

end, and at its forward end the figure of a tree having a slot in its rear side, the figures of a dog and cat connected with the base and tree by slides and springs, and a trip lever, whereby the weight of a coin dropped upon the said trip lever will release the dog, and the forward movement of the dog will release the cat, which will then run up the tree.

Mr. John S. Powers, of New Burlington, Ind., has patented an improved water gate, consisting of a base frame secured to the bottom of the stream, an inclined frame hinged at its upper stream end to the base frame, and supported at its down stream end by hinged standards having a crossbar attached to their upper ends, and wheels pivoted to their lower ends, and the stops attached to the base frame for the wheels of the supporting standards to rest against, so that the passage of animals will be prevented and the gate will be lowered to the bottom of the stream by a rise of water or an accumulation of rubbish.

An improved horse collar fastening has been patented by Mr Samuel Peters, of Sydney, Nova Scotia, Canada. The object of this invention is to provide the extremities of the horse collar with a fastening whereby the collar can be conveniently opened and closed, and thereby readily adjusted to or removed from the neck of the animal.

Messrs. Frederick H. Hubbard and John J. Ashley, of Brooklyn, N. Y., have patented an electric plaster which is an improvement on that class of healing plasters which are designed to have the curative properties supplemented or increased by electrical currents.

Mr. Hamline Q. French, of New York city, has patented an improvement in the construction of roofs for vaults, mausoleums, and structures of similar character built of stone and intended for burial purposes. The object of this invention is to obtain a building without vertical joints, and one held together and locked at the roof, so that by the locking and the weight of the roof the structure shall be made as enduring as the material of which it is built.

An improvement in window-cleaning chairs has been patented by Mrs. Anna Dormitzer, of New York city. This invention is designed as an improvement on the window-cleaning chair for which Letters Patent of the United States Nos. 200,441, 206,935, 206,936, and 219,234 were granted and issued to the same inventor, respectively, February 19 and August 13, 1878, and September 2, 1879, and its object is to further simplify the construction of the chair, and make it less expensive and more complete and durable.

An improved store counter seat has been patented by Mr. Willis M. Corwin, of Glen Cove, N. Y. The invention consists in a store counter seat in which a bar carrying the seat is provided with a catch recess, a hinged bar pressed forward by a spring to carry the seat beneath the counter, a catch bar to engage with the recess of the seat bar to hold the seat in place when under pressure, and a spring to raise the seat bar from the catch plate when the pressure upon the seat is removed, so that the seat, when released from pressure, will be carried in under the counter automatically.

Mr. Jacob Katzenberg, of New York city, has patented an attachment for button-hole and embroidery sewing machines for use in laying cords along the edges of button holes for the purpose of filling out or raising the stitches that surround it, thus producing more finished and durable work.

An improved baling press has been patented by Mr. Alpeus D. Channell, of Sabetha, Kan. This improvement consists in the combination, with two hoppers and two baling boxes, of hinged doors, hinged connecting bar, and the hand lever, whereby the hay in the hoppers can be forced into the baling boxes to be carried forward by followers.

Messrs. William F. Miller and Charles W. Stover, of Tipton, Iowa, have patented a hog-cholera compound consisting of turpentine one pint, spirits of camphor one pint, cayenne pepper one half of an ounce, and carbolic acid one half of an ounce.

The revenue laws extending the bonding of whisky from one to three years make it necessary to increase the number or capacity of bonded warehouses, and it is desirable that the racks in such houses should combine great storage capacity with cheapness of construction. The most approved method of construction at present is to set up rows of upright timbers within the house, about three feet apart in one direction, and brace or hold them together with iron bolts and rods having nuts on each end, and to lay on these bolts and rods the stringers in one tier above another for supporting the barrels of whisky. Mr. Thomas J. Pottinger, of Gethsemane, Ky., has patented an improved whisky rack for bonded warehouses which reduces the cost of bonded warehouses for storing whisky.

Mr. William F. Leach, of St. Clair, Mich., has patented a portable steam auger having a rotary steam engine to operate the boring tool, handles for carrying and holding the engine, a breastplate for forcing the boring tool forward to

its work, and a tool holder or coupling for connecting a boring tool with the engine.

A nail-holding and starting attachment for hammers has been patented by Mr. George C. Peeling, of Lock Haven, Pa. The object of this invention is to facilitate the driving of nails in places where they cannot be conveniently held by the hand.

Mr. Robert Gawne, of Toledo, O., has patented an improvement in propellers for vessels. A hollow cylinder is fitted in the vessel at the stern and extends through the stern post below the water line. A cylinder extends from the stern of the vessel to near the engine, its diameter being proportioned to the extent of rise and fall it is desired to obtain for the propeller. The propeller shaft is placed in line with the central axis of the cylinder, and carries a pinion that meshes with a gear wheel on the engine shaft. The pinion will thus be always engaged in any position to which the cylinder may be turned. By a semi-rotation of the cylinder the propeller is shifted from the highest to the lowest point, and can be thus positioned according to the load or the depth of the water. With a light load the propeller can be brought down into the water to obtain effective action, and with a deep-loaded boat the propeller can be raised in shallow water, as may be necessary.

