



**AN ADDRESS,**

**DELIVERED**

TO THE

**YORK**

**MECHANICS' INSTITUTION,**

**MARCH, 1832.**

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**BY DR. DUNLOP.**

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### ADVERTISEMENT.

The reader is requested to bear in mind, that the following Address was not written with the view of being printed—but the Committee having expressed a conviction, that its publication would be beneficial to the institution, the author at once consented, as he thought the good of the Society ought not to be forgone for any disadvantage he might suffer in having a composition *read*, which he intended should only have been *heard*.

## ADDRESS,

&c. &c.

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WHAT constitutes the power, the wealth, the greatness, the happiness of nations? Not the soil, however rich—the climate, however genial; or the population, however numerous or dense. These form but the inert body of national greatness, which, like other inert matter, must be subservient to the moral power of another body, unless the soul of intelligence is breathed into its own.

Did physical circumstances cause national greatness, Egypt and India, the oldest countries in the world, as well as the most fertile, and which, from their proximity to where the subsiding waters of the Deluge left the Ark, probably were first settled by that part of the human family who remained after the general destruction of the Antedeluvian world—which were the cradle of Science, of knowledge, and of the Arts of life—where Astronomy and Geometry had their birth; and where, it is probably not too great a stretch of imagination to suppose that, a portion of the knowledge that the Patriarch of the Flood had received from those who lived in the days when God was more familiarly known to his creatures was handed down by tradition.

These countries, rich beyond parallel in a teeming soil which returns an abundant harvest twice every year, all but spontaneously, with a climate ripening and bringing to perfection all the fruits of the earth, with a population as numerous as the sands on the Sea shore, what are they now? the one ground down and trodden under foot by Tartar hordes; and the one hundred and seventeen millions of the other legislated for, and governed by, the moral power of twenty-two thousand Europeans.

The advantage of historical knowledge consists, to a great extent, in the power that it gives us of judging of the causes of the rise, progress, decline, and fall of Nations, to enable us to regulate the present **BY**, and read the future **IN** the past.

Why are these Nations fallen? Because, though great in the Arts and Sciences, their knowledge was not diffused through the body of society, but confined rigorously to a part of it. **CASTE**, that

spell which paralyzes honest ambition and industry by precluding the possibility of a man bettering his condition or raising himself in the world, at the same time that it bestows all power and honor on one part of the community, necessarily renders the remainder indifferent to the public good, of which they have no share, and of the public improvement, which can not benefit them; and we shall find, in the prosecution of this enquiry, that whenever every class of the people of a State unite for the purpose of promoting its greatness, success is certain; but whenever the head of the State, or the lower parts of it exclusively pursue that object, failure is inevitable: in the one case, it is the hilt of the sword without the blade; in the other, the blade without the hilt; in either case it is useless as an instrument either of attack or defence.

Next in Chronological order follows Greece, the land of Heroes, of Poets, of Sages, of Arms, and of Arts—a land, each separate State of which contained scarcely more surface or more inhabitants than in an English County; yet, which for ages defied the greatest powers of the earth. Whence arose this wonderful phenomenon in the history of man? Simply, from all classes of the community being sufficiently intelligent to sympathise with, and participate in, all that constituted her national greatness. The eloquent harangues of Demosthenes were thundered in the open Market place to the assembled multitude—those prodiges of Art which claim our admiration and defy our imitation, the master pieces of a Phidias, or a Praxiteles, were open to the inspection of the people in the body of every Temple, while the wisdom of Plato was poured to his listening disciples from their porticoes. The Odes of their Poets were recited at the public Games, and the prize awarded by the voice of the multitude. Every Greek, whatever his rank might be, was a soldier by education, and every Greek could appreciate what caused the greatness of his country. Whatever his condition in life, he was a Critic in Philosophy, Eloquence, Poetry, Science, and the Fine Arts; and, exulting in his superiority over the rest of the world, he divided the human family into two classes—the Greek and the barbarian.

