

000. The manufacturing and operating expenses amounted to \$411,000,000, leaving a balance of \$149,000,000. Other expenses, interest charges, etc., brought the net earnings for the year to \$133,000,000.

During the past year this corporation mined 16,000,000 tons of ore and 709,000 tons of coal, besides manufacturing 9,522,000 tons of coke. The iron produced by the blast furnaces aggregated 7,976,000 tons. The production of Bessemer ingots was 6,759,000 tons, and of open hearth ingots 2,985,000 tons. Under the head of rolled and other finished products for sale, we find that the corporation turned out 1,921,000 tons of steel rails, 1,255,000 tons of merchant steel, shapes, etc., and 1,123,000 tons of wire and products of wire. Other manufactures, such as blooms, plates, tubes, sheets etc., brought up the total output of finished products to 8,197,000 tons for the year. The present activity of the corporation is shown by the fact that the unfilled orders on the books at the close of 1902 amounted to 5,347,000 tons of manufactured products.

The average number of employes of the corporation during the entire year was 168,127, to whom the aggregate amount paid during the year in wages was \$120,528,343. Of this total number of employes, 125,326 are employed in the various manufacturing properties. Finally, it is of interest to know that the total number of stockholders in the year 1902 was 58,629, which does not include the subscribers for preferred stock, nor 27,379 employes who availed themselves of an offer made them during last December.

#### THE ACCESSION OF GERMANY TO THE INTERNATIONAL CONVENTION.

The German Ambassador at Bern has notified the Swiss Federal Council that the German Empire will join the International Convention for the Protection of Industrial Property of March 20, 1883, as modified by the Act of the Conference at Brussels of December 14, 1900. The accession of the German Empire to the International Convention is to take effect on May 1, 1903.

The citizens of the United States and of the other signatories to the International Convention will therefore shortly be able to take advantage in Germany of the provisions of the treaty, the most important of which is that section which enables an inventor to file his German patent application during the year following the filing of his patent application in the United States, and to secure the United States date of filing as his date of priority in Germany, irrespective of the issue of the United States patent. As under the present law it is necessary to file a German patent application before the invention is disclosed in public print in any country, the amended provisions of the patent law will be availed of by many United States inventors, who, under the old practice, were debarred from protecting their inventions in Germany, because of the publication of their inventions, either on the issue of the United States patent or in connection with the introduction of the inventions.

#### THE REINTERMENT OF JAMES SMITHSON IN AMERICA.

Not so long ago the Italian government decided to remove all the bodies in the little cemetery of Genoa. That decision would not, in itself, very greatly affect the United States, were it not for the fact that in the cemetery in question the remains of James Smithson were interred in 1829. When the Smithsonian Institution was notified of the contemplated abolition of the cemetery, its Board of Regents decided to have the body removed to another cemetery in Genoa. Dr. Alexander Graham Bell asked the board to reconsider its action, and announced that he was ready to defray the expense of bringing the remains to this country. The proposition was favorably received.

It would be most fitting that the body of Smithson should find a last resting place in the country which he so greatly benefited. Foreigner though he was, Smithson gave his entire fortune of over \$500,000 "to the United States of America, to found at Washington, under the name of the Smithsonian Institution, an establishment for the increase and diffusion of knowledge among men." The gift is all the more remarkable, coming, as it did, from a man who had never seen this country and who was utterly unknown to us. It is pleasing to note that the faith which he had in the young republic has been justified in the benefits which the Institution that bears his name has conferred upon Americans. Perhaps more than any other public institution of the country, the Smithsonian Institution has stimulated scientific research among Americans.

