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Nec aranearum sane textus ideo melior, quia ex se fila gignunt, nec noster vilior quia ex alienis libamus ut apes.

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LECTURE

Delivered before the Miramichi Mechanics' Institute, during the last season,
BY MR. JAMES MURRAY,
NEWCASTLE.

Ladies and Gentlemen,

The subject which I beg to introduce to your notice this evening, is the *Progression of Man by the Cultivation of Scientific Knowledge.*

The situation of Man on the globe he inhabits, and over which he has obtained the control, is, in many respects, exceedingly remarkable. Compared with its other denizens, he seems, if we regard only his physical constitution, in almost every respect their inferior, and unequally unprovided for the supply of his natural wants, and his defence against the innumerable enemies which surround him. No other animal passes so large a portion of its existence in a state of absolute helplessness, or falls, in old age, into such protracted and lamentable imbecility. To no other warm-blooded animal has nature denied that indispensable covering without which the vicissitudes of a temperate, and the rigors of a New Brunswick climate, are equally unsupportable; and to scarcely any has she been so sparing of external weapons, whether for attack or defence: destitute alike of speed to avoid, and arms to repel the aggressions of his voracious foes; tender by a succession of atmospheric influences, and unfitted for the coarse aliments which the earth affords spontaneously during at least two-thirds of the year, even in temperate climates. Man, if abandoned to mere instinct, would be, of all creatures, the most destitute and miserable. Distracted by terror, goaded by famine, and driven to the most abject expedients for concealment from his enemies, and to the most cowardly devices for the seizure and destruction of his nobler prey, his existence would be one continued subterfuge or stratagem. His dwelling would be in dens of the earth, in clefts of rocks, or in the hollow of trees; his food worms, and the lower reptiles, or such few crude productions of the soil, as his organs could be brought to masticate, varied with occasional relics, mangled by more powerful beasts of prey, or contemned by their more pampered choice: remarkable only for the absence of those power and qualities which obtain for the others a degree of security and respect, he would be disregarded by some, and hunted down by others, until, after a few generations, his species would become altogether extinct, or at best would be restricted to a few islands in tropical regions, where the warmth of the climate, the paucity of enemies, and the abundance of vegetable food, might permit it to linger.

Yet Man is the undisputed lord of creation. The strongest and fiercest of his fellow creatures, the whale, the elephant, the eagle, and the tiger, are slaughtered by him to supply his most capricious wants, tamed to do him service, or imprisoned to make him sport; and everything may be made subservient to his use, if not directly, yet indirectly. Not so that of other animals. By the help of reason, Man tames the fiercest animals, pursues and catches the swiftest, nay, he is able to reach even those at the bottom of the sea. By his knowledge he increases the number of vegetables immensely, and does that by art and science which Nature, left to herself, could not accomplish. By ingenuity, he obtains from vegetables whatever is convenient or necessary for food, drink, clothing, medicine, and a thousand other purposes. He has found the means of going down into the bowels of the earth, and bringing forth its hidden treasures. With what artifice has he learned to get fragments from the most rocky mountains; to make the hardest stones as water; to separate the useful metal from the useless dross, and to turn the finest sand into some use. Thus, by the aid of scientific principles, derived from the observation of a

few of the most simple kind, and which are capable of immediate demonstration, he is enabled to explain the properties and effects, the sources, operations, and various applications of heat, the composition of air and water, and the various kinds of earths, minerals, metals, and other substances which enter into the structure of the globe we inhabit. Besides which, there are numerous phenomena of very frequent occurrence, which claim peculiar attention: the varied and often lovely colours that are seen reflected along the sky, the formation and varieties of clouds, the condensation and fall of snow, hail, rain, and dew, the motions of the air, sea and land breezes, trade-winds, whirl-winds, the hurricane, the tornado, and the simoom, the various appearances which prognosticate change of weather, the transparency, the glowing tints and depths of the ocean, with the motion of its waves, its tides, its currents, and its whirl-pools; the lakes, rivers, and springs which beautify the face of nature; the terrible convulsions which, under the form of earthquakes, lay the proudest cities in the dust, and overwhelm with fear the heart of man: these, and innumerable other wonders of creation, are calculated to arouse even in the most languid mind, a spirit of inquiry, which, once excited, will go forth upon its path rejoicing, fully conscious that at every step it is gathering strength, and enlarging the boundaries of human happiness.

