

SCIENTIFIC AMERICAN

ESTABLISHED 1845

MUNN & CO., Editors and Proprietors

Published Weekly at

No. 361 Broadway, New York

TERMS TO SUBSCRIBERS

One copy, one year for the United States, Canada, or Mexico \$3.00
 One copy, one year, to any foreign country, postage prepaid. £016s. 6d. 4.00

THE SCIENTIFIC AMERICAN PUBLICATIONS.

Scientific American (Established 1845) \$3.00 a year
 Scientific American Supplement (Established 1876) 5.00
 Scientific American Building Monthly (Established 1885) 2.50
 Scientific American Export Edition (Established 1875) 3.00
 The combined subscription rates and rates to foreign countries will be furnished upon application.
 Remit by postal or express money order, or by bank draft or check.
 MUNN & CO., 361 Broadway, New York.

NEW YORK, SATURDAY, AUGUST 2, 1902.

The Editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are sharp, the articles short, and the facts authentic, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

COMMERCIAL ALASKA.

A million dollars a month is the estimate made by the Bureau of Statistics of the present value of the market which "frozen Alaska" offers the producers and manufacturers of the United States.

By reason of the application of modern systems of travel and transportation, Alaska is now as accessible as Arizona. Three days of travel by modern ocean steamers from Seattle, among the islands and along the coast which form the southeastern extension of Alaska, lands the traveler at Skagway; twelve hours by rail over the mountains carries him to the headwaters of the Yukon, where comfortable and well-equipped river steamers carry him to the gold fields of central Alaska or down the Yukon River, which is navigable for more than 2,000 miles at this season of the year. From the mouth of the Yukon another comparatively short trip by steamer carries him to Cape Nome—the latest and greatest of the gold fields of Alaska.

Gold, fish and furs are the principal industries of Alaska at the present time; and their value to the United States is \$15,000,000 annually.

The cost of Alaska was \$7,200,000. The revenue which the government has derived from it since its purchase amounts to over \$9,000,000, and the value of the products is now twice as much every year as it cost. The total value of the products of Alaska brought to the United States since its purchase is (according to the best estimates that the Bureau of Statistics is able to make) about \$150,000,000, of which \$50,000,000 is precious metals, \$50,000,000 products of the fisheries, chiefly salmon, and \$50,000,000 more furs, chiefly seal fur. Probably \$50,000,000 of American capital is invested in Alaskan industries and business enterprises, including transportation systems. In the salmon fisheries alone, the companies engaged have a capitalization of \$22,000,000 and the value of their plants, including vessels, is given at \$12,000,000. In the mining industries there are large investments, the great quartz mill at Juneau being the largest quartz stamp mill in the world, while several other quartz mills represent large investments. With the inflow of capital, the development of transportation systems, and the gold discoveries, have come the building of towns and the development of cities with modern conveniences of life. Nome City, which is located but a comparatively short distance south of the Arctic circle, has now a population of over 12,000; postal facilities have been so extended that the number of postoffices is now about sixty, and mails are being regularly delivered north of the Arctic circle.

Agricultural opportunities in Alaska have, until within a recent period, been considered of but slight importance. As the country was explored, however, and its conditions of climate and soil studied, its natural products observed, and experiments made with various classes of agricultural productions, it became apparent that the agricultural possibilities of the country, and especially of the south and southeast, where the climate is modified by the Japan current, were of considerable importance, in view of the practicability of furnishing at least a part of the food supply of the population which the varied resources of Alaska seem likely to sustain and make permanent. Grasses for the support of cattle are abundant, and the experiments with live stock thus far justify the belief that this feature of the food requirements of Alaska may be furnished by the development of stock farms in the southern sections. In the north vast areas are covered with a moss similar to that upon which the reindeer thrives in other parts of the Arctic regions; and in view of this fact, the introduction of reindeer from Siberia was begun a few years since, and has proved extremely successful, about 3000 now being distributed through northwest Alaska. The experiment has advanced sufficiently to justify the confident belief that the reindeer will within a few years prove an important feature in furnishing both

the transportation and food supply of northern and northwestern Alaska.

