine pearls are the harmonious and true decorations for woman; instead of diverting the glance of the lover, they move him, make tenderness more tender—say to him—"No noise—let us love!" The pearl seems amorous of woman, and woman of the pearl. The ladies of the North, when they have once put on pearl ornaments, never afterwards remove them, but carry them day and night concealed beneath their attire. On very rare occasions, if the rich fur cape, lined with white satin, chances to slip aside, we may catch a momentary glance of the happy ornament, the inseparable necklace. It reminds one of the silken tunic which the Odalisque wears close to her person, and loves so much that she will not part with it until it is worn and torn beyond all possibility of repair; believing it as she does to be a talisman, an infallible love charm.

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It is just so with the pearl; like the silk, it drinks in and is impregnated with the very life of the wearer. When it has slept so many nights upon her fair bosom, the ornament is no longer an ornament, it is a part of the person, and is no longer to be seen by an indifferent eye. One alone has a right to know it, and to surprise upon that necklace the mystery of the beloved woman.

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CHAPTER IX.

THE SEA ROVERS (POULPE, &C.)

The Medusæ and the Molluscs are generally innocent creatures, and I have thus far dwelt, as it were, with them in their amiable and peaceful world. Thus far I have met with few carnivora; and even those few killed only in the stern necessity of hunger, and even of those part fed only on atoms, animal jelly, life unorganized, and scarcely commenced. As a consequence, pain, anger, cruelty were absent. Their little souls had, nevertheless, a ray, the aspiration towards the light alike of Heaven and of Love, revealed in the changing flame which illumines and rejoices the seas.

But, now, I have to enter into quite another world: a world of war, slaughter, fierce pursuit, and greedy devouring. I must confess that from the beginning, from the first appearance of life, death also appeared; a rapid and useful purification of the globe from the weak and slow, but prolific tribes whose fecundity would otherwise have been mischievous. In the oldest strata we find two wondrous creatures, the *Devourer* and the *Sucker*. The first is made known to us by the

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imprint of the Trilobite, a species no longer existing, an extinct destroyer of extinct species. The second is known to us by a frightful remnant, a beak of almost two feet pertaining to the great Sucker, the Leiche or Poulpe of Dujardin. Judging from that immense beak, this monster must have had an enormous body, and sucking-arms of twenty or thirty feet, like a prodigious spider.

Sad reflection, these murderous creatures are those which we earliest find in the depths of the earth. Are we then to suppose that death preceded life? No doubt; but the soft creatures upon which these monsters fed have perished utterly, not leaving remains or even imprint of themselves.

The devourers and the devoured, were they two nations of different origin? The contrary is more probable. From the mollusc, form undecided, matter still fit to be converted to any form, the superabundant strength of the young world, richly plethoric, abounding in alimentation, there must at an early period have proceeded two forms, contrary in appearance, but tending and qualified to the same end. Swelling and breathing, and measurelessly inflating itself, the Mollusc became an enormous balloon, an absorbing bladder, absorbing all the more as it stretched the more, ever craving and ever consuming, but toothless,—and we have the *Sucker*. On the other hand, by the self-same force, the Mollusc gradually developing articulated members of which each had its shell, and hardening this shelled creature everywhere, but especially at the claws and mandibles formed for gnawing and grinding, to pulp or powder, the very hardest substances became—the *Devourer*. Let us in the first place, in this chapter, speak of the first, the *Sucker*. [196]

The Sucker of the soft gelatinous world, was himself soft and gelatinous. Warring upon and devouring the molluscs, he himself none the less, remained mollusc, that is to say, still a mere embryo. There would be something absurd, caricatural, were it not so terrible, in this sight of a mere foetus, soft and transparent, yet cruel, raging, eager, breathing nothing but murder. For he, see you, goes not to war for the mere sake of food. He has a real passion for destroying, for destruction's sake; whenever he has gorged himself, well nigh to bursting, he will destroy still. Destitute of defensive armour, his threatening snortings disguise, but by no means quiet, his real anxiety; his real, his only safety, is an attack. He is the veritable bully of the young world; really vulnerable himself, and yet so terrible to others; he sees in everything that he meets only enemy or victim. At all risks he casts hither and thither his long arms, or rather his whip-lashes, tipped with cupping glasses, and upon enemy or victim, before the fight or the capture commences, he sends out his stupefying, paralysing effluvia. [197]

Double power. To the mechanical strength of these outstretched arms, add the magical force of that mysterious fluid, and a singularly acute hearing and quick eye. You see in all these, a creature to alarm you.

What must it have been, then, when the early world so lavished its wealth of alimentation, that these monsters of the deep could feed and swell indefinitely? They have decreased now, both in number and in size. Yet, even lately, Rang tells us that he has seen them big as a hogshead; and Peron has seen them quite as large in the South Sea. The creature rolled, and snorted in the rolling wave, with a noise to terrify, to astonish, all meaner creatures. His arms, six or seven feet in length, turning, twisting, writhing, and grasping in every direction, imitated some furious pantomime, some fantastic dance of at once furious and eccentric serpents.

After these matter of fact statements, it seems to me, that we should not be quite so incredulous, not quite so scornful, when we read the accounts of the old voyagers; we should not curl the lip *quite* so insolently as we read, in Denis de Montford, that he saw a monstrous Poulpe, grasp, with his enormous arms, lash, scourge, smite, stupefy with his electric lashes a fierce and strong mastiff which, in spite of all his efforts, and his terrible howlings, had to succumb, did succumb, *did* die in that giant and terrible embrace. [198]

The Poulpe, that terrible and living steam machine, can accumulate such incalculable force and elasticity, that, as d'Orbigny tells us (see his article CEPHAL.) it can leap from the sea to the deck of a ship. This at once relieves our old voyagers from the charge so often and so lightly made against them, of exaggeration and mere romance. They told us, and it now seems quite truly told us, that they came athwart a gigantic Poulpe that leaped inboard, twining its prodigious arms around masts and shrouds; and the monstrous creature would have had possession of the craft, and would have devoured all hands, but that these latter cut away its arms with their axes, as they would have cut away masts in a case of impending wreck, and the mutilated but still threatening creature fell into the sea.

Some have given this creature credit for arms of sixty feet in length; and others have reported that while cruising in the North seas, they fell in with the Kraken, a monstrous creature, half a league in circumference, no doubt, one of our terrible *Poulpes*, able to embrace, stupefy, and devour, a whale a hundred feet long.

The prolonged existence of these monsters, would have endangered Nature herself, would have absorbed our very globe. But, on the one hand, gigantic birds (perhaps, for instance, the *Epiornis*) made war upon them; and on the other hand the exhausted earth destroyed the monster by cutting off its supply of alimentation. [199]

Thank Heaven, our existing Poulpes are somewhat less terrible. Their elegant species of the present day, the Argonaut, that graceful swimmer in its wavy shell, the Calmar, good sailor, if ever there was one, and the handsome Seiche, blue-eyed, and beautiful to look upon, traverse the Ocean, hither and thither, annoying nothing but the small creatures that they need for their

support.

In them we see exhibited the first approach to the vertebral bone; they display, too, a perfect rainbow of changing colors, that come and go—shine, fade, dazzle and die. We may quite fairly call them the Chameleons of the sea. They have the exquisite perfume, ambergris, which the whale only owes to the countless multitudes of Seiches which it has absorbed. And the porpoises, too, make an enormous destruction of them. Your Seiches are very gregarious. About the month of May, they seek the coast to deposit their eggs, and the Porpoises await them there, sure of a splendid banquet. And your Porpoise is somewhat of a *gourmet* though sufficiently *gourmand*; he feeds delicately, though we cannot deny that he feeds largely. The head and the eight arms are his tid-bits, tender and easy of digestion; the rest of the carcass they may have who come for it. Tens of thousands of these mutilated Seiches you find upon the coast at Royan; and there, too, you will see the Porpoises making their mighty bounds when in chase of their coveted prey, the Seiches, or in bacchanal enjoyment and revelling when the prey has been taken and the banquet is over.

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Notwithstanding the strange, not to say grotesque, appearance of its beak, the Seiche is decidedly an interesting creature. All the various shades of the most brilliant and various rainbow, come and go, die and reappear on his transparent skin, according to the play of the light as he turns now hither and now thither, and as he dies his azure eyes look upon you with an expression, now flashing and now fading, which seems to rebuke you for your cruelty in killing, or to express a regret at parting with life.

The general decrease of that class, so immensely important in the past ages, is less remarkable as to the navigators (Seiches, &c.) than in the Poulpe, properly so called, the sad frequenter of our shores. It has not the same firmness as the Seiche, strengthened as the latter is by an interior bone, and it has not, like the Argonaut, a resisting exterior, a shell to protect the most vulnerable organs. Neither has it the kind of sail which aids its navigation and spares it the labor of *rowing*. It paddles about along our shores, hugging the shore like some timid coaster. And its conscious inferiority teaches it habits of treachery; it is at once timid and bold—lying in ambush until quite sure that it can devour without the preliminary necessity of a fight. Lying in wait in some rocky crevice, it awaits its prey. That having passed in unsuspecting security, your Poulpe throws out the terrible lashes, the weaker of the prey are devoured, the stronger get loose and escape. A man when swimming, if thus attacked, finds no difficulty in mastering his at once insolent and imbecile assailant. Disgusted, but not alarmed, he handles the creature without gloves, crushes, collapses him, and feels actually vexed with himself for having even for an instant been provoked by an enemy so contemptible. "Bah!" one is tempted to exclaim, on having so easily vanquished such a thing—"Bah! You came swelling, blowing, threatening, and after all you prove to be only a sham, a mask rather than a being. Without fixity, without substance, a blown-up bladder, now collapsed, to be to-morrow a mere drop, a nameless portion of the dark blue waters of the Sea."

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CHAPTER X.

CRUSTACÆ—BATTLE AND INTRIGUE.

If, from some rich collection of armor, of the middle ages, immediately after examining the mighty masses of iron in which our knights of old oppressed and half stifled themselves, we go to the Museum of Natural History, and examine the armor of the Crustacæ, we shall actually feel something very like contempt for our human skill. The former are a mere masquerade of absurd disguises, that seem especially designed for encumbering their warlike wearers, and rendering them impotent. But these latter, especially the armor of the terrible *Decapodes*, the ten-footed warriors of the waters, are so marvellously armed that had they but the stature and bulk of our human warriors, none of us could dare even to look upon them. The *veni vidi* of Cæsar, would be eternally followed by his soon-ended *Vici*; they would not need to seize, or to strike; their very aspect would thrill, magnetise—utterly stupefy and subdue us.

There they are, all ready for the fight, armed at all points. Within that terrible arsenal, offensive and defensive, how lightly, yet how strongly are they armed. There are the strong nippers, mandibles, ready to craunch through iron itself, and the cuirasses, furnished with the thousand darts, every one of which cries aloud to the foe *Noli me tangere*. We ought to be very thankful to Nature, that has made them thus diminutive. If only the stature and bulk of man were given to them, who, who, and by what means, could engage with them? Fire arms would be in vain; the Elephant, vast and mighty, and intelligent as he is, would have to hide; the fierce Tiger, with lashing tail, blood-shotten eyes and fatal paw, would seek shelter on the topmost branches of the tallest trees, and the trice solid hide of the Rhinoceros, would no longer be invulnerable.

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We perceive at once that the interior agent, the motive power of that machine, centralized within an almost invariable convex, has, even from that single peculiarity, a perfectly enormous force. The slender and delicate elegance of man, his longitudinal figure, divided into three parts, with four great and diverging appendages, distant, all, from his centre, make him, whatever we may say to the contrary, an essentially weak animal. In those armors of the old knights, in the great, telegraphic arms, and in the heavy, pendant legs, we, at a glance, see, and sadden, as we

see, the unsteady, uncentralized creature; halting and staggering, that the slightest collision will beat to the earth. In the crustacæ, on the contrary, the appendages are at once so firmly, so neatly, and so closely, conjoined to the short, rounded, and compacted body, that every blow, every touch, every grasp, has the whole weight, and the whole force and impetus of the entire mass. Even to the extremity of its claws, every inch is instinct with nervous energy, mighty with the whole physical force.

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It has two brain systems, head and body; but to concentrate its power thus, it must have no neck; head and body must be undivided, a dual unity. Marvellous, perfectly marvellous, simplification! The head combines eyes, feelers, claws and jaws. When the quick eye has discerned the enemy, or the prey, the feelers touch, the claws grasp, the jaws crush, and, immediately behind them, the stomach, which is itself furnished with a strong crushing machinery, triturates and digests whatever enters it. In an instant the prey is seized, crushed, digested, and disappears.

In this creature, every organ is superior.

The eyes can discern, both in front, and in rear. Convexed, exterior, and *en facettes*, they can, at a glance, sweep almost the entire horizon.

The antennæ, the feelers, organs of touch and trial, of warning and of guiding, have the sense of touch at their extremities, of hearing and of scent, at their base. An immense advantage, such as we do not possess. How would it be if the human hand could hear and smell? How rapid and concentrated would then be our power of observation. Divided among three senses, each of which works independently of the other, our impressions are, for that very reason, very often inexact or evanescent.

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Of the ten feet of the Decapodes, six are hands, hard, griping pincers, and, moreover, are, at their extremities, organs of respiration. And in this last particular our singularly armed warrior, by a quite revolutionary expedient, solves the problem which so much embarrassed our poor mollusc; how to breathe, in spite of the shell. To this he calmly replies: "I breathe through hand and foot. This great, this fatal difficulty of breathing, which would so surely overcome me, I overcome by the very same weapon with which I smite, the very same implement by which I seize and masticate my food."

The chief and most potent enemies of the Crustacæ, are the tempest and the rock. Little in the deep sea, they almost constantly lurk along shore in waiting for their prey. Often, as they lurk there waiting for the oyster to open and furnish them with a breakfast, a hard gale drives them from their ambush, and then their armor becomes their fatality. Hard, and destitute of elasticity, it receives the full and unmitigated shock of every collision; dashed upon the rocks, they leave it, if alive, only with broken weapons and rent armor. Happily for them, they, like the Oursin, can replace an organ, lost or mutilated. So well do they know that strange power, that they voluntarily shake off a claw, if confined by it. It would seem that Nature especially favors servants so useful. To counterbalance the infinite fecundity of other species, the crustacæ have an infinite power of absorption. And they are everywhere; on every coast; ubiquitous as the seas themselves. The Vultures, and other carrion birds, share with the crustacæ the essential office of health preservers. Let some large animal die, and, on the instant, the bird above, and the crab below and within, are at work to prevent it from polluting the atmosphere.

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The Talitre, that small and skipping crab that we might almost mistake for an insect, burrows in the sands of the sandy shores. Let a tempest drive a quantity of Medusæ or other such prey upon the beach, and you will immediately see the sands all in motion, and myriads of crabs swarming, leaping, hungry, and apparently determined to clear away the spoil before the next flood tide.

Large, robust, and full of wiles, the great crabs are a very combative race. So highly are they gifted with the instinct of war that they even resort to noise in order to intimidate their enemies; advancing to the fight they clash their claws together with a noise like that of castanettes. Yet, they are very prudent when they have to do with a stronger enemy. I remember to have watched them from the top of a high rock, when the tide was out. But, high above them as I was, they perceived that they were watched, and speedily beat a retreat; the warriors hurrying sidelong, as is their wont, into their secure ambush. They resemble Achilles far less than Hannibal. When they feel that they are the stronger, they will attack both the living and the dead, and the helplessly wounded man may well dread them. It is related that, on some desert isle, several of Drake's sailors were attacked and devoured by these greedy creatures.

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No living creature can fight them with equal weapons. The gigantic Poulpe who should enlance the smallest of the crab family, would do so at the risk of losing his antennæ, and the greediest of fish would not venture to swallow so hard a morsel.

When the Crustaceæ are large they are the tyrants and the terror of both land and sea; their impregnable armor enables them to attack everything. They would multiply to such an excess as to disturb the balance of living creatures, but that their armour itself is their great peril and destroyer. Hard and inelastic, it will not yield to the increasing growth of the animal and thus becomes its prison always, and at certain periods its torture.

To find, despite this solid wall, the means of breathing, it is obliged to place the organ of respiration in that very organ, the claw, which it most frequently loses. To allow for the growth of its interior substance, it is obliged—most perilous obligation!—to submit that the hard cuirass

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shell shall at times be discarded; that the creature shall have its seasons of *moulting*; that the eyes, and the claws, and the tentacles, which supply the place of lungs shall suffer with all the rest.

A strange and pitiful sight it is to see the Lobster writhing, twisting, struggling, to get out of its too confining armor. So violent is the struggle that he sometimes actually casts off his claws. Then he remains soft, weak, exhausted. In two or three days a raw shell covers the naked body; but the Crab does not so easily repair damages; it takes him much longer to renew his armor, and during that time he is the victim of all that previously were his unspared and unpitied prey. Even handed justice now becomes terrible to him. The victims now have their revenge; the strong is subjected to the law of the weak; falls, as a species, to their level, and pays full share in the great balance between Life and Death.

If one died but once in this world, there would be less of sadness, but every living thing must partially die daily; daily suffer moulting, that partial death which is essential to the continuance of life. Hence, a weakness and a melancholy to which we do not readily confess. But what is to be done? The bird in its moulting time is sad and silent; still more sad is the poor snake when it casts its skin. We, also, in every month, every day, every instant, are parting with portions of our living frame, but as gently as constantly, and only feel weakened, in those moments of dreamy melancholy, when the vital flame is weakened, that it may become stronger and more vivid.

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How far more terrible it must be for the creature whose whole external frame work must be rent asunder and cast off. It is weak, timorous, crushed;—at the mercy of the first comer.

There are crustacæ of the fresh water that must thus partially die a score of times in every two months. Others (the crustacean suckers) succumb to this terrible operation, are unable to renew their armor, and lose all power. So to speak, they resign their piratical commission, and, coward-like, take shelter in the viscera of the larger animals, which, in spite of themselves, have to forage for them and to feed them.

The insect in its Chrysalis seems utterly to forget itself, not only does it not suffer, but it even seems to enjoy that semblance of death, that unconscious life, which the infant enjoys in its warm cradle. But the crustacæ, in their moulting time, see themselves and feel themselves as they are, suddenly hurled from energetic and terrible life and power to the most complete impotency. They are alarmed, helpless, lost, and can but creep under some sheltering stone, seeing nothing, hearing nothing, feeling nothing but the terror of the coming foe and the unpitied death. Never having encountered terrible foe, or even serious obstacle, and relieved from all necessity of industry by their potent armor, they no sooner lose that than they find themselves utterly without resource. Each might protect the other, but they are all defenceless at the same time. Yet it is said that, in certain species, the male does strive to protect the female, and that if we take one we take both.

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That terrible necessity of moulting, and the eager research of man, more and more lord of the shores, and the extinction of the old species that afforded them such abounding alimentation, have necessarily kept down the increase of the crustacæ. Even the Poulpe which, being good for nothing, is neither hunted after nor eaten, has considerably decreased in number. How much more so, then, the crustacæ whose flesh is so excellent and so coveted by all creatures. They actually seem to be aware of this. The weaker among them resort to the grossest little rogueries to protect themselves; they are ingenious, intriguing. This latter epithet is the true one; they really resemble intriguers who, without visible means, contrive to support themselves upon the means of others. A kind of bastards, neither quite fish, nor quite flesh, they make increment alike of the living, the dying and the dead; occasionally even of land animals.

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The Oxystome makes himself a kind of miser, and thieves by night; the Birgus at nightfall quits the sea on a marauding expedition, and, for want of better, even ascends the cocoa tree and eats the fruit. The Dromios disguise themselves, and Bernard the Hermit, unable to harden his exterior, seizes a Mollusc, devours the body, and clothes himself in the shell. Thus fitted out, he prowls at evening in search of food, and we detect the furtive pilgrim by the noise which he cannot avoid making as he halts and staggers along, under the load of his ill acquired and ill fitting armor.

Others, at most times, but especially in the winter, seek the land, and burrow. Perhaps they would change their nature altogether and become insects, were the sea not so dear to them. As once in every year the twelve tribes of Israel were wont to wend their way to Jerusalem to celebrate the feast of Tabernacles, there are certain shores to which these faithful children of the sea repair to pay her their homage and to consign to her tender care their eggs, thus recommending their offspring to her who nursed their ancestry.

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CHAPTER XI.

THE FISH.

It was inevitable that the free element, the Sea, should, sooner or later, produce a creature like unto herself, eminently free, undulating and fluid, gliding like the wave, but with a

marvellous mobility founded on an interior miracle greater still, on an internal organization at once delicate and strong, and very elastic, such as no creature had previously ever approached to.

The Mollusc, crawling on its belly, was the poor serf of the glebe, and the Poulpe, with all his swelling and threatening pride, swimming badly and unable to walk or crawl at all, was still more completely the serf of chance. The warlike crustaceæ, by turns so high and so low, alternately the terror and derision of all, were at times the slave, the prey of even the weakest creatures.

Great and terrible servitudes those; how were they to be remedied?

Strength is the very soul of liberty. From the very beginning, Life seems gradually but confusedly to have sought the creation of a central axis which should give the creature unity, and enormously increase its strength of motion. The rayed family and the molluscs exhibit a presentiment, a partial sketch of it, but they were too much led away by the insoluble problem of the exterior defence. The covering, always the covering, was that which constantly occupied the attention of these poor beings. As to that one point, they produced masterpieces; the thorny ball of the Oursin, the shell at once open and closed of the Haliotide, and, finally, the armors of jointed pieces of the Crustaceæ, are the very perfection of armor at once defensive and terribly offensive. What more could be required? It would seem, *nothing*.

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Nothing? Say, rather, everything. Let us have a creature who shall trust entirely to motion, a creature of freedom and audacity, that shall look down upon all these creatures as infirm, or miserably slow; a creature that shall consider the envelope as a merely secondary matter, and concentrate his whole strength within himself.

The crustaceæ shroud themselves, as it were, in an exterior skeleton. The fish has his skeleton within, to which nerves, muscles, and all organs are attached.

This seems a fanciful invention, and one quite contrary to good sense; to place the hard and the solid beneath the thick covering of the soft! To place the bone, so useful without, precisely where it seems it must be so useless! The crustaceæ must needs have laughed in derision when they first saw the short, thick, soft fish of the Indian Ocean, for instance, without defensive armor, having no strength save inwardly, protected only by its oily fluidity, by the exuberant mucus that surrounds it, and which by degrees consolidates into elastic scales, a slight cuirass, which ever yielding, never yields entirely.

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It was a revolution comparable to that of Gustavus Adolphus, when he relieved his soldiery of their heavy iron armor, and covered their breasts only with the at once stout and yielding buff leather. A late revolution, but a wise one.

Our fish, being no longer confined like the crab or lobster, imprisoned in armor, is at the same time relieved from the cruel condition inseparable from that armor, the *moulting*, with its attendant danger, weakness, struggle, and enormously wasteful expenditure of strength. Like the superior animals and man, he moults slowly. He economises and hoards up strength, and creates for himself the treasure of a powerful nervous system, with numerous telegraphic threads that connect spine and brain. Even when the bone is soft or absent, and the fish preserves its embryonic appearance, he has nevertheless his great harmony in that abundant provision of nervous threads.

We do not find in the fish the elegant weakness of the reptile and the insect, so slender that in those parts one can cut through them as through a thread; his segments are within, and well protected. He uses them for contractile power, but does not, as the less perfect reptile and insect do, expose them to external injury.

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Like the crustaceæ, the fish prefers strength to beauty, and for this end has no neck; head and trunk form one mass. Admirable principle of strength, which enables him, in cleaving through so yielding an element as water, to strike, at will, with a thousand fold more force than is necessary, and then his motion is as the flight of an arrow or the flash of lightning!

The interior bone, single in the Seiche, is in the fish at once one and multiple; one for force of unity, multiple for elasticity, enabling the muscles alternately to contract and expand, and thus create swift motion. Marvellous, really marvellous is that formation of the fish, so solid without and contractile within, that inward keel to which are attached the motor muscles which work with an alternating shock. Exteriorly, he exposes only his auxiliary oars, short fins which are but little in danger, being strong, slippery, and sharp to wound, or to scrape. How superior in all this is the fish, to the Poulpe and the Medusa, which present to all comers soft flesh, a tempting morsel for the crustaceæ or the porpoise.

This true son of the water, gliding and mobile as his mother, glides by means of his mucus, cleaves with his head, impelled by his contractile muscles, and finally, with his strong fins rows and steers.

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The least of these powers would suffice, but he unites them all; a perfect model and absolute type of swift motion.

Even the bird is less mobile, seeing that he has to perch. He is fixed for the night, but the fish, never; even asleep, he still floats.

So extremely mobile, he at the same time is in the highest degree strong and lively. Wherever

there is water, there is the fish: he is the universal creature of the globe. In the loftiest lakes of Asia and of the Cordilleras, where the atmosphere is so rarefied that no other creature can endure it, the fish lives and thrives. It is the red fish of the Gudgeon species, which thus looks down upon all the earth. In like manner, in the great depths, beneath the most enormous weights, live the Herring and the Cod. Forbes, who divides them into ten superposed beds or stages, finds them all inhabited, and in the lowest of all, supposed to be so dark, he finds a fish provided with eyes so admirable that he finds sufficient light in that which seems to us the uttermost darkness of night.

There is yet another privilege of the fish. Many species, as Salmon, Shad, Eels, Sturgeon, &c., can live equally in fresh water or sea water, and regularly migrate from one to the other. Many families of fish include both sea fish and fresh water fish, as for instance, the Thornback. [217]

Nevertheless, peculiar degrees of heat, peculiar food, and peculiar habits, seem to confine them within certain limits in the seas, free as that element is. The warm seas are as a confining wall beyond which the polar species cannot pass; and on the other hand, the fish of the warm seas are stopped by the cold currents at the Cape of Good Hope. We know of only two or three species that can be properly called cosmopolitan. Few of them frequent the open sea; most of them hug the shore, and have favorite shores to frequent. Those of the United States are not those of Europe. Then, too, fish have peculiarities of taste which attach them to certain localities, though they do not actually confine them there. The Thornback grovels in the mud, Soles in sandy bottoms, the Bullhead loves the high bottoms, and the Sea Eel the rocks. The Scorpene, or flying fish, swims and flies by turns; when pursued by fish, she darts from the water, and for some distance sustains herself in the air; and when pursued by birds she drops back into the water.