Natural historians, moralists, poets, all mankind, are accustomed to speak of the exceeding beauties of Nature; but these cannot be felt, nor sufficiently appreciated, without being properly understood; and this, therefore, is one of the strongest inducements for us to cultivate such knowledge, for whatever may be the sphere of life in which we are destined to move, whatever may be the occupations or the duties we may have to perform, or the cares and anxieties that may oppress us, there are times when we escape from these into the free open air, to wander perhaps through the fields, or along the sea shore, on the road or the skirts of the forest; and the mind so informed then carries with it a talisman by which it can always summon up the most interesting subjects for its contemplation.

But besides the above inquiries, which relate principally to what is called inorganic matter, when we have examined the irregularities of the earth's surface, its plains and its vallies, its hills and mountains, its level shores and stupendous rocks, it will remain for us to consider the numerous tribes of organic beings which in these different regions find their appropriate habitations. We shall find that the vegetable kingdom alone opens up to us a world which first bewilders us by the multitudes of its beauties and wonders, and then charms us into meditation. All plants, from the humble moss clinging to its barren rocks, to the majestic pine of the forest—from the neglected weed on which we tread, to the lovely flower, it is our pride to cultivate, are under the influence of the same immutable laws; they all require light, heat, air and moisture; they all possess a living principle, and require a certain quantity and kind of nutriment, which is elaborated into sap, and converted into different kinds of matter for the leaves, flowers, and fruit; they have all the faculty of reproduction, whereby the same species is continued, and they all grow, attain maturity, and then die; and their decayed remains, even as human dust, then contribute to the formation of the earth, which is always by such means in course of renewal. The seeds and fruits of some of these plants, by processes of art, are converted into food, instances of which we have in the numerous kinds of grain now cultivated; others into materials which supply us with the means of clothing, examples of which we recognise in the hemp, flax, and cotton plants; others yield important medicinal substances, by which we are enabled to sub-

due the sufferings and progress of disease; besides which, I need scarcely add that timber is applied to so many purposes, that it forms a most important article of commerce. Thus the vegetable kingdom not only adorns the world with verdant loveliness, but all its productions, its grasses, herbs, shrubs and trees are adapted to supply the numerous wants of man; but not man alone thence derives support and enjoyment: the plants that grow beside rivers, the shrubs that adorn the sides of rocks, the trees that are grouped together and form extensive forests—all afford nutriment and protection to myriads of human beings. Here tribes of insects that have as yet escaped the notice of the naturalist, and birds whose notes of melody no human art can rival, fly at liberty. There, too, secure from the usurpation and dominion of man, animals, in their wild and undomesticated state, find shelter. As the principle of life which exists in plants does not lead to the manifestation of any sentient or thinking principle, they have been placed at the lower part of the scale of human beings, ascending from which the numerous living tribes which inhabit the air, the waters, and the earth, and which exhibit a regular chain of gradation from the most simple to the most complicated structures, engage our attention and interest. Hence the correctness of the poet,

“Organic life beneath the shoreless waves,
Was born and nurs'd in ocean's pearly caves;
First forms minute, unseen by spheric glass,
Move on the head, or pierce the watery mass;
These in domestic generations bloom,
New powers acquire, and larger limbs assume;
Whence countless groups of vegetation spring,
And breathing realms of fin, and feet, and wing;
Thus the tall oak, the giant of the wood,
Which bears Britannia's thunders on the flood;
The whale, unmeasured monster of the main,
The lordly lion, monarch of the plain;
The eagle, soaring in the realms of air,
Whose eye undazzled, drinks the solar glare;
Imperious man, who rules the bestial crowd,
Of language, reason, and reflection proud,
With brow erect, who scorns the earthly sod,
And styles himself the image of his God,
Arose from rudiments of form and sense
An embryon point, or microscopic ens.”

