

of 85 feet in the stand pipe, with an increased pressure in the mains in an emergency of fire, the increase of pressure being obtained by use of an automatic closing valve at the stand pipe, when a fire pressure was required. An ordinary pressure of 40 pounds is maintained in the mains for domestic service, and in case of fire the pressure is raised to 125 pounds.

The pump house shown is fully one-half mile from the electric plant, and the pumps are controlled entirely by means of a switch at the electric power house. The system has been found to meet all the requirements.

Corn Stalks and Coconut Husks.

In view of the great rapidity with which the modern rapid-fire guns can deliver shells, it has been felt for some time that, in addition to watertight subdivisions in war ships, other means of preventing any inflow of water should be used. The most favored method of accomplishing this result has been to fit a coffer dam, or double skin, for some distance above and below the water line, the space between being about three feet thick and filled with material which would expand and keep out water when a shot passed through. The material that was adopted in the United States navy for this purpose in 1892, called cellulose, is obtained from the husks of coconuts, being a brown, powdery substance, very light, and admitting of a good deal of compression. It was first used in France, and has been more or less used by various other foreign nations.

A Philadelphia inventor has recently brought to the attention of the Navy Department a new cellulose, composed of the pith of cornstalk, which is granulated by machinery. Secretary Herbert has determined to thoroughly investigate the new substance, and a board of experts was appointed a few weeks ago to conduct experiments. This board had duplicate coffer dams constructed, measuring six feet square and three feet thick, one packed with cocoa fiber and the other with cornstalk cellulose. A six and an eight inch shell were fired into each. Water was then forced into the dams under pressure. The water failed to penetrate the Marsden or American cellulose dam, but oozed through the cocoa product in a short time.

The English battle ship Inflexible is protected by coffer dams filled with a mixture of cork and oakum, which aggregates in weight 143 tons. With the French cocoa cellulose this weight would be reduced to 43 tons, while the American corn product would not weigh over 25 tons and furnish, it is claimed, more reliable protection.

Photography in Natural Colors.

A. and L. Lumiere point out that the indirect method of photographing in natural colors has not received a proper practical application, because of the difficulty experienced in selecting the colors and in preparing and superposing the monochromes. They recommend the use of orange, green and violet screens for preparing three series of negatives presenting a maximum of sensibility to the rays which the respective screens allow to pass. Specimens of photographs so prepared were exhibited before the Paris Academy of Sciences. The printing and superposition of the monochromes have been successfully accomplished by employing bichromated gelatine to which are added substances insoluble under certain conditions. If, for example, 5 per cent of ammonium bichromate and 5 to 10 per cent of silver bromide in the form of emulsion be added to a 10 per cent solution of gelatine, and the preparation be spread in a thin layer upon a plate of glass, a surface is obtained which can be exposed under a negative and will reproduce the picture by the action of light. After exposure the plate is washed with cold water, and the portion of the film acted upon by light, being rendered insoluble, remains and serves to print the image from on the application of suitable colors. The silver bromide, which, by the way, may be replaced by other insoluble precipitates, is easily removed by the action of sodium hyposulphite, and proofs can then be printed from the plate in any color, showing all the gradations of tint present in the negative. Polychrome prints may be obtained by receiving on the same plate monochrome red, yellow and blue images successively, by means of three corresponding negatives, and isolating each image from the preceding one by an impervious layer of collodion. By employing dyes of greater or less concentration or by simple decoloration with water, variation in the relative intensity of the monochromes is readily obtained.—Comp. Rend.

THE proprietors of the New York Recorder recently offered a prize for a relay bicycle race from Chicago to New York, distance by road about 1,000 miles. The race was finished on the 8th inst., time 64 hours 57 minutes and 30 seconds. A crowd of 10,000 persons gathered at the Metropolitan Bicycle Academy, corner 60th Street and Boulevard, New York, to witness the coming in of the two riders, the red and the blue. The finish took place at 1:57 A. M., when the red rider came in about an hour ahead of the blue.

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NEW YORK, SATURDAY, JUNE 29, 1895.

Contents.

(Illustrated articles are marked with an asterisk.)

