

VARIETIES.

Lord Ross' great telescope is a reflecting telescope; the concave mirror or speculum is 6 feet in diameter, 54 inches thick at the edges and 3 inches thick at the center, and weighs about 3 tons. It is composed of copper and tin—129 parts of copper to 574 of tin. Its focal distance is about 54 feet. It was ground with emery under water by the power of a small steam engine, and the process of grinding occupied 6 weeks. The whole telescope weighs 16 tons. The mode in which the celebrated philosopher, Du Buat, measured the velocity of water at the bottoms of rivers was by throwing in a gooseberry, as nearly as possible of the same specific gravity as the water. It was carried along the bottom almost without touching it. The action of a mixture of sulphuric and nitric acid on cane sugar forms a glutinous soluble mass, which when first washed with water and dried, and then highly heated, explodes without residue. It is known as explosive sugar. Many rivers, by the deposit of solid matters held in suspension in their waters, are constantly raising their banks. The surfaces of many rivers in alluvial districts are considerably higher than the land at a few miles on either side of them. The roof of Westminster Hall, London, constructed of sweet chestnut timber, is 400 years old. Wooden sailing vessels have occasionally remained sound after 100 years' active service. Iron and wooden ships are, other things being equal, insured at equal rates. The term "Sicilian Vespers" is generally used in reference to a terrible massacre of the French rulers of Sicily which took place in an insurrection of the people in 1282. At the time when the battle of New Orleans was fought, Jan. 8, 1816, a treaty of peace had been signed in Europe between Great Britain and the United States; but the news of it had not reached this country. The very common notion that the breastworks at the battle of New Orleans were formed of cotton bales is a mistake; they consisted almost wholly of earth. The remark, so eagerly attributed to General Taylor at the battle of Buena Vista, "A little more grape, Capt. Bragg," was not uttered at the time, as was publicly stated by Captain Bragg just after the election of Taylor to the Presidency. The examination so often attributed to Washington at Waterloo, "Oh! for night or Blocher," is stated, on good historical authority, never to have escaped the lips of the Iron Duke. There is a form of charcoal known as mineral charcoal, which is found associated with coal. Fine specimens have been obtained near Glasgow from the neighborhood of trap dykes and blind coal. In Tuscany and other parts of Italy and Sicily, volumes of steam, called fumaroles, issue in large quantities through openings in the earth. Luminous fumes are frequently extended to considerable heights by the friction to which they are subjected. They often become so loose upon the heads as to require to be taken off and set anew. In testing the ashes from coke, burned in the copper fire-boxes of locomotives, a considerable quantity of copper has been found. No such deposit was detected when waste ash was burned. 12. Jouts found that the power derived from the combustion of one pound of coal in a furnace was equal to that obtained by the decomposition of 9 lbs. of zinc in a galvanic battery. If a small quantity of a solution of starch be exposed for a short time to the light of the sun it will be converted into grape sugar. The surface of a stream flowing with any considerable velocity is always higher in the middle than at the sides. The Industry, a timber-built steam vessel, launched on the Clyde in 1814, is still in existence. Water, in passing from the solid to the liquid state, converts 10 degrees of sensible into latent heat; in passing from the liquid to the aeriform condition it absorbs about 1,000 of heat; ether, 153; and spirits of turpentine, 138. Ehrenberg, who is called the father of microscopy, differs from nearly all the microscopists of the world in regard to certain little organisms being animal or vegetable; they move along with a slow steady motion through the water, and Ehrenberg calls them animals, but it is generally regarded as settled that they are vegetable. Many animals, microscopic and some visible to the naked eye, are fastened permanently to the rock on which they grow, and so nearly resemble a plant that no casual observer would take them to be animals. Some of the microscopic animals resemble very closely a string of square beads, a part of them joined merely at the corners. Scientific American.

AMERICAN COPPER.—There was smelted at the Cleveland (Ohio) Works, last year, 1,127 tons of crude copper and 371 tons of fine, besides some thousands of barrels of stamp and crude masses.

The Massachusetts Legislature consists of 280 members, two of whom were born in England three in Ireland, one in Scotland, and one in New Brunswick. The remainder are Americans.

