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American Steel.

On several occasions we have directed public attention to the manufacture of steel from American iron, and have urged our iron producers to engage in the business. From present indications we are led to believe that, in a few years hence, we shall be making most of the steel required for common purposes, instead of importing it, as now, from abroad. The Damascus Steel Company have erected large works at Port Richmond, Staten Island, for making steel by Neville's patent, and they are now in successful operation, making about four tons per day. With an improved furnace and special manner of treatment they take the iron ore and convert it, by one continued process, into puddled iron, when it is rolled into strips, and has but to be cut into pieces and heated with fine carbon, some manganese and a cyanide, in crucibles, when it comes out cast steel of a very uniform and excellent quality, suitable for many purposes for which English steel has hitherto been used. The improved processes introduced by this company enable them to enter our metal market with no common advantages.

Iron is perhaps the most sensitive of all metals. A small difference in the quantity of carbon combined with it makes all the differences of pig iron, wrought iron and steel. Ordinary pig iron contains an excess of carbon, while common wrought iron contains but a trace of it. Steel, on the other hand, contains an amount of carbon intermediate between wrought and pig iron. In England the practice of making steel hitherto, has been to convert the pig metal into wrought by decarbonizing it, ~~then to carbonize it away with~~ the proper quantity of charcoal by another melting process. The question might very naturally arise here, "Why not convert the pig iron into steel direct, in the puddling furnace, by taking away the exact amount of carbon it has in excess, thus saving the expense of reducing it to wrought iron and then carbonizing it into steel afterwards?" This is a fair and sensible question, and we have to answer that, within the past two years, this has been answered effectively in England, by the manufacture of what is called puddled steel. The object of steel-puddling is simply to decarbonize the cast-iron down to the limit of steel, and upon reaching that point to avoid further decarbonization, otherwise the product becomes wrought iron. As the agent for removing the excess of carbon in the iron is oxygen, a considerable supply of it is furnished in the process; but this has to be cut off and the heat maintained in the furnace for some time before the process is completed. A quantity of cinder, and sometimes an oxyd of manganese, is placed in the furnace to supply the oxygen; and so much success has attended the invention that puddled steel, which has twice the strength of wrought iron, is now furnished as cheaply, and is taking its place for making the plates of steam-boilers, the hulls of vessels, and the shafting of machinery.

We are informed that the manufacture of puddled steel has been successfully commenced by that enterprising company, Messrs. Corning & Winslow, of the Troy (N. Y.) Works, and that they produce a quality equal to the best in England. By a recent number of the London *Engineer*, we also learn that J. Spence, of Liverpool, England, has obtained a patent for manufacturing puddled steel by an improved furnace, without using any cinder or oxyd to assist in decarbonizing the pig metal. It is so constructed and arranged that a sufficient supply of oxygen is permitted to enter the furnace, so as to reduce the carbon of the metal to the exact point; then it is shut off and the heat maintained (so as to purify the metal) for some time afterwards, before the process is completed. This improvement is a step in the right direction, and deserves attention from those who are interested in this business. Such enterprizes and such improvements afford us pleasure to chronicle; they are cheering landmarks in the pathway of manufacturing progress.

Alexander Von Humboldt.

~~This~~ great philosopher, traveler and author expired on the 6th instant in Berlin, Prussia, at the advanced age of ninety-one years. He had outlived three generations, his reputation as a man of science was world-wide, and he had been a witness of the most thrilling events that had ever transpired in the history of the world. He was born in 1769, seven years before the American Revolution, and had seen our country emerge from the condition of a few sparsely settled colonies to an independent empire, extending from the Atlantic to the Pacific Ocean, numbering thirty millions of inhabitants, and second to none in all that constitutes true greatness. He saw the old French Revolution rise in glory and go down in blood and gloom; he witnessed the rise of Napoleon the Great, and beheld his own land (Prussia) crushed beneath the despot's heel—a mere serf to France; he again saw the Corsican Conquerer chained a prisoner in St. Helena, and his whole kindred banished from Gaul; and now, just as his eyes were closing forever, the tramp of armed men fell upon his ear, going forth once more to battle under the banners of a Buonaparte and a Cæsar—the Gaul and the German—and who can tell what the end will be?

