## Sxicutific Ammitam.

HSTABLISHED 1845.
MUNN \& CO., Editors and Proprietors. published weekly at
No. 361 BROADWAY, NEW YORK.
o. D. MUNN.
A. е. веAch.

TERMS FOR THE SCIENTIEIC AMEIRICAN. Une copy, one year. for the U. S. or Canada.
Cne copp, sxx moonth, for the U. S . or Cauada
One cont, one year, 8300
400
400
 SCIENTIFIC AMERICAN, for ais
Colonial bank notes. Address

The Scientific American Supplement


 seven dollarg.
rexistesterest tay to remit is by draft, postal order, express money order, or
 rent Colonial bank notes.

Scientific American Export Edition.

Sind.

NEW YORK, SATURDAY, SEPTEMBER 24, 1887.

| Contents. |  |
| :---: | :---: |
| (Illustrated articles are marked with an asterisk.) |  |
| Adulterations, bakery, poisonous 200 \| Araphite carbon. ................ Alumina hleaching compounds... 192 Alvan Clark establishment, ${ }^{*}$., 191, 198 convenient. <br> nventions, agricuitural …....... ${ }_{202}^{194}$ |  |
|  |  |
|  |  |
| Arc lights, odor of. $\ldots \ldots \ldots \ldots \ldots .$.Arrow root,preparation of |  |
|  |  |
|  |  |
|  |  |
| Baracic cuid for bides ............ ${ }^{201}$ |  |
|  |  |
| Centrifugal extractors, s.eedo. of. 1979 |  |
|  |  |
|  |  |
| Congress, International Medical, 192 |  |
|  |  |
| Copper and nickel, coioring..... ${ }^{201}$ |  |
| Croton water, New york.......... ${ }_{103}^{193}$ |  |
|  |  |
|  |  |
| Fire, a. how to act at $\qquad$ 193 |  |
|  |  |
|  |  |
| as, natural, possible conse- | Well, boiling, new. |

TABLE OF CONTENTS OF
SCIENTIFIC AMERICAN SUPPLEMENT
No. 612
For the Week Ending September 24, 1887 . Price 10 cents. For sale by all neẅsdealers
Blograpthy.-Spencer Hullerton Baird.-Sketch of the life and $\begin{aligned} & \text { PAG } \\ & \text { labors of the eminent naturalist lately deceased... .............. } 980\end{aligned}$


I. ENGINGERING.-Hydraulic Governor Brake-An apparatus for

 INSTRUMENTS OF PRECISION. -Temperature Indicator for
Machines. An appras for ringing an alarm upon undue het.
ink of shaft bearings and similar parts of machinery. -1 illustra-



- MEDICINE AND PATHOLOOY.-Dr. Corning's System of Ad-
 Loeb's Respirator.-Au appliance of preventive surgery or obili- $\mathbf{9 r}$

1. META LLLURGY.-Progress of Metallurgy in 1886.-Summary of
the most interesting and important development of the year;
uees and cheapened production of magnesium; the basic steel pro-
cess.etc ......................................................




 x. TECHNOLOGP-Centrifuapl Extractors.- By Roner
son. The mathematics and mechanics of the subject treated at

## THE RETURN OF OLBERS' COMET OF 1815

Prof. Brooks announced the discovery of a comet on Aug. 25. It took its place on the cometic annals of the year as "Comet $f 1887$ (Brooks)," and the discoverer was serenely unconscious that he had found a celestial pearl of great price. Other astronomers observed the new comer, and its elements and ephemeris were computed.
Olbers' comet of 1815 was expected about this time, on its first recorded return after an absence of over seventy years. A surprising resemblance was found to exist in the orbits of the two comets. Indeed, so close is the identity that there is scarcely a doubt that the comets are one and the same. Therefore, those who are fortu nate enough to see the comet will behold the identical visitor that looked down upon our planet in 1815.
Olbers, a German astronomer, discovered the comet at Bremen, and Bessel, another German astronomer calculated its elements. He assigned its next perihelion passage to February 9, 1887, and, wonderful to relate, the comet is but six months behind time.
Thus cometic astronomy has its triumphs. Pons' comet of 1812 , also discovered by Prof. Brooks, looked down from the celestial. depths after an absence of a little more than seventy years. Olbers' comet of 1815 now returns to shine in our sky after an absence of seventy-two years, and the dwellers on this planet in the year 1910 will doubtless behold Halley's superb comet spreading its gossamer train over their heads, on its third recorded return, after an absence of seventy-

