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*Henry David Thoreau*

## Paradise (to be) Regained

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1843

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is equal to but one ray of its heat. The light of the sun is but the shadow of love. “The souls of men loving and fearing God,” says Raleigh, “receive influence from that divine light itself, whereof the sun’s clarity, and that of the stars, is by Plato called but a shadow. *Lumen est umbra Dei, Deus est Lumen Luminis*. Light is the shadow of God’s brightness, who is the light of light,” and, we may add, the heat of heat. Love is the wind, the tide, the waves, the sunshine. Its power is incalculable; it is many horse-power. It never ceases, it never slacks; it can move the globe without a resting-place; it can warm without fire; it can feed without meat; it can clothe without garments; it can shelter without roof; it can make a paradise within which will dispense with a paradise without. But though the wisest men in all ages have labored to publish this force, and every human heart is, sooner or later, more or less, made to feel it, yet how little is actually applied to social ends! True, it is the motive-power of all successful social machinery; but, as in physics we have made the elements do only a little drudgery for us — steam to take the place of a few horses, wind of a few oars, water of a few cranks and hand-mills — as the mechanical forces have not yet been generously and largely applied to make the physical world answer to the ideal, so the power of love has been but meanly and sparingly applied, as yet. It has patented only such machines as the almshouse, the hospital, and the Bible Society, while its infinite wind is still blowing, and blowing down these very structures too, from time to time. Still less are we accumulating its power, and preparing to act with greater energy at a future time. Shall we not contribute our shares to this enterprise, then?

realize from age to age. The winds which fan his cheek waft him the sum of that profit and happiness which their lagging inventions supply.

The chief fault of this book is, that it aims to secure the greatest degree of gross comfort and pleasure merely. It paints a Mahometan's heaven, and stops short with singular abruptness when we think it is drawing near to the precincts of the Christian's, — and we trust we have not made here a distinction without a difference. Undoubtedly if we were to reform this outward life truly and thoroughly, we should find no duty of the inner omitted. It would be employment for our whole nature; and what we should do thereafter would be as vain a question as to ask the bird what it will do when its nest is built and its brood reared. But a moral reform must take place first, and then the necessity of the other will be superseded, and we shall sail and plow by its force alone. There is a speedier way than the "*Mechanical System*" can show to fill up marshes, to drown the roar of the waves, to tame hyenas, secure agreeable environs, diversify the land, and refresh it with "rivulets of sweet water," and that is by the power of rectitude and true behavior. It is only for a little while, only occasionally, methinks, that we want a garden. Surely a good man need not be at the labor to level a hill for the sake of a prospect, or raise fruits and flowers, and construct floating islands, for the sake of a paradise. He enjoys better prospects than lie behind any hill. Where an angel travels it will be paradise all the way, but where Satan travels it will be burning marl and cinders. What says Veeshnoo Sarma? "He whose mind is at ease is possessed of all riches. Is it not the same to one whose foot is enclosed in a shoe, as if the whole surface of the earth were covered with leather?"

He who is conversant with the supernal powers will not worship these inferior deities of the wind, waves, tide, and sunshine. But we would not disparage the importance of such calculations as we have described. They are truths in physics, because they are true in ethics. The moral powers no one would presume to calculate. Suppose we could compare the moral with the physical, and say how many horsepower the force of love, for instance, blowing on every square foot of a man's soul, would equal. No doubt we are well aware of this force; figures would not increase our respect for it; the sunshine

A review of *The Paradise within the Reach of all Men, without Labor, by Powers of Nature and Machinery: An Address to all intelligent men, in two parts* by J.A. Etzler (1842).

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We learn that Mr. Etzler is a native of Germany, and originally published his book in Pennsylvania, ten or twelve years ago; and now a second English edition, from the original American one, is demanded by his readers across the water, owing, we suppose, to the recent spread of Fourier's doctrines. It is one of the signs of the times. We confess that we have risen from reading this book with enlarged ideas, and grander conceptions of our duties in this world. It did expand us a little. It is worth attending to, if only that it entertains large questions. Consider what Mr. Etzler proposes:

"Fellow-men! I promise to show the means of creating a paradise within ten years, where everything desirable for human life may be had by every man in superabundance, without labor, and without pay; where the whole face of nature shall be changed into the most beautiful forms, and man may live in the most magnificent palaces, in all imaginable refinements of luxury, and in the most delightful gardens; where he may accomplish, without labor, in one year, more than hitherto could be done in thousands of years; may level mountains, sink valleys, create lakes, drain lakes and swamps, and intersect the land everywhere with beautiful canals, and roads for transporting heavy loads of many thousand tons, and for traveling one thousand miles in twenty-four hours; may cover the ocean with floating islands movable in any desired direction with immense power and celerity, in perfect security, and with all comforts and luxuries, bearing gardens and palaces, with thousands of families, and provided with rivulets of sweet water; may explore the interior of the globe, and travel from pole to pole in a fortnight; provide himself with means, unheard of yet, for increasing his knowledge of the world, and so his intelligence; lead a life of continual happiness, of enjoyments yet unknown;

free himself from almost all the evils that afflict mankind, except death, and even put death far beyond the common period of human life, and finally render it less afflicting. Mankind may thus live in and enjoy a new world, far superior to the present, and raise themselves far higher in the scale of being.”

