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The WEST SHORE.



A FAMILY PAPER,
DEVOTED TO

AMERICAN SCIENCE, ART,

AND THE
RESOURCES OF PACIFIC NORTHWEST.

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Portland, Oregon.

THE WEST SHORE.

VOL. 6—No. 7. { L. Samuel, Publisher,
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Portland, Oregon, July–August, 1880.

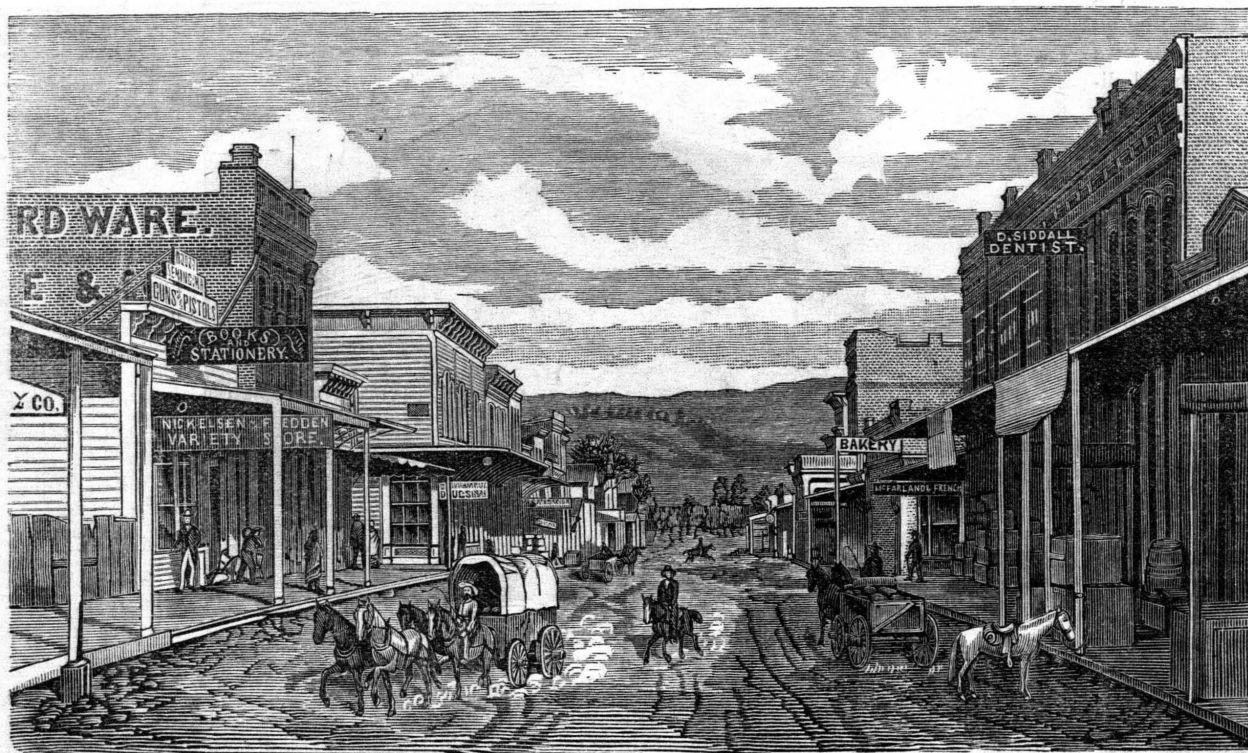
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HOW WE TRAVEL.

An Eastern correspondent asks the significant question, "What means have you for reaching the Pacific Ocean, and how do you get, overland, from Portland to Puget Sound and British Columbia?" Now, this is just such an inquiry as we love to answer, since it gives us the opportunity of enlightening, through our columns, hundreds of our Atlantic friends who have little or no idea of the modern and approved ways we have of living and doing

Columbia, so happily emblematic of the sovereign republic whose historic appellation it so nobly perpetuates. Then, on and on we go, adown this once mystic river of the West, spanning a full degree of longitude ere we are aware of the day's decline. Having arrived at Astoria, the foster-child of old John Jacob Astor, and essentially the commercial portal of the illimitable Pacific, it is at our option to stop here and listen to the moaning of the tide, or drop down ten miles farther to the

and through whose mighty gateway is riding, every hour of the day and night, half the commerce of the great West, we retrace our journey to start anew for that land of anomalous sights, the Puget Sound country. To do this, we embark on the *Dixie Thompson*, or one of her elegant sister craft, and hie like a bird to Kalama, the present river terminus of the Northern Pacific Railroad; thence, in one of the superb passenger coaches of this road, about sixty miles to the junction of the Olympia



SECOND STREET, THE DALLES, WASCO COUNTY, OREGON.—FROM A PHOTO BY F. J. GEHRES.

business in this far-off "Indian country." Why, indeed, after exchanging a ringing "Good-morning" with our friends, we take one of the Oregon Railway and Navigation Company's steamers, equal, in all respects, to the floating palaces of the Hudson, the great lakes, or the Mississippi, dash at the rate of twenty miles an hour down the sparkling waters of the beautiful Willamette, a river owned entirely, and in fee simple, by our booming State, until we find ourselves upon the broad bosom of the great

cape and see the waters that have come from a thousand tributaries lose themselves in the profundity of old ocean's dark eternity.

Here, since ages ago, the red man has listened to the voice of the Great Spirit, manifested in the thunder of the surf as it bombards the solid earth and then retires, crest-fallen, from the everlasting abutments of nature's own masonry.

Leaving this broad estuary of a river which has drained more than two hundred thousand square miles of territory,

& Tenino Railroad, a little hamlet fifteen miles from the head-waters of the Sound. Here it is, "Change cars for Olympia," or, we can remain in our seats and go to New Tacoma, about forty miles further on, at present the extreme northwestern terminus of the Northern Pacific road. Much as this route from the Columbia to the Sound has been commented on by travelers, it yet remains, in all its great essentials, an unwritten volume. As the iron horse rushes along in his impetuous career, the eye is regaled with a living

panorama of sylvan and mountain scenery that pales the limner's art and impoverishes our language to adequately portray.

Having taken our first glimpse of the sleeping Sound and sniffed the salt sea air, we take steamer passage for Victoria either at the capital city or Tacoma, just as fancy may be inclined to dictate. This wonder of inland seas, with its labyrinth of inlets and indentations, is traversed in a few hours, when we find ourselves dancing over the blue waters of the Strait of Fuca, a veritable arm of the North Pacific, and, in point of accessibility and spacious anchorage, second to no harbor on the globe. We arrive at Victoria, betimes, and marvel that a city of mid-winter flower gardens, nay, a city affording all the delights of a semi-tropical climate, can boast of forty-eight degrees thirty minutes north latitude. Victoria is the metropolis of Her Majesty's north-western possessions, and it is unqualifiedly pronounced by visitors a beautiful city. But duty calls, and we must return.

Having repaired to Beacon Hill and taken a parting glance at the snow-clad shaft of Mount Baker, we make our toilet for the homeward-bound trip.

For the sake of "completing the circuit," we will court the favor of old Neptune, and take the steamer from Victoria to Portland direct. A day and a night on the bosom of the great deep, and Cape Disappointment heaves in sight. The bar is crossed, a few hours suffice for our pilot to moor us at the company's wharf, and we once more saunter through the streets of Portland. So this is the way we travel.

It was a German editor who said that thieves were so scarce in America that a reward had to be offered for them.

OUR FAIR.

The Portland Mechanics' Fair for 1880 will open in the Pavilion on October 7th, and close on the 23d. The great success of the Fair of 1879 has induced the Society to make still greater preparations for this season. The capacity of the building is being doubled, so that when completed, in time for this year's Fair, it will be 200 feet square. The floral department will include a beautifully laid-out garden, with artificial waterfalls, grottos and romantic promenades. No pains are being spared to make the Fair of 1880 the finest exhibition of the industrial resources of the Pacific ever made in this State. By excluding all species of gambling schemes or exhibits of a

Treasurer, Wm. M. Ladd; Superintendent, E. Oldendorff. Board of Directors—Frank Dekum, Peter Taylor, Chas. Hodge, A. T. Smith, D. P. Thompson, Wm. M. Ladd, Geo. W. Weidler, W. Kapus, W. B. Honeyman, H. W. Monnastes, A. H. Morgan.

THE DALLES.

One of the liveliest business places in Oregon, to-day, is Dalles City, or, as it is better known, The Dalles. It is the county seat of Wasco, and has a population, as per census just returned, of 2,600. Like all other places, it has had its ups and downs, but never has it been on so firm a footing as at present. Its present prosperity is not the result of any mining or other excitement, but

arises from natural growth. As the country is settled up and the heretofore vacant lands are occupied by thrifty farmers, its peculiarly central location—allowing for but natural growth—insures for Dalles City a population of at least 5,000 at the close of the year 1882.

Our engraving of the principal business street will give our readers a general idea of the substantiability



UMATILLA HOUSE, THE DALLES.—From a Photo by F. J. Gehres.

doubtful character, the Society has won the confidence of the public, thereby securing a liberal support. As a rule, it will be found that the most meritorious exhibitions secure the best support, thus proving conclusively that "horse trots" are not absolutely indispensable to make a successful Fair.

To the energy and pluck of Mr. H. D. Sanborn, is principally due that we are now having a Mechanics' Fair in this city. The initial Fair was entirely arranged, managed and successfully carried out by him, and this acted as the stimulus which brought the present Mechanics' Fair into existence.

The officers for 1880 are: President, Frank Dekum; Vice President, Peter Taylor; Secretary, H. B. Nicholas;

of the place. The residences are neat, have well-kept lawns surrounding them, and some of them would be a credit to a city with 20,000 inhabitants. In a future number we intend to illustrate two or more of the handsomest residences.

Since the last disastrous fire visited The Dalles, from which the place has, however, entirely recovered, the citizens have organized into an efficient and well-drilled fire department, consisting of 125 active members, under the general command of Geo. Munger, Esq., the present Chief Engineer. The department owns an Amoskeag steam fire engine, one Honeyman engine, besides hose-carts, hooks and ladders, and other necessary apparatus

At convenient places in the business portion, are several large cisterns, whilst from the fire-plugs on street corners a 42-lb. pressure is obtained.

The place boasts of a neat and roomy Opera House, owned by Max Vogt & Co. It is constructed of brick, is entirely fire-proof, and has a seating capacity of 600.

The general health of the inhabitants is above the average. School facilities are very good, and places of worship numerous.

The traveling facilities are excellent. A daily line of the finest river steamers on the Pacific Coast, passing the grandest portion of the famous Columbia river scenery, land you in Portland, after a refreshing trip of ten hours, at an expense of \$5.

A line of railway connects the city with Celilo, and from there a steamer leaves daily for Eastern Oregon, Washington and Idaho.

The completion this summer of the O. R. & N. Co.'s line of railway to Walla Walla will bring Eastern Washington yet nearer to The Dalles and add still more to its importance. Several lines of stages, making regular trips to

the various mining districts, have their terminus here, whilst all the freights for Grant county and interior towns are here transferred to "prairie schooners." The Oregon Railway & Navigation Company's repair shops, employing a large force of men, are located here, and add to keep the money circulating amongst the prosperous and enterprising business men of the place.

