Scientific American.

ESTABLISHED 1845

MUNN & CO., EDITORS AND PROPRIETORS.

PUBLISHED WEEKLY AT

No. 361 BROADWAY, - - NEW YORK.

TERMS FOR THE SCIENTIFIC AMERICAN. (Established 1845.)

One copy, one year, for the U.S., Canada or Mexico. One copy, six months, for the U. S., Canada or Mexico. One copy. one year. to any foreign country, postage prepaid, £016s. 5d. 4.00 Remit by postal or express money order, or by bank draft or check.

MUNN & CO., 361 Broadway, corner Franklin Street, New York.

The Scientific American Supplement (Established 1876)

is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly. Every number contains lifectavo pages, uniform in size with SCIENTIFIC AMERICAN. Terms of subscription for SUPPLEMENT, \$5.00 a year for the U.S. Canada or Mexico, \$6.00 a year, or £1 is, 8d., to foreign countries belonging to the Postal Union. Single copies lifectures, Sold by all newsdealers throughout the country. See prospectus, last page. Combined Kares.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for one year, to one address in U.S., Canada or Mexico, on receipt of seven dollars. To foreign countries, eight dollars and fifty cents a year, or £1 lis, lld., postage prepaid.

Building Edition of Scientific American. (Established 1885.)

THE BUILDING EDITION OF THE SCIENTIFIC AMERICAN is a large and splendidly illustrated periodical, issued monthly, containing floor plans and perspective views pertaining to modern architecture. Each number is illustrated with beautiful plates, showing desirable dwellings, public buildings and architectural work ingreat variety. To architects, builders, and all wao contemplate building this work is invaluable.

Single copies 25 cents. By mail, to any part of the United States, Canada or Mexico, \$2.30 a year. To foreign countries, \$3.00 a year, or £0.23.4d. Combined rate for BUILDING EDITION with SCIENTIFIC AMERICAN, to one address, \$5.00 a year. To foreign countries, \$5.00 a year, or £16.3d. Combined rate for BUILDING EDITION, SCIENTIFIC AMERICAN, and SUPPLEMENT, \$3.00 a year. To foreign countries, \$1.00 a year, or £26s. 2d., postage prepaid.

Export Edition of the Scientific American (Established 1878)

with which is incorporated "LA AMERICA CIENTIFICA E INDUSTRIAL." or Spanish edition of the SCIENTIFIC AMERICAN, published monthly, uniform in size and typography with the SCIENTIFIC AMERICAN. Every number contains about 100 pages, profusely illustrated. It is the times scientific industrial export paper published. It circulates throughout Cuba, the West Indies, Mexico, Central and South America, Spain and Spanish possessions—wherever the Spanish language is spoken. The SCIENTIFIC AMERICAN EXPORT EDITION has a large guaranteed circulation in all commercial places throughout the world. \$3.00 a year, of \$10 las. 4d., postpaid to any part of the world. \$10 las. 4d., postpaid to any part of the world. \$10 las. MUNN & CO., Publishers, 361 Broadway, New York.

The safest way to remit is by postal order, express money order, draft or bank check. Make all remittances payable to order of MUNN Readers are specially requested to notify the publishers in case of any failure, delay, or irregularity in receipt of papers.

NEW YORK, SATURDAY, JANUARY 29, 1898.

Contents.

(Illustrated articles are marked with an asterisk.)