It would seem from this and various indications beside, that there is a transcendentalism in mechanics as well as in ethics. While the whole field of the one reformer lies beyond the boundaries of space, the other is pushing his schemes for the elevation of the race to its utmost limits. While one scours the heavens, the other sweeps the earth. One says he will reform himself, and then nature and circumstances will be right. Let us not obstruct ourselves, for that is the greatest friction. It is of little importance though a cloud obstruct the view of the astronomer compared with his own blindness. The other will reform nature and circumstances, and then man will be right. Talk no more vaguely, says he, of reforming the world — I will reform the globe itself. What matters it whether I remove this humor out of my flesh, or this pestilent humor from the fleshy part of the globe? Nay, is not the latter the more generous course? At present the globe goes with a shattered constitution in its orbit. Has it not asthma, and ague, and fever, and dropsy, and flatulence, and pleurisy, and is it not afflicted with vermin? Has it not its healthful laws counteracted, and its vital energy which will yet redeem it? No doubt the simple powers of nature, properly directed by man, would make it healthy and a paradise; as the laws of man’s own constitution but wait to be obeyed, to restore him to health and happiness. Our panaceas cure but few ails, our general hospitals are private and exclusive. We must set up another Hygeian than is now worshipped. Do not the quacks even direct small doses for children, larger for adults, and larger still for oxen and horses? Let us remember that we are to prescribe for the globe itself.

This fair homestead has fallen to us, and how little have we done to improve it, how little have we cleared and hedged and ditched! We are too inclined to go hence to a “better land,” without lifting a finger, as our farmers are moving to the Ohio soil; but would it not be more heroic and faithful to till and redeem this New England

is, which develops its principles in their full extent, and the outlines of the application to which they lead. There is no idea of comparison between what is explored and what is yet to be explored in this science. The ancient Greeks placed mathematics at the head of their education. But we are glad to have filled our memory with notions, without troubling ourselves much with reasoning about them.”

Mr. Etzler is not one of the enlightened practical men, the pioneers of the actual, who move with the slow, deliberate tread of science, conserving the world; who execute the dreams of the last century, though they have no dreams of their own; yet he deals in the very raw but still solid material of all inventions. He has more of the practical than usually belongs to so bold a schemer, so resolute a dreamer. Yet his success is in theory, and not in practice, and he feeds our faith rather than contents our understanding. His book wants order, serenity, dignity, everything, — but it does not fail to impart what only man can impart to man of much importance, his own faith. It is true his dreams are not thrilling nor bright enough, and he leaves off to dream where he who dreams just before the dawn begins. His castles in the air fall to the ground, because they are not built lofty enough; they should be secured to heaven’s roof. After all, the theories and speculations of men concern us more than their puny accomplishment. It is with a certain coldness and languor that we loiter about the actual and so-called practical. How little do the most wonderful inventions of modern times detain us. They insult nature. Every machine, or particular application, seems a slight outrage against universal laws. How many fine inventions are there which do not clutter the ground? We think that those only succeed which minister to our sensible and animal wants, which bake or brew, wash or warm, or the like. But are those of no account which are patented by fancy and imagination, and succeed so admirably in our dreams that they give the tone still to our waking thoughts? Already nature is serving all those uses which science slowly derives on a much higher and grander scale to him that will be served by her. When the sunshine falls on the path of the poet, he enjoys all those pure benefits and pleasures which the arts slowly and partially

But we see two main difficulties in the way: first, the successful application of the powers by machinery (we have not yet seen the “*Mechanical System*,”) and, secondly, which is infinitely harder, the application of man to the work by faith. This it is, we fear, which will prolong the ten years to ten thousand at least. It will take a power more than “80,000 times greater than all the men on earth could effect with their nerves,” to persuade men to use that which is already offered them. Even a greater than this physical power must be brought to bear upon that moral power. Faith, indeed, is all the reform that is needed; it is itself a reform. Doubtless, we are as slow to conceive of Paradise as of Heaven, of a perfect natural as of a perfect spiritual world. We see how past ages have loitered and erred. “Is perhaps our generation free from irrationality and error? Have we perhaps reached now the summit of human wisdom, and need no more to look out for mental or physical improvement?” Undoubtedly, we are never so visionary as to be prepared for what the next hour may bring forth.

Μέλλει τὸ Θεῖον δ’ ἔστι τοιοῦτον φύσει

The Divine is about to be, and such is its nature. In our wisest moments we are secreting a matter, which, like the lime of the shell-fish, incrusts us quite over, and well for us if, like it, we cast our shells from time to time, though they be pearl and of fairest tint. Let us consider under what disadvantages science has hitherto labored before we pronounce thus confidently on her progress. [¶58]

“There was never any system in the productions of human labor; but they came into existence and fashion as chance directed men.” “Only a few professional men of learning occupy themselves with teaching natural philosophy, chemistry, and the other branches of the sciences of nature, to a very limited extent, for very limited purposes, with very limited means.” “The science of mechanics is but in a state of infancy. It is true, improvements are made upon improvements, instigated by patents of government; but they are made accidentally or at hap-hazard. There is no general system of this science, mathematical as it

soil of the world? The still youthful energies of the globe have only to be directed in their proper channel. Every gazette brings accounts of the untutored freaks of the wind, — shipwrecks and hurricanes which the mariner and planter accept as special or general providences; but they touch our consciences, they remind us of our sins. Another deluge would disgrace mankind. We confess we never had much respect for that antediluvian race. A thoroughbred business man cannot enter heartily upon the business of life without first looking into his accounts. How many things are now at loose ends! Who knows which way the wind will blow to-morrow? Let us not succumb to nature. We will marshal the clouds and restrain tempests; we will bottle up pestilent exhalations; we will probe for earthquakes, grub them up, and give vent to the dangerous gas; we will disembowel the volcano, and extract its poison, take its seed out. We will wash water, and warm fire, and cool ice, and underprop the earth. We will teach birds to fly, and fishes to swim, and ruminants to chew the cud. It is time we had looked into these things.

