Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW, NEW YORK.

O. D. MUNN. A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

One copy, one year, postage included..... **$3 20**
One copy, six months, postage included **1 60**

Clubs.—One extra copy of THE SCIENTIFIC AMERICAN will be supplied gratis for every club of five subscribers at $3.20 each; additional copies at same proportionate rate. Postage prepaid.

☞ Single copies of any desired number of the SUPPLEMENT sent to one address on receipt of 10 cents.

Remit by postal order. Address

MUNN & CO., 37 Park Row, New York.

The Scientific American Supplement

is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly. Every number contains 16 octavo pages, with handsome cover, uniform in size with SCIENTIFIC AMERICAN. Terms of subscription for SUPPLEMENT, $5 00 a year, postage paid, to subscribers. Single copies 10 cents. Sold by all news dealers throughout the country.

Combined Rates.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for one year, postage free, on receipt of *seven dollars*. Both papers to one address or different addresses, as desired.

The safest way to remit is by draft, postal order, or registered letter. Address MUNN & CO., 37 Park Row, N. Y.

Scientific American Export Edition.

The SCIENTIFIC AMERICAN Export Edition is a large and splendid periodical, issued once a month. Each number contains about one hundred large quarto pages, profusely illustrated, embracing: (1.) Most of the plates and pages of the four preceding weekly issues of the SCIENTIFIC AMERICAN, with its splendid engravings and valuable information: (2.) Commercial, trade, and manufacturing announcements of leading houses. Terms for Export Edition, $5.00 a year, sent prepaid to any part of the world. Single copies 50 cents. ☞ Manufacturers and others who desire to secure foreign trade may have large, and handsomely displayed announcements published in this edition at a very moderate cost.

The SCIENTIFIC AMERICAN Export Edition has a large guaranteed circulation in all commercial places throughout the world. Address MUNN & CO., 37 Park Row, New York.

VOL. XL., No. 9. [NEW SERIES.] *Thirty-fourth Year.*

NEW YORK, SATURDAY, MARCH 1, 1879.

Contents.

(Illustrated articles are marked with an asterisk.)

TABLE OF CONTENTS OF

THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 165,

For the Week ending March 1, 1879.

Price 10 cents. For sale by all newsdealers.

STRIKES IN LIVERPOOL AND LONDON.

The strike in Liverpool now (February 13) includes not only the sailors and dock hands, but laborers generally, carters, and carpenters. The entire trade of the city is paralyzed. Thirty-five grain laden ships destined to Liverpool have stopped at Queenstown, and their owners do not know where to send them. Meanwhile there is danger that the grain will heat and spoil. Few, if any, ships are leaving the port; and steamers arriving can be discharged only by men brought from other ports and protected by the police and military.

The fleet chartered at Liverpool to convey troops and supplies to South Africa will have to be fitted out at other ports. The shipowners' committee and a deputation from the strikers met on the 12th, the former proposing to pay the old wages, provided the day's work shall be one hour longer. This proposition was rejected by the delegation. The shipowners' committee then, on their own responsibility, suggested that the question be referred to arbitration. This suggestion was also rejected.

The threatened strike of the Amalgamated Society of Engineers has begun at London, involving the engineers, boiler makers, steam engine makers, iron moulders, and other iron workers in all the great establishments which ordered a reduction in wages. It is said that the pattern makers and a hundred other trades intend to follow.

In view of the fact that strikes are invariably failures on a falling market, this action of the workingmen of Liverpool and London—both cities being overcrowded with laboring people—would seem to be anything but prudent. Every day's delay of manufacturing and commercial industry only hastens the decline of England from the commercial and industrial supremacy she has so long enjoyed; and the laboring part of the community must be the first to suffer from the loss of trade which England's rivals are only too ready to take up and keep.

HONOR TO PETER COOPER.

The eighty-ninth anniversary of Peter Cooper's birthday was appropriately celebrated at his house in this city on the evening of February 12, by a large gathering of prominent citizens, and the investment of the venerable inventor and philanthropist with the honorary degree of Doctor of Laws, conferred by the Regents of the University of New York. More correctly, perhaps, it might be said that the University of New York was permitted to honor itself by enrolling the name of Peter Cooper among those of its most honored alumni.

The life of Peter Cooper is typical of the nineteenth century and the American people—a time and country which have done so much to make possible the experience which, to use Mr. Cooper's own words, has compelled him "to believe that it is to the application of science to the laws of life that we must look for all future improvements in the condition of mankind." As one of the leaders in the application of science to human industry, both by personal invention and through the influence of the noble institution of practical learning which he founded, Mr. Cooper has won a place in the esteem of his countrymen excelled by few. To those who have to make their way in life by unaided effort and personal worth, the successful career of Peter Cooper is a perpetual encouragement and model. May he long enjoy the satisfaction of seeing the beneficent fruits of his industrial, scientific, and philanthropic efforts.

SAMUEL BATCHELDER.

Massachusetts has lately lost two notable sons, both aged men—Richard H. Dana and Samuel Batchelder. The first was a man of letters, and famous. No New Englander would dare admit that he had not heard of the author of the "Buccaneers." American encyclopædias give full particulars of his life and writings, though the one was uneventful, and the other without any marked effect upon the world's progress, even in literature. Mr. Dana was a dreamer, and his intensely practical countrymen rewarded him with fame. Mr. Batchelder was a doer, one of the pioneers in the cotton industry which has given New England so much of her wealth and influence; a brain worker of singular power; a man of science and invention. Look for his name in the American Cyclopædia, and you will not find it. The purely literary standard of culture hitherto prevailing leads invariably to the exaggeration of the importance of essayists and verse writers, and the almost total oversight of practical thinkers. By-and-by the value of science and practical energy and useful invention will be more justly esteemed among men.