The popular phrase, "As happy as a fish in water," is founded on a truth. In fine weather he floats at his ease, enabled as he is to rise or sink at pleasure, to make himself a balloon more or less filled with air, and therefore lighter or heavier. He moves in peace, rocked and caressed by the wave, and, if he so chooses, even sleeps as he floats. He is at once surrounded and isolated by the unctuous substance which renders his skin and his scales slippery and impenetrable by the water. His temperature varies but little and is neither too hot nor too cold. What a difference between a life so convenient, and that which is allotted to us dwellers upon the land; where at every step we meet with asperities and obstacles, which fatigue and exhaust us as we toil up or down our hills and mountains! The atmosphere varies, and often most cruelly, with our various seasons. For days and nights together, the cold rains pour pitilessly down, penetrating us; at times frozen, and piercing us with its sharp crystal points. [218]

The felicity and fullness of life of the fish is shown at the Tropics by the splendor of his colors, and at the North by the swiftness of his motion. In Oceania and the Indian Sea they rove and sport in the oddest forms and colors, taking their pleasure among the corals, and living flowers. Our fish, of the temperate and cold seas, are potent rowers; thorough sailors. Their slender and elongated figures give them an arrowy swiftness and grace of movement, which might serve as ensample to our ship builders. Some of them have as many as ten fins which serve them, at will, as sails or oars, and may be kept wide spread or close-reefed. Their tail, that marvellous rudder, is also the principal oar. The best swimmers have it forked, the entire spine ends there and which contracting its muscles gives the fish his swift motion. The Thornback has two immense fins, two great wings to cleave the waves. His long, supple, and slender tail is a weapon with which to lash and divide the waters. So slender and displacing so little water, this fish has no need of the air bladder which supports the thicker fish. Thus each has the peculiar provisions that fit it for its peculiar locality and surroundings. The Sole is oval and flat that it may glide in the sand, the Eel long and slender that it may glide through the mud, and the Lophies, that they may cling to the rocks, have hand like fins that remind one rather of frogs than fish. [219]

Sight is the great sense of the bird; scent is that of the fish. The Hawk, from above the clouds, pierces, with his glance, the deep space and marks the scarcely visible prey below; in like manner the Shark, from the depths of the water, scents his tempting prey, and darts upward upon it. Those that, like the Sturgeon, rummage the mud for food have exquisite touch. In the watery world half darkened, and having only uncertain and delusive lights, scent, and, in some cases, touch, must be relied on. The Shark, the Thornback and the Cod, with his great eyes, see badly, but have an exquisite sense of scent. The Thornback has that sense in such excess that he is provided with a veil for the express purpose of deadening it at will, when it probably affects his brain unpleasantly. To this powerful means of chasing their prey, we must add admirable teeth, sometimes like those of a saw. Some species have several rows of them, lining the mouth, the palate, the throat, and even the tongue. These teeth being so fine are, therefore, fragile; and behind, therefore, are others ready to replace them if they break. [220]

At the commencement of this second book, we said that it was necessary that the sea should produce these terrible and mighty destroyers to combat her own too great fecundity. Death by persevering excision and bleedings relieved her of a plethora which, otherwise, would have destroyed her. Against that alarming torrent of production which we have instanced in the case of the Herring and the Cod, those frightful multiplying machines which would have choked up the ocean and desolated the earth, she defends herself by the machine of Death, the armed swimmer, the fierce and voracious fish. Great, splendid, impressive spectacle! The universal combat between Death and Life, which we witness upon the land, fades into insignificance when we compare it to that which is going on in the depths of the sea. There, its surpassing grandeur, at first, almost alarms us, but when we examine more closely we see that all is harmonious and in [221]

marvellous equilibrium. That fury is necessary; that dazzlingly rapid exchange of substance, that prodigality of slaughter, are safety. Nothing of sadness, but a wild fierce joy seems to reign in all this. In this opposition in the sea of two forces, that seem so inevitably destructive of each other, the sea finds her marvellous health, her incomparable purity, and a beauty at once sublime and terrible. She triumphs alike in the living and in the dead, giving to them and receiving from them the electricity, the light which beams, flashes, sparkles everywhere, even in the long, dark, polar night.

What is melancholy in the sea is not her carelessness to multiply death, but her impotence to reconcile progress with the excess of movement.

She is a hundred times, a thousand times richer, and more rapidly fecund than the earth. She even builds up for earth. The increase of the land, as we have seen in the case of the Corals, is given by the sea; the sea is no other than the parturient and laboring womb of the globe. Her sole obstacle is in the rapidity of her births; her inferiority appears in the difficulty, which, so rich in generation, she finds in organizing Love. It is melancholy to reflect that the myriads upon myriads of the inhabitants of the sea have only a vague, elementary, and imperfect, Love. Those vast tribes that, each in its turn, ascend and go in pilgrimage towards pleasure and light, give in floods the best of themselves, their very life, to blind and unknown chance. They love, and they will never know the beloved creature in which their dream, their desire, was incarnated; they produce multitudes, but never know their posterity. A few, a very few of the most active, warlike, and cruel species love after our human manner. Those terrific monsters, the Shark and his female, are obliged to approach each other. Nature has imposed upon them the peril of embracing. A terrible and suspicious embrace. Habitually they devour, eagerly and blindly, everything that comes in their path—animals, wood, stone, iron—anything, but in their fierce love, they restrain their hunger. They approach each other with their sawlike and fatal teeth, and the female intrepidly allows the male to seize her with his, and thus fastened together, they sometimes roll furiously about for weeks, unwilling to separate, even though famishing, and invincible in their fierce embrace, even by the fiercer tempest.

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It is affirmed that even after they have separated, they lovingly pursue each other, the faithful male following his mate till the birth of his heir presumptive, the sole fruit of that marriage, and never, never devours him, but follows and watches over him. In fact, in case of peril to the sharking, the excellent farther takes him into his vast throat, but to shelter, not digest him.

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If the life of the sea has a dream, a wish, a confused desire, it is that of fixity. The violent and tyrannical embrace of the Shark, the fury of his union with the female give us an idea of a perfectly desperate love. Who knows if in other species, gentler and better fitted for families, who knows if this impotence of union, this eternal fluctuation of an objectless voyage, is not a cause of sadness? These children of the sea become owners of the land. Many of them ascend the rivers amorous with the fresh water, which they find so poor and possessed of so little nutriment, that they may deposit there, far from the raging waves, the hope of their posterity. At the very least they approach the shore in search of some sinuous and land locked creek. At this time they even become industrious, and with sand, mud, and grass endeavor to make little nests. A touching effort! They have none of the implements of the insect, that marvel of animal industry. They are far more destitute than the bird. By sheer dint of perseverance, without hands, or claws, or beak, and solely with their poor bodies, they yet pass and repass over it till they have pressed it into a sufficient cohesion, as Coste informs us in his description of the Sticklebacks. And what obstacles still await them! The female, blind and greedy, threatens the eggs, the male will not quit them, but guards and protects them, more motherly than the mother herself. This instinct is found in several species, especially in the humblest, the Gobies, a small fish, unfit for food, held in such contempt that if, by chance, caught, it is thrown back again to the water. Well, this lowest of the low is a tender father. Weak, small, destitute as he is, he, nevertheless, is the ingenious architect and laborious workman of the nest, and constructs it unaided, save by his tenderness and his strong will.

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It moves one to pitying reverie, to perceive that such an effort of the heart is arrested at the first effort of art, and by the fatality of the world, in which its nature detains it. We feel that that world of waters is not all sufficient for itself.

Great mother that hath commenced life, thou canst not perfect it; allow thy daughter, the Earth, to continue the work. You see it, even in your bosom; your children think of Earth and long for its fixity; they approach her, offer her their homage.

It is for thee still to commence the series of new beings, by an unexpected prodigy, a grandiose rough draft of the warm amorous life, of blood, of milk, of tenderness which will have its development in the terrestrial races.

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CHAPTER XII.

THE WHALE.

"The fisherman belated at night in the North Sea," says Milton, "saw an isle, a shoal, which, like the back of an enormous mountain, lay upon the water, and in that isle or shoal he fastened

his anchor. The isle fled and carried him away. That isle was Leviathan."

An error only too natural. D'Urmont Durville was similarly though not so fatally deceived. He saw at a distance what seemed a bank with breakers and eddies all around it, and certain patches upon it looked like rocks. Above and around this seeming bank the swallow and the stormy petrel raced and sported. The bank looked venerably grey, covered as it was with shells and madrepores. But the mighty mass suddenly moved, and two enormous columns of water which it threw high into the air, revealed the awakened Whale.

The inhabitant of another planet who should descend towards ours in a balloon and survey it from a vast height would say to himself, "The only creatures that I can discover there are from one hundred to two hundred feet long, their arms are only twenty feet long, but their superb tail, thirty feet, magnificently beats the Sea, and enables them to advance with a speed and a majestic ease which make it very evident that they are the sovereigns of that planet."

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And by and bye he would add: "It is a great pity that the solid part of that globe should be deserted, or at best peopled only by creatures so small that they are invisible. The sea alone is inhabited and by a kind and gentle race. Here the family is held in honor, the mother nurses and suckles her young ones with tenderness, and although her arms are very short she contrives during the raging of the tempest to protect her little one by pressing it to her vast body."

Whales are given to companionship. Formerly they were seen sailing along not only in pairs, but occasionally in large families of ten or twelve in the solitary seas. Nothing exceeded the grandeur of those vast and living fleets, sometimes lighted up by their own phosphorescence, and throwing to the height of thirty or forty feet in the Polar seas columns of water which smoked as it rose. They would approach a vessel, peaceably and in evident curiosity; looking upon her as some specimen of a new and strange species of fish; and they sported around and welcomed the visitor. In their joy they raised themselves half upright and then fell down again with a huge noise, making a boiling gulf as they sank. Their innocent familiarity went so far that they sometimes touched the ship or her boats. An imprudent confidence which was most cruelly deceived! In less than a century, the great species of the Whale have almost disappeared.

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Their manners and their organization are those of our herbivora. Like our ruminating animals they have a succession of stomachs where their nourishment is elaborated; they need no teeth and have none. They easily graze the living prairies of the sea, I mean the gigantic, soft, and gelatinous, fucus, the beds of infusoriæ, the banks of the imperceptible atoms. For such aliments the chase is not necessary. Having no occasion for war, they have no necessity for the sawlike teeth or the frightful jaws of the Shark and other destructive creatures. Boitard tells us that they never pursue. Their food is borne to them on every wave. Innocent and peaceable, they engulf a world of scarcely organized creatures which die ere they lived, and pass unconsciously into the crucible of universal change.

Not the slightest connection between this gentle race of mammiferæ, which, like our own, have milk and red blood, and the monsters of an earlier age,—horrible abortions of the primitive mud! The Whale, of far more recent origin, found a purified water, a free Sea, and a peaceful globe.

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He had finished, the Globe had, his old discordant dream of lizard-fishes, and flying dragons, the frightful reign of the reptile; he had got out of the sinister fogs and mists into the lovely dawn of harmonious conceptions. Our carnivorous creatures were not yet in existence. There was a brief time (a hundred thousand years, perhaps,) of great gentleness and innocence, when the Opossum and other pouched animals were on the earth; excellent creatures, that tenderly loved their families, that carried their young, and, in case of the fatigue or danger of those little creatures, sheltered them in their pouches. In the Sea appeared vast and gentle giants.

The milk of the sea, its superabundant oil, its warm animalized mucus, saturated with a marvellous power tending to life, swelling at length into those gigantic creatures, those spoilt children of nature which she endowed with an incomparable strength, and with the yet greater gift of the beautiful and warm red blood, which now for the first time appeared.

That is the true flower of the world. All the pale and cold blooded creation is languid and seemingly heartless, when compared with the generous and exulting life which boils with anger or love in the rich purple.

The strength of the superior creation, its charm, its beauty, reside in that blood. With it commenced a new youth in nature, a flame of desire, of love, and the love of family and race; to be completed and crowned in man by divine Pity.

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But with this magnificent gift of red blood, the nervous sensibility was enormously increased; the being became more vulnerable, more sensitive alike to pleasure and to pain. The Whale having scarcely any sense of scent or hearing, every thing in his organization is favorable to the sense of touch. The thick blubber which so well protects him from the cold, does not at all guard him against hurts. His finely organized skin of six tissues shudders and vibrates in them all at every blow, and their papillæ are most delicate instruments of touch. And all this is animated and made vivid by rich, red blood, which, even allowing for difference of bulk, is infinitely more abundant than that of the terrestrial mammiferæ. The Whale, when wounded, ensanguines the ocean to a great distance; the blood that we have in drops, is lavished upon him in torrents.

The female is pregnant nine months. Her milk is sweetish and warm, like that of the human

female. But as she has always to breast the wave, her front mammæ, if placed on the chest, would be exposed to all shocks; they are, therefore, placed a little lower on the belly. Here the young one is sheltered and safe from the shock of the wave, which is already broken, ere it reaches him. The form, inherent to such a life, contracts the mother, at the waist and deprives her of that adorable grace of woman, that beauty of settled and harmonious life, where all is tenderness. But the Whale, the great woman of the sea, however tender she may be, is forced to conform, in every thing, to her continual battle with the waves. For the rest, beneath that strange uncouth disguise, the organization, and the sensitiveness, are the same; fish above, the Whale is woman beneath. She is infinitely timid, too; the mere flight of a bird will sometimes terrify her so much that she dives so violently as to hurt herself by striking the bottom.

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Love with the Whale being subject to difficult condition requires a profoundly peaceful place. Like a noble elephant, who fears profane eyes, the Whales love only the desert. Their meeting place for pairing is towards the poles, in the solitary bays of Greenland, among the fogs of Behring, and, also, no doubt, in the warm sea which is known to exist close to the pole itself. A solitude they must have to mate in, be it arctic or antarctic.

Will that warm sea be found again? It is only to be reached by traversing the horrid defiles which open, close, and change, with every succeeding year, as though to prevent the return. The Whale, it is believed, pass under the ice from one sea to the other; a bold and perilous journey by that dark road. Compelled to rise to breathe every quarter of an hour, though they have reserves of air which will last them a little longer, they are much endangered as they pass through that enormous crust with only here and there a breathing hole. If one of these cannot be reached in due time, the ice is so thick and solid every where else, that no strength of the Whale could break through it; and he would be as helplessly drowned as Leander in the Hellespont. But the Whales know nothing about the fate of Leander; so they boldly venture, and for the most part pass safely.

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The solitude is great, it is a strange scene of death and silence for this festival of ardent and passionate life. A white Bear, a Seal, or, perhaps, a blue Fox, respectful and prudent, looks on from a distance. Fantastically brilliant chandeliers and mirrors are not wanting. Bluish crystals, huge and dazzling peaks of ice, and masses of virgin snow, are all around.

What renders this Elephantine Hymen the more interesting, is, that it is one of express consent. They have not the tyrannous weapons of the Shark by which he subdues his female, for on the contrary their slippery skins separate them. In their struggle to overcome this desperate obstacle to their happiness, one might suppose them to be fighting. The whale-men assert that they have seen this strange spectacle. The couples in their burning transports rear themselves upright like two vast towers, and endeavor to embrace with their short arms. They fall down again with an immense crash; and Bear and Man alike retreat, astounded by the deafening sobs of the vast creatures.

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The solution is unknown; those explanations, which have been given, are simply absurd. What is certain is, that, whether in the act of love or of suckling, or of defence, the unfortunate Whale suffers under the double oppression of its weight and its difficulty of breathing. She can only breathe with her head above water; if she remain below she will be choked. Is the Whale, therefore, a terrestrial animal? Not so. If by chance she be stranded on the coast, the enormous weight of her flesh and blubber overwhelms her respiring organs and she is strangled.

Placed wholly in the only element in which she can respire, she is asphyxiated just as surely as if kept beyond a certain space of time wholly beneath the water.

Let us speak plainly. This vast mammiferous giant is an incomplete creature, the first poetic offspring of creative power, which first contemplates the sublime and then reverts to the possible and the durable. The admirable animal was well provided as to size, strength, warm blood, sweet milk, and good disposition. It needed nothing but the means of living. It was made without respect to the general proportions of this globe, without respect to the imperative law of weight. In spite of his enormous bones, beneath, his gigantic sides were not strong enough to keep his chest sufficiently expanded and free. Escaping from his enemy, the water, he found another enemy in the land, and his mighty lungs were overwhelmed, and collapsed. His magnificent blowing apertures throwing up columns of water thirty feet into the air, are, in themselves, proofs of an organization infantine and rude. In throwing up that column towards the sky the *panting blower* seems to say, "Oh, nature, why hast thou made me a serf?"

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The life of this creature was a problem, and it seemed that this splendid but imperfect first draft of the vast and the warm-blooded could not endure. Their furtive and difficult love, their suckling amidst the roar and the rush of the tempest, in the hard choice between shipwreck and strangling; the two great acts of their life rendered almost impossible, and performed only by mightiest effort and most heroic will;—what conditions of existence are these!

The mother has never more than one little one, and that is much for her to achieve. Both she and it have three great annoyances, the difficulty of breasting the waves, the suckling, and the fatal necessity of rising to the surface to breathe. The education of the young one is a real combat. Tempest-tossed and sorely beaten by the waves, the young one sucks, as it were, by stealth, when the mother can throw herself on her side. Here the mother is admirable. She knows that the young one in endeavoring to draw the teat will be forced to leave its hold; and, therefore, seizing the favorable moment, she, as from a piston, discharges a tun of milk into the gaping and craving mouth.

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The male seldom quits the female. Their embarrassment is great when the eager and cruel fishers attack them in the person of their young one. The whale-men harpoon the young one, well knowing that the parents will follow it. And, in fact, they do make almost incredible efforts to save it and carry it off; they rise to the surface and expose themselves to the utmost danger. Even when it is dead, they still defend it; though so well able to dive and save themselves, they remain upon the water in full peril to follow the floating body of their little one.

Shipwrecks are common among them, for two reasons. In the first place they cannot, like the fishes, remain during tempestuous weather in the lower and peaceable depths; and in the next place, whatever the danger, they will not separate; the strong nobly share the fate of the weak; the whole family drowns together.

In December, 1723, at the mouth of the Elbe, eight females perished, and near their carcasses were their eight males; and a similar scene was witnessed in 1784, at Andierne in Brittany. In the latter instance, fish and frightened porpoises were driven on shore by the tempest, and strange and terrible bellowings were heard from a great family of Whales, tempest-driven, and struggling for life. There, again, the males perished with the females. Many of the latter were with young and defenceless against the pitiless waves; they were cast upon the shore to die. Two of them, in this situation, brought forth their young with piercing shrieks, and groans most harrowingly human.

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CHAPTER XIII.

THE SYRENS.

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Behold me once more on shore. I had enough, and to spare, of shipwreck. I want durable races. The Cetaceæ must disappear. Let us moderate our conceptions, and, of that gigantic faëry of the first-born mammalia, of milk and warm blood, let us preserve all except the giant.

Above all, let us preserve the gentleness, the love, and the love of family. Let us preserve them completely in those humbler but kindly races into which both elements infuse their spirits.

The benedictions of the Earth already begin to be felt. On quitting the life of the fish, many things impossible to it, easily become harmonized.

Thus the Whale, tender mother if ever there was one, could grasp her nursling, but could not press it to her breast, the arms being too high and short, and the breast, as we have already shown, being, perforce, placed far back. In the new creatures, which swim, but which also creep upon the land, such as seals, sea cows, &c., the breast, lest it should be hurt by the ground, is placed upon the chest, thus foreshadowing woman, and giving to the form and attitude, a grace most illusive at a distance.

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In reality, even closely examined, if it has less of charming whiteness, the breast of the new creatures is a true feminine breast; that globe which, swelling with love, and with the sweet necessity of giving suck, exhibits, in its gentle heavings, all the sighs of the heart beneath, and invites the child to nourishment and soft repose. All this is denied to the mother that swims and floats, but is enjoyed by her who rests. The fixity of the family, the constant tenderness, let us at once say, Society, all these commence from the moment that the child reposes on the maternal breast.

But how is organization to pass from creatures of the sea to creatures of both sea and land? Let us try to divine that transition.

At the outset, the parentage of the amphibious race is evident. Many, amphibious still, to their great inconvenience, have the heavy tail of the Whale. And this latter, in one species, at least, conceals in its tail the rude outlines and distinct commencements of the two hind feet of the highest of the amphibious creatures.

In the seas studded with islands, continually interposing land, the cetaceæ, so frequently interrupted in their passage, had to modify their habits accordingly. Their less rapid motion, and confined life, diminished their bulk, and from the Whale they were reduced to the sea Elephant, and reserving the memory of the superb which had armed certain of the cetaceæ, in their grand sea life, the sea Elephant still has strong, but very harmless fore teeth. Even its masticating teeth are not precisely either herbivorous or carnivorous. They are but ill adapted to either diet, and must needs operate but slowly.

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Two things tended to lighten the Whale; his mass of blubber, that vast mass of concentrated oil, which floated him on the water, and that powerful tail whose alternate strokes to right and left, urged him onward. But all this was unfitted for the amphibious creature, grovelling in shallow waters, or crawling on the rocks. The fish, so agile, scorns a creature that cannot catch him, and he consequently gets little other prey than the molluscs, as slow as himself. By degrees, he learns to eat the abundant and gelatinous sea wrack, which nourishes, and fattens, but without giving the strength of animal food.

Such a one we may see in the Red Sea, the Malay isles, and those of Australia. Crawling or sitting, that rare colossus, the Dugong, displays its chests and breasts. He is sometimes called

the Dagon of the Tabernacles, an inert idol, which in spite of its imposing aspect, cannot defend itself, and which will soon disappear, and enter into that region of fable which already contains so many realities, at which we as stupidly, as presumptuously, laugh. What has caused this great change, created the terrestrial Dugong, and his brother the Walrus? The plentiful alimentation of the generous and fertile earth, truly pacific before the coming of man, and doubtless, also, Love, so difficult to the Whale, so easy in the quiet and settled life of the amphibious.

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Love, to these latter, is no longer a thing of flight and danger; the female is no longer the shy giant that must be followed to the end of the world, but is content, on her bed of sea-weed, to obey the will of her master, whose life she makes pleasant. Few mysteries here. The amphibious live frankly and honestly in the face of day. The females being very numerous, voluntarily form a seraglio. From wild, fierce poetry, we descend to patriarchal manners and pleasures too facile. The male, good patriarch, notable for his large head, his moustaches, and his great front teeth, sits proudly between his Sarah and Agar, Rebecca and Leah, and his little flock of young ones, to all of which he is most kind. In his quiet life, the great strength of this sanguineous creature, turns wholly to family tenderness; he embraces all his family, and is willing to die, if need be, in their defence. But, alas! his strength and his fury serve him but feebly for even his own defence: his enormous mass delivers him over to the enemy. He bellows, and crawls, and is willing to combat, but unable—gigantic failure as he is; an abortion belonging to neither world, a poor disarmed Caliban.

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Weight, so fatal to the Whale, is still more so to these. Let us, then, still farther reduce the bulk, make the spine more supple, and above all, either do away with that tail, or rather, let us fork it into two fleshy appendages, which will be much more useful. This new being, the Seal, lighter, a good fisher, getting his subsistence in the sea, but living on the land, will employ his life in endeavoring to return to it, to climb the rock to which his females and their offspring await his return from fishing. Having no tusks, like those with which the Walrus assists himself in climbing, he presses into the service his front and back members, clings to the sea-weed, distending his members continually, until they form into fingers.

What is finest in the Seal, what strikes you the moment you catch sight of his round head, is the great capaciousness of brain. Boitard assures us that, with the exception of man, no creature has so fine a cerebral development as the Seal. We are strongly impressed by the aspect of the Seal, far more so than by that of the ape tribe, whose grimaces never fail to revolt us. I shall never forget the Seals in the Zoological Garden at Amsterdam, admirable museum, so rich, so beautiful, so well organized, decidedly one of the finest establishments in the world. I was there on the twelfth of last July, just after a great rain fall. The atmosphere was heavy and sultry, and two Seals sought shelter and coolness, swimming and playing in their pond. When they rested they looked up at me with their velvety eyes, and there was a mixed intelligence and melancholy in their fixed gaze. There was no language which we could mutually understand. Pity that, between soul and soul, there should be that eternal barrier!

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The earth is the world of their greatest affection. There they are born, there they love; thither, when wounded, they retire to die. Thither they take their pregnant females, form for them their beds of sea-weed, and provide them with fish. They are very affectionate, good neighbors, mutually defending each other; only at their season of amours they are a little apt to fight. Each male has two or three females that he finds a home for on some mossy rock of sufficient extent. That is his estate, and he suffers no intrusion upon it. He knows how to maintain his right of proprietorship. The females are gentle and defenceless. If ill treated, they weep, are agitated and cast despairing glances upon the assailant.

They are parturient during nine months, and nurse their young during five or six months, teaching them to swim, fish, and select the best food. No doubt they would keep them still longer, but the husband is jealous of his own progeny, fearing that the too weak mother will give him a rival.

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No doubt this brevity of education has limited the progress which the Seal would otherwise have made. Maternity is only complete when we come to the Sea Cow, an excellent family in which the parents have not the sad courage to drive away their young. The mothers nurse them for a long time; even while suckling a second, the mother still keeps by her the eldest, which, though it be a male, the father never ill treats, but seems to regard him with a love only second to that of the mother.

This extreme tenderness, peculiar to that species, is exemplified in the physical progress made in the organization. In the Seal, a great swimmer, and in the heavy and clumsy sea Elephant the arms still continue to be fins; closely attached to the body are incapable of extension. But at length the Sea Cow, the *Sea Mama* as the negroes call her, accomplishes the miracle. All extend and becomes pliant by a continuous effort. Nature exerts all her ingenuity upon the fixed idea of holding, pressing, caressing the young. The ligaments yield and extend, the fore arm appears and by and by appears the hand.

And then the mother has the great, the supreme pleasure to press her young one to her breast. Here, then, are two things which may enable these amphibious creatures to make great progress. Already they have the hand, that organ of industry, that essential instrument of future toil. It must be supplied, must aid the work of the teeth as with the Beaver, and the Ant, will commence, at the outset, with building a home for the family.

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On the other hand, education, also, has become possible. The young one rests on the maternal

bosom and, slowly drinking in her life, remains there a long time, and to an age when he can learn every thing,—all this depends on the kindness of the father who protects the innocent rival. And it is that which allows of progress.

And, if we might give credence to certain traditions, progress did marvellously continue. The developed amphibious creatures, according to those traditions, approached nearer and nearer to the human form and became Tritons and Syrens, men and women of the Sea. Only, in contradiction to the fables of the melodious Syrens, these are dumb in their utter impotency to find a language in which to address themselves to man and obtain his pity. These races will have perished, as has the unfortunate Beaver which cannot speak, but weeps.

It has been very lightly affirmed that these men and women of the Sea were Seals. But how is it possible that such a mistake could be made? Every species of the Seal has been known from very early times; even as early as the seventh century the Seal was hunted, not only for his skin, but also for his flesh, which was then eaten. [244]

The men and women of the Sea which are spoken of in the writings of the sixteenth century, were seen, not merely for an instant, and on the water, but brought to land, shown, and kept in the great cities of Antwerp and Amsterdam in the time of Charles V. and Philip II., and, therefore, under the very eyes of Vesale and other learned men and eminent naturalists. Mention is made of a marine woman who, for several years, wore the dress of a nun and lived in a Convent where any one might see her. She could not speak, but worked, and could spin, knit, and sew. Only one peculiarity, they could not cure her of,—her great love of the water, and her incessant efforts to return to it.