An improved sand and water break has been patented by Messrs. Charles W. Maxson, of Point Pleasant, and Jacob

**Drying Hay by Artificial Means.**

The system of drying hay by artificial heat, devised by Mr. W. A. Gibbs, of Gillwell Park, Chingford, Essex, has been before the public several years, and though its adoption has made slow progress, it is now being used by several well known agriculturists. Since the construction of the apparatus was first publicly described it has received several improvements, and it is now constructed with a single vibrating trough, along which the hay gradually traverses; the coke furnaces are combined in one with the trough, and shaking and vibrating mechanism upon two pairs of road wheels for easy transport, and the width has been reduced to seven feet.

A writer in the London Times recently saw the machine at work, and says that grass from a water meadow was being put through the apparatus, encountering at first a hot blast of about 400°, which drives off the moisture in steam, following through other streams of less heated air, and being delivered in a condition of finished aromatic hay of rich green color. Each load of more than two tons was put through in fifty-five minutes, or a slightly longer time than it took a man to load it in the field. One feature, he says, in Mr. Gibbs' machine is its value for converting injured hay into good, wholesome hay, the fans blowing out dust and must, while the sulphurous gas from the burning coke is believed to destroy the germs of microscopic life which may be the cause of disease in live stock fed upon foul hay. It is suggested that were these hay driers in the hands of men who let out thrashing machines, and could work them at a time of year when little thrashing remains to be done, they would save an immense acreage of hay every season in splendid condition. Another system, which promises to be of even higher economic value, has recently, however, been described as in successful use for several seasons by Mr. Neilson, and more recently by Mr. Knowles, of Colston Bassett Hall, Bingham, near Nottingham. This system consists in thoroughly tedding and lightly scattering the grass as soon as cut by a machine, and so expose it to the withering action of the air, whether under sunshine or showers. In about two days the green hay, without any turning or other labor expended upon it, and whether wet or not, is, in its half-made condition, carted and stacked. The rick at once begins to ferment and heat, and the heat so generated is employed to finish the process of hay-making. The temperature to which the hay is allowed to rise is regulated, and the means employed for this and for draining off all the superfluous moisture have been thus described:

In the raised base or staddle on which the rick is to stand, whether that is an ironwork structure or raised earth, is laid an airtight pipe, which may be of earthenware, of from three inches to six inches diameter, joined with cement, and this tube or air passage communicates with a vertical one in the center of the staddle, and rising a short distance to the center of the height of the rick. An exhaust fan connected with the horizontal part of the pipe is situated at a short distance from the stack, in a building or otherwise. In case of a long rick, the horizontal pipe is continued along the middle of the staddle, and two vertical pipes are used. Each aperture at the junction of the vertical and horizontal pipes is fitted with a sliding damper, and can be opened or closed by a rod extending outside the bottom of the rick. In stacking the hay a vertical air shaft or chimney is formed over each aperture, by the common method of drawing up a sack of straw or a round chaff basket as the building of the rick

proceeds; but these ventilating flues are carried up to only half the height of the stack. When the exhaust fan is set in motion, drawing air from the underground pipe and rarefying the air in the chimney, the replacement of that air can come only by currents penetrating the rick from the outside walls and roof, and gradually converging into the chimney in the center. By this exhaustion of the hot air and moisture out of the middle of the mass, cold air is induced to enter the stack at all points and to seek the central flue, bearing with it the excess of heat and the moisture, and cooling the whole substance of the rick. Very little power is required to drive a fan of the necessary size, and Mr. Knowles' five horse steam engine drives the fan when giving out a mere fractional part of its power. One horse, working a fan by means of an ordinary horse gear and intermediate motion, will do well; and two men turning a corn-dressing machine fan, arranged in connection with the air tube, have been able to accomplish all that was wanted for cooling a stack. With a gentle exhaust, the atmospheric air is caused to permeate every part of the rick in ample quantity for keeping down the temperature of the fermenting grass.

The writer referred to says: "Mr. Knowles has brought the internal temperature of a large rick from 130° down to 90° in the short period of forty minutes. In the rick while



URN FROM SEVRES.

W. Buck, of Freehold, N. J. The object of this invention is to prevent the bluffs or banks of a sea beach from being washed away by the waves or covered with sand.

**SEVRES URN.**

The engraving on this page shows a very elaborate urn from the porcelain factory at Sevres. Both design and ornamentation are so well shown in the cut as to require no comment.