The latest comer among the comets is an ordinary specimen of the family, has a stellar nucleus and a faint tail, but will grow brighter until it reaches perihelion, on October 6. It will be seen, by consulting Prof. Brooks' chart, published last week in the Scientific American, that it is nearly north of Denebola on September 26. We wish it were larger and more favorably situated for observation; but we are none the less grateful that, in however humble form, Olbers' comet has made its first recordef return on August 25, 1887.

The Ninth International Medical Congress.
The Ninth International Medical Congress opened its sessions in Albough's Opera House, Washington, on Monday, Sept. 5. The attendance at the convention was extremely large, upward of 3,500 medical men being present. The surgeons and medical authorities of the Continent and of England were present in numbers. At 11 A. M. Dr. Henry M. Smith, of Philadelphia, chairman of the executive committee, called the meeting to order, and in accordance with his announcement it was opened formally by President Grover Cleveland amid great applause. Dr. Nathan Smith Davis, of Chicago, was nominated president of the congress. On the stage various notabilities were present, including Secretary Bayard, Surgeon-General Hamilton of U. S. Marine Hospital, and Deputy Surgeon-General Marston of the British service, among others. After the full list of officers, including a long array of vice-presidents, had been selected, Secretary Bayard addressed the meeting in a long address alluding to the vocation of science in the republic. It was very well received. Drs. Lloyd, of the British navy, Leon de Forges for France, Unna for Germany, Mariano Scenola for Italy, delivered short addresses on behalf of the coutingents from their respective countries. Dr. Davis then delivered his presidential address.
The following day's proceedings comprised both bus iness and pleasure. Many receptions and excursions were provided for. For the heading of papers the convention was divided into sections, so that compara tively small audiences heard many of the most impor tant ones. Among the essayists may be named: Dr. Austin Flint, on "Fever, its Causes, Mechanism, and Rational Treatment;" Dr. Nicholas Senn, of Mil waukee, on "Intestinal Surgery ;" Dr. John Homans of Boston on "Laparatomy," based on 384 cases within of Boston on Laparatomy," based on 384 cases within
the writer's own knowledge. This operation, in volving opening the intestines for the removal of obstructions, has been several times perforined successfully by Dr . William T. Bull, of this city. Before his work only one successful case was chronicled, performed by Kocher, of Berlin.

Dr. Cyrus Edson, of the Board of Health of this city read a valuable paper on the "Milk Supply of Cities." The dissemination of scarlet fever, diphtheria, and typhoid fever by milk, already described by us, and the subject:of the ptomaine " tyrotoxicon" in milk were treated of. Dr. Whitmarsh, of London, read a paper opposing the Pasteur
his well-known views.
The committee appointed to arrange for the nex place of meeting reported in favor of Berlin, Germany. The date, as far as the year is concerned, is 1890 . The The date, as far as the yea
day has not yet been flxed.
The proceedings terminated with a banquet on Thursday, September 8, though excursionis and trips to Niagara and elsewhere prolonged the attendance of many of the foreign members.
Taken altogether, as regards the number present and the high rank of many of them in the profession, the quantity of papers read and their importance, and in
view of the many courtesies and attentions showered upon them by the society of Washington, the meeting may be pronounced one of the events of the year.