The Grand Trunk Railway Company have nearly six thousand box and platform cars in use in transporting freight on the road, and the Portland Company are engaged in building two hundred box cars additional. Placed in one train, they would reach twenty-five miles.

A FORTUNE LEFT TO A FORGER.—The Montreal Pilot says that Mr. Thomas Stephens, formerly a clerk in the City Bank, convicted eighteen months ago, on his own confession, of forgery, and sentenced to imprisonment in the Penitentiary for five years, it is said has just come into a fortune of £80,000 sterling.

Educational Department.

In the conducting of this journal we have entered on a task of no little importance and labour. The diversity of the elements with which we must necessarily come in contact, the object to be accomplished, and the difficulties that must be overcome ere our design can be consummated make our duty at once important and burdensome. We do not expect that through our success we will establish infallibility; we know the nature of the material with which we must engage, and the ground that we must occupy, too well for that; but we do expect to succeed as well in carrying out our designs as journalists usually succeed, and to do that which it is our duty to do in a manner that will be right in proportion to its importance, and that will be successful according as its value and the circumstances demand. We have long had the work in contemplation, and have seen the necessity of its being done, and the importance of its being done well, increase from year to year without any signs of a journal coming forth from any quarter, of our educational horizon portending efficiency for the task. The time that calls for special effort in this particular has come; the present phases of education demand that there be broader grounds taken, and if anything is going to be done it should be done now. The lively interest that is springing up on every side should be cherished, otherwise it will fade; and that which with proper care is destined to grow in brightness as the morning sun, and give happiness far exceeding wealth to us as a people, if not attended to will wither and the amount of good to be derived therefrom lessened.

It is true the journals of the Province are ready to contribute to the promotion of the cause of Education; the interest some of them have taken in it speaks credibly of them; but they cannot be expected to do the work that must be done before education is brought to that standard in which we all want to see it without thoroughly disregarding the advocating their religious and political tenets and adopting the language of science and of the school-room. Religion and science might go hand in hand, there is nothing in either incompatible with the other; but because science is one and religion is diverse, either kind and science cannot always succeed together in a journal. Party zeal of any kind and the reflection on any one may be entering the recesses of other subjects, it is true with regard to this that it shines most brightly in the deepest waters and is most beautiful to the steady gaze, and that that unwarranted stimulant that feeds faction is by no means to be desired in the investigation of its truths. It cannot divide the care due to it with another cause and prosper. But those who have long stood in their present various positions cannot now be expected thus to change their views or design; there are good reasons why they should not. The department ought to furnish a journal of its own; it is able to, it needs one, and why should it not? If there is any one thing pre-eminently calculated to benefit education throughout the Province, it is a journal that is worthy the cause. One furnished and sustained by the department cannot but be of more value to it than any other can possibly be. Its success and real value depends not on the contributors only, but on the whole body. What we want most is neither laws, rules, directions, nor change of system, nor additional machinery in its workings, nor legislation in any shape, nor any thing of that sort; but simply the elevation of the profession of teaching. Legislation may place the qualification of teachers far above what it is at present; but beyond that might result from it will be more than counterbalanced by the evil, unless the general improvement of the teachers warrants that but little diminution in the labour of teaching will follow; for while some would strive for the required accomplishments, others would abandon the work and turn their attention to other pursuits.

"The teacher must make his own profession," he does make it; but he alone must elevate it. In him only is the power to make it honorable, and efficient. If he is not successful or respected it is his own fault. The law can never make his school, he must do it himself; nothing can raise its usefulness above his capabilities. Nothing can eradicate the principles he instils, they give life and tone and bent to society continually; their moral and social influence imbues every community and follows every man and woman in

a greater or less degree through life and grey hairs to the grave. While laws that have drawn heavily on the capital and wisdom of the country are scarcely referred to during life, the principles instilled and matter furnished by the unassuming labours of the teacher have blended with every feature and been applicable either directly or indirectly, in every undertaking. His calling is a noble one, but in his qualities is its virtue. He, then, is the man to whom we must look for reform in education; he is the man to begin, and he must begin at home. But we shall have more to say on this subject.

