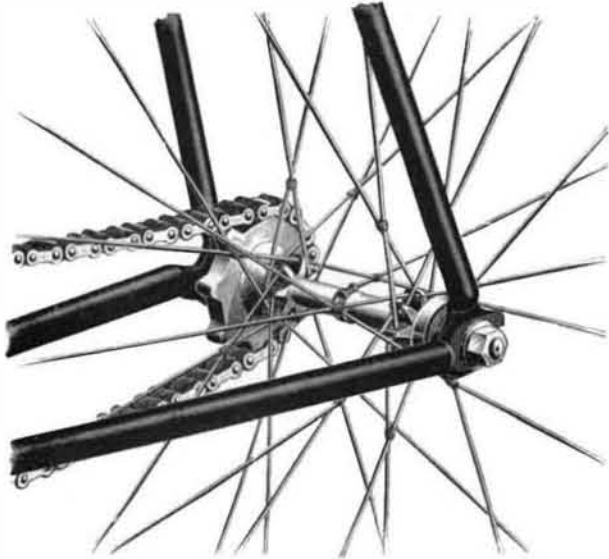


**THE VICTOR BICYCLE.**

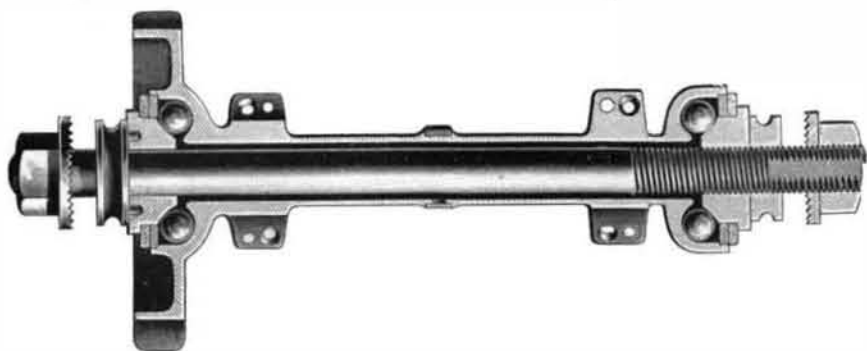
The Victor bicycle, made by the Overman Wheel Company, of Chicopee Falls, Mass., is a typical American wheel. All of its parts, including the saddle and tires, are made in one factory, giving it an almost unique status. During and since the days of the old ordinary or high wheel, the Victor has maintained its position in the front ranks of American wheels. In the product of the Overman Company for the present year many novelties are included. Among others may be particularly mentioned a detachable sprocket, enabling a change of gear to be made with little trouble;



REAR WHEEL AND CHAIN TIGHTENING ADJUSTMENT.

a narrow tread; the method of attaching the spokes to the hubs, by which straight spokes are secured, although tangent; the peculiar method of attaching the crank to the crank axle; the hand hole inner tube tire, are but a few of the characteristic features of the wheel. For the ensuing year eight wheels have been made, five road wheels with different classes of frames, the racing wheel, and two lady's drop frame wheels, termed the "Victoria."

One novel feature is that the rear wheel and the crank axle can be reversed. This brings the chain to bear upon the other sides of the sprocket wheel teeth,



SECTION OF REAR WHEEL HUB.

thus virtually supplying the machine with new sprockets.

One of our illustrations shows the rear wheel, chain-tightening adjustment, and spoke attachment, and another shows the rear wheel axle, which presents the dust-proof features of the bearing to the reader, and shows also the projections or lugs to which the spokes are attached. The spokes are drawn down in the centers from wire, being left of the original size at the ends, so as to secure a greater strength at these critical points. The Victor people have devised an ingenious dynamometer, which we also illustrate, by



THE VICTOR CYCLE DYNAMOMETER.

which may be shown the power exerted on the cranks by the rider. This has enabled the company to test the forms and sizes of the sprockets, which really seems a step in the way of accurate designing, instead of the almost guesswork followed heretofore by most makers. The dynamometer makes a record on a piece

of paper in a series of waves from the area bounded by which the power exerted can be calculated, indicator-card fashion. Some most interesting and unexpected results have followed from the use of this, and the Victor wheel, as placed upon the market, embodies the results of absolutely quantitative experiment.

