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OBITUARY.

With great regret we have to announce the death of Elias Howe, Jr., the inventor of the sewing machine. He died on the 3d of October in Brooklyn at the residence of his son-in-law. His personal appearance made him a marked man among those who did not know him by his intrinsic worth. His life is an instance of success under difficulties and a lesson for all who believe in the power of perseverance. He was born in 1819 at Spencer, Mass., the son of a farmer, who also carried on the business of a miller. His youth was spent on the farm, but when still a young man he learned the trade of a machinist. While working at this business in Boston he conceived the idea of a sewing machine. He succeeded in 1845 in producing a working machine, which would cost at least $300, even if manufactured in large quantities. So much opposition was made in this country to his invention that he was compelled to try to find a market in England. He succeeded in disposing of his right for two hundred and fifty pounds, reserving a royalty of three pounds on every machine sold. On his return to this country he found that machines were being made which infringed on his patent and he immediately took means to defend his rights and was driven into litigation to secure his patent from piracy. This occupied years and demanded large sums of money. In the meantime this invention began to pay, and from a few hundreds of dollars a year it rose to at least $175,000 annually. It was not until 1854 that Mr. Howe's claims were acknowledged. Having, ourselves, been employed and consulted by him from the date of his first patent until his final success, we understand thoroughly the painful and arduous labors which in Mr. Howe's case were necessary to his triumph. The merit of his invention and the persistence of his character combined, were the elements of his prosperity. In his death the world has lost a useful mechanic and society a valuable member. We give herewith an engraving of Mr. Howe, which will recall him to the recollection of many.

One trait in Mr. Howe's character should not be unnoticed; his useful patriotism. When the country was in need of soldiers he contributed money largely, and at a public meeting in Bridgeport he enlisted as a private soldier in the 17th Regiment, Conn. Vols., and the writer, then in the office of the Adjutant General, well remembers the stir of surprise among the clerks when Mr. Howe's enlistment papers came in to be filed. He went to the field and performed his duties as an enlisted man. More than this, when the government was pressed for funds to pay its soldiers he advanced the money necessary to pay the regiment of which he was a member.

ELIAS HOWE, JR.

THE BRITISH ASSOCIATION.

REAL IMAGE STEREOSCOPE,

Mr. Maxwell read a paper on a real image stereoscope, with illustrations of solid geometry. In ordinary stereoscopes the observer places his two eyes opposite two lenses, and sees the virtual images of two pictures apparently at the same time. In the real image stereoscope the observer stands about two feet from the instrument, and looks at a frame containing a single large lens. He then sees just in front of the lens, a real and inverted image of each of the two pictures, the union of which forms the appearance of a solid figure in the air between himself and the apparatus.

THE ANEROID BAROMETER.

Dr. Stewart, Superintendent of Kew Observatory, read an interesting paper on the behavior of the aneroid barometer at different pressures. Experiments had lately been made with the view of ascertaining to what extent an aneroid may be considered a reliable instrument when exposed to considerable changes of pressure, such as occur in mountain districts. By means of an air pump the aneroids, when placed in the receiver, might be subjected to any pressure. A method of tapping the aneroids has also been devised, and by this means the experiments as to the deviation of the results given by these instruments were conducted with comparative ease, and with the greatest accuracy. The experiments were still going on.

Sir William Thomson said the aneroid had become so popular an instrument that many had satisfaction in learning that it was capable of giving results with scientific precision. Dr. Stewart had shown that in taking a barometer up a mountain of 12,000 feet the error would only be about 300 feet, and had also shown how to correct this error. By carefully using these instruments, therefore, they had a probability of determining, with much less probability of error, the height of a mountain of 12,000 feet. Among the very important matters which occupied the attention of the British Association, one which might with very great advantage, be followed up, would be the carrying out of experiments on the elasticity of metals, and all solids capable of being experimented upon. He remarked upon the elasticity of metals, and even of rocks, and referred to the time taken by the earth in consolidating—that this had taken place less than a thousand million of years ago. The earth was not, he considered, one-tenth as old as the popular geologists would make it.

