

## A CENTURY OF PROGRESS IN THE UNITED STATES.

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tain. To-day steam has almost entirely superseded sails, and in our magnificent modern ocean liner a trip of five days and as many hours takes us across the Atlantic; then flitting along the coast, up the Mediterranean Sea, and thence through the Suez Canal, we come in contact with all the peoples of the world in less than a month. Steam navigation, first established in 1807 by Fulton, was the great agency of commercial growth. The ratio of steam to sails for the world has increased from 30 per cent steam in 1860 to 80 per cent in 1894. This enormous field of industry cannot be treated except superficially, and we must let the figures tell their own story.

In 1800 the exports of the United States were \$70,971,780, and the imports were \$91,252,768, or more than \$20,000,000 in excess of the exports. Up to 1876 the imports, as a rule, preponderated over the exports. For the last quarter of a century, however, our exports have (with the exception of the years 1888, 1889, and 1893) largely exceeded the imports. In the year 1900 our exports were \$1,394,186,371, which is the highest point ever attained. The imports for that year were \$849,714,670, which gave us a credit in the balance of trade amounting to over \$544,000,000, as compared with a debit of \$20,000,000 in 1880. The total of exports and imports for the year 1800 represented an aggregate for our foreign commerce at the beginning of the century of \$162,224,548, while that for 1900 is more than \$2,000,000,000, which is the largest in the history of the country. Add to this the inland commerce of our great navigable rivers and on the vast areas of the Great Lakes, and the total reaches incomprehensible figures. It is said that over 10,000 vessels are employed in this inland commerce. According to the report of chief of engineers for 1900, the total Lake Superior traffic through the American and Canadian canals for the eight months of navigation ending April 19, 1900, was 21,078 vessels carrying 27,520,205 tons of freight and 51,050 passengers. The traffic through the Detroit River between Lake Huron and Lake Erie is, however, even greater. The freight alone is estimated at 40,000,000 tons, and it is said that the number of passages of vessels through is fifteen times as many as those through the Suez Canal.

Notwithstanding these amazing figures the commerce of the United States is still in its infancy. With the recent acquisition of the Hawaiian Islands, Porto Rico and the Philippines, the development of Alaska, the increasing demand of the world for our products, the building of the Isthmian Canal, and the encouragement to American shipbuilding, the most rational prophecy must seem to many an enthusiastic dream too wild for realization. But the American people are not dreamers.

## MINERAL RESOURCES.

In 1800 there had been practically no development of the mineral resources of the country. The abundant forests supplied the necessary fuel, and for most of the people, took the place of coal. There were no railroads, battleships, nor sky-scraper buildings with their enormous demands for iron and steel; coal oil and natural gas were undiscovered assets, and the great electrical art with its demand for copper was not yet born. To-day the annual output of the United States for its principal mineral products is, as given by the Geological Survey for the year 1899, 13,620,703 long tons of pig iron valued at \$245,172,654; 585,342,124 pounds of copper valued at \$104,190,898; 54,764,500 ounces of silver valued at \$70,806,626; 3,437,210 ounces of gold valued at \$71,053,400; 193,321,987 short tons of bituminous coal valued at \$167,935,304; 53,944,647 long tons of anthracite coal valued at \$88,142,130; \$20,024,873 worth of natural gas; and 57,070,850 barrels of petroleum valued at \$64,603,904. The total production of petroleum in the United States during the past forty years, from 1859, when it was discovered, to the end of 1899, is 943,513,609 barrels. This amount of oil would fill a tank having a base of one square mile to a height of 189 feet, or it would form a river 15 miles long, a quarter of a mile wide, and 50 feet deep. Let the mind try for a moment to estimate the number of lamps which have been filled, trimmed, and kept burning from this supply. The total value of the mineral products of the United States, as estimated by the Geological Survey for the year 1899, is \$976,008,946.