**A New Process for Armor Plates.**

An interesting test of a 17-inch armor plate which had been reduced to a thickness of 14 inches after being carbonized occurred at the Indian Head proving ground on February 21, with a 10-inch rifle, using armor-piercing projectiles which were fired at velocities that would have penetrated ordinary plates of much greater thickness. The managers of the Carnegie Company conceived the idea that the resistance of a Harveyized plate might be increased by reheating and rolling subsequent to the surface carbonization process. The texture of the plate is thus toughened and its internal strains are minimized. This was tried and the plate was then sprayed with ice water to secure the advantages of chill hardening. The 17 inch plate which had been reduced to 14 inches in thickness was attached to the usual wooden backing, and was attacked with a 10 inch gun under the same conditions that govern the trials of 14 inch plates. The first shot fired was a Carpenter projectile propelled by 217 pounds of brown prismatic powder. The velocity was 1,859 feet per second. Its point went in about seven inches and was completely "upset," to use the technical term. The projectile was shattered. The great armor plate, which was 15 feet long, 8 feet 6 inches wide and weighed 33 tons, remained practically uninjured, not the slightest crack being developed. The second shot fired was a 500 pound Carpenter projectile propelled by 225 pounds of powder, developing a velocity of 1,940 feet per second. It crumbled to pieces, leaving a disfiguring hole, but the plate did not show any crack, even where it had been presumably weakened by the former shot. The 12 inch gun was then wheeled into position and a Sterling projectile was fired with a charge of 420 pounds of powder, the velocity being 1,858 feet per second and the striking energy being 20,370 foot tons. It bored a hole through the plate, but even this shot failed to develop a radial fracture. No other test was considered necessary, as this was the ordeal to which 17 inch plates are subjected, and the 14 inch plate had resisted cracking better than the 17 inch plates which had been furnished to the Indiana, Oregon, and Massachusetts.

Important results are sure to follow this test, for as John G. A. Leishman, President of the Carnegie Steel Company, says: "The making of armor plates is in its infancy. . . . The qualities of steel are so peculiar and subtle that any change in the process of handling it in its manufacture may lead to great changes in the result." It is evident that hundreds of tons of weight may be saved without sacrific-

ing the efficiency of the battle ship, and the weight of the two inches of armor saved means increased speed or greater coal endurance and added guns. Of course it is too early at present to say whether the government will order all future plates treated by this process or not, but Captain Sampson, Chief of Ordnance, said that this shot (the 12 inch) would have easily penetrated twenty inches of steel and fully twenty-eight of iron. So there is every reason to believe the government will be favorably disposed to the new process.

**Burns from Extreme Cold.**

At the last meeting of the Swiss Society of Natural Sciences, at Lausanne, M. Raoul Pictet gave some particulars concerning cold burns experienced by himself and assistants during his investigations of the lowest temperature attainable. There are two degrees of burns. In one case the skin reddens at first and turns blue the following day, and subsequently the area of the spot expands until it becomes nearly double its original dimensions. The "burn," which is usually not healed until five or six weeks after its occurrence, is accompanied by a very painful itching on the affected spot and the surrounding tissues. When the burning is more serious, produced by longer contact with the cold body, a burn of the second degree is experienced. In this case the skin is rapidly detached, and all parts reached by the cold behave like foreign bodies. A long and stubborn suppuration sets in, which does not seem to accelerate the reconstitution of the tissues. The wounds are malignant, and scar very slowly in a manner entirely different from burns produced by fire.