(Illustrated articles are a	miles with an asterion,
Aconcagua. Mount, ascent of 76 Alabama, battleship* 65	Kentucky, battleship*
Aluminum, acid resisting 70	Letters, the safe sealing of 75
Archæological news	Linoleum, underlays for 70
Arc lamp, 9,000 candle power* 75	London fire, the late
Battleships, our new* 65	Metals, world's consumption of 74
Bazin, M., death of	Microscopical examination of
Benin, curios from*	growing plants 75
Blacking, waterproof 70;	Moodus noises, the 67
Bridge swing, a curious 76	Natural science gift to Yale 75
Britannic, record of 68	Naval use of homing pigeons* 75
Bulkheads, watertight	Notes and receipts
Butterworth, death of Mr.* 67	Patent Office, business of the 76
Cabinet, Worthington's prescrip-	Patent Office needs 68
tion* 68	Patents granted, weeekly record
Catacombs lighted by electricity 76	of
Chimney and pole problem, the 71	Patent swindlers arrested 74
Commissioner of Patents, ap-	Pigeons, homing, in naval ser-
pointment	vice*
Crickets, the chirping of 68	Plaster casts, making 70
Cruiser, raising a stranded	Science notes
Electric light beacon, a great* 75	Scientific American offices, Wash-
Electric locomotives for London, 70	ington*
Fish, burrowing	Seismoscope, an electric 75
Gasoline motor, a new* 68	Sesame oil
Hawaiian expedition, Prof. Lib-	Tibet, Landor's expedition to 74
bey's	Tire removing device, Robin-
Inventions recently patented 77	son's*68
Inventors, and Manufacturers'	Trade mark law, Bolivian 74
Association 67	Wood oil, Chinese &
•	

TABLE OF CONTENTS OF

Scientific American Supplement

No. 1152.

For the Week Ending January 29, 1898.

Price 10 cents. For sale by all newsdealers.	
Ī	AGE
I. BACTERIOLOGY.—Bacteriology in 1897 House Flies, Gnats and Mosquitoes as Destroyers of Pathogenetic Microbes.	18416 18419
II. BICYCLES.—The Pneumatic Tire	18408
III. BIOGRAPHY. — Theodor Mommsen, Octogenarian. — A biographical sketch by CHARLES DE KAY of the eminent historian, with a portrait. — Illustration.	18405
IV. BOTANY AND HORTICULTURE.—Castanopsis Chrysophylla. —1 illustration	18416
V. CHEMISTRY.—Chemistry in 1897.—An excellent review of the chemical progress in the year 1897, referring to researches on argon, liquefaction of fluorine, synthetic remedies, etc	18406
VI. ELECTRICITY.—A Review of American Electrical Progress During the Year 1857.—A resume of the interesting and important advances during 1897	
VII. FISHERIES.—The United States Fish Commission Salinome- ter.—Jillustrations	18417 18411
VIII. MARINE NAVIGATION.—Lambert's Gliding Boat.—An illus- trated description of a curious boat which propels itself by glid- ing over the waves.—2 illustrations	
1X. MARINE ENGINEERING.—Auxiliary Engines and Transmission of Power on Naval Vessels.—By GEORGE W. DICKIE—A valuable paper dealing in a masterly manner with the various methods of transmitting power to various parts of the vessel.—4 illustrations.	18409
X. MECHANICAL ENGINEERING.—A Large Boring Mill.—I illustration.	18409
XI. METALLURGYThe Use of Aluminum in the Brass Foundry.	18419
XII. MISCELLANEOUS: Engineering Notes. Electrical Notes. Selected Formulæ	18418
XIII. PHOTOGRAPHY. — Photographic Formulas. — Formulas for pyrogallic acid, hydroquinone and eikonogen developers	18407
XIV. TECHNOLOGYA Lack of Whalebone	18411
XV. TRAVEL AND EXPLORATION. — Story of the Yukon.— Getting into the Yukon.—An exhaustive article, occupying more than four pages of the SUPPLEMENT, written by WILLIAM OGIL- VIE. F.R.G.S., who is almost the best known authority on the subject.—The paper is filled with valuable memoranda of per- sonal experiences in the Yukon.—7 illustrations	18412

THE APPOINTMENT OF A COMMISSIONER OF PATENTS.

The vacancy created by the decease of the late Com missioner of Patents imposes upon the executive the duty of selecting a properly qualified successor to this important office. In the whole range of offices which are filled by government appointment there is none that calls for so many special qualifications as this, and the selection should be made primarily with regard to the administrative and professional ability of the candidate—the question of mere political services and the recommendations of political friends being made strictly subordinate.

The Patent Office has suffered too severely in the past from the incompetence of political appointees. Men have been placed in charge who, whatever may have been their political qualifications, were altogether unfitted to fill a position which calls for a thorough knowledge of the patent system and an unusual political office seekers possessed of a certain versatility which enables them to fill acceptably a wide variety of positions; but we do say that there are certain offices, the duties of which can, in the very nature of things, be filled only by specially qualified men.

may be by political motives, has failed to eradicate.

very first acts was to rid the patent practice of an previous administration of the affairs of the office. he conducted the affairs of the department with sole reference to its best interests.