A very good flouring mill is located here and owned by S. L. Brooks and Mrs. P. M. Humason. They manufacture about fifty barrels of a superior quality of flour per day, for which they find a ready sale in the upper country, although they ship considerably to Portland. This firm also own the city

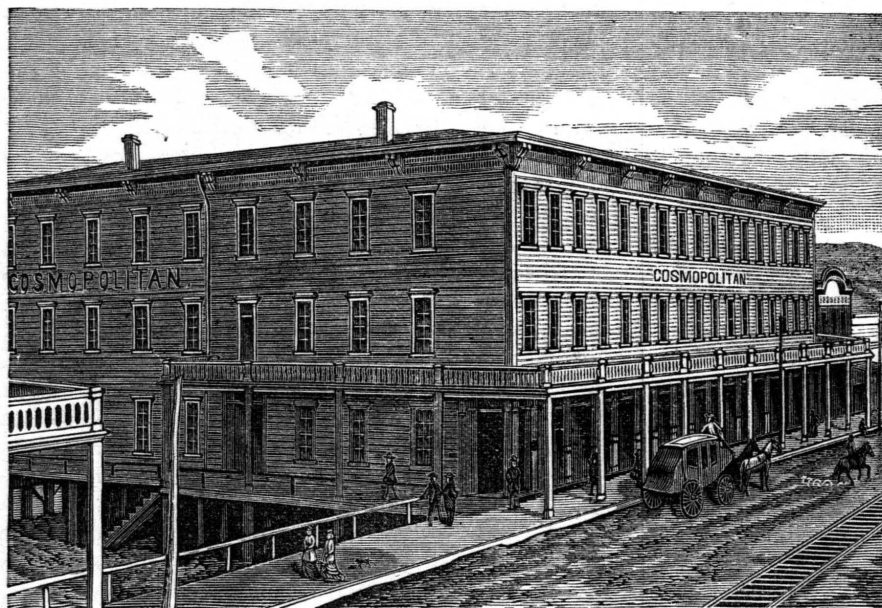
water works, a very valuable piece of property. Mr. Brooks has been a resident here since 1863, owns one of the handsomest residences in the place, and is an enterprising citizen.

The hotels of The Dalles are far above the average of what one would expect to find at a place having but 2,600 inhabitants. The Umatilla House, owned by D. Handley and N. B. Sinnott, is certainly the finest furnished house to be found outside of Portland. It occupies 100 feet front by 120 feet in depth, and cost nearly \$35,000. The office is 30x40 feet, and contains the handsomest counter and most elegant key-rack in the State. They are constructed of ash, maple and walnut, and are the work of the Oregon Furniture

and in suits, with bath-rooms on second and third floors. The rooms are all thoroughly ventilated and well furnished, especially so is the elegant ladies' parlor, 24 feet square. All the furniture for this immense establishment was purchased of the Oregon Furniture Manufacturing Company. The present firm first started this hotel in 1863, they afterwards enlarged and had the house nearly ready for occupancy, when the big fire destroyed the entire establishment. They immediately rebuilt and opened the present house on October 25, 1879. Some idea of the business transacted by this house may be formed when we tell our readers that the Umatilla House uses nearly \$600 worth of meat every month, and

that it furnishes, on an average, 500 meals per day.

The Cosmopolitan is owned by Thomas Smith, and although a somewhat smaller house, is in no way inferior to any hotel outside of Portland. Mr. Smith first opened the Empire Hotel at The Dalles, in 1861; finally he removed to Salem, where the traveling public will remember him as the genial pro-



COSMOPOLITAN HOTEL, THE DALLES.—From a Photo by F. J. Gehres.

Manufacturing Company, of this city. A large Macneale & Urban safe furnishes a safe receptacle for the valuables of the guest. The lavatory is supplied with marble basins and beautiful large pier-glass. The billiard room is 50 feet wide and 40 feet in depth, contains four of Brunswick, Balke's & Co.'s tables, and thirty elegant settees, especially designed for this house by Mr. Samuel Loewenstein, President of the Oregon Furniture Manufacturing Company. The dining-room is 50x90 feet, and has a full corps of attentive waiters, headed by a competent steward. Two flights of easy stairs, one from the dining-room and one from the office, lead to the upper floors, and here we find 123 sleeping apartments, singly

prietor of the Chemeketa. In 1874, he became one of the proprietors of the Occidental Hotel at Portland, remaining there until 1879. His hotel at The Dalles being destroyed by the big fire of 1879, he rebuilt, and opened the present house on the 27th of October of that year. The house has a frontage of 120 feet, by 40 feet in depth, with an L 60 feet long. The rooms, of which there are 75, are all light, thoroughly ventilated, and neatly furnished by the firm of Shindler & Chadbourne, of Portland. The billiard room contains two tables, of the latest pattern, and the ladies' parlor has one of Decker & Son's elegant pianos. The dining-room is 60x40 feet, is neatly furnished, and the tables are supplied

(Continued on page 200.)

THE COLUMBIA.

This magnificent steamship, the latest acquisition of the Oregon Railway and Navigation Co. to their extensive fleet of floating palaces, arrived here from the shipyards of Messrs. Roach & Co., her builders, and is now undergoing a thorough overhauling previous to being placed on the Portland and San Francisco line, leaving here on her initial trip on or about August 16th. Five hundred thousand dollars have been expended in her construction, and it is claimed that in all her appointments and conveniences she is one of the finest steamship afloat.

The Columbia is 334 feet in length, 38½ feet beam, 23 feet depth of hold and 3,200 tons measurement. She is provided with compound engines, and makes an average of 14 knots per hour. Commodore F. Bolles, well known to the traveling public of the Pacific coast, and who brought her out, will be her future commander.

The dining room of the Columbia is of elegant proportions, with two guests' or communicating rooms at the after end. The interior is finished in hard woods—French walnut, Hungarian ash and bird's-eye maple—each section being relieved by two small pilasters running up the entire height and finished with handsome mahogany capitals. The vessel is elegantly fitted throughout in the matter of carpets, furniture and upholstery. Prominent among the newest features is the heating apparatus, consisting of a register in every room, supplied with air driven in by an engine and controlled by the occupant of the room. In hot weather it can be utilized for cold, and in cold weather for hot air, thus securing perfect ventilation and doing away with the disagreeable odor of steam heaters and leakage in the rooms. But the greatest innovation is the adoption of the Edison electric light throughout the ship, the Columbia being the pioneer in this great, and, to passengers, most agreeable improvement. These lights are maintained by four of Edison's dynamo machines in the engine room, arranged so that each line is under command of the engineer. The lights of the state rooms are under control of the steward on the outside. All of the rooms are fitted up with electric calls, and the offices, smoking room, etc., are provided with telephones—the smok-

ing room being in connection with the steward's room, and the captain's with the chief engineer's, purser's and steward's. Among other improvements are an electric tell-tale on the bridge, enabling the captain to tell, by simply pressing a button, whether the engine is going ahead or back, and at what speed, so as to prevent any accident by mistaken signals from the bridge to the engine room. The steering gear has connection with the freight hoister, but with self-acting attachment. The elevators for discharging cargo are new in design, and the running engines at the ports are arranged so that a truck loaded with freight runs from the lower hold out to the dock entirely by steam.

The Maxim electric headlight is of novel construction, and is supplied by a current from one of Maxim's dynamo machines placed between decks.

The four Edison machines are arranged along one side of the engine room, as shown in Fig. 2. One of them is a dynamo electric machine used in exciting the field magnets of the others. The several circuits extending from these machines are controlled by a switch board seen at the farther side of the engine room. The state rooms on the upper and lower decks are on separate circuits; so also are the saloons. This arrangement admits the employment of the light as a signal to indicate when the time approaches for extinguishing the lights altogether, by simply breaking the circuit for an instant ten minutes before the prescribed retiring hour.

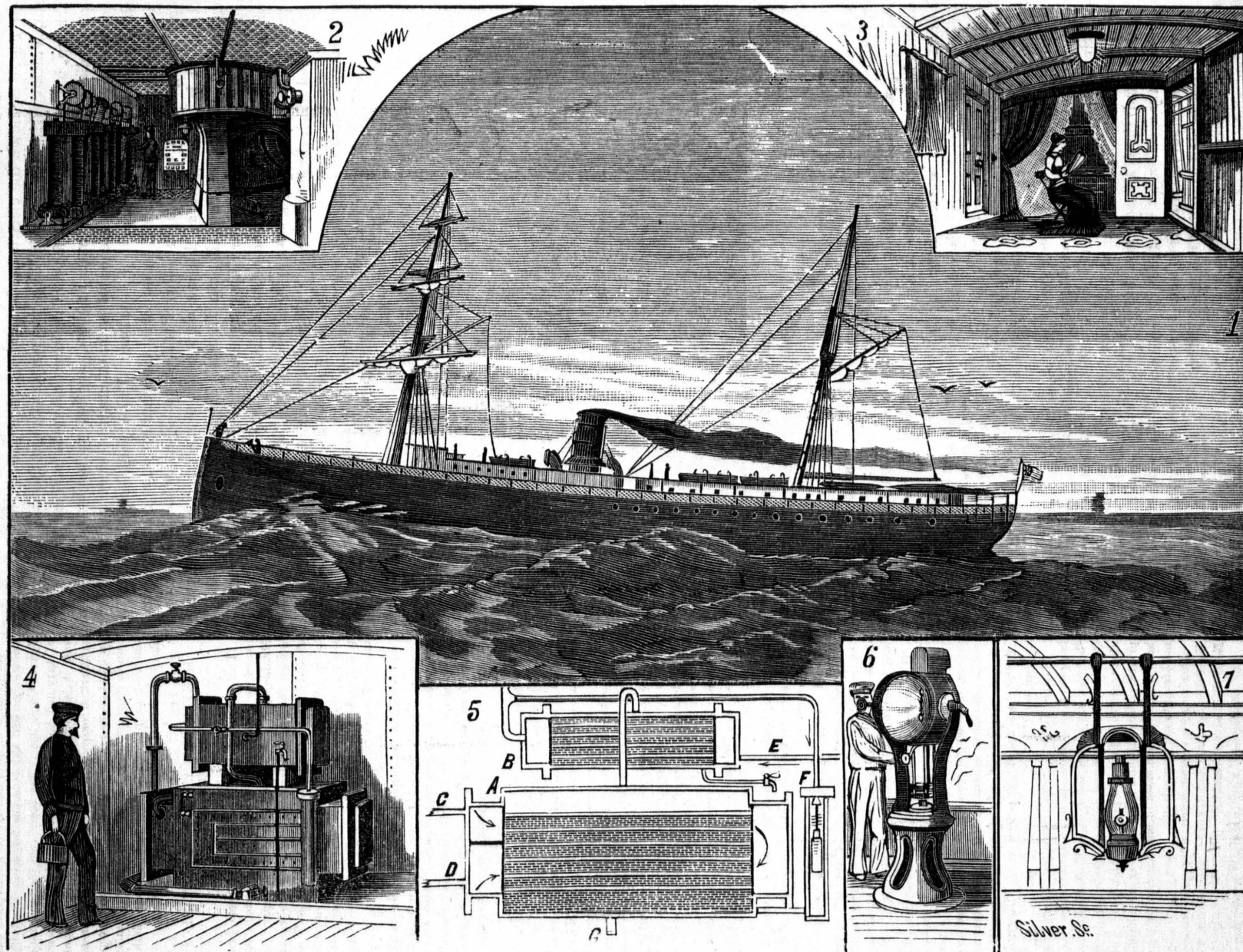
Fig. 3 gives a good idea of one of the elegant state rooms provided with an Edison lamp pendent from the ceiling, and Fig. 7 shows the style of lamp adopted for the dining saloon; the lamps in the grand saloon are on the same general plan, differing a little only in form. The lamp fixture, as will be noticed, is of the same form as those used for oil lamps, and by an ingenious mechanical contrivance they are either adapted to the electric or oil lamp, so that should the electric lamps in any way fail the oil lamps may be immediately substituted. The electric lamp globes are frosted lightly by dipping them in hydrofluoric acid. The globe thus treated seems to increase the amount of light proceeding from the incandescent horse shoe carbons, so that by some they are credited with double

the actual amount of light, while in reality one-twenty-third is absorbed by the globe.

