

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.....\$3.00
One copy, six months, for the U. S., Canada or Mexico..... 1.50
One copy, one year, to any foreign country, postage prepaid, £0 16s. 5d. 4.00

The Scientific American Supplement

(Established 1876)

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, for the U. S., Canada or Mexico. \$6.00 a year, or £1 4s. 8d., to foreign countries belonging to the Postal Union. Single copies 10 cents.

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 in great variety.

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 finest scientific industrial export paper published.

The safest way to remit is by postal order, express money order, draft or bank check. Make all remittances payable to order of MUNN & CO.

NEW YORK, SATURDAY, SEPTEMBER 11, 1897.

Contents.

(Illustrated articles are marked with an asterisk.)

Animal and plant growth..... 162
Antiquity of man in America..... 162
Archaeological news..... 170
"Arch Rock," San Francisco Bay..... 171
Beer pipe cleaner, Gaynor's..... 164
Boiler tube corrosion..... 168
Books, new..... 173
Bottle, non-refillable, Springfield's..... 164
Brain, the, affected by worry..... 168
British Association meeting—II..... 162
Diving bell, a great..... 169
Dynamo, how to build..... 161
Electrical work for amateurs..... 161
Electricity, what is it?..... 163
Electric meters..... 162
Eye sanitation..... 170
Fire, the Paris..... 164
Fog, the dangers of..... 169
Geology of the Yukon region..... 171
Harp, strings for (724)..... 172
Honey and bee keeping..... 167
Inventions recently patented..... 172
Lawn sprinkler, White's..... 164
Magnetism, variation of earth..... 163
Mail bag catching and delivering..... 168
Mask, a Carthaginian..... 168
Miner's concentrator, Moore's..... 164
Panama Canal condition..... 164
Patent competitions, disreputable..... 170
Patents granted, weekly record..... 173
Phillippium, a new element..... 169
Photographic light of fireflies..... 163
Physicians, a congress of..... 163
Polar expedition, the Jackson..... 167
Railway mail catcher and deliverer, Winsor's..... 168
Railway, new, in China..... 163
Science notes..... 170
Scientific truth in art..... 162
Screw propeller, repairing..... 162
Subway, the Boston..... 163
Vital processes in animals and plants..... 162
Vistaecope, Eddy's..... 167
Weeds, the most troublesome..... 172
Yukon region, geology of the..... 171

TABLE OF CONTENTS OF Scientific American Supplement

No. 1132.

For the Week Ending September 11, 1897.

Price 10 cents. For sale by all newsdealers.

I. ARCHÆOLOGY.—Address by Sir JOHN EVANS.—A continuation of the address of the great anthropologist..... 18092
The Story of the Philadelphia Expedition.—Explorations of the University of Pennsylvania in Babylonia.—A review of "Nippur; or, Explorations and Adventures on the Euphrates"..... 18091
II. BIOGRAPHY.—Edward Drinker Cope, Naturalist.—The conclusion of this interesting biographical sketch..... 18092
III. BOTANY AND HORTICULTURE.—Aristolochia Goldiana.—1 illustration..... 18091
IV. ELECTRICITY.—Electric Traction in Paris.—A description of a new method of electric traction in Paris, working by accumulators.—3 illustrations..... 18094
Some Electrical Sport.—JAMES W. HOBART.—Description of the method of making an electric flash light.—1 illustration..... 18094
V. GEOLOGY.—The British Association.—Address in Geology.—An address by Prof. G. M. DAWSON..... 18089
VI. MATHEMATICS.—British Association.—Address in Mathematics and Physics.—An address by Prof. A. R. FORSYTH..... 18099
VII. MECHANICAL ENGINEERING.—Machine Moulded Wheels.—3 illustrations..... 18099
VIII.—MEDICINE.—Dr. Mount Bleyer's Treatment for Consumption by Electricity.—On the application of the principles underlying these experiments in the sterilization of lung tissue in tuberculosis.—The primary action of the galvanic current.—It increases the amount of ozone in the blood, as shown by chemical test of the blood in the arteries.—With his theory of animal electricity..... 18100
The Influence of Light on the Skin..... 18101
Electric Light in Rheumatism..... 18102
IX. METEOROLOGY.—The Mount Etna Observatory.—A description of the observatory erected on the largest volcano in Europe.—5 illustrations..... 18090
X. MISCELLANEOUS.—Lighthouse Progress, 1887-1897.—A review of the progress in lighthouse affairs for the last ten years..... 18085
Engineering Notes..... 18097
Electrical Notes..... 18097
Selected Formulae..... 18097
XI. NATURAL HISTORY.—The Turanian or Aral Tiger in the Zoological Gardens at Berlin, Germany.—1 illustration..... 18089
XII. PHYSICS.—British Association.—Addresses in mathematics and physics.—An address by Prof. A. R. FORSYTH..... 18099
XIII. TECHNOLOGY.—Cuinat's Acetylene Gas Generator.—3 illustrations..... 18100
XIV. TRAVEL AND EXPLORATION.—The Klondike Gold Fields.—By H. E. CARROLL.—A most interesting account of the newly discovered Eldorado, with views of a departing steamer, a map of Alaska, and a view of the Chilkoot Pass.—3 illustrations..... 18087
Hagenbeck's Panorama of a Northern Sea.—1 illustration..... 18098