But knowledge and science, without virtue, cannot save a nation. Gold effected what Steel could never perform—the Rulers of Greece were bribed, and she became enslaved.

Rome followed Greece almost as a servile copyist; but not having her enthusiasm in the prosecution of science, she was necessarily

less successful. War and aggrandisement were the great objects of ROMAN ambition. In Greece, the honors of War held only an equal place, in the estimation of the people, with the honors of Science; and the Crown awarded by the public voice for superiority of genius raised its possessor's rank in society equally the same whether that Crown was composed of laurel or of parsley.

Rome colonized for military purposes only; and having the resources of the world at her command—holding its mines and its revenues to fill her Exchequer, and its very inhabitants for her slaves, for a time continued to exist and flourish without the aid of Commerce or Manufactures. But this system necessarily wrought its own destruction. The successful General, or Prætor, who amassed a fortune greater than that of a modern Monarch by the plunder of a Province, became a Roman Noble, while the soldier who had fought by his side must be contented with his scanty pittance of unground wheat for his food, and a little vinegar and water for his drink. Thus the wealth of all the world became collected in Rome at the very time when ninety-nine out of the one hundred of its inhabitants were either retainers of the wealthiest Nobility the world ever knew, or paupers, subsisting chiefly on the donations of corn allowed them to save them from starvation out of the public stores.

Thus Rome, by a different road, arrived exactly at the same end that Egypt and India had done. The few alone had any interest in the well-being of the State—the many, feeling that they were as low as the could be, were perfectly conscious that no change could be for the worse. What constitutes the strength of England was the weakness of Rome. The extent of her possessions, instead of by Commerce adding to her wealth, by the expence that they caused deducted from her resources. And in the second and third century we find that the Rulers of Rome became aware of the danger of their situation. We find her gradually withdrawing her Garrisons from the extremities nearer to the centre, and that her barbarian foes, conscious of her declining strength, never failed to occupy the ground that she had abandoned, till, by little and little, they were driven from Britain to Gaul, then across the Alps, till at last the second invasion of barbarians got possession of the Capitol itself. The light of Science and Literature, driven from their ancient seats of Italy and Greece, burned with a feeble flame in the Western Empire, till the hordes of the East extinguished it there. They succeeded that long night of ignorance, that chaos of the moral

world, which can only be described in the sublimely simple words with which the Scriptures depict the primeval chaos of the physical world, "it was without form and void, and darkness was on the face of the deep."

What Rome wanted was Commerce and Manufactures. These must necessarily, in all communities, establish a middle order in society, which forms a communicating link between the highest and the lowest; and one rank, shading imperceptibly into another, permits a common sympathy to pervade the whole: and in this state of things every man must have an interest in the common good; for, though only a part of the community can possess property and be men of rank and of influence, yet, every man sees that the door is open to him to possess these distinctions, and every man feels anxious to promote the good of a community, which, at the same time, may, or must, promote his own individual good: whereas, when there are but two classes in the community, the Lord and the Slave, the one is at such an incalculable distance above the other, that hope in the lower class to reach the rank of the higher would be madness.

The ashes of the fire of knowledge had smouldered where that fire had burned longest and brightest—in Italy. And there, accordingly, we find it burst forth anew, connected, as it always is, with Mechanical and Commercial power.

The small Italian Republics, having gradually shaken off, or amalgamated with, their barbarous conquerors, set out in pursuit of the Arts and Commerce. Their country produced silk, and they learned the arts of weaving and dying it. Glass, then a matter of luxury, was almost exclusively manufactured at Venice: and Navigation, being in its infancy, and the route to India by the Cape of Good Hope not discovered, their local situation gave them the monopoly of the trade of the East, and their Cities became the Enterpot and the Mart of the Commodities of the two ends of the then known world; and, stimulated by wealth, their Merchant Princes acquired imperishable fame by resuscitating learning that had been dead for centuries, and reviving those Arts which were all but forgotten.