There can be no question as to the quality or steadiness of the Edison light, this practical application of 120 lamps having settled that point. As to the economy of the system of lighting and of the durability of the lamps, Mr. Edison and his supporters do not hesitate to say that these points are sufficiently well established to insure commercial success. Certainly there is no place where a lamp of this character would be more desirable than on ship-board, where the apartments are necessarily limited in size and pure air is a matter of great consequence.

Among the marked improvement in state room fixtures we notice particularly the arrangement of the berths, which are similar to those of a Pullman palace car. When the berths are not in use they are folded out of the way, affording a cosy little room, where one may enjoy the comforts or discomforts of a sea voyage in seclusion.

The system of water supply for fire and other purposes is most complete. Pipes lead to all parts of the vessel, and terminate in lengths of hose conveniently placed, and in the pipes a constant water pressure is maintained on much the same plan as the well known Holly system of water supply; so that all that is necessary to obtain a copious discharge of water in any part of the ship is to open a valve. The still by which a constant supply of fresh water is maintained is new in its construction and arrangement. Fig. 4 shows the exterior, and Fig. 5 is a vertical longitudinal section showing the exterior. The still, A, is traversed longitudinally by flues through which the steam circulates, entering through the pipe, C, returning to the boiler through the pipe, D. The still, A, communicates with the condenser, B, by a pipe entering the top of the latter. The condenser is traversed lengthwise by tubes through which cool water passes, entering by the pipe, E, and leaving by a vertical pipe at the opposite end. A portion of the water used in cooling the condenser is taken to the still through the float valve, F, which keeps the water at a uniform level. The still is provided with a blow-off, G, for clearing out the salt; it also has a surface blow-off. This apparatus is cap-



THE NEW STEAMSHIP COLUMBIA, OF THE PORTLAND AND SAN FRANCISCO LINE.

able of supplying 1,200 gallons of pure fresh water daily.

In Fig. 6 is shown the electric head-light, which consists of a Maxim electric lamp, having its arc in the focus of a parabolic reflector, which may be turned in any direction and a cone of light projected a long distance.

In building this magnificent steamship nothing seems to have been forgotten. It is as complete as the best engineering and inventive skill can make it. The engines are provided with independent air pumps and other improvements. Everything has a symmetrical and finished appearance.

THE DALLES.—(Continued from page 197.) with the very best that the markets afford. The entire management of the house is under the personal supervision of Mr. Smith, and no pains are spared by him to make his guests as comfortable as possible.

Adjoining the Cosmopolitan and occupying a stone building is the firm of Snipes & Kinersly, successors to H. J. Waldron. This house was first established sixteen years ago, but passed into the hands of the present firm about two years since. This house is decidedly solid, Ben Snipes, the Oregon Cattle King, being the senior, whilst Mr. Kinersly, well known to the traveling public as the former purser on the steamer between The Dalles and Cascades, is the junior. They do a large wholesale business, but sell at retail as well, and carry a very extensive stock of drugs, chemicals, oils, brushes, crockery, glassware, wall-paper, books and stationery.

Nearly opposite the Cosmopolitan we find the elegant tonsorial parlor of Rudolph Lusher. He started here in 1861, and although having his establishment destroyed by the big fire, he has now a finer place than ever, in fact, we doubt if Oregon can boast of another barber shop as handsomely furnished as Mr. Lusher's. He has three of Archer's No. 3 patent chairs, the only ones of the kind north of San Francisco, and they are so easy that one reluctantly arises after once sitting in them. The other furniture is of new and neat design, and supplied by the Oregon Furniture Co. In the rear of the barber shop are five bathrooms. They are kept scrupulously clean, and contain all the latest improvements to be found in first-class establishments.

Z. F. Moody, dealer in general merchandise, occupies a fire-proof brick building on a prominent corner. He has ample storage facilities, and carries an immense stock of general merchandise. He first started business in 1862, with others, but since 1878 has been alone. From July, 1874, to 1878, he was Government mail contractor from Portland to The Dalles, and has been engaged in numerous other enterprises. He has a large circle of business friends, and therefore does a very extensive trade.

McFarland & French, the largest business house, with but one exception, east of the Cascades, occupy a substantial stone building corner of Second and Washington streets. In their sales-room they have 65,000 square feet storage room, and their stock of general merchandise is simply immense. They do a wholesale and retail business. Their agricultural implement department is located further up the street, occupying 50x120 feet. Here they keep everything necessary for the farm. The present firm has been in existence but three years, but is a continuation of French & Gilman, established in 1862, and the estimation the firm is held in by their patrons, is proven by their constantly increasing trade.

There are numerous other enterprising business houses located here, but as this article already occupies more space than we at first intended it should, we must defer mention of them for a future number.

A little boy came to his mother, the other day, and said: "Mamma, if I am made of dust, I should think I would get awful muddy when I drink."

A lazy boy was complaining that his bed was too short, when his father sternly replied, "That is because you are always too long in it, sir."

BISHOP SCOTT GRAMMAR SCHOOL.

This excellently conducted institution of learning re-opens for the term on Tuesday, August 31. Prof. J. W. Hill, the head-master, has every reason to feel proud of the estimation this school is held in by parents who have had their boys educated here. The instruction in the different branches is practical and thorough, and particular attention is paid to the conduct and morals of students.

The Annual Report of the Seamen's Friend Society, printed in neat pamphlet form, has been presented to us by Chaplain Stubbs. The Chaplain, as well as the friends of the Society, have accomplished good work the past year, and we hope they will continue prosperous.

SEA-HORSE.

No proprietor of a Sea-Horse has ever, to our knowledge, had any occasion for using Kendall's Spavin Cure, but it has been used on thousands of spavined horses with most wonderful success, and it is now being used with the very best of satisfaction for every kind of a blemish or lameness on beast or man. As it does not blister and is certain in its effects, it is becoming the most popular liniment ever used for horse or human flesh. Read the advertisement in another column.

MCKENNEY'S PACIFIC COAST DIRECTORY.

This work, consisting of nearly 1,600 pages, just issued, is now being delivered to subscribers by Mr. Leonard, one of the publishers. To give the work a critical examination, would require weeks of study. A cursory reading of the book leads us to the belief that it is, perhaps, the most complete work of the kind ever issued on the Pacific Coast. It is certainly a valuable work, and well worth the money charged for it.

"Physicians and their Patients," by Dr. C. H. Merrick, of Canyonville, Oregon. This is a sensible lecture, occupying twenty pages, which every one should read. If broadly circulated, it would certainly establish a better understanding between patient and physician, resulting in general good to all.

The beautiful Music Store of Simon Harris, opened here during the past month in the Emerald Block, has a ready become one of the popular resorts for our music-loving residents. Mr. Harris himself is an accomplished musician, and there are possesses superior advantages in selecting instruments. His stock of Musical Merchandise and Pictures was personally selected by him during his recent visit to European marts. Those entrusting orders to him, can rely on getting none but first class goods.

HUNDREDS of clergymen, doctors, and others, have used Kendall's Spavin Cure with the best of success. Read the advertisement.

First premium awarded to Abell for the best cabinets, cards, and retouched photographs, at the late State Fair.

Amid the longings of the business man for a breath of pure seaside or mountain air, comes the thought that the next time he wants printing done, he will call on Himes the Printer, at the Red Front, 5 Washington Street, Portland.

H. Sinsheimer, the energetic agent for the Decker & Son Piano, offers for this month something entirely new. "The Baby Upright," seven octave, in rosewood case, for only \$250, the best and handsomest instrument for the money ever offered on the Coast. Call at his salesrooms, No. 129 First street, and take a look at this beautiful instrument.

A LIVE HOUSE.—Notwithstanding the general complaint of dullness in business circles, we find that the Dry Goods house of J. F. D. Wrinkle & Co., corner of First and Salmon streets, are doing about all that they can possibly attend to. The principal secret of their success is, they are reliable, have a well selected stock of merchandise, and are not afraid to use printer's ink.

Don't drive a lame horse when you can get Kendall's Spavin Cure for \$1; it is worth \$5. Read their advertisement.

The Californian, a thoroughly Western magazine, published at San Francisco, for \$3 per year, grows brighter and more sparkling with each succeeding number. Send 25 cents to the publishers for a specimen copy.

SCENES IN THE YOSEMITE VALLEY.

Our engraving gives a faint impression of some of the majestic objects in the Yosemite valley, Cal. The scene is in the canyon of the Merced river, which branches out an angle from the Yosemite valley proper. In the foreground is seen the trail leading up the Merced canyon, and which brings the visitor ere long to a near view of the wonders which are peculiar to this branch of the Yosemite. The trail rises rapidly and follows the course of the Merced river. So sharp is the ascent that in two miles an elevation is attained 2,000 ft. higher than the entrance to the canyon. In reaching the lower level the Merced river plunges over numerous cascades and makes two grand falls, which are among the greater attractions of the Yosemite, according to Whitney, not only on account of their height and the large body of water in the river during most of the season, but also on account of the stupendous scenery in the midst of which they are placed.

The first of these two grand cataracts is Vernal fall, which is shown in the center of the engraving. Whitney places the height of this fall, at the average stage of the water in June and July, at 400 ft. The rock behind the fall is a perfectly square cut mass of granite extending across the canyon. The rock near the bottom of the fall is steeply inclined, so that a precise definition of the place, when the perpendicular part ceases, is very difficult amid the blinding spray and foam. Alongside of the headlong roaring stream from Vernal fall the trail leads up to the base of the fall from which the visitor may ascend by ladders. At the summit of the fall the view down the canyon, as well as in the opposite direction, is extremely fine. The system of ladders by which this summit is reached, in the winter time is covered by masses of icicles wonderful to behold.

Aloft in the sky, above the center of the engraving, is the "cap of liberty," a most notable object. It is a mass of rock, isolated, and nearly perpendicular on all sides, rising perhaps 2,000 ft. above its base. The cap of liberty has a striking resemblance to the object its name indicates. It is so marked that it is often recognized as it is viewed from various elevated points about the valley. It is an embodiment of grandeur, and its impress is firmly fixed upon the mind of the beholder.

The visitor who ascends the canyon of the Merced above Vernal fall meets something grand and impressive every time the view changes. About a mile from Vernal fall, but hidden from view by the lofty bluff in the engraving, is Nevada fall, which is pronounced by Whitney as in every respect one of the grandest waterfalls in the world, whether we consider its vertical height, the purity and volume of the river which forms it, or the stupendous scenery by which it is environed.

LONGEVITY OF BRAIN WORKERS.—The great thinkers and hard brain workers are long-lived is asserted, with a considerable array of facts, in a volume by Dr. Beard. He presents a list of some 500 of the most eminent names in history, including a number like Pascal, Mozart, Keats and others, who died young, and finds the average age of the 500 to have been over 64 years. As this is far beyond the average age of farmers, mechanics and business men, he concludes that the wear and tear of brain work is not so exhausting as is commonly supposed. The London *Spectator*, however, reviewing this theory, maintains that excessive mental toil must shorten life, and did evidently shorten it in the case of many of the 500 cited, but they had originally more vigorous constitutions and a larger amount of vital force, and, by virtue of this superior vitality which explains, in part, also, their superior brain power, they were able to continue hard work even to old age, before breaking down under the pressure; though the same vital force would have prolonged life for many years if they had not exhausted it prematurely.