But it will be asked—"If these creatures really existed, how is it that we do not see them now?" Alas! We need not seek far for the reply. They were so generally killed! It was considered a sin to let them live, "for they were *monsters*." This we are expressly told by the old writers.

Whatever had not the known form of animality, and, especially, whatever approached to the form of man passed for a *monster*, and was pitilessly dispatched. Even the human mother of a greatly deformed child, could not protect it; the poor creature was smothered, as being a child of the Devil, an invention of his malice to outrage the creation and calumniate the Deity. On the other hand, those Syrens, too analogous to humanity, were all the more taken and detested for a diabolic mockery. In such horror and hate were they held in the eyes of the middle ages that their appearance was considered a prodigy, an omen that God permitted to terrify sinners. People scarcely dared to name them, and made haste to get rid of them. Even the bold sixteenth century still believed them to be men and women in shape, but Devils in reality, and not even to be touched, excepting with the harpoon. They had become very rare when miscreants made a profit of keeping and exhibiting them. [245]

But do there now exist any remains, any whole, or even partial, skeletons of these creatures? We shall know that, when the Museums of Europe shall throw open to our view the whole of their immense collections. I am aware that room is wanting for that; and it is always likely to be wanting, if we need a palace. But the most simple building, if it only be sufficiently spacious and weather tight, would serve to hold such collections, and needs not to be at all costly. Hitherto, we have only seen mere specimens and selections. [246]

Let us add that stuffed amphibious creatures, to give us a real idea of them, should be so placed as to exhibit *these monsters* in the attitudes of their actual life. Let the maternal Seal, or the Sea Cow, be seen on its rock, as a Syren, in the first use of her hand and pressing her little one to her breast.

Is this to affirm that these creatures might have ascended to us? Or that we have descended from them? Mallet supposed so, but I cannot see the least probability in either.

The Sea, no doubt, commenced everything. But it is not from the highest marine animals, that has proceeded the long parallel series of terrestrials that is culminated and crowned in Man. They were already too fixed, too special, to form the first rude sketch of a nature so different. They had carried far, almost exhausted, the fecundity of their species. In that case the elders perish; and it is very low down in the obscure juniors of some parent class that the new series commences that is to ascend so much higher. [See notes at the end of the volume.]

Man was not their son, but their brother—a terribly tyrannical brother.

See him at length arrive, the active, the ingenious, the cruel monarch of the world! My book grows brighter, clearer. But what does it now proceed to exhibit? Alas! What sad things must I now draw into that broad, bright light! This creature, this tyrannical sovereign, can create a second nature within Nature. But what has he done with the first, with his mother, and his nurse? With the very teeth that she has given him, he has cruelly gnawed her bosom! [247]

How many animals that lived peaceably, were becoming civilized, began even to practise some of the arts, are now hunted and terrified into the condition of mere brutes? The Ape-kings of Ceylon, whose sagacity was so well known in India, and that Brahmin of the creation, the Elephant, have been chased, subdued into the state of mere beasts of burthen.

The freest of beings, that formerly sported so joyously and harmlessly in the sea, those affectionate Seals, those gentle Whales, the pacific pride of the Ocean, have fled to the polar seas, the terrible world of ice. But they cannot all support, for long, so hard a life; in a brief time

they will all have disappeared.

An unfortunate race, the Polish peasants, have learned to understand the intelligence of the dumb exile which has taken refuge in the lakes of Lithuania. The Poles say—"Woe to him who makes the Beaver weep."

That artist-animal has become a timid beast, which knows nothing and can do nothing. The few that still survive in America, still retire farther and farther from the vicinage of man. A traveller lately found one, far, very far off, beyond the great lakes. It was timidly resuming its traditional labors, and had commenced building a house for its family. When it saw a man, it dropped the wood on which it was working; it did not even dare to escape, but burst into tears.

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THE HARPOON.

"The Sailor who sights Greenland," says Captain John Ross, with a grave simplicity, "finds nothing to delight him with the sight." I can very well believe it. In the first place, it is an iron-bound coast of most pitiless aspect, whose dark granite does not even preserve a vestment of snow. Everywhere else, Ice; not a trace of vegetation. That desolate land which hides the Pole from us, seems a veritable land of Famine and of Death.

During the brief time when the water remains unfrozen, one might contrive to live there; but the place is frozen up for nine months in the year, and during all that time, what is to be done? And what can one get to eat? One can scarcely even search for food. The night lasts for months together, and at times the darkness is so dense that Kane, surrounded by his dogs, could only discover them by the humid warmth of their breath. In that long, long, darkness, on that sterile land, clothed in impenetrable ice, there wander, however, two Hermits, who persist in living in that land of horror. One of these is the fishing Bear, a bold and eager prowler, in rich fur, and in so thick an under vestment of fat, that he can for a long time defy both cold and hunger. The other, a grotesque creature, looks, when seen from a distance, like a fish reared upwards, standing on the tip of its tail; a fish clumsily and awkwardly built, and having long hanging fins. But this seeming fish is a man. Each scents the other, the brute and the man; both are fierce with hunger, yet the Bear sometimes declines the combat, and retreats before the fiercer, and still more famished, man.

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A famishing man is very terrible in his cruel courage. With no other weapon than a sharpened bone, our Greenlander pursues the enormous Bear. But he would have long since perished of famine, had he no other food than his terrible compatriot. He saved himself from death only by a crime. The earth affording nothing, he turned his attention to the Sea, and as it was closed by the ice, he found nothing there to kill except his gentle acquaintance the Seal. In him he found the oil without which he would be dead of cold, even sooner than of hunger.

The day dream of the Greenlander is that at his death he will pass to the Moon, where he will have wood, fire, the light of the hearth. Here below, in Greenland, oil supplies the place of all these. He drinks it, in huge draughts, and is at once warmed and nourished.

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A great contrast between that man and the somnolent, amphibious creatures, that, even in that climate, can live without any very severe suffering! The gentle eye of the Seal, sufficiently indicates that. Nursling of the Sea he is always, in connection with her, and there are always clefts in the ice, at which the excellent swimmer knows how to provide himself with food. Heavy and clumsy as we may take him to be, he can adroitly mount on a piece of ice and steer himself in search of a convenient fishing place. The water, thick with molluscs, and fat with animated atoms, richly nourishes the fish, for the use of the Seal, who, having well filled himself, returns to his rock, and sleeps too soundly to feel the cold, or to fear anything.

The man's life in Greenland, is the very contrary of this. He seems to be there in spite of Nature, an accursed being, upon whom everything makes pitiless war. Looking upon the photographs that we have of the Esquimaux, we can read their terrible destiny in the fixity of their gaze, and in the harsh, dark eye; black as midnight. They look as though petrified by perpetually seeing before them the vision of an infinite wretchedness. That gazing upon eternal terror, has hidden beneath a mask of iron the man's strong intelligence, which, however, is rapid and full of the expedients suggested by the endless dangers and sufferings of such a life.

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What was he to do. His family was famishing, his children cried for bread, and his wife shivered upon the snow. The North wind, pitilessly assailed them all with mingled hail and snow, that horrid pelting which blinds, stupefies, deprives one of sense and voice. The Sea was frozen

up; so, fish was out of the question. But the Seal was there, and how many fish there were in one Seal; what an accumulation of the richest oil! The Seal was there, defenceless, sleeping. Nay, had he even been awake, he would not have tried to escape. He is like the Sea Cow; you must beat him if you wish to drive him away. Take one of their young and it is in vain that you throw him into the Sea, he will get out and still follow you, gentle and attached as your favorite dog. This facile, this affectionate, trait in the creature's character, must have terribly troubled the man who first thought of killing such a creature; must have made him hesitate and resist the temptation. But at length cold and famine got the upper hand, and he committed the assassination; from that moment he was rich.

The flesh nourished the famishing people, the oil served to warm and cheer them, and the bone and sinews served for many domestic uses, while the skin served to clothe them. And what was still more useful was, that by industriously sowing the skins together they made a vehicle, at once light, and strong, and water proof, which the man called his canoe, and in which he dared to put out to sea. [255]

A miserable little vehicle it was; long, slender, and weighing scarcely anything. But it was every where very firmly closed up, except an opening in which the rower seated himself, drawing the skin tightly around his waist. One would suppose that such a craft must upset and be swamped; but nothing of the sort occurs. It darts like an arrow over the crest of the wave, disappears, reappears, now in the eddies, now between the icebergs.

Man and boat are one; a marine entity; an artificial fish. But how inferior is this artificial fish to the true one! He has not the floating bladder, which enables the fish to make itself lighter or heavier as the occasion may demand. Still more, the man has not the vigorous motion, the lively contraction and expansion of the spine to communicate such power to the strokes of the tail, nor has he the oil which, being so much lighter than water, will always ride above the waves. What the man best imitates is the fin, but even that only imperfectly. The man's fins, his oars, are not attached to his body, but, moved by his long arms, are weak compared to the fin, and, moreover, soon fatigue the rower. What is it that makes amends for so much of inferiority in the means of the man? His terrible energy, his vivid reason which, from beneath that fixed and melancholy countenance, flashes out from time to time, invents, resolves, and finds an instant remedy for all the deficiencies which, in this floating skin, momentarily threaten him with death. [256]

Frequently our rower is stopped by a mass of ice which peremptorily refuses him a passage. Then comes a new expedient, the parts are changed on the instant. Hitherto the canoe has carried the man; now the man carries the canoe. He takes it on his shoulder and traverses the icy portage till he comes again to open water, the ice crackling beneath him as he crosses it. Occasionally icebergs, floating, and terrible mountains, are so close that they leave between them only a narrow passage which our man passes through at the risk of being in an instant crushed, flattened between them. Those icy walls now widen, now contract, the space between them; they may, at any moment, come together with a force that would crush a seventy-four, to say nothing about our poor Greenlander in his poor skin canoe. Such a fate did, in fact, once occur to a tall ship; she was cut in two, flattened, crushed; by the coming together of two icebergs.

These Greenlanders tell us that their ancestors were Whale fishers. They were less wretched then, more ingenious, and better provided. No doubt they had iron; procured probably from Norway or Iceland. Whales have always been very numerous in the Greenland seas. A grand object of desire to those to whom oil is a thing of the very first necessity! The fish give it by drops, the Seal in waves—the Whale in mountains! He was truly a man, and a bold one, who first, with his poor weapons, with the sea howling at his feet, and the darkness closing around him, dared to pursue the Whale! A bold man, he, who trusting to his courage, the strength of his arm and the weight of his harpoon, first believed that he could pierce that mighty mass of blubber and flesh and convert it to his own profit!—the man who first imagined that he could attack the Whale and not perish in the tempest that would be raised by the plunges and terrific tail-blows of the astonished and suffering monster! And, as if to crown his audacity, the man next fastened a line to his harpoon, and braving still more closely the frightful shock of the agonized and dying giant, never once feared that that giant might plunge headlong into the deep, taking with him harpoon, line, boat,—and man! [257]

There is still another danger, and no less terrible. It is that instead of meeting the common Whale, our man should fall in with the Cachalot, that terror of the seas. He is not very large, perhaps not more than from sixty to eighty feet. But his head alone measures about a third; from twenty to twenty-five feet. In case of such a meeting, woe to the fisher; he would become the chased instead of the chaser, the victim instead of the tyrant. The Cachalot has horrible jaws, and no fewer than forty-eight enormous teeth; he could with ease devour all; both boat and man. And he seems always drunk with blood. His blind rage so terrifies all the other Whales that they escape, bellowing, throwing themselves on the shore, or striving to hide themselves in the sand. Even when he is dead they still fear him and will not approach his carcass. The fiercest species of the Cachalot is the Ourque or Physitone of the ancients, which is so much dreaded by the Icelanders, that when they are on the sea they will not so much as name him lest he should come and attack them. They believe, on the other hand, that a species of Whale, the Jubarte, loves and protects them, and provokes the monster in order to save them from his fury. [258]

Many think that the first who undertook so perilous a task as that of Whale fishing must have been eccentric hot heads. According to those who think so, that perilous chase could never have

originated with the prudent men of the North, but must have been initiated by the Basques, those daring hunters and fishers who were so well accustomed to their own capricious sea, the Gulf of Gascony, where they fished the Tunny. Here they first saw the huge Whales at play and pursued them, frenzied by the hope of such enormous prey, and pursued them still, onward and onward, no matter whither; even to the confines of the pole. [259]

Here the poor Colossus fancied it must needs be safe, for it could not fancy any one would be desperate enough to follow it thither, and so it went tranquilly to sleep. But our Basque mad-caps approached it stealthily and silently. Tightening his red belt around his waist, the boldest and most active of the Basque sailors leaped from the deck right on to the back of the sleeping monster, and, fearlessly or carelessly, drove the harpoon home to the very eye. Poor Whale!

CHAPTER II.

DISCOVERY OF THE THREE OCEANS.

Who opened up to men the great distant navigation? Who revealed the Ocean, and marked out its zones and its liquid highways? Who discovered the secrets of the Globe? The Whale and the Whaler! [260]

And all this before Columbus and the famous gold seekers, who have monopolized all the glory, found again, with much outcry about their discovery, what had so long before been discovered by the Whalers.

That crossing of the Ocean which was so boastfully celebrated in the fifteenth century, had often been made, not only by the narrow passage between Iceland and Greenland, but also by the open sea; for the Basques went to Newfoundland. The smallest danger was the mere voyage, for these men, who went to the very end of the then world, to challenge the Whale to single combat. To steer right away into the Northern seas, to attack the mighty monster, amid darkness and storms, with the dense fog all around and the foaming waves below, those who could do this, were, believe it well, not the men to shrink from the ordinary dangers of the voyage. [261]

Noble warfare; great school of courage! That Fishery was not then, as it is now, an easy war to wage, made from a distance, and with a potently murderous machine. No; the fisher then struck with his own strong hand, impelled and guided by his own fearless heart; and he risked life to take life. The men of that day killed but few Whales, but they gained infinitely in maritime ability, in patience, in sagacity, and in intrepidity. They brought back less of oil; but more, far more, of glory.

Every nation has its own peculiar genius. We recognize each by its own style of procedure. There are a hundred forms of courage, and these graduated varieties, formed, as it were, another heroic game. At the North, the Scandinavian, the ruddy race from Norway to Flanders, had their sanguine fury. At the South, the wild burst, the gay daring, the clear-headed excitement, that impelled, at once, and guided them over the world. In the center, the silent and patient firmness of the Breton, who, yet, in the hour of danger could display a quite sublime eccentricity. And lastly, the Norman wariness, considerably courageous; daring all, but daring all for success. [262]

Such was the beauty of man, in that sovereign manifestation of human courage.

We owe a vast deal to the Whale. But for it, the fishers would still have hugged the shore; for almost every edible fish, seeks the shore, and the river. It was it that emancipated them, and led them afar. It led them onward, and onward still, until they found it, after having almost unconsciously, passed from one world to the other. Greenland did not seduce them, it was not the land that they sought, but the sea, and the tracks of the Whale. The Ocean at large is its home, and especially the broad and open Sea. Each species has its especial preference for this or that latitude, for a certain zone of water; more or less cold. And it was that preference which traced out the great divisions of the Atlantic.

The tribe of inferior Whales, that have a dorsal fin, (Baleinopteres) are to be found in the warmest, and in the coldest seas; under the line, and in the polar seas. In the great intermediate region, the fierce Cachalot inclines towards the South, devastating the warm waters. On the contrary, the Free Whale fears the warm waters; we should rather say that they did, formerly, fear them;—they have become so scarce! Especially affecting, for their food, the molluscs, and other forms of elementary life, they sought them in the temperate waters, a little to the northward. They are never found in the warm, southern current; it was that fact that led to the current being noticed, and thence to the discovery of the *true course from America to Europe*. From Europe to America, the trade winds will serve us. [263]

If the Free Whale has a perfect horror of the warm waters, and cannot pass the Equator, it is clear that he cannot double the southern end of America. How happens it, then, that when he is wounded on one side of America, in the Atlantic, he is sometimes found on the other side of America, and in the Pacific? *It proves that there is a north-western passage*. Another discovery which we owe to the Whale, and one which throws a broad light alike on the form of the globe, and the geography of the seas!

By degrees, the Whale has led us everywhere. Rare as he is at present, he has led us to both poles, from the uttermost recesses of the Pacific to Behring's strait, and the infinite wastes of the Antarctic waters. There is even an enormous region that no vessel, whether war ship or merchantman, ever traverses, at a few degrees beyond the southern points of America and Africa. No one visits that region but the Whalers.

Had they chosen, the magnates of the earth might much earlier have made the discoveries of the fifteenth century. They should have addressed themselves to the sea rovers, to the Basques, to the Icelanders, to the Norwegians, and to our Normans. For very many reasons, they could not venture to do so. The Portuguese were unwilling to employ any but men of their own nationality, and formed in their own school. They feared our Normans, whom they chased and dispossessed from the coast of Africa. On the other hand, the kings of Castile always felt suspicious of their subjects, the Basques, whose privileges rendered them a kind of republic within a monarchy, and who, moreover, were well known to be both bold and dangerous. It was this feeling which caused these princes to fail, in more than one enterprise. We need mention only one of them, the miserably ruined Armada, so proudly and absurdly called the *Invincible*. Philip II, who had two veteran Basque Admirals, gave the command of the Armada, to a Castilian. The advice of the veterans was neglected, and thence the disaster.

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A terrible disease broke out in the fifteenth century. The hunger, the thirst, the raging thirst for gold. Kings, priests, warriors, people, all cried aloud for gold. There was no longer any means of balancing income and expenditure. False money, cruel persecutions, atrocious wars, all and every thing, were employed, but still the cry was for gold, and the gold was not forthcoming. The alchemists confidently promised that they would soon make it; but it was to be waited for, that gold; still, still, it was not forthcoming. The treasury became furious as a hungry Lion, devoured the Jews, devoured the Moors, and of all that mighty devouring there was not a morsel left between the teeth of the still gold-hungry nations.

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The peoples were quite as eager as the kings. Lean and sucked to the very bone, they begged, they prayed, they implored, for a miracle that would bring down gold from Heaven.

We all know the story of Sinbad the Sailor, that capital story in the *Arabian Nights*. The poor porter, Hindbad, bending under a load of wood, stops before the doors of Sinbad's palace, to listen to the music, and bitterly complains of the contrast between the lot of the poor porter Hindbad, and that of Sinbad, the returned, renowned, and magnificently rich Sinbad. But when the enriched sailor related all the perils he had undergone, and all the sufferings he had endured, Hindbad stood aghast at the tale. The entire effect of the story is to exaggerate the dangers of the great game, the vast lottery of travelling, but also to exaggerate the profits that may be made by it, and to discourage steady and humble industry.

The legend, which, in the fifteenth century, influenced so many hearts, and turned so many brains, was a rehash of the fable of the Hesperides, an Eldorado, a land of gold, which was located in the Indies; a terrestrial paradise, still existing here below. The only difficulty consisted in finding that same golden land. They did not care to seek it in the North, which was the reason why so little use was made of the discovery of Newfoundland and Greenland. In the South, on the contrary, gold dust had already been found in Africa. That was encouraging.

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The learned dreamers of a pedantic century heaped up texts and commentaries, and the discovery, by no means difficult in itself, was rendered so, by dint of lectures, reflections, and utopian dreams. Was this land of gold, Paradise, or was it not? Was it at our antipodes? and, in fact, have we any antipodes? And at this last question all the Doctors, all the men of the black robe, stopped the learned quite short, and reminded them that upon that point, the Church was quite positive; the heretical doctrine of the Antipodes having been formally and expressly condemned. Behold a serious difficulty! Our learned dreamers were stopped short.

But why was it so difficult to discover the already discovered America? The reason seems to be that the discovery was at once hoped for and dreaded.

The learned Italian bookseller, Columbus, felt quite satisfied upon the subject. He had been in Iceland to collect traditions, and on the other hand the Basques told him all that they knew about Newfoundland. A Gallician had been cast away there and had lived there. Columbus selected for his associates the Pinçons, Andalusian pilots, who are with much probability supposed to be identical with the Pinçons of Dieppe. We say that this is very probable because our Basques and Normans, subjects of Castile, were intimately connected. They are the same who, under the name of Castilians, were led by the Norman Bethencourt to the famous expedition of the Canaries. Our kings conferred privileges on the *Castilians* settled at Honfleur and Dieppe; and, on the other hand, the men of Dieppe had trading establishments at Seville. It is not certain that a Dieppois found America four years before Columbus, but it is about certain that these Pinçons of Andalusia were Norman privateers.

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Neither Basques nor Normans could obtain authority to act under the commission of Castile. It was an able and eloquent Italian, a persistent Genoese, who seized upon the fitting moment, and used it, and set all scruple aside,—that moment when the ruin of the Moors had cost so dear to Castile, and when the cry of Gold, Gold, or we perish, became louder, more piteous, and more unanimous, than ever. That moment was when victorious Spain shuddered as she counted the cost, paid and unpaid, of her wars of the crusade and the Inquisition. The Italian seized upon that lever and used it most unscrupulously; becoming most devout among the devout. More apparently bigoted than the Bigots themselves, he pressed the very Church into his service.

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Isabella was reminded of the great sin and scandal of leaving whole nations of Pagans still in the valley of the shadow of death; and it was particularly pressed upon her observation, that to discover the golden land, was the one thing needful to acquiring the ability to exterminate the Turk and to recover Jerusalem.

It is well known that of three ships the Pinçons shipped two, and commanded them, and they led the way. One of them, indeed, mistook his course, but the others, Francis Pinçon and his younger brother Vincent, pilot of the vessel *Nina*, signalled to Columbus, on the 12th of October, 1492, to steer to the south-west. Columbus, who was on a westerly course, would have encountered the gulf stream in its fullest force, and directly thwart hawse, and he would have crossed that liquid wall only with the greatest difficulty. He would have perished, or would have made such little way that his discouraged crew would have mutinied. On the contrary, the Pinçons, who probably had collected some traditions on the subject, steered as though they were well acquainted with the current; they did not attempt to cross it in its force, but keeping well to the southward, crossed without difficulty and made the exact spot where the trades blow directly from Africa to America in the latitude of Haiti. This is proved from the journal of Columbus himself, who candidly avows that he was guided by the Pinçons.

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Who first saw America? One of Pinçon's sailors, if we may put any confidence in the report of the royal enquiry of 1513.

From all this it would seem pretty plain that a good share of both the glory and the gain ought to have been awarded to the Pinçons. They thought the same, and commenced legal proceedings, but the king decided in favor of Columbus. Why? Apparently because the Pinçons were Normans, and Spain preferred to recognize the right of a Genoese, without national feeling, than that of French subjects of Louis XII, and of Francis I, to whom, as French subjects, they might some day, from fear or favor, transfer their rights. One of the Pinçons died of despair, caused by this very manifestly unjust decision.

But still, who had overcome the great obstacle of religious repugnance? Whose eloquence, tact, and perseverance, in fact set the expedition fairly afloat? Columbus, and Columbus alone. He was the real author of the enterprise and he was also its heroic conductor, and he merits the glory which his posterity preserves and ever will preserve for him.

I think with M. Jules de Blosseville (a noble heart and a good judge of great and heroic things) that in all these discoveries the only real difficulty was the circumnavigation of the globe, the enterprise of Magellan and his pilot, the Basque, Sebastian del Cano. The most brilliant, but at the same time the easiest, was the crossing the Atlantic, catching the trade wind, and thus getting to America far south of the point at which it had long before been discovered at the North.

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The Portuguese did a far less extraordinary thing in taking an entire century to discover the Western coast of Africa. Our Normans, in a very brief space had discovered the half of it. In spite of all that is said about the laudable perseverance of Prince Henry, in establishing the Lisbon school, the Venetian Cadamosto clearly proves the want of ability of the Portuguese pilots. They no sooner had one at once bold and highly gifted, in the person of Bartholomew Diaz, who doubled the Cape, than they replaced him by Gama, a noble of the king's household, and, above all, a soldier. The truth is, that the Portuguese cared more about conquests to make, and treasure to gain, than about discoveries, properly so called. Gama was brave as brave could be, but he was only too faithful to his orders to suffer no other flag in the same seas. A ship load of Pilgrims from Mecca, whom he barbarously murdered, exasperated all the hates, and augmented, throughout the East, that horror of the very name of Christian, which more and more closed Asia, alike against discoverers, for the sake of discovery, and adventurers for the sake of plunder.

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Is it true that Magellan, before his great enterprise, had seen the Pacific laid down upon a globe by the German, Behaim? No; that globe has never been produced. Had he seen, in the possession of his master, the king of Portugal, a chart which had it so laid down? It has been said, but never proved. It is far more probable that some of the adventurers who, already, for twenty years, had been traversing the American continent, had seen the Pacific, not on globes or charts, but with their own eyes. That report, which was circulated, spread admirably well with the theoretical calculation of such a counterpoise, necessary to our hemisphere, and to the equilibrium of the globe.

There is not a more terrible biography than that of Magellan. Throughout, we have nothing but combat, far voyages, flights, trials, attempted assassination, and at length, death, among the scourges. He fought in Africa, he fought in the Indies, and he married among the brave but ferocious Malays;—whom, by the way, he seems not a little to have resembled.

During his long residence in Asia, he collected all possible information, preparatory to his great expedition, to find the way by America, to the Spice Islands, the Moluccas; thus getting spices so much cheaper than by the old course. His original idea of the enterprise, was, thus, an altogether commercial one. To lower the price of pepper, was the primitive inspiration of the most heroic voyage ever made on this globe!

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The true court spirit of intrigue, reigned in Portugal in full power over everything. Magellan finding himself ill treated there, went over to Spain, where Charles V. magnificently furnished him with five ships, but not choosing to put full confidence in a Portuguese malcontent, the king associated with Magellan a Castilian. Magellan sailed between two dangers, the jealousy of the

Castilian, and the vengeance of the Portuguese, who sought to assassinate him. He soon had a mutiny in the fleet, and displayed, in crushing it an indomitable heroism, and no less barbarity. The mutineers he savagely put to death, and his Castilian colleague he put into irons. To increase his troubles, some of his vessels were wrecked. His people were unwilling to proceed with him, when they saw the desolate aspect of Cape Horn, the truly discouraging aspect of Terra-del-Fuego, and Cape Forward. The islands, which form, under the name of Cape Horn, the southern point of America, seem to have been violently rent from the continent by the fury of many volcanoes, and suddenly cooled. As the result, they present a frightfully heterogeneous mass of sharp peaks, huge blocks of granite, of lava, and of basalt, all these, grotesquely, yet frightfully, arranged, in frowning confusion, and clothed in ice and snow. [273]

All had quite enough of this at a single glance, and bold Magellan's word—"Onward!" He filled away his sails, steered now to starboard, now to larboard, then to starboard again, and at length found himself in that boundless sea which was then so *Pacific* that it then received the name which it has ever since borne; though all who have sailed upon it, well know that at times, it can comport itself in an anything rather than pacific style.

