Scientific American.

NEW-YORK, MARCH 22, 1856.

Science and Revelation.

The history of our globe, as given by geologists generally, from their interpretation of the remains of animals and vegetables found in the earth's crust, has excited much controversy among men of science—divines and scholars—during the past half century; and the controversy is still carried on with no small amount of vehemence. The main subject of discussion is the account of the Creation in the first chapter of the Bible. The general belief entertained from of old regarding the meaning of this chapter, is that the acts of distinct creations, described therein took place during *days* like those we now enjoy—of twenty-four hours duration; also, that the period of time which has elapsed since those grand events, amounts to about six thousand years. Soon after geology commenced to be studied as a science, this interpretation of the acts of Creation began to be disputed, by geologists asserting that the rocks presented evidence of the far greater antiquity of the earth, and that the *days* of Creation mentioned in Genesis meant great epochs of time —perhaps millions of years. Fifty years since Dr. Chalmers, combatting the views of those who asserted that geology taught infidelity, said, "this is a false alarm; the writings of Moses do not fix the antiquity of the globe." Since then great has been the number of essays and books which have issued from the press, discussing the question *pro* and *con*. These are too numerous for us to mention; our present object is, principally, to notice two of the most recent, viz., the work of Taylor Lewis, Prof. of Greek in Union College, Schenectady, N. Y., and an elaborate Review of it in the last number of the *Bibliotheca Sacra*, by Prof. Dana, of Yale College.

Prof. Lewis, who is stated to be deeply learned in the Hebrew language, admits that the *days* mentioned in the first chapter of Genesis mean great epochs of time, but he casts aspersions on Geology, men of science, and science itself. We admit that certain theorizings of individuals, like the writings of Aristotle, may pass current for science; but it is "science falsely so called." Real science is simple truths or facts arranged or set in order; it is nothing more; Prof. Lewis does not clearly make this distinction, and Prof. Dana has answered him correctly and ably in defence of science.

We will now endeavor to present the substance of Prof. Dana's account of the history of Creation, because it is the latest, clearest, and best we have seen, and must be of interest to every son of Adam. He states that Geology proves our earth to have been at one time a fiery ball in space; then dry land and seas appeared, with a tropical climate over the whole globe. At a later period, mountains began to enlarge, the dry land to expand, a temperate climate to gather about the poles, and tribes of animals became more localized. Then, in the last age before man, the continents take their full breadth; rivers flow, everywhere valleys are formed; the zones of climate became nearly like our own, and every region of the globe has its peculiar fauna. "Finally, the features, and climates, and life, attain all their present variety, as man appears to take his place at the command of his Maker."

His ideas regarding the production of light are peculiar, and as we have seen the same views before, and now find them endorsed by Pro. Dana, we presume they are accepted as the most correct theory of light by all who have paid any attention to the subject. He says, "without mutual molecular action, there could be neither light nor heat. But let it be endowed with intense *attraction* of different degrees or conditions, and it would produce light as the first effect of mutual action begun. The command, 'Let light be,' was the summons to activity in matter." The plain meaning of this is, that the matter composing the earth was in existence before the law of gravity, and that when it (matter) was endowed with gravity, the mutual action resulting therefrom produced light; in other words, light is an effect of the law of gravitation.

The records of the rocks, Prof. Dana asserts, declare that the creations of the animal kingdoms came not forth all at once, but in long progression. There was an age when shell-fish, such as cuttle-fish, corals, and trilobites, were dominant. The earth was then too warm, and the atmosphere too impure for more exalted forms. "This was the Silurian age of geological science." The next age was when fishes filled the seas, which is the Devonian of Geology. Then followed another, when reptiles, frogs, and salamanders commenced. Land plants then came forth, and were of exuberant growth, to abstract carbonic gas from the atmosphere and purify the air. The vegetable products of that age are now found in our coal fields. After this came the "Reptilian age," when there were reptiles larger than whales in the water; leviathan reptiles on land, and flying reptiles in the air.

In each of these ages there were distinct creations succeeding to exterminations of previously existing life. "Through the Silurian, Devonian, Carboniferous, and Reptilian ages, in America—fifteen times at least the seas were swept of their species, and in the succeeding epoch not a species of the former occurs." All this occurred during the *fifth* day of Genesis, according to geologists, which may have occupied a period of more than a million of our years.