A MOUNTAIN OF OBSIDIAN.—Near the foot of Beaver lake, in the National Park of Yellowstone, a recent party of explorers came upon a remarkable mountain of obsidian or volcanic glass, which rises in columnar cliffs several hundred ft. in height. As it was desirable to pass that way, the party had to cut a road through the steep glassy barricade. This they effected by building huge fires on the glass to thoroughly heat and expand it, and then dashing the cold water of the lake against the heated surface so to suddenly cool and break it

A POWERFUL TESTING MACHINE.—E. and T. Fairbanks & Co. have completed two or three large testing machines lately ordered by the Government to be used in testing the strength of iron and steel. These machines are very compactly built, occupying but about five ft. square on the floor, and about ten ft. high—all of iron and steel, and weighing four tons each. The metal to be tested is clamped securely between two heavy iron collars, which are drawn apart by two heavy screws turned gradually by hand with a combination of gear wheels. The testers are really weighing-machines also, hav-



VIEW IN THE CANYON OF THE MERCED — YOSEMITE VALLEY.

up by shrinkage. Large fragments were in this way detached from the solid side of the mountain, then broken up small by sledge hammers and picks not, however, without severe lacerations of the hands and faces of the men from flying splinters. In the Grand canyon of the Gibson river, the explorers also found precipices of yellow, black and banded obsidian, hundreds of ft. high. The natural glass of these localities has from time immemorial been dressed by the Indians to tip their spears and arrows.

"CHERRIES are high, firm and in demand, with scarcely any obtainable," as the small boy said when he gazed wistfully at Deacon Close-watcher's delicious 'Early June's.'

ing levers, beams, poise, etc., and as fast as the power is applied to the metal to be tested, the poise on the scale beam is moved automatically, indicating the number of pounds of strain applied. At a trial a bar of steel an inch and an eighth wide and five-sixteenths thick stood a strain of over 41,000 lbs. before it was pulled apart, and before it broke it was reduced in width an eighth of an inch, and in thickness nearly a sixteenth. So heavy and powerful are these machines that there was no perceptible recoil when the steel parted. The one tested as above is going to Cincinnati; and just to test its strength, a heavy bar of steel was placed in its jaws, and 100,000 lbs. strain put upon it without any visible effect.—*St. Johnsbury (Vt.) Caledonia.*

A VISIT TO MT. VERNON.

We had a holiday; so I took that opportunity to go to Mount Vernon, the home of Washington. It is 17 miles down the river; has been bought by a party of ladies called Regents, and is kept in exquisite order. Ticket on the boat, admitting you to the grounds, cost a dollar; that takes you there and back. Col. Hollingsworth has the place in charge, and meets visitors every day at the boat and conducts them through the house. It is quite a long walk up to the house, but a lovely, shady one; the grounds are on a high bluff, and the river runs around on two sides. Majestic trees grow all along the slopes. The house was much finer than I expected to see. He must have lived like a prince there. It is frame and painted white, three stories high; a high veranda to top of second story across the front. Servants' quarters form two other sides of the square and enclose a pretty back yard on which the back windows of the house open. From this yard their flower garden opens. The box planted to mark the beds so many years ago has now grown to a beautiful hedge. The ivy planted by Martha is there. It has a great many rooms; they must have entertained considerably. There are mahogany and magnolia trees on the place, as well as the native trees. At the Conservatory bouquets and flowers are for sale, which add to the revenue. It is now paid for, and the Regents are out of debt. You can run clear down to the river. An elegant ice-house (empty of course) shows the nice work done in those days. It is very, very deep, and all four sides nicely bricked. It required a long ladder to get down to the ice. The old milk house—you have seen many like it—the spring walled in and the gutter for the crocks—it too is not used. It is pretty far from the house; but they had slaves in those days. The old tomb is still kept fenced in with a wicket fence; the new tomb is a Mausoleum. The two graves were beautifully decorated. His has nothing on it but "Washington." The old furniture looked quaint. Much of it did really belong to them. The rest is of the style used in that day. The bed on which he died stands in his room. In accordance with the old Virginia custom, his room was shut up for two years after his death. His room has two little dressing rooms leading off from it. His wife, after his death, took the room in the third story, with ceiling sloping nearly to the floor and one deep window (dormer style) looking out on his grave. This room she never went out of, until carried to her grave 18 months afterward. A hole was cut in the door for the cat to go in and out. A child asked one of the Regents that morning "where the cat was." She pointed to one in the yard that was purring around a group of merry girls. The Regents were there that day holding executive session—a handsome looking set of ladies past middle life. About 300 people went down that day. Only one boat goes every day, and none other is allowed to land at the wharf. A nice lunch is for sale under a shed.—*Cor. Pacific States Watchman.*

THE hair is much abused in its relations to healthfulness and growth. Pulled, twisted, torn, burned into a friz, and besmeared by all sorts of unguents and lotions, it is a wonder that baldness is not really the rule instead of the exception among those who most prize its beauty—the female sex. And it is equally neglected, if not abused, by most physicians, many of whom, while heartily-condemning the thousand and one preparations well known to be not only injurious to the hair, but dangerous to the general health, show their total neglect on this part of their cure by relinquishing it to barbers and quacks. The treatise before us admirably fills a long-tolerated gap in the literature of the subject, which should not only be welcome to all physicians for whom it is a scientific treatise, while for the general reader it is also an entertaining work on the manners and customs of dressing the hair by all nations in all ages.

AUNT JERUSHA GOES BLACKBERRY-ING.

"A bit a pound!" sez I to the copper-colored becued John, with hiz coal-oil kans balanced on a willer pole over his shoulder like the Goddess of Justice on the new court-house in Stockton, which really does need a coat ov whitewash. I furgot to say, his kans were about half full ov the greenest ripe blackberries I ever sot my two ies on. "A bit a pound," sez I, recapitulating, "that are too much; why, a man can pick—let me see—about five dollars worth a day at them figures," so sez I, "no, I don't keer to lay in any to-day," an arter I'd dismissed him, a per-lite way, I sez to Andrew Jackson, sez I, "let's us go arter sum blackberries." "La!" sez he, "Aunt Jerusha, the river flats is jest overflowed with high water, and you can't get a pint if you'd try." Now, that's a man for you; they are like the menfolks ov Bible time. They can always see a lion in the way, an sez I, "You stay at home an tend to that soft soap I'm bilin' on the kitchen stove, an' picket out the pet goat an do the churning an a few other little chores, an I'll try my luck arter a few wild blackberries. I've got a friend who resides on the river bank near the blackberry fields, so I made up my mind I'd get him to set me acrost the slough in a skift, on the bank ov the river, where there is just dead loads on 'em. I took a little boy 'long to carry my lunch-basket, an seven or eight extra pails and kans—I do hate to be short ov measures when you git into a nice thick patch on 'em. We arrived on the pier ov embarkation about 10 o'clock A. M. The aspect of nature waz enchantin', the river bottom ov some 10 acres or more, which had been a potato field, but which had succumbed to the force of the flood of old Mokelumne an waz now a plasid lake, with a strong current runnin' through it. My friend plied the oars with true artistik skill, an in less than no time we waz headed for the strip of Woodland that told us plainly it waz the high and dry bank ov the river, beneath whose green foliage the deep rich berries waz basken in a June sun. We skirted along the willers that waz growin' in the water for a long while, and saw a good many bushes (blackberry bushes I mean), but the northerner a few months ago had nipped the berries in the bud, so we continued on for a spell, findin' no berries, but more water than we'd expected. Arter awhile, the boy who sot in the bow to balance the boat cried out, "There are 'em!" an that short sentence waz equy az wellcom as land in site to the wery mariner. An the boy waz rite; there waz a clump ov bushes an sum live oak branches growin' rite out ov the water, an the berry bushes coverin' um like a hop vine over a smoke-house back in Missouri. We pulled up alongside, but couldn't anker, coz we couldn't touch the bottom with our oar, but we clung to the limbs, an arter awhile the man took the bords which formed an upper floor in the skift, an made a gang-plank by throwin' one end out into the branches an restin' the other end on the skift. I put a musketo net round my head, for the pesky fellers waz az thick az bees in buck-wheat blossoms, but a limb flew back an relieved me ov my proteckshun, an I stood an looked at it dangle in mid-air like a flag. Well, I walked out into the top ov that tree on the gang-plank, an I guess I must have gone a little too far, coz it sunk down before I could git back an let me into the water over two feet. Gracious! how cold the water waz! I know I didn't say a word, tho' that miserable urchin says I hollered "Help! help! I'm drownin'!" Wal, we couldn't find no dry land an less blackberries, an from now on, in this season, I'll pay John Chinamen any price for the delishus eteteras before I'll go berryin' agin', an if you take the advice ov a friend, you'll do likewise, while I remain a berryin'. Yours—Aunt Jerusha, in Lodi Review.

AN old man was wondering "why in these days it seems impossible to have an honest horse race," when a neighbor interrupted him with the remark that "it's because we haven't an honest human race."

WHAT TO DO WHEN THE FARM IS PAID FOR.

In an essay read before the Lake George Fruit Growers Association, by Mrs. A. B. Bartlett, of Georgetown, Fla., the following positions are taken: When our agriculturist has got his place into such a condition that he has a comfortable income—no debts—regular meals every day, as he chooses, his young people fairly educated, then what? "Well, civilization, life." Life in all its fullness and beauty, as intended by our all-wise Creator. He has health, or ought to have, and every good thing is open to him. Just so far as his taste is in harmony with the laws of right living, and the peace of his fellow-creatures, so far is he at full liberty to carry out his tastes. Then comes in all the amenities of civilization. In the world of books he has free access to all its wit, all the wisdom of the past. With Romeo he can woo fair Juliet in the balcony, tame the shrew with Petruchio, or see Bottom translated in the magic Athenian wood, with tears of inextinguishable laughter. Aladdin had a wonderful lamp, which, when he rubbed, immediately there came to him a genius of the air, who brought him whatsoever he desired. Like that lamp is the love of reading, to the man of imagination. It brings "that light which never was, on sea or on land," whereby the universe of common things is transfigured and glorified. Or if he cares not for the figments of others' brains, nor the history of their toil, defeat, or triumph, then can he travel over the "whole round world" and see it with his own eyes.

Civilization has so triumphed for him, with less of toil and weariness, than a century ago it would have required for the journey from Florida to Washington. So entirely, in the history of these United States, have agriculture and civilization marched abreast and with an even stride. If he care neither for books nor travels, the whole world of art, architecture, music and painting await his call. If he love the drama, his sons and daughters are ready to enjoy themselves and entertain him, by enacting before him temperance dramas, scenes from the immortal Pickwick, and choruses from the jubilee singers. Thus the successful agriculturist lays the foundations, broad and strong, for the highest civilization. By the succession of its humblest processes, slowly but surely, eradicating those nomadic instincts, which for ever prevents the noblest, possible savage, from attaining the development and self-poise of civilization. Our agriculturist may be to a degree ideal, without some ideal, he will never become even a passable agriculturist. My claim is, without a fair development of agriculture, civilization is impossible, or at least there is no record of any such. Also, that the agriculturist has a claim to enjoy the highest products of civilization. But in agriculture, as in every thing else, there is a tendency to take the means for an end, and the farmer and fruit grower who has worked hard to secure a roof over his head, and sufficient food and clothing to keep him in order, as a working machine, forgets that he has any possibilities, other than mechanical, and keeps on the old routine, like Bunyan's man with the muck rake, or like a horse so used to grinding in a treadmill that he returns to the old wheel with endless travel, and no progress, long after the grists are all ground, and the mill unused.