MAGNETISM.

Professor Swan read a paper on the phenomena which occur when magnetized steel is dissolved in acids. Dr. Phipson remarked that magnetism, like electricity, distributes itself upon the surface of bodies: and he possessed one or two striking experiments calculated to prove that the amount of surface alone influences the intensity of magnetism in a body.

Sir Wm. Thomson stated that the paper which had just been read contained a very interesting investigation, from the continuation of which they might look for some very important results, but that it was impossible to allow this paper to pass without a protest against the first sentence. Dr. Phipson commenced his paper by saying that it was generally admitted that electricity, like magnetism, generally distributes itself on the surface of bodies, and the only conclusion that could be drawn from this was that it pervades their entire mass. The president did not blame Dr. Phipson for supposing that magnetism resides on the surface, for he had quoted authors of repute. But the truth was that this was just another illustration of the fact that a very large portion of the statements made on natural philosophy were false. In many of the popular books there were statements not merely false in theory, but false as being in direct opposition to facts published many years ago. For example, the question of where magnetism resides was long ago tried, and on examination a false conclusion was arrived at, and which had been proved to be false by a celebrated mathematician. Harlow, long ago, when experimenting on bars of iron, found that the magnetic influence was not discoverable. His experiments were rough, as indeed were all his experiments, and with the rashness which characterized many investigators, he at once stepped to the conclusion that magnetism resides at the surface, and that statement of his had been the fruitful parent of many fallacies.

LUMINOUS METEORS, COMETS, ETC.

Mr. Glaisher, in his report upon luminous meteors, said that the object of the committee was to ascertain more particularly the nature of meteoric flights. Last year there were a vast number of observations. One large meteor was observed at Cardiff, and the luminosity remained visible for about eighteen minutes. One was also seen above Dundee of extraordinary brilliancy, which was ascertained to be about 51 to 57 miles above the earth. A curious detonating fireball was then described. This body was seen in broad daylight in France in the month of June last, and was of a very extraordinary character. Another was seen at Glasgow, which passed nearly over St. Andrews, where it appeared to consist of three parts, each equal to Venus, and it was calculated that this meteor passed at a distance of about 50 miles above the earth. At Aberdeen, a brilliant fire ball was first seen last November, which, it was afterward found was seen also over the whole of Scotland, and as far as Nottingham. A remarkable fire ball, seen near Basle—of which there was a colored diagram on the wall—had been observed in the observatory at Basle and also in Paris.

Professor Alexander Herschel, Glasgow, said that the spectroscope showed a yellow light, but of what this light was composed it was impossible to say. As observers multiplied, however, with telescopes armed with spectroscopes, this difficulty would no doubt be resolved. The connection between comets and meteors had this year been established without doubt, and that connection gave wide scope for speculation as to the origin and character of meteoric bodies. Mr Huggins had made an observation of the light of a comet, and although that observation was not perfect, still it was sufficient to identify the light of the nucleus of the comet with that of the meteoric bodies. There were two theories as to these meteors. Leverrier had shown that their orbit extended from that of Uranus to that of the earth, while an Italian astronomer believed that they came from the utmost fields of space. Fifty-six showers were well established, and it was by the study of these showers that they hoped to continue, and possibly confirm and extend their researches by the assistance of those zealous observers who had hitherto been their supporters and constant assistants.

Professor Herschel said it was too bold to say that every shooting star was a comet. They were more likely the dissipated parts of comets—probably comets torn into shreds by the sun's attraction drawing them into space.

ON THE COLORS OF SOAP BUBBLES.