Magellan at length perished in the Philippines. Four vessels were lost. The only one which survived, was the *Victory*, whose crew was reduced to thirteen men. But among them was the great and intrepid Pilot, the Basque, Sebastian, who, in 1521, returned to Spain, the first of mortal men who had been completely round the globe.

Nothing could be grander. The sphericity of the globe was thus made matter of certainty. That physical marvel of water uniformly extended over a globe, and constantly adhering to it, that strange mechanical postulate, was fully demonstrated. The Pacific was at length known, that grand, and till then mysterious laboratory, in which, far from our ken, Nature so profoundly labors in life-creating and life-nurturing, making new rocks, new islands, new continents. [274]

A revelation, that, of immense significance; and not only of material, but also of moral significance, which gave a hundred fold increase to man's daring, and sent him forth on another daring voyage, on the boundless Ocean of the Sciences, to circumnavigate,—with more or less of success, as it may chance,—the INFINITE!

CHAPTER III.

THE LAW OF STORMS.

It is but yesterday, as it were, that we have built ships fit for southern navigation; for navigation in those seas where the long, strong, *rollers*, pile themselves, each upon each, into absolutely mountainous masses of storm-lashed waves. What, then, shall we say of the early navigators who ventured into such seas with their clumsy leewards, heavy, and yet scarcely sea-worthy cock-boats? [275]

Especially for the polar seas, whether arctic or antarctic, we need ships expressly built for such rude service. They were bold men, those who, like a Cabot, a Brentz, a Willoughby, ventured in their clumsy, ill-found, badly rigged, and scarcely sea-worthy tubs to navigate the icy seas; to dare Spitzbergen, to make Greenland by that funereal cape *Farewell*, and to coast the thousand giant icebergs in sight of which, men in our own day, a hundred Whalers have gone to pieces.

What chiefly rendered those ancient heroes so sublime was their very ignorance, their blind courage, their desperate resolution. They knew but little of the sea, and of the Heavens they knew still less; the compass, their only instructor and their only reliance, they dared the most alarming phenomena without being able even to guess at their causes. They had none of our instruments which speak to us so plainly and so unmistakably. They went blindfolded towards, and fearlessly into, the uttermost darkness. They, themselves, confess that they feared, but also, they would not yield. The sea's tempests, the air's whirlwinds and water spouts, the tragic dialogues of those two Oceans, of air and water, the striking, and, not so long since, ominous phenomena of the Aurora Borealis, all this strange and wild phantasmagoria seemed to them the fury of irritated Nature, a veritable strife of Demons against which man could *dare* all—as they did—but could *do* what they also did—nothing. [276]

During three centuries but little progress was made. Read Cook, read Peron, and you will readily comprehend how difficult, uncertain, and perilous was navigation, even up to an hour so near our own.

Cook, that man of immense courage, but also, of most lively imagination, himself confesses, as his Journal testifies, that he knew how uncertain and perilous was the profession of the seaman even so lately as his day. In his Journal, we read; "The dangers are so great, that I venture to say, that no one will dare to go farther than I have gone." [277]

Now it is precisely since then that voyages have become, at once, more distant, more regular, and less dangerous.

A great age, a Titanic age, the 19th century, has coolly, intelligently, and sternly noted all those phenomena which the old navigators braved, but did not examine. In this century it is that

we, for the first time, have dared to look the Tempest squarely, and fearlessly, and scrutinizingly, in the eyes. Its premonitory symptoms, its characteristics, its results;—each and all have been calmly watched, and carefully and systematically registered; and, then, from that registration, necessarily come explanation and generalization, and thence, the grand, bold—and, as our not very distant ancestors would have said, impious system—the *Law of Storms*.

So! What we took, what we in the old, bold, but blind day, took for matter of caprice, is really, after all, reducible to a system, obedient to a Law! So! then, those terrible facts, that made the brain swim, the boldest quail, because they *fought shadows* and *walked in the darkness*, so! then, those terrible facts have a certain regularity of recurrence, and the seaman, resolute and strong, calmly considers whether he cannot oppose to those regular attacks a defence no less regular. In brief, if the Tempest has its *science*, can we not create and use an *art*? An art not merely to survive the Tempest but even to make it useful? [278]

But our science and our art cannot be called into life and activity until we shall have laid aside our old and ill founded notion that Tempests are caused by "the caprice of the winds." Attentive observation has taught us that the winds are *not* capricious, that they are the accident, sometimes, also, the agent of the Tempest, but that, generally speaking, the Tempest is an *electrical phenomenon*, and often occurs in the absence of gales.

Romme (brother of the Conventionalist, principal author of the Calendar) laid the foundations of our very important science. English seamen had remarked that in the tempests in the Indian Seas, they sailed for days together, and yet made no headway. Romme collected and systematized all their observations, and pointed out the important fact that the same occurred in the tempests of China, Africa, and the Antilles. He also first pointed out that rectilinear winds are of rare occurrence, and that, usually, tempests have a circular character,—are, literally, a *whirl* wind. The great *whirling* tempests of the United States in 1815, and that of 1821 (the year of the great eruption of Hecla) when the winds blew from all points to a common centre, aroused philosophical attention, both in America and Europe. Brande, in Germany, and at the same time, Redfield in New York, were the next after Romme in profiting by these facts to lay down the law that, generally, the tempest is a *Whirl*-wind, advancing, and at the same time *revolving on its own base*. In 1838, the English engineer, Reid, being sent to Barbadoes after the too celebrated tempest which killed fifteen hundred people, ascertained, with mathematical precision, this double movement of advance and rotation. But his still more important discovery was that *in our northern hemisphere the tempest turns from right to left*, that is to say from East to North, and round the compass, back to East; while in *southern tempests it turns from left to right*. A most important fact to regulate the seaman's course. [279]

Reid very rightfully gave his book the bold title of—"On the Law of Storms."

But it was the law of their *Motion*, not the explanation of their *cause*; it told nothing, either, of what Storms do, or of what they are.

Here France came to the rescue. In 1840, Peltier published his *Causes of Whirlwinds*, and his ingenious and numerous experiments established the fact that whirlwinds, whether at sea or on shore, were *electrical phenomena*, in which the winds play only a secondary part. Beccaria, a full century earlier, had suspected that fact, but it was reserved for Peltier to establish the fact, by making miniature storms. [280]

Electrical whirlwinds readily take their rise in the neighborhood of volcanoes,—those ventilating pipes of the subterranean world, and therefore they are more common in the subterranean world, than in ours.

The Atlantic, open at both ends, and swept in all directions by the winds, should necessarily, have more rectilinear, and fewer circular tempests; but Piddington quotes a great number of the latter.

From 1840 to 1850, the immense compilations of Piddington and Maury were made, at Calcutta and New York. Maury is rendered illustrious for his charts, his *Directions*, and his *Geography of the Sea*. Piddington, less artistical, but not less learned, in his *Seaman's Guide*, that Encyclopedia of storms, gives the results of an infinite experience, the minutest and most precise means of calculating the distance of the whirlwind, its rate of speed, and the nature of its various waves. He confirmed the ideas of Peltier, as to the electric theory, and showed that those who had dwelt on the caprice of the whirlwind, had, in truth, completely mistaken the effect for the cause.

The old art of auguries, and science of presages, never contemptible, was most happily revived by that excellent book.

The setting of the Sun, is by no means an indifferent augury. If he set red, and if the sea retain the reflection of his blood-red rays, rely upon it, a storm is brewing, in that other Ocean—the air; if around him you see a lurid red within a white circle, and the stars are flickering, and seeming to fall, be sure that the upper regions of the atmosphere are threatening. [281]

Still worse, it is, if, upon a dirty sky, you see small clouds marshalling, like so many purple arrows, flying from all quarters to one common point, and if, at the same time, the larger masses assume the shape of strange buildings, ruined bridges, broken rainbows, and a hundred other eccentricities; then rely upon it, the storm has already commenced in the upper region. At present, all is calm, here below, but, on the horizon, you may discern the faintly flashing, and

silent lightnings. Listen attentively, and, from time to time, you shall hear the low mutterings of the distant thunder; and the waves, as they break upon the beach, seem to sob. Look out! The sea tells you, plaintively, of the coming storm. "What are those wild waves saying?" They are warning you, I repeat, of the coming storm. The wild, free birds have already taken warning, and hasten to their secure shelter in the clefts of the rocks. If they are far from land when they see, and feel, and hear, the first threatenings of the rising storm, they settle down upon your masts, and yards, and shrouds. And first among them comes that bird of evil omen, the "Mother Carey's Chicken," the Stormy Petrel. Look out, my brothers; I assure you the tempest approaches.

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Does it thunder? Be very glad of that, brother seaman; the electric discharge is taking place far above us, and we shall have the less of the tempest. It is an old popular observation, but confirmed by the science of Peltier and by the experience of Piddington and others.

If the electricity, accumulated on high, discharges itself here below, it will create circular currents, and we shall have whirlwind, fierce tempest, and, probably water spout.

This last sort of storm not uncommonly attacks you when you are seemingly quite safe in harbor. In 1698, Captain Langford, in port and well anchored, saw that he was about to be thus assailed, slipped his cable, and found safety on the open sea. Other craft, whose commanders had less freight or less daring, remained at anchor and were destroyed.

At Madras and at Barbadoes, warning signals are given to the ships at anchor. In Canada, the electric Telegraph, swifter than Nature's own electricity, sends warning of the coming storm from port to port.

To the sailor when on the broad Ocean, the great friend and adviser is the Barometer; its perfect sensitiveness gives you the most exact information of the weight with which the storm-laden atmosphere oppresses it. Usually, it tells you of nothing but fine weather; it almost seems to sleep. But at the first and most distant note of the rising storm, it suddenly awakens, is agitated, and its mercury descends, ascends, redescends. The barometer has its own tempest. Peron when at the Mauritius observed that flashes of pale light escaped from the mercury, and filled the whole tube. During gales, the sensitive instrument seems actually to breathe. "In its fluctuations," say Daniel and Barlow, "the water barometer breathed, blew, like some wild animal."

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But the Tempest advances and occasionally illuminates the horizon all around with its electric lightnings. In 1772, during the great storm in the West Indies, when the sea rose seventy feet above ordinary high water mark, the dense darkness of the night was dissipated by balls of lurid fires that lighted up every shore.

The approach of the storm may be more or less rapid. In the Indian Ocean, thickly studded with islands and obstacles, the whirlwind and the water-spout approach you only at the rate of some two miles an hour; while when they come along the course of the warm current, that comes to us from the Antilles, they travel at the rate of from forty to fifty. Their speed would, in fact, be incalculably great but for their oscillation, beaten as they are by the winds, both internally and externally.

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Slow or rapid, the fury of the tempest is the same. In 1789, in a single instant and with a single rush, the tempest dashed to pieces every vessel in the port of Ceringa; at a second rush the town was flooded; at the third it was in ruins, and twenty thousand of its inhabitants were dead. In 1822, off Bengal, a water spout was for twenty-four hours sucking up air and water, and, when it burst, fifty thousand people perished.

In different localities, different aspects of the Tempest. In Africa you have the *upas*, the fierce compound of *simoom* and *tornado*. The atmosphere seems calm and clear, and yet you feel a strange oppression of the lungs and a general anxiety as terrible as it is strange. Then a black cloud, "no bigger than a man's hand," appears on the horizon, approaches with lightning speed, lengthening, widening, and deepening as it approaches (*vires acquirit eundo*) the storm descends, and in a quarter of an hour all around is devastated, utterly ruined, and ships have utterly disappeared. Nature takes no heed of such small matters. About Sumatra and Bengal, you see in the evening or night (never in the morning) a dark arched cloud in the sky. It rapidly increases, and presently, from that dark cloud, come down flashes and sheets of pale and ghastly lights. Woe to the mariner who shall encounter the first wind that rushes from that sinister cloud; he will pretty certainly go down.

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But the ordinary form is that of a huge funnel. A sailor, who was caught in one of these terrible storms, says: "I found myself, as it were, at the bottom of an enormous crater of a volcano; all around was darkness, above a glimmering of lurid lights." That light is what is technically termed "*the eye of the Tempest*."

When the Water spout, the horrible Typhoon, empties itself, human science and human daring are of no avail. Roaring, howling, shrieking, hissing, the storm fiends are at work above, below, around the luckless vessel. Suddenly there is a dead, a quite horrible silence, and there comes forth, seemingly, from the very centre of the water spout, a blinding flash, and a deafening report, and when you, at length, recover power to look aloft, you find that mast and spars have been shivered.

Seymour tells us that, sometimes, after being caught in one of those horrible Typhoons the sailors, for a long time, have blackened nails and weakened sight. Sometimes, too, this terrible

Typhoon sucks up not only air and water, but also the luckless ship, holds it suspended in the air, and then dashes it rudely down into the watery abyss. From this terrible action and pitiless power of the Typhoon, the Chinese derived their notion of the terrible mother *Typhon*, who, hovering in the sky, picks out her victims and is ever conceiving and bearing the *Ken Woo*, whirlwinds of fire and iron. To that terrible *Typhon* they have erected temples and altars, adoring her and praying to her in the vain hope of humanising her.

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The brave Piddington had no adoration to spare for her; on the contrary, he gives her a marvellously ill name. He calls her an only too strong corsair, a pirate so strong and so tricky that there is no dishonor in getting out of her way.

That perfidious enemy sometimes sets a snare for you; tempts you with a *good wind*. Avoid that same *good wind*, turn your back to it if you possibly can. Give that dangerous companion the widest possible berth. Steer very clear of the storm cloud or it will suddenly sink you; ship, crew and cargo.

Such is the advice of the brave and skillful Piddington, and, assuredly, one would gladly take such advice. But how? It would be utterly useless if the storm cloud and the ship were brought together within narrow and land locked waters. But, in general, this enormous compound of whirlwind and water spout embraces a circle of ten, twenty, or even thirty leagues, and this gives every ship, on which a constant and intelligent look out is kept, a fair chance of keeping at a respectful distance from so redoubtable a foe. The great point to be ascertained is, *where is the centre*, the nucleus, the terrible home, of this terrible *Typhon*. And then to ascertain its rate of progression and its line of approach.

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The sailor of the present day has two excellent lights to steer by; his Maury and his Piddington. On the one hand, Maury teaches him the general laws of the air and sea, and the art of selecting and using the currents, directing him, as it were, along the streets and highways of the Ocean. On the other hand, Piddington in his small, but instructive volume, sums up for him, and places in his hands, the *Experience of Tempests*; not only how to avoid them, when possible, but sometimes when to make them useful.

And this it is that at once explains and justifies the fine sentence of the Dutch Captain Jansen. "At sea," says he, "the first impression is that of the power of nature, the profundity of the depths—and our own nothingness. On board of the largest ship, we still feel that we are constantly in danger. But when the mind's eye has penetrated the depths and surveyed the expanse, man no longer fears the danger. He rises to the true sense of the situation. Guided by Astronomy, shown by Maury along the highways and byways of the Ocean, he steers his course safely and *confidently*."

This is truly sublime. The Tempest is not abolished, it is true; but ignorance, bewilderment, that terrible bewilderment which is born of danger and darkness, are abolished. At least if the seaman of the present day perish, he will know the why and wherefore. Great, oh, very great is the safeguard of having the calm, clear presence of mind, with our soul and intellect unruffled and resigned to whatever may be the effect of the great divine laws of the world which, at the expense of a few shipwrecks, produce Equilibrium and Safety.

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CHAPTER IV.

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THE POLAR SEAS.

What most tempts man? The difficult, the useless, the impossible. Of all maritime enterprises, that to which the most persistent energy has been given, is the north western passage, the direct line from Europe to Asia. And yet, the plainest common-sense might anticipatively have told us that, given, the existence of such a passage, in a latitude so cold, so blocked up by ice, it would, practically, be useless; few would, none could, make any regular use of it. *Open this year, it is quite sure to be closed up next year.*

Remember that that region has not the flatness of Siberia; it is a mountain of a thousand leagues, horribly broken, with deep chasms, with seas, that, thawed one hour, are frozen up the next, passages between icebergs, which shift their position from time to time, open to invite you, and close to crush you. At length, in 1853, that passage was found, by a man who had got so far in, that it was safer to go ahead, than to recede, and who, therefore, went daringly and desperately forward, till he found that which he sought. Now we know what that passage is; men's minds are calmed down; we know that there is such a passage, and we have not even the smallest desire to make use of it.

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When I spoke of that passage, as being *useless*, I spoke of it as a commercial highway. But in following this commercially useless enterprise, we have made many very useful discoveries for Geography, Meteorology, and the magnetism of the Earth; just as silly Alchemy, has done so much for wise, and admirably useful Chemistry.

What was the original idea? To open a short way to the land of gold, to the East Indies. England, and other powers, jealous of Spain and Portugal, reckoned upon surprising them in the very heart of their distant possessions, in the very sanctuary of wealth. From the time of Queen

Elizabeth of England, adventurers having found, or stated that they found, some portions of gold in Greenland, searched into, and made bold use of the old Northern legend of *treasure hidden beneath the Pole*; mountains of gold, guarded by Gnomes, &c., &c. And the legend inflamed men's minds. Upon so reasonable a notion, sixteen ships were sent out, having on board the sons and hopes of the noblest families. There was quite a competition as to who should have leave to go in quest of that Polar Eldorado; and those who sought it, succeeded in finding only hunger, icy barriers, suffering, and—Death! But that check was unavailing; during three hundred years, explorers, with a perfectly marvellous perseverance, continued to explore, to fail, to be martyred, and to die. Cabot, the earliest of them, was only saved by the mutiny of his crew, who would not allow him to go any farther. Brentz died of cold, and Willoughby of famine. Cortereul lost all, property, and life; and Hudson was set adrift by his men, and, as he had neither sails nor provisions, it is but too probable that he perished miserably, though his fate was never precisely ascertained. Behring, in finding the strait which separates America from Asia, perished of fatigue, cold, and want, on a desert island. In our own day, Franklin perished, in the ice; he and his men having been reduced to the most horrible cannibalism.

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Every thing that can discourage man, is combined in these Northern voyages. Considerably before the Polar circle is reached, a cold fog freezes upon the sea, and covers you with hoar frost; sails and ropes are icy and stiffened, the deck is one sheet of glare ice, and every manœuvre is a work of immense difficulty; and those moving shoals, the icebergs, that are so much to be dreaded, can scarcely be made out at the distance of the ship's length. At the mast-head, the look-out man, an actual living stalactite, every now and then warns the watch upon deck of the approach of a new enemy, a huge white phantom, a terrible iceberg, often from two to three hundred feet out of the water.

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But these preliminary horrors, which announce to the seaman his approach to the world of ice and suffering, so far from deterring, increase his desire and determination to proceed. In the mystery of the Pole, there is, I know not what, of sublime horror and heroic suffering. Even those who have only gone as far North as Spitzbergen, retain in memory a profound impression of its drear and horrible sublimity. That mass of peaks, chains, and precipices, which, for four thousand five hundred feet, rears its icy front, is like a gigantic apparition, in that gloomy sea. Its glaciers flash forth living lights, dazzling flashes of the most brilliant colors, green, blue, and purple, contrasting marvellously with the uniform whiteness of the snow. During the nights, whose duration is not of hours, but of months, the *Aurora Borealis*, every now and then lights up the dreary scene in the strange splendors of a sinister illumination; vast and terrible bale fires, that, from time to time, light up the whole horizon, forming, with their magnificent jets of lurid lights, a fantastic Etna, that throws temporary and illusive light on that scene of eternal winter.

All is prismatic in an atmosphere surcharged with icy particles, where the air is full of mirrors and little crystals. Hence, the most astonishing mirages, rendering one uncertain whether he may take the evidence of his own eyes as to the reality of any thing that he thinks he sees. Merely aërial reflections and colored mists appear solid masses, castles, cathedrals, islands,—anything; and what you see upright at one moment, is upside down a moment afterwards. The strata of air which produce these effects, are in constant revolution, the lightest ascends above the others, and in an instant the mirage changes form, color, size, and character. The slightest variation of the temperature, lowers, raises, or slopes, the huge mirror; the image becomes confounded with the object; they separate, disperse, another succeeds, and then a third, pale and feeble, appears, to disappear in its turn.

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It is a world of illusion. If you love to dream; if, especially, you love day-dreaming, with fancies wild or tender, go to the North, and there you will see real, yet no less fugitive, all that your waking dreams have ever painted. In that world of mirages, the atmosphere will put all your "castles in the air" to utter shame. No style of architecture but that magical atmosphere can imitate. Now you have the classic Greek, with its porticos and colonnades; anon, Egyptian obelisks appear, the one pointing high and sharp, towards the sky, the other lying prostrate, and in twain, at the base of the former. And, then, mountain upon mountain appears, Pelion upon Ossa, a whole city of giants, with Cyclopean walls, which change into the circular sacrificial stones of the Druids, with dark, mysterious caves beneath. Finally, all disappears; the wind rises, and the mists and atmospheric reflections are dispersed. In this veritable world of the upside down, the law of gravitation is repealed, or, at the least, disregarded; the weak and the light, carrying the strong and the heavy; a spacious church is seen on the top of a slender spire, an Egyptian pyramid whirls, dances, upon the sharply pointed apex; it is an eccentric, a mad, school of art, where you pass at once from the beautiful to the terrible, from the terribly sublime to the absurdly fantastic.

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Sometimes a terrible incident occurs. Against the great stream, which flows majestically and slowly from the north, there suddenly comes, from the south, a huge iceberg, whose base is some six or seven hundred feet below the water. It is impelled by the strong under-tow, and advances so swiftly that it dashes aside, or to pieces, whatever it happens to encounter. Arrived at the plain of ice, this moving giant, this terrible iceberg is not at all embarrassed. Thus, Duncan, writing in 1826, describes a scene of the kind—"The field-ice was broken up for miles in less than a minute, with reports loud as those of a hundred pieces of artillery. As the mountainous heap approached us, the space between it and us was filled with the mighty masses, into which the shock of her collision had broken up the massive field ice. We should assuredly have perished, but the huge mass suddenly sheered off to the northeast, and we were saved."

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It was in 1818, after the European war, that this war against nature, this search after the

north-western passage was resumed. It opened with a serious and singular event. The gallant Captain Ross, being sent with two ships into Baffin's Bay, was completely deceived by the phantasmagoria of that world of spectral delusions. He distinctly saw, as he thought, a land which has never existed, maintained that if he proceeded he would certainly lay the bones of his ships on that non-existent shore, and actually returned to England. There he was laughed at, and accused of timidity, and he was refused by the Admiralty, the command of another expedition, which he solicited, in the interest of his honor. Sir Felix Booth, a London distiller and liquor merchant, more liberal than the British Government, presented Ross with a hundred thousand dollars, and Ross returned to the North, determined to pass or die. Neither the one nor the other was granted to him! But he remained during I know not how many winters, forgotten, in those terrible solitudes. He had all the appearance of a mere savage, so long and so horrible was his destitution, when he was saved by some whalers, who, when they first saw him, asked him if he had, by any chance, fallen in with *the late Captain John Ross!*

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His Lieutenant, Parry, who confidently believed that he could pass, made four attempts to do so; trying first by Baffin's Bay and the West, and then by Spitzbergen and the North. He made some discoveries by boldly pushing forward in a sledge-boat; a sledge on the ice, and a boat in the water. But the ice always defeated his bold attempts, and he was no more successful than Ross.

In 1882, a brave young Frenchman, Jules de Blassville, conceived that France, in his person, might win the glory of discovering the north-west passage. He risked, at once, money and life; and purchased death. He could not even get the selection of a proper ship. They gave him the *Lilloise*, which sprang a leak on her very first day out, and he had her repaired and refitted, at his own cost of about eight thousand dollars. In this unsafe vessel, he sailed for the iron-bound coast of Greenland. According to all appearance, he did not get even as far out as that. He has never since been heard of, nor has any portion of his unseaworthy vessel been picked up. Most likely she foundered, with all hands on board.

The English expeditions have been fitted out in a very different style; every thing was provided that prudence could suggest or liberal-expenditure supply; yet they succeeded no better. The gallant, scientific, and ill fated, Franklin, was blocked in by the ice in 1845. For twelve years from that date the English, with an honorable persistence, sent out expeditions in search of him. And not England alone; France and America no less honorably assisted, and both those great nations lost some of their brightest and best in the brave, though fruitless, search. Side by side with the name of Franklin, as connected with the icy peaks and capes of that desolate region, our Belliot, and others, must be named, who devoted themselves in hope to save him. And, on the other hand, Captain John Ross offered to organize and lead an expedition to search for Blainville. Dark Greenland is connected with a host of such brave, sad reminiscences, and the desert is no longer quite a desert when connected with such touching testimonies of *human brotherhood*.

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There is something very touching in the persistent belief, the inflexible affection, of Lady Franklin. She could not, would not, believe herself widowed, but incessantly besought for further search after her brave husband. She vowed that she was quite sure that he still lived for his country and for her; and so well did she impress her own belief upon the Admiralty board, that, seven years after he was completely missing, he was officially named, not as *Captain*, but as Vice Admiral. And she was right; he was then still living. The Esquimaux saw him in 1850, and he had then sixty of his men with him. Very soon after he had only thirty, and those so worn by fatigue and want that they could not hunt, or even walk, and as each one died he was eaten by his far more wretched survivors. If Lady Franklin's advice had been duly attended to, her brave husband and most, perhaps all, of his men would have been Saved. For she said—and the soundest sense dictated her words—that he should be sought for to the southward, inasmuch as it was to the last degree improbable that in his desperate situation he should aggravate it by proceeding towards the North. But the Admiralty, perhaps more anxious about the north-west passage than about the lost Franklin, persisted in sending expeditions to the North, and the afflicted lady did for herself what the Admiralty would not do for her. At a great expense, she fitted out a vessel to search to the southward of his last known or presumed position. But it was already too late. Only the bones of Franklin were found.

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In the mean time longer, but more successful, voyages were made towards the South pole. There we do not find the same commingling of land and sea, ice and tempestuous thaws, that make up the great horror of Greenland. There is a boundless sea of immense and mighty waves, and a glacier far more extensive than ours of the North. Very few islands; those which have been seen, or, rather fancied, have most probably been only shifting and wandering icebergs. Everything there varies with the varying character of the winters. Morel in 1820, Weddell in 1824, and Ballery in 1839, found an opening, and made their way into an open sea, which none since have been able to find.

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The French Kerguelen and the English James Ross have, undoubtedly, discovered lands. The first, in 1771, discovered the large island which he named after himself, but to which the English have given the appropriate title of *Desolation*. Two hundred leagues in length it has some excellent ports, and, in spite of the severity of the climate, it is tolerably prolific in seals and birds, with which a ship can be plentifully provisioned. That glorious discovery which Louis XVI., on his accession, rewarded with a peerage, was, subsequently the ruin of Kerguelen. False charges were brought against him, and the rivalry of noble officers overwhelmed him, jealous rivals with a hateful intrepidity, bearing false witness against him. It was from a dungeon of six feet square that, in 1782, he dated the narrative of his discovery.