Up to this period, we have been contemplating the decay of national power and greatness—here we have its rise: The Mechanical Arts produce Commerce—Commerce wealth, and wealth knowledge; and again, all these principles re-act on each other, and each tends

to strengthen and increase the rest. What these have done for England, I shall not attempt to describe; as, from want of knowledge, I may be unable, and, from the partiality of a Briton, unfit. I shall, therefore, borrow the eloquent eulogy of a Statesman, a Scholar, a Philosopher, a Patriot, and a Foreigner:\*

“We have pointed out the means offensive, and defensive, of a Country which Nature has separated from the rest of the world, by the obstacles of the Sea, and which Nautical Science has surrounded by ramparts hitherto impregnable: ramparts which serve also as means of attack; which convey armies from one hemisphere to another, and which, even on the most distant shores, meet with England still! England, equally prudent and ambitious, possesses on every Continent, out posts which, according to the fluctuations of her fortune, in turn give aid to her in conquest, and refuge in retreat; and which, at all times, are fields for the enterprise and activity of a Commerce which braves every danger, and never allows itself to rest.

“Let us pause for a moment to contemplate this spectacle, unexampled in the history of Nations. In Europe, the British Empire borders at once, towards the North upon Denmark, upon Holland, upon France; towards the South, upon Spain, upon Sicily, upon Italy, upon Western Turkey. It holds the keys of the Adriatic and the Mediterranean; it commands the mouth of the Black Sea, as well as of the Baltic. No sooner had its Navy, the Arbitrator of the Archipelago, ceased to be adverse to the cause of Greece, than on the instant the Ports of Peloponnesus found new liberators in the posterity of the Heraclides: and, from Corinth to Tenedos, the Sea which leads to the Bosphorus, became to the descendants of the Argonauts the road to Victory, and to a second and a richer golden fleece—National Independence! In Europe the British Empire permits this conquest.

“In America it gives boundaries to Russia towards the Pole, and to the United States towards the temperate regions. Under the torrid zone it reigns in the midst of the Antilles, encircles the Gulf of Mexico, till, at last, it meets those new States, which it was the first to free from their dependence on their Mother Country, to make them more surely dependent upon its own Commercial industry; and, at the same time, to scare, in either hemisphere, any mortal who might endeavor to snatch the heavenly fire of its genius, or the

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\* The Baron Dupin.

secret of its conquests, it holds, midway between Africa and America, and on the road which connects Europe with Asia, that rock to which it chained the Prometheus of the modern world.

“In Africa, from the centre of that Island, devoted of yore, under the symbol of the Cross, to the safety of every Christian Flag, the British Empire enforces from the Barbary States that respect which they pay to no other power. From the foot of the Pillars of Hercules, it carries dread into the remotest Provinces of Morocco. On the shores of the Atlantic it has built the Forts of the Gold Coast and of the Lion’s Mountain.\* It is from thence that it strikes the prey which the Black furnish to the European, races of men; and it is there that it attaches to the soil the freed men whom it snatches from the trade in slaves. On the same Continent, beyond the tropics, and at the point nearest to the Austral Pole, it has possessed itself of a shelter under the very Cape of Storms. Where the Spaniards and the Portuguese thought only of securing a Port for their Ships to touch at—where the Dutch perceived no capabilities beyond those of a Plantation—it is now establishing a Colony of a second British people; and, uniting English activity with Batavian patience, at this moment it is extending around the Cape the boundaries of a settlement which will increase in the South of Africa to the size of those States in the North of America. From this new focus of action and of conquest, it casts its eyes towards India; it discovers, it seizes, the stations of most importance to its Commercial progress, and thus renders itself the exclusive ruler over the passes of Africa, from the East of another hemisphere.

“Finally—As much dreaded in the Persian Gulf, and the Erythrean Gulf, as in the Pacific Ocean, and the Indian Archipelago—the British Empire, the possessor of the finest Countries of the East, beholds its Factors reign over eighty millions of subjects. The Conquests of its Merchants in Asia begin where those of Alexander ceased, and where the Terminus of the Romans could never reach. At this moment, from the banks of the Indus to the frontiers of China—from the mouths of the Ganges to the Mountains of Thibet; all acknowledge the sway of a Mercantile Company, shut up in a narrow street of the City of London!