Sir DAVID BREWSTER.—In repeating the beautiful experiments of Prof. Plateau "On the Equilibrium of a Liquid Mass Without Gravity," the colors of the soap bubble were presented to him upon soap films plane, convex, and concave; but the changes of form which they underwent, and their motions upon the film itself, were so incompatible with the common theory of their formation, that he was led by a few experiments to discover their origin and mode of production. The paper proceeded to give an account of experiments which, Sir David remarked, were sufficient to establish the almost incredible truth, that the colors of the soap bubbles are not produced by different thicknesses of the film itself, but by the secretion from it of a new substance flowing over the film expanding under the influence of gravity and molecular forces into colored groups of various shapes, and returning spontantaneously, when not returned forcibly, into the parent films.

Several inquiries were made as to the nature of the soap used, and whether glycerine might not be added with advantage. Sir David Brewster briefly replied to these questions, stating that the experiments could be made by any person in the course of a few minutes, and that all the phenomena described were emitted with ordinary soap bubbles. A mixture of glycerine made the films last much longer.

Sir Wm. Thomson pointed out that the mechanical questions involved in the seemingly simple operation of blowing soap bubbles were the greatest enigmas to scientific men. The extraordinary expansion and adhesion combined in the

vapor spheres were well worthy of the fullest investigation.

ACTION OF LIGHTNING.

In the summer of 1827, a hay stack in the parish of Dun, in this county, was struck with lightning. The stack was on fire, but before much of the hay was consumed the fire was extinguished by the farm servants. Upon examining the hay-stack, a circular passage was observed in the middle of it, as if it had been cut out with a sharp instrument. This circular passage extended to the bottom of the stack, and terminated in a hole in the ground. Captain Thomson, of Montrose, who had a farm in the neighborhood, examined the stack, and found in the hay stack, and in the hole, a substance which he described as resembling lava A portion of this substance was sent by Captain Thompson to Dr. Brewster, of Craig, who forwarded it to Sir D. Brewster with the preceding statement. The substance found in the hole was a mass of silex obviously formed by the fusion of the silex in the hay. It had a highly greenish tinge, and contained burnt portions of the hay. Sir D. Brewster presented the specimen to the museum of St. Andrews.

A NEW ELECTRIC MACHINE FOUNDED ON INDUCTION AND CONVECTION.

BY SIR WILLIAM THOMSON.—The princple of the machine (a model of which was exhibited) wasthat of the "Successful Merchant" who commenced life with a capital of ½d., and after a month's persevering industry, realized the handsome sum of £1 and continued to goon increasing his capital at a compound rate of interest. The object of theinstrument referred to was not to increase money but electricity, and that increase was at a compound rate. Precisely in conformity to the law which applied to compound interest and the increase of the successful merchant's capital was the increase of electricity by this machine. Given the smallest quantity of electricity, and the instrument increased it at the rate of compound interest, and this increase went on at a perfectly uniform rate. But just as the capitalist finds that he cannot always go on getting higher and higher interest for his money, but must ultimately, perhaps, be content with 4½ per .cent., instead of 5, so was it to some extent the case with this machine. When a very high charge was reached, the increase of the quantity of available electricity was not so great, owing to sparks passing in various parts of the machine, preventing the operator from retaining the full quantity of electricity which was got by it. There was great necessity for an easy-going electric machine, and that now shown fulfilled this condition.

NEW MAGNETIC AND ELECTRIC MACHINE.

BY WM. LADD.—Two plates of iron, both ends of each plate fixed to a portion of a hollow cylinder; these plates are then placed a certain distance apart, and insulated from each other in such a manner that the cylindrical pieces will form the two hollow circular passages; into these spaces two armatures are placed. The plates are surrounded by a quantity of stout copper wire connected together, the two terminals of which are brought into connection with the commutator of the smaller armature, so that each change of polarity in the armature will augment the magnetism. If the armature in connection with the electro-magnet is made to rotate, there will be a very feeble current generated in it; but this passing round the electro-magnet will increase its power with every additional impulse. The only limit to the power of the machine is the rapidity with which the armature is made to rotate. The great improvement in this invention is the introduction of a second armature. The machine in the Paris Exhibition measures about 24 inches in length, 12 inches in width, and 7 inches high, and Mr. Ladd found that though not perfectly constructed, its power would keep 50 inches of platinum wire .01 in diameter incandescent, and when a small voltameter was placed in circuit with the second armature it would give off 250 cubic centimeters of gas per minute, and in connection with an electric regulator would give a light equal to about 35 Grove's or Bunsen's element, the driving power expended being less than one horse.