In 1838, America, France, and England each fitted out an expedition in the interests of science. The illustrious Duperrey had pointed out the way to important magnetic observations, and it was desired to continue them under the very pole. The English expedition, with this object, was entrusted to the command of James Ross, nephew and lieutenant of the Captain John Ross of whom we have spoken. It was a model expedition for which everything was foreseen, and provided, and James Ross brought back his crew without having lost a man, or even had a man sick.

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The American Wilkes and the French Dumont d'Urville were not thus admirably fitted out; and perils and sickness scourged them fearfully. James Ross, more fortunate, doubled the Arctic circle and found real land; but he confesses, with a really admirable modesty, that he chiefly owed his success to the admirable manner in which his government had fitted him out. The *Erebus* and the *Terror* with their powerful machines, their ice saw, and their iron shielded prow, cut their way through the ice till they reached an open sea abounding in birds, seals, and whales, and lighted up by a volcano of twelve thousand feet in height, a northern Etna. But no vegetation, no landing place, but an enormously high and sharply scarped granite upon which not even the snows could retain their hold. But it *was* land; not a doubt of that. That Polar Etna, which they named after their good ship *Erebus*, is there to prove it.

A terrestrial nucleus, therefore, is girdled by the arctic sea.

April and May of 1853, were a grand date in the history of the arctic pole.

In April that passage was found which had been so perseveringly and vainly sought for during three centuries. The discovery resulted from a bold stroke of desperation.

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Captain Maclure having made his way in by Behring's strait was, for two years, shut in by the ice. Finding it impossible to return, he determined, at all hazards, to push forward. He did so and in only forty miles further found himself along side of English ships in the Eastern ocean. His boldness saved him and the great problem was at length solved.

At that very time, May, 1858, New York sent out an expedition for the extreme North. A young naval surgeon, Elisha Kent Kane, only about thirty years old, but who had already sailed far and wide, announced an idea which greatly excited the American mind. Just as Wilkes had proposed to find a world, Kane proposed to find a sea, an open sea, under the pole. The English, in their routine, had searched from East to West; Kane proposed to sail due North and take possession, for his country, of that, as yet, undiscovered open polar sea. The bold proposal was enthusiastically hailed. Grinnell of New York, a great ship owner, princely alike in fortune and in heart, generously gave two ships; learned societies, and not a few of the general public, assisted with pecuniary contributions, with a perfectly religious zeal made up and contributed warm clothing. The crews, carefully selected from volunteers, were sworn to three things; to be obedient to orders, to abstain from spirituous liquors, and from profane language. A first expedition failed, but its failure daunted neither Mr. Grinnell nor the American public; and a second was fitted out, with the aid of certain English societies, who had chiefly in view the propagation of the gospel or a final search after Franklin.

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Few voyages are more interesting than this second one of Kane's. We can readily understand the ascendancy which young Kane acquired over his followers. Every line of his book is marked by his strength, his brilliant vivacity, and his practical exemplification of the bold American watchword—*Go ahead*. He knows every thing; is confident of everything; prudent, hopeful, more than hopeful,—positive. Every line tells you that he is a man to be conquered by no obstacle. He will go as far as mortal man can go. The combat is curious between such a character and the pitiless and icy North, that rampart of terrible obstacles. Scarcely has he sailed when he is already seized by the cold hand of winter and detained for six months amidst the ice. Even in the spring he had a cold of seventy degrees! At the approach of the second winter, on the 28th of August, nine out of his seventeen men, deserted him. But the fewer his men and resources, the bolder and sterner he became, being determined, as he tells us, to make himself the better respected. His good friends, the Esquimaux, who hunted or fished for him, and from whom he is even compelled to take some small objects, stole three copper vessels from him. In return he kidnapped two of their women. An excessive and savage chastisement. It was hardly prudent to bring these poor creatures among the eight seamen who still remained with him; all the less prudent when we consider that discipline was already so much relaxed. They were married women, too. Siver, wife of Metek, and Aninqua, wife of Marsiqua, were in tears for five days. Kane laughed at them and makes us laugh too, when he says: "They wept and made terrible lamentation; *but they did not lose their appetite*."

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At length their husbands and friends took back the stolen articles and took all that had passed in good part, with the native good sense of men who had no weapons, but sharpened fish bones, to oppose to revolvers. They agreed to every thing and promised the utmost friendship and most faithful alliance. A week after, they disappeared and we may easily imagine with what feelings of friendship! Of course, wherever they went, they would warn the natives to shun the white man. And thus it is that we close the uncivilized world alike against ourselves and civilization.

The sequel is sad. So cruel are the sufferings of the seamen that some die and others want to return. But Kane is of quite another mind, he has promised to discover a new sea, and discover it he will. Plots, desertions, treacheries, all add to the horrors of his situation. In the third winter he must have died, destitute as he was of food and fuel, had not other Esquimaux supplied him with fish; he aiding them by hunting. In the mean time some of the men, who had been out exploring,

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had the good fortune to find that sea about which he was so anxious. At least they reported that they had seen a vast extent of open unfrozen water, and, all around, birds which seemed to find there the shelter of a less severe climate.

That was enough to warrant the return. Kane, saved by the Esquimaux, who took no advantage either of their superior numbers or of his extreme destitution, left there his vessel frozen up in the ice.

Weak and exhausted, he yet contrived, in eighty-two days, to get back to the South. But he got back only to die. That intrepid young man, who approached nearer to the pole than any other man had ever done, dying, carried off the prize which the learned societies of France laid upon his tomb—the great geographical prize.

In his narrative, which contains so many terrible things, there is one which seems to me to be very touching. It enables us to estimate the exceeding sufferings of such an expedition; I allude to the death of his dogs. He had some excellent ones of the Newfoundland breed, and some of the Esquimaux; they, rather than men, were his companions and his friends. During his long winter nights, those nights of months, they watched around his ship, and when he sallied out in the dense darkness he recognized the brave brutes by their warm breath as they came and licked his hands. [305]

The Newfoundlanders were the first to grow sick. He fancied that they suffered less from the cold than from the privation of light; when the lanterns were shown to them they seemed to revive. But, by degrees, a strange melancholy grew upon them, and they went mad. Next followed, in the same sad course, the Esquimaux dogs, and none remained but his little slut, Flora, *the wisest* little thing—as he calls her—and she neither went mad nor died. I believe this is the only point, in his fearfully interesting narrative, at which you can perceive that that brave, stern heart, for an instant sank.

CHAPTER V.

MAN'S WAR UPON THE RACES OF THE SEA.

On reviewing the whole history of Voyages, we are impressed by two quite contrary feelings:

1. We admire the courage and genius with which man has conquered the seas, and dominated his whole planet.

2. We are astonished to find him so unskilful in all that concerns the conciliation of the inhabitants of the various seas and lands, that he has conquered. Every where, the voyager has gone, as the enemy of the young populations, whether human or brute, whether terrestrial or maritime, which, properly treated, would have been, each in its own limited sphere, so servicable to him. Man, as to the globe on which he has made such grand discoveries, is like a musical novice, before some immense Organ, from which he can produce but a few notes. Emerging from the middle ages, after so much of philosophy and theology, he still remained barbarous; of the sacred instrument, he only knew how to break the keys. [307]

The gold seekers, as we have seen, sought only gold, nothing but that; man they pitilessly crushed. Columbus, though the last of them, shows this with a quite terrible plainness and simplicity, in his own journal. His words make us shudder, anticipating, prophesying, as they do, what would be done by his successors. No sooner has he landed in Haiti, than he enquires, "where is the gold? Who has got gold?" The natives smiled, in their innocent astonishment, at this fierce desire for gold. They promised him that they would search for it for him, and in the mean time, gave their rings and ornaments to satisfy the earlier, that eager appetite.

He gives us a most touching description of that unfortunate race, so interesting for its beauty, its kindness, and its tender confidence. But the Geonese, touchingly as he described that people, had his own mission of avarice, his hard, stern habits of thought. The Turkish wars, the atrocious galleys, and their wretched slaves, piracy and manstealing, were the common life of that day. The sight of that young, unarmed community, those poor, naked children, and lovely and innocent women, inspired him only with the horrible mercantile thought, that they might be very easily enslaved.

He would not, however, consent to have them carried away from the beautiful island; they and it, belonged, said he, to the King and Queen, Ferdinand and Isabella. But he said these darkly and terribly significant words—"They are timid and well fitted for obedience. They will do whatever they are ordered to do; a thousand of them would retreat before three or four of ours. If your Highnesses give me the order to carry them off or to enslave them here, there is nothing to hinder it; fifty men will suffice to do it." Thus wrote he in his Journal, or Despatch, of 14 and 16, December. [308]

Presently came from Europe the wholesale sentence of that whole poor innocent people. They were ordered to be the slaves of gold—all subjected to compulsory labor, some to seek gold, and others to feed the goldseekers.

Columbus confesses that in twelve years, six sevenths of that once happy population had

perished; and Herrera adds that in twenty-five years, that population had fallen from a million of souls to fourteen thousand.

What followed, is only too well known. The gold seeker and the planter exterminated the natives and incessantly replaced them at the expense of the negroes. And what has been the consequence? That in the low, hot, immensely fecund countries, the black race alone, are permanent. America will belong to that race; Europe has achieved precisely the opposite of that which it intended.

Every where, in all directions, the colonizing impotency of Europe has displayed itself in America. The French adventurer has not survived; he took thither no family, and did take thither all the worst vices of his native land. As a natural consequence, instead of civilizing the barbarians, he added their vices to his own, and sank to their barbarous level. With the exception of two temperate countries into which they went *en masse*, and in families, the English have not been much more successful than the French in planting their race permanently and healthily in transmarine colonies. In another century, India will scarcely know that the Englishmen once lived there. Have the Missionaries, whether Catholic or Protestant, made any converts? Dumont, the thoroughly well-informed Dumont, tells me—"not one!"

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Between them and us, there are thirty centuries and thirty religions. Try to force their intellect, and the result will be that which the truly great Humboldt observed in those American villages which are to this day called "*Missions*;" that, having lost their own native energies and traditions, without acquiring ours, they will sink into a sort of stupefaction, become merely so many children of a larger growth, alive in body, but dead in mind,—all but idiots, useless alike to themselves and to others.

Our voyages, upon which we moderns, and more especially the learned, so plume ourselves, have they been really, or at all, servicable to the savages? I really cannot see it. While, on the one hand, the heroic races of North America have perished of hunger and wretchedness, the soft, effeminate, gentle races of the South, perish, too, to the great shame of our seamen, who, in that distant part of the world, have thrown off even the very mask of decency. Population at once kindly and weak, in whom Bourgainville discerned such excess of complaisance, among whom the English Missionaries have gained much profit, but not a single soul,—kindly and weak people, they are perishing miserably beneath the double scourge of the worst vices and the most loathsome diseases of the old world.

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Formerly, the long coast of Siberia was well peopled. Under that terribly hard climate, the nomadic natives hunted the richly, the preciously, furred animals which at once fed and clothed them. The Russian despotism, at once strong and senseless, compelled them to adopt the settled life of agriculturists, in a climate, and upon a soil, where agriculture is an absurdity, an impossibility. The consequence is that these peoples have gradually died off. On the other hand, the trading spirit, that greedy and insatiable devourer, has refused to spare the brutes in their breeding seasons, and as a necessary consequence, the brutes have disappeared with the men; and now, for a thousand miles along that coast, you have a terrible solitude, where man hunts not, and where the brutes are not. The winds may whistle shrilly, the frost may be bitter and biting as ever, but there is neither man nor beast to listen to the one or to shudder beneath the other.

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Had our voyagers to the North been truly wise, their very first care should have been to form a good, firm friendship with the Esquimaux, to mitigate their miseries, to adopt some of their children and have them well instructed in Europe, and thus lay the foundation of a great indigenous race of discoverers. We learn from Captain John Ross, and from not a few others, that they are very intelligent, and very readily acquire the knowledge and the arts of Europe. Marriages would have been contracted between European sailors and the native women; a mixed population would thus have sprung up, to which all that northern portion of the American continent would have been "native and to the manor born." And that would have been the, at once, safe and sure way of discovering the much coveted North-western passage. Thirty years—a single generation—would have done it effectually—and in three hundred years it has been done only uselessly because you have terrified those poor savages; because you have destroyed alike the man of the soil and the *Genius Loci*. What is the use of merely seeing that desert, when, in the very act of seeing it you make it either depopulated or hostile?

We may be quite sure that if man, civilized man, has thus ill treated his uncivilized brother man, he has been neither more friendly nor more merciful for the brutes. He has converted the gentlest and the most affectionate of them forever, irreclaimably, into savage and merciless foes to man. And man, civilized man, has done this. All the old authors concur in telling us that when these poor brutes first (most unluckily for themselves!) made the acquaintance of man, they exhibited nothing but the most confident and inquisitive sympathy. He could walk past and through whole families of Sea Cows and Seals, and they never fled from him. The Penguins, and their kindred species, followed him, begged a share of his shelter, yea, even nestled at night beneath his garments.

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Our forefathers, quite justly, believed that, to a very great extent, the animals feel and love, even as we do. Certain it is that they have a singular and very decided taste for music. The very Shad, simple as they seem, will follow you to the sound of bells; Valence tells us; and Noël tells us that he has often seen the poor Whale, the Joubarde roll and frolic around the bark, delighted with the music, and, fearless of the *man*!

What the poor, dumb creatures most enjoy; what they most possess of intelligent life; what they have most been deprived of by dint of human and very cruel persecution;—is the right, the security, the sanctity of marriage! Fugitive and isolated, they now only retain that which we, most cruelly, have left to them; temporary concubinage, that miserable temporary concubinage which makes sterile every creature that is subjected to it.

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Marriage, fixed, settled, faithful, is the very life of nature,—and we find it in even the poorest living tribes on which man's tyranny has not yet imposed unnatural laws. The Roebuck, the Pigeon, that prettiest of the Parrot family, the "Love Bird," and hundreds of other species, which we, in our profound ignorance and fancied learning, despise, have this instinctive love of marriage. You may notice that, even among the other and wilder birds and beasts, the matrimonial tie is inseparable, at least, until the young family is old enough to take care of itself.

The Hare, in its timid and ever anxious life, the Bat, that strange prowler in the dark night hours, are very very tender of their families. The Crustaceæ, even, nay, even the very Poulpes have their marital affection; take the female and the male is sure to be there, to combat vainly, and to be taken with her.

How much more, then, shall Love, the Family, *Marriage*, in the true sense of that word, exist among our gentle, truly gentle, till brutally persecuted, amphibious creatures! Slow, sedentary, attached to home, how natural, how inevitable it is, that, the male should be true to his mate,—and she to him! Among them the husband will die for, or with, the wife, either for the young one. And, among them, too, we find what we too often, only in vain look for among what we presumptuously term the higher animals, the young one will boldly leave its shelter and fight for the mother that has previously rescued him.

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Steller and Hartwig mention a strange, an almost human scene enacted in the family of the Otarie, another amphibious creature. The female had allowed her young to be stolen from her. The male, furious, beat her severely, and she grovelled and wept.

The Whales, which have not the fixed abode of the amphibii, yet cross the Ocean in couples. Duhamel and Lacepede say, that in 1723, two Whales being attacked kept firmly side by side. One of them being killed, the other, with terrible moanings of mingled despair and grief, of sympathy and rage, threw itself upon the dead body of its mate and died, rather than retreat. If there was in the world one being which, even more than any other ought to have been spared, it was the free Whale, that admirable creature so abounding in value; that most inoffensive of all the creatures of the Ocean whose very food is different from that of man. Excepting its terribly strong tail, this creature has not even a weapon of defence. And, then, the poor thing has such a host of enemies! Every one and everything seems to be hostile to it. Its parasites establish themselves, not only on, but in its vast gnawing, even its very tongue. The Narvel, with its terrible tusks pierces it, the Dolphins gnaw it, and the bold, ever hungry, swiftly swimming, Shark tears huge bleeding morsels from it.

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And, then, there are two blinded and ferocious foes that, in most dastardly fashion, thin that inoffensive race even anticipatively; killing the pregnant mother. First, there is the horrible Cachalot, whose head makes a full third of its entire frame. This horrid creature, with its crushing jaws, armed with forty-eight teeth, literally eats the unborn young one. Man, still more cruel, causes the poor creature a more prolonged suffering. The cruel harpoon, plunged again and again into that quivering and sensitive body inflicts suffering, such as we cannot even think of, without blushing for that human nature of which we so often and so unblushingly boast.

Dying slowly, and in the long agony of many wounds, and of many convulsions, she writhes, shudders, lashes the sea into a mad foam with her terrible tail, and, even as she dies, feels about with her poor hand-fins, as though striving once more to embrace and caress her little one. Something dreadfully human, as it seems to me, is that death scene of the poor Whale!

At this day we can scarcely even imagine what were the scenes of butchery some two hundred years ago; while the Whales swam in shoals and every shore swarmed with the amphibii. The enormous massacres polluted the ocean with blood to an extent such as our human battles, from the earliest day, cannot even begin to compare with. In a single day, from fifteen to twenty Whales were killed, and fifteen hundred Sea Elephants! And this was mere killing for the sake of killing. For what was to be done with so many of those huge creatures, each of which had so much blood and so much oil? What was the meaning of all this cruel slaughter? What the result? Just simply, to redden and pollute so many miles of the pure Ocean! To have the cold and cruel enjoyment of most brutal tyrants; to watch, with cruel eye, the lingering agonies and the fierce, but impotent struggles, of one of God's noblest and most inoffensive creatures! Peron relates, with a disgust which does him honor, that he saw a brutal sailor thus slowly and brutally butcher a female Seal. She groaned and writhed like something human; and whenever she opened her poor, bleeding mouth, he dashed the oar into it, breaking her poor teeth at every thrust.

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Durville tells us that at the new Shetland isles, in the South Seas, the English and Americans actually exterminated the Seals in four years; killing, in their blind rage, alike the newly born and parturient female, and often they killed only for the skin, losing the vast and very precious amount of oil.

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Such slaughter as that is really a disgrace to our common humanity; such butchery reveals a terrible, a loathsome, instinct, that makes us shudder as we look around upon even our best and kindest, and reflect how soon and upon what slight temptation they, too, may become cruel! On

a smiling shore and among a notably amiable people, we remember one of these murderous massacres to have taken place. Some five or six hundred Tunnies were driven into a lovely bay that they might be ignominiously murdered in a single day. The drag nets, so vast that the capstan and the bars had to be brought into requisition, to *heave*, rather than draw them in, brought the poor creatures into that beautiful bay, to them, a veritable *chamber of death*, and all around were bronzed, hardy, and cruel men, armed with harpoons and pikes. And from distances of even twenty leagues around, fair women—shame to our nature!—yea, women sat or stood to witness that truly brutal butchery. The signal is given and the dastardly butchers strike, and the pierced and bleeding victims writhe, bound, agonize—as though they were human, and pitiless woman applauds the prowess—Godwot!—of pitiless man! The waters, agitated by the vain, though mighty struggle of the victims, is polluted and discolored with blood and foam, and woman—Woman looks on this horrid scene and, when the last victim has given its last gasp, sighs deeply and departs, wearied, but not satisfied, and whispers—Is that all? And yet we call ourselves only, "a little lower than the angels!"

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CHAPTER VI.

THE LAW OF THE OCEAN.

A great and deservedly popular writer, Eugene Noël, who throws a bright, broad light upon every subject which he touches, most truly says, in his important work on Pisciculture, the following words: "We might make the Ocean an immense food-factory, more productive than even our earth itself, fertilizing and supporting everything, seas, rivers, lakes, and Lands. Hitherto we have cultivated only the lands—let us now cultivate the waters. Nations! Attention!"

More productive than the land? Eh! How is that to be?

M. Baude explains the matter very clearly, in his recently published and very important work on Fishery. He shows very clearly that, of all creatures, the fish consumes the least, and produces the most. Merely to keep that creature alive, nothing, or next to nothing, is required. Rondelet kept a carp three years in a bottle of water, and gave it nothing save what it could extract from that water; yet, in that time, it so increased in bulk that he could not get it out of the bottle! The Salmon, during its stay, of two months, in fresh water, scarcely feeds at all, and yet in that time scarcely loses flesh. Its stay in salt water, during the same space of time, gives it the enormous increase of six pounds in weight. How little that resembles the slow growth of our land animals! If we were to pile up into one heap all that it takes to fatten an Ox or a Pig, we should actually be astounded at the amount of food required for the like increase of weight.

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And, accordingly, those people whose demand most urgently presses upon their power of supply, the Chinese, with their three hundred millions of ever craving appetites, have directly applied themselves to the art of promoting that great power of reproduction, that richest manufacture of nourishing food. On all the great rivers of China, prodigious multitudes find in the waters, the food which they would but vainly ask from the land. Agriculture is always more or less precarious; a blighting wind, a frost, the slightest accident, can sentence a whole nation to all the horrors of Famine. But, on the contrary, the living and teeming, the exulting and abounding, harvest beneath the waters, nourishes innumerable families, and makes those families almost as prolific and abounding as itself.

In May, on the great central river of the Empire, a vast trade is done in Fish *fray*, which is bought, sold, and resold, for the purpose of stocking the fish-ponds of private persons, who feed their fish from the mere offal of the household.

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The Romans,—so long ago!—had the same wise system;—only they, sometimes, were barbarous enough to feed their fish with slaves! Bad enough, that, and to spare; but at least they left us the precious legacy of these words—"The spawn of the sea fish *can* become fish in fresh water." In the last century, a German, by the name of Jacobi, discovered, or rather, revived, the art of *artificial fecundation*; and, in our own century, and with still more productive effect, France, copying from England, has done the same thing. A fisherman of Bresse, Remy, has practised, since 1840, the art which has now become European.

Taken in hand by such men as Coste, Pouchet, &c., this art has ceased to be merely empirical—it has become a *Science*. Among other things, it has become known that there are certain regular connections between the salt and the fresh water; the fish from the former, coming, at certain seasons, to spawn in the latter. The Eel, wherever bred, as soon as it has the thickness of a needle, hastens to ascend the river, and in such numbers that it actually whitens the whole stream. This treasure, which, if properly taken care of, would give many thousands of pounds of the most nutritious food is unworthily, shamefully, destroyed; sold as so much mere manure. The Salmon is no less faithful; invariably it comes from the sea back to the river in which it had its birth. Mark hundreds of them, and not one of them shall be missing. Their love of their native river is such that they will even, (see the *Salmon Leaps* of Scotland, Ireland, and Northern England) *leap*, springing from the tail, over seemingly insurmountable obstacles! Such are the Fish!

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Upon land, we take care of our *Horses*; why not PRESERVE THE SEA? Why not *protect the*

breeding Season of the Ocean? The young and the pregnant females, should be held sacred, more especially as to those species which are not superabundantly productive, such as the Cetacæ, and the Amphibii. To kill, is a necessity of our nature, our teeth and stomach sufficiently testify to that; but that very necessity obliges us to preserve life.

On the land, we feed and protect our flocks and herds. But for the food and protection which we give to them, most of them would not exist at all, or would have been devoured by wild beasts. We have a right, or at least, a plausible excuse, for killing them, but we take care to spare the young and the pregnant.

In the seas there are still more young lives annihilated when we depart from this law of *preserving* that we may the more plentifully kill. We may, if we prudently as well as mercifully so will it, make the generation of the inferior animals, an element almost infinitely productive. In our seas and rivers, chiefly, it is, that Man appears the Magician. High time it surely is, that he should unite to his power both kindness and wisdom. He is in reality, the opponent of death; for, though appetite compels him to kill, his skill and care can create torrents of teeming life.

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As regards those precious species which, foolishly, as well as cruelly, we have almost annihilated, and especially for that greatest and most precious life of all, the Whale, there should be an absolute peace, for at least half a century. That great, that really magnificent species, will then repair its losses. Being no longer persecuted, it will return to the temperate zone, which is its natural climate, where it will find its natural food in the abounding animalculæ of the comparatively warm waters. Being thus restored to its natural climate and its natural food, it will regain its old gigantic proportions. Let the old rendezvous of their Love be held sacred, and again we shall see the Leviathan, the whale of two or three hundred feet long. Let this magnificent creature's haunts be respected, especially in its breeding season, and in half a century it would be as plentiful as of old. Formerly it abounded in a bay of California. Why not make that bay sacred to it? Then it would not seek shelter among the horrid glaciers of the pole. Let us respect their reason of Love, and enormous will be the benefit to ourselves.

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Peace! I say again; peace for the Whale, the Sea-Cow, the Sea-Elephant; peace for all those precious species which man's inhumanity has so nearly crushed out of existence. A long, a sacred peace should be granted to them; like that which the Swiss so wisely granted to the Chamois, which, when almost extinct, was thus rendered numerous as ever. For all, whether Fish or Amphibii there is needed a season of perfect rest, like the *Truce of God*, which in the olden day prevented the chivalry of Europe from butchering each other.

These creatures themselves instinctively comprehend what we either know not or neglect; for, at their season of maternity, they lose their timidity, and venture to our shores, as though certain that at such a season, they will be held sacred. At that season, they are in their greatest beauty and their greatest strength. Their brilliant color and their flashing phosphorence indicate the utmost vigor of their existence, and in every species that is not menacingly superabundant, that season of reproduction should be respected. Kill them afterwards? By all means—but pray do not anticipatively kill in the one fish a whole shoal of fishes.

Every unoffending creature has a right to the moment of happiness, to that moment when the individual, however lowly placed, goes beyond the narrow limits of his individual *Self*, and from his dark individuality, glances into and feels the Infinite Future.

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And let us aid Nature; then shall we be blessed, from the lowest depths to the starry heights; then shall we receive the blessing glance of that God who hath made both great and small, and who has commanded us to imitate Him.

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BOOK FOURTH.

THE RESTORATION OF THE SEA.

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CHAPTER I.

ORIGIN OF SEA BATHING.

The Sea, so ill treated by man, in this pitiless warfare, has been to him most generously kind. When Earth, which he loves so much, when that rude Earth wears, weakens, exhausts him, it is that so much feared, so much abused Sea, which takes him to her bosom, and restores him to new life.

And, in fact, is it not from her that life primitively sprang? She contains within her all the elements of life in a quite marvellous plenitude. Why, then, when we feel ourselves sinking, do we not repair for restoration to the abounding source of life?

That source has space and kindness enough for all, but is especially kind to the too civilized

children of men, for the sons and daughters who are suffering for the fathers and mothers, victims of mistaken or sinning Love, less culpable than the sinning parents, yet a thousand fold more punished. The Sea, that vast female, delights to restore them; to their weakness she gives her strength; and restores them young, beautiful, healthful, from the boundless stores of her wide expanse and fathomless depths. Venus, who was born of Ocean, is from Ocean reborn every moment, and not a sick, suffering, peevish, pale, and melancholy Venus, but the triumphant, Venus full of passion and certain of fecundity.