"SALICYLIC" OR "SALICILIC"?—The Louisville *Medical News* raises the question whether the current form *salicylic* is consistent with its derivation from the Latin *salix*, the genitive of which is *salicis*. Clearly the spelling should be *salicilic*, after the analogy of *salicine*. It is not easy to understand how the other orthography could have arisen.

"AND how is your neighbor, Mrs. Brown?" inquired one nicely-dressed lady of another. "She's well enough, I suppose. I haven't seen her to speak to her for six weeks." "Why, I thought you two were on the most friendly terms." "Well, we used to be; but we've exchanged servants."

MAKE CHILDHOOD SWEET.

Wait not till the little hands are at rest
Ere you fill them full of flowers;
Wait not for the crowning tuberose
To make sweet the last sad hours;
But while in the busy household band,
Your darlings till need your guiding hand,
Oh, fill their lives with sweetness.

Wait not till the little hearts are still,
For the loving look and phrase;
But while you gently chide a fault,
The good deed kindly praise,
The word you would speak beside the bier
Falls sweeter far on the living ear,
Oh, fill young lives with sweetness.

Ah! what are kisses on clay cold lips
To the rosy mouth we press,
When our wee ones fly to their mother's arms,
For love's tenderest caress?
Let never a worldly bauble keep
Your heart from the joy each day should reap,
Circling young lives with sweetness.

Give thanks each morn for the sturdy boys,
Give thanks for the fairy girls;
With a dower of wealth like this at home,
Would you rifle the earth for pearls?
Wait not for death to gem love's crown,
But daily shower life's blessings down,
And fill young hearts with sweetness.

Remember the home where the life has fled,
Where the roses have faded away;
And the love that grows in youthful hearts,
Oh! cherish it while you may!
And make your home a garden of flowers,
Where joy shall bloom through childhood's hours,
And fill young hearts with sweetness.

A LECTURE FOR YOUNG WOMEN.

We have devoted considerable space to lecturing young men and husbands, and it would be only fair to read a lecture to the young women. A recent author, who calls his book "Nuggets of Gold," gives the following paragraphs:

"I know many young women—oh, too many of them, and I think they can be found anywhere—whose mothers are working their lives out, or whose fathers are keeping themselves impoverished by hiring other women to wait on them, but who ought to be doing the work for some neighbors who really need help. I have seen families consisting of three or four bouncing women, and two or three others, all of whom would be in the most pitiable distress on any occasion of the hired girl's leaving them for a few days; and such a commotion as the house would be in if she should leave for good, so that another must be hunted up! Yes, the distress is pitiable, and the helplessness, the uselessness and the insipidity of a large proportion of American women is the more pitiable. The fathers and the husbands of that class of women are to be pitied. They should be specially avoided by young men who have any aspiration for advancement. And I notice that many prudent young men do avoid marrying altogether, because they cannot afford the expense of a wife, when it ought not to cost a man much more with a wife and a baby or two, than it usually costs him alone.

"And this false education of women is the cause of all the trouble in the hired girl problem, which is everywhere the great difficulty of housekeeping. So many girls who ought to be trained to the necessary duties of the household are indulged in idleness; and when they marry, their husbands, respectively, have to marry another woman or two to take care of them; that an inordinate demand for hired girls is created, and the supply is to be made up of the poorest material; for any young woman really fit to do the work and have the care of a house, very soon learns that that kind of work is too degrading for her, according to the prevailing public sentiment. Take any town of 5,000 inhabitants, and probably there are not less than from 100 to 200 families depending on hired girls, where they ought to be dispensed with and the work done by their wives or the daughters, as the case may be; which increases the demand and diminishes the supply so that it is becoming more and more difficult for those who necessarily must have help, to obtain anything worthy of the name, for love or money."

CHEESE CURING ROOMS.

The best Eastern cheese makers are fully aware of the influence exerted by the curing-room upon the quality of the product. The president of the Wisconsin Dairymen's Association lately offered a cash prize for the best essay on the construction of curing-rooms, which was awarded to Mr. J. A. Smith, of Sheboygan county. Of the general importance of the curing-room he said, "On the question of curing cheese, I will say that I believe it is the point most neglected and abused of any of the stupidities we practice on offending cheese, that are comparatively perfect when they come from the hoop. There is far less difference in the quality of cheese at that time than there is after that. If all the cheese of a county like Jefferson and Sheboygan were taken from the factories, say twice a week, and put into suitable curing-rooms, where they would have the best care in addition to being in the right kind of an atmosphere, the product would sell for tens of thousands of dollars more per annum than it does now."

It will be interesting to review briefly the style of building which the prize essayist prescribed for a curing room. Although some details which he insists upon may not be essential in this country where winters are not so severe as at the East, our readers can perhaps use his ideas as suggestive and modify their construction to meet local conditions.

"The end and aim should be to construct a curing-room capable of good ventilation, in which cheese can be placed when taken from the hoop, that has a temperature of from 65 to 70, and which can be maintained night and day, with very little variation, till the cheese are boxed and shipped. To do this it is necessary for the room to be constructed so that the cheese maker can work in harmony with the universal law that heated air will rise easily, rapidly, and freely if it has a chance, and that cold air will fall by the operation of the same law. It moves most naturally in perpendicular lines. To move heated air in a lateral direction requires far more force, as it has to struggle against the natural law that makes it rise. Hence, the positive heat force should be in the base of the building, and the escape or ventilation, at the top. So if I was going to build a cheese curing-room, to be heated either with wood or coal stoves, I would make the stone or brick base walls six and one-half ft. high, put the heating stove at one end of the basement room, the chimney at the other, and run the pipe the whole length of the room, enough below the floor joists to make it safe in regard to fire. The superstructure I would have only one high story in height, so that one or more skylight ventilators, having an orifice of 30 square ft. could be easily made without running them through a second story; but I would have a double air space between the ceiling and the roof, to the end that the hot rays of the sun could not penetrate, as they will through a roof and one ceiling. The floor of the curing-room, instead of being laid with matched stuff, I would have of one and one-half inch boards, laid far enough apart to let through the warm air from below, making interstices wider as the floor was laid from the stove to the chimney end of the building, for the reason that as the air would be warmest at the stove end the interstices should be less, to let it through. The windows should be double, and have blinds. The walls of the superstructure, if made of brick, should have an air space within, or be furrowed and plastered, so as to give an air space. If made of wood, the studding should be six inches wide, papered and sealed, both sides, and the space filled with sawdust, shavings well packed down, or grout. What is wanted is to make and retain the whole air of the room warm so as to mark 70° on the thermometer when the outside air is below that point, and when it is hotter than that outside, shut out the influence of the heat as much as possible. There will be a few hot days each season, when the heat will arise above 70° in such a building, but the influence of those days may be very much modified by

throwing wide open the basement door and the windows and the skylights at night, and at times in the day when the sun is not pouring down its hottest rays. While the plan will not keep the temperature where it ought to be during a very few of the very hottest days, yet it has complete control of the room to make it as warm as required at any time, and that time embraces nineteen-twentieths of the time, or more, of making and curing the cheese, during the time our factories are usually operated."

Concerning the size of curing-rooms, the remarks of the Wisconsin essayist may be of general application: "A building 20x40 ft., having three rows of double racks running lengthwise of the building, each rack being four shelves in height, would make storing room plenty for a four thousand pound vat worked full each day. This would admit of the cheese being kept until the oldest were about seventy days old, and would store the contents of near two vats full, if sales were made as fast as the cheese is thirty days old. After cheese are thirty days old, if kept well curing in the meantime, they should be put in a cooler room than is essential for new cheese, and so I would have a partition two-thirds the distance from the stove end, across the room, and have it made with large folding doors in it, and the floor so arranged with stops that the heat from below could be shut off from that portion of the curing-room. Into this room I would put the older cheese till time of shipment. I have used 'turners' and cheese box covers to set cheese on, but have not found anything so satisfactory as about one and one-half inch boards planed on both sides, and about one inch wider than the diameter of the hoops used."

SELF-CLEANING FLOORS.—Now that many of our dairymen are building fine barns it may interest them to know of an arrangement which has been used for some time in the East. Automatic platforms, by which the stable may be made to clean itself, can be made. One dairyman has had one in operation for more than two years. Not five minutes of time have been expended in his stable in two years in cleaning. Let the fore feet of the cattle stand on a wooden platform and their hind feet upon an iron grating, made of wrought iron bars three-eighths of an inch thick and one and one-half inches wide. The bars of the grates are placed one and five-eighths inches apart, and rests on iron joists one-half inch by two, these resting on an angle iron sill at the back of the platform, and the other end resting on the wooden platform. Through these gratings the droppings fall. Harris Lewis once said that "cows cannot be kept clean unless you sit up all night with them." This plan sits up with them and keeps them perfectly clean. There must be a receptacle below the grate which must be cleaned when filled; but this cleaning is no more labor than when the manure is thrown out into a pile. Gratings can be put in for about six dollars per cow and will last a life-time. The cattle stand upon these bars with ease. Their feet stand across the bars. The grating cannot be used in barns in which the manure freezes. No wood-work comes in contact with the manure, and therefore there is no wood to be rotted. If winter dairying is to be inaugurated, cows must be kept clean. The platform costs no more than the bedding of a cow for one season. This platform saves all the liquid as well as solid manure in the gutters under the platform. This saving the liquid manure is equal to the whole cost of the grating in a single year. In Flanders the liquid manure of a cow is estimated at \$10 per year.

COMPRESSED AIR AS A MOTOR.—The question of the economy of the use of compressed air as a motor, is about to be tried on an extensive scale at Rochester, N. Y. A large company has been formed in that city, which has purchased an extensive water power to be utilized in compressing air, which will be conveyed in pipes to the various manufacturing establishments and machine shops of the city, to be used as a motor in place of steam. It will also be used for the propulsion of street cars.

MARRYING FOR LOVE.