Ash sifter, Briner's..... 404
Artesian well, oil, gas, and water from..... 407
Bicyclist's distance recorder..... 405
Bicycle, the..... 409
Bonaparte and the refractor..... 403
Books and publications, new..... 411
Botanical garden, the New York..... 405
Brake slack adjuster, Freese & Nicholson's..... 405
Bursting of a steam boiler..... 409
Cable, Atlantic, projectors of the..... 408
Canal, Harlequin, opening..... 409
Canal, ship, Block Island..... 402
Cellulose for skins of vessels..... 402
Clearing House, N. Y. vault..... 403
Clothes wringers (5650)..... 407
Cotton crop, the, of 1895..... 401
Electrically operated pumps..... 401
Electrical notes..... 407
Franklin, Benjamin, on torpedo..... 407
French humanity..... 403
Glass, silvering..... 407
Hair curler, Brand's..... 404
Ignorance not a legal defense..... 403
Insects and flowers..... 410
Inventions, recently patented..... 411
Kiel Canal celebration, the, in Germany..... 402
Lakes, temperature of..... 402
Lead wort, the..... 404
Lens, the great Yerkes, testing..... 403
Life, long, secret of..... 403
Loading an ocean steamer..... 410
Lubrication, uneconomical..... 403
Notes and queries..... 411
Odometer, the Bell's..... 405
Organ of steamer St. Louis..... 408
Patent decisions of the courts..... 403
Patents granted, weekly record..... 412
Photography in natural colors..... 404
Piano action frame, Butcher's..... 410
Flow, faults of the..... 404
Power, cost of, at Niagara..... 406
Rifle, the Blake repeating..... 406
Steam trap, the Bundy..... 406
Street car fenders..... 405
Sweeper, street car, Walle's..... 404
Tanning, quebracho for..... 404
Water supply, DeKalb, Ill..... 401
Welding, electric..... 407
Wheel, the, how to ride..... 406
Yellowstone Park falls and geysers..... 408

TABLE OF CONTENTS OF SCIENTIFIC AMERICAN SUPPLEMENT No. 1017.

For the Week Ending June 29, 1895.

Price 10 cents. For sale by all newsdealers.

I. CHEMISTRY.—Detection of Blood Spots in Presence of Rust.—By Herren MECKE and WIMMER.—An important contribution to the literature of medical jurisprudence..... 16258
The Production of Diastase and of an Alcoholic Ferment from Fungus.—This important discovery is due to a Japanese chemist named Jokichi Takamine..... 16252
II. CIVIL ENGINEERING.—The Boston Electric Railway Subway, description of this important engineering work which will extend from the Fitchburg Railway Station to the Public Garden, and will relieve the streets of this congested district.—With profiles and cross sections of the subway.—The total cost of the improvement will be about \$5,000,000.—The article includes a map and view of one of the stations.—10 illustrations..... 16254
The Chicago Drainage Canal.—A description of this great engineering work, from its inception to the present time.—The estimated cost of this work is \$21,798,203.—It will be completed about November 1, 1896.—The article gives illustrations of graders, derricks, cantilevers, and hoisting machinery.—9 illustrations..... 16248
The Effects of the canal on the Commerce of the Lakes.—This article includes the estimates of the amount that the canal will probably lower the lake level and the damage that would result thereby to the commerce of the lakes..... 16248
III. ELECTRICITY.—The Iodine Voltmeter.—A full description of the new and delicate form of voltmeter, which is especially valuable for weak currents..... 16253
IV. MECHANICAL ENGINEERING.—The Old and the New.—By ROBERT ALLISON.—A paper presented at the Detroit meeting (June, 1895) of the American Society of Mechanical Engineers.—Includes a discussion by Mr. Samuel Webber and others, containing many reminiscences of old tools and methods of practice..... Rustless Coatings for Iron and Steel.—Paints.—Of what composed, how destroyed, classification as true pigments and inert substances, adulterants, etc.—By P. M. WOOD.—An important paper, giving the results of many experiments on the protection of iron and steel, including natural and artificial asphalt coatings..... 16250
V. METALLURGY.—The Rarer Metals and Their Alloys.—Continuation of Professor Roberts-Austen's valuable lecture read at the Royal Institution.—This installment takes up the subject of armor plates and attack of projectiles, and the preparation for the microscope of diamonds and other forms of carbon obtained from carbonized iron.—5 illustrations..... 16256
VI. MINERALOGY.—Corundum Deposits of Georgia..... 16258
VII. NATURAL HISTORY.—The Action of Light on Animal Life.—The present article discusses the question of whether sunshine increases or diminishes an animal's susceptibility to disease..... 16258
VIII. PHOTOGRAPHY.—Binocular Photomicrography.—By Hon. A. A. ADEE.—Contains the result of a series of interesting experiments..... 16255
IX. PHYSICS.—Breath Figures.—By Dr. J. G. McPHERSON, F.R.S.E.—Interesting paper on this curious phenomenon.—Gives a number of examples. No one, as yet, has clearly explained how these impressions are produced by heat and electricity..... 16253

THE CELEBRATION IN GERMANY.