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How between this great and salutary, but somewhat rude, strength and our weakness, can there be any connection? What union can there be between elements so greatly disproportioned? That was a serious and difficult question; to solve it required an art, an initiation. To understand that question thoroughly, we must make ourselves acquainted with the time and occasion when this art first revealed itself. Between two ages of strength, the strength of the age of the Renaissance and that of the Revolution, there was a period of depression both moral and physical. The old world had died, the new one was not yet born, and the misbegotten children of worn out parents were weak and unhealthy. On the one hand, the excessive indulgence of the rich; on the other hand, the awful privations of the poor, decimated the nations, and most decimated, precisely those nations which most boasted their civilization. France thrice ruined, from base to apex, in a single century succumbed beneath the orgies of the Regency. England triumphed over our ruin, yet had death and destruction within her own bosom. Her Puritan idea had departed, and another had not yet come. Weakened by the fierce lusts of Charles II., she was still farther degraded by the paltry briberies of Walpole; and in the debasement of the Public the worst passions of the Individual came to light. The fine book of *Robinson* exhibits the horrors of the terrible Lust of Strong Drink;—a terrible book, that, in which Medicine calls to its aid all the denunciations of Religion, and denounces the gloomy suicide of celibatism.

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Anxieties, evil habits, effeminate and unwholesome life;—all these betray themselves in the softened tissues, the meagre forms, the horrid scrofula. Lovely complexions cover the most vile diseases. Anne of Austria, renowned for her extreme clearness of complexion, died of loathsome ulcer; the Princess of Soubise, that dazzlingly fair beauty, rotted, so to speak, into her grave. In England, the Duke of Newcastle asked the learned Doctor Russell why it was that the beautiful Lily and Rose concealed so much of scrofula.

It rarely happens that a worn out race recovers itself; but the English did so. For some seventy or eighty years it recovered a wonderful strength of activity. Partly it owed its recovery to its political and social disturbances,—for there is nothing so conducive to health as movement; but it must be confessed that the chief cause of its renovation was its change of habits. It changed in everything,—education, food, medicine; all were changed, for all felt that health and strength were necessary to success in anything and everything.

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There needed no great genius for such a Reform; the true theory had been propounded; all that was necessary was to make the Science an Art, to *practise* what hitherto had only been *preached*. The Moravian, Comenius, writing a century before Rousseau, said: "Return to Nature; educate according to Nature;" the Saxon Hoffman said: "Return to Nature; make her your Physician." Hoffman appeared just in time to combat the evils caused by the orgies of the Regency, evils in which the remedies were as bad as the disease, the Physician as fatal as the Quack. Hoffman truly said to his age—"Leave Doctors alone; live temperately, drink water, and you will need no medicines." That was a true moral reform. And thus among ourselves, Priessnitz in 1830, after the Bacchanalia of the Restoration imposed upon the luxurious aristocracy of Europe the coarse food of the peasant, and, in the hard northern climate, the open air bath, in snow water; that Hell of cold which, in its reaction, gives such a glow of heat. And the rich and the delicate submitted to this hard discipline; so great is our human love of life and fear of death.

And, in fact, why should not water be the safety of man? Berzelius assures us that four-fifths of our living frames are water; just as four-fifths of our globe are covered by Oceans, Seas, Lakes, and Rivers. For our arid Earth the Sea is a constant Hydropathist, curing it of its otherwise deadly dryness, and nourishing and beautifying its fruits and flowers. Strange and prodigious magician, that same water! With so little, making so much; with so little, destroying so much—destroying so slowly, but so surely!

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Gutta lapidem cavat, non vi, sed stepe cadendo;
"The plastic globule wears the rugged rock,
By frequent falling, not by sudden shock."

Water is at once the most potent and the most elastic of all forces, lending her aid to all the metamorphoses of our globe, covering, penetrating, transforming all around us.

Into what frightful desert, into what gloomy forest, will not man penetrate in search of the healing springs which boil up from the bosom of the earth? What a perfectly superstitious belief we have in those springs which bring to us the hidden and healing virtues! I have seen fanatics who had no Deity but Carlsbad, that wonderful meeting of the most contradictory waters. I have seen the worshippers of Bareges, and I confess that I have myself submitted to the gushing and sulphureous waters of Acqui in their strange and almost animal pulsations. The hot baths of earth have no medium in their action; they are either certain health or certain death. How many sufferers who might have lingered through weeks, months, or even years, have been quickly slain by them! Frequently, those potent waters give a sudden revival, and, together with health, bring back the very passions which caused disease; passions hot as the waters which revived them. The very atmosphere above these sulphureous waters is intoxicating, the *aura* of the Sybil that

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maddened her into Prophecy! An outburst which compels us to speak that which we would most conceal. And how terribly self-revealing we are in those Babels to which, under the plea of seeking health, we resort to throw aside the conventionalities, in too many cases the very decencies of Society. There, pale, worn sufferers, of both sexes, sit at the gaming table in eager passion to win gold, and, in reality, winning only an earlier Death.

Very different is the saving breath of the great Sea; in itself it is a purifier. That never ceasing interchange of the ocean of air, and the ocean of water, forbids life ever to languish. Early and late, those oceans of air and sea are at work. At every instant each passes through the crucible of death—and at every instant revives. The whirlwind and the water spout give newer and stronger life to the vexed ocean.

To live on land is to repose; to live on sea is to combat, and to combat savingly;—for those who can bear it, a Spartan training in which many perish, but those who survive are very strong. [335]

In the middle ages there was a perfect horror of the Sea. They libelled the great Sea, they called that fertile mother "the kingdom of the prince of the powers of air"—the very name which was given to Satan. The nobility of the seventeenth century would by no means consent to have its palaces near the huts of the rude seamen. The frowning castle, with its ugly and formal garden, was almost always built, as far as possible from the sea, on some place destitute of sun and air, but marvellously rich in fog and miasmata. In England it was just the same. If the manor house was on a hill, the advantage of the situation was sedulously provided against by a forest of tall trees, and quite as often, instead of being on the hill, it was in the pestilent marsh below. At the present day, England, wiser than of old, builds by the sea side, rejoices in sea baths even in winter, and is rewarded by strong health. The people of the sea coasts better knew, even in earlier times, the life-giving power of the sea. Its purifying power first struck them; they observed its power in curing scrofula of its disgusting sores, and they well knew the power of its bitterness in killing the parasite worms which, otherwise, would kill the child. They ate the Sea weed and the *Halcyonia*, well knowing that the iodine that they contain contracts and makes firm the flesh. Russell, who heard and noted these popular recipes, was thus enabled to answer the question of the Duke of Newcastle, and did so in his excellent book, published in 1750, on the use of Sea water in cases of glandular wasting. [336]

There is a great force in his sentence—"The great want is not how to cure, but how to repair, *to create*."

He proposed a miracle, but a quite possible one; to make new flesh, new tissues. And he proposed to do that chiefly with the child, who, though born of polluted parents, might yet be re-made.

It was at the same time that Bakewell, the Leicestershire farmer, *created* meat. Up to that time horned cattle were chiefly valued for their milk, from his day forth they are made to yield a more generous food. The poor milk diet, in fact, had to be abandoned by men who are compelled to be so active, so laborious, so untiring. Russell's little book, in 1750, created Sea bathing; it is not too much to say he created it, for it really was he who made it in vogue.

This whole grand theory may be summed up in a very few words:

"It is necessary to drink sea-water, to bathe in sea-water, and to eat sea-weed; clothe your children as lightly as possible, and let them have plenty of air. The Ocean breeze, and the Ocean water; there you have the sure cure." [337]

That last advice seems very bold. To have the half naked child exposed to the open air in a damp and variable climate, is, no doubt, anticipatively, to lose the weak; but the strong will survive, and their posterity will be the better brought up. Let us add that business, and navigation, by earlier relieving the boys from school, from the sedentary life of the young nobles at Oxford or Cambridge, make them a new race.

In his ingenious book, guided only by popular tradition, Russell doubtless was far enough from suspecting how, in a single century, all science would come to the aid of his theory, and that each would aid him in making of the Sea a perfect system of Therapeutics.

The most valuable elements of terrestrial life are abundantly in the sea; and science may well say to us—"Hither! Hither, worn and wearied nation, swinked laborer, failing woman, young child, fading because your parents sinned; hither! to the Sea, and the Sea shall cure you!" The universal base of life, the embryonic mucus, the living animal jelly in which man continually takes and retakes the marrowy substance of his being, is so abounding in the sea that we may call it the sea itself. Of that mucus, both marine animals and marine vegetables are made. Her generosity puts earth to shame. She is liberal to give, be ye therefore, willing to receive. [338]

"But," it maybe said, "we are attacked in the very foundation and support of our being. Our bones bend, bow, and we are weak, and tottering from their insufficient nurture." Well! The lime which they need abounds in the sea; so abounds that her madrepores build islands of it, and are at this moment building whole continents. Her fishes carry it hither and thither in such vast quantity that, washed upon every shore, it serves as a manure.

And you, young female, you who, visibly, are wasting into an early grave, repair to the sea, where every breath you draw shall be a restorative. That restorative iodine, is in every breath that blows, in every wave that heaves, in every fish that swims. The Cod alone have enough to

iodise the entire earth.

Is it animal warmth that you lack? The sea affords you the most perfect, the most equable, the most widely diffused warmth; warmth so great, in fact, that were it not diffused, it would melt the earth from Pole to Pole, and make each Pole another Equator.

The rich, warm, red blood, is the triumph of the Sea; by it she has animated and armed with mightiest strength her giants, so much mightier than mightiest giants of the earth. She has made that element, and she can remake you, poor, pale, drooping flower. She abounds, superabounds, in that rich red blood; in her children it so abounds that they give it forth to every wind. [339]

And there is the revelation of the whole mystery. All the principles, pale mortal, that are combined in you, she has in separation. She has your bone, your blood, your sap and your heat—in one or the other of her creatures, she has them all.

And she has, also, what you have not, a superabundant strength. Her breathing gives I know not what of inspiring excitement; of what we may call physical heroism. With all her violence, the great generating element inspires us with the same fiery vivacity, the same wild love, with which she herself palpitates.

CHAPTER II.

CHOICE OF COAST.

Earth is her own doctor; every climate has its own remedy. More and more will Medicine lie in Emigration. But it must be an Emigration of foresight, not one of those mad-cap, rapid, and most mischievous journeys in which the patient rushes from one extreme of climate to another, but prudently calculated to the obtaining of those vivifying aids which nature every where holds in store for those who know how to profit by them. The youth, that is yet to be born, depends upon these two things—the *Science of Emigration* and the *Art of Acclimatization*. Hitherto, man has remained a prisoner like an oyster on its rock. If he occasionally emigrates to some small distance from his temperate zone, he, for the most part, goes to die. He will only become free, really brave, when the science and art of Emigration and Climatization shall make him free of the whole globe. [340]

Few diseases are cured in the place and under the circumstances which have given rise to them; they hold to certain habits which the localities perpetuate and render unconquerable. There is no Reform, physical or moral, for those who persist in the originating vice. [341]

Medicine, guided by the auxiliary sciences, directs us in the new road to the desired end. Our emigrations must be made prudently and gradually. Can we, safely, without preparation, without alteration of diet and of habits, be suddenly removed from an inland to a maritime abode? Can we prudently take to the sea-bath until the sea breeze shall have trained our physical frame? Can we suddenly and without preparation encounter the severe shock, the horripilation of the really tremendous shock of the cold water bath in the cold open air? These questions we are glad to say are more and more being put and answered by our physicians.

The extreme rapidity of our railroad journeys is very mischievous even to the strong;—in many cases fatal to the ailing. To pass, as so many do, from Paris to the Mediterranean in twenty-four hours, passing at every hour into a different climate, is as perilous a thing as a nervous person can do. You arrive agitated, giddy. When Madame de Sevigné took a whole month to travel from Brittany to Provence, she proceeded by slow and calculated degrees from one climate to another, and its opposite. She proceeded, by slow degrees, from the maritime climate of the West into the inland climate of Burgundy. Then, travelling slowly by the upper Rhone into Dauphiny, she, with the greater safety and comfort, braved the free winds of Valence and of Avignon; then, halting awhile, and resting at Aix, in the interior of Provence, far from the Rhone and from its shores, she made herself Provençal in lungs. [342]

France has the enviable advantage of being between two seas, and thence the facility of alternating, as the disease may require, between the saline tonicity of the Mediterranean and the moister and—except in case of tempest—the far milder air of the Ocean.

On each of the two coasts there is a graduated scale of stations, more or less mild, more or less strengthening. It is very interesting to observe, and very useful to follow, this double scale,—proceeding, as a general thing, from weaker to stronger.

The climate of the Ocean parting from the strong, rough, ever-heaving waters of the channel, becomes extremely mild at the South of Brittany, milder still in the Gironde, and mildest of all in the land-locked basin of Arcachon.

The air of the Mediterranean, which we may call circular, has its highest note in the dry, though keen, climate of Provence and Genoa, becomes more mild as you approach Pisa, milder and less variable in Sicily, and at Algiers attains a wonderful mildness and regularity. And on your return be sure of a balmy air at Majorca and the little ports of the Rousillon, so well sheltered from the harsh north wind. [343]

The Mediterranean commands our admiration by two characteristics; the beauty of its shores and the brilliant purity of its sky and atmosphere. Very salt, very bitter is that sea; but what a glorious blue sky is above it! It gives out by evaporation about thrice as much water as it receives from all its tributary rivers. It would become all salt, like that terrible Dead Sea, but for the lower currents, the under-tow, like that from Gibraltar, for instance, were not constantly tempering it with the waters of the Ocean.

All that I have seen of its shores are beautiful, though somewhat stern. Nothing common-place about those shores. The volcanic, the lurid bale fires of the lower earth, have everywhere made their mark upon the upper earth; those dark Plutonic rocks are never tiresome like the marshy sands of other shores. If the famous Orange woods sometimes seem somewhat monotonous, they compensate you when here and there, a sheltered spot, you find the true African vegetation, the Aloe and the Cactus, the hedge of Myrtle and Jessamine, and the wild and perfumed landes. Above, it is true, bald and frowning mountains loom, and their long offshoots run even into the very sea.

"It seemed to me," said a traveller, "that I was between two atmospheres; the air above, and the air below." He describes the varied world of plants and animals which were reflected by the crystal mirror of that deep blue sea of Sicily. I was less fortunate off Genoa, where, gazing into the depths, I saw nothing but a desert. The dry and sterile rocks, the volcanic framing of the shores, dark as midnight, or of a still sadder and more ghastly and ghostlike white, showed me nothing but antique sarcophagi—reversed churches, reminding one, at times, of the cathedrals of Florence, or the leaning tower of Pisa. Sometimes, also, I seemed to see "strange monsters of the deep." Whales? Elephants? I do not know; but of real life not a trace. [344]

Such, however, as that beautiful sea is, it admirably nerves and hardens the dwellers on its shores, and the sailors on its bosom; it makes at once the most fiery and the most solid of races. Our giants of the North, are, perhaps, stronger, but certainly are not more enduring, and, as certainly, they do not so readily, or so safely acclimatise, as the seamen of Genoa, of Calabria, or of Greece, bronzed as they are, not by an accident of the skin, but by the permeation, the imbibation of the Sun's rays. A friend of mine, a learned physician, sends his pale patients from Paris or Lyons to take their Sun-baths in the South, and himself lies nude on the rocks, for hours together. He has only his head covered; as to all the rest of his person, he is bronzed as an African. [345]

The really sick will go to Sicily, to Algiers, to Madeira, in search of health. But the restorative of the pale, worn populations of our great cities, is best to be found in the more varied and more strengthening climates of the country which has given to Earth its most iron humanity, its heroes by sea and by land, and in the council chamber—that truly iron race of the Columbuses, the Dorias, the Massenias,—and the Garibaldiis.

Our extreme Northern ports, Dunkirk, Boulogne and Dieppe, where the winds and waters of the Channel meet, are also a great nursery of renewed life, and restored strength. That great breeze and that great sea, might recall one from the grave. You may see there perfectly incredible recoveries. Go there without any real and vital wound, and you recover on the instant. The whole human machine acts strongly; digests well, breathes freely. You need not even strive for health when there, for nature says to you, as Tully said to Atticus, *Jubeo valere,—I command you to be well*. The sturdy vegetation that flourishes upon the very margin of the sea, seems to rebuke our weakness. Each of the little ports which pierce our Norman coast, is swept by the nor' westerly wind, which strengthens and revives us; but grows less violent, though not less salubrious, at the mouth of the Seine, beneath the fruitful orchards of Honfleur and Trouville. The good river, sweeping away to the left, carries with it a softer and gentler air. Higher up, you meet the strong, the sometimes really terrible, sea of Granville, Saint-Maloës, and Cancale, about the best of naval schools for young folks, a school which will make the strong still stronger. [346]

But if, on the contrary, we have to deal with some weakling, some young child, born to weakness, or some young mother, made weak by too frequent parturition, we must select some milder shelter. And such a warm and always calm shelter, you will find, without going further South, among the sleepy little isles and peninsulæ of Morbihan. These isles form a labyrinth more perplexed than that in which the English king sheltered his fair Rosamond. Entrust your own treasure to that shelter, and none shall know of her save the Druidic rocks and the handful of fishermen who inhabit those at once wild and gentle shores. Does some gentle patient ask us on what people live, in those marine solitudes? We reply, upon Fish, Fish—still Fish! It is not far from St. Gildas, where the Bretons assure you that Heloise sought her Abelard. They contrive to live there as cheaply and as well as Robinson Crusoe and his man Friday.

Places more civilized and attractive are to be found farther South, such as Pornice, Royan, Saint George, Arcachon, &c. [347]

I spoke elsewhere of Saint George's, bordered by many a bitter and precious plant; and Arcachon, too, is as attractive, with its resinous and wholesomely pleasant odor of its pine woods. But for the worldly rush from that great and Wealthy Bordeaux, but for that flood of health seekers, which pours into it at certain seasons, it is at Arcachon that we would shelter the dearly beloved patient, that dear and delicate creature for whom we fear the rush and crush of the hard working day world. That place, as long as we contemplate it only within the inner basin, offers the contrast of an absolute and very deep calm with a terribly rough sea close by. Beyond the lighthouse is the terrible Gascon sea, within the bay a lazy tide, so lazy that you cannot hear its murmurs, as low, as light, as the quiet tread of lady's gentle footstep on the sea-weed carpet of

that strand.

In an intermediate climate which is neither North nor South, neither Brittany nor Vendée, I have visited again and again, and always with pleasure, the pretty and staid shelter of Ponice, with its frank seamen and its pretty girls, with their conical hats. It is a pretty quiet little place, which, protected as it is by the island (rather the peninsula) of Noirmantiers, receives only a slanting and exceedingly well behaved sea; that enters silken in its softness. And in that bay of several leagues, these creeks, with sloping shores, made, as it would seem, on purpose for baths for women and children, they are so sheltered and so safe. Those nice sandy beaches, parted by such sheltering rocks, conceal so much, and yet reveal so much of the sea life, the plain, blunt, yet ever kindly and courteous life of the seaman! But if those sheltering rocks do much good, they also do no little injury. The sheltered creek and safe haven, keeps out the Tempest;—but, it also keeps out the fishes. By little and little, but very regularly, the grand rush and the grand murmur of the sea are kept out, and yet, that half silence has a very great charm. No where else have I so much welcomed, or so richly enjoyed, that great luxury of the undisturbed Day-dreaming.

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CHAPTER III.

THE HOUSE.

Permit an ignoramus who, yet, has paid a pretty high price for what he *does* know, to give you some quiet advice upon certain points upon which books, hitherto, have told you little and Doctors nothing. That this advice may come the more directly to both head and heart, I will address them to an imaginary patient. Imaginary? Not so; I have met such a patient many times.

You meet a young lady seriously ill, or manifestly about to be so, she is very weak, and her young child is weaker still. The Winter has been hard upon them, and the Spring still harder. Yet it is only weakness;—lassitude, the *tedium vitæ* which Byron truly calls "more terrible than death itself." And she is sent to the sea-side for the Summer.

A great expense, that, for a fortune below even mediocrity; painful moving for the mistress of a family; hard separation, above all, for husband and wife who truly love each other. They bargain, they would fain shorten that separation. Would not one month be enough? But the wise Physician knows better, and says it would *not*; he well knows that a very short sojourn at the sea side is far more likely to injure than to benefit. The sudden, the severe shock of the sea bath is likely enough to injure even the strong; to the feeble it is simply murderous. You should first breathe the sea air;—acclimatize yourself. Do this during the month of June, then you shall have July, August, September, and, in some seasons, even October for your baths, and the bath and the great, strong, keen winds will harden your frame against the fast approaching Winter.

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Few men are free during the whole Summer; happy the husband who can be away from the thronged city to pass a couple of the Summer months at the sea side with his suffering wife. However much he may feel inclined to sacrifice every secondary interest for her, it is for her interest that he must remain in the counting house or the factory. There are strong links in the chain of our daily life which we may not, which we cannot, break. Therefore, the wife must go alone; and, for the time, behold them loving, and yet divorced. Shall I give you my opinion? *Let* her go alone; better for her than if she went in the train of some rich luxurious family.

That gregarious travel and gregarious abode have their pleasures, no doubt; but, also, they have their evils. In such cases we are apt either to become enemies, or, which is still worse in the case of woman, to become too friendly. The style of life at a watering place sometimes, and not seldom produces results which we regret through the whole remainder of life. In my opinion the smallest inconvenience of that gregarious watering-place life (smallest but very far from small) is that the very people who alone would be both morally and physically benefited by the sea, lose all that benefit by carrying to the solemn shore the frivolity, the late hours, the false gaiety of the great town.

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Alone we think; in the crowd we gossip and scandalise. The great and the rich lead the young and suffering female into their own dissipations, and the consequence is that she has by the sea shore a really more mischievous excitement than she would have had in Paris, or London, Saint Petersburg or New York, and will entirely lose the end for which, loving husband, you sent her thither. Reflect upon it, young woman, be courageous, but also be prudent. It is in an innocent solitude that you may, if you will, enjoy with your child, that you will most surely find the renewed health and strength that you so much desire. In that infantine, pure, but noble and poetic life, I again assure you, it is that you will find restoration. Believe me the delicate and tender justice which makes you fear expense, while he at home is toiling so hard, will well repay you. The old Ocean will love you the better if you love only it, and will lavish upon you its great treasures of health and youthfulness. Your child will flourish like a young bay tree and you shall increase in grace and beauty; and you will return to your far home youthful and dearly beloved.

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She resolves, she departs, for a place, the waters of which are well known by chemical analysis to have the qualities suited to her case. But there are many local circumstances which cannot be known or even guessed at from a distance. The Doctor who recommends particular waters seldom knows the place, though he knows the waters.

For some of the more important watering places Guides have been published which are not without merit, so far as they point out the particular diseases for which particular waters are suited. But very few give details which enable one to choose between a healthy and unhealthy, a pleasant and an unpleasant, situation. They do not venture upon such particulars as would enable one to choose between places as well as between waters, but confine themselves to so general a eulogy of the latter as to leave us in the dark as to the former.

What is the precise exposition? Look at the map and you perceive that the coast slopes to the South, but even this tells you nothing; for it may chance that a peculiar curve of the land may place your house under a cold or damp influence, from a Northern or Western exposure. [353]

Are there any marshes in the neighborhood? In most cases the answer must be, yes. But the difference is very great whether the marshes be salt and renewed, and made salubrious by the sea, or whether they be stagnant marshes of fresh water which after droughts emit feverish miasmata.

Is the sea very pure, or mixed? And in what proportion? A great mystery. For nervous persons, however, for novices just commencing with salt water bathing, the mildest are the best. A sea, somewhat mixed, an air less salt and keen, and a less desolate shore, having some of the charms of the country, are the best recommendations.

A grave point is the choice of a house; and who shall direct you as to that? No one. You must see for yourself; you must observe all the particulars on the spot. You will learn little from persons who have visited or even lived there. They praise or condemn this or that place not on account of its real merit, but according to the pleasure they have enjoyed or the friends they have made there. They recommend you to some of those friends who receive you admirably; at first you are delighted, but in a short time you discover many inconveniences, and sometimes the house is even dangerously unhealthy. Yet you do not like to leave it, lest you should mortify both those who recommended you and the kind and amiable family who so hospitably received you. [354]

"Well, then," you say, "I will ask no recommendation, but on reaching the place I will consult an honest and skilful doctor who will be able to enlighten me." Honest! that is not enough, he must also be very intrepid to tell you frankly any of the bad qualities of the place, for he would be a ruined man, he would take leave of the whole place, would live as solitary as a wolf; and, indeed, would be lucky if some personal injury were not done to him.

I have a perfect horror of the absurdly flimsy houses which speculators build in our variable climate. These pasteboard erections are so many dangerous traps. In the full heats of Summer such bivouacs are all well enough, but often one has to remain in September and October amid the high winds and the torrents of rain.

For themselves the landlords build good substantial houses, but for poor patients they build chalets of wood, ill closed, and not even moss-covered, like the Swiss chalets. It really is treating us quite too ill.

In those villas, apparently luxurious, but in reality wretched, no provision is made for comfort. Drawing-rooms for show,—and commanding a view of the sea, they have, but no provision is made to gratify that feeling of home comfort, so dear to the sick, and more especially so to woman. She feels unsheltered, as though constantly exposed to half a gale of wind, and constantly passing from one temperature to another. [355]

On the other hand, the solidly built house of the Fisherman is often low, damp, and inconveniently arranged in its interior. Often, it has not even a double ceiling, but mere planks, which admit cold draughts into the upper rooms, inflicting coughs, rheumatism, and a score of other diseases.

Whatever may be your choice, Madame, between these two kinds of house, do you know what I heartily wish for you? Laugh, if you please. What I wish you to have, even in June, is a good fire-place, with a very excellent chimney, well closed against the wind. In our beautiful France, with its cold north-west and its rainy south-west, which occasionally predominates for nine months, a good fire may be necessary, even in June. On a damp evening, when your child returns shivering from his promenade, a fire is necessary, to warm him, before he goes to bed.

Two things ought to be especially looked after, wherever you lodge, fire and good water, the latter a thing rarely to be found near the sea. If it is altogether bad, endeavor, by the use of beer or tea, to dispense with drinking the plain water, or if you must use it, let it previously be boiled. [356]

Why cannot I, with a single word, build you just such a villa as I have in my mind? I do not speak of the show-house, the almost castle, such as the wealthy build at the sea side, but of the humble house, fitted for humble fortunes. It is an art which is yet to be created, and one which no one seems to suspect, that of building a house, at once small and substantial. The houses which are built for us, especially at the sea side, are built in direct contradiction with our needs in so changeable a climate. Those Kiosks, with their flimsy ornaments, may do well enough for well-sheltered situations, but make one fancy that the wind must needs blow them into the sea. The Swiss chalets have immense overhanging roofs, which so well protect from the snow, but also have the serious defect of excluding the light. The sun, in our northern seas, should not be excluded, but most cordially received. As to the imitations of chapels, gothic churches, and the like toys, we need say nothing about them, they are really beneath notice, so absurdly ill calculated as they are for comfortable homes.