**The Root of the Cotton Plant.**

The value of the cotton plant (*Gossypium herbaceum*) has been increased by the discovery that the bark of the roots yield a promising dyestuff. Mr. W. C. Staehl reports that when the bark of cotton root is exhausted by alcohol of the specific gravity of 0.84, a dark reddish-brown liquid is obtained, which, when distilled to recover the spirit, leaves a resinous matter which amounts to 8 per cent of the original weight of the bark. The new product thus obtained appears black and shining, but when pulverized takes the color of cochineal. It dissolves in 14 parts of alcohol, 15 parts of chloroform, and 122 parts of benzol. It dissolves also in caustic alkalies, and is precipitated from these solutions by acids. Hydrate of potash colors green. Sulphuric acid dissolves it with a red-brown color.

building he lays at various heights wooden tubes of bore large enough to admit a thermometer to be introduced on a lath, these tubes reaching horizontally from the outside to the center; and thus the heat of all portions of the stack can be examined. A temperature of 100° is considered the maximum at which it is advisable to let the fermentation work, the fan being set in operation as soon as the temperature approaches this. The same provision of air ducts and a manually operated exhaust fan has been employed with advantage in keeping barley and other corn stacks from heating."

This system of drying half-made hay or dry corn deserves to be made generally known, not only because of the large quantities of crops which may be saved by it, but because of the remarkable economy of labor which it secures. The system should, moreover, afford our agricultural implement makers an additional article of manufacture, by means of which the system might be carried out with facility.

#### New England Life Two Generations Ago.

Recently Mr. P. T. Barnum gave to his native village, Bethel, Conn., a bronze fountain costing \$10,000. At the presentation Mr. Barnum described with rare felicity the manner of living to which he was born. He said:

"I can see as if but yesterday our hard-working mothers hatching their flax, carding their tow and wool, spinning, reeling, and weaving it into fabrics for bedding and clothing for all the family of both sexes. The same good mothers did the knitting, darning, mending, washing, ironing, cooking, soap and candle making, picked the geese, milked the cows, made butter and cheese, and did many other things for the support of the family. We babies of 1810, when at home, were dressed in tow frocks, and the garments of our elders were not much superior, except on Sunday, when they wore their 'go-to-meeting clothes' of homespun and linsey-woolsey. Rain water was caught and used for washing, while that for drinking and cooking was drawn from wells with their 'old oaken buckets' and long poles and well-sweeps.

"The first water works ever built in Bethel were got up by my father and Capt. Noah Ferry for their own exclusive use about 1820, 60 years ago. I distinctly remember seeing the lead pipes made in Capt. Ferry's barn. The water was brought from the spring belonging to Esquire Benjamin Hoyt, on Hoyt's Hill.

"Fire was kept over night by banking up the brands in ashes in the fireplace, and if it went out, one neighbor would visit another about daylight the next morning with a pair of tongs to borrow a coal of fire to kindle with. Our candles were of tallow, home-made, usually with dark tow wicks. In summer nearly all retired to rest at early dark, without lighting a candle except upon extraordinary occasions. Home-made soft-soap was used for washing hands, faces, and everything else. Families in ordinary circumstances ate their meals on trenchers (wooden plates). As I grew older our family and others got an extravagant streak, discarded the trenchers, and rose to the dignity of pewter plates and leaden spoons. Tin peddlers, who traveled through the country with their wagons, supplied these and other luxuries. Our food consisted chiefly of boiled and baked beans, bean porridge, coarse rye bread, apple sauce, hasty pudding, eaten in milk, of which we all had plenty. The elder portion of the family ate meat twice a day, had plenty of vegetables, fish of their own catching, occasionally big clams, which were cheap in those days, and shad in their season—these were brought from Norwalk and Bridgeport by fish and clam peddlers. Uncle Caleb Morgan, of Wolf-pits or Puppytown, was our only butcher. He peddled his meat through Bethel once a week. It consisted mostly of veal, lamb, mutton, or fresh pork, seldom bringing more than one kind at a time. Probably he did not have beef oftener than once a month. Many families kept sheep, pigs, and poultry, and one or more cows. They had plenty of plain, substantial food. Doves of hogs ran at large in the streets of Bethel.

"Our dinner several times each week consisted of 'pot luck,' which was corned beef, salt pork, and vegetables, all boiled together in the same big iron pot hanging from the crane, which was supplied with the iron hooks and trammels, and swung in and out of the huge fireplace. In the same pot with the salt pork, salt beef, potatoes, turnips, parsnips, beets, carrots, cabbage, and sometimes onions, was placed an Indian pudding, consisting of plain Indian meal mixed in water, pretty thick, salted and poured into a home-made brown linen bag, which was tied at the top.

"When dinner was ready the Indian pudding was first taken from the pot, slipped out of the bag, and eaten with molasses. Then followed the 'pot luck.' I confess I like to this day the old fashioned 'boiled dinner,' but doubt whether I should relish a sweetened dessert before my meat. Rows of sausages, called 'links,' hung in the garret, were dried, and lasted all winter.

"There were but few wagons or carriages in Bethel when I was a boy. Our grists of grain were taken to the mill in bags, on horseback, and the women rode to church on Sundays, and around the country on week days on horseback, usually on a cushion called a pillion, fastened behind the saddle, the husband, father, brother, or lover riding in front on the saddle. The country doctor visited his patients on horseback, carrying his saddle-bags, containing calomel, jalap, Epsom salts, lancets, and a 'turnkey,' those being the principal aids in relieving the sick. Nearly every person, sick or well, was bled every spring."