And it becomes the moralist, too, to inquire what man might do to improve and beautify the system; what to make the stars shine more brightly, the sun more cheery and joyous, the moon more placid and content. Could he not heighten the tints of flowers and the melody of birds? Does he perform his duty to the inferior races? Should he not be a god to them? What is the part of magnanimity to the whale and the beaver? Should we not fear to exchange places with them for a day, lest by their behavior they should shame us? Might we not treat with magnanimity the shark and the tiger, not descend to meet there on their own level, with spears of shark’s teeth and bucklers of tiger’s skin? We slander the hyena; man is the fiercest and cruelest animal. Ah! he is of little faith; even the erring comets and meteors would thank him, and return his kindness in their kind.

How meanly and grossly do we deal with nature! Could we not have a less gross labor? What else do these fine inventions suggest, — magnetism, the daguerreotype, electricity? Can we not do more than cut and trim the forest — can we not assist in its interior economy, in the circulation of the sap? Now we work superficially and violently. We do not suspect how much might be done to improve our relation

to animated nature even; what kindness and refined courtesy there might be.

There are certain pursuits which, if not wholly poetic and true, do at least suggest a nobler and finer relation to nature than we know. The keeping of bees, for instance, is a very slight interference. It is like directing the sunbeams. All nations, from the remotest antiquity, have thus fingered nature. There are Hymettus and Hybla, and how many bee-renowned spots beside? There is nothing gross in the idea of these little herds, — their hum like the faintest low of kine in the meads. A pleasant reviewer has lately reminded us that in some places they are led out to pasture where the flowers are most abundant. “Columella tells us,” says he, “that the inhabitants of Arabia sent their hives into Attica to benefit by the later-blowing flowers.” Annually are the hives, in immense pyramids, carried up the Nile in boats, and suffered to float slowly down the stream by night, resting by day, as the flowers put forth along the banks; and they determine the richness of any locality, and so the profitableness of delay, by the sinking of the boat in the water. We are told, by the same reviewer, of a man in Germany, whose bees yielded more honey than those of his neighbors, with no apparent advantage ; but at length he informed them, that he had turned his hives one degree more to the east, and so his bees, having two hours the start in the morning, got the first sip of honey. True, there is treachery and selfishness behind all this, but these things suggest to the poetic mind what might be done.

Many examples there are of a grosser interference, yet not without their apology. We saw last summer, on the side of a mountain, a dog employed to churn for a farmer’s family, traveling upon a horizontal wheel, and though he had sore eyes, an alarming cough, and withal a demure aspect, yet their bread did get buttered for all that. Undoubtedly, in the most brilliant successes, the first rank is always sacrificed. Much useless traveling of horses, *in extenso*, has of late years been improved for man’s behoof, only two forces being taken advantage of, — the gravity of the horse, which is the centripetal, and his centrifugal inclination to go ahead. Only these two elements in the calculation. And is not the creature’s whole economy better economized thus? Are not all finite beings better

great, for the improvement of his own condition, or that of his fellow-men, can ever be effected by individual enterprise.”

Alas! this is the crying sin of the age, this want of faith in the prevalence of a man. Nothing can be effected but by one man. He who wants help wants everything. True, this is the condition of our weakness, but it can never be the means of our recovery. We must first succeed alone, that we may enjoy our success together. We trust that the social movements which we witness indicate an aspiration not to be thus cheaply satisfied. In this matter of reforming the world, we have little faith in corporations; not thus was it first formed.

But our author is wise enough to say that the materials for the accomplishment of his purposes are “iron, copper, wood, earth chiefly, and a union of men whose eyes and understanding are not shut up by preconceptions.” Ay, this last may be what we want mainly, — a company of “odd fellows” indeed.

“Small shares of twenty dollars will be sufficient,” — in all, from “200,000 to 300,000,” — “to create the first establishment for a whole community of from 3,000 to 4,000 individuals” at the end of five years we shall have a principal of 200 millions of dollars, and so paradise will be wholly regained at the end of the tenth year. But, alas! the ten years have already elapsed, and there are no signs of Eden yet, for want of the requisite funds to begin the enterprise in a hopeful manner. Yet it seems a safe investment. Perchance they could be hired at a low rate, the property being mortgaged for security, and, if necessary, it could be given up in any stage of the enterprise, without loss, with the fixtures.

Mr. Etzler considers this “Address as a touchstone, to try whether our nation is in any way accessible to these great truths, for raising the human creature to a superior state of existence, in accordance with the knowledge and the spirit of the most cultivated minds of the present time.” He has prepared a constitution, short and concise, consisting of twenty-one articles, so that wherever an association may spring up, it may go into operation without delay; and the editor informs us that “Communications on the subject of this book may be addressed to C.F. Stollmeyer, No. 6, Upper Charles street, Northampton square, London.”

which stands behind every spade in the field. This it is that makes the valleys shine, and the deserts really bloom. Sometimes, we confess, we are so degenerate as to reflect with pleasure on the days when men were yoked like cattle, and drew a crooked stick for a plow. After all, the great interests and methods were the same.