THE ANTIQUITY OF MAN IN AMERICA.

Sir John Evans, the new president of the British Association, has attacked our paleolithic pretensions. For years it has been thought that the State of New Jersey was at one time inhabited by men who were the contemporaries of the post-glacial men of Europe. Sir John Evans, the highest living authority on the antiquity of man, tells us the chipped stone implements found in the Trenton gravels are not paleolithic at all, but were probably made by the red Indians.

Chipped flint weapons, which showed no signs of grinding and polishing, totally unlike those found at the surface, have been discovered at the bottom of thick beds of gravel in the valley of the Somme, at Amiens and Abbeville. From the nature of the evidence these implements showed the handiwork of man who existed after the glacial period. On the floor of caves chipped stone weapons were found which had been overlaid by a thick layer of stalagmite, which forms with extreme slowness.

If the American relics could be shown to have been the work of people existing shortly after the glacial period, it is plain from their superior workmanship that the paleontological man in America must have possessed greater intelligence than the man of the Somme Valley. What militates against this view of the paleolithic man in America is that implements of a similar type to those of the Trenton drift have been found in some of the disused quarries in which the red Indians fabricated their weapons.

Our own men of science have long believed that they saw in these stone implements the work of men who inhabited this continent just after the glacial period. If, after a critical examination of the whole question, it is decided that the weapons are paleolithic and not neolithic, we can only conclude that the development of intelligence was more rapid on the western shores of the Atlantic than on the eastern, and there is little fear that our native paleoliths will lack defenders.

REPAIRING THE SCREW PROPELLER OF A TRANSATLANTIC STEAMER.

The chief engineer, A. Witte, of the North German Lloyd steamer Barbarossa succeeded recently in removing the remnants of a lost screw blade and affixing a new blade without taking the steamer from its dock, and placing it in a dry dock, as is usually done when making such repairs. In order to bring the propeller out of the water for making the repairs, the compartments in the bow of the steamer were allowed to fill with water so that the steamer assumed an inclined position, with the bow twenty-four feet down in the water and the stern but twelve feet.

SCIENTIFIC TRUTH IN ART.

The painter and the poet are hardly considered as good guides in scientific matters. Cosmogony or natural history constructed on their lines would probably be fearful and wonderful. So-called "poetical license," which means in plain English that the poet or the painter has a dispensation to take amazing liberties with events or natural laws, is condoned in the men who deal in imagination rather than facts. Occasionally a poet or a painter by the exercise of intuitive genius has set forth a great fact in advance of its scientific ascertainment, thus playing the part of a seer as well as a chronicler.

know how Turner mastered the electric flash, which is the most bewildering and most evanescent of all things, and where scientific investigators who apparently had a stronger motive for ascertaining the exact truth, fail, he succeeded, though he might be supposed to have been moved chiefly by his plastic sense with no reference to scientific accuracy.