In Mr. Barnum's boyhood the richest man in town was actually worth as much as \$3,000.

#### California Silk Exhibits.

In view of the new life which silk culture is assuming, it is worthy of note that the exhibits of silk winding appliances and silk products are very rich in this year's Mechanics' Fair, San Francisco. The *Mining and Scientific Press* says: First are the handsome and well filled cases of Joseph Neumann, a pioneer in California silk culture and manufacture. His position is on the main floor, near the musicians' stand. His exhibit is an unusually large one, occupying one elevated glass stand and a glass case. Both in variety and quantity of cocoons and raw silk, the display is remarkably good, and reflects great credit upon the exhibitor for the care, perseverance, and expense he has gone to in endeavoring to build up this industry in California. Several pyramids representing the silkworms spinning their cocoons are shown, besides over twenty cases of cocoons, all raised in this State. These latter represent many different varieties, from the smallest up to the full size of the French annual. The specimens of raw silk exhibited are very fine, and establish, as clearly as it is possible to do, that the silk manufactured from the worm bred in this State is, in its raw condition, equal to that of any country in the world. Mr. Neumann, through his own unaided individual efforts, has done much to establish this, and he is deserving of every praise for it. Interspersed among his exhibits are the different medals (nine in all) that have been awarded his exhibits in other places and countries, the whole constituting a well arranged display of silkworm productions and the marks of appreciation extended toward them by others.

The two other exhibits of silk may be found adjoining each other in the east gallery. One of these is by the California Silk Culture Association, which is the name chosen by a large number of energetic and public spirited ladies for their society, which is now the most active agency in awaking new interest in silk culture. The society has already enlisted a large number of ladies in different parts of the State in sericultural experiments, and the results thus far obtained are very encouraging. The exhibit of the Silk Culture Association is very comprehensive. It contains, first, a collection of wild silkworm moths from India and China, as also a number of the ordinary kinds. They are the property of Dr. Behr, of this city. In cocoons, the finest exhibit is that made by Mrs. S. A. Sellers, of Antioch. It is made under the auspices of the association, and comprises the following different varieties, all of California growth: French annual, Japanese annual, and bivoltines. The French annual cocoons are considered the best for manufacture, being also the largest. The bivoltines, or, as the name signifies, bi-annuals, are the smallest varieties. In addition to the cocoons, Mrs. Sellers exhibits a lot in different colors of reeled raw and floss silk, together with a number of silkworm eggs and moths. The display is a very complete one, occupying one entire large case, and would do credit to any exhibition in the world. The other exhibitors in the stall of the California Silk Culture Association are Mrs. Keeney and Mrs. McLean, of San Rafael; Mrs. Dodson, of Red Bluff; Mrs. James G. Whitney, San Francisco; Mrs. F. Dennis, Sutter Creek; and Mr. Bettelheim, of Antioch. The newly invented frame for silkworms to wind cocoons, the idea of Felix Gillett, of Nevada City, is worthy of notice, as are two very fine specimens of the California wild silkworm moth. It is stated that a very similar kind of moth to the California one is found in some portions of Tartary, and that the people make from it a rough silk cloth that gives unending wear. Garments made from it have been handed down by the Tartars from generation to generation, from time immemorial. Mrs. T. H. Hittell, the indefatigable Secretary of the California Silk Culture Association, has some interesting old German illustrated works treating of the silkworm and silk culture, and Miss Mary Wackenreuder, of San Bruno, has a very pretty imitation in wax of the mulberry tree, and the silkworms feeding. The operation of reeling the silk from the cocoons may be seen on Wednesday and Saturday afternoons.

One of the most striking displays in the pavilion is that of the California Silk Manufacturing Company, of this city. It consists of a large upright glass case filled with silk manufactures, chiefly spool silk. There is an architectural method of showing this spool silk, which shows much skill, and presents a charming effect. An excellent imitation of the State Capitol at Sacramento, and the steps approaching thereto and the lawns approaching it, is all made of silk manufacture. The building is wholly of spools of selected colors and embracing all kinds of silk thread.

#### New Dental Alloy Amalgam.

Dr. Henry S. Chase, of St. Louis, Mo., in a paper read before the Wisconsin State Dental Society, says his new alloy is made as follows: Melt forty pennyweights of pure silver; add to this thirty pennyweights pure tin; stir it, then add five pennyweights of antimony and five pennyweights of pure tears of zinc. When mixed, add thirty pennyweights of pure tin again; stir, and throw on the surface of the "melt" one half ounce of beeswax to burn off; and while burning, pour the "melt" into the cup of a vulcanizing flask to cool. Cut it up with very coarse file. Remove every particle of iron with horseshoe magnet. This amalgam must be washed in alcohol while mixing with mercury. Squeeze it in dry buckskin. This amalgam is whiter

for washing, and takes less mercury. Squeezing injures some amalgams; it does not hurt this. The amalgam pellets must be dry when placed in the cavity. This amalgam remains very white in the mouth. If all the tin should be melted at once, the antimony and zinc would never melt. If the antimony and zinc are put in the melted silver before the tin, then the antimony and zinc will burn up or oxidize.

