

Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT

No. 261 BROADWAY, 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.

Remit by postal order. Address

MUNN & CO., 261 Broadway, corner of Warren street, 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, uniform in size with SCIENTIFIC AMERICAN. Terms of subscription for SUPPLEMENT, \$5.00 a year, postage paid, to subscribers. Single copies, 19 cents. Sold by all newsdealers 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., 261 Broadway, corner of Warren street, New York.

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.

The SCIENTIFIC AMERICAN Export Edition has a large guaranteed circulation in all commercial places throughout the world. Address MUNN & CO., 261 Broadway, corner of Warren street, New York.

NEW YORK, SATURDAY, MARCH 4, 1882.

Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as 'Agricultural inventions', 'Mechanical invention, value of', 'Explosive phenomena', etc., with corresponding page numbers.

TABLE OF CONTENTS OF

THE SCIENTIFIC AMERICAN SUPPLEMENT,

No. 322,

For the Week ending March 4, 1882.

Price 10 cents For sale by all newsdealers.

Detailed table of contents for the supplement, including sections like 'I. ENGINEERING AND MECHANICS', 'II. CHEMISTRY AND TECHNOLOGY', 'III. ARCHÆOLOGY, GEOLOGY, ETC.', etc.

FORTY YEARS IN THE PATENT OFFICE.

The last annual report of the Commissioner of Patents contains a comparative statement of the business of the office from 1837 to 1881 inclusive. Since 1840 the table shows the number of applications, the number of issues, the receipts, expenditures, and the surplus, where there has been any. Eight of these years (1837, '40, '41, '53, '54, '56, '57, '61) show a deficiency, the fees received being slightly less than the expenditures. Curiously the year 1855 shows a surplus of nearly \$37,000, though the two preceding and the two succeeding years were years of deficiency.

The fluctuations in the number of patents applied for and issued have been much less marked, though considerable variations are noticeable. The number issued in 1837 was 435. The number of applications reached a thousand in 1844, and five years later the issues for the first time reached and slightly exceeded 1,000. The year 1855 saw the number of issues raised to 2,000. During the next ten years the increase was tolerably steady, rising to 9,458 in 1866.

The ratio between the number of applications and the number of grants has shown considerable variations. During the earlier years the proportion of rejections was much greater than at present, amounting in 1847 to two-thirds of the total applications. This, in the opinion of the Commissioner, is largely attributable to the fact that the earlier inventors had fewer opportunities for discovering what had already been done in the same fields of invention.

The total number of patents issued up to 1843 was less than three thousand. Ten years were required to raise the number to ten thousand. In the next ten years they rose to over forty thousand, and to a hundred thousand early in 1871. Since then the increase has been very rapid, more being issued between 1871 and 1880 than in the preceding thirty years.

THE PROFITS OF SILK CULTURE.

The estimates of possible profit in silk production, made by a writer in the Louisville Courier Journal, and quoted in our issue of February 11, must be taken with a large discount. His estimate of 1,000 pounds of silk from 40,000 eggs can be accounted for only on the hypothesis that he has somewhere misread pounds for ounces.

The figures given by Professor Riley, in his report as United States Entomologist for 1878, are more trustworthy; and his conclusion from them is that "silk culture never was and never will be an exceedingly profitable business; but it adds vast wealth to nations engaged in it, for the simple reason that it can be pursued by the humblest and poorest, and requires so little outlay."

The special advantages which silk raising offers to our people arise from the fact that our women folk in rural districts have much unoccupied time which might be pleasantly and profitably devoted to the care of a few worms, though it would not pay to hire the work done at current rates of wages.

It takes about six weeks to handle a crop of worms, and the yield of four ounces of eggs will furnish employment for two persons. The average number of eggs in one ounce is 40,000. The average yield of one ounce of eggs, the worms being well cared for, is 100 pounds of fresh cocoons, which will weigh 23 pounds when choked. Four ounces of eggs will yield about 400 pounds of fresh cocoons, which lose two thirds of their weight in the process of killing with heat, or "choking."

There are many thousand families in the country who have ground for growing a few mulberry bushes and spare

time to devote to the care of a few thousand worms, to whom the addition of \$200, or half or quarter of that sum, to the annual income, would be an item worth considering. As the Scotch proverb has it, "Many mickles make a muckle." With proper organization for marketing the cocoons, the aggregate efforts of many thousand women and children otherwise unemployed might make the country independent of the rest of the world in the matter of silk production.

NEEDS OF THE PATENT OFFICE.

A considerable portion of the recent annual report of the Commissioner of Patents is properly devoted to a presentation of the urgent needs of the Patent Office for an increase in its working force and in the room provided for the transaction of its rapidly increasing business.

The receipts of the office during the past year were nearly \$100,000 larger than in any previous year, and the excess of receipts over expenditures (nearly a quarter of a million dollars) was correspondingly greater than ever before. The Commissioner says frankly, "At the present rate of increase in the number of applications for patents either the work must accumulate upon the examiners' desks, or the quality of the work done must be such as to bring discredit upon the thoroughness of official examinations."

The annual increase alone represents a number two-thirds as great as the entire number of patents applied for in 1861, when Congress appropriated money enough for the support of sixteen principal examiners, each with two assistants.

Now the office has twenty-six principal examiners, twenty-four of whom have three assistants each. Thus in twenty years the examining force has been just about doubled, while the number of applications has increased from 4,643 in 1861, to 26,059 in 1881, or nearly sixfold. Twenty years ago the examiners had to be familiar with 31,000 American patents; now the number of existing patents exceeds 250,000, and the examiners are expected to search them all, besides the largely increased number of foreign patents and scientific periodicals.

As the office was never designed to be a source of revenue to the government, justice to inventors requires that the fees charged for service shall be materially reduced, or else the surplus should be expended in making the work of the office more thorough and speedy. Public interest dictates rather the latter course. In view of these facts, the Commissioner's recommendation, that four additional examining divisions be created, each to consist of a principal examiner with three assistants, seems well within bounds.

Seeing that any mistake in the Patent Office is liable to be followed by costly litigation or worse, neither individual inventors nor the public at large can afford to have such mistakes occur; certainly not the inventors, who, during the past six years, have paid into the treasury, through the Patent Office, a million dollars more than the service of the office has cost the government.

John Cooke.

John Cooke, President of the Danforth Locomotive and Machine Works Company, at Paterson, N. J., died in that city, February 20, at the age of 57. Mr. Cooke's successful business life affords another illustration of the truth that natural capacity, zeal, and patient work can win success in spite of the most unfavorable conditions.

Joseph Earle Sheffield.

Joseph E. Sheffield, founder of the Sheffield Scientific School of Yale College, and a liberal benefactor of the college in other respects, died February 17. Mr. Sheffield was born at Southport, Conn., in 1793. His father and grandfather were extensive shipowners. At fifteen years of age he began his business life as clerk in a shipping office in Newbern, N. C.