The Preparation of Arrowroot in Bermuda.
According to the last report of the United States Commissioner of Agriculture, it appears that of late years a considerable impetus has been given to the cultivation and preparation of arrowroot in Bermuda and large quantities are annually exported from the island. In cultivation, the method adopted is very similar to that practiced in the culture of the com mon potato. The ground is first well manured and plowed deep; it is then harrowed and laid out in drills about six inches in depth and three feet apart In thesedrills the roots are set about eight inches apart covered with the plow, and the surface smoothed by harrowing. The plants require at least a year to ma ture, and economical planters set the drills somewhat wider apart, and introduce an intermediate row of the potato, the crop of which is ready for remova before it can injure the arrowroot crop. Indian corn s occasionally planted in these rows, which is cut for forage when green, as, if it is allowed to mature, the main crop would be impaired by it. The mode of pre paring the fecula from the roots greatly influences its value, and the superiority of the Bermuda arrow root is attributed to the extreme care and cleanliness xercised in the different processes of manufacture. The roots, after being collected, are washed, and thei outer skin completely removed. This operation has to be performed with great nicety, as the cuticle contains a resinous matter which imparts color and a disagree able flavor to the starch which no subsequent treat ment can remove. After this process, the roots are again carefully washed, and then crushed between powerful rollers, which reduce the whole mass to pulp. This is thrown into large perforated cylinders, where it is beaten by revolving wooden paddles, while a stream of pure water carries off the fecula from the fibers and parenchyma of the pulp, and discharges it in the form of milk, through the perforated bottom of the cylinder, from whence it is conveyed in pipes and passed through fine muslin strainers into large reservoirs, where it is allowed to settle, and the water is drawn off. After being repeatedly washed, it is allowed to settle for some time, when the surface is skimmed with palette knives of German silver, in order to re move any slightly discolored particles which may ap pear on the top, and retaining only the lower, purer and denser portion for drying for market. The roller and cylinders are made of brass and copper, in order to preserve the purity of the material. The drying process is conducted also with great care and cleanli ness. The substance is spread in flat copper pans, and immediately covered with white gauze to exclude dust and insects. These pans are placed on rollers, and run under glass-covered sheds when there is any dange from rain or dews. When thoroughly dry, it is packed with German silver shovels into new barrels, thes being first lined with paper, which is gummed with arrowroot paste.

The Volunteer Chosen as Defender of the America's Cup
After several unsuccessful attempts, a decisive trial race came off between the Mayflower and Volunteer, at New York, on September 16. The latter won by 16 minutes $2 \frac{3}{6}$ seconds over a $41 \frac{1}{3}$ mile course. The breeze was a strong one, and the Volunteer gained over 12 minutes of her lead in going ten miles to windward. The race was watched by the Thistle, which went over the course with the yachts. The final international contests are set for September 27, 29, and, if necessary, October 1, 1887. The Volunteer is beyond cavil our best boat, and it is to be hoped that she will win. If defeated, it will be a difficult task to get the cup back to America.

Alumina Bleaching Compounds.
Hypochlorite of alumina has long since been employed in bleaching, under the name of "Wilson's bleaching liquid," and has been preferred on the grounds that "it accelerates the bleaching process and deteriorates the fibers of the tissue much less than the chloride of lime." Up to the present, the usual method of manufacture has been by double decomposition of alumina sulphate and chloride of lime. "Experiments have proved that similar but still more energetic bleaching compounds of alumina are produced by the direct action of chlorine on aluminates, and especially on aluminates of sodium or calcium and of magnesium, whereby the use of chloride of lime is entirely obviated. These bleaching alumina compounds may be prepared either in the form of a solution or in a solid form." Chlorine is passed through a solution of the aluminate or over the solid substance till no more is absorbed. The inventor claims that the alumina compounds prepared in the manner he describes act as very rapid bleachers "in consequence of the delivery of ozonized oxygen." "The use of acid baths is also dispensed with; also these alumina compounds deteriorate the fibers much less than chloride of lime."-R. Weiss, Oranienburg, Russia.