These we likewise find governed by general laws. They require light, heat, air and food; they all have the power of multiplying their individual and distinct races; they all grow, and enjoy the power of locomotion; they all have senses which warn them of the approach of danger, and enable them to select the substances which are most proper for their support; they all have their appropriate regions, some being inhabitants of hot, others of cold climates; some being destined to live on the heights of mountains, others in the depth of vallies. They all have the habits which are connected with certain peculiarities, visible in the structure of their several frames. They all endure only a temporary existence, some of them living only for a few minutes, others for many hundred years. Finally, the remains of their disorganised bodies, like the plants of which I have spoken, contribute to the formation of the soil on which we tread. The Naturalist, finding himself perplexed by the multitude of these animated beings, has arranged them according to their respective forms and habits into certain general divisions, and these again he has subdivided into particular classes, genera, species and varieties.

At the head of these, pre-eminently distinguished by the faculty of speech, and the power of his mind, we find MAN, whose knowledge, when tempered with humanity, teaches him humility, forbearance, and gentleness to all living things. In his uncivilized state, Man is perhaps a more abject and helpless being than any other that moves on the face of creation. Nor is it until the light of reason dawns that he can perceive how to minister to his numerous necessities and comforts. Naked, unarmed, and exposed to all the inclemencies of the weather, he seeks

only to supply his immediate physical wants. His hunger he satisfies by eating the fruits of the trees, or the roots of herbs; his thirst he slakes at the river's side, and his only habitation is the depth of otherwise unfrequented woods. In this state, he has no language to articulate his ideas.

But I turn from a picture so humiliating to human vanity, to contemplate man in his more civilized state, enjoying all the luxuries which have been conferred upon him by the progress of the arts and sciences.

It is said that Rome itself originally consisted of only a few mud cottages, irregularly scattered; and Vitruvius informs us that even in his time the temple of Romulus was preserved, thatched with straw. Such was the origin of that proud city which afterwards became mistress of the world; and this is only a type of the great changes, improvements, and contributions to happiness that have been, and will be effected, by the progress of the Human Mind.

A proof of what may be accomplished by a persevering cultivation of the arts and sciences, is well exemplified in the following extract:

“Edward Drinker was born in a cottage in 1680, on the spot where the city of Philadelphia now stands, which was inhabited at the time of his birth by Indians, a few Swedes and Hollanders. He often spoke of picking blackberries, and catching wild rabbits, where that populous city now stands. He remembered William Penn arriving there the second time, and used to point out the spot where the cabin stood in which Mr Penn and his friends were accommodated on their arrival. He saw the same spot of earth (in the course of his own life covered with woods and bushes, the receptacles of wild beasts and birds of prey) afterwards become the seat of a great city, not only the first in wealth and refinement in America, but equalled by few in Europe. He saw great and regular streets where he had often pursued hares and other wild animals; he saw fine churches rise upon morasses, where he used to hear nothing but the croaking of frogs; extensive wharves and warehouses where he had so often seen the Indian savages draw their fish from the river and that river afterwards covered with ships from all parts of the world, which in his youth floated nothing larger than a canoe; and on the same spot where he had so often gathered huckleberries, he saw a magnificent City Hall erected, and that hall filled with legislators, astonishing the world by their wisdom and virtue. He also saw the first treaty ratified between the United States of America, and the most powerful Prince in Europe, with all the formality of parchment and seal, and on the same spot where he saw William Penn ratify his first and last treaty with the Indians. Finally, he saw the beginning and the end of the British empire in Pennsylvania. He had been the subject of many crowned heads, but when he heard of the many oppressive and unconstitutional acts passed in Britain, he bought them all, and gave them to his great grandson to make kites of; and embracing the liberty and independence of his country in his withered arms, and triumphing in the last year of his life in its salvation, he died on the 17th November, 1782, aged 103 years.”

Great Britain herself, which has held so pre-eminent and commanding a position among other nations, has in like manner arisen from as humble an origin. And to what may her glory and prosperity be principally attributed; to the advanced state of the arts and sciences. It is this which led her conquests both by land and sea; it is this which at the present moment forms the broad basis of her commerce. The application of the principles of science to her different manufactures has brought many of them to a state of most wonderful perfection; nay, it is impossible to examine them without experiencing the highest gratification. When, therefore, it is considered that the knowledge of a