Mr. Batchelder was born in Jaffrey, N. H., June 8, 1784—five years before the first cotton mill was erected in the United States. His parents removed to Ipswich, where, in 1808, the young man helped to build the second cotton mill in New Hampshire. Afterward he took charge of it, becoming so closely associated with the establishment and growth of the cotton industry in this country, as to justify the remark that, "If he did not create this great manufacturing interest, he watched over it in its infancy, and contributed by his enterprise, sagacity, and inventive genius to its rapid development and its vigorous and far-reaching prosperity."

Mr. Batchelder early became known as a scientific manufacturer who understood all the details of his business, and was intrusted by capitalists with the founding of the cotton industry at Lowell. He built the Hamilton Mills, and afterward, while in charge of them, designed those fabrics for which Lowell has been famous and which have been staple articles of commerce ever since. In 1831, when the success of Lowell's manufacturing enterprise had become acknowledged such as had never before been known in New England, Mr. Batchelder united with parties in Boston in purchasing the site of a factory in Saco, Me., then recently burnt, and took charge of the erection of the York Mills, becoming their superintendent. He soon saw and appreciated the capabilities of the place, and with his associates secured the whole water power at what was then called the Saco Falls, and laid the foundation of another great manufacturing city.

Having made the York Mills one of the most successful corporations in New England, and secured a competency, Mr. Batchelder, in 1846, resigned his trust and removed to Cambridge, intending to devote himself to his library, which was large and choice, to his grounds, and to the gratification of his tastes generally. But when the great manufacturing enterprise at Lawrence was projected he again was swept in as one of the proprietors, and soon after he became actively engaged once more in manufacturing enterprises, holding the office of director in many corporations, and that of treasurer in the Portsmouth Mills, until 1855, when he took charge of the York Mills, which had declined during his absence, put them in running order, and has since been treasurer and manager of them, as well as of the Everett Mills at Lawrence.

An account of Mr. Batchelder's success as an inventor was given in the SCIENTIFIC AMERICAN last summer, in connection with an illustrated description of his ingenious, simple, and efficient dynamometer. Mr. Batchelder also invented the steam cylinders and connections so universally used for drying yarns. About the year 1833 or 1834 he invented and applied the first stop motion to the drawing frame, which he patented in England; and it has since been in general use in that country as well as this.

THE PLAGUE IN RUSSIA.

The condition of things in Southeastern Russia is unmistakably alarming. There have been several local outbreaks of plague in Turkey and in North Africa during recent years; and during the past year the movement of Turkish levies, the herding together of homeless refugees, the massing of Russian troops in unhealthy districts, and the return of troops from infected places, have furnished conditions extremely favorable for the development and spread of epidemic diseases. Whatever the cause, it is certain that an epidemic of a peculiarly malignant character began in the low country north of the Caspian Sea early in the fall, and has since steadily spread northward and eastward in spite of the unfavorable season and the most energetic attempts to isolate the infected regions.

At first the disease was described as a malignant typhus fever, a disease which has prevailed very largely among Russian troops in Turkey. Later reports from Russian physicians give as the characteristics of the existing epidemic the well known symptoms of the true plague, but describe them as extremely rapid in their development; the victims generally dying within ten hours of the first attack, sometimes within four hours. Ninety per cent of those taken with the disease die, and naturally the wildest alarm prevails in the districts menaced. A large number of Cossacks who fled from one of the first infected villages were lately found frozen to death on the banks of the Volga. The dead lie unburied in the streets, and as soon as warmer weather returns the festering corpses must materially aggravate the pestilence.

Leibermeister describes the true oriental plague—whose excursions into Europe during former centuries proved so terribly fatal—as a fever of a most acute and violent type, accompanied by buboes or carbuncles, and often followed by a long train of disorders. Four stages of the disease are recognized: 1. The stage of invasion; 2, the stage of intense fever; 3, the stage of fully developed buboes; 4, the stage of convalescence.

The first stage begins suddenly, sometimes with fever. The general health is seriously disturbed. There is great bodily and mental weakness, headache, dizziness; face pale and flabby, features distorted, eyes languid, speech awkward, gait staggering; nausea, vomiting, and diarrhea occur. This stage lasts from a few hours to one or more days. The change from this to the second stage is marked by fever, usually beginning with a chill, and followed by extreme lassitude and fever, with its attendant consequences. Soon the patient passes into a well formed typhus condition, with delirium, passing on to stupor. The tongue becomes dry, cracked, hard; the tongue, teeth, lips, and nostrils, are covered with a dark mucus or with soot black crusts; cardiac weakness or paralysis follows. After two or three days buboes appear and the third stage begins. The fever diminishes, and a sticky, offensive perspiration covers the body. The pulse becomes fuller and less rapid, and the mind grows clearer. Buboes now appear on the groin, with carbuncles on the back of the neck and other parts of the body, and gangrene.

Convalescence begins between the sixth and tenth days, and is often protracted by continued suppuration of the buboes. Among the sequelæ of the disease are enumerated parotitis, furuncle, abscesses of the skin and muscles, pneumonia, protracted fever with continued typhus condition, dropsy, partial paralysis, mental disturbance, etc. Genuine relapses also take place. Death may occur during any stage of the disease, though generally between the third and fifth days. The mortality is greater than that of any other