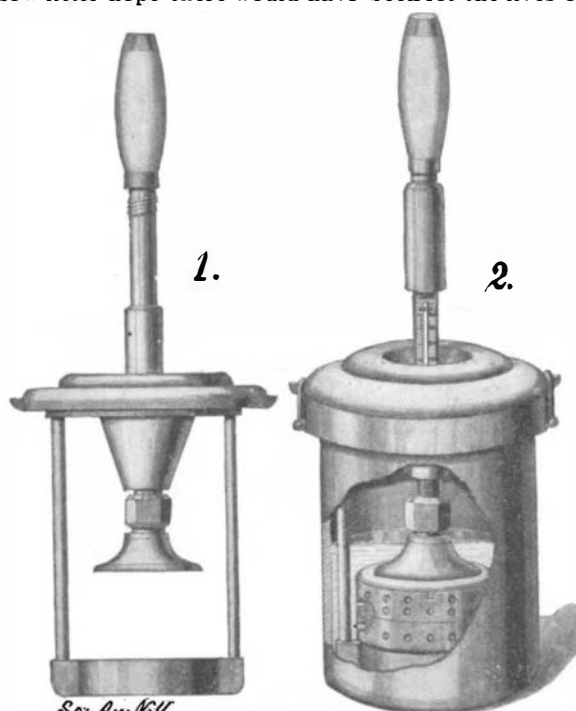
## FISH AND FISHERIES.

The fisheries of the United States have always been valuable, but in the early part of the century they were superintended only by a kind Providence. Fortunately, the bountiful supply exceeded the demand. In the year 1860 they had attained a commercial value of \$13,768,198. In 1871 the Fish Commission of the United States was established, whose principal work was the propagation of useful food fishes, including lobsters, oysters and other shell fish, and their distribution to suitable waters. In the prosecution of its work the Commission has 34 stations situated in different parts of the country, 5 fish-distributing cars, 2 steam vessels and 1 sailing vessel. This institution is now planting in American waters desirable food fishes at the rate of 9,000,000 annually, and they include shad on

the Atlantic coast, white fish on the Great Lakes, salmon on the Pacific coast and cod on the New England coast. The value of this national enterprise has long since established itself, and the fishing industry to-day is an important and growing branch of our national resources. According to the Statesman's Year Book for 1900, the fisheries of the United States employ 6,529 vessels and 202,129 persons. The capital invested is \$61,868,616, and the annual value of the product is \$47,826,328. Oysters constitute about a third of the product.

## TELEGRAPH AND TELEPHONE.

In 1800 communication between remote points was only by mail, and the mail was slowly carried by post horses and sailing vessels. To hear from friends in Europe required many months of delay. To-day we communicate with Europe by cable in a fraction of a minute and talk over the telephone with friends a thousand miles away. In 1844 the first line of telegraph was built, under the direction of Prof. Morse, between Baltimore and Washington, by special appropriation of Congress, and the first message over it—"What hath God wrought"—was prophetic of a mighty revolution in the world's life. To-day one great company—the Western Union—has 933,153 miles of wire, 22,900 offices, and in the current year sent 63,167,783 messages. Add to this the equipment and business of the Postal Telegraph Company, and the total would be 1,108,153 miles of wire, 25,900 offices and 80,667,783 messages. Even these figures must be increased somewhat by small companies, the fire alarm and the district messenger service, while submarine cables to the number of 1,500 add 170,000 miles of line and 6,000,000 messages annually in extension of the business of the United States. It is appalling to think how helpless we would have been in our campaigns in the East, and how little hope there would have been for the lives of



THE TUTTLE-BOWIE VULCANIZING APPARATUS.

our compatriots in Pekin, had there been no cable. The telephone, invented by Prof. Bell in 1876 and immediately introduced, utilized in 1899 in the hands of the one parent company a million and a half instruments and over a million miles of wire, and in that year more than five million connections were made daily. The telegraph and telephone are the great distance annihilators and time savers of the nineteenth century, and enter into the life of almost every other industry. They are both American inventions.

## THE BALANCE SHEET.

In closing this review no more significant object lesson can be presented than the nation's balance sheet, which for the year ending June 30, 1900, was:

RECEIPTS.	
From internal revenue.....	\$295,327,326.76
From customs.....	233,164,871.16
From postal service.....	102,354,579.29
From miscellaneous.....	38,748,053.97
Total receipts.....	\$669,595,431.18
EXPENDITURES.	
Civil and miscellaneous.....	\$98,542,411.37
Military establishment.....	134,774,767.78
Naval establishment.....	55,953,077.72
Indians.....	10,175,106.76
Pensions.....	140,877,316.02
Interest on public debt.....	40,160,333.27
Deficiency in postal revenues.....	7,230,778.79
Postal service.....	102,354,579.29
Total expenditures.....	\$590,068,371.00
Surplus.....	79,527,060.18