It can safely be said that there is no department man will be chosen who, like him, is thoroughly conpossesses the necessary judicial qualities for this difficult and responsible position.

Judge A. P. Greeley has been the practical head of the department during the protracted illness of the late Commissioner, and his management has been characterized by excellent judgment and unusual administrative capacity. His appointment would be received lic works of doubtful utility, there would be little diffiwith great satisfaction not only by the department but culty in obtaining the needful funds. We believe that by the inventors and manufacturers of the country, to the committees at present include the following whom his name is already well and honorably known. 'names:

APPROPRIATIONS.

We have more than once had occasion to call the attention of the public to the fact that, unless more generous appropriations are made by Congress for Vt.; Stephen A. Northway, O.; William A. Stone, carrying on the business of the Patent Office, its work Pa.; Mahlon Pitney, N. J.; James A. Hemenway, is certain to fall hopelessly in arrears. The failure of Ind.; James J. Belden, N. Y.; Samuel S. Barney, Wis.; the Patent Office staff to keep pace with the business of the office is not due to any want of capacity or zeal on the part of its examiners and clerical force. It is Leonidas F. Livingston, Ga.; Thomas C. McRae, Ark.; safe to say that there is no department whose staff is worked so hard-so completely overworked-as this, and that the business of the office is falling behind is to be attributed solely to the fact that the force employed is altogether inadequate.

This fact has long been recognized by the Patent Commissioner, and urgent requests have been made from time to time for increased appropriations to enable the necessary increase in the force to be made. In the report of the late lamented Commissioner of Patents for the year ending June 30, 1897, the subject injustice is being done to one of the best administered

is referred to as follows: "I desire to call especial attention to the steady increase in the business of this office, and to say that, if the work is not to fall hopelessly in arrears, an increase of force must be provided during the ensuing fiscal year." One would naturally suppose that such urgent representations as these would meet with ready response from Congress; yet, as a matter of fact, the appropriations have been as steadily refused as they have been persistently requested.

Now the gross injustice of the course pursued by Congress will be evident when it is borne in mind that the money which the Patent Office requests is its own money, paid by inventors in the shape of patent fees, and set apart in a fund known as the Patent Office fund, whose object is to meet the current expenses of the office.

For many years past there has been an excess of receipts over expenditures in the business of the office, amount of judicial and administrative ability for the and the fund, which is now being augmented at the conduct of its affairs. We do not deny that there are rate of over \$300,000 a year, has already reached a total of over \$5,000,000.

The business of the Patent Office is carried on by means of annual appropriations from the Patent Office fund. The Commissioner of Patents has no authority whatever over a single dollar of the receipts of his Among these, and perhaps chief among them, is that office. He turns every cent over to the Treasurer of Commissioner of Patents; and that its duties can of the United States and he is dependent entirely upon only be properly performed by a professional man, one the annual appropriations of Congress for means to who has had a thorough acquaintance with patent | carry on the business of his department. For many practice, is proved by the record of the various gentle- years there has been a steady increase in the business men who have filled the position in the past. When a of the Patent Office without any commensurate innovice has been placed in charge, the results have crease in the staff or the annual appropriations. In been far from satisfactory. The attempted improve- 1886 the office received 35,968 applications; in 1896 ments and so-called reforms in the laws and working of there were 43,982. Up to 1870 the total number of pathe office have been fruitless or positively harmful, and tents issued by foreign countries was 358,000, whereas have had to be reversed or repealed by a later com- between 1871 and 1896, 1,282,000 patents were issued in missioner. Abuses have crept into the system of patent these countries. The increase in the transactions of practice, which the political appointee, controlled it the office has called for enlarged accommodations and an increased working staff, and the surplus which When the new commissioner enters upon the duties of this bureau has been accumulating would at any time his office, he should do so feeling that he is absolutely have been more than enough to meet the emergency. free from all external controlling influences of a polit- Yet, for some unaccountable reason, Congress, though ical nature. He should realize that he is given the lavish - over lavish - in its appropriations for other office because he understands its duties, and is justified purposes, has pursued an extremely parsimonious polby his past training and experience to perform them icy with regard to the Patent Office. This refusal is intelligently. It was this fitness coupled with his un- the more unjust because, as we have pointed out. this doubted integrity and independence that rendered the Department is merely asking that the surplus of its own appointment of the late commissioner so acceptable, earnings may be appropriated to its own needful exand his administration so successful. One of his penses. The recommendations of the Commissioner for appropriations are passed on by the Patent Comabuse which had grown to extraordinary dimensions mittees in the Senate and the House, who almost invabecause of the laxity which in this respect marked the riably approve them. They then come before the Appropriation Committee, who failing to see the broad A patent lawyer himself of long experience, he un-distinction between this appropriation and appropriaderstood thoroughly the working of the system, and tions say for rivers and harbors, have almost invariably cut them down to a figure much below the growing necessities of the office.

