unoccupied land, able to support millions of additional immigrants. Let us add to these natural blessings, the results of the energy and enterprise of an active and intelligent population; our cities with all the conveniences and comforts of European towns of twice their population, and of twenty times their age; our villages springing up where lately were but dismal swamps or tangled forests; the remotest points of this extensive country soon to be connected by railroads, now either drawing to completion, in progress, or guaranteed; the facilities afforded for the education of our children by our common schools, our grammar schools, our private seminaries, our colleges, and our universities; the progress of knowledge, advanced by the scientific and literary societies and institutes established in our cities and towns; the solemn duties of religion inculcated by fixed ministrations or by the occasional visits of the missionary; the voice of prayer and praise rising each Sabbath alike from the stately piles in our towns, which rear their spires towards heaven, and the lowly shanty, which scarce lifts its humble head under the leafy arches of our backwoods; and all this with the full and free enjoyment of the blessings of civil and religious liberty. In his opinion, the language of dissatisfaction or complaint but little becomes those who enjoy such advantages. Thanksgiving was rather their duty—thanksgiving to Him from whom all blessings flow, for what in His abundant mercy He had given to them, and prayer to the same Almighty Being for contentment with what they had—for peace, wherein they might use and enjoy what His bountiful hand had provided for them. By peace, he meant not freedom from war—he meant not tranquillity undisturbed by aggression from without—of that he had no fears; but he did mean freedom from internal strife, from civil commotion, from the injurious influences of bickerings and contentions with each other. He did mean that peace which is produced by mutual forbearance—by laying aside national feuds and party differences, and by the union of all, casting aside their distinctions—whilst they still held fast to their principles—for the advancement of the welfare of their common country, the land of the Maple Leaf! He knew no more appropriate words in which this supplication could be offered, than those, which must be familiar to many whom he addressed, and in which he doubted not all would cordially join—that "they might live in the fear of God, in dutiful allegiance to the Queen, and in brotherly love and Christian charity each towards the other." (Applause.)

Short Memoirs of Eminent Men.

SIR ISAAC NEWTON.

Isaac Newton was born on Christmas-day, 1642, Old Style, at Woolsthorpe, a hamlet in the parish of Colsterworth, in Lincolnshire. His education was commenced at the parish school, and at the age of twelve he was sent to Grantham for classical instruction. At first he was idle, but soon rose to the head of the school. The peculiar bent of his mind soon showed itself in his recreations. He was fond of drawing, and sometimes wrote verses; but he chiefly amused himself with mechanical contrivances. Among these was a model of a windmill turned either by the wind or by a mouse enclosed in it, which he called the miller; a mechanical carriage, to be kept in motion by the person who sat in it; and a water-clock, which was long used in the family of Mr. Clarke, an apothecary, with whom he boarded at Grantham. This was not his only method of measuring time; the house at Woolsthorpe, whither he returned at the age of fifteen, still contains dials made by him during his residence there.

The 5th of June, 1660, was the day of his admission as a sizer* into the distinguished society of Trinity College, Cambridge. He applied himself eagerly to the study of mathematics, and mastered its difficulties with an ease and rapidity which he was afterward inclined almost to regret, from an opinion that a closer attention to its elementary parts would have improved the elegance of his own methods of demonstration. In 1664 he became a scholar of his college, and in 1667 was elected to a fellowship, which he retained beyond the regular time of its expiration in 1675, by a special dispensation, authorizing him to hold it without taking orders.

It is necessary to return to an earlier date, to trace the series of Newton's discoveries. This is not the occasion for a minute enumeration of them, nor for any elaborate discussion of their value or explanation of their principles; but their history and succession require some notice. The earliest appear to have related to pure mathematics. The study of Dr. Wallis's works led him to investigate certain properties of series, and this course of research soon conducted him to the celebrated Binomial Theorem. The exact date of his invention of the method of Fluxions is not known; but it was anterior to 1666, when the breaking out of the plague obliged him for a time to quit Cambridge, and, consequently, when he was only about twenty-three years old.

