Scientific American.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW, NEW YORK

O. D. MUNN. A. E. BEACH.

TERMS.

One copy, one year - - - - - - - - $3 00
One copy, six months - - - - - - - 1 50
CLUB RATES { Ten copies, one year, each $2 50 — 25 00
Over ten copies, same rate, each — 2 50
TO BE HAD AT ALL THE NEWS DEPOTS.

VOL. XXVII., No. 10. [NEW SERIES.] *Twenty-seventh Year.*

NEW YORK, SATURDAY, SEPTEMBER 7, 1872.

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SCIENCE AND THEOLOGY.

One of our late semi-religious exchanges contains an editorial, in which the modern scientists, Huxley, Spencer, Darwin, *cum suis*, are taken to task for not being the same orthodox believers in the different dogmas of Christian theology as were Isaac Newton and the scientists of his time. The question is asked if the fame of the modern *savants* would not be just as great if, in religious matters, they had the faith of Newton; as if the opinion of a thinking being concerning such subjects was a matter of choice. The simple reason why men like Huxley are not as orthodox as similar men in the time of Newton is that we live now in the end of the nineteenth century, and that the world has progressed since Newton's time. The best half of the present civilized population of this earth has commenced to see that blind faith in matters of religion is by no means a virtue, as was formerly believed, but that reason is a Divine gift to mankind, the use of which it is highly sinful to despise.

We may as well ask why so many prominent modern theologians, and even laymen (we will not mention names), are now-a-days not so orthodox, and why they have not the same views on many important points of doctrine as those of a few centuries ago. We may as well point to the fact that the blind faith of the middle ages is no more to be found in the Christian world, except perhaps in the Leontine city of Rome; and even there the motives of that faith are open to strong suspicion that it is not a faith adhered to for its own sake, but instigated by self interest.

The effect, of the whole editorial referred to, does not amount to anything, as in place of giving a single argument against the tendency of modern science, it consists of a long winded lamentation that religion is not made as much of, by the modern scientists, as it used to be in olden times; and that science in place of being the handmaid of theology, has since those times frequently arrogated itself to contradict its teachings. And this is true.

THEOLOGICAL ERRORS CORRECTED BY SCIENCE.

Theology taught that the earth was flat, and supported on rocks, below which there were immense dark caves or spaces, the abode of evil spirits, while the firmament above was an arched vault supporting another immense space, full of light, the abode of the good spirits; science taught that the earth was round, in fact a sphere floating without support in space, and that the firmament was not an arched vault but surrounded the whole earth, and was an infinite space, full of suns and worlds.

Theology maintained that the earth was a stationary center around which the whole universe revolved; science took the conceit out of theology and mankind in general by proving that the earth was a comparatively insignificant globe, floating in the immensity of space, and revolving like a small inferior wheel in an immense piece of highly complicated machinery. Theology maintained, on the authority of a translated, mutilated, and obscure tradition, that the whole universe was created in six literal days; in fact theology made the absurd assertion that the Unchangeable Divine Being could have existed for all eternity without doing anything, and then suddenly changed his mind and in less than a week created a universe, set it all going, and then needed rest like a frail human body, suggesting the blasphemous idea that the Divine Creator was tired out. Science proved that, as far as concerns this earth, it was formed many millions of centuries ago, and went through different stages of transformation, each lasting immense periods of time, and that the Divine power was active all the time as it is now, and will be for ever. Theologians maintained, on the ground of the same tradition, which they continually have been misunderstanding and misinterpreting, that this single creative act took place six thousand years ago; but science produced relics of plants and animals which must have lived millions of years ago, while the circumstances and localities in which they were found proved that other millions of years preceded them.

In all these, as in every other instance, science has been triumphant, while theologians had to give in and acknowledge, however reluctantly, these triumphs; and notwithstanding they at first cried that religion was in danger, that they accused the scientists of Radicalism, Deism, Atheism, and hurled at their heads other accusations of the same sort, the only activity they exercise now, consists of attempts at reconciliation between science and theology: and this indeed is their legitimate calling.

