Miscellaneous.

British Association for the Advancement of Science.

GEOMETRY AND THE HUMAN FORM.

D. R. Hay, F. R. S. E., read a paper "On the Geometrical Principles of Beauty in general, and more particularly as applied to Architecture and the Human form." It is based upon the supposition that the eye is capable of appreciating the exact sub-division of spaces, just as the ear is capable of appreciating the exact sub-division of intervals of time; so that the division of space into an exact number of equal parts, will affect the eye agreeably, in the same way that the division of the time of vibration in music into an exact number of equal parts agreeably affects the ear. The basis of his theory, accordingly, is, that bodies are agreeable to the eye, so far as symmetry is concerned, whenever the principle angles are exact, submultiples of some common fundamental angle. The author proceeded to apply his theory to the human figure, and seven diagrams were exhibited. The line which represents the human figure being once assumed, every other line is determined by means of angles alone. For the female figure, those angles are, one-half, one-third, one-fourth, one-fifth, one-sixth, one-seventh and one-eighth of a right angle and no others. Every line makes with every other line a good angle. The male figure was stated to be constructed upon the female figure by altering most of the angles in the proportion of 8 : 8; the proportion which the ordinary untempered flat seventh bears to the tonic.

VIEWS OF THE MOON.

Mr. Nasmyth made some observations on the lunar surface and its relation to that of the earth. His address was illustrated by a number of very fine drawings, giving a most beautiful and accurate representation of the appearance of the moon as seen through a large telescope. He said that in endeavoring to become acquainted with the structure of the moon, the first step he had taken was to make a comprehensive map of the entire lunar surface, to which he begged to direct the attention of the section. It would be seen at once that the most remarkable feature of the lunar surface was the great number of rings which appeared almost entirely to cover it, overlaying, intersecting and apparently elbowing each other out of the way. It was now pretty well demonstrated that these rings were the result of intense volcanic action at some remote period. In order to give an explanation of the causes which had led to this very remarkable display of volcanic action, it was necessary to keep in view a fact pretty well established, that the earth, at least, had been originally in a hot and molten condition. The evidence for the same fact as regards the moon, was even stronger. Setting out with this idea, he would proceed to draw conclusions from it. On referring to the map, it would be observed that in six-eighths of the lunar volcanic mountains, there was a cone in the centre of the ring or crater. The same thing was observed on extinct volcanic mountains on the earth, the cone in the centre being the fruit of the last efforts of the expiring volcano. Another thing that was apt to strike us, as a remarkable feature of the lunar mountains, was their enormous vastness, one of the rings being 60 or 80 miles from side to side, and several being 40 to 50 in diameter. The reason of this was to be found in the force of gravitation being reduced to an immense extent on the surface of the moon as compared with the earth, the mass of the moon being only one sixty-fourth part of that of our globe. Another remarkable feature of the lunar surface was the great multitude of these volcanic mountains. In order to explain this, it should be kept in view, that while the ratio of the mass of the moon was to that of the earth as 1 to 64, the ratio of its surface to the surface of the earth was as 1 to 16; and as he would show immediately, this fact was sufficient to explain the greater number of volcanic discharges on the surface of the moon as compared with the earth. He had said before that the moon was originally in a hot and molten condition. When the cooling process commenced, the exterior crust of course cooled first, and consequently contracted, grasping, and tightening, and crushing the interior mass, which was, as it were, hide-bound. The result was, that the confined mass within burst its covering and sputtered out the whole of the matter that was to be seen on the moon's surface. Mr. N. illustrated this part of his address by the fragments of glass globes which had been filled with hot water, and then plunged into cold. The water within, confined by the cooling glass, had burst through, producing cracks arranged in precisely the same way as the corresponding cracks on the surface of the moon. The address concluded with an explanation of the elevated ridges of mountains which appeared to run over the moon, some of the ridges being of considerable length. This was explained on the supposition that after the interior mass had cooled, the outer crust fell in, and its surface being larger than that of the interior mass, the result had been that the superabundant matter protuberated, and formed ridges of hills.

Professor Nichol said, he was sure he was giving utterance to the opinion of every one present, when he said that the drawings which had been exhibited by Mr. Nasmyth were the most beautiful and faithful representations of the surface of the moon that had ever been constructed. He had little doubt that Mr. Nasmyth's investigations would ultimately lead to the most important results, especially in relation to the science of geology.