On one occasion, when M. Pictet was suffering from a severe burn due to a drop of liquid air, he accidentally scorched the same hand very seriously. The scorched portion was healed in ten or twelve days, but the

wound produced by the cold burn was open for upward of six months. In order to try the effect of radiation in dry cold air, M. Pictet held his bare arm up to the elbow in a refrigerating vessel maintained at 105°, when a sensation of a peculiarly distinct character was felt over the whole skin and throughout the muscles. At first this sensation was not disagreeable, but gradually it became decidedly so, and after three or four minutes the skin turned blue and the pain became more intense and deep seated. On withdrawing the arm from the refrigerator at the end of ten minutes, a strong reaction was experienced, accompanied by a superficial inflammation of the skin.

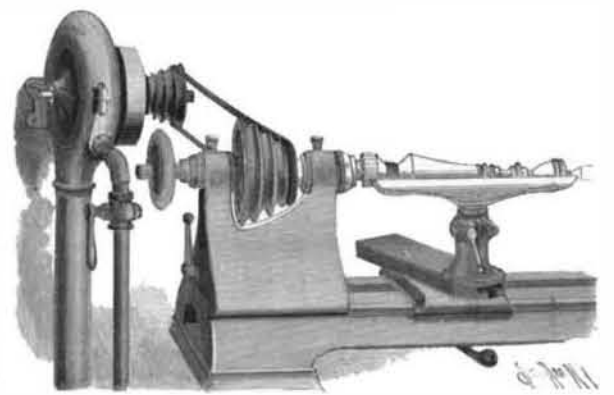
**THE WEED WATER MOTOR.**

These motors belong to the class of tangential or impulse wheels, and power is developed by a jet of water under pressure impinging on a bucket of proper shape to receive and retard the stream until its force is spent, the water being then discharged into the outlet of the casing. The manufacturers, Messrs. A. J. Weed & Company, Nos. 106 and 108 Liberty Street, New York City, have given much time and study to the attain-



THE WEED WATER MOTOR.

ment of the proper shape and proportion of the working parts to make the most effective motor. The motors are especially adapted for the use of dentists, jewelers, and amateurs who desire a light power for small lathes, polishing wheels, scroll saws, sewing machines, etc., and special small countershafts designed for these motors are furnished where it is desired to use the power at a distance from the water supply. The motor is well made, the bearings being adjustable, so that all wear can be taken up without disturbing any other part of the motor, and with proper care the machine will last for years. A flywheel on the shaft forms part of the driving pulley, and insures a smooth and steady speed under quite a variation of load. The driving pulley is arranged for either flat or round belt as may be desired. Where the motor is intended for permanent use it should be con-



WATER MOTOR RUNNING LATHE.

nected up with lead or iron pipe with a stopcock, but for occasional service pressure hose may be used and attached to the regular faucet at will, by the use of an improved adjustable connection.

**Skunk Oil.**

An Iowa correspondent of an exchange gives the following information concerning the origin of skunk oil: "As I live in a district where the skunk is only too well known, perhaps I may be able to answer your correspondent's question about the origin of skunk oil, commonly sold in the drug stores around us as a remedy for rheumatism. Skunks lie in their holes during the winter, never appearing above ground, excepting on very fine days. Before retiring underground, they become well loaded with fat. When killed by drowning them, by filling up their holes with water, they are dug out without producing any offensive odor. The 'stink bag' is removed, the skin is secured, and then the fat is taken out and treated just as the fat of the hog is treated in making lard. The preparation of skunk oil is a profitable industry during the winter months. A German family living at Esterville, in Iowa, twenty miles from my residence, do a considerable business in its preparation every year."