#### Three-high Rollers.

The Lauth three-high mill, for rolling sheet iron or steel and plates, is rapidly gaining in favor in Germany, Belgium, and France. In the beginning, as Daelen reports in the *Zeitschrift des Vereins Deutscher Ingenieure*, some trouble was experienced by reason of the fact that the middle roll wore rapidly. This was caused by the adhesion of cinder to the roll, and its being passed through over and over again. This has been done away with by suitable stripping devices. Krupp has built a sheet mill for steel, having 26.4 inch top and bottom rolls and 15.2 inch middle roll, the maximum thickness of plates entering the rolls being 0.5 inch. In turning out 0.06 inch sheets, the engine makes 60 revolutions; it makes 50 for 0.04-inch sheets, 40 for 0.03 inch sheets, and 30 revolutions below that gauge. The engine has an automatic Corliss gear, a 37.6 inch cylinder, and 62.80 inch stroke. A Lauth three-high plate train at the same works has 35.6 inch top and bottom rolls, and a steel 17.80 inch middle roll, which is raised and lowered mechanically before every pass. The mill is run at the rate of 50 to 60 revolutions per minute.

#### Rapid Progress in Texas.

A special statistical edition of the *Galveston News* shows that 1,634 miles of railway have been completed in Texas within a year, and that within two years 41 additional towns of commercial importance have been reached by rail or have sprung into existence, and that the value of the State's products has increased from \$57,820,141 in 1878-79 to \$95,960,930 in 1880-81. The amount and value of the chief staples of the State for the past year are: Cotton, 1,260,247 bales; value, \$56,711,115; wool, 20,671,839 pounds; value, \$4,754,522; hides, 12,262,052 pounds; value, \$1,471,446; cattle, 781,874 head; value, \$15,923,018; horses and mules, 28,175 head; value, \$1,408,750; grain, 39,665 car loads; value, \$6,941,375; lumber, 278,609,542 feet; value, \$5,572,191; cotton seed cake and oil, \$1,242,315; miscellaneous products, \$1,344,728; sugar and molasses, \$591,470. Total value, \$95,960,930.

There has been expended during the year for railroad construction within the State something like \$20,000,000, which added to the above would give a grand total of \$115,960,930 as the sum derived by Texas to the credit of its industrial and agricultural resources, or fully double that of the year 1878-79.

#### An Electric Storm at Sea.

The German war schooner *Nautilus* reports passing through a singular storm while crossing the South Pacific from Tahiti to Sydney, Australia.

On the afternoon of May 11, the whole heavens appeared to be enveloped in cloud, which made it so dark that the crew could scarcely see the length of the ship. The thunder became deafening, and the flashes of lightning almost blinded the sailors' eyes. All around the vessel the lightning was striking the water, so that persons on board expected the vessel itself would be hit. But this they were spared. The effect, however, was singular and grand, and at times the vessel appeared to be in flames in several places at once. Bolts of lightning on several occasions fell to the water within 20 or 40 yards of the ship's side. While this peculiar storm lasted very little rain fell and the sea was almost entirely still.

#### Reversing the Wheels.

Experiments lately made at Blackburn with a train made up in imitation of that of the express which ran into the train standing in Blackburn Station, to test the statement of the driver that he reversed his engine as soon as he found the brakes did not check his train, are of some interest, though they elicited the fact that the reversal of an engine of a train running at a high velocity has but a very small effect in reducing the speed. A high speed was attained, and the engine was reversed a quarter of a mile before reaching the station, but the train ran through the station at about twenty miles an hour, and had to be stopped by the brakes. Locomotive driving wheels, when running the reverse way, are not effective in stopping a train. The experiment shows how little can be gained by reversing an engine under such circumstances.

#### The Largest Land Owner on the Continent.

Colonel Dan Murphy, of Halleck's Station, Elko County, came to California in 1844, and may be said to have made the country pay him well for his time. He is now probably the largest private land owner on this continent. He has 4,000,000 acres of land in one body in Mexico, 60,000 in Nevada, and 23,000 in California. His Mexican grant he bought four years ago for \$200,000, or five cents an acre. It is sixty miles long and covers a beautiful country of hill and valley, pine timber, and meadow land. It comes within twelve miles of the city of Durango, which is to be a station on the Mexican Central. Mr. Murphy raises wheat on his California land, and cattle on that in Nevada. He got 55,000 sacks last year, and ships 6,000 head of cattle a year right along.—*Reno Gazette*.

**A Japanese Earthquake Record for 2,000 Years.**

The *Japan Gazette* prints a translation from a noted *O-Jishin Neudarkki*, giving a calendar of earthquakes in Japan for 2,000 years. A summary of the record is printed in the *San Francisco Bulletin* of July 25.