FORCE OF WAVES.

Mr. Stevenson made a statement of the result of certain observations made by him on the force of the waves with reference to the construction of marine works. In designing such works the engineer has much difficulty in ascertaining the force of the sea with which he has to contend, and hitherto his professional experience has been his only guide in making such designs. The object of Mr. Stevenson's experiments is to ascertain, by means of a self-registering instrument, the force of the waves per square foot of surface. The instrument consists in a disc on which the sea infringes, and the import is rigistered by means of a spiral spring. The result of the experiments hitherto made, may be stated to be a force of about 1½ tons per square foot for the German ocean, and of three tons for the Atlantic ocean, the experiments from which these results were obtained being made at the Bell Rock and Skerryvore Lighthouses. In proof of the correctness of these results Mr. Stevenson referred to the circumstance that at Bell Rock the water has been known to rise to the height of 106 feet, and that at Plynish in Argyleshire, beams of wood were broken measuring twelve inches square, and indicating a force of one and half tons per square foot.

REVOLVING LIGHTS.

Mr. Swan then brought forward his communication on the "Limits to the Velocity of Revolving Light-House apparatus, caused by the time required for the production of Luminous Impressions on the Eye." Mr. Swan having referred to the well known fact that the impressions of light remain for a definitive portion of time, about one tenth of a second, said that no experiments so far as he knew had been made as to the time required for making the impression. His improvement had been undertaken with this view. The brightness of the impression he found to be in proportion to the time of making it. When the time was one-fiftieth of a second, for example, the brightness of the impression was about one-tenth of the brightness of the full light. From this Mr. Swan inferred that the light could not exceed a certain rate of revolution, otherwise a sufficiently vivid impression could not be made upon the eye.

INVENTION OF TUBULAR BRIDGES.

A communication was received from M. Jules Guyot, of France, claiming priority of the invention of Tubular Bridges, and contending that English engineers had taken their ideas from him.

Gen. Pasley said that Mr. Stephenson laid claim to his invention of iron girders, great or small, and on this he rested his claim to the Tubular Bridge, and just as a telescope of a foot long is as much a telescope as Lord Ross's, so was Stephenson's first idea to his last—he was the inventor of the Tubular Bridge.

ASTRONOMY.

Sir David Brewster, the President, delivered the address—one of the most splendid we have ever read. The following is an extract, in which a high and most deserved compliment is paid to Daniel Kirkwood, of Pennsylvania.

"The planet Neptune was discovered before a ray of its light had entered the human eye; and by a law of the solar system just discovered, we can determine the original magnitude of the broken planet long after it has been shivered into fragments; and we might have determined it even after a single fragment had proved its existence. This law we owe to Mr. Daniel Kirkwood, of Pottsville, an humble American, who, like the illustrious Kepler, struggled to find something new among the arithmetical relations of the planetary elements. Between every two adjacent planets there is a point where their attractions are equal. If we call the distance of this point from the sun the radius of a planet's sphere of attraction, then Mr. Kirkwood's law is, that in every planet the square of the length of its year, reckoned in days, varies as the cube of the radius of its sphere of attraction. This law has been verified by more than one American astronomer, and there can be no doubt, as one of them expresses it, that it is at least a physical fact in the mechanism of our system. This law requires the existence of a planet between Mars and Jupiter, and it follows from the law that the broken planet must have been a little larger than Mars, or about 5,000 miles in diameter, and that the length of its day must have been about 5½ hours. The American astronomers regard this law as amounting to a demonstration of the nebular hypothesis of Laplace; but we venture to say that this opinion will not be adopted by the astronomers of England. Among the more recent discoveries within the bounds of our own system, I cannot omit to mention those of our distinguished countryman, Mr. Lassels, of Liverpool. By means of a fine 20 feet reflector, constructed by himself, he detected the satellite of Neptune, and more recently an eighth satellite circulating round Saturn—a discovery which was made on the very same day by Mr. Bond, Director of the Observatory of Cambridge in the United States."

We thus conclude all the extracts we intend to give of the proceedings of this Association, except on the Patent Laws, reserved for next week.

A New Sugar Cane.