*A sizer in this University is next in degree below a pensioner; the name given to such under-graduates as support themselves entirely at their own expense.—*Ed.*

This change of residence interrupted his optical researches, in which he had already laid the foundation of his great discoveries. He had decomposed light into the coloured rays of which it is compounded; and, having thus ascertained the principal cause of the confusion of the images formed by refraction, he turned his attention to the construction of telescopes which should act by reflection, and be free from this evil. He had not, however, overcome the practical difficulties of his undertaking, when his retreat from Cambridge stopped for a time this train of experiment and invention.

On quitting Cambridge, Newton retired to Woolsthorpe, where his mind was principally employed upon the system of the world. The theory of Copernicus, and the discoveries of Galileo and Kepler, had at length furnished the materials from which the true system was to be deduced. It was, indeed, all involved in Kepler's celebrated laws. The equable description of areas proved the existence of a central force; the elliptical form of the planetary orbits, and the relation between their magnitude and the time occupied in describing them, ascertained the law of its variation. But no one had arisen to demonstrate these necessary consequences, or even to conjecture the universal principle from which they were derived. The existence of a central force had indeed been surmised, and the law of its action guessed at; but no proof had been given of either, and little attention had been awakened by the conjecture.

Newton's discovery appears to have been quite independent of any speculations of his predecessors. The circumstances attending it are well known: the very spot in which it first dawned upon him is ascertained. He was sitting in the garden at Woolsthorpe, when the fall of an apple called his attention to the force which caused its descent, to the probable limits of its action and the law of its operation. Its power was not sensibly diminished at any distance at which experiments had been made: might it not, then, extend to the moon, and guide that luminary in her orbit? It was certain that her motion was regulated in the same manner as that of the planets round the sun; if, therefore, the law of the sun's action could be ascertained, that by which the earth acted would also be found by analogy. Newton therefore proceeded to ascertain, by calculation from the known elements of the planetary orbits, the law of the sun's action. The great experiment remained: the trial whether the moon's motions showed the force acting upon her to correspond with the theoretical amount of terrestrial gravity at her distance. The result was disappointment. The decision was to be made by ascertaining the exact space by which the earth's action turned the moon aside from her course in a given time. This depended on her actual distance from the earth, which was only known by comparison with the earth's diameter. The received estimate of that quantity was very eroneous; it proceeded on the supposition that a degree of latitude was only sixty English miles, nearly a seventh part less than its actual length. The calculation of the moon's distance, and of the space described by her, gave results involved in the same proportion of error; and thus the space actually described appeared to be a seventh part less than that which correspond to the theory. It was not Newton's habit to force the results of experiments into conformity with hypothesis. He could not, indeed, abandon his leading idea, which rested, in the case of the planetary motions, on something very nearly amounting to demonstration. But it seemed that some modification was required before it could be applied to the moon's motion, and no satisfactory solution of the difficulty occurred. The scheme, therefore, was incomplete; and, in conformity with his constant habit of producing nothing till it was fully matured, Newton kept it undivulged for many years.

On his return to Cambridge, Newton again applied himself to the construction of reflecting telescopes, and succeeded in effecting it in 1668. In the following year Dr. Barrow resigned in his favor the Lucasian professorship of mathematics, which Newton continued to hold till the year 1703, when Whiston, who had been his deputy from 1699, succeeded him in the chair. January 11, 1672, Newton was elected a Fellow of the Royal Society. He was then best known by the invention of the reflecting telescope; but, immediately after his election, he communicated to the society the particulars of his theory of light, on which he had already delivered three courses of lectures at Cambridge, and they were shortly afterwards published in the Philosophical Transactions.

The next few years of Newton's life were not marked by any remarkable events. They were passed almost entirely at Cambridge, in the prosecution of the researches in which he was engaged. The most important incident was the communication to Oldenburgh, and, through him, to Leibnitz, that he possessed a method of determining maxima and minima, of drawing tangents, and performing other difficult mathematical operations. This was the method of fluxions, but he did not announce its name or its processes. Leibnitz, in return, explained to him the principles and processes of the Differential Calculus.

In 1679 Newton's attention was again called to the theory of gravitation, and by a fuller investigation of the conditions of elliptical motion, he was confirmed in the opinion that the phenomena of the planets were referable to an attractive force in the sun, of which the