We give the following abridgement of an address delivered by President Arcey, at the Annual meeting of the New York Teachers' Association held at Poughkeepsie, Aug. 2nd, 1859.

Each has been said in behalf of teachers and their duties, and their devotion to their arduous labors. They have deserved much; all that has ever been said in their favor, and more. Perhaps, too, they have deserved the ridicule and laughter that have been showered upon them by fluent writers and pungent satirists. They may have deserved the flings and gibes of the wrangling politician, when he has thrust out his forked tongue that his doubled purposes might be the better served; but their shafts have seldom produced more than flesh wounds. The justice of the teacher's cause and their conscientiousness of it, have shielded them from very serious injury. The political wheel, in its multifarious revolutions, has at times started onward the educational car when the skies were propitious. At other times, when the great ships have lain idle along our docks, and the purserings were lightened in commercial maris, and the grain has ceased to flow eastward from the great prairies of the west, then has the teacher's sky darkened and his dial, like the dial of Ahaz of old, has been put back full ten degrees. But his heavens are clearing; the dawn of the coming day is now seen in the horizon, though the streakings of morning light lift up the darkness, but faintly. The rust of his armor is giving place to well polished joints, and educational rubbish melting away before him; slowly but surely is his power coming to the rescue. Minds that have been only subjects for ridicule in him, now speak out boldly for him and his vocation, and they recognize in him that power which must civilize and enlighten the world, if it is ever to be civilized and enlightened.

A recent writer in speaking of the position and power of the teacher, and who ten years ago might have portrayed a Dominic Sanson or an Ichabod Crane, instead, thus remarks: "The office of teacher is a ministry of providence. It is a divine work that he has to perform. It is not a trade nor yet a secular profession growing out of the conventional necessities of society and founded on the propriety and convenience of distributing labor into different hands. Teaching has a broader basis than trades and professions; it belongs to mind, as mind springs from the essential conditions of its present state, and involves the whole system of Providence in its mode of dealing with mankind. His office is a necessary result of those laws which the Creator has impressed on mind, and his agency is intimately, inseparably connected with those ends which cultivated intellect is designed to subserve. Other men in their business relations to society may be viewed as a sort of *after-pieces*; that the diversity and complexity of the social state call into existence. The teacher does not occupy such a position. Society affords a field of action, but does not originate his responsibilities; nor can it define the measure of his duties. Standing in closer contact with mind than any other human being, and working in a sphere peculiarly spiritual and sacred, he must be contemplated as one of those select means that Providence ordains to fulfill its vast purposes of mercy to the family of man. His work therefore is pre-eminently moral. A portion of his labor, by its nature and results, is incorporated with the present constitution of society, which may be seen in the smiling homes and the crowded thoroughfares of business. But the great work of the teacher is not made visible by outward and perishable signs. Mind exists for higher purposes than are attained in civilization; for Providence has clearly indicated that he shall make the moral portion of our natures the sphere of his greatest efforts.

The justness of this estimate no one can successfully gainsay. It may be, and probably is, unappreciated by the masses; but all who weigh candidly what ought to be the chief object of our educational system, will hardly dissent from the standpoint, from which the teacher and his responsibilities should be viewed. A lower standard would no doubt satisfy Wall Street, Niagara, Saratoga, and the money-getters and pleasure-seekers generally; but it could not satisfy those infinite desires and aspirations that have a life beyond the power of the money bag or the interests of fashion. If hitherto the chief responsibilities of the teacher have had too single an eye to the satisfying of the physical appetites of society, he, if he would not find himself in the position of the gentleman in the play, must now prepare to discharge higher trusts and more essential duties. The day is quite upon us when the fact, that the ability to instruct rests only on a given amount of intellectual knowledge, can not be the proper test of a qualified leader in the educational struggle with the ignorance and prejudices and passions of our race. The future instructor must rest his claims on something higher and nobler

than the fact that he has borne sophomore honors in some renowned institution, where he has received his due quota of freshman drubbings, and has done his part towards conferring the same Tom Hux discipline upon others or perhaps has started in the midnight orgies of burying Euclid, or may have been the recipient of a wooden spoon, or have donated one to others.