The first necessity for a sea-side house, is great strength, a solid thickness of walls, which will obviate that rocking which we always feel in slight buildings. We want such a solidity of construction as even in the greatest tempests will give courage to a timid woman, and enable her to say with a smile of pleasure. "How very comfortable we are in here, while such a storm rages without!"

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The second point is that on the land side, the house should be so perfectly sheltered that on that side we can sit and forget the sea, and in the neighborhood of that great movement find the most complete repose.

To meet those two needs, I prefer the form which affords least hold to the wind, the crescent form, with the convex front to the sea, so that every window will in turn receive the Sun.

The concave portion of this half circle would be sheltered by the horns of the crescent, so as to enclose the pretty flower garden of the mistress of the house. Stretching from this flower garden, the progressive sloping of the soil would allow of a kitchen garden of a certain extent, well sheltered from the wind.

We are told that "Flora shuns the sea;" what she really does shun, is not the sea, but man's negligence, ignorance, or indolence. At Eteretat, before a very heavy sea, on the high overlooking beach, and exposed to heavy winds, there is a farm, with an orchard of superb trees. What precautions have been taken? A simple hedge-crowned bank, five feet high, and behind that a row of elms, which shelter all the rest. Many places Brittany would furnish us with like instances. Who does not know that Roscoff raises fruit and vegetables in such profusion as to sell them cheaply, even in Normandy?

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But to return to our building. I want it low-pitched; only a ground floor, and over that the bed-chambers. Our house, therefore, will be but small; but, on the other hand, it must be very thick, must have two rows of chambers, an apartment looking out on the sea, and another on the land.

The ground floor apartment, looking towards the land, would be somewhat sheltered by the upper story, which would project about five feet. This would make the interior crescent a sort of gallery for use in bad weather. The lower rooms would be a dining room;—a small room for our books (voyages and travels, and natural history) and a bathroom. I do not mean an actual library or luxurious bath. The necessary, and the very plain, the convenient, and nothing more.

On very rough days, when the beach is hardly the fit place for delicate patients, I should wish to see the lady reading or working in her pretty parterre. She would have some life there, flowers, an aviary, and a little tank of sea water to receive the little creatures which the fishermen would be sure to give her. Of course she would also have an excellent compound microscope.

For the aviary, I should prefer the free one which I have advised elsewhere, into which the birds come at night for protection and a little food. It is closed upon them at night, to protect them from birds of prey, but opened for them very early in the morning. They return to this aviary very regularly. I believe, even, that if the aviary were large enough, and the tree which they most affect were enclosed, they would freely breed there, and confide their little ones to your protection.

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Delightful, and yet serious life, this, that we have planned for our fair patient and her sole child. What charming solitude in this short widowhood. How new the situation. No housekeeping, no business. With her boy, she is even more alone than she would be without him. But for him she would be intruded upon by reverie and vain fancies. But her innocent guardian, her boy, keeps all such fancies away. He occupies her, causes her to talk, and talks to her of home, and he thus constantly reminds her of him who, in their far off home, is toiling for them, and she counts the days to her return.

Flourish, pure and amiable woman. You are now even younger than ever, you have become a girl again, free, sweetly free, under the guardianship of your boy.

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CHAPTER IV.

FIRST ASPIRATION OF THE SEA.

It is a great and sudden transition to leave Paris in the beautiful month of June when the great city is resplendent with its magnificent gardens and its chestnut trees in bloom. June would be delightful on the coast if one had a single companion and the crowd had not arrived. But when one is alone on the deserted, with the great sea, we are touched with a sort of melancholy.

On a first visit to the coast the impression made is not very favorable. There is aridity, there is wildness, and yet there is a certain monotony. The novel grandeur of the spectacle makes us feel, by contrast, how weak and small we are, and that thought thrills the heart. The delicate chest that so lately was confined in a chamber, and now finds itself suddenly removed to this vast open chamber of the universe, with the sun shining so brightly and the sea breeze blowing so strongly, feels oppressed. The child comes, goes, and the mother sits down, shivering in the free fresh breeze. The warmth of the home she has but just left comes to her mind and she saddens. But her

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boy frolics gaily and that soon consoles her.

All this will soon pass away Madame. Be resolute; your impressions will be very different when you become better acquainted with the Sea and think of its myriads of inhabitants. And that painful constriction of the lungs will pass away too, when you become accustomed to the free atmosphere of the sea. You require time to accustom yourself to it, by and by, not thinking about it, as your boy plays with you in sheltered nooks, you will breathe freely and your chest will dilate without pain and without conscious effort. But, just at first, I advise you not to stay too long at a time on the beach, but rather to take your walk inland.

The land, your accustomed friend, recalls you. The pine woods rival the sea in healthful emanations; and theirs have less of harshness. They penetrate all our being, enter by every pore, modify and purify the blood, and perfume us with their subtle aroma. In the Landes behind the pine woods, the herbs and even the coarse grass on which you tread, yield perfumes not enervating or intoxicating as the dangerous roses, but agreeably bitter. Seat yourself among them and you, like them, will be sheltered by this slight slope of land. Might you not, now that you are thus sheltered, fancy yourself a hundred leagues from the sea? Drink in the sweet breathings, the pure spirits, the very soul of these wild flowers—that, in purity, are your very sisters. Gather them if you will, Madame; they ask for nothing better. Somewhat rude, perhaps, and yet so beautiful; and in their virginal perfume they have that singular mystery of calming and strengthening. Do not fear to hide them in your fair bosom and upon your beating heart.

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Let us not forget that these sheltered landes are, at certain hours, burning hot. They so absorb and concentrate the rays of the sun. The weak woman is wilted there. The young girl, full of vigorous life, feels her pulses boiling and has redoubled power; her brain swims and she has strange and dangerous day dreams. If you wish to go there let it be on some moist and rather cloudy day; or, still better, rise at a very early hour when all is cool, when the wild thyme still keeps somewhat of its dew, and while the Hare is still abroad.

But let us return to the Ocean. At ebb-tide he manifests, and, in some sort, presents to you, the rich life that he nourishes. You must follow, step by step, the retiring waves, though the wet sand will sink some little beneath your feet. Fear not. The gentle wave will, at the most, kiss your feet. If you look closely you will perceive that the sand is not, as you at first thought it, dead, but is here and there moved by numerous lingerers that the ebb-tide has left behind. On certain beaches, small fish are thus hidden in the sand. At the mouth of the rivers the Eel's writhing movement, throws up the sand in mimic earthquakes. The Crab, too eagerly engaged in feeding, or fighting, has now to hasten back to the sea, and in his flight he leaves an odd mosaic, a zigzag line marking his oblique travel, and at the end of that line you will find him lying in wait for the coming in of the tide. The Solen (*Manche de Couteau*), that razor-shaped shell fish, has plunged deep into the sand, but betrays himself to you by the breathing holes that he has left. The Venus you can just as certainly trace by the fucus attached to its shell, but floating on the surface; and the undulations of the soil betray to you the covered ways of the warlike annelides, and viewing them with the aid of your microscope you will be charmed with the rainbows of their changing colors.

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But the finest sights are caused at the first low ebb, which always follows the high Spring tide. At such ebbs, immense and unexplored spaces are left bare, and we can survey that mysterious bottom of the sea, on which we have so often speculated and dreamed. There you discover, in motion, in life, in all the secrecy of their retreats, astonished populations, which fancied themselves secure, and which rarely, if ever before, had been looked upon by the sun, and still more rarely by the eye of man. Be not alarmed, swarming populations of minute creatures, you are seen only by the inquisitive but compassionate eye of a woman; it is not the cruel and coarse hand of a fisherman that invades your retreat. But you ask, what does she want with you? Nothing but to see you, salute you, show you to her boy, and leave you in your natural element, and with every kindly wish for your health and prosperity. At times we need not wander far; at such times in a cleft of the rock, we may find every minute species, old Ocean having diverted himself with lodging a whole world of minute creatures within the space of a few square feet. We sit and we watch, and the longer and the more closely we watch, the more do we see of life, at first imperceptible. And so interested are we that we should sit there for an indefinite time, were we not chased to shore by that imperious master of the beach, the flood Tide.

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But to-morrow, at ebb, she will return to the beach, that school, that Museum, that inexhaustible amusement for both mother and child. There the delicate and penetrating sense of woman and the tenderness of her heart seize and divine all. Maternity tells her all the secrets of increasing, diminishing, and recreating life. Do you ask why her instinct so quickly reveals creation to her; why she enters as one so thoroughly at home, into the great mystery of Nature? It is because she is Nature herself.

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In the depths of the unctuous waters the small algæ, small, but unctuous and nourishing, and other little plants of delicate and pretty figures, form a miniature prairie which is browsed by a vast herd of molluscæ, Limpets, Whelks, and a hundred other species, watch, wait, feed, there, and to-morrow you will find them there still. But do you therefore suppose that they are utterly inert? That they have no confused idea of Love and the Unknown? Of some benevolent thing which at certain hours returns to refresh and nourish them? Oh yes, they both think of it and expect it; those widows of the great Ocean well know that he will return to caress the earth. Anticipatively they look towards the Ocean, and even those which have a fixed abode, turn from the rock and open their shells towards the incoming tide. And if it come in somewhat strongly

they are all the more delighted; too happy to hail that living wave that advances so strongly, as in haste to caress them.

"See my child" says the young mother, "at our approach the motionless ones remain, but the quicker have fled. Now see, they take courage again. The active shrimp, with its fine feelers, rainbowed by the water, creates a great commotion in that mimic and miniature sea, and the slow and hesitating sea spider, at once timid and daring, saves herself by ascending to the warm surface, and the crab advancing and surveying, suddenly returns into his miniature forest of sea weed.

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"But what do I see now? What *is* that? A large, motionless shell suddenly takes life, and moves. Oh, but that is not natural, and the impostor betrays himself by his awkward gait and his many stumbles. Yes, yes, we detect you now, you most cunning of all cunning crabs, Sir Bernard the Hermit, who would fain pass yourself off for an innocent mollusc! Your bad conscience agitates you too much."

On the shore of our ocean, strangers to these movements, the animated flowers expand their corollæ. Near to the heavy anemone those charming little annelides appear in the sunlight. From a tortuous tube rises a disc, an umbrella, white or lilac, sometimes flesh color. Thrown, itself, a little on one side, it casts off from itself an object which has nothing comparable to it in the whole vegetable world. Not one of these is like its sister, and all are admirable for their velvety delicacy.

See one of them, without umbrella, which throws off a whole cloud of light cottony threads, scarcely tinted with a silver grey, while five longer filets are of the richest cherry color. They wave, they entwine, they untwist, and their silvery heads form beautiful images in the water. To the coarse senses of man, such a sight as that would suggest no serious thought; but to the nervous and delicate woman, it is much. At those colors, by turns flashing and fading, she reflects on her own young life that now flashes, now fades, and now threatens to expire. Affecting thought! Again she looks into the pretty miniature Ocean of a few feet square, and there she better discerns Nature, the fertile mother, but the stern mother too.

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And our fair patient is plunged into an oppressive reverie. Woman would cease to be woman, that is to say, the charm of the world, if she had not that touching gift of *Tenderness for everything that lives; pity, and loving tears.*

She has not wept as yet, our fair patient, but she has been so near to doing so! Her boy perceives it. Being already attentive and quick, he remains silent; and, silently they return. That was the amiable first day when she first began to spell with her heart the language of Nature. And at her very first lesson that language had so stirred the tenderness of that poor heart! The daylight was dying, the sea bird, on rapid wing, approached the shore and sought his nest. And as our patient and her boy entered their already dark garden, the cry of the night bird was heard. But the aviary was well closed, and the innocent little refugees within were asleep with heads under wings. Having herself seen that all was thus safe, she relieved her heart with a sigh, and embraced her son.

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CHAPTER V.

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BATHS—RESTORATION OF BEAUTY.

If, as certain French physicians maintain, sea-water baths have only a mechanical action, infuse no new principle into the blood and *are merely a simple branch of hydropathy*, it must be confessed that of all the forms of hydropathy they are the harshest and most hazardous. Let it once be clearly shown that that sea-water, so rich in life, bestows no more of vitality than fresh water and we must confess that it is little less than madness to take sea-baths in the open air and at all the risk of the wind, the sun, and the thousand possible accidents.

Whoever has seen a poor creature come out of the water after taking his first bath, whoever has seen him come out pale and shuddering, must perceive how dangerous such experiments are to certain constitutions. Be assured that none of us would submit to so much suffering if health could be as readily secured without suffering and without danger, in one's own house, and by common fresh water hydropathy.

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And, as though the impression of a first sea-bath were not sufficiently strong, it is aggravated for a nervous woman by the presence of the crowd of bathers. For her it is a cruel exhibition to make before a critical crowd, before rivals, delighted to see her ugly, for once; before silly and heartless men, who, with telescope in hand, watch the sad hazards of the toilette of the poor humiliated woman.

To brave all this the patient must have faith, great, surpassing faith, in the Sea. She must believe that no other remedy will meet her case, and must determine that, at whatever risks, she will be permeated by the virtues of the sea water. "And why not be thus *permeated?*" ask the German physicians. "If at first entering the water you contract and close up your pores, reaction brings almost immediately a warmth that reopens them, dilates the skin and renders it very capable of *absorbing* the life of the sea."

The two operations, the closing and the reopening of the pores, the first chill and the succeeding glow, almost always take place in five or six minutes. To stay in longer than the latter space of time, is almost always injurious.

Moreover, we should not venture upon this violent emotion of the cold bath without a preliminary course of warm bathing, to facilitate absorption. Our skin which is entirely composed of the little mouths which we call pores, and which, in its way, both absorbs and digests, as the stomach does, wants time to get accustomed to such strong nourishment as the *mucus* of the sea, that salted milk with which the sea makes and remakes such myriads of creatures. By a graduated course of baths, hot, warm, lukewarm, and almost cold, the skin acquires this habit, and, so to speak, this appetite; and "increase of appetite grows by what it feeds on."

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For the hard ceremony of the first cold sea-water baths, at least, the odious gaze of a mob of people is to be avoided. Let them be taken in private and with no one present but a perfectly reliable person who, at need, will help the nervous patient, and rub her with hot cloths and revive her with warm drinks containing a few drops of the potent elixir.

"But," it may be said, "the presence of other bathers lessens the danger; we are far different from Virginia, who, in an extreme danger, preferred drowning herself to taking a bath." A great mistake; we are more nervous now than ever we were. And the impression of which I speak is at once so vivid and so revolting—I mean for nervous people—that it is quite capable of killing, by aneurism or apoplexy.

I love the people, but I hate a mob; especially a noisy mob of fast livers who come to sadden the great Sea with their noise, their fashions, and their absurdities. What! Is not the land large enough? Must such people come to the Sea to martyrize the sick and to vulgarize the majesty of the Sea, that wild and true grandeur?

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I once had the ill luck to run from Havre to Honfleur in a craft loaded with such fools. Even in that short trip they found time to grow weary of quiet, and to get up a ball. One of them—probably a dancing master—had his Kit with him and played all sorts of dances in the presence of that great Ocean. Happily one could not hear much of that small music; scarcely now and then could a shrill note or two rise above the solemn, the truly solemn bass of the Sea's roar. I can easily imagine the sadness of the lady who, in July, suffers under the invasion of a mob of these fops, fools, and gossips. All liberty is then at an end. Even in the most retired spot the drowsy ear of night is vexed by the boisterous echoes from saloon, and dancing room, coffee-room and Casino. In the day the host of yellow gloves and varnished boots crowds the shore. One lady is observed alone, with her boy. Why is that? Impertinents wish to know, they approach, and, gathering sea shells for the child, endeavor to force their conversation on the mother. The lady is embarrassed, bored to death, and has to confine herself to her lodging or venture out only in early morning, while the empty pated revellers are still sleeping off the effects of the last night's follies. Then, from her seclusion flow a thousand ill natured comments. She becomes alarmed, for some of these idlers have influence and may, possibly, injure her husband.

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Nowhere more than at the sea side, are we inquisitive, and the poor woman becomes agitated and sleepless during the long hot nights of July and August, and if, towards morning, she at length sleeps, she is not much more tranquil. The baths, far from cooling, add the saline irritation to the fierce heat of the dog days. From her youth she derives, not strength, but fever; and, weak and highly nervous, she is all the more disturbed by that interior storm.

Interior, but yet not hidden. The Sea, the pitiless Sea, brings to the skin the proofs of that excitement which the sufferer would fain keep hidden. She betrays it by red blotches, slight efflorescences. All these petty annoyances, which still more afflict the children, and which in them the mother looks upon as signs of returning health, the mothers feel as humiliations when seen on their own faces. They fear that they will therefore be less loved. So little do they know of the heart of man. They know not that the sharpest spur of love is not beauty, but suffering.

"Oh! If he should find me ugly!" is the poor woman's morning thought, as she looks in her glass. She at once fears and desires the coming of her husband. And yet she feels so lonely, and fears, she knows not what, amidst that noisy crowd. She dares not go out, she becomes feverish, and at length is confined to her bed. In little more than twenty-four hours, the beloved one is by her side.

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Who has summoned him? She certainly has not. But, in his great straggling handwriting, her boy has written to his father thus: "My dear Papa, come quickly. Mamma is confined to bed, and the other day she said 'oh if he were here!'" And accordingly he was there, and immediately she felt herself recovering. And he, how happy he is! Happy to see her restored, happy to be necessary to her, and happy to see her looking so beautiful. She is somewhat sun burnt, but how young she looks! What life in her glance, and in her flowing and silky hair!

Is this mere fiction, this so prompt restoration of life, beauty, and tenderness; this delightful incident of finding in a wife, a young mistress, so happy in being rejoined by a husband? Not at all. It is an agreeable sight which right often may be witnessed. If rare among the very rich, it is not so among the laborious families whose labor makes them, during most of their lives, close prisoners. Their forced separations are painful, and their reunion has a charm, a rapture, which they do not even try to conceal.

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When we consider the prodigious tension of modern life, for toiling men, (that is to say, for every one but a few idlers) one cannot but be glad to witness those scenes of joy, when a reunited

family expand their hearts. Those who have no hearts, call all this vulgar and prosaic. But, the form matters little, where the substance is so surpassingly good. The careworn merchant, who, from three months to three months, has only with utmost difficulty saved the bark in which the destiny of his wife and children is exposed to shipwreck; the administration victim; the employé, worn well nigh to death by the injustice and tyranny of the offices—these suffering captives, are released, for a brief space, from their galling chains, and the tender family, the mother and child, endeavor to make the husband and father forget his cares.

And well able are wife and child to wile the worn man into that sweet temporary oblivion. Their gaiety, their caresses, and the distractions of the sea-side, soothe his wearied soul, and fill his mind with other and happier thoughts. It is their triumph. They hurry off to visit *their* beach, to contemplate *their* sea, and to enjoy his admiration, which he, worthy man, just a little exaggerates, because he wishes them to be pleased. Yes! it is *their* sea; having bathed in it, they have taken possession; and he, the toilworn husband and father, must share with them in their vast possession. The young woman no longer fears that crowd which formerly so much annoyed, and even alarmed, her; now that he is beside her she is not merely safe, but bold, daring; to say the truth, just a little presumptuous. She is quite familiar with the sea; familiar enough to be determined to learn to swim. At first she is supported by her active and bold boy. Supported by him, she swims—but I fear if left to herself her native timidity would return, and she would sink. Yet she is in love with the sea; yea, jealous of the sea. For, in fact, the sea inspires no moderate passions. There is I know not what of electric inspiration, of all-absorbing passion for the Sea, in all who truly know it.

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CHAPTER VI.

THE RESTORATION OF HEART AND BROTHERHOOD.

There are three forms of Nature which especially expand and elevate our souls, release her from her heavy clay and earthy limits, and send her, exulting, to sail amidst the wonders and mysteries of the Infinite.

First; there is the variable Ocean of Air with its glorious banquet of light, its vapors, its twilight, and its shifting phantasmagoria of capricious creatures; coming into existence only to depart on the instant.

Second; there is the fixed Ocean of the earth, its undulating and vast waves as we see them from the tops of "earth o'er gazing mountains," the elevations which testify its antique mobility, and the sublimity of its mightier mountains clad in eternal snows.

Third; there is the Ocean of waters, less mobile than air, less fixed than earth, but docile, in its movements, to the celestial bodies.

These three things form the gamut by which the Infinite speaks to our souls. Nevertheless, let us point out some very notable differences. The air-Ocean is so mobile that we can scarcely examine it. It deceives, it decoys, it diverts; it dissipates and breaks up our chain of thought. For an instant, it is an immense hope, the day of an infinity;—anon, it is not so; all flies from before us, and our hearts are grieved, agitated, and filled with doubt. Why have I been permitted to see for a moment that immense flood of light? The memory of that brief gleaming must ever abide with me, and that memory makes all things here on Earth look dark.

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The fixed ocean of the mountains is not thus transient or fugitive; on the contrary, it stops us at every step, and imposes upon us the necessity of a very hard, though wholesome, gymnastic. Contemplation here has to be bought at the price of the most violent action. Nevertheless, the opacity of the Earth, like the transparency of the air, frequently deceives and bewilders us. Who can forget that for ten years Ramon, in vain, sought to reach Mount Perdu, though often within sight of it?

Great, very great, is the difference between the two elements; the Earth is mute and the Ocean speaks. The Ocean is a voice. It speaks to the distant stars, it answers to their movements in its deep and solemn language. It speaks to the Earth on the shores, replying to the echoes that reply again; by turns wailing, soothing, threatening, its deepest roar is presently succeeded by a sad, pathetic sigh. And it especially addresses itself to Man. As it is the fecund womb in which creation began and still continues, it has creation's living eloquence; it is Life speaking to Life! The millions, the countless myriads, of beings, to which it gives birth, are its words. That milky Sea from which they proceed, that fecund marine jelly, even before it is organized, while yet white and foaming,—speaks. All these mingled together makes the unity, the great and solemn voice of the Ocean.

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And, "what are those wild waves saying?" They are telling of *Life*, of the eternal Metamorphosis; of the great fluid existence, shaming our senseless ambitions of the earth-world.

They are telling of *Immortality*. An indomitable strength is at the bottom of Nature, how much more so at Nature's summit, the Soul! And it speaks of Partnership, of Union. Let us accept the swift exchange which, in the individual, exists between the diverse elements; let us accept the superior Law which unites the living members of the same body—Humanity; and, still more, let

us accept and respect the supreme Law which makes us create and cooperate with the Great Soul, associated as we are—in proportion with our powers,—with the loving Harmony of the world—copartners in the Life of God.

The Sea very distinctly, in that voice that is mistakenly supposed to be a mere confusion of sounds, articulates those grave words. But man does not easily recognize those words, when he first arrives on the shore exhausted by worldly struggles, deafened, distracted, by worldly babble. The sense of the higher life is dulled even among the best of us; the best of us, to a greater or less extent, resist that sense. And who shall teach us to quicken and obey that sense? Nature? Not yet. Softened into tenderness by the family, by the innocence of the child and the tenderness of the wife, man first takes an interest, real and strong, in the things of humanity, in the cares and studies which tend to preserve the family. But woman is earlier and more deeply interested in the Sea, in the Poetry of the Infinite. And thus we see that souls have sexes as well as bodies have. For the man thinks of the seaman more than of the sea's wonders; he thinks of its dangers, of its daily and hourly tragedies, and of the floating destiny of his family. The woman, tender as she is to individuals, takes less interest in classes. Every laborious man, who visits the coast, bestows his principal attention and his principal sympathy upon the hard life of the man of toil, the fisherman and the sailor; upon that hard hard life so laborious and perilous and so little productive of gain. [380]

Such a man, while his wife rises and dresses her sweet child, walks upon the beach in the early morning just as the fishing boats return. The morning is cold, the night has been rainy, and the boats have shipped many a heavy sea. The men, and not only men but very small boys, too, are wet to the skin. And what have they brought back? Not much;—but they *have* come back, and that is much. For last night, see you, they shipped many a sea and looked at death closely many a time. Ah! When the stranger reflects upon the hard life brought immediately under his purview, surely, however much he may have complained of his own lot, he will now learn to say "My lot is far better than theirs." [381]

In the evening, just when the sun sets, coppery and threatening, into the sinister horizon, these men already have to sail again. And the stranger says to them, "Shall you not have bad weather, think you?" "Sir," they reply, "we must earn our bit of bread," and they and their sturdy boys push off to Sea. And their wives, more than serious, sad, follow them with their eyes; and more than one of those wives whisper an earnest prayer. And the stranger, too, whispers his prayer, and says to himself, "They will have a dirty night; would that they may return in safety."

And thus it is that the Sea opens the heart, and that even the hardest hearts are softened in presence of the great stern mother. In that presence, no matter what we may strive to think, we become humanized, sympathizing, tender. And Heaven knows how much need and how much occasion there are for sympathy there! Every kind of want and struggle is to be found among those brave, honest and intelligent marine populations who are incomparably the best of our country. I have lived a good deal on the coast. Every heroic virtue, which an inland population would praise so highly, is there an every day and very common-place matter. And, still more curious!—there is no pride among these hardy mariners. All our French pride is for the landsmen—the soldiery. But among our marine population the greatest dangers count for nothing; every one braves such every day, and no one ever thinks of boasting of them. I have never met with men who were milder or more modest (I had almost said more timid) than our Gironde pilots who, from Royan and from St. George's gallantly put out, to face all that Cordouan has of peril. There, as at Granville, and every where else on that coast, it is the women alone who have anything to say, or any business to do, on land. The brave pilots, when once on shore, never say a word in the way of command; peaceable as their valiant wives are superbly noisy, the men leave the women full authority to administer the poor income and to rule (occasionally with a pretty hard hand) the youngsters of the household. The husband, in fact, though he reads no Latin, literally and practically translates the Latin poet: [382]

"Happy, when in mine own house I am as nobody."