Alexander Von Humboldt received a high education in the University of Gottingen, where his taste for the sciences was cultivated with assiduity. His fame as a mineralogist was early established, and at twenty-three years of age, he was appointed to the important government post of Superintendent of Mines in Franconia. Having felt a strong desire to visit distant lands, he soon resigned this situation, and sold a large estate to furnish means for traveling in America. After man disappointments, he was at last enabled to visit the New World under the patronage of the Spanish government, and in 1799 commenced to explore the great valley of the Orinoco. During the five years he was a traveler on our continent, he visited the sources of the Amazon, climbed the snow-capped peaks of the Andes, and under a burning sun traversed vast plains, pestilential swamps, and barren deserts where the foot of white man had never trod before.

It affords us much pleasure to state that Baron Von Humboldt included a portion of our own country within his extended American tour. He visited our principal seaboard cities, and was personally known to some of our distinguished men. He quitted this country in 1804, and returned to his native land. Our institutions made a most favorable impression upon his mind, and he ever afterwards retained a pleasant recollection of our people. His published accounts of these travels, attracted the attention of the whole civilized world. The field was fresh, the power of the author's description was vivid; they were filled with thrilling incident, and contained a mass of new geographical, botanical, and mineralogical information of the most interesting character. His fame was at once established by their publication, and honors poured in upon him from the scientific associations of all lands. They were printed in seventeen large volumes, richly illustrated with figures of the subjects described. They embraced geography, zoology, botany, mineralogy, the natural history of animals, astronomy, geology, climatology, in short, every branch of science. So varied and profound were his attainments, it was at once felt that he stood out in bold relief as the most accomplished traveler that ever lived We would be neglectful, however, of a sacred duty, if we were to forget to state, in connection with this subject, that he had for an associate the celebrated French *savant*, Bonpland, who accompanied him in his journeys, and assisted in his literary labors.

Of late years, the name of Humboldt was made more widely known by his "Cosmos," a work written during the long and pleasant twilight of his life, in which he considers (and in this view he is right) all created things as linked together forming one uniform whole, and affording evidence of one great creative mind as the author of the visible creation. This work has been translated into several languages—our own among the number—and is replete with curious, varied and profound information.

Of this great man we can truly testify he was a benefactor to the human race, and his career is a noble example of a long life well spent in severe physical and mental toil, whereby the sphere of man's information has been greatly extended and enriched. His memory was prodigious, his intellect active and acute, and his taste exquisite; and over everything which he wrote he threw the charm of a genial disposition and a generous heart. For the past fifty years he has been the Nestor of Science, and has gone down to the grave bearing the esteem of all men, and "laden with wealth and honors nobly won."

Trial Trip of the Russian Frigate General Admiral.

On page 30 of the present volume of the Scientific American we gave an account of the successful launch of this splendid war frigate, built for the Russian government by our distinguished fellow-citizen, William H. Webb. We also presented an account of her dimensions, model, &c. Her capacity is about 6,000 tuns; length on spar deck 307 feet; breadth 55 feet; length over all about 325 feet, depth of spar deck 34 feet. She is pierced with 44 side ports and two stern ports on lower deck, and 30 side ports and four large ports forward, and four large ports aft on spar deck. Her armament will consist of 40 shell guns of large calibre on gundeck, and 20 long guns and two pivot guns of the largest size on her spar deck. The gun carriages are all of solid mahogany, although the contract was only for the ordinary white oak. The crew will number 800 men, and she has capacity to carry water and provisions for their sustenance sufficient for six months, in addition to which she has stowage room in her coal bunkers for 1,200 tuns of coal, and will draw not over 25 feet with everything on board for a six-month's cruise.