“Thus, from one centre, by the vigor of its institutions, and the advanced state of its Civil and Military Arts, an Island, which, in the Ocean Archipelago, would scarcely be ranked in the third class,

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\* Sierra Leone.



tion by land, only a small number of roads, injudiciously cut, and it kept up. Of a sudden, an individual conceives the idea to profit by the general impulsion which industry had received, by cutting a Canal to carry to Manchester the product of the mines. Shortly afterwards, a Town which thrives, and of which the exuberant wealth seeks every where productive outlets—Liverpool—aspires to still higher designs; she is the first to form and to realize the project of opening a navigable channel between the Irish Sea and the German Ocean. Other channels, even more extended, are established by degrees: thus, within the short space of half a century, a double row of Canals is formed, both for great and for small navigation, for the purpose of uniting together opposite Seas; basins, separated by numberless chains of hills and mountains; opulent ports; industrious Towns; fertile plains; and inexhaustible mines: And this presents a developement of more than 1000 leagues in length, upon a portion of territory not equal to one-fourth of France!

“ In order to distribute the water necessary for the daily life of the inhabitants, and the gas which produces a light so brilliant and so pure, that it seems, even in the darkest night, to be almost an anticipation of dawn—to fulfil this one object of general utility, pipes and conduits have been laid down, which even already form a ramification of above 400 leagues beneath the pavement of London.

“ The communications in the open air are an object of equal solicitude, and of works even vaster still. The roads which already existed are enlarged; are reconstructed with more art, and kept up with more care. New channels are thrown open to Commerce, and a system of roads is now being formed, of which the total length is at present more than 46,000 leagues in England alone.

“ While these prodigies are taking place, basins and ports are constructed for shipping. Moles, Piers, Lighthouses, newly established, increase the security of access, and the shelter of every anchorage upon a line of more than 600 leagues of coast. Thanks to these works, at this moment, in the three Kingdoms, 22,300 Merchant Vessels, manned by 160,000 men, and capable of carrying two millions of tons of merchandise, are scarcely sufficient for the exportation of the superfluity of interior circulation; for the trade along the coast, and for the importation of those foreign products necessary to keep up a circulation so immense.

“ Such is the progress, the origin of which dates only from the seven year's war: a progress, which the disastrous war against the

Colonies slackened, but could not interrupt ; a progress, which on a sudden received new life, by the loss of these very Colonies ; a progress, which, above all, has advanced with gigantic strides during the wars, so bloody and so long, of the Republic, the Consulate, and the Empire of France.

“ It is thus that England was flourishing within, whilst her sacrifices, without, seemed to hasten her ruin and prepare her fall ;—it is thus, that, even during peace, entering into a war of industry against all Nations, animated by its internal Commercial force, as a living being is by its vital force, she has overthrown all her rivals at the extremity of the New World, the same as in the heart of the Old one. Once having gained the ascendancy in this contest, she casts aside her ancient armour, and throws down the ramparts raised by her Commercial prohibitions.\* She opens her Ports to foreigners, and offers them an entrepôt for their merchandize.† She asks only one favor of her rivals in industry ; that is, to descend, unarmed like her, into the Arena where her recent exploits render her certain of victory. What then has the British Administration done to produce, in so short a time, public works which alone have rendered possible the great results of which we have been tracing the picture ? Nothing. It has allowed Commerce a free course, and has thought that it served it sufficiently in securing to it protection without, liberty within, and justice every where. It has allowed Manufactures, Proprietors, and Merchants, of great, of moderate, and of small capital, to confer with one another upon their mutual wants ; upon the works which may be useful to them ; and lastly, upon the means whereby themselves to undertake and to execute those works,

“ These works, which thus procure to Commerce a new prosperity, had, at the same time, the advantage of adding to the value of landed property. To those territorial possessions which all human knowledge never will be able to extend beyond the boundaries which nature has given to them, it adds the possession of industry, unlimited in their variety, their greatness, and their wealth, like the genius from which they spring. Thus, during the short interval of sixty years, Commercial industry has created a property inseparable from the soil, to the extent of 500,000,000 upon Roads, of a

\* For the last three years, the British Parliament has been repealing in succession the most odious restrictions of the famous Laws known under the name of the Navigation Acts.