Undoubtedly one great cause of the neglect of the inwhich, as a rule, has been purer, more free from politi- | terests of the Patent Office is the total misunderstandcal intrigue, than this; and it is earnestly to be hoped ing of the real nature of the annual requests of the that, in selecting a successor to Mr. Butterworth, a Commissioner for money. They are not requests for "appropriations" in the common sense of the term. versant with the workings of the patent system and The money asked for does not come out of Uncle Sam's pocket in the way that river and harbor or pension appropriations do. The Commissioner merely requests It has never been the practice of the SCIENTIFIC that a sufficient amount of the earnings of the Patent AMERICAN to advocate the claims of particular indi- Office may be placed at his disposal to enable him to viduals in matters of this kind; but in the present case transact its business to the best advantage. Whether we feel compelled to state that our past experience of the amount allowed by the Appropriation Committee be the acting incumbent of the office convinces us that large or small, it will not make the nation's purse lightno better man could possibly be selected for the posi- er or heavier—it will merely be a question of the Patent Office fund lying idle or being applied to its legitimate

> If the Appropriation Committee would only judge this matter on its own merits, and not confound it with the extravagant appropriations asked for various pub-

Senate Appropriation Committee.—William B. Allison, Ia.; Shelby M. Cullom, Ill.; William J. Sewell,

House Appropriation Committee. —Joseph G. Cannon, Ill.; Henry H. Bingham, Pa.; William W. Grout, William H. Moody, Mass.; Samuel J. Pugh, Ky.; Joseph D. Sayers, Tex.; Alexander M. Dockery, Mo.; John M. Allen, Miss.; John C. Bell, Col.

There is no question that the immediate remedy lies with these gentlemen, for it is in the committee that the appropriations have almost invariably suffered their first reduction. We think that the surest way to secure a proper recognition of the rights of inventors would be for the people to bring all possible pressure to bear upon their representatives, both by personal interviews and by written communications.

The cause is a worthy one. An altogether inexcusable

and most successful of our institutions. If ever a requested appropriation—if appropriation it can be called -was reasonable and proper, it is this. To refuse it is to deny to the inventors in this country what is justly their own, and deny them the services for which they have paid.

In recommending this matter to the active interest of inventors throughout the whole country, we would remind them that the vexatious delays which they experience in securing their patents are due entirely to the action of Congress in curtailing the appropriations for the Patent Office. Moreover, there is every indication that matters will steadily grow worse if Congress persists in its present policy. We are informed through private sources that it will take the present force of examiners fully three months to examine the cases which came in during the month of December alone. In short, the work is accumulating at a rapid rate and no relief is in sight, as we understand that the Appropriation Committee have already expressed their disinclination to admit any increase of appropriation during the coming year. The matter of agitation for relief rests now largely with the inventors and manufacturers of the country, and if they bestir themselves and write urgent letters to their representatives and to the members of the Committee on Appropriations whose names are given above we believe that the necessary relief may yet be secured.

DEATH OF MR. BUTTERWORTH.

Commissioner of Patents, who has been ill for several weeks at Thomasville, Ga., died on Sunday, January 16, at that place. The end was peaceful and whenit came his wife and children were at his bedside. Mr. Butterworth went to Thomasville to recuperate from an attack of pneumonia. He was convalescing when a relapse took place which resulted in his death.