The man who marries for love has generally the vital temperament—is combative, sagacious and independent, and takes a genial view of everything. A life of indolence and stagnation has no charms for one whose blood is warm, and whose hopes are high: he likes to be in the thickest of the fight, giving blows and taking them; watching for the turn of events with coolness and foresight; pleased at his own independence and struggle; eager to show the world what he can achieve; and the contest rouses all the strength and manliness of his nature. He wins the respect of his fellows by his own worth. He often brings home pleasant surprises for his wife and children. You may recognise him in trains loaded with parcels, which he good naturedly carries with perfect unconcern of what others think—a new bonnet, music, books, a set of furs for his wife; while in another parcel the wheels of a cart, a jack-in-the-box, a doll or skipping-rope intrude through the paper and suggest the nursery. He never forgets the dear ones at home; the humanizing influence of that darling red-cheeked little fellow who calls him father brings a glow of rapture of the purest pleasure earth holds; for the man who has never felt a tiny hand clasp his will always lack something—he will be less human, less blessed than others. This is the noble, the honest, the only form of life that imparts real contentment and joy, that will make a death-bed glorious, and love see peace through its tears. It is so purely unselfish, so tenderly true, it satisfies the highest instincts, it stimulates men to the best deeds they are capable of. By studying how to live, we best know how to die; and the finest life is that which ministers to others' needs, and increases the joys of those dependent on us, whom we love, and who look to us for support, solace and light, even as the earth is revived by the sun; for feeling is life, the pulsation of delicious sympathy, the spring in a desert, the manna from the skies.—*Anon.*

OUR BOYS.—How we shall train them for life's work? Let us first secure health, by fresh air, wholesome food, and cleanliness. I would emphasize this last. How many mothers bathe their children insufficiently? Don't fail to accomplish this health-giving duty less than once a week. Bathe the entire body. When the child is old enough to go from under your own immediate care to a room of his own, see that he attends to this duty himself. Prepare for him suitable conveniences—a stand, wash-bowl, and clean towel. Keep this room in order, so far as it is your place to. Many mothers think anything is good enough for the boys—tattered quilts, one sheet or none, a pillow made by rolling up some cast-off garments, no carpet, no pictures, no comfort of any kind. Nothing elevating or pleasing to a refined taste, the best method in the world to raise uncouth boys. This is not an overdrawn picture, but many found in real life in well-to-do families. Make their rooms as convenient and attractive as for their sisters. Make a place for their clothing and other effects, and teach them to be orderly with the same and about their person. Teach them all the little niceties of refinement, such as attention to their hair, wrists, finger-nails, and clothes. I can see no reason why they will not grow up with as refined tastes and delicate a sense of propriety as their sisters. It is one great step toward preparing them for the duties of manhood. Treat them so they will give you their confidence. Don't deal harshly or find fault unless you wish them to seek sympathy elsewhere than of mother.—*M., in Inter-Ocean.*

SANITARY ERRORS.—It is a popular error to think that the more a man eats the fatter and stronger he will become. To believe that the more hours children study the faster they learn. To conclude that if exercise is good, the more violent the more good is done. To imagine that whatever remedy causes one to feel immediately better is good for the system, without regard to the ulterior effects.

PERFECT WORK.

We are told in the Book that whatever our hands find to do we should do with all our might. Beyond question this is most excellent advice, and yet it is not enough for certain success in life that our utmost energy be put into all we have to do. Work may be energetically performed and yet but indifferently. Quality is quite as important as quantity. It should be the aim of everyone not only to work out with his utmost strength what his hands may find to do, but to do it in the best possible manner. In whatever avocation he chooses, whether that of a lawyer, doctor, preacher, mechanic or shoveler of sand, his aim should ever be to excel—to do his work better and more of it than his fellows. Capability and efficiency are sure to command a proper recognition for the possessor of these admirable qualities. They are always in demand. "There is plenty of room at the top" in any calling, and the greater the energy and skill required to reach that position, the greater the demand therefor, and the more ample and sure the recompense.

SPONTANEOUS COMBUSTION.—Some experiments made at Riga with reference to the spontaneous combustion of various materials, wadding, raw flax, hemp, the waste of silk, wool and cotton spinning, also sponge, as well as the wood dust found in the cabinet-makers' shops, appear to demonstrate the important fact, among others, that small quantities really take fire sooner than large ones. The substances named were saturated with various fluids—oils, turpentine, petroleum, various varnishes, etc., All the fibrous materials took fire when saturated with any of these oils, or with mixtures of the same; sponge and wood dust, on the contrary, proved to be entirely harmless. Combustion ensued most rapidly with 17 grains of wadding and 67 grains of a strong oil varnish, namely in 37 minutes; while 200 grains of washed cotton waste, of which a portion was saturated with 750 grains of strong oil varnish, and the remainder wrapped about it, required a period of well-nigh 14 hours. On these materials being placed in a well-sheltered spot, and subjected to a heat of from 18° to 40° C., silk did not flame up, but slowly charred; and, as already mentioned, small quantities seemed to take fire sooner than large.

A FOSSIL FOREST.—An interesting discovery has been made at Edge Lane Quarry, Oldham, England, says the *London Times*. The quarrymen, in the course of their excavations, have come upon what has been described as a fossil forest. The trees numbered about 12, and some of them are about two ft. in diameter. They are in good preservation. The roots can be seen interlacing the rock, and the fronds of the ferns are to be found imprinted on every piece of stone. The discovery has excited much interest in geological circles around Manchester, and the "forest" has been visited by a large number of persons. The trees belong to the middle coal measure period, although it has been regarded as somewhat remarkable that no coal has been discovered near them. The coal is found about 250 yards beneath. Prof. Boyd-Dawkins, of Owens College, has visited the quarry, and declares there is not such a sight in Europe.

WATTS' OLD WORKSHOP.—James Watts' old workshop, at Heathfield Hall, his home near Birmingham, is kept still as he left it—even to the dead embers in the Franklin stove. A correspondent of the *Record*, of Philadelphia, says that order and system exist throughout the room. All boxes, etc., are labeled, even to that containing snuff, and of the countless small tools, each is nicely wrapped in paper or laid in trays. On the copying machine, in course of preparation, is a small model, not more than an inch in diameter—a perfect copy of an original in the machine. This was the great engineer's last hobby, pursued for pleasure, after steam pumps and engines had brought him a competency, and he had retired from active pursuits.

CLIMATE IN CONSUMPTION.

Apropos of the journey from Cannes to St. Petersburg of the invalid Empress of Russia, who went home in mid-winter for fear of dying away from her family, a distinguished Vienna physician publishes a vigorous protest against the practice of sending consumptive patients to warm climates without regard to the stage of their disease or their circumstances. He has taken note of 50 cases of such patients, who have been sent by their physicians to spend a winter in Italy or Egypt, and among them all he found only three who received any benefit from the change, while many were positively injured. Much that he says is as applicable to this country as to Europe. No doubt many of our physicians prescribe a winter sojourn in Florida or Nassau, to patients in advanced stages of lung complaint, without much consideration of possible effects upon them of an enervating atmosphere, the absence of home faces and home comforts, and the weariness and loneliness of a listless life among strangers. A warm winter climate is no doubt beneficial in the early stages of the disease, and in some instances may effect a cure; and in more advanced stages its influence may alleviate the sufferings of the patient and retard the progress of the fatal malady. But the wise physician should carefully consider whether the possible benefits will not be more than counterbalanced by the fatigues of the journey and the discomforts and home-sickness attendant upon life in hotels, away from family and friends. Every one who has visited our Southern winter resorts, has been moved at the spectacle of melancholy invalids hoping for some magical effect from the climate, which they never should have been led to expect. Consumed with *ennui*, and no society save that of other patients, these poor people watch the thermometer and the progress of their ailments, shivering with cold when the mercury approaches the freezing point, and bitterly regretting the snug Northern homes which many of them should never have left.—*Materia Medica.*

DRINKING ICE WATER.—There is no more doubt that drinking ice water arrests digestion than there is that a refrigerator would arrest perspiration. It drives from the stomach its natural heat, suspends the flow of gastric juice and shocks and weakens the delicate organs with which it comes in contact. An able writer on human diseases says habitual ice water drinkers are usually very flabby about the region of the stomach. They complain that their food lies heavy on that patient organ. They taste their dinner for hours after it is bolted. They cultivate the use of stimulants to aid digestion. If they are intelligent they read upon food and what the physiologist has to say about it—how long it would take cabbage and pork and beef and potatoes and other meats and esculents to go through the process of assimilation. They roar at new bread, hot cakes and fried meat, imagining these to be the cause of their maladies. But the ice water goes down all the same, and finally friends are called in to take a farewell look at one whom a mysterious Providence has called to a clime where, as far as is known, ice water is not used. The number of immortal beings who go hence, to return, on account of an injudicious use of ice water, can hardly be estimated.—*Baltimore Sun.*

RUSSIAN RAILWAY SYSTEM.—The Russian railway system presents one striking feature. The companies are bound to maintain at each station, at their own cost, a mounted Cossack gendarme, who is armed with a Berdan and revolver, and forms a part of the very powerful "railway police force" of Russia. Recently the companies have had to maintain from three to six gendarmes at their principal stations, and the total cost of the force, falling upon the shareholders of the Russian railway companies, now amounts to 650,000 roubles, or over \$400,000 per annum.

FIRST LOCOMOTIVE IN AMERICA.

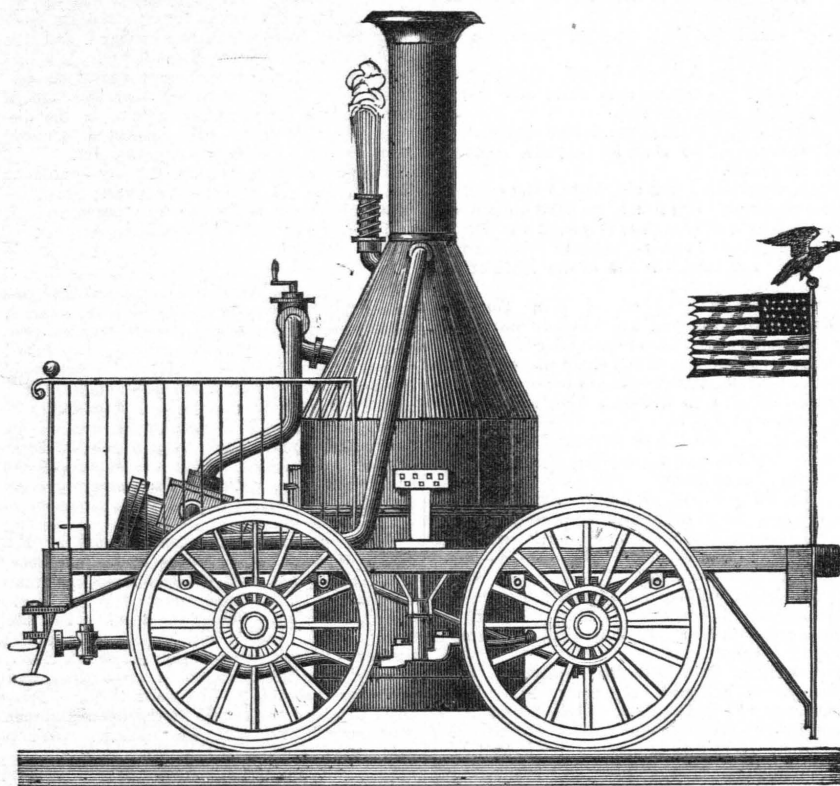
It is about 50 years since the locomotive was introduced in the U. S. There is now living in San Francisco one of the veteran railroad men of the country, who is absolutely familiar with the interesting incidents of the early history of the railroad and the locomotive engine in this country, "all of which he saw and part of which he was." The name of this veteran is David Matthew, now nearly three-score-and-ten. He is a worthy representative of the American mechanic, at once intelligent, alert and trustworthy. In the course of an entertaining conversation with Mr. Matthew recently, we learned that he was born in Scotland and arrived in this country at the tender age of seven, and that a few years later he was sent to the West Point foundry shops in New York City to learn the trade of machinist. It was at these West Point machine shops that the very first American locomotives were built, and where

chine, which were constructed after the English practice, sprung and got off the track; but they were replaced by cast iron wheels, and on December 14th and 15th the engine was again tried and ran at the rate of 16 to 21 miles an hour with five cars carrying about 50 passengers, and without the cars it attained a speed of 30 to 35 miles an hour. In the *Charleston Courier*, March 12, 1831, there is an account of a later trial of the speed of the "Best Friend," on which occasion, the writer remarks, "safety was assured by the introduction of a barrier car, on which cotton was piled up as a rampart between the locomotive and the passenger cars." The second locomotive for service built in this country was called the "West Point," and was for the same road. It was also constructed at the West Point machine shops.