It is a rather serious objection to Mr. Etzler's schemes, that they require time, men, and money, three very superfluous and inconvenient things for an honest and well-disposed man to deal with. "The whole world," he tells us, "might therefore be really changed into a paradise, within less than ten years, commencing from the first year of an association for the purpose of constructing and applying the machinery." We are sensible of a startling incongruity when time and money are mentioned in this connection. The ten years which are proposed would be a tedious while to wait, if every man were at his post and did his duty, but quite too short a period, if we are to take time for it. But this fault is by no means peculiar to Mr. Etzler's schemes. There is far too much hurry and bustle, and too little patience and privacy, in all our methods, as if something were to be accomplished in centuries. The true reformer does not want time, nor money, nor cooperation, nor advice. What is time but the stuff delay is made of? And depend upon it, our virtue will not live on the interest of our money. He expects no income, but outgoes; so soon as we begin to count the cost, the cost begins. And as for advice, the information floating in the atmosphere of society is as evanescent and unserviceable to him as gossamer for clubs of Hercules. There is absolutely no common sense; it is common nonsense. If we are to risk a cent or a drop of our blood, who then shall advise us? For ourselves, we are too young for experience. Who is old enough? We are older by faith than by experience. In the unbending of the arm to do the deed there is experience worth all the maxims in the world.

"It will now be plainly seen that the execution of the proposals is not proper for individuals. Whether it be proper for government at this time, before the subject has become popular, is a question to be decided; all that is to be done is to step forth, after mature reflection, to confess loudly one's conviction, and to constitute societies. Man is powerful but in union with many. Nothing

pleased with motions relative than absolute? And what is the great globe itself but such a wheel, — a larger tread-mill, — so that our horse's freest steps over prairies are oftentimes balked and rendered of no avail by the earth's motion on its axis? But here he is the central agent and motive-power; and, for variety of scenery, being provided with a window in front, do not the ever-varying activity and fluctuating energy of the creature himself work the effect of the most varied scenery on a country road? It must be confessed that horses at present work too exclusively for men, rarely men for horses; and the brute degenerates in man's society.

It will be seen that we contemplate a time when man's will shall be law to the physical world, and he shall no longer be deterred by such abstractions as time and space, height and depth, weight and hardness, but shall indeed be the lord of creation. "Well," says the faithless reader, "'life is short, but art is long;' where is the power that will effect all these changes?" This it is the very object of Mr. Etzler's volume to show. At present, he would merely remind us that there are innumerable and immeasurable powers already existing in nature, unimproved on a large scale, or for generous and universal ends, amply sufficient for these purposes. He would only indicate their existence, as a surveyor makes known the existence of a water-power on any stream; but for their application he refers us to a sequel to this book, called the "Mechanical System." A few of the most obvious and familiar of these powers are the Wind, the Tide, the Waves, the Sunshine. Let us consider their value.

First, there is the power of the Wind, constantly exerted over tire globe. It appears from observation of a sailing-vessel, and from scientific tables, that the average power of the wind is equal to that of one horse for every one hundred square feet. "We know," says our author —

"that ships of the first class carry sails two hundred feet high; we may, therefore, equally, on land, oppose to the wind surfaces of the same height. Imagine a line of such surfaces one mile, or about 5,000 feet, long; they would then contain 1,000,000 square feet. Let these surfaces intersect the direction of the wind at right angles, by some contrivance, and receive, consequently,

its full power at all times. Its average power being equal to one horse for every 100 square feet, the total power would be equal to 1,000,000 divided by 100, or 10,000 horses' power. Allowing the power of one horse to equal that of ten men, the power of 10,000 horses is equal to 100,000 men. But as men cannot work uninterruptedly, but want about half the time for sleep and repose, the same power would be equal to 200,000 men. . . . We are not limited to the height of 200 feet; we might extend, if required, the application of this power to the height of the clouds, by means of kites."

But we will have one such fence for every square mile of the globe's surface, for, as the wind usually strikes the earth at an angle of more than two degrees, which is evident from observing its effect on the high sea, it admits of even a closer approach. As the surface of the globe contains about 200,000,000 square miles, the whole power of the wind on these surfaces would equal 40,000,000,000,000 men's power, and "would perform 80,000 times as much work as all the men on earth could effect with their nerves."

If it should be objected that this computation includes the surface of the ocean and uninhabitable regions of the earth, where this power could not be applied for our purposes, Mr. Etzler is quick with his reply — "But, you will recollect," says he, "that I have promised to show the means for rendering the ocean as inhabitable as the most fruitful dry land; and I do not exclude even the polar regions."

The reader will observe that our author uses the fence only as a convenient formula for expressing the power of the wind, and does not consider it a necessary method of its application. We do not attach much value to this statement of the comparative power of the wind and horse, for no common ground is mentioned on which they can be compared. Undoubtedly, each is incomparably excellent in its way, and every general comparison made for such practical purposes as are contemplated, which gives a preference to the one, must be made with some unfairness to the other. The scientific tables are, for the most part, true only in a tabular sense. We suspect that a loaded wagon, with a light sail, ten feet square, would not have been blown so far by the end of the year, under equal circumstances, as a

"At night the roof and the inside and outside of the whole square are illuminated by gas-light, which in the mazes of many-colored crystal-like colonnades and vaultings, is reflected with a brilliancy that gives to the whole a lustre of precious stones, as far as the eye can see. Such are the future abodes of men." . . . "Such is the life reserved to true intelligence, but withheld from ignorance, prejudice, and stupid adherence to custom." . . . "Such is the domestic life to be enjoyed by every human individual that will partake of it. Love and affection may there be fostered and enjoyed without any of the obstructions that oppose, diminish, and destroy them in the present state of men." . . . "It would be as ridiculous, then, to dispute and quarrel about the means of life, as it would be now about water to drink along mighty rivers, or about the permission to breathe air in the atmosphere, or about sticks in our extensive woods."