A new and valuable specimen of sugar cane, called the crystaline, has been introduced into the parish of Plaquemines, La. It came from Cuba. It is a very large cane, with a tough rind and a remarkably large and firm eye, indicating its capacity to stand frost, and it seems to be very juicy, has every appearance of a very productive cane, and one that will suit the climate of New Orleans. The Picayune says it has been introduced into other parts of the State, and grows abundantly and vigorously. The kinds of cane cultivated in Louisiana are five—the Bourbon, the green ribbon, the red ribbon, the Otaheite, and the Creole cane. The Bourbon and the red ribbon are the most extensively cultivated. Both kinds withstand a slight frost, and more so than the others. As the Crystaline cane, according to the account given of it, appears to be excellently qualified to resist frost, and to be very juicy, vigorous and prolific, it will doubtless be generally welcomed by the planters.

A Scientific Hatching Machine.

A Hatching Machine has been invented in France, by Mr. Vallee, which is described by the Paris correspondent of the Intelligencer. A drum enclosing a warming cylinder forms the basis of his system. He introduces warm air into the drum in which the eggs are deposited, and by circular openings gives access to currents of cold air. It is by the distribution and vigorously rational combination of warm and cold air that he obtains that dampish temperature in which lies the secret of incubation, from which results the development of the embryo in the egg. By this instrument artificial hatching is successfully carried on in every state of the atmosphere and at all seasons. But after the burst of the shell, a mother must be provided for the young. M. Vallee's ingenuity thus provides for this emergency. A lamb skin is fastened by one extremity to a plank, and made to open at the other like a pair of bellows. This affords a cover for the little ones and keeps them warm as would a veritable mother hen. The result of M. Vallee's experience touching the period of incubation necessary for the various species of eggs is curious and worthy of record. Here it is—Chickens, 21 days; partridges, 24 do.: pheasants, 25 do.; guinea hen, 25 do.; common duck, 28 do.; peafowls, 28 do.; barbary ducks, 30 do.; geese, 30 do. The degree of heat required is from 40 to 50 degrees French or Centigrade scale, equal to from 104 to 122 Fahrenheit. A small lamp of the Locatelli system suffices to raise the temperature of the apparatus to the proper elevation. With such a machine every farmer could have a fine supply of fowls.

A Grand Explosion of a Chalk Cliff.

A grand explosion recently took place at Seaforth, near Brighton, England: it was no less than the throwing down a huge cliff into the sea to form a barrier against its future ravages. A number of sappers and miners had been employed for seven weeks, making the necessary preparations; 16 tons of gunpowder were deposited in the various shafts, and 10,000 people assembled to witness the explosion. The gunpowder was fired from voltaic batteries, when suddenly the whole cliff along a range of 120 feet, bent forward toward the sea, cracked in every direction, crumbled into pieces, and fell upon the beach in front, forming a bank down which portions of the cliff rushed for several yards, like a stream of lava, into the water. The whole multitude were paralyzed for a few moments, as it shook the ground like an earthquake. In Seaforth, three-quarters of a mile distant, one chimney fell, and glasses and dishes were violently shaken on the tables. 300,000 tons of the cliff were thrown down. This is the greatest explosion, as a scientific experiment, which has ever been performed.

Bridge Across the Straits of Dover.

The Paris Siecle contains the following—

"The Academy of Sciences has at present under considerations a plan of a most extraordinary character, being neither more nor less than a suspension-bridge, between France and England. M. Ferdinand Lemattre proposes to establish an aerostatic bridge between Calais and Dover. For this purpose he would construct strong abutments, to which the platform would be attached. At a distance of 100 yards from the Coast, and at distances of every 100 yards across the Channel he would sink 4 barges heavily laden to which would be fixed a double iron chain of peculiar construction. A formidable apparatus of balloons of an elliptical form, and firmly secured, would support in the air the extremity of these chains, which would be strongly fastened to the abutments on the shore by other chains. Each section of 100 yards would cost about 300,000 francs, which would make 84 millions for the whole distance across. These chains, supported in the air at stated distances, would become the support of this fairy bridge, on which the inventor proposes to establish an atmospheric railway. This project has been developed at great length by the inventor."

Since the Britannia Bridge was constructed it is wonderful how many stupendous paper projects have been brought forward to eclipse it.

Purifying of Gas.

Mr. Prosser, C. E., 28 Platt st., this City, is assignee of the Patent for purifying gas, described in Number 2 and will be pleased to assist in the introduction of this improvement, into any of our gas works.

Notice.

We will publish a plan next week for the establishment of a line of Telegraph across the Atlantic.