The first locomotive built in America for a northern road was called the "De Witt Clinton," and was the third American locomotive. It was for actual service on the Mohawk and Hudson railroad. This engine, like the others,

to enable it to turn sharp corners easily and safely. The machine so constructed was called the "bogie" engine. The first of these engines ever built was for the Mohawk and Hudson road, and was called the "Experiment." It was put on the road and ran by Matthew, who says it was as "fleet as a greyhound." The "Experiment" had been built to burn anthracite coal solely; after a while it was rebuilt and adapted to the use of any kind of coal, and its name was changed to the "Brother Jonathan." Shortly after these changes had been made the English locomotive "Robert Fulton," belonging to the same company was also rebuilt and furnished with the truck, and named the "John Bull." The "Brother Jonathan" was a remarkable machine for those pioneer days. Mr. Matthew says of it: "With this engine I have crossed the Mohawk and Hudson railroad from plane to plane, 14 miles, in 13 minutes, stopping once for water. I have tried her speed upon a level, straight line, and have run a mile in 45 seconds by the watch. She was the fastest and steadiest engine I have ever run or seen, and I worked her with the greatest ease." This is certainly wonderful speed, and may be, as Matthew earnestly maintains it is, the fastest time at least on the American railroad record.

In comparison to the splendid and efficient engine of to-day, our first locomotives, built after the English model mainly, were clumsy and crude machines. Since then our improvements have been manifold and extraordinary, and the American locomotive is now pronounced the most "perfect railroad tool in the world." Its exquisite symmetry and flexibility, and its extraordinary power must fill the mind of a veteran like Matthews—who has watched its growth from its infancy in this country—with feelings of generous admiration and pride.—*Mining and Scientific Press.*



THE "BEST FRIEND"—FIRST AMERICAN BUILT LOCOMOTIVE.

the first English locomotive brought to the country was received and set up and exhibited.

The first locomotive engine built in America for actual service on a railroad was called the "Best Friend," and was constructed for the Charleston and Augusta railroad company. This pioneer locomotive (which is the subject of our accurate and handsome illustration) was built at the West Point foundry machine shops in New York City, and the work of fitting it up fell to the lot of Mr. Matthew. Immediately after the engine was completed it was placed on the company's road, and the first experiment with a train was made November 2, 1830, N. W. Darrell acting as engineer.

Some few days previous to the above date, or about the 20th of October, in accordance with a notice given in the Charleston papers, a public trial was made with this locomotive, without any cars attached, at which trial Mr. W. B. Ewer, one of the proprietors of this paper, was present. It was on this occasion that the first American built locomotive turned its wheels for the first time on a railroad track. At the trial on November 2d the wooden wheels of the ma-

chine was built at the West Point machine shops, and was also fitted up by Mr. Matthew; and when it was completed he took it to Albany, June 25, 1831, and made the first excursion with a train of cars over the road August 9, 1831. According to Mr. Matthew's statement, the "De Witt Clinton" weighed $3\frac{1}{2}$ tons, and hauled a train of 3 to 5 cars at the speed of 30 miles an hour. It is especially noteworthy that both the cab and the tender of the "De Witt Clinton" were covered to protect the engineer from the weather—a "happy thought" of honest David Matthew, for which all American engineers at least ought to hold him in kind remembrance. About the middle of August the English locomotive, "Robert Fulton," built by the younger Stephenson, arrived and was placed on the Mohawk and Hudson road for service in the middle of the following September.

These locomotives had been used and fairly tested both on the southern and northern railroads, and the necessity for a radical change in their construction had become evident. Very soon John B. Jervis devised the plan of putting the truck under the forward part of the engine

PROGRESS IN UTILIZATION OF SOLAR HEAT.—

Since May last year, M. Mouchot has been carrying on experiments near Algiers with his solar receivers. The smaller mirrors (0.80 m.) diameter) have been used successfully for various operations in glass, not requiring more than 400° to 500°. Among these are the fusion and calcination of alum, preparation of benzoic acid, purification of linseed oil, concentration of syrups, sublimation of sulphur, distillation of sulphuric acid, and carbonization of wood in closed vessels. The large solar receiver (with mirror of 3.80 m.) has been improved by addition of a sufficient vapor chamber and of an interior arrangement which keeps the liquid to be vaporized constantly in contact with the whole surface of heating. This apparatus on November 18th, last year, raised 35 liters of cold water to the boiling point in 80 minutes, and an hour and a half later showed a pressure of eight atmospheres. On December 24th M. Mouchot with it distilled directly 25 liters of wine in 80 minutes, producing four liters of brandy. Steam distillation was also successfully done, but perhaps the most interesting results are those relating to mechanical utilization of solar heat. Since March the receiver has been working a horizontal engine (without expansion or condensation) at a rate of 120 revolutions a minute, under a constant pressure of 3.5 atmospheres. The disposable work has been utilized in driving a pump which yields six liters a minute at 3.50 m. or 1,200 liters an hour at 1 m., and in throwing a water-jet 12 m. This result, which M. Mouchot says could be easily improved, is obtained in a constant manner from 8 A. M. to 4 P. M., neither strong winds nor passing clouds sensibly affecting it.

IMPORTANT TO FISHERMEN.—The *Scientific American* says it is a well-known fact that fish always return to the same ground each year to spawn, but that it has recently been discovered that they always follow the left-hand side of the river on their trips to the spawning grounds, and returning take the right-hand side of the river. Our fishermen should remember this.

ABRAHAM DAVENPORT.

HARTFORD, MAY 19, 1780.

In the old days (a custom laid aside with breeches and cocked hats) the people sent their wisest men to make the public laws. And so, from a brown homestead, where the Sound Drinks the small tribute of the Mianus, Waved over by the woods of Rippowams, And hallowed by pure lives and tranquil deaths, Stamford sent up to the councils of the State Wisdom and grace in Abraham Davenport.

'Twas on a May-day of the far old year Seventeen hundred and eighty, that there fell Over the bloom and sweet life of the spring, Over the fresh earth and the heaven of noon, A horror of great darkness, like the night, In a day of which the Norland sages tell— The twilight of the Gods. The low-hung sky Was black with ominous clouds, save where its rim Was fringed with a dull glow, like that which climbs The crater's sides from the red hell below. Birds ceased to sing, and all the barn-yard fowls Roosted; the cattle at the pasture bars Loved, and looked homeward; bats on leathern wings Flitted abroad; the sounds of labor died; Men prayed and women wept, all tears grew sharp To hear the doom-blast of the trumpet shatter The black sky, that the dreadful face of Christ Might look from the rent clouds, not as he looked A loving guest at Bethany, but stern As Justice and inexorable Law.

Meanwhile in the old State House, dim as ghosts, Sat the lawgivers of Connecticut, Trembling beneath their legislative robes. "It is the Lord's Great Day! Let us adjourn," Some said; and then, as if with one accord, All eyes were turned to Abraham Davenport, He rose, slow cleaving with his steady voice The intolerable hush. "This well may be The Day of Judgment which the world awaits; But be it so or not, I only know My present duty, and my Lord's command To occupy till he come. So at the post Where He hath set me in His Providence, I choose, for one, to meet Him face to face— No faithless servant frightened from my task, But ready when the Lord of the harvest calls; And therefore, with all reverence, I would say, Let God do His work, we will see to ours. Bring in the candles," And they brought them in.

Then by the flaring lights the Speaker read, Albeit with husky voice and shaking hands, An act to amend an act to regulate The shad and alewife fisheries. Whereupon Wisely and well spake Abraham Davenport, Straight to the question, with no figure of speech Save the ten Arab signs, yet not without The shrewd dry humor natural to the man; His awe-struck colleagues listening all the while, Between the pauses of his argument, To hear the thunder of the wrath of God Break from the hollow trumpet of the cloud.

And there he stands in memory to this day, Erect, self-poised, a rugged face, half seen Against the background of unnatural dark, A witness to the ages as they pass, That simple duty hath no place for fear.

—John Greenleaf Whittier.

HOW SHE MARRIED HIM.

Keziah Buckthorne had survived, by a considerable period, whatever of feminine charms and graces she might have once possessed, when a handsome fortune dropped down upon her as if from the clouds.

Had the riches come a score of years sooner there is no telling what might have been. Keziah's attractions had never been, so to speak, dazzling. But 20 years have great potency in turning dimples into wrinkles and lines of beauty into crows' feet; and many an adventurous Colebs who might have found Miss Buckthorne a match acceptable, with such a fortune, at 25, passed her by at 45, saved from the sin of covetousness by the reflection that she and her money were inseparable conjuncts.

Even Topham Gynblaney, the daily problem of whose life is to keep adjusted the balance between a very moderate income and quite expensive tastes, and who looked upon a thrifty marriage as the goal of human wishes, after a few visits of reconnaissance to Kesiah, which left him in doubt that he had but to say the word to receive a gracious answer, left the word unspoken.

Mr. Gynblaney's visits had ceased for some weeks, when a message came one day that Miss Buckthorne was quite ill—had fallen into a decline, in fact—and had been given up by Dr.

Croke. She desired to see Mr. Gynblaney and such other friends as might wish to bid her farewell ere she started on that journey whence there is no return.

Of course there was no refusing such a request. Decorously clad in solemn black, and with a face put on to match, Topham Gynblaney presented himself at the invalid's door.

"How is she, Doctor?" he inquired gravely, of a dried-up little man, who met him at the threshold with a countenance in which was a whole homily on the vanity of hope.

"Sinking rapidly," Dr. Croke replied; "those who wish to see her alive have no time to spare."

"There is no chance for her, then?"

"Not the slightest. Constitution gone—nervous system shattered—lung collapsed—no recuperative force—no—"

"How long do you think she'll last?" interrupted Topham, anxiously.

"Eight-and-forty hours at the furthest; more likely less than half of it."

"Would you like to see her?" asked the doctor, at length.

"I called for that purpose," returned the other.

"Let me apprise her of your presence," said the doctor; "in her present state any sudden surprise might prove fatal."

After a brief absence the doctor returned.

"This way," he said, leading the visitor to the sick room.

Mr. Gynblaney was shocked at the spectacle that met him. His heart, we have hinted, was pretty tough; but tough as it was, it was touched at the sight of the pale emaciated face—enough of itself to dispel all doubt of the truth of the doctor's predictions.

"This is—very—kind—of you, Top—Mr. Gyn—blaney, I mean," the sick lady murmured, a spasmodic cough interrupting her words.

Mr. Gynblaney took the chair placed for him at the bedside, and clasping in his own the thin hand extended to welcome him, returned its trembling pressure.

The doctor and the nurse retired to prepare a posset for the patient, leaving the latter and Mr. Gynblaney alone.

"I trust you will be better soon," said Mr. Gynblaney, with well-meant hypocrisy.

"That—is—past—hoping—for," was the scarcely audible answer. "Dr.—Croke—has—told—me—the—worst—"

Dr. Croke, we may here remark, always told his patients the worst. If they got well the more credit to him. If they died, of course it wasn't his fault.

A sudden thought flashed across Mr. Gynblaney. If he could only marry Miss Buckthorne now! In two days or less, he would be a widower, and the lawful possessor of his wife's fortune. Here was an opportunity indeed.

Rubbing his eyes with his handkerchief till they watered and looked red from the force of the friction, he gave the hand in his another and more tender pressure.

"Dear Keziah," he whispered softly between his sobs, "how—how—cruel that—that we should be parted thus!"

"I have long cherished the purpose," he went on hurriedly, mastering his emotion with an effort, "of asking you to be mine. Diffidence alone restrained me. But if you will even now consent—"

"Do—you—feel—that—it—would—be—a—comfort—to you—Top—Topham, dear—"

The cough would not allow her to finish.