Thus is Paradise to be Regained, and that old and stern decree at length reversed. Man shall no more earn his living by the sweat of his brow. All labor shall be reduced to "a short turn of some crank," and "taking the finished article away." But there is a crank, — oh, how hard to be turned! Could there not be a crank upon a crank, — an infinitely small crank? — we would fain inquire. No, — alas! not. But there is a certain divine energy in every man, but sparingly employed as yet, which may be called the crank within, — the crank after all, — the prime mover in all machinery, — quite indispensable to all work. Would that we might get our hands on its handle! In fact, no work can be shirked. It may be postponed indefinitely, but not infinitely. Nor can any really important work be made easier by cooperation or machinery. Not one particle of labor now threatening any man can be routed without being performed. It cannot be hunted out of the vicinity like jackals and hyenas. It will not run. You may begin by sawing the little sticks, or you may saw the great sticks first, but sooner or later you must saw them both.

We will not be imposed upon by this vast application of forces. We believe that most things will have to be accomplished still by the application called Industry. We are rather pleased, after all, to consider the small private, but both constant and accumulated, force



see, full of fruits and flowers, arranged in the most beautiful order, with walks, colonnades, aqueducts, canals, ponds, plains, amphitheatres, terraces, fountains, sculptural works, pavilions, gondolas, places for public amusement, etc., to delight the eye and fancy, the taste and smell." . . . "The walks and roads are to be paved with hard vitrified large plates, so as to be always clean from all dirt in any weather or season. . . . The channels being of vitrified substance, and the water perfectly clear, and filtrated or distilled if required, may afford the most beautiful scenes imaginable, while a variety of fishes is seen clear down to the bottom playing about, and the canals may afford at the same time, the means of gliding smoothly along between various sceneries of art and nature, in beautiful gondolas, while their surface and borders may be covered with fine land and aquatic birds. The walks may be covered with porticoes adorned with magnificent columns, statues, and sculptural works; all of vitrified substance, and lasting forever, while the beauties of nature around heighten the magnificence and deliciousness.

"The night affords no less delight to fancy and feelings. An infinite variety of grand, beautiful and fanciful objects and sceneries, radiating with crystalline brilliancy, by the illumination of gas-light; the human figures themselves, arrayed in the most beautiful pomp fancy may suggest, or the eye desire, shining even with brilliancy of stuffs and diamonds, like stones of various colors, elegantly shaped and arranged around the body; all reflected a thousand-fold in huge mirrors and reflectors of various forms; theatrical scenes of a grandeur and magnificence, and enrapturing illusions, unknown yet, in which any person may be either a spectator or an actor; the speech and the songs reverberating with increased sound, rendered more sonorous and harmonious than by nature, by vaultings that are moveable into any shape at any time; the sweetest and most impressive harmony of music, produced by song and instruments partly not known yet, may thrill through the nerves and vary with other amusements and delights."

common racer or dray horse would have drawn it. And how many crazy structures on our globe's surface, of the same dimensions, would wait for dry-rot if the traces of one horse were hitched to them, even to their windward side? Plainly this is not the principle of comparison. But even the steady and constant force of the horse may be rated as equal to his weight at least. Yet we should prefer to let the zephyrs and gales bear, with all their weight, upon our fences, than that Dobbin, with feet braced, should lean ominously against them for a season.

Nevertheless, here is an almost incalculable power at our disposal, yet how trifling the use we make of it! It only serves to turn a few mills, blow a few vessels across the ocean, and a few trivial ends besides. What a poor compliment do we pay to our indefatigable and energetic servant!

"If you ask, perhaps, why this power is not used, if the statement be true, I have to ask in return, why is the power of steam so lately come to application? so many millions of men boiled water every day for many thousand years; they must have frequently seen that boiling water, in tightly closed pots or kettles, would lift the cover or burst the vessel with great violence. The power of steam was, therefore, as commonly known down to the least kitchen or wash-woman, as the power of wind; but close observation and reflection were bestowed neither on the one nor the other."

Men having discovered the power of falling water, which, after all, is comparatively slight, how eagerly do they seek out and improve these privileges! Let a difference of but a few feet in level be discovered on some stream near a populous town, some slight occasion for gravity to act, and the whole economy of the neighborhood is changed at once. Men do indeed speculate about and with this power as if it were the only privilege. But meanwhile this aerial stream is falling from far greater heights with more constant flow, never shrunk by drought, offering mill-sites wherever the wind blows; a Niagara in the air, with no Canada side; — only the application is hard.

There are the powers, too, of the Tide and Waves, constantly ebbing and flowing, lapsing and relapsing, but they serve man in but few ways. They turn a few tide mills, and perform a few other insignificant and accidental services only. We all perceive the effect of the tide, how imperceptibly it creeps up into our harbors and rivers, and raises the heaviest navies as easily as the lightest chip. Everything that floats must yield to it. But man, slow to take nature's constant hint of assistance, makes slight and irregular use of this power, in careening ships and getting them afloat when aground.