In all the tumult created by this antagonism, which is unwisely kept up by a certain class of theologians, there is one great consolation. It is the consideration that the relative positions of theology and science have been changed since the time of Newton. Then the spirit of the tribunal which condemned Galileo still prevailed; every new scientific theory was tested by the teachings of the theologians of the day, and if these men decided that it was contrary to their doctrines, it was condemned; this being the spirit of the society which was under the tutelage of the clergy, no man, not even Newton, dared to be anything but orthodox. No doubt this had a great deal to do with the difference in the apparent theological opinions of the scientists of that time and of the present day, when science, by experience made conscious of her superiority, has lifted up her head, and in place of being the handmaid of theology, and being judged by theologians, has placed herself in position to judge the teachings of theology, and to decide which are true and which are erroneous. Let the reader keep in mind that we speak of theology and not of religion.

We maintain that a scientist who devotes his life to the study of God's own handiwork has more true religion and a more exalted idea of that mysterious Divine Being, who, with such wisdom, power, and superior conception of the truly beautiful, presides in the management of the infinite Universe, than the so-called theologian who, neglecting the study of God's own handiwork, confines himself to the discussion of old obscure literary traditions. For our part, at least, we must confess that our religious feelings of awe for the Creator have often been severely shocked by visits to a certain theological seminary, on hearing the professor expatiate before his class of theological students, on the classified properties of God, what He is, and what He is not. To the scientist such a lecture is nothing but arrogance and blasphemy, and such lectures are, alas, occasionally propounded in some of our orthodox churches.

PROGRESS OF AMERICAN INDUSTRY---INAUGURATION OF FIVE GRAND INDUSTRIAL EXPOSITIONS.

If we may judge from the magnitude of several expositions that have lately been inaugurated in different parts of the land, it is very evident that our country is now making the most gratifying industrial progress. Besides the usual town, county and State agricultural exhibitions, where the best products of local industry are always brought forward, we are favored this year with several extraordinary exposisions, very comprehensive in their nature and highly creditable to the nation.

In New York city, the grand industrial exhibition of the American Institute, now open, forms a marked attraction. The display is unusually fine. All the prominent industries are represented, while a series of remarkable experiments, new products and new inventions, for the first time made public, lend interest to the occasion. The American Institute has purchased the buildings on Third avenue at 63d street, and they have been fitted up with special reference to the convenience of the public and the various exhibitors. The buildings cover some three acres of ground. Ample provision has been made for the operating machinery, a department which interests every visitor.

At Newark, N. J. the grand exhibition so long in preparation has lately been inaugurated with much enthusiasm, and its success is a matter of just pride to all the inhabitants of New Jersey. This State, although small, is remarkable for the wealth of its natural resources. A fertile soil covers its surface, beneath which are found rich and inexhaustible stores of iron, copper, zinc, and other valuable minerals. The wonderful growth of the city of Newark is itself an indication that these natural advantages are duly appreci ated. Its population now exceeds one hundred thousand. Over a thousand railway trains daily connect it with New York. Newark is rapidly becoming the Birmingham of America. Every sort of manufacturing industry is carried on here in the most approved manner, and all are beautifully exemplified in the present exhibition. The building is very large and the display exceedingly good.

The exhibition of the Maryland Institute just opened at Baltimore is a splendid affair, and is attracting hosts of visitors. The display is very fine, and reflects great credit upon the abilities of its managers. The Institute building is large and commodious.

The Cincinnati National Exposition, open from Sept. 4th to Oct. 5th, is arranged in sixteen grand departments and is undoubtedly the most extensive exhibition that has taken place in the Northwest.

The Grand National Industrial Exposition, just opened at Louisville, Ky., marks a new era in the history of the southwestern States. An immense fireproof structure, of elegant design, has been erected at public expense in the heart of the city, for the special purposes of the exhibition. The building is said to be the largest ever erected in this country, and in it are collected all the noblest examples of American genius and industry.

PROGRESS OF THE NEW DOCKS IN THIS CITY.--ARTIFICIAL STONE BLOCKS WEIGHING SEVENTY-NINE TUNS.

