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Contents.

(Illustrated articles are marked with an asterisk.)

Anaconda, large..... 248
Balloon trip from Cherbourg to London*..... 249
Books and publications, new..... 251
Business and personal..... 251
Cabbage flies and worms..... 245
Carriages, care of..... 241
Cloths, waterproofing..... 247
Coal formation, new theory of... 245
Cocoa palms as lightning conductors..... 246
Electric lamps for mines..... 250
Engines of the paddle steamer Ozone*..... 243
Fearless, the..... 241
Foolhardiness..... 248
Game carrier, Stevens'*..... 243
Highways, public, use of..... 248
Home, a, the incentive to own.... 244
Inventions, agricultural..... 251
Inventions, engineering..... 251
Inventions, index of..... 251
Inventions, miscellaneous..... 251
Lamps, electric, for coal miners.. 250
Looms, stop motion for*..... 244
Mining experiments, submarine. 248
Mortar, monster, "Fere," the.... 240
Nitrate of soda..... 244
Natural history notes..... 250
"Noble forehead" fallacy, the.. 247
Nature the great teacher..... 240
Notes and queries..... 251
Ore concentrator, Channell's*... 242
Passenger depot of the Erie Railroad*..... 246
Patent rights as property..... 248
Patents, points on..... 247
Photographic notes..... 241
Photography, phosphorescent.. 241
Photo printing on silk..... 245
Pneumatics with a steam vacuum, experiments in*..... 247
Rafters, lengths and bevels of, instrument for obtaining*..... 242
Railway track system, Noonan's* 242
Route taken in balloon trip from France to England*..... 249
Socialism, Petroleum V. Nasby on..... 250
Steamers, fast, at low cost..... 241
Stethoscope, vibrating, Bloodgett's*..... 248
Sulky, saddle, Stillman's*..... 248
Telephonic induction..... 245
Tin, aluminum..... 242
Toboggan, improved*..... 248
Tool, riveting, Stevens'*..... 242
Top, chameleon*..... 239
Top, scientific, experiments with*..... 239, 244
Tree growth after girdling, remarkable..... 240
Typewriter, cheap*..... 246
Vinegar sharp, what makes..... 241
Wages, rise of, the century's..... 240
Women, scientific..... 244

TABLE OF CONTENTS OF

SCIENTIFIC AMERICAN SUPPLEMENT

No. 568.

For the Week Ending October 16, 1886.

Price 10 cents. For sale by all newsdealers.

PAGE

I. ASTRONOMY.—Comets and Meteorites.—By RICHARD A. PROCTER.—A discussion of the origin of these bodies, in support of the writer's theory and in answer to Professor Newton's criticism thereof..... 8997

II. CHEMISTRY.—Alkaline Chromates.—Note on the twofold function of chromic acid.—Interesting as affecting battery solutions.... 8994
A Method of separating the Two Isomeric Toluidine-Sulphonic Acids.—By E. A. SCHNEIDER..... 8994
Liquid Carbonic Acid.—Manufacture and distribution as practiced in Berlin, according to Dr. Raydt's process.—3 illustrations... 8994
Nitrates and Nitrites in Waters and Artificial Solutions..... 8994

III. ELECTRICITY.—Absolute Electrometer for measuring Very High Potentials.—By E. BICHAT and R. BLONDOT.—A balance electrometer by which very high electrostatic potentials can be measured.—1 illustration..... 8991
Another Electric Launch..... 8991

IV. ENGINEERING.—Economical Quay Walls.—Description and full details of construction of the Rouen quay wall, and comparison of the same with the New York piers on the Hudson River..... 8990
Improvements in the Manufacture of Gas.—The Stedman-Stanley furnace; a review from *La Nature* of this American invention.—1 illustration..... 8987
The Stampede Pass Tunnel on the Northern Pacific..... 8989
The "Trompe," or Hydraulic Blower.—Interesting account of this historical blowing machine, formerly in use in connection with Catalan forges.—1 illustration..... 8990

V. GEOLOGY.—Earthquake Recorders for Use in Observatories.—By J. A. EWING.—2 illustrations..... 8997

VI. MATHEMATICS.—Radii of Curvature Geometrically Determined.—By Prof. C. W. MACCORD, Sc.D.—No. V.—The epicycloid, hypocycloid, and epitrochoid.—5 figures..... 8985

VII. MECHANICS AND TECHNOLOGY.—Colors of Metals and Alloys.—Abstract of Prof. Roberts-Austen's lecture before the British Association..... 8993
Grindstones.—By JOHN HARDISTY.—Valuable suggestions as to management, and more especially the turning up of grindstones.—1 illustration..... 8986
Sulphuric Acid in Refined Petroleum and Distillate.—Tabular statement of determinations of sulphuric acid in different oils, and discussion of the results..... 8994
The Hubner Carding Engine and the Modifications that have been Introduced into It.—A complete review of this subject, very fully illustrated by 18 figures..... 8983
The Lafitte Process of Welding Metals.—By WILLIAM ANDERSON, M. Inst. C. E.—A new method of applying the flux in welding. 8986
Wire Stitching Machine.—Machine for use in box making, pamphlet binding, etc.—2 illustrations..... 8989