### Nature and Science.

A strange conflict is going on just now between nature and science. The field of battle is in the chemical laboratory. Chemistry is making advances along new lines, and products are being obtained by artifice which hitherto have only been known as those of nature. This is the field of synthetic chemistry. Whereas, until recently, chemists have occupied themselves almost wholly with the processes of analysis—that is to say, the taking of things apart—now they are trying to put elements together so as to imitate natural compounds. Some speculative theorists go so far as to assert that in the future we shall be able to manufacture all kinds of foods, and even most prized delicacies, in the laboratory, so that there will be no further necessity for tilling the soil and raising crops.

There is no doubt whatever, remarks a writer in a contemporary, that wonders now undreamed of will be accomplished in the chemical laboratory of the future. Already some things are beginning to be made which hitherto have been products of nature exclusively. Madder, originally obtained from a plant, has been driven out of the market by Turkey red, a substitute obtained from coal tar. Indigo is now manufactured artificially, and the only reason why it has not driven out the original vegetable product is that the processes required are too costly. But it may happen any day that a means will be discovered for producing indigo more cheaply by chemical means. Then an important agricultural industry of India will be wiped out.

Attempts have been made to produce quinine by artifice, but without success. It is not unlikely, however, that this may be accomplished before very long. As a result, many people interested in the natural production and marketing of this alkaloid would be ruined, but the cheapening of the substance would be beneficial to mankind. Chemists have been experimenting for the purpose of obtaining many of the valuable alkaloids of plants—with opium, for example. They have tried to manufacture morphine, which is one of a considerable number of active principles contained in opium. At least fifteen alkaloids have been separated from opium. In this direction chemists have not been very successful. Success in the experiments is of no value practically so long as they cannot produce the alkaloids more cheaply than they can be got from the plants themselves. This remark applies

to atropin, an active principle of the deadly nightshade plant, which chemists have tried to reproduce.

Chemists have succeeded in making glucose or grape sugar in the laboratory. They have also produced other sugars hitherto unknown. But there is no profit in it, because the processes involved are too complicated and expensive. In manufacturing these sugars, some of which are not found in nature, they begin commonly with glycerine.

In the making of illuminating gas, coal tar is produced, and this coal tar contains a great variety of peculiar compounds termed "hydrocarbons." These hydrocarbons, as their name indicates, are composed of hydrogen and carbon, in varying atomical arrangements and molecular weights. They serve in the laboratory as convenient organic substances for the application of chemical processes. By various "monkeys" of chemistry they are transformed in all sorts of ways. About one hundred of these hydrocarbons have been isolated up to date. Nearly all of them are transparent white fluids, some of which form crystals at ordinary temperatures. Among them may be mentioned benzole, naphthaline and toluene. Naphthaline is a large ingredient in the "moth balls" used for preserving clothing. From benzole is made aniline, and from the latter many of the most gorgeous colors used in the arts and industries are got. From the hydrocarbons of coal tar are manufactured many valuable medicines, particularly antipyretics—that is to say, anti-fever remedies.

Among the achievements of the newer chemical science is the artificial manufacture of quartz crystals. This discovery is of no practical value, because the crystals obtained are microscopic.—Boston Journal of Commerce.

### The Nervous System—Its Course of Disease.

In the consideration of the problem of disease, sufficient importance, the Charlotte Medical Journal thinks, is not attached to the nervous system as an etiological factor.

It has been found by experimental analysis that the chemical composition of the perspiration varies greatly with the passions and emotions under which the individual labors. Reasoning by inference, may not the same be said of other secretions? Certainly we know that toxic changes occur in human milk as the result of great anger, and the depressing emotions entirely check gastric secretion and render the mouth

foul. The influence of fright in causing the hair to stand, the skin to assume the appearance of goose-flesh, and the muscular system to become generally paralyzed, is well known. It is also true that suspense and disappointment give rise frequently to excessive micturition and emotional diarrhea.

If, then, the emotions have such power to influence bodily functions and change the secretions, may not the development of toxins be traced to this source? It would be interesting, in this connection, to know whether the emotional temperament is more prone to disease than the phlegmatic individual.