† By the law relating to entrepôts London is destined to become the rendezvous of nations and the mart of the Universe.

1,000,000,000 upon Rivers and Canals, and of another 1,000,000,000 upon the Maritime Ports and Sea Coast."

Such are the effects of Commercial power; and on Mercantile knowledge Commerce must in all Countries chiefly, and in a poor Country solely, depend. China, with two hundred and sixty millions, has not the foreign Commerce enjoyed by Holland, who has barely three; and, but for Commerce, Holland might have remained a bog and England a forest. A Country without Manufactures (like Spain, for instance) can only export the surplus of her Agricultural produce, and import of course no more than the value of that produce; for a Nation can buy just exactly to the same amount that she can sell. Whereas, the skill and industry of a scientific Nation creates wealth. Thus, a pound of cotton, of the value of 3s. 6d., imported into England, and exported in the shape of a web of flowered muslin, worth £25, the difference of the two values is created by, and is the wages of, Mechanical skill. In Britain, we have the gradations of rank from the King to the laborer; and in every rank, numerous members, keenly alive to the means to be employed for the public good, and all sensible of the value of knowledge and mechanical improvement, and aware of the rank in public estimation that the advancement of these must confer—when we see among our men of Science the noble names of Worcester, Dundonald, Cavendish, Boyle, and Seymour; and as the patrons of the Arts of life, Bridgewater, Portland, Devonshire, and perhaps half the Peerage besides—when we see, in the middle ranks, a Davy, a Telford, a Rennie, a Smeaton, and a Brunell—we can easily see great reason to hope, that the Arts will flourish under such professors, backed by such patrons; but our hopes become a certainty when we know that much, if not the greater part, of our Mechanical improvement has sprung from the genius and intelligence of the working mechanics of Great Britain—when we reflect, that a trade which produces more money by one-half than our whole National Revenue, was called into existence little more than half a century ago by the genius of a man, who, till he attained the age of five-and-forty, filled the humble situation of a Village Barber—when we remember that those stupendous communications which at once so immensely add to the wealth of the Country through which they pass, and to that of the individuals who have constructed them, the Canals of England, the lowest value set upon, which is sixty millions; a sum that we feel difficult even to imagine, owe their origin to the genius

of a millright; and when we consider that he whose improvements of the Steam Engine have amounted almost to the merit of the invention of it, and who has given to his Country, containing only twenty-one millions, a power, in Manufacturing alone, which one hundred and fifty millions could not attain without its aid, who has, by the rapidity and cheapness with which travelling and transport can be effected, done so much to alter the relations of society, and to improve its resources; to add to its wealth, comfort, and happiness; who has almost realized Archimedes' Lever to turn the world; that this great and illustrious individual, whom I am proud to call my townsman, who has effected more than sages or heroes for the good of mankind, was a journeyman Watchmaker:—We must see, in a moment, that if means are taken to instruct people of their class in the principles of the Sciences which govern the Arts they practice, we increase a thousand fold the chances of future Brindleys, Arkwrights, and Watts, arising to add to the greatness of our Country, and to bestow benefits on the whole family of mankind.

The man who had the honor of first conceiving the idea of instructing the working classes, and of carrying the plan successfully into effect, was the late John Anderson, Professor of Natural Philosophy in the University of Glasgow.