USE OF LICHENS AS DYE STUFFS.

Dr. Lindsay said it had been expected that the aniline dyes—a product from the distillation of coal tar—discovered a few years ago, would supersede the lichinous dye stuffs previously in use, in consequence of the breaking up of the Highlands by railways, and the improvement of the communication between Glasgow, Edinburgh, and the south. To him, however, it seemed that all such predictions were at least premature. He had come to conclusions favoring the belief that lichens would not be superseded, at least, for a long time to come. He then proceeded to give numerous details of the use of lichen dyes for commercial and domestic purposes.

Mr. R. Pullar said: It is very important to investigate the question of the value of lichen products, as many more districts might be found where the lichens are produced, and a certain market for them. Orchill or cudbear will not, I think, be replaced by coal tar or aniline colors for many purposes, and especially for rich crimson or claret shades on woollen goods. I think there is every likelihood of this material being used to a greater, instead of less extent, and the introuction of the coal tar colors has rather increased than dimdnished its use. I do not think the lichen products will ever compete with the coal tar colors for light shades. It is a well-known fact, which can be corroborated by the ladies present, that purples, violets, and other shades produced in former days by the orchill or cudbear, gave way very much sooner than those produced from coal tar. A violet dress or ribbon was formerly stained red so easily by exposure to the atmosphere or the slightest acid, that very few persons thought of having such colors; while, since the introduction of the coal tar shades, however, which, some say, are not so fast as the old colors, there is now an enormous sale, because they can be worn with impunity, and the colors, in most cases, stand well for a long time. This is an extraordinary fact, but can be corroborated by every person of experience.

INFLUENCE OF AIR ON VITAL ACTION.

In this paper Dr. Davy described a certain number of experiments, the result of which showed how much longer some animals are capable of resisting privation of air than others. In one instance an egg, an inchoate animal, so to speak, was hatched, producing a healthy chicken, after having been acted upon by an air pump twenty-six days; a young bird expired in about half a minute, a fish—the minnow—in about half an hour, the frog and toad in about the same time, the earth worm in about an hour and a-half; the insects, such as the dragonfiy, butterfly, after the apparent death for more than an hour, recover on exposure to the air, and that repeatedly. By other experiments on birds by means of submersion in water, he showed that different species varied greatly in ability to bear exclusion of air; thus while all the snake birds of which he had made trial expired under water in about a minute or less, the buzzard lived about twenty minutes and a half, the common fowl about four minutes and half, the goose and duck about ten minutes. Reasoning on the results, he infers that each individual animal has something peculiar in its organism determining its peculiarities of function or action, peculiarities more readily described than accounted for. He holds the subject to be in a great measure mysterious, nor is he sanguine, referring to the new and ingenious views on the genesis of species, that they will tend, except partially, to enlighten the subject, considering that life itself is a mystery, and the origination of life, as regards natural science, an unsolved problem.

THE BORING OF LIMESTONE BY ANNELIDS.