### Process for Imparting a Silky Appearance to Cotton and Other Yarns.

BY H. JACOB, ARGENTEUIL, FRANCE.

The cotton or other yarn is first prepared by passing through a liquid obtained by distilling together methyl alcohol and  $\beta$  naphthol disulphonate of sodium. The threads are then separated from each other by passing through thread guides and thread plates, and then through a first series of dressing boxes containing very fluid collodion, and dried by passage through a series of drying chests. The alcohol and ether given off from the collodion are suitably condensed and used for preparing further quantities of collodion. The dressing and drying is repeated a second time, using collodion of greater viscosity; and again a third time, the collodion being still thicker. The drying chests are connected by dressing boxes, which are formed of a central tube communicating with one of the collodion distributors. To the ends of this tube are connected by union joints other tubes of the same diameter, and opening into the interior of the drying chests. These tubes only communicate with each other by small orifices, which are of the same diameter as the threads to be dressed. The collodion is forced through the tube by a piston plate resting on the collodion in the receiver, and is weighted.

The capillary tube has inlet and outlet orifices provided for the passage of the thread at the same time the collodion is forced on to it, the excess of collodion being squeezed off previous to drying.

The threads finally pass through glazing rollers which have a rotary, also an alternating rectilinear movement, so that the whole of the thread surface is submitted to the glazing action. The collodion may or may not be colored by aniline dyes.

### RECENTLY PATENTED INVENTIONS.

#### Railway Appliances.

**SWITCH.**—Frederick B. Kron, New Orleans, La. This invention provides a mechanism designed to be worked to throw the switch from a rapidly moving train or car without decreasing its speed, the mechanism being strong and inexpensive, applicable to all kinds of cars, and arranged to keep itself clear and unclogged. Combined with the switch point is a base plate with raised central portion and inclined sides and ends, one side merging into one of the main rails, the central portion being longitudinally slotted, a lever to be engaged by an arm in a bracket projecting down from the car being pivoted on the under side of the base, and extending across the slot, while a link connects the lever with the switch point, a spring being connected to the lever and to the base plate.

#### Electrical.

**TROLLEY WIRE SUPPORT.**—Marcus T. Murphy, New Orleans, La. This support comprises a post from which extends a lateral arm on which is a vertically movable rod, a spring supporting the rod elastically in position, and the rod carrying an insulated wire hanger. The device is very simple and inexpensive, and sustains the wire in such way that the trolley wheel may run firmly on it, but so that the wire will yield vertically in case of excessive pressure from beneath.

**DENTAL ENGINE.**—William E. Wheeler, Dayton, Tenn. This invention embodies an electric motor having field magnets and in which the armature runs vertically or in a perpendicular position, the shaft having a friction disk adapted to engage and drive the drill-operating devices. It has easily operated shifting devices whereby the speed of the drill-operating drive wheel can be increased or decreased as desired, and the motor stopped when the drill-holding cable is hung up at rest. With this improvement the operator can at all times stand on both feet and work from each side of the chair, thus facilitating the work and mitigating the pain of the patient.

#### Mechanical.

**ENVELOPE THREADING MACHINE.**—Sylvester P. Denison, Belleville, N. J. This is a machine to rapidly and accurately attach an opening thread to facilitate opening a sealed envelope, and the invention consists of a pair of oppositely arranged clamping devices with a reciprocating thread carrier adapted to carry and deliver a thread from one clamping device to the other, stretching the thread between the clamping devices. After the thread is cut and attached to the envelope blank the several flaps are folded to inclose the thread at the joint of the front and lower back flap, with the ends preferably projecting beyond the sides of the envelope, which may be readily opened by pulling on the projecting end of the thread to break the joint between the back flap and the front.