The first entry in the Japanese chronology is 295 years B.C.: "In the fifth year of the reign of Kōrei-tei, the seventh Emperor, the earth in the province of O-mi sank down, and in one night was changed into a lake. During the same night Fujiyami was upheaved. This was the first earthquake." The presumption is that this was the first of which there is any authentic record in Japan. We here have the origin of the famous and sacred mountain of Japan, provided the account is correct. An earthquake which made a part of one province into a lake, and raised a mountain nearly 17,000 feet high, certainly ought to have an authentic record. It is known that a mountain was lifted out of the plains in one of the States of Mexico in comparatively modern times. The next notation is about the year 412 A.D., when there was a "strong earthquake." Here is an interval of about 700 years in which no convulsion was severe enough to make a part of the ancient record, or if so the record as now read is silent. From the year 600 A. D. earthquakes were frequent. Coming down to the year 976, the record says there was "the greatest earthquake that ever took place, and the shaking continued for over 200 days." In the year 1510 it is noted that the shaking continued 75 days, and during this time a stone portal of one of the great temples was broken down.

A great earthquake is noted in 1595, during which a large temple was destroyed. In 1703 "the earth shook for 200 days in Kuanto, or the eight Eastern Provinces." In 1707 a great earthquake took place in Osaka. "Men and women escaped into boats, but they were all drowned by the sudden rising of the waves." In the southern and northern divisions of the town, 620 dwelling houses were destroyed by the shock. The number of the killed in the southern division was 3,620; in the northern, 2,331. The number of the killed by the waves in the southern division was 12,000 souls, and in the northern 12,030; 22 bridges were destroyed, and the waves rolled up with thousands of ships as far as Dōtombori. The number of the killed was counted in all at 29,981. At this time blue mud gushed forth along the shores of the Provinces of Kii, Ise, Mikawa, and Totomi, and many lives were destroyed by the sudden rolling in of high waves. Fujiyama shook and erupted. Ashes fell in the neighboring country. At this time Hōyeizan was created. Hōyeizan is a parasitic cone on one side of Mount Fuji.

The intervening earthquakes are not here noted, because there is no statement of any destructive results. In 1751 an earthquake is noted at Takata. "During this time the mountain slipped down, and 10,000 lives were lost." During the earthquake of 1847 many persons were killed. In 1854 there was a severe shock. "The dead were innumerable. Those who died by the high waves at Okata were numbered at over 6,000." A list of the towns and provinces is given where the earthquake was the most severe. This was apparently the greatest earthquake ever known in Japan:

"In Osaka, a great many ships were destroyed and persons killed by the high waves which rose after the earthquake. In the river Aikawa, 174 junks and 180 boats of various descriptions and 150 persons were destroyed. In the river Kidzūkawa 590 junks were destroyed. Up to the 11th day of the 11th month (1854, December 30) over 600 bodies were drawn out of the river. Counting the dead of various provinces there were over 6,000. In every part of the city buildings of various descriptions, such as Buddhist and Shinto temples, towers, bridges, theaters, etc., were destroyed and burned. Consequently in many quarters of the city a vast number of human beings died. The sea shores and river sides were damaged, and ships of every kind were destroyed, while the men who were in them almost without exception lost their lives. In the neighboring countries or villages the damage was equally great. The commencement of the shake was at half past the fifth hour, that is, at 9 o'clock in the morning of the 12th. From this hour the shaking continued almost unceasingly until 4 o'clock in the afternoon of the 13th day, when the greatest shock occurred. After this no more severe shocks were felt. Several buildings were destroyed and men were killed. At Nagoya, in the Province of Owari, the shaking was severe on the 4th and 5th days of the 11th month (1854, Dec. 23 and 24). Great numbers of houses were destroyed, many being attacked by waves. High waves of about twenty feet in height rolled over the rice fields of Chitagori, and in three places large dikes were injured. Houses at Susaki, O-i, Kamezaki, etc., were destroyed. In Yawata, in the Province of O-mi, buildings of various descriptions, such as dwelling houses, Buddhist and Shinto temples, etc., were leveled to the ground. The damages in Hikone and Nagahama were about equal. The damages in Samegai were also great. Mount Yorozan slipped down, and the clear water of the neighboring streams became muddy. Seven or eight tenths of Kano and O-gaki were also injured. More than one-half the houses in Sunomata suffered, and mud gushed forth from fissures in the earth. Two-tenths of Hagiwara and eight-tenths of Inaba were also destroyed. In a village between Niizaka and Nakago the earth was split to a depth of four or five feet, and the level of the earth was made uneven. Yokosuka, between Okitsu and Yejiri, was half destroyed. Shimidzu, a harbor between Yejiri and Fuchui, was very much damaged. The

houses were all reduced to ashes and taken by the waves far out to sea."