#### A REGULAR TRANSATLANTIC MARCONI SERVICE.

At the time of his last visit to New York, Marconi informed a representative of the SCIENTIFIC AMERICAN that in the course of a few months a regular transatlantic wireless telegraphic service would be established. The promise then made has now been fulfilled. In its issue of March 30, the London Times

headed its foreign news with two New York dispatches of about two hundred words each, which were received "by Marconigraph." A leader in the Times states that the message marked the establishment for the first time of the regular transmission of news by the Marconi system on a contract basis. After pointing out that messages can be sent from the United States to England at a cost but little in excess of the cable rate from England to France, the Times comments upon the slowness of Englishmen to appreciate at its true worth the meaning of Marconi's work. It says:

"They may rely upon it that considerable interests are going to be seriously affected by the new developments, and they would do well to cultivate whatever scientific and economic imagination they may possess.

"In the same way those who are responsible for national interests ought to very carefully watch and anticipate the bearing upon various strategical problems of the agency that more than ever before annihilates space and time."

The Times, it is said, will have for the present a monopoly of this system of carrying news, as the number of words that can be sent is rather limited.

#### NEW AMERICAN AUTOMOBILE SPEED RECORDS.

That the Ormond-Daytona beach is an ideal racing course, as one would expect from a glance at the illustrations of it in our recent Automobile and Yachting number, was proved by the breaking of several American speed records in the trials held there the last of March. A new kilometer record of 32 4-5 seconds was made by Winton in his "Bullet" racer. This was 2 seconds better than the time made by Fred Walsh on Fournier's Mors racer at the Staten Island speed trials last May. Winton also came within 2-5 of a second of equaling Fournier's mile on the Coney Island boulevard, by making this distance in 52 1-5 seconds. This is the fastest mile ever run by an American machine driven by an American. The present world's record figures for the mile and kilometer are 46 and 28 seconds respectively. Mr. Winton also reduced his 10-mile track record of 10 minutes, 50 seconds to 10:26 1-5. This included making a turn at the end of the 5-mile stretch. According to the stop watch of the gentleman who rode with him, Winton made the first 5 miles in 4:46 1-5.

The former American mile and kilometer records for cars under 1,000 pounds, made by L. C. Thompson on a Renault machine, were badly beaten by H. T. Thomas on a special 825-pound Oldsmobile racer. These records of 1:35 3/4 and 59 seconds were reduced to 1:06 1-5 and 42 seconds respectively. The motor bicycle records of C. H. Metz on an Orient of 1:10 2-5 and 43 3-5 seconds for the mile and kilometer were beaten by Oscar Hedstrom on an Indian motor bicycle, the new times being 1:03 1-5 and 39 seconds.

#### RUBBER VINE IN HONDURAS.

Recently Señor Don Floriano Davadi, governor of the Department of Conyagua, Honduras, informed the American consul at Tegucigalpa that some time previous he discovered in the Pijo Mountains a vine growing in an uncultivated state, varying in diameter from 4 inches to 2 feet, which on cutting produces a sap the nature of which is rubber. These vines grow to 100 feet in length, and they are said to belong to the African family of rubber vines. In Honduras, no one seems to know the name of the vine or the botanical family to which it belongs. The discoverer regards it as superior in quality to the Para rubber of commerce, and asserts that his convictions are borne out by the analyses made by American and European chemists.

The vine thrives at great altitudes as well as in the lower valley levels. Such luxuriance of growth has this plant attained that it is quite capable of being cut in commercial quantities. It may be quickly propagated in the rich soil of the Department by means of seedlings, and the growth being so much faster than that of rubber trees, Señor Davadi thinks the quantity of gum obtained would be large. The trees require six years' attention before sapping can begin.

It has been proposed to form a company for the exploitation of rubber in the Yoro district, but though the names of several prominent men have been connected with the enterprise, nothing has, as yet, been done to begin operations.

#### REPORT OF THE BERLIN-ZOSSEN TRIALS.

Chief Engineer Reichel has at last published his report giving the results of experiments made with high-speed electrical trains on the military road between Berlin and Zossen. At a speed of 100 miles an hour the electromotive force was 15,000 volts. Mechanical power equal to 2,500 horse power was used in starting the trains, which, when at full speed, required only 700 horse power. Mr. Reichel, in his report, gives it as his opinion that a speed of 125 miles can be attained, provided the required amount of electric energy can be supplied, as when at full speed from 1,400 to

1,500 horse power is required. For freight transportation also, electric power gave good results. A train of 200 tons gross weight was easily moved, even over grades of 1.2 per cent, at a speed of 32 1/2 miles an hour. Through the possibility of supplying the motor car directly with a current of 10,000 and more volts, the weight of the motor cars and that of the transformers could be reduced from 92 to 78 tons.