#### Agricultural.

**CORN HARVESTER.**—Christen J. Skeen, Viborg, South Dakota. A machine capable of harvesting at one time two rows of corn, shocking the corn in the

machine as the stalks are cut, has been designed by this inventor. As the machine is drawn forward the stalks are severed close to the ground by two sets of cutters, and fed rearwardly to simultaneously form two shocks, which are held in upright position until they have acquired a proper size, when the platforms upon which they stand are drawn from beneath them, the trip mechanism being operated from the driver's seat and the shocks guided to the ground. The binding cord is drawn from a cup or holder to partially surround the shock as it is being formed, the binding being completed when sufficient corn has accumulated to form the shock.

#### Miscellaneous.

**SAND DRIER.**—La Motte C. Atwood, St. Louis, Mo. According to this improvement a pipe leads from a hot air furnace to the open end of a revolvable cylinder having internal flanges, there being an exhaust fan at the opposite end of the cylinder and a bar extending through it on which deflectors are adjustably hung. The machine is easily operated and is adapted to rapidly dry a large quantity of sand, the furnace and fan causing a constant stream of hot air through the cylinder, while the sand is kept constantly in the air by means of the flanges and deflectors, its freed moisture passing away as vapor. The flow of sand through the machine is regulated according to its degree of wetness and the temperature of the air forced through it.

**STAGE EFFECT.**—Elmer E. Vance, New York City. This improvement is designed to facilitate the representation on the stage of a vessel at sea, imitating its rocking and swaying movement. It provides for the laying over the regular stage of a false stage, hinged at its forward edge to the main stage, and its rear portion being mechanically controlled to raise and lower it and give it more or less lateral movement. The false stage is preferably constructed of a series of sections, and is beveled with a feather edge where it meets the main stage, preventing the line of sight from the audience being obstructed, and thus producing a complete illusion.

**PERMUTATION PADLOCK.**—Hermann Wagner, Quinnesec, Mich. This is an improvement in locks for trunks and desks, the combination when set requiring considerable skill to discover it, and the construction being simple, durable, and inexpensive. The lock casing has slideways with openings in the ways and in the casing, the tongue of a keeper entering the openings in the casing and being engaged by locking slides, each of which has releasing openings for the tongue. A combination slide is adjustably carried by each locking slide.

**FILTER.**—Gaston Descamps, Havana, Cuba. This is an apparatus designed to filter a large quantity of liquid in a comparatively short time, and comprises a tank or vessel in which is suspended a basket or net containing the filtering material in the shape of a sponge. The liquid to be filtered is passed through several filtering compartments, and for very heavy tanks a special raising and swinging mechanism is provided for removing the covers when necessary.

**FAUCET AND ATTACHMENTS.**—Joseph E. Wright and Edwin A. Grover, San Antonio, Texas. For drawing beer or other liquids and preventing the contact of air within the keg, these inventors have provided

a sliding attachment for a faucet, comprising an inflatable air bag and a fixed and sliding tube for pushing the bag out of the faucet proper into the keg, afterward permitting injection of air, there being valves for regulating the discharge of the contents of the keg. The construction is adapted for use in place of the ordinary beer faucet, and is inexpensive and durable.

**STOVE LIFTER.**—Frederick E. Armstrong, Genoa, N. Y. This invention comprises a handled shank having a fixed jaw and a spring-pressed lever fulcrumed on the shank to form, with the fixed jaw, a pair of jaws, for conveniently lifting and holding a gridiron, no matter what its position may be on the stove.

**AWNING SHUTTER OR BLIND.**—Andrew Schmitt, Brooklyn, N. Y. This shutter is made in sections connected by link hinges, permitting one section to be passed over and beyond the other, there being lock nuts on the pivots of one or more of the hinges, enabling the lower shutter section to be held in any desired position relative to the upper section. This shutter may be used as an awning or a shield for a window or other opening, or for a sign or to display goods. It is readily adjusted to its various positions and may be locked to close the opening covered.