The gross area of Alaska is, according to the 1900 census, 590,804 square miles. The Governor of Alaska in a recent report states that this is equal to the combined area of the twenty States of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi and Tennessee.

THE SCARCITY OF HORSES.

With all our American ingenuity and enterprise in manufacturing electric cars and automobiles to relieve the horse of the drudgery of increasing work and the cruelty of drivers, the horse is being advanced to a higher plane of utility and luxury. There is no longer a demand for the cheaper grades of street-car horses. The African war took several thousand, but the armies of the world call for the better class of horses. The old cab horse, that stands in the streets day and night, is being supplanted by automobiles in cities where good pavements prevail, just as the horse was relieved from the street cars by electricity; thus, step by step, the horse is being advanced, and we welcome every improvement in mechanical power as a blessing to the horse.

The growth of our cities and industrial centers increases the demand for horses of a better class. The big draft teams in our city streets indicate the prosperity in this country; and it is the ambition of our manufacturers to get the finest draft horses to be had. While our merchants and express companies are increasing the number of handsome active horses, the grocers and tradesmen utilize many of the cheaper animals. While a few wealthy people own an automobile they must have fine horses, and with the cheap price of vehicles in America, with so many big factories, almost everybody has a horse and buggy, surrey, or carriage, while all who can afford it have handsome coach and carriage horses—the prices of which are higher than ever before known. The demand for all the better classes of horses is far greater than the supply, because our farmers became discouraged six or eight years ago, and quit breeding, when panic prices were below cost of production, and the fear that the bicycle and electricity would soon displace the horse.

With the return of prosperity came the increased demand for horses, but a higher class and at higher prices. We now have an era of industrial horses and horses of luxury, never before known in the history of this country. After our civil war in 1865, we discovered we were horse poor, with millions of little trotters, mules and ranch ponies. We began importing draft horses, and later the large handsome coach horses, to increase the size and utility of our American horses. We imported these animals by the thousand from Europe to improve our own, more liberally than any nation has ever imported any pure breeds of stock, and when prices dropped the export buyers took 50,000 to 75,000 a year to Europe, until our prices last year got so high that they could handle but a few.

With the revival of commercial prosperity came the increased demand for good horses; and with no breeding for a few years, the horse buyers soon culled out the good horses, and we are now in the midst of a horse famine.

Farmers rallied to horse breeding as prices advanced, and our importers are again annually importing shiploads of pure-bred stallions of the Percheron or French draft breed, known in the cities as the Normans; from France some of our importers brought 200 last year, and brought still more this year. The importations of Belgians, English Shires and Scotch Clydesdales are all increasing for our draft horse production, while our importations of French coach, German coach and hackney horses is annually growing.

Eight to ten years ago, these stallions would not sell for more than \$200 to \$500; now they readily sell at \$2,000 to \$5,000—ten times as much. They are chiefly bought by companies organized to improve horse breeding in different localities of the horse-breeding States: Ohio, Indiana, Illinois, Iowa, Kansas, Nebraska, Minnesota, Wisconsin, Michigan and Missouri. The little American trotter, while the fastest horse in the world, bred for speed, but lacking the size and beauty of carriage and coach horses, is relegated to the sporting racetrack, much as the thoroughbred is fit only for racing. The draft horse is now the most profitable and most popular horse with the American farmer, who requires a good draft team for his farm work. The little trotters are increased in size and utility by crossing with the large handsome coach horses.

The whole world wants more good horses. England, France and Germany cannot supply their cities and their armies. Russia, with 25,000,000 horses, has no good horses for export. America is the only country from which large supplies may be had, and when our increased horse production begins to mature, we

can supply the world as well as our own increased market interests in all our growing cities. The export trade will always maintain good prices for our horses, and while many farmers may still raise scrubs, the enterprising American farmers get the best improved horses to be found in the horse-breeding countries of the old world. Now they breed to suit the market demand for high-class horses to supply the markets of the world.