A list of about fifty places is given where the waves were very high and a great deal of destruction was wrought. The earthquakes appear to have lasted through the latter half of the year 1854. The earth opened in seams several feet wide for miles in extent, provinces were inundated, cattle and men destroyed. As late as December 23 of that year it is noted that great waves rolled up the rivers, and a great number of ships were destroyed. At Yusa 600 houses were swept away by the waves. At the village of Hiroura, out of about 1,000 houses, all but three were carried by the waves out to sea. In a number of other villages it is noted that half the houses were carried away by the waves. Then follows another list of towns where the earthquakes of that month or the tidal waves were the most destructive:

"Shook actively in Kojima, in the Province of Awa, and the seventh part of the city was destroyed or else burned by fire. High waves rolled up in Tanabe and Kumano, in the Province of Kii, and all the ships which were near the shore and on the river banks were thrown up and utterly wrecked. Waves equal in force to these attacked several other places. In some villages not only the houses but also the animals were swept entirely away."

The record ends with 1854.

**The British Science Association.**

The annual meeting of the British Association for the Advancement of Science began in York, England, August 31. It is known as the jubilee meeting, the first meeting of the association having been held in the same city just fifty years ago. It has met in York but once since, in 1844. An interesting feature of the jubilee gathering is a loan collection in which the instruments of scientific research used half a century ago will be contrasted with those now in use, with as complete a chain of intermediate links as can be obtained. Below is a list of the presiding officers of the association from 1831 to 1881, with the places of meeting:

Year.	Met at.	President.
1831.....	Yorks.....	Lord Fitzwilliam.
1832.....	Oxford.....	Dr. Buckland.
1833.....	Cambridge.....	Professor Seagewick.
1834.....	Edinburgh.....	Sir T. M. Brisbane.
1835.....	Dublin.....	Dr. Lloyd.
1836.....	Bristol.....	Lord Lansdowne.
1837.....	Liverpool.....	Lord Burlington.
1838.....	Newcastle.....	Duke of Northumberland.
1839.....	Birmingham.....	Rev. W. Vernon-Harcourt.
1840.....	Glasgow.....	Marquis of Breadalbane.
1841.....	Plymouth.....	Dr. Whewell.
1842.....	Manchester.....	Lord Ellesmere.
1843.....	Cork.....	Lord Rosse.
1844.....	York.....	Dean Peacock.
1845.....	Cambridge.....	Sir John Herschel.
1846.....	Southampton.....	Sir Roderick Murchison.
1847.....	Oxford.....	Sir R. H. Inglis.
1848.....	Swansea.....	Marquis of Northampton.
1849.....	Birmingham.....	Rev. T. R. Robinson.
1850.....	Edinburgh.....	Sir David Brewster.
1851.....	Ipswich.....	Professor Airy.
1852.....	Belfast.....	Colonel Sabine.
1853.....	Hull.....	Mr. William Hopkins.
1854.....	Liverpool.....	Lord Harrowby.
1855.....	Glasgow.....	Duke of Argyll.
1856.....	Cheltenham.....	Dr. C. G. B. Daubeny.
1857.....	Dublin.....	Dr. Lloyd.
1858.....	Leeds.....	Professor Richard Owen.
1859.....	Aberdeen.....	Prince Albert.
1860.....	Oxford.....	Lord Wrottesley.
1861.....	Manchester.....	Mr. William Fairbairn.
1862.....	Cambridge.....	Professor Willis.
1863.....	Newcastle.....	Sir William Armstrong.
1864.....	Bath.....	Sir C. Lyell.
1865.....	Birmingham.....	Professor Phillips.
1866.....	Nottingham.....	Mr. W. R. Grove, Q.C.
1867.....	Dundee.....	Duke of Buccleuch.
1868.....	Norwich.....	Dr. J. D. Hooker.
1869.....	Exeter.....	Professor Stokes.
1870.....	Liverpool.....	Professor Huxley.
1871.....	Edinburgh.....	Sir W. Thomson.
1872.....	Brighton.....	Dr. W. Carpenter.
1873.....	Braford.....	Dr. A. W. Williamson.
1874.....	Belfast.....	Professor Tynndall.
1875.....	Bristol.....	Sir John Hawkshaw.
1876.....	Glasgow.....	Dr. Andrews.
1877.....	Plymouth.....	Dr. Allen Thompson.
1878.....	Dublin.....	Mr. Wm. Spottiswoode.
1879.....	Sheffield.....	Dr. G. J. Allman.
1880.....	Swansea.....	Professor A. C. Ramsay.
1881.....	York.....	Sir John Lubbock.