THE BRITISH ASSOCIATION MEETING.—II.

In addition to the mention in last week's issue of the SCIENTIFIC AMERICAN of papers presented at the recent meeting of the British Association at Toronto, we subjoin a brief synopsis of what was said by some other eminent scientists at the meeting. Prof. A. W. Walker, lecturer in St. Mary's Hospital, London, presented some curious records, obtained photographically, showing the

EFFECT OF VARIOUS DRUGS ON THE NERVES.

He had two sets of electric wires connected with the nerve of an animal that was the subject of his experiment. One set was so attached as to impart a shock to the nerve whenever the circuit was closed. The other was connected in such a way as to register any sympathetic electric current produced in the nerve itself at a short distance from the point of excitation. The two were entirely distinct currents. A delicate galvanometer was controlled by the second one. A tiny beam of light was reflected by the galvanometer on a photographic plate, which was shoved along a short distance by clockwork every minute. When the professor excited the nerve by closing the first circuit, the galvanometer would swing just so far and make its record automatically. There was a series of short vertical lines, all starting from the same base line and parallel with each other. They showed by their length the exact amount of sympathetic electricity produced in the nerve. After the professor had made about ten such records, all of the same length, to show the normal effect of his excitation, he would inject some ether, chloroform or laughing gas into the tissue near the nerve. Almost immediately the amount of the sympathetic current manifested would diminish and perhaps disappear for a few minutes. The traces on the photographic plate would show this with wonderful distinctness. Different drugs produced different results. A singular thing about all this business was that when a drug had made the nerve practically insensible to an exciting current sent in one direction it would respond if the current was sent in the opposite direction. The sympathetic current would flow in the opposite direction also, and the lines produced by the beam of light on the galvanometer would be found on the opposite side of the base line. The photograph, with its two sets of projections, some upward and some downward, reminded one of the well-cleaned backbone of a fish. Prof. Walker's aim in exhibiting this work was merely to show a new method of investigation and not to reveal any new discoveries.

VITAL PROCESSES IN ANIMALS AND PLANTS.

Prof. Raphael Meldola, a London chemist, presented a paper on the above subject which attracted the attention alike of the physiologists, botanists and chemists at the meeting. It is believed by physiologists and botanists that all vital processes in animals and plants are conducted in those parts of their fabric called the cells. These processes are attended by chemical changes. The method and mechanism by which the changes are wrought are not yet known. Several investigators are studying this fascinating and important problem. Prof. Meldola is disposed to accept, as the possible explanation of the phenomena, a notion advanced by Fischer for another purpose. He thinks that the constituent atoms of the substance, which are transformed, may have a shape that is particularly favorable to combination with the protoplasm of the cell. It is a sort of geometrical idea, but not unreasonable. Within the last few years chemists have ascertained the exact composition of various dyes, perfumes and other rare and costly natural products, and have imitated nature. Prof. Meldola is not sure that man follows Nature's ways in all this work. He thinks that many compounds which man would make by combining the elementary ingredients are really the products of the disintegration of still more complicated compounds that existed previously. Such a supposition makes it necessary, of course, to believe that there was originally a building up by Nature of these complex substances, but her route and plan might have been very different from that which we now suppose.

ELECTRIC METERS.

Prof. W. E. Ayerton, of the Central Institution, in London, read a paper on this subject prepared by one of his students. From this and the ensuing comment, it appears that electric meters are subject to several influences which impair their accuracy. Mere temperature changes will affect some of them. A magnet held near others will interfere with their operations. It is possible to take current from a supply wire and store it in an accumulator without making a record, if a certain type be used, and through neglect to wind the clock in the same, there is a chance that the meter will register backward and show the supply company to be in debt