VIII. MISCELLANEOUS.—Barefoot Horses.—Advocacy of the non-shoeing of horses..... 8998
Coral Fishing.—Interesting account of the Mediterranean coral fishery and of its mercantile importance and prospects..... 8996
French Pointers.—Note on the Paris dog show.—1 illustration.... 8997
Resonating Gongs.—Ingenious application of the resonator.—1 illustration..... 8986
The Philosophy of Soaring Birds.—By Prof. DE VOLSON WOOD.. 8991

IX. NAVAL ENGINEERING.—On the Progress and Development of Marine Engineering.—By WILLIAM PARKER.—A very lengthy and full review of this subject in all its aspects.—7 figures..... 8987
The Fastest Sea Boat in Existence.—An ocean-going torpedo boat built for the Chinese Government..... 8989

X. PHYSIOLOGY.—Why Some People Grow Fat.—By N. A. RANDOLPH, M.D.—The chemistry and theory of the subject, and practical views.—One of the fullest discussions on the subject that has ever appeared..... 8995

XI. PHYSICS.—Capillary Attraction.—By WILLIAM THOMSON.—Conclusion of this lecture, the most important of the recent contributions to the subject.—Illustrated by 18 figures..... 8992
Soap Bubbles.—Report of Prof. Rucker's British Association lecture.—Interesting sequel to Prof. Thomson's lecture on capillarity 8993

THE "FERE" MONSTER MORTAR.

Some details have come to hand concerning the new Fere gun from which the French expect so much. It is, we learn, a mortar of unusual size, throwing twelve shells with more than ordinary precision for its type. The shells are a trifle over three feet in length, and contain an explosive said to possess extraordinary power of destruction. At a recent trial at Malmaison, the superiority of this gun over all others of its class was clearly shown, if the reports are trustworthy. It tore up masses of rock and shattered steel plates which would have proved an effective barrier to similarly constructed guns with which the military world is familiar. To the purely military mind perhaps the work it did when confronted with earthworks is the most interesting and important, for earthworks protected by steel armor have come to be looked upon as an effective defense, at least against all manner of mortar attack, even if impotent against the modern rifle at short range. The explosive projectiles of the Fere gun tore away the steel plating protecting a well constructed earthwork, and transformed into an indistinguishable mass the mounds that were expected to smother it.

The noise from the explosion of these shells is said to be terrific; and while, heretofore, the bark of the mortar shell has been regarded as worse than its bite before earthworks or heavy masonry, the Fere gun would seem to reverse this order of things, its sting being even more direful than its song. The reader will recall the great promise and little performance of Admiral Porter's mortar flotilla before Forts Philip and Jackson, in the Mississippi, during the civil war. Admiral Farragut waited patiently, or rather impatiently, with his fleet of gunboats lying idle in the tideway, while Porter essayed to reduce these works with his mortar play. Under so skillful an officer as Porter, the mortar boats may safely be said to have been placed most advantageously for the attack. A terrific fire of bombs was maintained for hours, and a very shower of these missiles fell in and about the works. But no great harm was done. The defending batteries were only temporarily silenced; and when the storm ceased, the gunners, who had been under shelter, returned to their stations, and it was seen that the aggressive power of the forts had not been perceptibly impaired. Satisfied of the impotence of mortar attack, Farragut now opened on the forts with his heavy guns, fough this way up the river, and took New Orleans.

Now, the Fere gun, it is alleged, is far more destructive than the ordinary mortar, but, like the latter, its range is short, and this will naturally tend to restrict its use. If the enemy would considerately abstain from using his big field pieces while it was in play, it might, perhaps, do great execution; but should he, while out of range of its projectiles, let drive at such a battery, it could not, save under peculiarly advantageous conditions, be worked at all.

It will be remembered how great was the disappointment of the French in 1870 with the performance of the mitrailleuse. It was a terrible engine of execution at close quarters, but these conditions were not always present; and when they were, the destructive work of the German long-range field pieces preceding the actual onset often resulted in rendering them valueless.

The Century's Rise of Wages.

Discussing wages, in one of his lectures before the students of Harvard University, Professor Thompson gives many facts of curious interest. In 1793 the Schuylkill and Susquehanna Canal Company advertised for workmen, offering $5 a month for the winter months, and $6 for summer, with board and lodging. The next year there was a debate in the House of Representatives which brought out the fact that soldiers got but $3 a month. A Vermont member, discussing the proposal to raise it to $4, said that in his State men were hired for £18 a year, or $4 a month, with board and clothing. Mr. Wadsworth of Pennsylvania said: "In the States north of Pennsylvania, the wages of the common laborer are not, upon the whole, superior to those of the common soldier." In 1797 a Rhode Island farmer hired a good farm hand at $3 a month; and $5 a month was paid to those who got employment for the eight busy months of the farmer's year.