The next epoch, *the sixth day*, was the advent of man, and the more perfect mammals, and Prof. Dana asserts with other geologists, that "the whole plan of creation had evident reference to Man, as the end and crown of the animal kingdom," and science has no evidence that any living species have been created since his appearance on this globe.

There is no dispute whatever in regard the order of creation; geologists assert that the *orders* of creation described in Genesis, exactly accord with geological science, and the *records* of the rocks and Scripture are in perfect harmony. The only subject of dispute, then, is in reference to the question of *time*; there is not, and cannot be, any conflict between "Science and Revelation."

Gold and its Uses.—No. 3.

EXTRACTING GOLD—The question of greatest importance, and the only one to which *most special* attention should be directed at present, is the extracting of gold from quartz in the most expeditious and cheapest manner possible. This embraces no less than three processes: the crushing of the quartz, the extracting of the gold from it, and then the separation of the gold from its amalgam.

The best machine for crushing quartz (some assert) is the old fashioned stamping mill, having its metal stampers so made that they can be turned to act on four sides, one after another, as they wear out. Then there is the old Chilian mill, composed of heavy rollers passing over the quartz; there is also the *ball* quartz crusher, and various other machines, the majority of which worth noticing have been illustrated in the columns of the SCIENTIFIC AMERICAN. There is also another class of machines, those designed to embrace crushing, washing, and amalgamating, at one continuous operation, such as the machine illustrated last week on page 209.

One principle of operation positively necessary in recovering the gold from quartz is to grind the quartz to fine powder, and to use friction and water to bring all the gold in the ground quartz into contact with the mercury. No subject has been more voluminously discussed, during the past three years, than this one—"the best method of extracting gold." Week after week the London *Mining Journal* has contained letters from various correspondents, each giving his own experience, and insisting on the correctness of his own opinions. Experienced miners from California and Australia have long battled against one another, then "sheathed their swords for lack of argument." We had thought the controversy ended some time since, but in the most recent numbers of the *Mining Journal* we notice that it has broken out again. One correspondent asserts that the old stampers are the best crushers; another that crushing rollers are the best. One asserts that gold can be recovered from quartz without mercury, by simply washing, while another asserts this to be impossible. One recommends the roasting of the quartz previous to grinding, while another condemns this as being a most expensive process. And what is very strange, these controversialists do not present the views of mere theorists, but those of men who have worked at the mines, and who have had experience in the extraction of gold from its native matrix. All this affords evidence that a perfect system for extracting gold from quartz has either yet to be discovered, or else, if there is one in existence, it is but imperfectly known. Our object is to direct attention to improvements—to lead men to think, experiment, and devise.

CALIFORNIA—The *American Mining Magazine*, published in this city—a truly scientific work—states that there is gold enough in California to employ the labor of centuries, but it can no longer be obtained as formerly The time has gone past in that country for making fortunes by the simple pickaxe, spade, and pan—by hand labor. Machinery and capital are now required for obtaining the royal metal. The character of California mining has entirely changed since 1850. Shafts have now to be sunk to an immense depth, tunnels run far into the mountains, extensive dams erected, and flumes carried from rock to rock, over deep valleys and extensive ravines. All this requires capital and combined labor. In Neveda County—an extensive field for quartz mining operations—there are sixteen quartz mills in successful operation; five are run by water, and the others by steam and horse power. There are about $2,000,000 invested in this kind of mining, and the *Mining Magazine* says: "This amount will be doubled in a few years, for it is proved beyond dispute that quartz veins are not only remunerative but inexhaustible." There is, therefore, before our country now, fields for gold mining of boundless extent, and exhaustless produce; therefore the gold interests of the United States —which previous to 1848 were of but feeble importance—are the greatest in the world with perhaps but one exception, those of Australia. Those interests, therefore, now claim a large share of, and deserve still more public attention.

CHEMISTRY OF GOLD.—Gold is not easily acted on by acidulous agents, still there are two definite oxyds of it. When gold is fed into a vessel containing *aqua regia*—nitro muriatic acid—which contains free chlorine in the nascent state, it is dissolved, and a per-chloride of gold formed, which is a red, deliquescent, crystalline compound, soluble in water, ether, and alcohol, and is decomposed by light and heat. When proto-chloride of tin is added to a solution of per-chloride of gold, a fine purple precipitate is formed, which is called the "purple of Cassius," and is used in porcelain painting, and for tinging glass a red color.