The following is Mr. Etzler's calculation on this head: To form a conception of the power which the tide affords, let us imagine a surface of 100 miles square, or 10,000 square miles, where the tide rises and sinks, on an average, 10 feet; how many men would it require to empty a basin of 10,000 square miles area, and 10 feet deep, filled with sea-water, in  $6\frac{1}{4}$  hours and fill it again in the same time? As one man can raise 8 cubic feet of sea-water per minute, and in  $6\frac{1}{4}$  hours 3,000, it would take 1,200,000,000 men, or as they could work only half the time, 2,400,000,000, to raise 3,000,000,000,000 cubic feet, or the whole quantity required in the given time.

This power may be applied in various ways. A large body, of the heaviest materials that will float, may first be raised by it, and being attached to the end of a balance reaching from the land, or from a stationary support fastened to the bottom, when the tide falls the whole weight will be brought to bear upon the end of the balance. Also, when the tide rises, it may be made to exert a nearly equal force in the opposite direction. It can be employed wherever a *point d'appui* can be obtained.

“However, the application of the tide being by establishments fixed on the ground, it is natural to begin with them near the shores in shallow water, and upon sands, which may be extended gradually further into the sea. The shores of the continent, islands, and sands, being generally surrounded by shallow water, not exceeding from 50 to 100 fathoms in depth, for 20, 50, or 100 miles and upward. The coasts of North America, with their extensive sand-banks, islands, and rocks, may easily afford, for this purpose, a ground about 3,000 miles long, and,

without leaving his apartment; he may, at any time, bathe himself in cold or warm water, or in steam, or in some artificially prepared liquor for invigorating health. He may, at any time, give to the air in his apartment that temperature that suits his feeling best. He may cause, at any time, an agreeable scent of various kinds. He may, at any time, meliorate his breathing air, — that main vehicle of vital power. Thus, by a proper application of the physical knowledge of our days, man may be kept in a perpetual serenity of mind, and if there is no incurable disease or defect in his organism, in constant vigor of health, and his life be prolonged beyond any parallel which present times afford.”

“One or two persons are sufficient to direct the kitchen business. They have nothing else to do but to superintend the cookery, and to watch the time of the victuals being done, and then to remove them, with the table and vessels, into the dining-hall, or to the respective private apartments, by a slight motion of the hand at some crank. Any very extraordinary desire of any person may be satisfied by going to the place where the thing is to be had; and anything that requires a particular preparation in cooking or baking may be done by the person who desires it.”

This is one of those instances in which the individual genius is found to consent, as indeed it always does, at last, with the universal. This last sentence has a certain sad and sober truth, which reminds us of the scripture of all nations. All expression of truth does at length take this deep ethical form. Here is hint of a place the most eligible of any in space, and of a servitor, in comparison with whom all other helps dwindle into insignificance. We hope to hear more of him anon, for even a Crystal Palace would be deficient without his invaluable services.

And as for the environs of the establishment,

“There will be afforded the most enrapturing views to be fancied, out of the private apartments, from the galleries, from the roof, from its turrets and cupolas, — gardens, as far as the eye can

The countryman who visited the city, and found the streets cluttered with bricks and lumber, reported that it was not yet finished, and one who considers the endless repairs and reforming of our houses might well wonder when they will be done. But why may not the dwellings of men on this earth be built, once for all, of some durable material, some Roman or Etruscan masonry, which will stand, so that time shall only adorn and beautify them? Why may we not finish the outward world for posterity, and leave them leisure to attend to the inner? Surely, all the gross necessities and economics might be cared for in a few years. All might be built and baked and stored up, during this, the term-time of the world, against the vacant eternity, and the globe go provisioned and furnished like our public vessels, for its voyage through space, as through some Pacific ocean, while we would “tie up the rudder and sleep before the wind,” as those who sail from Lima to Manilla.

But, to go back a few years in imagination, think not that life in these crystal palaces is to bear any analogy to life in our present humble cottages. Far from it. Clothed, once for all, in some “flexible stuff,” more durable than George Fox’s suit of leather, composed of “fibres of vegetables,” “glutinated” together by some “cohesive substances,” and made into sheets, like paper, of any size or form, man will put far from him corroding care and the whole host of ills.

“The twenty-five halls in the inside of the square are to be each two hundred feet square and high; the forty corridors, each one hundred feet long and twenty wide; the eighty galleries, each from 1,000 to 1,250 feet long; about 7,000 private rooms, the whole surrounded and intersected by the grandest and most splendid colonnades imaginable; floors, ceilings, columns, with their various beautiful and fanciful intervals, all shining, and reflecting to infinity all objects and persons, with splendid lustre of all beautiful colors, and fanciful shapes and pictures. All galleries, outside and within the halls, are to be provided with many thousand commodious and most elegant vehicles, in which persons may move up and down like birds, in perfect security, and without exertion. Any member may procure himself all the common articles of his daily wants, by a short turn of some crank,

on average, 100 miles broad, or 300,000 square miles, which, with a power of 240,000 men per square mile, as stated, at 10 feet tide, will be equal to 72,000 millions of men, or for every mile of coast, a power of 24,000,000 men.”

“Rafts, of any extent, fastened on the ground of the sea, along the shore, and stretching far into the sea, may be covered with fertile soil, bearing vegetables and trees, of every description, the finest gardens, equal to those the firm land may admit of, and buildings and machineries, which may operate, not only on the sea, where they are, but which also, by means of mechanical connections, may extend their operations for many miles into the continent. (Etzler’s *Mechanical System*, page 24.) Thus this power may cultivate the artificial soil for many miles upon the surface of the sea, near the shores, and, for several miles, the dry land, along the shore, in the most superior manner imaginable; it may build cities along the shore, consisting of the most magnificent palaces, every one surrounded by gardens and the most delightful sceneries; it may level the hills and unevennesses, or raise eminences for enjoying open prospect into the country and upon the sea; it may cover the barren shore with fertile soil, and beautify the same in various ways; it may clear the sea of shallows, and make easy the approach to the land, not merely of vessels, but of large floating islands, which may come from, and go to distant parts of the world, islands that have every commodity and security for their inhabitants which the firm land affords.”