The teacher must be as well qualified in morals as in intellect, and more thoroughly than he has hitherto been in both. That portion of our nature which continually admonishes us because of the injustice it almost constantly receives from our departure from the laws of rectitude, must be cherished with more assiduous care, and drawn out by the sunshine of generous impulses. The lecture and recitation room ought to contain, first moral, then intellectual students; for he only can exercise his whole intellectual strength who holds his moral nature inviolate.

Our intellectual acts ought to be so grounded in a correct moral nature, that conscience should ever be ready to remove all hesitancy of immediate action, and guarantee a just result, that he who falters in the discharge of his duty may take courage thereby.

Less than this can not be safely taught to any existence but a brute. He who teaches less commits an error, and inflicts a loss upon the recipient of such instruction, commensurate with an eternal existence. A being with infinite attributes must be instructed, if instructed at all, with reverence to those attributes. To instruct the finite only, or chiefly, is to keep the casker, and throw the jewel away. Such an error committed in the business world would stamp its author a dolt; and make him a laughing stock and a by-word among his competitors.

SELF-MADE MEN.

We copy the following from the *Conservatory Journal*—a paper published in Boston, Mass., by W. E. Barker, No. 16 Summer-street. It is devoted to the establishment of a conservatory of art, science and historical relics in the Bay State, and contains the proceedings of the scientific societies; many original articles and a variety of items of interest cannot fail to instruct while they delight the reader. Its object is a laudable one, so good, indeed, that we wish it every success. The price is only \$1 per annum, and it is published weekly.

Biography has no greater end than to record the lives of those who, beginning their careers in an obscure and humble position, have terminated them in distinction and eminence; and to present for the emulation of adorning posterity, the bright examples of the great self-made, whose only passport to fame was their individual energy, industry, integrity, and application. Biographical literature abounds with these instances. The catalogue of popes, emperors, statesmen, soldiers, scholars, men of science, the literati, and merchants, will each contribute its quota of the names of those talented and persevering men who have shed a lustre on their respected orders. To select a few at hazard: Pope Sixtus V. was a swineherd. Cardinal Wolsey, for some time prime minister of England, during the reign of Henry VIII, sprang from obscurity. The Emperor Napoleon I. was only a lieutenant of artillery when Louis XVI. of France terminated his existence on the pory scaffold of the Place de Greve. Lord Clive, Governor-General of India, and conqueror of the Great Mogul, commenced his career as a writer in the East India Company's Service. La Place was the son of a Normandy farmer. Most of Napoleon's most celebrated Marshals, Murat, King of Naples, Ney, Junot, Bernadotte, and others, rose from the ranks. James Cook, the renowned circumnavigator, was a laborer's son. Gifford, the essayist and reviewer, and the poet Bloomfield were shoe-makers.

Lord Campbell, lord chief justice of England, was a parliamentary reporter, and was for some time employed on the *Morning Chronicle*, a London daily paper; as also was Charles Dickens, formerly a lawyer's clerk. George Stephenson, the engineer, worked in a coal-pit when a boy. Faraday, one of the brightest luminaries of science, was a book-binder's assistant. Hugh Miller, the geologist and editor, whose posthumous works have recently been published in the country was a stonemason. Burns followed the plow. Elihu Burritt was a blacksmith. But we need not stretch our eyes across the Atlantic for instances of self-culture and advancement. America has, both in public and private life, a long array of names from which we can call some of the greatest and most valuable examples on record, and in which distinction has been one, or fortunes amassed, in defiance of every difficulty, and in the face of every obstacle. Roger Sherman, Franklin, Washington, Astor, Rittenhouse, Cary, Haines, King the traveler, Bowditch, Smith, Whitney, Benjamin West, and many others may be cited for universal encouragement and imitation. Scientific American.

MATHEMATICAL, ETC., QUESTIONS.

5. Required the general propositions, of which the 9th and 10th of the 1st Book of Euclid are particular cases.

6 Prove that the height of the Pole above the horizon is equal to the latitude of the place.

Is the practice of giving *home lessons* based on a correct principle?