Gold dissolved in nitro muriatic acid can be precipitated by adding to it a solution of the proto-sulphate of iron. The gold subsides to the bottom of the vessel containing the solution, and forms a brown powder, which, after being washed in hot water, then digested in hot dilute muriatic acid, is again washed, and forms the pure gold employed in gilding china or porcelain ware. It is intimately commingled with honey and a little borax, as a vehicle, is painted on the ware with a pencil, burned in a kiln, then burnished afterwards. Great care is exercised in mixing this gold powder, so as not to press it too hard, as this readily brings it into its metallic state again. Gold dissolved in *aqua regia* can be reduced to a crystalline state by simply driving off the acid, by exposure to heat on a tile in an oven. This crystal gold can be reduced to a metallic state again by simple pressure, and it has thus been used for filling the cavities of decayed teeth. We have also seen a ring of good metallic gold made from crystal gold pressed into a fine mold.

Silver and copper are harder than gold; hence, mixed with these metals, it produces an alloy harder than itself. The gold employed in jewelry is much adulterated. The skilful jeweler can give different shades of color to golden ornaments by exposing them to different chemical agents, which dissolve a portion of the copper and silver alloy, while they do not touch the gold. The following is a French jewelers' receipt for brightening gold jewelry: Take two ounces of saltpeter, one of common salt, and one of alum, and dissolve them in a pint of hot water. Ten ounces of jewelry boiled in this for twenty minutes will have obtained a bright and beautiful color, after which they are to be taken out and washed well in warm soft water, and dried. The surface of the gold will have a dull appearance, but it can be made lustrous by burnishing.

A solution of gold in ether applied to the surface of fine polished steel instruments gilds them—the ether being driven off with heat. Fine articles of cutlery are thus gilt sometimes. The per-oxyd of gold will combine with ammonia and form a brown powder, terribly explosive when heated to 290°, touched with an electric spark or rubbed by friction.

Voice of the New York Senate.

We are happy to announce that the resolution lately brought before the Senate of the New York Legislature, instructing Senators and Representatives in Congress to use their votes and influence against the extension of the Woodworth patent, has passed by a triumphant majority. Indeed the whole Senate voted in favor of the resolutions except a few members who either went in the negative or did not desire to put their names on record. The resolve was carried by 24 ayes; nays only 4. This sweeping majority is a correct indication of the popular feeling upon the subject; it is only occasionally that opportunity occurs for a favorable expression of the public will in these matters. We believe that the above emphatic result will have great effect at Washington.

The resolutions alluded to were introduced by the Hon. Erastus Brooks, Senator from New York City. In a speech of great ability he portrayed the magnitude of the privileges enjoyed by the Great Monopoly, and the injustice of allowing it to continue longer. For his earnest and successful labors in this cause he is entitled to the lasting gratitude of the public.

The career of Senator Brooks as a Legislator, although not yet very extended, is a noble one. In every movement that affects the interests and prosperity of the people he is sure to be found upon the right side. He is an earnest and efficient worker—an honest and rising man.

Recent American Patents.

Method of Straining Saws.—By T. Sharp, of North Greenbush, N. Y.—Consists in placing a strong elliptical, upright spring behind the saw; the spring is pivoted in the center; each end of the saw is connected, by means of a stout cord, with one of the ends of the springs; the cords pass over friction rollers; the elasticity of the spring keeps the saw constantly strained, and at the same time permits the requisite up-and-down movements. This is a cheap method of straining mulley saws.

Machine for Cutting out Boot and Shoe Soles.—By William Wells and Mellen Bray, of Turner, Me.—Consists of a peculiar arrangement of knives, whereby the soles are cut out into the exact form, the edges beveled or skived, and the groove or rand formed on the under side for the stitches. The three operations are all done simultaneously, with great rapidity and exactitude.

Bench Hook for Carpenters—By Clinton W. Clapp, of Wappinger's Falls, N. Y.—This invention consists in the employment of a sliding jaw attached to a shank formed of two parts, said parts being connected in a peculiar way, and having beveled ends, so that they may be operated like a wedge and secure the sliding jaw at the desired point, when said jaw grasps or is forced into the piece of work to be held.

Pen and Ink.—By A. F. and C. M. H. Warren, of Brooklyn, N. Y.—This is an improvement in Fountain Pens. The pen holder is made hollow, and serves as an inkstand. The lower extremity of the holder is tapped so as to permit the escape of the ink to the pen. One point of novelty consists in a peculiar arrangement of a piston within the handle, so