SOME OLD SHIPS.

Investigations recently made show beyond a doubt that the oldest warship extant is the "Victory," Admiral Nelson's flagship at the battle of Trafalgar. The "Victory" was launched in 1765, and is now 137 years old. She has passed many a year tied up to her dock at Portsmouth, and the tooth of time has left its destructive mark upon her. Not so long ago the British Admiralty spent a considerable sum of money in saving the old ship from ruin.

As a general rule, the lifetime of a ship built of the very best material scarcely exceeds 120 years. To be sure, there are exceptions. Perhaps the most remarkable of these is the case of the whaler "True Love," of Hull. The "True Love" was a bark of 248 tons, and was built in Philadelphia in 1748. After she had sailed for a few years under the American flag, she was purchased by an Englishman and converted into a whaler. When she was 97 years old, old enough to be retired, she still voyaged to the Arctic Ocean. After changing hands once again she was still in active commission for forty-four years as a carrier of wood in the Baltic Sea. Finally, after an active life of 139 years, she succumbed to the inevitable ax.

Still another hoary ship was the sailing vessel "Betsey Cains." The exact date of her launching is not known. But it is definitely recorded that in 1688 she bore the name "Princess Marie," and had the honor of carrying Prince William of Orange to England. She was then used for a time as a pleasure yacht by Queen Anne. After her period of royal usefulness had passed, she was sold and rechristened "Betsey Cains." Her end was pathetic. She was shipwrecked at Tynemouth in 1827, after she had carried the English flag uninterruptedly for 139 years.

A long life was also granted to the three-masted schooner "Three Sisters," a contemporary of the "Betsey Cains." She had taken part in 1689 in the siege of Londonderry. At the beginning of the last century, after she had attained the respectable age of 130, she was still voyaging in the Irish Sea.

In an account of old ships the brig "Brotherly Love," which carried Capt. Cook on many a notable voyage should not be omitted. After a service of 140 years she sank in a collision in the harbor of Hamburg.

In November, 1892, the Danish ship "De Tree Sostrene" cast anchor in the harbor of Dundee. Some curious person hit upon the idea of looking up the history of the vessel. The investigation proved that the Danish ship was built in 1772 in Ruckjöbing, and was at that time 120 years of age.

The "Success," which voyaged from one English port to another, was launched in 1789. As late as 1895 she made a voyage to Australia, and later crossed the Atlantic Ocean.

An investigation carried out some time ago by the shipping register officials of Great Britain showed that on their books were recorded twenty-four English ships over a hundred years old, and thirteen over ninety-five years old. A ship twenty-six years old was reckoned "middle age."

It is, of course, difficult to ascertain what is the maximum term of service of a steamship under the most favorable conditions. It is remarkable, however, that of the steamers built from 1815 to 1830, not a single one seems to be in existence. This is, perhaps, due not so much to a lack of endurance in the steamship as to the fact that the cost of running a modern vessel is less than that of an old-timer. The oldest vessel of the English merchant fleet is the sidewheeler "Sir Charles Ogles," of Halifax, built in Dartmouth in 1830. The oldest English iron steamer is the Cardiff ship "Swift," which is now 71 years old, and is still in active service.

A NEW FORM OF RADIATION.

In a paper read before the Académie des Sciences, M. Albert Nodon describes his researches upon actino-electric phenomena. He finds that when luminous or ultra-violet rays are projected on a thin conducting plate they give rise, on the non-lighted face, to radiations, which are analogous to X-rays or those of radium. The phenomena may be observed by a simple arrangement consisting of a small box of blackened zinc, having a movable slide on one side, on the other a door, and an opening in the bottom. The box is placed upon a gold-leaf electrometer with single leaf, inclosed in a Faraday wire cage. The box contains a brass sphere, insulated, which when charged forms a condenser with the walls of the box, and the variations of charge are observed by the gold-leaf of the electrometer. The metal box is light-tight and con-