

The one on the scale of infinite greatness and grandeur; the other on the scale of infinite smallness and perfection. In the one we have weighty orbs moving in order through spaces immeasurable vast! In the other we have molecules inconceivably small, acting in spaces incalculably minute! But in both systems, a perfect order of arrangement; a mutual and regulating attraction.

By chemistry it is shown that an atom must be less than one-six-millionth of a line in diameter, or that it would require 72,000,000 atoms to be placed side by side to make one linear inch, while Newton's experiments would show that molecular attraction cannot be exerted at a greater distance than one millionth part of an inch.

But in the one, as in the other, we have the essential correlation of forces, of the maintenance of harmony and equilibrium, among innumerable orbs or innumerable atoms; in the one case we call it gravity, in the other, cohesion, or chemical attraction, influenced by light, heat, and electricity.

The grains of sand are innumerable! how much more the ultimate elements of matter! There are probably more than 100,000,000 atoms in a drop of water! How many in a pint! How many in Lake Erie! How many in the Pacific Ocean! How many in all the water that spring and flow and heave upon the face of our globe! And then, again, the ultimate elements of pure water are only two,—oxygen and hydrogen, which two elements retain eternally their identity and properties, for they are unchangeable. It would be as easy to transform Jupiter into Venus, as to change an atom oxygen into one of hydrogen; it would be as practicable for an ox to fly, or a fish to walk, as for hydrogen to support combustion or oxygen to burn. These molecular particles are also indestructible. They often wander but are never lost. In many relations, but essential in all—composing a necessary part of things, very different at different times, and yet never destroyed. For if these ultimate atoms had been counted one thousand years ago, and counted to-night, their number would be found the same.

The same particle of oxygen may at one time glitter in the tiny dew drop, at another refract the crimson of the rainbow; at one period in the nectar of a flower, at another, a part of the flower itself. Many centuries ago an atom of oxygen that composed a compound part of food eaten by beautiful Eve, might have been found in a draught of water which quenched the thirst of faithful Abraham, when journeying to Mount Moriah, and be afterwards an ingredient of the wine drunk by David, when seated upon the throne of Israel. A molecular mite of this element may variously have entered into the composition of the body of a beast, a bird, or a fish—and one of the very same molecules of this gas, which was inhaled by the weak lungs of William Prince of Orange, a hundred and fifty years ago, may be floating in this Town Hall to-night, and fifty years hence be inhaled by the reigning grandson of our present beloved Sovereign, when he shall sit as King over an extensive empire.

But I will conclude. My object has been to show that the atomic field of wonders is marked with the impress of God's footsteps. Every design, whether large or small, plain or complicated, proves the existence of the designer. When that design shows a benevolent object, we must conclude that the designer is good. When it exhibits a skilful construction and arrangement, we are satisfied that the workman is wise. If it require the exercise of great power to overcome counteracting obstacles, we decide that the actor is powerful. We conclude with the words of Cowper:—

"How sweet to muse upon his skill displayed;  
Infinite skill in all that he has made,  
To trace in Nature's most minute design  
The signature and stamp of power divine.  
Contrivance exquisite, expressed with ease,  
Where unassisted sight no beauty sees;  
Tho' invisible in things scarce seen revealed,  
To whom an atom is an ample field."

## II. The Whitworth Scholarships.

The *Canada Gazette* contains the following interesting memorandum and correspondence. Its importance, will doubtless, be appreciated by the intelligent young mechanics of the Dominion. Many of them have the ability, and, we trust, the disposition, to compete for the honourable distinction which Mr. Whitworth, himself a mechanic, thus generously places within their grasp:

DOWNING STREET, 30th May, 1868.

SIR,—At the request of the Committee of Council on Education, I have the honour to inform you of the endowment by Mr. Whitworth of certain scholarships for mechanical science. As will be seen from Mr. Whitworth's memorandum, he proposes that "Thirty scholarships of £100 each should be open to all of Her Majesty's subjects, whether of the United Kingdom, India, or the Colonies,

who do not exceed the age of twenty-six years, and be held either for two or three years, as experience may prove to be desirable."

I have &c.

[Signed,] BUCKINGHAM & CHANDOS.

The Viscount MONCK,

MR. WHITWORTH'S SCHOLARSHIPS FOR MECHANICAL SCIENCE.

At Whitehall the 5th day of May, 1868.

By the Right Honorable the Lords of the Committee of Her Majesty's Most Honorable Privy Council on Education.

My Lords read Mr. Whitworth's letter of the 4th May, 1868, transmitting a memorandum on his Scholarships and on the establishment of sixty exhibitions of £25 for the present year, preparatory to the competition for his Scholarship, and requesting that the Science and Art Department may conduct the necessary examinations and correspondence.

Their Lordships have great pleasure in acceding to Mr. Whitworth's request and giving every assistance in carrying out his patriotic munificence.

Manchester, 4th May, 1868.

SIR,—Referring to your letter of March 28th, by which you transmit to me a copy of the Minute which the Lords of the Committee of Council on Education had passed in acknowledgement of my endowment of Scholarships for promoting Mechanical Science and to the concluding sentence of the Minute which invites further suggestions and offers to render assistance in carrying out the intentions of the endowment:

1. I beg leave to enclose for the information of the Lords of the Committee of Council on Education a memorandum on the subject of the endowment which I trust will meet with the approval of their Lordships, and that they will cause it to be circulated and the necessary correspondence arising out of it to be conducted by the Science and Art Department.

2. I would beg leave to ask the Lords of the Committee of Council on Education to undertake the examinations for these Scholarships.

3. As respects the preparation of the necessary details for the examination in the use of tools, I am willing to be responsible to myself with the aid of friends, and I propose to obtain the consent of a few gentlemen to advise with me from time to time in whatever may rise in the future of my consideration.

4. In reply to the invitation of their Lordships to submit for consideration whether honours in the nature of Degrees might not be conferred by some competent authority on successful students each year, thus creating a faculty of Industry analogous to the existing faculties of Divinity, Law and Medicine. I am of opinion that such honours would be a great incentive to exertion and would tend greatly to promote the object in view.

5. I venture further to express a hope that the Government will provide the necessary funds for endowing a sufficient number of Professors of Mechanics throughout the United Kingdom.

6. In conclusion, I inform you that the necessary arrangements for securing the endowment have been made, and I have given instructions for the preparation of the Draft of a Deed of Trust which will be sent for the approval of the Lord President.

I am Sir, &c.

JOSEPH WHITWORTH.

To the Secretary of the Science and Art Department.

MEMORANDUM ON SCHOLARSHIPS FOR MECHANICAL SCIENCE.

To be completed for in May, 1869.

1. Having offered to the Lords of the Committee of Council on Education to "found thirty scholarships of the annual value of one hundred pounds each, to be applied for the further instruction of young men, natives of the United Kingdom, selected by open competition for their intelligence and proficiency in the theory and practice of Mechanics and its cognate sciences, with a view to the promotion of Engineering and Mechanical Industry in this country," I propose that the following should be the general arrangements in the first instance, which may be modified after the first competition has taken place in May, 1869.

2. That the thirty Scholarships of £100 each should be open to all of Her Majesty's subjects whether of the United Kingdom, India, or the Colonies, who do not exceed the age of twenty six years, and be held either for two or three years, as experience may prove to be desirable; that ten Scholarships should be competed for and awarded in May, 1869, at the annual examinations in Science, provided