fectly square—against drilling three-sided holes for a tap bolt—against drilling holes so small that the tap must be driven in with a hammer before it will "take"—against tapping holes in castings as they come from the foundry, full of scale (this we have repeatedly seen done)—and against the whole array of misuses to which these costly appurtenances of a machine-shop are subjected. It takes time to make a tap, and as a great deal depends upon having them in good condition, more attention should be given to the proper use of them.

GEOLOGY AND THE "KING CRAB."

"Visitors to the Aquarium House at the Zoological Gardens have no doubt noticed the living specimens of that curious creature, the 'king crab,' which are now in a tank alive and well. The most curious part of their structure is the eyes; they have four, which are composed of numerous lenses, like the dragon-fly or bee, and are so arranged that they can see objects on each side of them. Besides being interesting simply as living creatures, king crabs are the nearest existing relations to the ancient form of beasts called 'trilobites.'"—*The London Field.*

The king crab is what is commonly known here as the "horse-shoe." Such creatures are taken by thousands annually on the marshy coasts of New Jersey and Long Island, and are used extensively for manuring the land. No living specimens are now found in England, but their fossils are not uncommon. The past geologic age of Europe is similar in many of its features to the present in the New England States. Hugh Miller in his lecture on geology says: "America though emphatically the *New* World in relation to its discovery by civilized man, is at least in these regions an *old* world in relation to geological type; and it is the so-called *Old* World that is in reality the *new* one." Professor Agassiz says: "If we compare a list of the fossil trees and shrubs from the tertiary beds of Œningen with a catalogue of the trees and shrubs of Europe and North America it will be seen that the differences scarcely go beyond those shown by the different floras of those continents under the same latitudes. But what is quite extraordinary and unexpected is the fact that the European fossil plants of that locality more closely resemble the trees and shrubs which grow at present in the Eastern parts of North America than those of any other part of the world. The present Eastern American flora and fauna have a more ancient character than those of Europe. The plants, especially the trees and shrubs growing in our days in the United States, are as it were, old-fashioned." On this topic Hugh Miller again says: "Towards the close of the miocene period old Scotland exhibited features greatly resembling those presented to the Puritan fathers by the forest-covered shores of New England, little more than two centuries ago.

The Launch of the "Re d' Italia."

The powerful steam ram frigate, *Re d' Italia*, built by William H. Webb, Esq., for the Italian Government, was launched from the constructor's yard, at the foot of Sixth street. East River, at 5 minutes before 10 o'clock, on the morning of the 18th ult. The frigate is 280 feet in length, and has 58 feet beam. The sides of the vessel will be covered with 4½-inch iron plates; these, we believe, are to be made in France, and the combined thickness of the ship's sides, including all, will be 38½ inches; the backing is of wood. The frigate will be about 7,000 tuns burthen; she is to be propelled by two horizontal back-acting engines, having cylinders 84 inches in diameter by 45 inches stroke; furnished with surface condensers and all the modern improvements. The screw propeller is a massive brass casting and weighs nearly 30,000 pounds. It is a two-bladed, expanding-pitch screw, and will be fitted with patent hoisting gear, so arranged as to be hoisted out when under sail alone. All the work done upon the vessel, so far, is of the most substantial description, and will conduce greatly toward sustaining the builder's reputation abroad.

A large number of ladies and gentlemen were present on the occasion of the launch, which passed off very handsomely, and Mr. Webb may congratulate himself, under the circumstances, that Fortune favored all his efforts to attain success.

CAUSES OF THE PHENOMENA IN ORGANIC NATURE.—THE ORIGIN OF SPECIES.

Of late years men of science and others have wrangled much over Mr. Darwin's work on "The Origin of Species." In most of the English and American reviews his treatise has been severely criticized, as having an infidel tendency; not on account of the facts therein given, but the conclusions of the author. He appears to have been very generally misunderstood, judging from a most interesting little work just issued by D. Appleton & Co., this city, being the publication of six lectures delivered to working men, by Thomas H. Huxley, F. R. S., Proffessor of Natural History in the School of Mines, London. Broadly stated, the subject of these lectures consists of an inquiry into the origin of species and a discussion on the causes of the phenomena in organic nature.

The meaning of organic nature is something that grows, has life and reproductive powers. It is exemplified in the seed of a plant in contradistinction to a grain of sand. Organic nature embraces the vegetable and animal kingdom, as entirely distinct in functions from rocks, fluids, and what chemists call "elementary matter." Animals and plants are divided by naturalists into groups, and these into kingdoms, sub-kingdoms, provinces, classes, orders, families, genera, and species. It was once very generally believed (and many persons entertain such views still) that there was such a thing as spontaneous generation—that is, mere elementary matter, such as pure water or mineral dust exposed in favorable positions, to light and heat, would bring forth vegetation and animalcula spontaneously. Hence it has been asserted that, if there is such phenomena as the spontaneous generation of life, according to the "development theory" of some naturalists and the views of Mr. Darwin on the origin of species, man may have been developed from the lowest forms of spontaneous generation. If such views were founded on facts in natural history, pantheism, viz., that "God is nature and nature is God," would be supported upon a very firm foundation.