This surplus of a single year is more than seven times as much as the entire receipts of the government in 1800, and ten times as much as its entire expenses in that year. To-day the United States is by far the richest country in the world. Its wealth exceeds that of the United Kingdom, which is the next in rank, by about \$22,000,000,000. In 1800 our population was 3,308,483; now it is 76,304,799. The sixteen States have grown

to forty-five, and our territory expanded from 909,050 square miles to 3,846,595 square miles. At the opening of the revolutionary war there were but 40 newspapers. In 1850 these had grown to 2,526, and to-day we have 20,806. Note also the following growth in national wealth. According to the eighth census, that wealth was in 1789, \$619,977,247; in 1850, \$7,135,780,228; and in 1860, the highest estimate, by individual returns, made it \$19,098,156,289. According to Mr. Mulhall the wealth of the United States in 1890 reached \$64,876,000,000 and in 1900 will be \$91,040,000,000. This makes in 1900 the sum of \$1.195 for each inhabitant. The addition which the last ten years has made to the national wealth is \$25,000,000,000. This result in the accretion of national resources is commented on by Mr. Mulhall himself as "really stupendous." Expressing the growth of this period in more comprehensible terms, he says it means that for every day in every year of the past decade the United States has grown (daily) at the rate of 4,000 in population, 800 in school children, 29,000 in acres of farms, \$7,500,000 in wealth, and \$1,100,000 in manufactures. According to Statistician Powers of the twelfth census, this saving of \$25,000,000,000 in ten years is a greater saving than all the people of the Western continent were able to make from the discovery by Columbus to the breaking out of the civil war, which statement seems justified by the figures already given from the eighth census. He also says that the savings of these ten years represent more houses, buildings, machinery, tools, implements, clothes and means of transportation than the race was able to add by its savings from Adam to the Declaration of American Independence.

The infinitude of factors in this epoch of progress is too great for comprehension, and embarrasses the mind in any effort to expand to a full appreciation of its details. The United States, however, has not yet attained its majority, and the future has still great things in store for us. Seventeen million children are in our schools and colleges, and these in the next century will take our places as active workers, and with the masterful equipment of education, coupled with the energy of new blood, a reverent respect for religion, patriotism and morality, and a heritage unparalleled, such forces will undoubtedly carry the republic to a greater prosperity and a more exalted destiny.

## A RAPID METHOD OF VULCANIZING RUBBER.

A new method of vulcanizing has been patented by Mr. G. H. Tuttle, of Montgomery, Ala., and Mr. G. M. Bowie, of Whitecastle, La., by means of which it is said only one-third the time ordinarily consumed is required. Fig. 1 is an elevation of the press employed, and Fig. 2 is a perspective view of the vulcanizer, together with a box containing the article to be vulcanized.

The apparatus as shown in Fig. 1 consists of a bottom and a funnel-shaped top connected by uprights. Into the funnel-shaped top a screw fits, which also engages the socket of a presser-plate. The socket is in the shape of a nut, so that it can be turned by means of a wrench. Into the upper face of the top a rod screws, which carries a thermometer, a handle, and a protecting sleeve, which can be screwed on a thread on the rod or shifted down, as in Fig. 1, to cover the thermometer.

Between the presser-plate and the bottom a box is to be inserted, consisting of a top and a bottom and perforated upper and lower sections, the several parts being fitted together loosely, so that they can be readily taken apart. The press, with the box, is set into a vessel, the upper rim of which engages a corresponding groove in the top of the vulcanizer, the vessel and vulcanizer being locked together by catches or other fastening devices.

The article to be vulcanized is embedded in plaster-of-Paris in the perforated box; and the box is then placed on the bottom of the vulcanizer. Together with the lower portion of the press, the box is immersed in hot water for the purpose of softening the rubber. When the rubber has been softened, the nut socket is turned to apply further pressure for the purpose of expelling the excess of rubber. Then the press with the box is inserted in the vessel into which enough hot mercury has been poured to cover the box. The vessel is therefore placed upon a stove. The heat of the mercury passing into the box through the perforations causes the rubber to be vulcanized in the well-known manner. To secure this result, a temperature of about 320° F. is maintained in the box for about half a hour. The box with the vulcanized article is then removed from the vessel and the mercury is allowed to cool.

By this improved method the same results are attained as with the ordinary methods, but in about one-third the time. Moreover, the heating medium is always fully under control, and being a metallic liquid cannot explode.

The American District Telegraph Company is about to adopt the audiphone system in New York city. The ordinary call boxes will not be done away with, but the audiphone will be substituted where desired. A monthly rental will be required for the new system.