Their wives, greatly interested about the foreigner, had, nevertheless, let it be boldly as truly said, a royal, a magnificent, a generous, kindly feeling. At St. Georges, they cut up, and scraped up, all their linen to make lint for the wounded at Solferino. At Entretat, three Englishmen being wrecked, and in awful danger, the whole population, men, women and children, rushed to the rescue, and dragged them to land with all the outward and visible signs of a real and a violent sensibility. And they were fed, and clothed, and tended, and relieved, even as though they had been compatriots, and very dear friends. This occurred in April, 1859. [383]

Oh! Those kind French people! And yet, how hard, hitherto, has been their life! In our *regime* of Classes (so useful, however, in itself, and from which we derive so much of giant strength) the sailor is compelled, at any moment, to leave the merchant service for the war ship, daily and hourly growing more severe, more crushing, in its hard discipline! Forty years ago the sailor sang, as he worked at the capstan bar; *now* he heaves in silence. (Ial. Arch II. 522). And in the merchant service, the great fisheries are almost worked out. The profits of the Whale Fishery belong, almost entirely, to the outfitter. (Boitard, Diet. art. Cetaceæ, Whales, &c.) The Cod has diminished, the Mackerel grows more and more scarce. A very precious little book (*The Story of Rose Duchenin*, by herself) gives a most touching picture of this great destitution. Alphonse Karr, that admirable writer, had the good sense to write that book from the dictation of that Fisherman's Wife, without altering a word of hers, or adding a word of his own. [384]

Étretat is not, properly speaking, a port. Situated little, if any, above the level of the Sea, and

defended only by the pebbly bar which the sea has washed in, it is but poorly sheltered. And consequently, it is necessary that, according to the old Celtic custom, every vessel that runs in there, must be hauled up to the Quay by the cable and the capstan; the capstan bars being handled by the women, for the lads are all at sea. The labor and the difficulty will be easily understood by all who read this. The lubberly craft, as it is drawn up, hits hard from boulder to boulder, and ascends only by leaps, violent and damaging, and still more threatening than either. And at every leap and every shock, those poor women suffer from the hard blow to their necks and from the bitterly painful emotions of their poor hearts.

When I first witnessed this terrible labor, I was wounded, saddened in mine inmost heart. My first impulse was to bear a hand and lend my aid. But the thing would seem so singular, I thought, that a something, I know not what, of false shame, arrested me. But every day I lent a hand, at least with my wishes and my prayers. I went, and looked. Those young and charming, though anything but pretty, women and girls did not sport the short red petticoat of the coasts, but long robes; and for the most part, they had the refined and delicate aspect of the young lady of the great city. Bending to that hard toil (a filial, and, therefore, a noble toil) they had a certain mingled grace and pride, and, in all that hard toil, not a complaint, not even a sigh, escaped them.

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That very small Quay of Boulders, small as it is, yet is too large. I saw there a number of vessels, abandoned, useless. For, see you, the Fishery has become so unproductive! The fish have fled that shore. Entretat languishes, perishes, so near to languishing, and, but for its sea-bathing, perishing, Dieppe, which owes its present existence—such as it is!—to the greater or less number of visitors, who render Dieppe in one season prosperous, and in another as nearly as possible, bankrupt. And this very influx from Paris, worldly Paris, is, after all, morally, at least, a real scourge to that marine population.

Our Norman populations who discovered America, and who, ever since the fourteenth century, have known Africa, are every year becoming less and less in love with the sea, so that, year by year, more and more of them are turning their faces inland. The descendant of the bold fellow who formerly harpooned the Whale, is now a pale cotton-spinner of Montville or of Balbec.

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It is for Science, it is for the Law, to put a stop to this fearful decay. The former with its skill, its sound advice will,—if such advice be resolutely acted upon, *economise the Sea* and revive that Fishery which is the very nursery of Seamen; and in the next place, the Law, less exclusively caring for the interests of the real *élite*, the real flower and elect of the country, in no wise to be compared to those great masses from which we draw our soldiery, but who, under given circumstances, will be able to cut the Gordian knot of the world.

Such were my reflections, on the little wharf or Quay of Etretat, in the cloudy and rainy summer of 1860, while the capstan bar was heaved at by young females, while the capstan screamed at every turn, and while the whole scene put one in mind of *desolation for the present, and worse to come*.

And thus is it with our century. Ever since 1730, and so in the present day, labor, fatigue, and slowness have been upon us. Let us all, of no matter what rank, put hand and strength to the capstan bar! But, alas! how many of us prefer *picking up pebbles on the wild* sea shore!

We read that Scipio, stern conqueror of Carthage, and Terence, the lucky refugee from that shipwreck of a world, amused themselves in picking up shells on the sea shore; capital friends in their forgetfulness of the past. They enjoyed the *dolce far niente*; they were luxurious in their enjoyment of the illusion of being *boys once more*. But let not that be *our* wish. We will not, we must not, we dare not, forget *our* duty; no, with persistent labor, with uncooling ardor, we will put our hands to the capstan bar, and help to *warp up* this great, but worn and much tried century.

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CHAPTER VII.

THE NEW LIFE OF THE NATIONS.

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Just as I was finishing this book, in December, 1860, resuscitated Italy, that great and glorious mother of the modern nations, sent me tidings, in the shape of a small book, a mere pamphlet. It was my "New Year's gift for 1861."

And from that Italy how often have we had great and beautiful tidings? In 1300 news from Dante; in 1500 news from Americus Vespucius; in 1600 from Galileo. And what are our present tidings from Florence?

Apparently, but small. But who knows? Perhaps the results will be immense! It is a discourse of but a few pages, a medical pamphlet, and its very title is more likely to repel than to attract. And, yet, in those few pages there is matter which, duly acted upon, may change the whole destiny of our great, but weak, our often wise, but still more often mistaken Humanity.

Opposite to the Title I find two portraits, one a deceased boy, and another dying. The author of the pamphlet is a Doctor, who, very unusual thing! has been so terribly impressed by the fate of

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his poor unknown and, but for him, uncared for children, that he has been led to write for our instruction, his pain and his regret.

The elder of these children, of a fine and high nature, in the bitterness, as it would seem, of a great destiny cut short, has a bouquet upon his pillow. His mother,—poor, poor, mother! has given it to him this morning, having nothing else to give, and the nurses, seeing the quite religious love with which he cared for the poor gift of that poor mother, have allowed him to keep it.

The second, still younger, in all the tender grace of his four or five years, is evidently dying; his eyes are fast veiling beneath the death film. Each of these poor boys had shown sympathy for the other. When they could no longer speak their sympathy, they *looked* it in their tender glances, and the good kind Doctor, (blessings on him for the kindly thought!) had them placed opposite to each other, and his engraving shows them to us (touching sight), just as, dying, they exchanged their sympathizing glances!

The whole is truly, and nobly, Italian. In any other country a man would fear to be laughed at in showing himself thus truly tender. Not so in Italy. The Doctor wrote to his Italian public, just as he might soliloquise in the privacy of his own study; and he unreservedly pours out all his feelings with an intensity, with a perfectly feminine sensibility, which will make the worldly man laugh, and the kindly man weep. And it must be confessed that his native language has much to do with his power over our feelings; it is the language of women and children, at once so tender and so striking, beautiful even in its terrible accent of grief and suffering. It is a shower of mingled tears and roses.

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And then he suddenly stops himself. and apologizes. He would not have written thus, but for sufficient cause, and that cause is that "Those poor children would not have died if they could have been sent to the sea-side." And, the inference? That at the sea-side we must have Hospitals for children. Now here, if you please, is a really skilful, as well as greatly humane, man. He touches the heart; and the rest necessarily follows. Men listen attentively and are touched; women burst into an agony of tears. They beg, they pray, they insist—and who is to resist them? Without waiting for government action, or government aid, a voluntary society has founded a "*Children's Sea-Bathing Hospital*" at Viareggio.

All who have been there admire the crescent-like sweep, made by the Mediterranean, when it quits Genoa passes the magnificent road of Spezzia and reaches the Virgilian Olive Groves of Tuscany. About half way from Leghorn a cape, stolen from the Sea, is the site, henceforth the sacred site, of this truly admirable foundation.

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Florence, by the way, has preceded all Europe in the way of charitable foundations; she had hospitals before the close of the tenth century, and in the year 1287, when Beatrice inspired and maddened Dante, her father, the cruel persecutor of the greater, far greater Dante, founded the hospital of *St. Maria Nuova*. Even Luther, though in his travels he saw little to admire in Italy, *did* admire, and very heartily, its Hospitals and the beautiful Italian women, who, veiled, stood by the bedsides of the sick sinner and the dying pauper.

This new foundation, of which we have spoken, will, we trust, be a model for Europe. We owe that much to children; for upon them it is that fall the worst effects of our murderous toils and our still more murderous excesses in every kind of bad life.

It is impossible not to perceive the visible and terrible deterioration of our Western races. The causes of it are numerous and very various. The chief of them all is the immensity and the constant and rapid increase of our hours of labor. For the most part, it is compulsory; compelled by trade regulations and trade necessities. But even where no such compulsion exists, there the same ardor of long hours and hard toil exists. I know not what demoniac fire exists in our modern temperament. Compared to ourselves, all former centuries have been positively idle. Our results, no doubt, are immense. From our prolific brain and iron hand, proceeds such a marvellous flood of art, science, inventions, productions, and ideas, that we are actually glutting the markets, not only of the present, but also of the future. But at what cost are we doing all this? At the price of an awful expenditure of strength, and of nervous energy; we are enervating ourselves, our works are prodigious, and *our children* are miserable. We condemn them to disease, suffering, and premature death even before they are born. *Our spendthrift waste of energy entails feebleness and early death upon them!* And let it be remembered that this immense amount of production is the work of only a comparatively small number. America does little of it, Asia next to nothing, and even in Europe all, or nearly all, is done by a few millions in the extreme West. The others laugh to see the really working peoples thus wear themselves out. Poor Barbarians! Do you fancy, then, that this Russian or that Backwoodsman, can replace, at need, a mechanic of London or an optician of Paris? No; we have become such by the education and the practice of long centuries. A whole and a very long tradition is in us. What would become of you if we should die? None of you are ready to succeed us.

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But this same murderous toil, this absolutely suicidal production, if we be willing to accept it for ourselves, it is our duty *not* to accept it for our children; we have no right thus to *add murder to suicide*. And, yet, that is what we really are doing. They are born already, with our fatigue, our cerebral exhaustion. With a perfectly frightful precocity, they *know*, they *can*, they *will*, and they *do*. But how long? The grave opens for them *so* early!

The human infant, like the young plant, needs rest, air, and a sweet liberty. Do we give our

children any of these? No; our very virtues, as well as our vices, deny them all. Everything seems to combine to kill them early. Do we love them? No doubt; and yet our worst malice could not do more than we do to kill them early or to cause them to live miserably, pitifully, sufferingly, effeminate. Such a society as ours, so overworked, so over excited, so constantly agitated, is, (whether society will confess it or not) a real, and a murderous war upon our children.

Especially there are times and seasons in the course of the child's growth when his life quite literally hangs upon a thread. Life, at those times, seems to borrow human voice, and to ask,—"Can I possibly last?" At those critical times, see you, the contact of so many, the close, sedentary, and imprisoned life of cities, is just simply Death to those delicate and fading creatures. Or, even worse than Death, it is the commencement of a long career of suffering and helplessness far worse than Death itself. In this latter case you leave a poor creature who, now sick, now well, drags on a wretched existence, a misery to himself and a burthen upon public charity.

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All this must be cut short. We must have foresight combined with humanity. We must snatch the child from these murderous surroundings; we must take him from man and give him to the grand nursing of the fecund Nature—of the Sea. And, then, the child will live and become Man. Your very foundlings, if you thus treat them may some day become your Nelsons and your Napiers, and your community, instead of having to support an habitual patient of your hospitals, will have the bold seaman or the strong laborer.

And, for the matter of that, why need we depend upon the State to do this great thing? Florence hath taught us that the royal heart is fully equal to any other royalty; woman in her mercy, *is* a royalty; she commands, entreats, and man obeys. Woman! Have mercy upon the children!

If I were a young and lovely woman, I well know what *I* should say, and what *I* should do. I should have all around me my magnificence and my luxury, and when on some fine day, my lover in his love should be eager, passionate, ready to give great gifts, I would say to him:—

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"Please offer me none of your Cachemires, designed in England and woven in India; for Diamonds I really care nothing; Berthollet who knows so well how to imitate Nature can make Diamonds, if he so please. But if you really wish to make me a present which I shall love, and for which I shall love you, be so good as to get me a nice well sheltered, yet beautifully sunny home, in which I can lodge some three score, or so, of poor children. They will want no fine furniture; not much of any kind. Once established in that sunny, quiet, and kindly home, they will be well fed, and well cared for; and, my word for it, not a woman will go to the sea-side for her own health who will not give her mite towards the support of those poor children. If Beatrice of Florence could influence her father to found such a home, such a saving refuge, cannot we women of France do as much? Is it that we are less beautiful, or are you less truly in Love?"

"If the Sea, as you every morning tell me, has beautified and improved me so much; surely, your best gift would be my keepsake for the beach. And if you really love me, you will share with me in this work, this great work of bringing to the bosom of the great Ocean-mother a whole family of these perishing children. Let her take our pledges of a durable tenderness and purest love! Let her bear witness that, in the presence of the Infinite, we *were*, in very truth, united in one holy thought!"

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One woman has thus commenced and another will continue, the common mother, France. No Institution more useful, no money better expended. And, in fact, not much needs to be expended. The chief thing necessary will be to transfer some of our charitable institutions from the interior. For many of those institutions expend their funds in mere waste; in fact, some of them might be quite truly termed Pauper Manufactories.

The Romans had the good sense never to grudge expense for anything that concerned the public health. Just look at their splendid aqueducts, just consider their public baths where quite gratuitously, or, at the utmost, at the charge of a half cent, the meanest could bathe, and you will at once understand their public spirit, their really large and grand patriotism. Fresh water baths, salt water baths, everything was provided for that lazy and non-producing plebeianism! Perhaps, in fact, in the politico-economical sense, the Patricians of Rome did too much for that, at once indolent and seditious *Plebs*. And shall we, WE, WE hesitate to do far less to save our own race, that one creative and laborious race that creates all that is really progressive on our globe?

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I speak not here merely, or even principally, of the children; but of all. Every town, at this very instant, has a town within a town, a town of horrible sufferers; of the poor, and the afflicted; they are going to be Paupers not only now, but for the whole remainder of their lives. Again, and again, and again they will come; cured to-day, and returning to-morrow worse and more helpless than ever. They must be enormously expensive; and who pays the cost? Why their hardier fellow workmen who, in the ultimate result, pay all our expenses! And the laborer dies young, and leaves his young ones a burthen on the public purse.

Prevention is better than cure. You can do far more for the man who is in danger of being sick than for him who is already worn out. Ten days or a fortnight of rest and good living at the sea-side, will restore him to you, a good, sound, solid laborer. His carriage, and the cheap shelter, for so few days! by that recuperating sea-side, I tell you again, will restore him to you, a good sound, honest, and independent laborer. And the man will be saved, and his young family; and such a man as, if you once lose him, you cannot easily replace. No! You cannot replace him, for, as I

have already said, every really working man is the slow product, of a long tradition of thought and of labor, and he himself is a work of art; of that so much misunderstood human art in which *Humanity itself becomes a creative Power.*

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Who shall give me to see that crowd of inventive people, that creating and manufacturing people, who in the world's service are hourly wearing themselves out; who, I ask, will give me to see that People, that true People, enabled to repair their shattered frames at the magnificent sea-side? Let this ability be provided for them, and all classes and conditions will equally share the benefit. And let it not be forgotten that all classes and conditions *owe* thus much to the worn toilers, for by their toil, their excessive toil, all classes are benefited. It is by their very blood, by their very marrow, that all classes receive their enjoyments, their elegance, and their enlightenment. Let society, then, give to them the repose, the saline air, the restoring waters of the great restoring Sea. In doing thus much, society will benefit itself; while doing the simplest justice to its worn toilers.

Have pity upon yourselves, all ye poor men of the West. Consult upon, and act for, the common weal. Earth entreats you to live and offers you that which is her best, the SEA, to repair your own strength and thus secure your children against your weakness. Earth would be ruined if you persist in ruining yourselves, for you are her Genius, her inventive and working Soul. She lives by your life, and if you die she also will die. In the name, then, of Humanity and of Nature, too, Nations! Attention! Mercy for yourselves; Earth supplies you with the means of laboring and living; THE SEA offers you the still better means of living WELL.

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"That vast animal the Earth, which for heart has a magnet, has at its surface a doubtful being, electric and phosphorescent, more sensitive, and infinitely more prolific, than the Earth itself.

"That being which we call the Sea,—is it a parasite of the vast animal which we call the Earth? No. It has not a distinct and hostile personality. It vivifies and fecundates the Earth with its vapors; it even appears to be the Earth itself in that which it has of the most productive; in other words, its principal organ of fecundity."

German Dreams! But are they, in feet, entirely Dreams? More than one great mind, without going quite so far, seem to admit for both Earth and Sea a kind of obscure personality. Ritter and Lyell say: "The Earth labors herself; can she be impotent to organise herself? How are we to imagine that the creative power which we observe in every being on the globe can be denied to the globe itself?" But how does the globe act? How at the present time does it obtain accretion? From the Sea and its living denizens.

The full solution of these great questions would require a more profound study of Physiology than we as yet have made. Nevertheless, during the last twenty years every thing tends this way: 1. We have studied the irregular and exterior phase of the movements of the Sea, we have inquired into the *Law of Storms*. 2. We have studied the movements proper to the Sea, its *currents*, the play of its arteries and veins, of which the first propel the salt water from the Equator to the Poles, while the second return it, freshened, to the Equator: 3. The third and more difficult question on which modern chemistry will throw light, is that as to the real nature of the marine *mucus*, of that unctuous gelatine which is every where found in Sea water, and which appears to be a living liquid.

It is quite recently that the sounding of Brooke, and more especially the soundings for the submarine telegraph from Europe to America, have begun to reveal the secrets of the bottom of the Sea. Are its lowest depths peopled? Formerly, that was denied, but Forbes and James Ross found life throughout them.

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Previous to those splendid discoveries, which were made less than twenty years ago, the book of the Sea could not be written. The first attempt at writing it was made by M. Hartwig. For my own part, I was still far from the idea of writing it when, in 1845, in preparing my book of "THE PEOPLE," I commenced, in Normandy, my study of the population of the Coasts. In the fifteen subsequent years, this vast and difficult subject has been continually growing upon me, and has followed me from shore to shore.

The [first book](#) of this Volume—*A glance at the Seas*, is, as the title indicates, merely a preliminary promenade. All the important matters therein are discussed in the following three books. I except two, however, *Tides* and *Beacons*. Here my principal guide has been M. Chazallon's important *Annual*, already numbering twenty volumes, the first having appeared in 1839. If the Civic Crown was bestowed upon the man who saved one human life, how many such crowns has not M. Chazallon deserved! Anterior to his labors, the errors, as to the tides, were enormous. By immense labor he has corrected the observations for nearly five hundred ports from the Adour to the Elbe. His *Annual* gives the most exact information upon the Beacons. Similarly valuable is the clear and agreeably written exposition in the *Souvenirs* of M. de Quatrefages on the Lighthouse system of Fresnel and Arago. The admirable system of revolving lighthouses, in which the lights flash and disappear, at short and regular intervals, is due to Lemoine, Mayor of Calais.

For the various names of the Sea refer to Ad. Pictet-*Origines Indo-Europeennes*. On the water, consult the Introduction to Deville's *Annual of the Waters of France*; Aime's *Annales de Chimie* II., V., XII., XIII., and XV. Morren, the same, I, and Acad de Bruxelles, XIV., &c. On the saltness of the Sea Chapman quoted by Tricaut *Ann. de Hydrographie* XIII., 1857, and Thomassy's *Bulletin de la Société Géographique*, 4 June, 1860.

I did not thoroughly comprehend the Shore of *Saint Michel en Greve* and the questions concerning it, until I read in the *Revue des Deux Mondes* the two very fine articles of M. Baude, full alike of facts and ideas. I speak elsewhere of his excellent views on the Fisheries.

In speaking ([Chap. III.](#)) of Brittany, I must acknowledge my obligation to the book of Cambry which formerly gave me my first ideas upon that subject. It should be read in the edition which Émile Souvestre enriched, and we may say doubled, with his excellent notes and notices which thenceforth made us thoroughly acquainted with the *Derniers Bretons*. In several admirable little tales of graphic and striking truthfulness, Souvestre has given the best existing pictures of our western coasts, especially of Finisterre and the neighboring shores of the Loire. I should be glad to quote something from a writer so agreeable, and a friend so sincerely lamented, but the limits of this little book prevent me from quoting any literary matter. [403]

The remarkable observation made by Elie de Beaumont, quoted by me in [Chapter 4](#) of Book I., stands at the head of his article—which, in itself, is a great book—*Terrains* in the Dictionary of M. d'Orbigny.

What I have said about St. George's, in [Chapter 7](#), is much better said in Pelletan's books on *Royan* and in his *Pasteur du Desert*. That Pastor, as is generally known, was the grandfather of Pelletan, the reverend minister Jarousseau, so admirably heroic in saving his enemies. His small house, still standing, is a veritable Temple of Humanity.

NOTES TO BOOK 2. [Chapter I.](#) *Fecundity*. On the Herring, see Vol. I of De Reste's translation of an anonymous Dutch work; Noël de la Moriniere in his excellent works printed and unpublished; Valenciennes' *Poissons*, &c.

[Chapter II.](#) *Milky Sea*. Bory de Saint Vincent, *Diet. Classique*, Articles *Mer et Matieres*; Zimmerman, the *World before Man*, a beautiful and popular work which is in every one's hands. I am indebted also to the work of M. Bronn, crowned by the *Academy of the Sciences*. On the universal innocuousness of the vegetation of the Sea, consult Pouchet's *Botanique* a work of the highest order. For the plants which become animals; see Vaucher's *Conferves*, 1803; Decaisne and Thuret *Annales de Sc. Nat.*, 1845; Volumes III., XIV. and XVI., and *Comptes de l'Acad.*, 1853, Vol. XXXVI.; also, articles of Montagne Dict d'Orb. On the Volcanoes, see part 4, of Humboldt's *Cosmos*, and Ritter, translated by Elisee Reclus, *Revue Germ.*, 30th November, 1859.

[Chapter III.](#) *The Atom*. In the text I have quoted the great masters, Ehrenberg, Dujardin, Pouchet, Heterogenie. In the end spontaneous generation will conquer.

Chapters [IV.](#), [V.](#), [VI.](#), &c. Throughout this book, in ascending from inferior to superior life, I have taken for my guiding thread in the great labyrinth, the hypothesis of Metamorphosis but without serious intention of constructing a *chain of beings*. The idea of ascending Metamorphosis is natural to the mind, and is, in some sort, irresistibly imposed upon us. Cuvier himself, at the close of his Introduction to his *Poissons*, confesses that if that theory has no Historical value it *has a logical value*. On the *Sponge*, see Paul Gervais Dict. d'Orb. V. 375; Grant in Chenn, 307, &c. On Polypes, Corals, and Madrepores (Chapters [4](#) and [5](#)) besides Forster, Peron and Dawin consult Quoy and Gaimard; Lamouroux, *Polypes Flexibles*; Milne Edwards, Polypes and Ascidies of the Channel, &c. On the Calcaire, see the two Geologies of Lyell. [404]

[Chapter VI.](#) *Medusæ, Polypes, &c.* See Ehrenberg, Lesson, Dujardin, &c. Forbes shows by vegetable analogies that these animal metamorphoses are very simple phenomena. *Annals of Nat. History*, December, 1844. See also his excellent dissertations, *Medusæ*, in quarto, 1849.

[Chapter VII.](#) *The Oursin or Sea Hedgehog*. See the curious dissertations in which M. Cailland has described his discoveries.

[Chapter VIII.](#) *Shells, Pearl, and Mother of Pearl*. The capital work on these is Blainville's *Malacology*. See, also, on the Pearl Mabiuis of Hamburgh, *Revue Germ.*, July 31, 1858. I have profitably consulted on this subject our celebrated Jeweller, M. Froment Meurice.

[Chapter IX.](#) *The Poulpe*. Cuvier, Blainville, Dujardin *Ann. des Sciences Nat.*, first series, Vol. V. p. 214, and second series Vols. 3, 16, and 17; Robin and Secord, *Locomotion of Cephalapodes*, *Revue de Zoology*, 1849, p. 333.

[Chapter X.](#) *Crustaceæ*. Besides the classical and important work of Milne Edwards, I have consulted d'Orbigny and various travelers. See, also, the fine Atlas of Dumont d'Urville.

[Chapter XI.](#) *Fish*. The Introduction of Cuvier, Valenciennes' article *Fish*, in d'Orbigny's Dictionary. This last article is a complete book, learned and excellent. On the anatomy of Fish see the celebrated dissertation of Geoffroy. For what I have said on the nests made by spawning Fish I am indebted to Messrs. Caste and Gerbe.

Chapters [XII](#) and [XIII](#). *Whales, Amphibii and Syrens*. Here, Lacepede is at once instructive and eloquent. Nothing can be better than Boitard's articles in d'Orbigny's Dictionary.

NOTES TO [Book 3](#). *Conquest of the Sea*. This book sprang naturally out of my perusal of travels and voyages from the first History of Dieppe, by Vitel Estancelin, down to the recent discoveries. Especially consult Kerquelon, John Ross, Parry, Weddell, Dumont, d'Urville, James Ross, and Kane; Biot in the *Journal des Savants* and the luminous and precious abridgement of those works, by M. Langele in the *Revue des deux Mondes*. On the Fishery, besides the great works of Duhamel, see Tiphaine, "Economie History of the Western Seas de France, 1760."

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NOTES TO [Book 4](#). *Restoration by the Sea*. As long ago as 1725, Maragli seems to have suspected the presence of iodine. In 1730, an anonymous work, *Comes Domesticus*, recommended Sea Bathing.

The Bibliography of the Sea would be endless. There are many excellent books. Among them I may mention "the Mediterranean Sea," by W. H. Smith, 1854, the Manuals and Guide books of Guadet, Roccas, Cochet, Ernst, &c.

On the degeneracy of Races, see Morel, 1857: Magnus Huss, "*Alcoholismus*," 1852, &c.

I owe my acquaintance with the pamphlet of Doctor Barellay (*Ospizi Marini*) to my illustrious friend Montanelli, and to the delightful articles of M. Dall' Ongaro.



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Some presumed typos were corrected. Although most words were left as per the printed version, some standardization was made (ex., Arcachon for Archachon, Archacon and Arrachon). Based on some research, the following list of changes were made.

Page(s)	Change
26	Grindenwald => Grindelwald
28 , 173	Livingston => Livingstone
34	Sheveningen => Scheveningen
32	Eloretat => Étretat and Fecamp => Fécamp
98	Biarrity => Biarritz
99	Hèaux => Héaux and Epees de Treguier => Épées de Tréguier
133	Ponchet => Pouchet
149 , 151	Geoffray => Geoffroy
158	Added missing quotes at end of top and beginning of next paragraph
165	Medea => Medusa
171	Vetelles => Velelles
222	everything that comes in their path--animals, ("path--" added)
236	Cataceæ => Cetaceæ
402	appearing => appeared
404 404	Chapter IX. <i>Fish.</i> => Chapter XI. <i>Fish.</i>
ad2	LA VINIA => LAVINIA

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