We do not propose to consider at length the system of dock construction adopted by the Department two or three years since, which was in the main a composite plan, made up from scores of projects duly elaborated in drawings and specifications, and laid before the authorities in answer to their invitation. (This plan was illustrated in our issue of August 24, ult.) The fact that the famous European models of dock construction, those of Liverpool, for example, afforded no guide in selecting a system for New York, our tide rising but five feet instead of twenty five, left the field open for, and even demanded, considerable originality in providing a practical method. This last is now being put under way, although it will doubtless be some years before it is completed. The improvements contemplated will, when finished, give the city a wharfage of thirty-seven miles. The Commissioners seem disposed to employ, in their work, the means that experience has shown to be the most efficient, as, for instance, in a trial of *Béton Coignet*, which, by the way, depends rather upon the peculiarity of its making than upon any special novelty in its composition. On the dock at the foot of Little 12th street, two large blocks of this material are now lying, each weighing seventy-nine tuns, while two others of the same kind and weight are lying on the dock at foot of West 17th street. Each block is seven feet high, twelve long, and ten wide, but instead of being cast in molds of these internal dimensions, they are formed, as it were, in a succession of layers. A rectangular box, like the "cope" of an ironmolder's flask, ten by twelve feet internal area, is laid on a suitable flooring; the plastic material is then poured in and rammed until all the superfluous water is driven out; after which it is allowed to remain until tolerably hard. The mold or frame is then lifted up nearly but not quite clear of the mass. More material is then poured into the mold, above the other, and treated in the same way, and so on until the block is brought to the requisite hight. In building piers, bulk heads, etc., those blocks are laid on a "rip-rap" or foundation of broken stone.

The commencement on the west side, of the bulkhead that in time will surround the city, may be seen jutting out from the edge of the Battery, and the mode adopted in laying its foundations is the type of that to be employed in all similar cases in the dock improvements. A "rip-rap" foundation, formed by dumping broken stone upon the bottom, is first made. Into this, vertical piles are driven around the space to be occupied by the superstructure, this space being further enclosed by timbers laid on the broken stone and secured to the piles. Concrete in a plastic condition is then poured in, and two divers in armor take a mighty straight-edge and move it across to level off the top. When the concrete hardens, the piles and timbers are taken out of the way and the blocks of stone, natural or artificial, are laid upon the concrete in regular courses.

THE DERRICK FOR LAYING THE BLOCKS.

For laying the blocks and for other analogous purposes, a new floating derrick has just been completed. It draws ordinarily about five feet nine inches of water, and when engaged in very heavy hoisting, from eight to nine feet. The scow upon which the tower mast and boom are supported is about sixty feet square, and the arrangement is such that usually the weight on the deck of the scow is sufficient to balance or counterpoise that lifted when the derrick is in operation. The lifting power exceeds somewhat one hundred tuns, and the load can be lifted to a hight of sixty-four feet. The boom and mast are both of wrought iron, while the tower is of wood, strapped and bolted with iron. The mast is made hollow and the hoisting ropes pass up through it from the winding drums of the engines. Of these last, one is for lifting light and the other heavy weights. Each engine has two cylinders, one at each end of its drum shaft. Their cylinders are twelve inches in diameter, and fourteen inches piston stroke. The boiler is of the vertical tubular type, has two hundred tubes, is five feet six inches in diameter and eleven feet six inches high, and rated rather loosely at from fifty to one hundred horse power. It has eighteen feet of grate surface, and the tanks from which it is supplied with fresh water are located beneath the deck of the scow. We may further mention that the hight of the derrick from the deck to the top of the mast is one hundred and sixteen feet, and that the boom has a length of fifty feet one way and sixty the other, or one hundred and ten in all.

We note no unusual activity in the work of the department, but that there is some progress is shown by the items we have mentioned. The fact that changes are made at these points where the owners of water front property desire them, instead of continuously from any given locality renders any analysis of the advancement made extremely difficult, but as these changes are all in accordance with the comprehensive plan alluded to at the commencement of this article, every day's work is so much accomplished toward making our city docks and wharves somewhat in accordance with the magnitude of our commerce and the wealth and prosperity of our people.

IRIDESCENT ENGRAVINGS.

The beautiful iridiscence of the pearl has been ascertained by microscopic investigation to be due to the presence upon its surface of exceedingly fine ridges or lines, the edges of