Towards the end of the last century, he gave a course of Lectures to the working Mechanics of Glasgow, taking care to adopt language strictly suited to the state of their acquirements; and, at his death, he bequeathed his Philosophical Apparatus and his fortune to found an Institution where Lectures were to be delivered on Chemistry, Mechanics, and Natural Philosophy, to the working classes, calling their attention to any facts in these Sciences that bore more immediately upon any of the Mechanical Trades. The result has been beneficial in the highest degree. The first Lecturer who succeeded Professor Anderson, Doctor Birkbeck, carried the plan to London, though he allowed upwards of twenty years to elapse before the utility of such a measure struck him, and then claimed it as his own. The result has long since been felt in Glasgow and its vicinity. Numberless improvements have been made in the Mechanical Arts by the pupils of the Andersonian Institution; the most conspicuous, if not the greatest, of which is the illuminating of the Town Clocks by Gas; the flame being ignited by a perforated pipe charged with Gas, along which the light is flashed from the Street to the Belfrey, and by a cog fitted to one of the

wheels of the Clock, the light is extinguished by a stop cock, at the precise moment that the sun rises. The inventor of this ingenious and useful contrivance is a Pastry Cook; and his mind was first turned to scientific pursuits by the Lectures of the Andersonian Institute, of which he was then a pupil, and now a patron.

The results of the Metropolitan Institute have been amazing. Similar Institutions have sprung up in every part of the Kingdom. Mechanics' Magazines have been instituted as places at once for the deposit and circulation of the Mechanical knowledge of individuals, which, but for them, might have perished with them: And a society has been formed for the purpose of diffusing useful knowledge to the middle and lower orders. Here again we have the combination of all classes in a great object of public good, which cannot fail, in the end, to enhance the power of the Nation, and add to the happiness of the individuals composing it.

I have now only, in conclusion, to congratulate the people of York, that the thirst of knowledge, which exhibited itself in the Mother Country, has extended to the westernmost Capital of His Majesty's widely spread dominions; for where a love of knowledge exists, knowledge must follow of course: for, though a man may be disappointed in the attainment of the precise object of which he is in pursuit, yet, the very effort made to attain it must have strengthened his mind by the exercise of his intellect, and put him in possession of new facts, which are in themselves knowledge; and, though not conducive exactly to the object he had in view, will yet certainly prove useful to him in the general attainment of Science.

It cannot be too often repeated, that knowledge is power; and the Nation that possesses the greatest quantity of knowledge, from that very fact, is the most powerful: Let the founders of this Institution, therefore, go on in the laudable design they have begun; persevere, and success is certain.

*The Committee beg briefly to lay before the public, the objects that they propose by the establishment of a Mechanics' Institution.*

In this country every industrious man, from the high rate of wages and the low price of provisions, can, even while laying by a part of his earnings, enjoy all the necessaries of life—all its comforts, and many of its luxuries,—but from the highest luxury, and the most permanent and enduring, the luxury of knowledge, he is debarred. It is to confer on him this blessing, that the Mechanics' Institute is founded, and it proposes to accomplish this end, by establishing a good library of works on useful knowledge, particularly as regards the Mechanic Arts, by lectures, conversations, and instructions in the rudiments of physical science, and by procuring by degrees a philosophical apparatus, whereby these intentions may be carried more fully into effect.

But it is not alone the improvement of the working classes in knowledge, that is contemplated by the Committee, tho' that is their principal object.

It has been found by experience, that whenever you introduce a taste for information and intellectual enjoyment, you diminish a propensity to follow grovelling, demoralizing, and sensual pleasures,—and tho' you were not to give one useful idea to one mechanic in the Province by the means proposed; yet, you do no mean service to the public, if you give him a rational and innocent recreation, which will prevent him flying to the Dram-Shop, for a stimulus to rouse him from the languor of inactivity: under all these circumstances, the Committee appeal with confidence to the good sense and good feeling of the community, for countenance and support.

**N. B.** Donations of Cash, Books, Apparatus, Natural or Artificial Curiosities will be thankfully received by any of the Officers of the Institution.

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