The engines and boilers of this vessel were manufactured at the Novelty Iron Works, in this city; and to all appearance, and so far as they have been tested, they seem to be in all respects worthy of the reputation of the builders. It must be confessed, however, that even in spite of the care of our marine engine builders, and the simplicity of the plans which have generally obtained among them, we have yet our reputation to establish in this department. We think, as a general thing, that British marine engines have proved more substantial and reliable than those made in this country. It is true that English and Scotch engineers have had more experience in this branch than our own; but we are rapidly fixing our reputation, and in respect to the case before us everything seems to be complete. There are two horizontal back-action engines, with 84-inch cylinders and 45 feet stroke; nominal horse power, 800, actual, 2,000. The propeller is Griffiths' Patent, illustrated on page 352 of Vol. XII of the Scientific American; the blade is made of brass and is 19 feet in diameter and 31 feet pitch. It is arranged on an adjustable frame, so that it can be readily lifted from the water. The propeller is driven by a line of shafting 124 feet long and seventeen inches in diameter at the journal. What is technically called the "thrust"—that is, the force of the screw against the ship—is kept off by a "collar thrust bearing" and a "parry roller bearing," arranged so that either can be used and readily unshipped. The engines proper weigh 150 tuns, the propeller 12 tuns, and brass fixtures 12 tuns. The engines are supplied with Silver's marine governor, the object of which is to prevent "racing" in a head sea, or the sudden and swift revolution of the shaft when the plunges of the ship raise the screw out of the water. This governor was illustrated on page 356 of Vol. XI of the Scientific American, and we are happy to know that its worth is beginning to be appreciated. There are six horizontal tubular boilers, provided with a telescopic smoke-pipe, which is arranged so as to be hoisted or lowered at pleasure, being readily taken out of the way of the sails or during action. It is 11 feet in diameter. There are 38 furnaces provided with Van Syckles' grate-bar (which has also been illustrated in this journal), and these furnaces have 21,000 square feet of fire surface and 700 square feet of grate surface. The fire-room floor is 70 feet long by 10 feet wide, and we were much pleased to notice thas it is well ventilated. Our sympathy has often been stirred for the fireman pent up in his suffocating and uncomfortable quarters.

A very important feature in connection with the construction of this ship is the admirable system of ventilation recommended by Dr. D. B. Reid, of Edinburgh. The ventilating apparatus consists essentially of two pipes, each about 300 feet long and two feet in diameter, which command the whole ship. These have communication with the sleeping berths, the cabins, the hold, and every place where ventilation is required. This is the largest ship on which Dr. Reid's plan has been applied, although it has been adopted on several British vessels. The currents of air are produced by the aid of a donkey engine having a boiler of its own; this engine also drives two steam pumps, which pump out bilge water, supply water to six main boilers, and can be made to perform efficient service in case of fire.

The trial trip of this splendid specimen of naval architecture took place on Wednesday, the 18th inst. In consequence of a dense fog she did not go out to sea, but spent the entire day in cruising about the Narrows and the Upper Bay. The vessel was easily turned in a small circle; the screw made 48 revolutions per minute; and it was stated that a speed of twelve-and-a-half knots per hour was attained. The company on board consisted of about 600 persons—gentlemen and ladies; and the whole affair passed off to the entire satisfaction of all; and it was the unanimous opinion that the *General Admiral* is the most complete and superb vessel of the kind ever built. Several Russian officers were on board, and were highly gratified with their ship.

Not the least interesting portion of the affair was the exhibition of silver-ware, porcelain, glass and crockery, which alone cost $13,300. There is one set of porcelain for the Grand Duke, with the Russian coat of arms; one set for the captain, and one for the officers.

Early in June she will leave this port for Cronstadt, stopping at Cherbourg, France. Mr. Webb and family, with the Russian officers, Captain Shestakoff, Schwartz, Frastchenko and Selirianoff, and Lieutenants Mojaisky, Belavenstz and Kolobuim, who have been superintending her building, will accompany her to her destination. The total cost of this vessel is about $1,000,000.

The Inventors' Exchange.

We are receiving inquiries from all parts of the country relative to "The Inventors' Exchange," an agency for the sale of patents, recently established, and having rooms in the same building occupied by the Scientific American. So far as we are acquainted with the gentlemen having the business in charge, and the system of their operations, we think the object a good one, and have no doubt the inventor who cannot attend to introducing his own invention may avail himself of the services of "The Inventors' Exchange" to advantage. By the perusal of an advertisement which appeared in our columns last week, those who have not already informed themselves in regard to the object of this exchange may be enlightened.