A strong boy could be had at that time in Connecticut at $1 a month through those months, and he earned it by working from daybreak until eight or nine o'clock at night. He could buy a coarse cotton shirt with the earnings of three such months. The farmers could pay no better, for the price they got for produce was wretched. Butter sold at eight cents a pound, and when it rose suddenly to ten cents, several farmers' wives and daughters went out of their minds with the excitement. Women picked the wool off the bushes and briers, where the sheep had left it, and spun and knit it into mittens to earn $1 a year by this toilsome business. They hired out as help for twenty-five cents a month and their board.

By a day's hard work at the spinning wheel a woman and girl together could earn twelve cents. As late as 1821 the best farm hands could be had for twenty-five cents a day, or twice as much in mowing time Mathew Carey, in his letters on the Charities of Philadelphia (1829), gives a painful picture of the working classes at that time. Every avenue to employment was choked with applicants. Men left the cities to find work on the canals at from sixty to seventy-five cents a day, and to encounter the malaria, which laid them low in numbers. The highest wages paid to women was twenty-five cents a day; and even the women who made clothes for the arsenal were paid by the Government at no high rates. When the ladies of the city begged for an improvement of this rate, the Secretary hesitated, lest it should disarrange the relations of capital and labor throughout the city. Poor people died of cold and want every winter in the city, and the fact seems to have made an impression only on benevolently disposed persons like Mr. Carey.

Nature the Great Teacher.

In his new book, "Nature's Teachings," the Rev. J. G. Wood has discussed a subject not before handled at length. Its object is to show how man's implements and mechanical devices have been anticipated in nature. He asserts that there is no invention of man which is not anticipated, that all his mechanical devices have been used in nature for countless centuries. He claims that the great discoverers of the future will be those who carefully study the natural world.

The burr stones of mills are a copy of molar teeth. The hoofs of a horse are made of parallel plates like a carriage spring. The finest file made by man is a rough affair when compared with a Dutch rush used by cabinet makers. The jaws of the turtle and tortoise are natural scissors. Rodents have chisel teeth, and hippopotami have adz teeth, which are constantly repaired as they are worn. The carpenter's plane is anticipated by the jaws of a bee. The woodpecker has a powerful little hammer. The diving bell only imitates the work of the water spider. This insect, although as easily drowned as any other, spends a great part of its life under water. Having constructed a small cell under the water, it clasps a bubble of air between its last pair of legs, and dives down to the entrance of its cell, into which the bubble is put. A proportionate amount of water is thus displaced, and when all of it is expelled, the little animal takes up its abode in this subaqueous retreat.

In laying its eggs on the water, the gnat combines them in a mass shaped somewhat like a lifeboat. It is impossible to sink it without tearing it to pieces. The iron mast of a modern ship is strengthened by deep ribs running along its interior. A porcupine quill is strengthened by similar ribs. When engineers found that hollow beams were stronger than solid ones, they only discovered a principle which had been used in nature for centuries before the creation of man. A wheat straw, if solid, could not support a heavy head. The bones of the higher animals, if solid, would have to be a great deal heavier to bear the weight which they have to support. The framework of a ship resembles the skeleton of a herring, and he who would improve aerial navigation might study the skeleton of a bird with advantage. Palissy made a careful study of the shells by the seaside, in order to learn the best method of fortifying a town.

The ship worm feeds on wood, and gradually tunnels its way through any submerged timber. It also lines its burrow with a hard, shelly coating. Brunel, taking a hint from this, was the first to succeed in subaquatic tunneling. The Eddystone Lighthouse is built on the plan of a tree trunk, and fastened to the rock in a manner somewhat similar to the way a tree is fastened to the soil. It is supposed that the first idea of a suspension bridge was suggested by the creepers of a tropical forest.

Mr. Wood gives an interesting account of the origin of the plan for the Crystal Palace. Mr. Paxton, a gardener, having noticed the structure of the great leaves of the Victoria Regia, a plant which had been introduced into England a few years previous, struck the plan of copying in iron the ribs of the leaf and filling the remaining space, which corresponds to the cellular portions of the leaf, with glass. Thus, by copying nature, an obscure gardener became Sir Joseph Paxton, the great architect.—*Wilmington Collegian.*

Remarkable Tree Growth after Girdling.

M. E. S. writes that on his farm in Vermont, in June, 1884, he attempted to kill a poplar tree by girdling. He removed a strip of bark about three inches wide entirely around the tree, at a place about four feet from the ground, scraping off the pulp that had formed between the wood and bark that year. The wood thus left bare seasoned over that summer, but the tree did not die, and has continued to grow till the present time, above the place where the bark was removed, but has not grown any below that. The measurements are given as 26½ inches in circumference above the place where the bark was removed, and 21 inches circumference below. The tree did not put out leaves quite as soon as the other trees near it, but it blossomed as full as any of the poplars around, and is said to be looking as healthy as they are.

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