Mr. Darwin does not discuss the question of spontaneous generation at all, and science completely silences pantheism. Every organism commences existance in an egg-cell or seed, and each seed is believed to have been specially created, with special functions and powers of reproduction, as stated in the Scriptures. M. Pasteur, a distinguished French chemist, has lately made a great number of carefully conducted experiments to test the theory of spontaneous generation. The results of his labors seem to be conclusive against the theory; no such property as spontaneous creation belongs to elementary matter acted upon by the forces of nature. An old and bitterly disputed question thus appears now to be settled scientifically.

Another question of much dispute seems to be settled by Mr. Darwin; thus the Caucasian, the Malay, and the Negro, according to his facts, are varieties of species, and may all have descended from a single pair, as set forth in the Scriptures. On the other hand, Prof. Agassiz and others believe they have descended from different original pairs, and thus they would really be different orders. In 1793, a new variety of sheep was produced by Seth Wright of Massachusetts. He had a flock, the members of which were specially gifted with the power of jumping fences, and thus tormenting the proprietor and his neighbors. In one accidental buck lamb, which had very short bowed legs, the acute mind of Seth Wright saw a remedy for his troublesome fence-jumpers, and by careful breeding he at last obtained an entire flock of long-bodied short-legged sheep, called the "otter breed," from this single buck which could not jump a foot-rail. Various species of dogs, hogs, and pigeons have been produced in the same manner. In structure they are different from others of the same genus, but psycologically they are identical. There is a well defined limit to organic varieties in animals. Two entirely different races may mix; but their progeny, as in the case of mules, become sterile. Proffessor Huxley states that there are no reliable exceptions to this law.

The rapid powers of production in plants from a single specimen, is set forth by Prof. Huxley as follows:—"Suppose the habitable part of the globe to be 51,000,000 square miles, and the climate and soil equal over that space, it may be entirely covered in nine years from the product of a single plant bearing fifty seeds, each plant requiring one square foot of soil for support." It is hardly conceivable that the whole stated available surface of the earth could be stocked in about nine years from a single plant, yet the figures demonstrate such a possibility.

VALUABLE RECEIPTS.

Bronzing Metals.—The production of different colors on the surface of metals, such as works of fine art, &c., is called bronzing. Mere surface-coloring is executed with metallic powders mixed and applied with a varnish. But the most perfect bronzing is produced by chemical action on the metal itself—its own surface being thus made to form the bronze color. Dr. Ure says, respecting this art:—"Coins and metals may be handsomely bronzed as follows:—2 parts of verdigris and 1 part of sal-ammoniac are to be dissolved in vinegar; the solution is to be boiled, skimmed and diluted with water till it has only a weak metallic taste, and upon further dilution lets fall no white precipitate. This solution is now made to boil briskly and is poured upon the objects to be bronzed. These objects must have been previously cleaned and made perfectly free from grease and set in a copper pan. This pan, with the articles now in it, is put on a fire and the solution made to boil for some time. The articles, if made of copper, will acquire an agreeable reddish-brown hue without losing their luster; but if they are boiled too long, the coat of oxide upon them becomes too thick and looks scaly and dull; and if the solution is too strong, the copper becomes covered with a white powder which becomes green on exposure to the air. The pieces thus bronzed must be washed well in warm soft water and then carefully dried, or they will turn green. The antique appearance is given with a solution of three-quarters of an ounce of sal-ammoniac and a drachm and a half of binoxalate of potash (salt of sorrel) dissolved in a quart of vinegar. It is applied with a soft rag to the surface of the metal, then allowed to dry. Several applications are thus made until a coating of sufficient thickness is obtained. Copper acquires a brown color by rubbing it with a solution of the common liver of sulphur or sulphuret of potash."

The Chinese are said to bronze their copper vessels by taking 2 ounces of verdigris, 2 ounces of cinnamon, 5 ounces of sal-ammoniac and 5 ounces of alum, all in powder, making these into a paste with vinegar and spreading it upon the surface of the article, which should be previously brightened. The article is then held over a fire till it become uniformly heated, then it is cooled, washed and dried. It thus receives one, two or several of such coats until the desired color is obtained. An addition of sulphate of copper to the mixture makes the color chestnut-brown.

A good method of bronzing copper articles, such as tea urns, to prevent them tarnishing, is described in most all the best treatises on chemistry. It is as follows:—The copper is first cleaned, then brushed over with peroxide of iron (generally colcothar) made into a paste with water or with a dilute solution of the acetate of copper. The article is then placed in a muffle in a furnace and heated cautiously for some time, then taken out and cooled. Upon brushing off the oxide the surface underneath is found to have acquired the desired hue.

Another method of bronzing copper is to brush it over with a paste of black lead, place it over a clear fire till moderately heated, then brush it off. A very beautiful bronze is thus produced. The surface of the copper must be perfectly bright when the black lead is applied. A thin film of wax or tallow applied to copper and the article placed on a clear fire until the wax or grease begins to smoke, produces a bronzed surface. In all these operations great care is necessary in managing the articles properly when subjecting them to the action of heat.

The following is a receipt which we have been told will produce a beautiful dark bronze on brass:—To 1 pound of muriatic acid add 6 ounces of the peroxide of iron and 3 ounces of yellow arsenic; mix these together and let the solution stand for about two days, shaking it occasionally. The brass article, perfectly