“Thus may a power, derived from the gravity of the moon and the ocean, hitherto but the objects of idle curiosity to the studious man, be made eminently subservient for creating the most delightful abodes along the coasts, where men may enjoy at the same time all the advantages of sea and dry land; the coasts may hereafter be continuous paradisiacal skirts between land and sea, everywhere crowded with the densest population. The shores and the sea along them will be no more as raw nature presents them now, but everywhere of easy and charming access, not even molested by the roar of waves, shaped as it may

suit the purposes of their inhabitants; the sea will be cleared of every obstruction to free passage every-where, and its productions in fishes, etc., will be gathered in large, appropriate receptacles, to present them to the inhabitants of the shores and of the sea.”

Verily, the land would wear a busy aspect at the spring and neap tide, and these island ships, these *terræ infirmæ*, which realize the fables of antiquity, affect our imagination. We have often thought that the fittest locality for a human dwelling was on the edge of the land, that there the constant lesson and impression of the sea might sink deep into the life and character of the landsman, and perhaps impart a marine tint to his imagination. It is a noble word, that mariner — one who is conversant with the sea. There should be more of what it signifies in each of us. It is a worthy country to belong to — we look to see him not disgrace it. Perhaps we should be equally mariners and terreners, and even our Green Mountains need some of that sea-green to be mixed with them.

The computation of the power of the waves is less satisfactory. While only the average power of the wind and the average height of the tide were taken before, now the extreme height of the waves is used, for they are made to rise ten feet above the level of the sea, to which, adding ten more for depression, we have twenty feet, or the extreme height of a wave. Indeed, the power of the waves, which is produced by the wind blowing obliquely and at disadvantage upon the water, is made to be, not only three thousand times greater than that of the tide, but one hundred times greater than that of the wind itself, meeting its object at right angles. Moreover, this power is measured by the area of the vessel, and not by its length mainly, and it seems to be forgotten that the motion of the waves is chiefly undulatory, and exerts a power only within the limits of a vibration, else the very continents, with their extensive coasts, would soon be set adrift.

Finally, there is the power to be derived from sunshine, by the principle on which Archimedes contrived his burning-mirrors, a multiplication of mirrors reflecting the rays of the sun upon the same

little art, a simple application of natural laws, a canoe, a paddle, and a sail of matting, to people the isles of the Pacific, and a little more will people the shining isles of space. Do we not see in the firmament the lights carried along the shore by night, as Columbus did? Let us not despair nor mutiny.

“The dwellings also ought to be very different from what is known, if the full benefit of our means is to be enjoyed. They are to be of a structure for which we have no name yet. They are to be neither palaces, nor temples, nor cities, but a combination of all, superior to whatever is known. Earth may be baked into bricks, or even vitrified stone by heat, — we may bake large masses of any size and form, into stone and vitrified substance of the greatest durability, lasting even thousands of years, out of clayey earth, or of stones ground to dust, by the application of burning mirrors. This is to be done in the open air without other preparation than gathering the substance, grinding and mixing it with water and cement, moulding or casting it, and bringing the focus of the burning mirrors of proper size upon the same. The character of the architecture is to be quite different from what it ever has been hitherto; large solid masses are to be baked or cast in one piece, ready shaped in any form that may be desired. The building may, therefore, consist of columns two hundred feet high and upwards, of proportionate thickness, and of one entire piece of vitrified substance; huge pieces are to be moulded so as to join and hook on to each other firmly, by proper joints and folds, and not to yield in any way without breaking.”

“Foundries, of any description, are to be heated by burning mirrors, and will require no labor, except the making of the first moulds and the superintendence for gathering the metal and taking the finished articles away.”

Alas! in the present state of science, we must take the finished articles away; but think not that man will always be the victim of circumstances.

“Large and commodious vehicles, for carrying many thousand tons, running over peculiarly adapted level roads, at the rate of forty miles per hour, or one thousand miles per day, may transport men and things, small houses, and whatever may serve for comfort and ease, by land. Floating islands, constructed of logs, or of wooden-stuff prepared in a similar manner, as is to be done with stone, and of live trees, which may be reared so as to interlace one another, and strengthen the whole, may be covered with gardens and palaces, and propelled by powerful engines, so as to run at an equal rate though seas and oceans. Thus, man may move, with the celerity of a bird’s flight, in terrestrial paradises, from one climate to another, and see the world in all its variety, exchanging, with distant nations, the surplus of productions. The journey from one pole to another may be performed in a fortnight; the visit to a transmarine country in a week or two; or a journey round the world in one or two months by land and water. And why pass a dreary winter every year while there is yet room enough on the globe where nature is blessed with a perpetual summer, and with a far greater variety and luxuriance of vegetation? More than one-half the surface of the globe has no winter. Men will have it in their power to remove and prevent all bad influences of climate, and to enjoy, perpetually, only that temperature which suits their constitution and feeling best.”