Mr. Butterworth was a descendant of a long line of Quakers. He was born in Warren County, Ohio, 1839, and lived on a farm with his parents until he was eighteen years old, and enjoyed scant educational advantages. In his nineteenth year he went to Cincinnati to fit himself for a professional life. He was admitted to the bar in 1861 and commenced the practice of law in Cincinnati. He enlisted in the Union army in the civil, war and rendered gallant service, retiring with the rank of major. He resumed the practice of law in Cincinnati and the first public position which he held was that of United States District Attorney in 1871. He was a member of the Ohio Senate in 1873-74 and was first elected to Congress in 1878. After the retirement of E. M. Marble as Commissioner of Patents in 1883, Mr. Butterworth was appointed in his stead. He served in that capacity until he resigned to become a member of the Forty-ninth Congress. He was afterward elected to the Fiftieth and Fifty-first Congresses and declined the nomination for the Fifty-second Congress. After his retirement from Congress he settled in Washington and soon built up a large practice, chiefly in patent law. He was appointed Commissioner of Patents by President McKinley, April 1,

While in Congress Mr. Butterworth was admittedly one of the readiest and ablest debaters on the floor of the House, and was always the champion of good gov-

ernment and pure politics. He was president of the the important reports received was the one from the a clap of thunder, followed for a couple of hours commission sent by the United States government to legislative committee, read by Mr. Arthur Stewart, Europe to induce foreign countries to take part in the Chicago World's Fair. During his first tenure of office as a Commissioner of Patents, Mr. Butterworth com- created in the Patent Office. The object of such a the wind in a tempest. The ground was so shaken as piled a most comprehensive work on the "Growth of division was to have the patents so classified and ar- to cause houses to tremble and crockery to rattle as the Industrial Arts." The work gives the history of two ranged that the work of examination to determine the though an earthquake were in progress. hundred of the arts, from the rude beginnings up to the most complicated examples of modern inventors'

When Mr. Butterworth entered upon his duties as the Commissioner of Patents for the second time, he soon showed that his administration would be liberal minded toward inventors and that those who had been practicing before the Patent Office in an illegitimate manner need expect no mercy from him. He found many abuses to cure, and in his efforts to correct some of them he encountered strong obstacles and made some enemies; but he persisted, and during the last few months of his incumbency he did much to earn the gratitude and respect of the inventors.

The Secretary of the Interior, in speaking of the death of Commissioner Butterworth, said:

"The death of Commissioner Butterworth is a great loss, not only from a personal aspect, but to the country at large. Everybody loved Butterworth who knew him, and the Interior Department suffers in his loss. Every mark of respect will be paid his memory.

The Patent Office will be closed the day of the Patent Office, the only department of the government funeral."

Postmaster-General Gary said: "The death of Major Butterworth will be deplored by the whole country. His was one of the most lovable of natures. He was a kind friend, a loving parent and a thoroughly conscientious man. His face will be missed by the legions of those fortunate enough to have known him, and his place in the party to which he was devoted cannot be filled."

The employés of the Patent Office assembled in the room of the Commissioner on the afternoon of January 17 to participate in a meeting called in honor of the memory of their dead chief. Acting Commissioner Greeley paid an eloquent tribute to Major Butterworth. A committee was appointed to draft suitable resolutions. President McKinley was deeply pained by the death of his old friend, and at the Capitol there was a universal expression of grief.

The funeral services were held in Washington on January 19 and were attended by President McKinley, Vice-President Hobart, Speaker Reed and members of the cabinet, and most of the prominent officials of the different government departments.

AMERICAN ASSOCIATION OF INVENTORS AND MANUFACTURERS.

The regular annual meeting of this association was held at the Shoreham Hotel, Washington, D. C., on Museum and their careful preservation as relics of the January 18. The president, Francis H. Richards, of unprecedented progress of science and the useful arts The Hon. Benjamin Butterworth, United States | Hartford, Conn., called the meeting to order. Among | during the past half century. The Secretary of the

THE LATE HON. BENJAMIN BUTTERWORTH.

which was in effect that the association should concentrate its efforts to have a classification division that of heavy muffled thunder, and a roar not unlike previous state of the art would be facilitated. Suitable resolutions were passed commemorating the death of the advent of the whites among them, called the region Commissioner Butterworth and Mr. Gardiner G. Hubbard, the latter being one of the organizers of the association.