**Nearsightedness in Schools.**

The results of an inquiry into this subject are given in a recent number of the *Elsass-Lothringische Volksschule*, showing that myopia is greatly spreading amid the boys and girls of the German schools, the mischief being more marked as the children get up into the higher classes of the schools. The number of shortsighted in the elementary classes was 5 to 11 per cent (the examination embracing 10,000 children); in the higher schools for girls the proportion was from 10 to 24 per cent; in the *realschulen*, between 20 and 40 per cent; in the gymnasias, between 30 and 55; and in the two highest classes of all, between 35 and 88 per cent. A physician at Tübingen has found in an examination of 600 students of theology 79 per cent suffering from myopia, and he attributes this frequency to the small, crabbed print of the dictionaries. No doubt, also, a large proportion of the children's shortsightedness arises from defective living and bad sanitary conditions. In connection with this branch of the subject may be mentioned the report of a society at Leipsic for enabling children under this condition of life to be sent either to the seaside or the country. During 1880 there were 131

children sent away, namely, 67 boys and 64 girls. Of these 119 were forwarded to the Ergerbirge, and the remainder to the baths at Frankenhäusen, in Thuringia. During the six weeks of the stay the average weight of each child increased to about 1¼ kilogrammes, the measurement of the chest in nearly every case was also increased, and the sight of many perceptibly improved. The expense of the visit per child was about £2 13s.

**RECENT INVENTIONS.**

Mr. Charles O. Nyqvist, of Brooklyn, N. Y., has patented an improved storm rudder which enables seamen to readily control their vessels should the rudder become unshipped or disabled in a storm. The invention consists in placing rudders on the sides of vessels, and in arranging suitable mechanism for operating the rudders, whereby the vessel can be guided and controlled should the ordinary rudder become disabled.

An improved car coupling has been patented by Mr. George Holford, of Sedgwick, Kan. The invention consists of a vertically sliding spring-actuated connecting bolt which engages with the head of the connecting link upon three sides, the bolt being adapted to move in ways formed in the drawhead.

Mr. William H. Howland, of San Francisco, Cal., has patented an improvement in machines for grinding ore. These improvements relate to machines for grinding ore, either wet or dry, and for grinding paints and other materials. The inventor makes use of a pan-shaped receptacle for the material with a ring-shaped bed, and fixed around a central shaft carrying the driver. The driver consists of a conical sleeve, to which the grinding blocks are hung, so as to be thrown out centrifugally by rotation of the driver. A pipe supplies air or water within the driver, from which it passes to the grinding surface, and acts to carry the ore or other material outward.

An improved fish and game trap has been patented by Messrs. Gottlieb Rentz and Frank. H. Herzog, of Quincy, Ill. This invention consists in a wire with hooks at the ends, and a spring coil in the middle, forming two shanks, which are provided with short bends to receive the end of a spring trigger when the two shanks are crossed. When the animal bites or nibbles at the bait the spring trigger snaps upward, thus releasing the spring shanks, which are forced apart in the mouth of the animal.

An improvement in bottle washers has been patented by Mr. Lawrence Wagner, of Jefferson City, Mo. The object of this invention is to provide a safe, speedy, and simple method of cleaning bottles.

Mr. Armand Muller Jacobs, of Moscow, Russia, has patented a process of preparing a mordant for use with alizarine in dyeing in turkey red color, which consists, first, in uniting about two hundred and twenty parts of oil or fat and fifty parts of sulphuric acid, the mixture being stirred for about three hours until a temperature of 30° to 45° Reaumur is reached, and then left at rest for about twelve hours; secondly, adding to this mixture a watery solution of crystallized soda, and allowing the whole to stand about twenty-four hours; thirdly, drawing off the neutralized oil and adding about twenty-six parts of aqua ammonia.

An improved temporary binder has been patented by Mr. George H. Reynolds, of New York City. The invention consists in combining with a book cover a stiffener having strips, flanged plates apertured and attached to covers at each end, metallic strips that are passed into the folds of the papers, and a slotted studded tube carrying a spring catch.

An improved millstone face has been patented by Mr. George A. Coles, of Middletown, Conn. The object of the invention is to save middlings by preventing the granules formed in the furrows from being crushed or pulverized by the lands as the middlings make their way toward the skirts of the stones. The invention consists in connecting the main furrows of a millstone by channels made at right angles to a given radius of the face of the stone, and being limited in extent by the furrows and distributed over the working surface of the stone from the bosom to the skirt.

An improved dish cleaner and drainer has been patented by Mr. Samuel B. Luckett, of Knightstown, Ind. The invention consists in constructing a dish washing and drying apparatus, with a base frame, posts, and a top frame having dish receiving notches, a pan to receive the drip water, longitudinal bars for supporting cups while drying, a hinged angular plate or apron for supporting dishes while being washed, and a perforated pan for supporting knives and forks while drying.

Mr. Bat Smith, of Spanish Camp, Texas, has patented a composition for preserving wood, consisting of coal-tar, crude carbolic acid, and crude pyroligneous acid.

Mr. John H. Gramps, of Stone Arabia, N. Y., has invented a holder for use with ordinary hand lamps, by which such lamps can be securely held on sewing machines, tables, etc., and at other places where there is liability of the lamps being upset. The invention consists in a combined clamp and adjustable holder adapted for being secured to the edge of a table, and for holding the lamp in any position required.

Mr. Gamaliel King, of Westfield, Mass., has patented an improved whip formed of a central cord and sectional rattan cover.

An improved rein holder has been patented by Mr. Edward C. Clarke, of Circleville, Ohio. This is a device to be attached to the dashboard, seat, or other part of a carriage or other conveyance for holding the reins.