**FURNITURE BRACE.**—James E. Summers, Clifton Forge, Va. This is a tension device applicable to the legs of furniture, the frame of a bedstead, etc. It comprises a casing to be secured to the article to be braced, racks sliding at right angles to each other in the casing, near an opening in which is journaled a pinion engaging the racks, each rack at its outer end being adapted to receive a wire, and the several wires engaging opposite sides of the article to be braced.

**TIP FOR CIGARS OR PIPES.**—Joseph S. B. Hartsock, Washington, D. C. This is a cap or tip to be used on the end of a pipestem or the small end of a cigar to prevent the hot stream of smoke from coming directly against the tongue. It is a hollow cap with closed back end and a circumferential row of lateral outlets extended in the form of slots to the edge to form spring tongues and having also fixed centrally within it a penetrating pin. In smoking the smoke issues in radiating jets, instead of directly at one spot.

**THREAD GUIDE AND CUTTER.**—Joseph Walter, Brooklyn, N. Y. This is a simple device to be attached to a spool to permit the thread to be removed as desired without becoming tangled or the loosening of the thread upon the spool. It is held upon the spool by means of spring jaws, a slight pressure upon which permits the ready turning of the spool as thread is unwound, a knife being secured in position to conveniently cut the thread after the desired length has been drawn out.

**DESIGN FOR CARPET.**—Hugo Werner, New York City. This carpet is decorated with connected leaf scrolls, the members of which are made up of leaf figures distinct in themselves and overlapping, the main stem having a petal formation from which the bunchings of leaves appear to emanate.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

### NEW BOOKS AND PUBLICATIONS.

**NOMENCLATOR COLEOPTEROLOGICUS.** Eine etymologische Erklärung sämtlicher Gattungs- und Artnamen der Käfer des deutschen Faunengebietes. Von Sigm. Schenkl. Frankfurt a. M., Germany: H. Bechhold. Pp. 224. Price bound, 5 marks.

This little volume gives an entomological explanation of the order and species names of the German coleoptera and also of the terminological expressions used by scientists, to enable others to understand the words used and their origin.

**STATE OF NEW YORK.** Annual report of the Forest Commission for the year 1893. Vol. I and Vol. II. Albany: James B. Lyon, State printer. 1894. Pp. 388, 468.

The two volumes contain a report of the Forest Commission of the State of New York. It differs from the ordinary legislative report in having a really very large proportion of very readable matter about the primeval forests of the State. It is beautifully illustrated, moreover, with photogravures, and it is to be hoped that the elegant production will do its part in preserving from the destruction menacing them the woods so necessary to our well-being. The report, in every way, does all those concerned the highest honor, and now that forestry is coming to the front, it cannot but be believed that our woods will yet be saved. Some of the camping scenes and illustrations of Adirondack resorts are most attractive. The second volume is devoted to the laws pertaining to the forests, forest highways, railroads, etc., and is of special interest only.

**THE DAILY NEWS ALMANAC AND POLITICAL REGISTER FOR 1895.** Issued by the Chicago Daily News. Pp. 455. Price 25 cents.

The annual cyclopaedia of former days is to a great extent replaced by almanacs of this type issued by the leading newspapers of this country. The immense quantity of matter contained in this work renders it impossible to review it within the limits of our space. It contains two indexes, one for the present volume and one for the years 1885 to 1894 inclusive.

**THE CHURCH OF SANCTA SOPHIA, CONSTANTINOPLE.** A study of Byzantine building. By W. R. Lethaby. Harold Swanson. 1894. London and New York: Macmillan & Company. Pp. viii, 307. Price \$6.50.

The author of this interesting monograph opens it by quotations referring to the unsurpassed beauty of the famous church, now mosque, of Constantinople. In the making of the book every endeavor was made to produce a true edition de luxe. In the paper, with the natural rough edge, and the typography not only is nothing more to be desired, but in it one of the most elegant samples of book making that we have ever seen is found. The illustrations in black and white are satisfactory and to the point, and in the text a quantity of historical information is contained, which is of greater interest to many than