#### SCIENCE NOTES.

Prof. Spring (Chem. Zeit.) has examined the commonly accepted theory advanced by Hagenbach, that the blue color of the sky is due to the refraction of light caused by solid or liquid particles floating in the air. In laboratory experiments the author never succeeded in obtaining the blue color, the reflected rays of light always showing either red, yellow or violet. Purification in no case removed the blue tint from the air. After exhausting all physical means in an attempt to reproduce the blue color, the author concluded that the blue of the sky depends upon chemical conditions. The color deepens instead of fades as the observer rises above the earth. These conclusions are supported by the fact that liquid air is also blue.

M. J. Thoulet has investigated the constitution of the ocean bed, and finds that the more deeply it is penetrated, the less the proportion of slime and the less calcareous matter. On the other hand, the proportion of sand grains and pure clays increases with the depth. No regularity obtains in the distribution of the non-calcareous mineral grains. This normal distribution appears to be more pronounced the deeper the ocean bed itself lies below the water surface, but, in any case, the variations due to ocean depth are small. Even in the deepest water the constitution of the bed shows traces of the conditions prevailing near the surface of the ocean above the bed. The latter remark is of importance, as the author points out, when we consider that a complete analysis—chemical, mechanical, and mineralogical—applied to ancient geological strata is competent to shed a flood of light upon the ancient conditions that prevailed at the surfaces of oceans that have long since disappeared, leaving no trace other than their effect on the ancient ocean beds.

C. Delezenne finds that the venom, both fresh and dried, of the cobra, the adder, and the puff adder, all contain a peculiar ferment, a kinase, which, although itself without proteolytic action on albumin, is able to impart to pancreatic juice a very powerful digestive action on that substance. This ferment is entirely destroyed by heating the venom to 100 deg. C. for fifteen minutes. The poison of the puff adder is the most active in this respect, 0.5 to 1 mgm. of the venom being sufficient to enable 1 c.c. of pancreatic juice to digest 50 cgm. of albumin in ten or twelve hours. Cobra poison was found to be slightly less active in this respect, while that of the viper had a marked lower proteolytic action, five or ten times more being requisite to produce the same effect. The kinase appears to resemble in its properties the ferments secreted by certain micro-organisms, and to possess the same action as the enterokinase of the intestinal juice. The part played by this substance in serpent venom is being investigated.

Metallic construction appears to have had a very low power of resistance during the volcanic eruption at St. Pierre. Not only was it incapable of withstanding the weight of the burning matter, says the American Architect, but some chemical action is likely to have taken place which transformed the particles. M. Amedée Knight, a senator of Martinique, was on the island at the time of the disaster, and he has been able to furnish details about the destruction which were not observed by others. He describes the effects shortly as corresponding with those which might be expected if some colossal Nasmyth's hammer had been employed in operation on the town. Most things have been reduced to a fine powder. One of the cases mentioned is the market of St. Pierre. After the cyclone of 1891 the authorities decided to reconstruct it in the most solid manner. Cast-iron was adopted. It is now impossible to find the slightest trace of a construction which had an area of 2,000 meters square.

A new and interesting departure in the shape of ships' hulls has been designed by Constructor Kretschmer, of the German Naval Department. He has been led to make this innovation in the desire to increase the efficiency of a vessel, without at the same time an abnormal augmentation of the coal consumption. Prof. Kretschmer, instead of designing the hull somewhat after the form of a fish, has taken as his model an aquatic bird, which, like the ship, makes its way along the surface of the water. In his design the ship's hull has the shape of a tetrahedron or double wedge. By this means it is anticipated that the efficiency of vessels will be increased by fifty per cent. Another great advantage is that such vessels will have no wash.