The following amendments to the constitution and by-laws were adopted:

The object of this association is to maintain, foster and protect the patent system of the United States, to increase the efficiency of its operation and the stability of patent property.

To accomplish these results the association aims to strengthen public opinion favorable to the patent system, by demonstrating the enormous advantages which have been derived by the people of the United States therefrom, in the increase of manufactures and material wealth which has resulted from new machines and methods produced under the stimulus of the legal protection afforded to inventors by the patent system of the United States.

To procure from Congress legislation authorizing the

which pays all of its expenses out of its income, to spend so much of that income as may be necessary for the scientific, thorough and efficient examination of applications for patents, to the end that patents may be granted only for inventions undoubtedly new; and

To strengthen the legal remedies for the protection of such patents as may be issued after a thorough ex-

The association proceeded to ballot for the officers for the ensuing year, with the following results:

President, Francis H. Richards, Hartford, Conn.; first vice president, J. C. Anderson, Chicago, Ill.; second vice president, L. W. Serrell, New York City; third vice president, Philip T. Dodge. New York City; fourth vice president, Theodore N. Ely, Philadelphia; secretary and treasurer, Arthur Stewart, Baltimore; members of the executive council, C. E. Billings, Hartford, Conn.; Dr. R. J. Gatling, New York; Robert S. Taylor, Fort Wayne, Ind.; Albert A. Pope, Boston, Mass.: Daniel Frazer, Washington, D. C.; Marvin C. Stone, Washington, D. C.; Lewis Miller, Akron, Ohio; G. H. Schulte, Milwaukee, Wis.; Jas. T. Du Bois, Washington, D. C.

Committees on Legislation and Ways and Means were appointed.

A resolution was passed recommending the removal of the models in the Patent Office to the National

> Interior and the Secretary of the Smithsonian Institution are to be urged to favor this step.

THE MOODUS NOISES.

It is stated that the disturbances of the lower Connecticut Valley, which produce what from early colonial times have been called the "Moodus Noises," have begun again, after a period of rest of twelve years.

For twenty years, up to 1729, the villagers of the town of East Haddam heard these noises almost continuously. The Rev. Mr. Hosmer, in a letter written August 13, 1729, says, in speaking of the phenomenon: "Whether it be fire or air distressed in the subterraneous caverns of the earth cannot be known; for there is no eruption, no explosion perceptible, but by sounds and tremors, which are sometimes very fearful and dreadful. I have myself heard eight or ten sounds successively, and imitating small arms, in the space of five minutes. I have, I suppose, heard several hundreds of them within twenty years; some more, some less terrible. Sometimes we have heard them almost every day, and great numbers of them in the space of a year. Oftentimes I have observed them coming down from the north, imitating slow thunder, until the sound came near or right under, and then there seemed to be a breaking like the noise of a cannon shot or severe thunder, which shakes the houses and all that is in them."

The center from which the noises proceed seems to be Mount Tom, situated at the junction of Moodus and Salmon Rivers. The severest shocks have been felt as far northeast as Boston and as far southwest as New York, and have there been noticed as earthquakes. In 1816 and 1817 these noises were more than usually loud. On the recent recurrence there was a sound resembling

by a roar like the echoes of a distant cataract. A day later there was heard a crashing sound like

The Indians, familiar with these noises long before now embraced in the town of East Haddam, and particularly that situated in the vicinity of Mount Tom, Matchemâdoset, or "at the place of bad noises." This name, corrupted and contracted to Machamoodus, and finally to Moodus, gives name to a branch of Salmon River and to a manufacturing village. The region where these subterranean disturbances have occurred from time immemorial is one of deformed crystalline

SIR JOHN LUBBOCK has gone to the ant again, and if he keeps up his visits and others imitate him, that interesting insect will become useless for Sunday school purposes. Sir John succeeded in getting fifty ants helplessly drunk and then placed them outside an ant hill. The sober ants came out, picked up their friends, and put them to bed to sleep off the effects of Sir John's liquor; the strangers, however, they sternly rolled over into the ditch.