### British Association for the Advancement of Science.—No. 3.

BINOCULAR VISION—Sir David Brewster read a paper on this subject. Prof. Dove had published an account of some beautiful experiments in connection with this subject some years ago, and showed in his paper that when different colors at the same real distance are regarded by the eye they appear to be at different distances; this is also the case when a white surface is compared with a black. Now M. Dove argues if a white surface and a black one be stereoscopically combined, one of them must be seen through the other. Taking a figure for the left eye with a white ground, and a second figure of the same object on a black ground for the right eye, when these two figures are combined, a beautiful effect is observed; the figure starts into a relief, and its sides appear to possess a shining metallic luster. This is the case when the surface of each single object is quite dull and lusterless. On this experiment M. Dove founds a theory of luster, supposing it to be produced by the action of light received from surfaces at different distances from the eye. An example of this is the effect observed on looking at varnished pictures; one portion of the light comes from the anterior surface of the varnish, and the other from its posterior surface, the action of both of these conspiring to produce the observed luster. The metallic luster of mica is also referred to by M. Dove as an example of the same kind. In his communication Sir David Brewster controverted the theory here laid down, and based his objections on the following remarkable experiment:—where a white surface without definite boundary, and a black surface of the same kind, are regarded through the stereoscope no luster is observed. Sir David therefore infers that the luster is due not to the rays from one surface passing through the other to the eye, but to the effort of the eyes to combine the two stereoscopic pictures.

CURIOUS MOTIONS ON THE SURFACES OF ALCOHOLIC LIQUORS—A paper on this subject was read by J. Thomson. The phenomena of capilliary attraction in liquids are accounted for according to the generally received theory of Dr. Young, by the existence of forces equivalent to a tension of the surface of the liquid, uniform in all directions, and independent of the form of the surface. The tensile force is not the same in different liquids. Thus it is much less in alcohol than in water. This fact affords an explanation of several very curious motions observable, under various circumstances, at the surfaces of alcoholic liquors. One part of these phenomena is, that if, in the middle of the surface of a glass of water, a small quantity of alcohol, or strong spirituous liquor, be gently introduced, a rapid rushing of the surface is found to occur outwards from the place where the spirit is introduced. Another part of the phenomena is, that if the sides of the vessel be wet with water above the general level surface of the water, and if the spirit be introduced in sufficient quantity in the middle of the vessel, or if it be introduced near the side, the fluid is even seen to ascend the inside of the glass until it accumulates in some places to such an extent that its weight preponderates, and it falls down again. The manner in which Mr. Thomson explains these two parts of the phenomena is, that the more watery portions of the entire surface, having more tension than those which are more alcoholic, drag the latter briskly away, sometimes even so as to form a horizontal ring of liquid high up round the interior of the vessel, and thicker than that by which the interior of the vessel was wet. Then the tendency is for the various parts of this ring or line to run together to those parts which happen to be most watery, so that there is no staple equilibrium, for the parts to which the various portions of the liquid aggregate themselves they become too heavy to be sustained, and so fall down. On this matter Mr. Thomson exhibited a very decisive experiment by pouring water on a flat silver tray, previously carefully cleaned from any film which could hinder the water from thoroughly wetting the surface. The water was about one-tenth of an inch deep. Then, on a little alcohol being laid down in the middle of the tray, the water immediately rushed away from the middle, leaving a deep hollow there, which laid the tray bare of all liquid, except an exceedingly thin film.—These and other experiments, which he made with fine lycopodium powder dusted on the surface of the water, into the middle of which he introduced alcohol gently from a fine tube, were very simple, and can easily be repeated. Certain curious return currents which he showed by means of the powder on the surface, he stated had not yet been able fully to explain.

ON THE ANCIENT STONE WRITINGS OF THE BABYLONIANS AND ASSYRIANS—The following is an abstract of an interesting discourse before the Association on the above subject, by the celebrated Col. Rawlinson:—

"Col. Rawlinson began by saying he feared the vastness, as well as to a great extent the novelty, of the subject would prevent him doing it anything like justice in the very limited time he had at his disposal. The excavations which had been carried on in Assyria and Babylonia had been continued through six or seven years—they had ranged over tracts of country one thousand miles in extent—the marbles excavated would be sufficient to load three or four ships, and the historical information contained in them would exceed ten thousand volumes in clay. Of course, in dealing with such a subject he could only select a portion of it—and even of that he could only communicate the heads. The part to which he wished to direct their attention was the Cuneiform Inscriptions. This phrase merely signified the wedge-shaped form of writing, and was not employed in any particular language or by one particular nation. The cuneiform system of letters was a species of picture writing, invented, not by the Semitic inhabitants of Babylon, but by those who preceded them. This writing was, however, reduced by the Semitic race to letters, and adapted to the articulation of their language. Their mode of writing consisted of several elements—the picture-writing, and the phonetic, which was equivalent to the alphabet of their language. He had been able to obtain among the ruins of Nineveh a tablet which actually exhibited the several developements of this system of writing into a regular alphabet. The cuneiform inscriptions were divided into three branches—Persian, Scythic, and Assyrian—and it was on the third of these that he wished to say a few words. About twenty years ago his attention had been directed to a series of inscriptions in cuneiform characters on a rock at Behistun, near Kermaixhah. The tablet was divided into three compartments, giving three different versions of the same inscription, and on the simplest of these, the Persian, he set to work, and found, by comparing it with the two others that they corresponded, with the exception two or three groups, from which, on further investigation, he made out Hystaspes, Darius, and Xerxes. By means of these proper names he obtained an insight into the Persian alphabet, and by analyzing the names of the ancestors of Darius and Hystaspes, and obtaining a list of the tributary provinces of Persia, he managed to form the alphabet. This was, however, but the first step; the great object being to decipher the Assyrian inscription, and this could only be done by comparing it with the Persian. The tablet was situated on the face of the rock, five hundred feet from the ground, with a precipice above it of one thousand two hundred feet, and in order to reach it it was necessary to stand on the top rung of a ladder, placed almost perpendicular. Nor was this all, for there was still the Babylonian to be copied, and it was engraved on the overhanging ledge of rock, which there was no means of reaching but by fastening tent-pegs into the rock, hanging a rope from one to the other, and while thus swinging in mid-air, copying the inscription. An insight into the system of writing being thus obtained, the fortunate discovery of the ruins of Ninevah furnished a great mass of documents to which it might be applied. Wherever they had found tumuli, or any appearance of a ruin, trenches were sunk, galleries opened, and in almost every case they came upon the remains of inscribed tablets. The decipherment of these inscriptions led to important results in an ethnological point of view, both as indicating the race to which the writers belonged, and affording important information with reference to the habitat of races and their migrations.—Among the many points which they were now enabled satisfactorily to settle, he alluded to the connection between the Turanian and Hamic families, and to the occupation of Western Asia by the Scythic, and not the Semitic race. He also mentioned that from the inscriptions he believed it could be shown that the Queen of Sheba came from Idumea. An erroneous impression was at one time in circulation that the information obtained from the inscriptions was adverse to Scripture. But so much was it the reverse of this, that if they were to draw up a scheme of chronology from the inscriptions without having seen the statements of the Scriptures, they would find it coincide on every important point. He then mentioned some circumstances with reference to the mound at Birs-Nimroud, which he had recently uncovered, and which he found laid out in the form of seven terraces. These were arranged in the order in which the Chaldeans or Sabeans supposed the planetary spheres were arranged, and each terrace being painted in different colors, in order to represent its respective planet. He also mentioned a small ivory cylinder which he had discovered, and round which were engraved mathematical figures, so small that they could hardly be seen with the naked eye, and which could not have been engraved without the aid of a very strong lens. In concluding, he said that before the British Association met next year, he hoped to be able to bring before them the decipherment of several highly important inscriptions.

### Gratitude to Improvers of the Iron Manufactures.

The city of Newark, N. J., is celebrated for various kinds of manufactures, such as jewelry, carriage-making, patent leather, and malleable iron castings. A number of companies are engaged in the two latter kinds of manufactures; they employ a great number of persons, and the fame of their productions is coextensive with our country's commerce. The *Tribune* of the 4th inst. contains a very interesting article on the subject, and attributes—justly we have been informed—the introduction of both of these manufactures to Seth Boyden, an ingenious and enterprising Massachusetts mechanic, who took up his abode in Newark about thirty years ago. At that time an endless variety of small iron articles now made of cast-iron, were fabricated by forging them of wrought-iron, from the fact that common cast-iron is exceedingly brittle, and does not possess the quality of toughness. The discovery of rendering cast-iron tough by what is termed malleablizing, was one of the most important inventions ever made. It was well-known in England before it was in our country, but was kept a profound secret. In 1825 some malleable iron castings having been imported from England by David Beach, of Newark, they arrested the attention of Seth Boyden, and he immediately commenced experiments to discover the process; and he labored for years, until success crowned his enterprise and efforts. The process of malleablizing or rendering cast-iron tough, consists in submitting common articles of cast-iron to a high heat, for several days, in an iron box, separated from one another by iron filings, and then allowing them to cool very slowly. Soon after Seth Boyden discovered how to render cast iron tough, he erected a foundry in Newark, in company with some others, and commenced business. At that time malleable iron castings sold readily for 30 cents per pound; their price now ranges from nine to sixteen cents. Instead of only one small foundry doing the whole malleable iron business in our country as in 1827, there are now seven different establishments in Newark alone, whose sales amount to $375,000 per annum, and there are various like foundries in other different cities. And how has Seth Boyden been rewarded for his discovery, and the valuable contribution which he has made to the solid wealth and industrial progress of our country? The *Tribune* says he is now working as a journeyman in a Newark machine shop. It is stated that he had made considerable money, but he never loved it for its own sake; his desire has been to elaborate useful ideas for the good of the community, and so when he has made money by one useful discovery or in the way of business, he has been impelled by a restless desire to use it in making experiments to discover new improvements. Such men as Seth Boyden are public benefactors, they do more for the material prosperity of their country than the most renowned orators or statemen. We hope that Seth Boyden will never know the approach of penury. If the citizens of Newark ever allow this to be the case, they will never escape the obliquy of ingratitude.

Republics have been accused for pre-eminence in ingratitude, but are monarchial governments stainless in this respect? Let us take a case and try it. The greatest improvements ever made in the manufacturing of wrought bar iron were invented by Henry Cort, a native of Lancaster, England. In the years 1783 and 1784 he obtained two patents; one rendering cast iron malleable in a reverberatory furnace heated by the flame of coal to avoid the impurities of the fuel mixing with the metal in a fluid state—the process called *puddling*. The other invention was the manufacture of bar iron, by passing the puddled iron in *blooms*, through fluted or grooved rollers. These two inventions are now used in the manufacture of bar iron in every civilized country under the sun. All nations are his debtors; the benefits conferred upon them by his inventions are beyond calculation. His improvements have reduced the cost of making bar iron 66 per cent., and have been the means of saving, to Great Britain alone, no less, it is calculated, than £300,000,000 sterling in sixty years, and have raised that country from being an importer of iron from Russia, America, and other countries, to be the greatest iron manufacturer and exporter in the world. And how was Henry Cort rewarded for his inventions by a grateful monarchy? In making his experiments he expended a private fortune of more than $100,000, and when he had them perfected he was obliged to take into partnership another person who could furnish some capital to carry on the business. His partner was a deputy of the British Navy, who saw at once the value of the improvements, and invested £27,000—about $115,000, which he privily applied from the public funds entrusted to his care. He soon afterwards died, and when his accounts were examined, it was found he was a public defaulter. His effects were then seized by the government, and with them the two patents of Henry Cort, whose business was destroyed, and from this blow he never recovered, and a few years afterwards he died a ruined and broken-hearted man. It is indeed true that when reduced to poverty in 1794, upon the representations of several bankers and merchants in London, Wm. Pitt obtained a pension for him of $1000 per annum, which he received for only six years, his death having occurred in 1800.

How boundless was this generosity of the British Government and the British public to this inventor. Just think of the paltry sum of one thousand dollars per annum, doled out to him, when his inventions were saving to the public of more than £10,000,000 per annum and in 1853 no less than £65,000,000 sterling. And for this great public benefit the British Government paid him altogether twelve hundred pounds—about six thousand dollars—while he himself had spent a private fortune of $100,000 in perfecting his invention. Oh what ingratitude. Can any Republic be more ungrateful; has any Republic ever exhibited so much ingratitude? We think not. Do not let the British public throw the blame of such ingratitude upon their government; they hold the public purse strings, and the blame must rest on them. One of Henry Cort's sons and three daughters, each over seventy years of age, we understand, are now living in indigent circumstances in England, while, the nation has grown rich on their father's discoveries. If the Monarchy desires to show its gratitude, here are worthy objects for its display. May such charges never have to be made against our own country.

### A Great Traveler.

The celebrated Dr. Barth, the German traveler, who has recently returned from Africa to Europe, traveled 12.000 miles in that strange and pestilential part of the globe. His explorations of Central Africa rank as high, and are just as important, as the contributions of Cook to the geography of the Pacific, and those of Humboldt to the knowledge of America.