BY MR. E. RAY LANKESTER.—The author stated that, in the discussions concerning the boring of molluscs, no reference had been made to the boring of annelids—indeed they seemed to be quite unknown—and brought forward two cases, one by a worm called Lencodore, the other by a Sabella. Lencodore is very abundant on some shores, where boulders and pebbles may be found wormeaten, and ridled by them. Only stones composed of carbonate of lime are bored by them. On coasts where such stones are rare they are selected, and all others left. The worms are quite soft and armed only with horny bristles. How, then, do they bore? Mr, Lankester maintained that it was by the crabonic acid and other acid excretions of their bodies aided by the mechanical action of the bristles. The selection of a material soluble in these acids is most noticeable, since the softest chalk and the hardest limestone are bored with the same facility. This can only be by chemical action. If, then, we have a case of chemical boring in these worms, is it not probable that many molluscs are similarly assisted in their excavations? Mr. Lankester did not deny the mechanical action in the pholas and other shells, but maintained that in many cases the co-operation of acid excreta was probable. The truth was to be found in a theory which combined the chemical and mechanical view.

AMERICAN INSTITUTE FAIR.

The exhibition of the American Institute may now be fairly said to have reached its full glory. The confusion so characteristic of the earlier days of the Fair is no longer apparent. The sound of saw and hammer no longer blend with the dulcet tones of the orchestrion, and the musicians have now to contend only with untiring buzz saws, and machinery incessantly and loudly calling for lubrication. The articles have been classified in a catalogue, but implicit reliance placed upon the statements of this important document would be ap to lead the unsophisticated into some serious errors, or convey some ideas respecting their nature and construction entirely at variance with his previous conceptions. A revised edition which is promised before many days will, it is hoped, in some measure remedy this evil.

The most novel and attractive feature of the exhibition is by general consent conceded to be the Pneumatic Railway, erected by Mr. A. E. Beach, of the SCIENTIFIC AMERICAN, and every one visiting the Fair seems to consider himself specially called upon to visit, and, after actual experience, to pronounce his verdict upon this mode of traveling. Having accomplished this feat, descending from the mouth of the tube to the main floor, the visitor immediately enters the "Department of Intercommunication," a brief glance at the articles exhibited in which shall be the subject of this notice.

The group most naturally suggested by the title is the telegraph and its kindred applications, and under this grouping, the fine display made by the Bishop Gutta-percha Company first attracts attention. Prominently hung upon the eastern wall of the hall are samples of deep-sea cables, including pieces from cables which have been actually laid in different parts of the world. In a show case is to be seen a specimen of the first submarine cable ever made in which gutta-percha was used as an insulator, being a piece of the identical cable laid across the Hudson River for the Magnetic Telegraph Company in 1848. The conductor consists of a single iron wire of No. 9 gage, insulated with two coatings of gutta-percha, the outer one much oxidized from contact with the air, but the inner coating still perfect. Insulated air-line cables, water pipes, photographic baths, acid pitchers, bottles and vessels in great variety, make up quite an interesting collection. Proceeding on our journey of observation, the telegraphic apparatus of Dr. L. Bradley next deserves attention. In addition to a creditable assortment of relays, keys, etc., the Doctor exhibits a rheostat of superior workmanship, a tangent galvanometer, and other instruments of like character.

A larger and more varied collection of telegraphic instruments fills the show-cases of Tillotson & Co. All the necessary equipments for a well-ordered office are here to be found. A Morse apparatus in full operation at this stand has undoubtedly given to many observers their first insight into the mysteries of telegraphy. On the same table is to be seen Gardiner's machine for lighting illuminating gas by frictional electricity. By its side the electro-medical apparatus of Dr. Jerome Kidder, forms always the center of a crowd of the curious, each anxious to experience the effects of the magneto-electrical shock.

Needham's pneumatic way for transporting packages and mail matter comes next in order. It is claimed that this arrangement possesses marked advantages over the ordinary tube designed for carrying passengers. In the latter the air acts on but one side of the car at once, consequently, it is said, the momentum of one half the air set in motion is lost, but in Needham's model the tube is made continuous, the inclosed column of air being then isolated from the atmosphere, and the whole force is utilized. Classed under the same group, though of a somewhat different character, is Hall's electric switch, so arranged that the continuous ringing of a bell gives evidence of the misplacement of the switch.

Having now introduced the subject of railroads, we pass next to a consideration of the group under which all articles relating to railways are classed.

A locomotive head light of handsome proportions, manufactured by Radley, McAlister & Co., of this city, is prominently posited. The burner of this lantern appears to combine many meritorious points. It is made wholly of brass, its parts being screwed or brazed together so as to be easily removed, repaired and replaced. By the employment of air chambers, the burner is kept perfectly cool, thereby giving a flame of uniform brilliancy and steadiness; a great saving in the evaporation of the oil, and furnishing a sure preventive against the almost universal liability of explosion. A head light manufactured by this firm, we are informed, graces the famous Grant Locomotive, now on exhibition at the Paris Exposition. A handsome head light is also exhibited by Peter Budenbach. The Metropolitan Transit Company show the model of their proposed plan for a three-tier railroad. A contrivance for removing obstructions from, and cleaning the tracks of, street railways, is the invention of John B. Read. The plan is undoubtedly feasible, but we fear that a legal enactment alone would induce the car companies to adopt any plan, however meritorious, for saving life and limbs of their passengers. The subject of bridge building, according to the classification, belongs to this group, but the sole exhibitor seems to be the Moseley Company, who exhibit a model four feet long, which they advertise will support the weight of thirty-five persons weighing one hundred and thirty-five pounds each. They propose to make good the truth of this assertion before the Fair closes. Persons of the proper weight anxious to distinguish themselves, will govern themselves accordingly.

In the group including vehicles and harnesses, the steam carriage for common roads, the invention of P. H. Rocker, of Boston, seems to be the chief attraction. The carriage is an ordinary buggy, with an upright boiler mounted on springs, behind. The cylinders are beneath the carriage body, in front, the pistons acting directly upon the crank serving as the rear axle and which turns the hind wheels. What success the vehicle has met with, we were not able to ascertain, no person seeming to have charge of it, and, as was the case in innumerable other instances, inventive imagination must supply, in great measure, the place of reliable information. Near the steam carriage, the arrangement of C. Ducreux, for instantaneously detaching horses from carriages, is illustrated by a working model. The object to be attained cannot be too highly commended, and providing some means for easily releasing running horses from vehicles, should be enforced by law, if in no other way it can be brought about. In this arrangement a lever under control of the driver loosens the trace and other connections, and instantly frees the horses. Colburn's method of effecting the same result is quite simple and equally valuable for the readiness with which the horse may be attached or detached from the carriage. A spring bolt on the harness saddle fits into a socket on the shafts; this is the only attachment, tugs, traces, whiffletrees, and breeching being entirely dispensed with. Should the horse run away with the carriage, or, slipping on a treacherous pavement, fall down, the driver pulls a cord connected with the spring bolt, when the animal is instantly detached. Mr. John Raddin, of Lynn, Mass., the exhibitor of this latter contrivance, presents to the public an elastic carriage wheel which is bound to make glad the heart of every member of the riding community who has ever occasion to ride over the cobble stone style of street pavement. The wheel is rendered elastic, so as to relieve the jar and rattle in striking against, or passing over, stones or inequalities, by applying to the end of the spokes a packing of india-rubber in a box or socket fitted to the felly. By this arrangement such riding, if we are to receive the assurances of the inventor, is rendered an absolute pleasure, the degree of the enjoyment being, we suppose, proportionate to the amount of jolting experienced. An elastic car wheel of the same inventor has between the hub and web, a ring of rubber pressed in by bolts and flange, to take the load and jar. The hub being separate from the web, it can be replaced when required with small expense. Turning again to carriage wheels, we willingly make a note of Stuart's metallic hub, whose peculiarity consists in dovetailing each spoke separately inside the hub, so that, while they can never get loose or work, they may be easily removed and new ones inserted without removing the tire.

In the group of which vessels are the characteristic type, we notice first an application by Mr. Montgomery of his corrugated iron to the construction of ships' ribs. Near by is a tank in which swims one of Golding's combined mattress