The ship canal recently opened across the northern peninsula of Germany was celebrated with rejoicings and festivities by the people of that great empire. On the invitation of the Emperor the representatives of the leading foreign governments took part; England, France, Russia and Italy sent some of their greatest war ships. The naval pageant was very grand. It is gratifying to know that the United States was represented by four such noble vessels as the Columbia, the New York, the San Francisco and the Marblehead. Report says the American ships presented a more attractive appearance and excited more interest than any of the assembled fleets, due, no doubt, to the white color of our ships, their clean and graceful lines.

The new canal, while it is a work of high importance to Germany as a means of defense in time of war, and of special commercial advantage in time of peace to her, to England and other nations of Northern Europe, is likely to be of little utility for ships of the United States. Seldom, probably, will American vessels have occasion to use the canal. Yet a stranger might have supposed, from the ringing cheers and enthusiastic demonstrations of the populace, as the Marblehead came into view and passed from town to town, bearing the star spangled banner through the windings of the canal, that Germany considered the Americans as holding the greatest interests, next to themselves, in the success and operations of the new waterway. Doubtless it was the presence of the glorious old flag, the symbol of free institutions, under which so many Germans, so many of their own kindred, live and prosper, under which so many of them have fought and died, that roused their feelings and caused their acclamations. Next to the emblem of the Fatherland, no ensign is so dear to the German heart as the flag of the American Union.

TEMPERATURES OF LAKES.

Mr. Desmond Fitz Gerald, at the annual meeting of the American Society of Civil Engineers at Nantasket, June 18 to 22, read an interesting paper on the temperature of lakes, based on experiments made by him during the past five years. The author deduced from his observations that in lakes and ponds less than 25 feet in depth the temperature at the bottom does not differ materially from that at the surface. In deeper bodies of water, however, the conditions are quite different. Experiments made on Lake Cochituate, the base of the Boston water supply, showed that when the surface is frozen during the winter the temperature at the bottom is usually 39.2 degrees. The strata of water lie in the order of their densities, and the temperature decreases gradually until within a few feet of the surface, when it suddenly falls to a point just above freezing. The disposition of the strata is not disturbed after the forming of the ice until the spring thaws. By April 1, the surface water has become warmed to the same temperature as that at the bottom, and, as the whole body is in more or less unstable equilibrium, the winds and currents are sufficient to produce circulation from top to bottom. This continues until the first of May, when the surface temperature has risen about five degrees above that of the bottom. The consequent difference in density prevents further circulation, and, while the warming of the surface continues, the temperature of the bottom remains stationary until the middle of November.

During this period the summer stagnation takes place. The lower layers of the water gradually collect all the organic matter from the upper layers, and decay continues until there is no more oxygen left to support it. At the same time the water grows darker and more impure until by October it is usually offensive to the smell and has a dull yellow color. About November 1 the temperature of the bottom begins to rise, until by the middle of the month it has increased from 20° to 30°, at which point it equals that of the surface.

The temperature of the whole mass then falls at nearly the same rate during a second period of circulation until the surface freezes and stratification again takes place. During the November circulation, and again in the spring to a less extent, all the impure water at the bottom is brought to the surface and the infusoria and diatoms spring into life in great numbers, owing to the union of the organic matter from the bottom with the oxygen in the surface water.

Block Island Ship Canal and Harbor.

The new canal connecting Great Salt Pond, on Block Island, with the ocean, has been practically completed by the Hartford Dredging Company. The canal makes an entrance with one of the finest land-locked harbors along the Atlantic coast. The width is 400 feet and the depth 14 feet. The distance excavated from water to water is 600 feet. Inside the lake the excavation extends 200 feet, and outside the ocean entrance has been deepened for 400 feet, making a total of 1,200 feet. The breakwater is 600 feet long. This year \$50,000 has been appropriated for the work, and last year \$25,000.