Who knows but by accumulating the power until the end of the present century, using meanwhile only the smallest allowance, reserving all that blows, all that shines, all that ebbs and flows, all that dashes, we may have got such a reserved accumulated power as to run the earth off its track into a new orbit, some summer, and so change the tedious vicissitude of the seasons? Or, perchance, coming generations will not abide the dissolution of the globe, but, availing themselves of future inventions in aerial locomotion, and the navigation of space, the entire race may migrate from the earth, to settle some vacant and more western planet, it may be still healthy, perchance unearthy, not composed of dirt and stones, whose primary strata only are strewn, and where no weeds are sown. It took but

spot, till the requisite degree of heat is obtained. The principal application of this power will be to the boiling of water and production of steam.

“How to create rivulets of sweet and wholesome water, on floating islands, in the midst of the ocean, will be no riddle now. Sea-water changed into steam, will distil into sweet water, leaving the salt on the bottom. Thus the steam engines on floating islands, for their propulsion and other mechanical purposes, will serve, at the same time, for the distillery of sweet water, which, collected in basins, may be led through channels over the island, while, where required, it may be refrigerated by artificial means, and changed into cool water, surpassing, in salubrity, the best spring water, because nature hardly ever distils water so purely, and without admixture of less wholesome matter.”

So much for these few and more obvious powers, already used to a trifling extent. But there are innumerable others in nature, not described nor discovered. These, however, will do for the present. This would be to make the sun and the moon equally our satellites. For, as the moon is the cause of the tides, and the sun the cause of the wind, which, in turn, is the cause of the waves, all the work of this planet would be performed by these far influences.

“But as these powers are very irregular and subject to interruptions; the next object is to show how they may be converted into powers that operate continually and uniformly for ever, until the machinery be worn out, or, in other words, into perpetual motions” . . . “Hitherto the power of the wind has been applied immediately upon the machinery for use, and we have had to wait the chances of the wind’s blowing; while the operation was stopped as soon as the wind ceased to blow. But the manner, which I shall state hereafter, of applying this power, is to make it operate only for collecting or storing up power, and then to take out of this store, at any time, as much as may be wanted for final operation upon the machines. The power stored up is to react as required, and may do so long after the

original power of the wind has ceased. And though the wind should cease for intervals of many months, we may have by the same power a uniform perpetual motion in a very simple way.”

“The weight of a clock being wound up gives us an image of reaction. The sinking of this weight is the reaction of winding it up. It is not necessary to wait till it has run down before we wind up the weight, but it may be wound up at any time, partly or totally; and if done always before the weight reaches the bottom, the clock will be going perpetually. In a similar, though not in the same way, we may cause a reaction on a larger scale. We may raise, for instance, water by the immediate application of wind or steam to a pond upon some eminence, out of which, through an outlet, it may fall upon some wheel or other contrivance for setting machinery a going. Thus we may store up water in some eminent pond, and take out of this store, at any time, as much water through the outlet as we want to employ, by which means the original power may react for many days after it has ceased.” . . . “Such reservoirs of moderate elevation or size need not be made artificially, but will be found made by nature very frequently, requiring but little aid for their completion. They require no regularity of form. Any valley, with lower grounds in its vicinity, would answer the purpose. Small crevices may be filled up. Such places may be eligible for the beginning of enterprises of this kind.”

The greater the height, of course, the less water required. But suppose a level and dry country; then hill and valley, and “eminent pond,” are to be constructed by main force; or, if the springs are unusually low, then dirt and stones may be used, and the disadvantage arising from friction will be counterbalanced by their greater gravity. Nor shall a single rood of dry land be sunk in such artificial ponds as may be wanted, but their surfaces “may be covered with rafts decked with fertile earth, and all kinds of vegetables which may grow there as well as anywhere else.”

And, finally, by the use of thick envelopes retaining the heat, and other contrivances, “the power of steam caused by sunshine may react at will, and thus be rendered perpetual, no matter how often

or how long the sunshine may be interrupted. (Etzler’s *Mechanical System*.)”

Here is power enough, one would think, to accomplish somewhat. These are the powers below. Oh ye millwrights, ye engineers, ye operatives and speculators of every class, never again complain of a want of power; it is the grossest form of infidelity. The question is, not how we shall execute, but what. Let us not use in a niggardly manner what is thus generously offered.

Consider what revolutions are to be effected in agriculture. First, in the new country a machine is to move along, taking out trees and stones to any required depth, and piling them up in convenient heaps; then the same machine, “with a little alteration,” is to plane the ground perfectly, till there shall be no hills nor valleys, making the requisite canals, ditches, and roads as it goes along. The same machine, “with some other little alterations,” is then to sift the ground thoroughly, supply fertile soil from other places if wanted, and plant it; and finally the same machine, “with a little addition,” is to reap and gather in the crop, thresh and grind it, or press it to oil, or prepare it any way for final use. For the description of these machines we are referred to “Etzler’s *Mechanical System*, pages 11 to 27.” We should be pleased to see that “*Mechanical System*,” though we have not been able to ascertain whether it has been published, or only exists as yet in the design of the author. We have great faith in it. But we cannot stop for applications now.

“Any wilderness, even the most hideous and sterile, may be converted into the most fertile and delightful gardens. The most dismal swamps may be cleared of all their spontaneous growth, filled up and levelled, and intersected by canals, ditches and aqueducts, for draining them entirely. The soil, if required, may be meliorated, by covering or mixing it with rich soil taken from distant places, and the same be mouldered to fine dust, levelled, sifted from all roots, weeds and stones, and sowed and planted in the most beautiful order and symmetry, with fruit trees and vegetables of every kind that may stand the climate.”

New facilities for transportation and locomotion are to be adopted: