American and English Inventions.

Two weeks ago, we noticed with no small amount of satisfaction, the praise which had been bestowed upon an American machine by the "London Times." We also took occasion to point out the benefits that might be derived by the introduction of American cheap agricultural machines and implements into Great Britain. The praise of the "London Times," we are sorry to say, has given offence to our able cotemporary, the "London Mechanics' Magazine," which takes occasion to indulge in the following language:—

"We are not surprised that American journalists should so frequently remind us that the American people are altogether outstripping our own countrymen in mechanical ingenuity and inventive power. Such intimations, however fabulous in their character, come very inoffensively from the writers of a nation to which all others look for amusing displays of conceit and arrogance. We all know the ardent attachment of that people to a species of literary and scientific pyrotechnics; all their productions go up as rockets, but most of them come down as sticks."

Our cotemporary then quotes the remarks in the "Times," condemns them, and claims the invention—an American Threshing Machine—as "a mere modification of certain mechanical arrangements first invented and patented in England." We hate cant and rant, and although the "Mechanics' Magazine," makes the "Sci. Am.," by name, an exception to all we have quoted, we do say that our cotemporary is unjust in its language. The charge of "conceit and arrogance" may be justly applied against the English with respect to American inventions. Superciliousness is a leading feature of the English press, and with two many of the English people; this characteristic, at least, they have always exhibited towards American inventions and discoveries, until they have been actually forced to swallow their own animadversions. How the "American Department," at the World's Fair was at first ridiculed, we all know; but at last American inventions created more sensation, and excited more attention than those of any other nation. The feats of Hobbs in opening the best English locks, and the failure of all the English locksmiths to open the American lock, are events too fresh in the memories of all to be forgotten. The victory of the yacht "America," was no pyrotechnic display, but a real rocket which carried consternation and envy into the heart's core of the whole Royal Yacht Club of England. The triumphs of the American reaping machines will never be forgotten, and yet no sooner were those triumphs made public, than the American Reaper, (as has been done by our cotemporary) was claimed to be a British invention; some of Bell's machines, it was said, having been sent to America many years before. The fact stands out now, that the American reapers are entirely different in their construction and mode of operation from Bell's.

We know that we are much indebted to England for many excellent inventions; indeed, we cannot number them all, and we do not blame an Englishman or Frenchman, German or Scot, for talking with feelings of pride, respecting what his countrymen have invented. The spirit that we detest is depreciation of what others have done; we condemn such a spirit when we see it displayed in any man, be he an American citizen or an Englishman. Our cotemporary, it appears to us, exhibits such a feeling; if it knew Americans better, its tone would be quite different.. It is not courteous for a scientific paper of any country to sneer at American science. The Members of the Royal Society in London laughed at the "scientific pyrotechnics" of Franklin, when his experiments were first read to them; since then, *they* have been laughed at by everybody. The fresh words of gratitude expressed by the people of Liverpool to a distinguished American—Lieut. Maury—for what he has done in nautical science, for the benefit of the world, are not yet cold upon the breeze.

We have already said that we feel grateful to England for her inventions and discoveries; they have been and still are of immense benefit, not only to America but the whole world; but at the same time America has paid back to England a large amount of her debt, and we intend, in the course of time, to pay it all back with compound interest:—American cut-nail machines, pin-making machines, card-making machines, carpet power looms, gun-stock turning machines, sewing machines, reciprocating reaping machines, superior yacht models, locks and clocks, excavating machines, and superior wood planing, and many other American machines, are now very extensively employed in England. The nature of our country has called forth an amount of inventive genius, which that of no other country could. We have also mechanics in our workshops from all countries in the world, and their combined skill, with such extensive information as all travelled men possess over the untravelled, leads to general excellence. In a late lecture, delivered by Sir Benjamin Brodie, M. D., in London, he stated that a friend of his, after his return from America to England, was more surprised at the passiveness of his countrymen, in comparison with the Americans, than he was with the passiveness of the Spaniards in comparison with the English. Improvement is a passion with us Americans, and although we sometimes mistake novelty for improvement, it only teaches us a useful lesson, but does not arrest our progress, nor make us foolishly conservative. *Our* object, in scientific literature, has been to spread abroad the truth as we believe it, and to consider the scientific men and inventors of all nations, brothers—scientific republicans. Although we have an ardent attachment to our country and her institutions, this we believe has never warped our judgment, nor blinded our eyes to the merits of foreign inventions, and we trust never will.

Horse Power, Actual and Nominal of Steam Engines.

As we have received a number of communications lately respecting the "horse power" of steam engines, we present the following condensed from Bourne, who is held by practical engineers good authority:—

Horse power is an amount of mechanical force that will raise 33,000 lbs. one foot high in a minute. This standard was adopted by Watt as the average force exerted by a strong horse. His engines were made of a certain size, corresponding to their recorded horse power; that is the diameter of the cylinder afforded a key to the power of the engine, as the steam carried was uniform in pressure, and so was the velocity of piston. At the present day, we cannot say that a certain diameter of cylinder is the key to its power. The steam is the power, and some engines whose nominal horse power is given by the bore of the cylinder may exert double the nominal amount.

The number of pounds pressure on the square inch multiplied by the number of square inches in the area of the piston, and by the number of feet the piston travels in one minute gives the amount of impelling force—about one-tenth the power so calculated, is deducted in large engines, for friction—the remainder is the effective force, which if divided by 33,000 gives the actual horse power.

Lightning Conductors.

Mr. E. Merriam, in a communication addressed to the "New York Courier and Enquirer," says:—

The Gem of the Seas, which arrived at Melbourne, Australia, August 2nd, from New York, was struck by lightning during a hailstorm on the 8th of July, which shivered the rod to atoms, and melted it in several places. Several of the passengers were benumbed by the shock, and one of the passengers was transfixed in his chair for some minutes—about the same time the vessel was knocked on her beam ends, while under storm sails.

This adds another to our list of vessels furnished with conductors that have been struck by lightning, in which the conductor was destroyed, but the ship and its inmates were saved. Had the rod been in one entire piece, it would not have been rent, but such rods cannot be used on board ship.

The period in which this ship was struck by lightning was almost simultaneous with an earthquake, felt in the Sandwich Islands, and with a profuse fall of meteors in the vicinity of New York, and succeeded by a hailstorm in France, in which two women and a child were killed by the hail. The sparrows and swallows which were flying in the air at the time, were killed by the hail. A storm of thunder and lightning extended over a large surface in North lat. 43° at the same time. Thus we see electric energies exerted at the same time in both hemispheres, showing the great extent of atmospheric currents.

Recent Foreign Inventions.

Separating Metals from their Ores and Alloys.—James Napier, of Glasgow (author of the work on dyeing) patentee.—This invention relates to the treatment of ores and alloys of copper and tin. The inventor arranges the substances in different classes, and operates upon these classes severally. For example:—in dealing with sulphurets known, or found by testing to contain tin, he mixes them, as far as is practicable, in such proportions that the whole copper in the mixture shall range from eight to fourteen per cent. of the weight of the ores. He then calcines this mixture in the ordinary way, until the quantity of sulphur remaining in the ore does not exceed a fifth of the weight of the copper, when it is transferred to an ordinary fusing furnace, and a hundredweight of coal is added to every ton of calcined ore. (The coal is employed simply in order to obtain clean slag.) The whole is then well-fused, has the slag skimmed off from it, and is run off into sand-beds. The alloy, "white metal," found at the bottom of the first and second beds being removed and reserved for another process, the remainder of the melt may be roasted, and refined as usual, but the inventor prefers to again calcine it for eighteen hours, and then to fuse it along with other ores containing no sulphur. The inventor describes other somewhat analogous processes, and claims the application of his improvements, not only to the ores and alloys of copper and tin, but also to all substances containing portions of copper and tin.

Hardening and Coloring Artificial Stone and Cements.—B. Barrett, of Ipswich, Eng., patentee.—The inventor introduces the liquid indurating substance into an exhausted chamber containing the stone to be indurated, the liquid substance being previously heated to a temperature of about 50° or 60° Fah. When the stone requires to be colored the color is laid on with a brush and allowed to dry, before the indurating process is commenced. The mixture employed by the inventor for indurating stone is composed of 56 parts, by weight, of sulphur, dissolved by the aid of steam or dry heat, and 44 parts of diluted vinegar, or acetic acid, containing 17 parts of acid to 8 of water.

In preparing indurating mixtures to be applied to the exteriors and interiors of buildings, whether the surface be of brick, stone, cement, or plaster, he employs—

Mixture 1.—14 parts by weight of shellac, 14 parts of seed lac, 1 part of coarse turpentine, and 14 parts of pyroligneous spirit.

Mixture 2.—Gutta percha dissolved in coal tar, naphtha, or other suitable solvent, in the proportion of 3 parts by weight, of gutta percha, and 8 parts of the solvent.

Mixture 3.—One bushel of limestone or chalk, 12 gallons of water, 12 lbs. of alum, half a gallon of beer grounds, and half a gallon of gall, well mixed together.

These solutions, when heated, are to be laid on with a brush until the surface will absorb no more.

Soap.—H. C. Jennings, of London, patentee.

This invention consists in converting stearine into soap by means of a carbonated alkali with heat, instead of employing a caustic lye or alkali, with long boiling. The patentee uses in combination with stearine, whether obtained from palm oil, tallow, or any other vegetable or animal substance that yields stearine, such portions of common fat, or resin, or other substance, as will tend to cheapen the manufacture, and produce the commoner kinds of soaps. The result of this process is a harder and more neutral soap than that ordinarily produced.

[Collated from our foreign exchanges, "Mechanic's Magazine," "Newton's London Journal," "Artizan," "L'Invention," Paris, &c.

Chemical Action of Solar Radiations.

The following paper from the "London Atheneum," by R. Hunt, who has devoted so much attention to such subjects, will be read with interest by all our opticians and photographers. We learn from it how much of the mysterious and unknown still enshroud the subject of "light," which Milton terms "offspring of heavens' first dawn:"

"This is an account of the continuation of an examination of the chemical action of the rays of the prismatic spectrum, after it had been subjected to the absorptive influences of different colored media. The mode of examination has been to obtain well-defined spectra of a beam of light passing through a fine vertical slit in a steel plate by prisms of flint and crown glass, and of quartz. The spectrum, being concentrated by a lens, was received upon a white tablet, and submitted to careful admeasurement; the colored screen (sometimes colored glass and sometimes colored fluid) was then interposed, and the alterations in the chromatic image were carefully noted; the chemical preparation was then placed upon the tablet, and the chemical impression obtained. The relation which this image bore to the luminous image was a true representation of the connection between the color of a ray and its power to produce chemical change. The examination was extended to the photographic preparation known as the calotype, and to iodide and bromide of silver in their pure states, and when excited by gallic acid, M. Edmond Becquerel, in a paper communicated to the Academy of Sciences, of which an extract appears in the "Comptes Rendus," Vol. xvii. p. 883, states 'that when any part of the luminous spectrum is absorbed or destroyed by any substance whatever, the part of the chemical rays of the same refrangibility is equally destroyed.' The author's experiments prove that this conclusion has been formed too hastily. Although there are many absorptive media which, at the same time as they obliterate a particular colored ray, destroy the chemical action of the spectrum, yet there are a still more extensive series which prevent the passage of a ray of given refrangibility, and do not, at the same time obstruct those rays which are chemically active of the same degree of refrangibility. This is particularly exemplified in the case of glasses colored yellow by different preparations. With some of these, the blue rays are obliterated, the chemical action of this part of the spectrum not being interrupted; whereas in some other examples those rays permeate the glass, but are almost entirely deprived of chemical power. A still more curious fact is noticed for the first time, of some media which have the power, as it were, of developing chemical action in a particular part of the spectrum where the rays did not appear previously to posses this power.—Several glasses exhibited this phenomenon to a certain extent, particularly such as were stained yellow by the oxyde of silver; but one glass showed this in a remarkable manner. This glass was yellow when viewed by transmitted light, but it reflected pale blue light from one of its surfaces; it obliterated the more refrangible rays down to the green, and rendered the yellow rays far less luminous than usual. In nearly every case the yellow rays are found to be not merely inactive, chemically, but to prevent actively chemical action. After the spectrum has been submitted to the action of this glass, *all chemical power is confined to this yellow ray*. The author has hitherto supported the view, that photographic phenomena and the illuminating power of the sunbeam were distinct principles, united only in their modes of motion. He was led to this from observing that where there was the most light there was the least power of producing chemical change; and as illuminating power diminished, the chemical phenomena of the solar rays increased. The results, however, which he has obtained during the sunshine of the past summer, lead him to to hold that opinion in suspension. In many of the spectra obtained, there appears to be evidence of the conversion of one form of force into another, the change indeed of light into actinism or chemical power; and, again, the exhibition of the ordinarily invisible chemical rays in the form of light.