"It would—it would!" he exclaimed, with a burst of well-feigned feeling. "To call you mine, but for an hour, though I lost you the next, would forever link my soul to a precious memory which—"

Mr. Gynblaney was on the point of ending his flight in an inglorious flop-down when Kesiah came to the rescue.

"It—shall—be—as—you—please,—dear," she sighed.

"No time is to be lost!" he cried, springing up. "Let us send for a minister at once!"

Just then the doctor and the nurse returned. The minister was summoned, and a few minutes

sufficed to make Topham Gynblaney and Kesiah Buckthorne one flesh.

A tinge which might have passed for a blush 20 years ago, overspread the bride's countenance. For some moments she lay like one entranced with happiness.

"Topsy, dear," she said, when they were again alone, "I feel as if I could eat something; they've kept me on gruel till I'm nearly starved."

"What would you like dearest?"

"Some tea and toast, and chops, and boiled eggs, and —"

"Good heavens!" exclaimed the doctor, entering in time to catch a portion of the list, "do you wish to commit suicide?"

"What hurt can it do?" she answered. "You have already told me there is no hope."

"I think we might as well gratify her," her husband added; and finding himself outvoted, the doctor held up his hand in horrified protest.

The repast was brought and received ample justice.

Next morning Mrs. Gynblaney was up by-times packing her trunks for an elaborate wedding tour, from which her husband and the doctor strove in vain to dissuade her. It would be hard to tell which of them was most amazed. Both were firmly convinced that the age of miracles was not yet past—unless, as the disconsolate Gynblaney half suspected, he had been made the victim of a cunning plot.

Ten years have passed and Topham Gynblaney has still the old problem to puzzle over, for Mrs. Gynblaney holds her own purse strings, and insists on "Topsy's" living on his own income.—Selected.

It is told of an American map agent that on a recent trip he was attacked by highway robbers, who demanded his money. As he was too prudent to carry money in the country, they failed to make a haul out of their victim. "But," said the agent, "I have some splendid maps of the country along with me, which I should like to show you." And in a twinkling he was off his horse, had a map stuck upon a pole, and explained it so effectually that he sold each of the banditti a map, pocketed the money and resumed his journey.

A COLORED banker, much alarmed by the failure of several other banks in his neighborhood, closed his own establishment. A man knocked at the barred door. "Who's dar?" cried the banker. "Open the door!" called the man. "Dis bank's closed," remarked the banker. "Don't care whether the bank's closed or not," cried the stranger, "I left a pair of new boots here yesterday and I want them." Presently the door was thrust partly open and one boot pushed out, with the remark: "We is only payin' 50 cents on the dollar to-day."

JOSEPH WIDMER, seven feet in height, and the tallest man in Missouri, died a short time since. The St. Louis *Republican* says that he served in the war in Col. Frederick Hecker's regiment, and at the time of the first parade of his company, Col. Hecker, noticing that he stood head and shoulders above all others, yelled out, "You rascal, get down from that stump!" When the enraged colonel drew near to learn why his order was not obeyed, he saw what he afterward said was the longest bean-pole he ever beheld.

SCIENCE AND COMMON SENSE.—"Common sense," says Prof. Huxley, "is science exactly so far as it fulfills the ideal of common sense; that is, sees facts as they are, or at any rate without the distortion of prejudice, and reasons from them in accordance with the dictates of sound judgment. And science is simply common sense at its best; that is, rigidly accurate in observation, and merciless to fallacy in logic."

AN unfortunate Indianapolis man who lost several toes by a car-wheel, was consoled by an Irishman near by with: "Whist, there, you're making more noise than mony a man I've seen with his head off."

A SYLVAN SERMON.

Rambling once in a beautiful Kansas wood, a sight both beautiful and suggestive arrested my attention. A grand old oak stood before me, its trunk and main branches encircled, and its stately head enveloped in a thrifty vine, which the tree, in its "glorious magnificence" had "swept around itself;" but which, from inherent limitations, it could not wholly appropriate. Here and there, indeed, a withered branch whispered the danger of ultimate decay from the luxuriant fullness of the vine-life whose creative ends the fine old tree could neither absorb nor fulfill, but might, to a limited extent, assist and even arrest.

When both were starting out in life—the earth beneath them and the heaven above them, theirs by primal endowment—the vine, modestly conscious of innate power to glorify by her attachment, and obedient to the social law of her nature, had gracefully accepted the proffered support of the sturdy tree. From that time onward, in summer's heat and winter's storm, they had found succor and refreshment, each in the other's embrace; and when in the course of their development, there had come revelations of natural differences and surplus energies, suggesting diverse activities and new departures, they had acquiesced without question or apprehension of adverse interests. To repress the individuality of either would be to invite the nonentity of both. So the grand old tree, festooned and crowned to his utmost, and holding fast his allegiance, sustained his beautiful vine, and day by day watched her, glad in her unfolding beneficence, swaying in the breeze, soaring sunward, or coyly tending to his side. At last there came a day when weighed down by accumulating leaf and flower and branching responsibilities, her beautiful head trailed in the dust!

*** A mighty rustle, a quick rebound of lithe, enfolding arms from loosed tendril, and the prone vine lifted by the passing breeze caught the extended branch of a neighboring tree-top; and here safe in her additional supports, she sent out thrifty laterals to lattice the intervening space, and made of her extended sphere a bower of beauty, where the wearied body might find rest, and the muddled brain grow clear, and may-hap, learn from bird and bee, that in the divine economy, tree and vine owe sweet uses outwardly, and in living for themselves or each other only, must decay and grovel in the dust.—Mrs. C. I. H. Nichols.

"A WOMAN AT THE BOTTOM OF IT."

In 1702, Elizabeth Mallet established and edited the *London Daily Courant*—the first daily paper in the world—in London, England.

"In June, 1877," says the *London Annual Register* of that year, "the Chilean Congress granted to women the right to vote."

Mrs. Jas. Brander, an eminent English teacher, has been appointed by the British Government, Inspector of Schools for Madras, India. The appointment, says the *N. Y. Tribune*, was wholly unsolicited.

We frequently hear a lady exclaim, "Oh, dear! I wish I were a man!" But we do not remember ever hearing a man wish himself a woman. No; man never dared allow his wishes to soar so high. He is contented to admire rather than be admired. N. B.—This is not taffy.

EITHER we must make the ocean wider or the steamships narrower. Something must be done to enable two ships to pass without going through each other. Society kind of demands it, and the comfort of the passengers seconds the demand.

"One kind of ship I always steer clear of," said an old bachelor sea captain, "and that's courtship, 'cause on that ship there's often no mates and two cap'ns."

EVOLUTION ADMITTED, WHAT THEN?

It is gratifying to note an obvious subsidence of alarm on the part of eminent divines in regard to the acceptance of evolution doctrines, accompanied by the bolder enunciation of rational views respecting religion. Dr. E. O. Haven, Chancellor of the University of Syracuse, and now a Methodist bishop, sends a communication to a leading religious journal under the above title, which is full of significant foreshadowings that are worthy of notice.

Dr. Haven utters a very important truth when he says: "Men are prone to associate their religion with its drapery. This becomes obsolete and must be changed, and the looker-on fancies that the very body and soul are gone." This is the view of science. Religion, like other things, is progressive, and proceeds from stage to stage, successively molting its integuments with increasing expansion and a higher life, or, by the figure of Dr. Haven, shedding its worn-out clothing as occasion requires. It is a great point gained in this matter to discriminate between the living body and its accidental and temporary wrappings—between perennial truth and its obsolete accompaniments. The credal habiliments are not the vital thing they invest, and to cling to them as if they were is superstition. Dr. Haven's point of view enables us to appreciate the triviality of denominational cuts, fits and styles; and illustrates the futility of venerating theological rags and tatters instead of the essential religious ideas which require ever to be clothed anew as men grow in grace. And what a pitiful spectacle, moreover, it is to see people so confused and perverted in their notions as to actually worship the heaps of old clothes that have been long ago worn out and cast off.

We are glad to observe that Bishop Haven does not recoil from the conception of creation as a continuous, ever-unfolding work. He wisely accepts the view of God, compelled by evolution, as that of an eternally-creating Spirit. He says, "Is there any reason whatever to believe that God at any past period, large or small, had any more or less to do than now with this earth and all that it contains?" And again: "Had we all been educated in a theory of gradualism and constancy and improvement, and thoroughly saturated with it, and yet aroused into a profound belief in God, as is certainly conceivable on that theory, and then, should the theory of a Deity sometimes awake and sometimes asleep be suggested, it would shock some feeble minds into atheism." But would not strong minds also be thus shocked, and justly so; and would not the atheism be real? When evolution has become an established and familiar idea in the religious world, and the Creative Power is conceived—as far as such conception is possible to finite faculties—as the mighty, ever-energizing spirit of which the boundless universe is but the manifestation, a reversion to present current notions of the method of creation will assuredly be regarded as a lapse into atheistic paganism, analogous to a present backward plunge into fetichism.—Prof. E. L. Youmans.

A NEW SKATING SURFACE.—A skating surface, called by its inventor, "crystal ice," has been laid down in a London skating rink. It consists of a mixture of the carbonate and sulphate of soda. The crystallization of these salts produces a floor which so closely resembles ice, both in appearance and the resistance of its surface, that when it is a little "cut up" the deception is said to be quite astonishing. It can be skated on with ordinary ice skates. When roughened too much it is smoothed by steaming with an apparatus provided for the purpose.

"NEVER mistake perspiration for inspiration," said an old minister in his charge to a young pastor just being ordained.

DOMESTIC RECIPES.

RHUBARB AND APPLE JELLY.—Wipe, peel and cut up a bundle of rhubarb; peel, core and quarter three pounds of apples; take the thin rind of half a dozen lemons, and put it into a preserving pan with one and one-half pint or two quarts of filtered water and the juice of the lemons. Boil until reduced to a pulp. Strain the juice through a napkin, pressing the fruit well. Weigh the juice, and allow one pound of loaf sugar to every pound of juice. Boil up the juice, add the sugar, boil, skim well, and when it jellies on the skimmer pour into pots, and tie down when cold. The jelly makes excellent sauce for puddings, and, when liked, can be colored with some cochineal, if it is wanted of redder color. The pulp, stewed down with loaf sugar, can be used for children's or servant's jam puddings, or is very nice put into a glass dish, covered with a custard, and garnished with pastry, or with sponge cakes, cut into slices and fried lightly in butter.

OAT MEAL FOR BREAKFAST.—In the last five years the consumption of oat meal in this country has probably increased 20-fold. People differ so much in their likes and dislikes that we do not insist upon anybody eating oat meal because somebody else does, but the great growth of the popularity is beyond doubt. Generally the Irish and Scotch meal have been considered best, but they sell comparatively high, and persons well acquainted with the subject say that Akron meal of Ohio is just as good. Oat meal should be well cooked. As it is usually made a breakfast dish, it may be soaked over night, and then boiled like mush for, say, half an hour, while the other part of the breakfast is getting ready. No doubt it is more wholesome eaten plain, but the temptation to use various "dressings"—generally cream and sugar—is too strong for any except very firm health-seekers. But where these are eaten it should be, as the friends say, "in moderation."

ORANGES AS A REGIMEN.—A vast number of oranges are eaten by the Spaniards, it being, in fact, no uncommon thing for the children of a family to consume ten or a dozen oranges each, before breakfast, gathering them fresh for this purpose from the trees. Such wholesale consumption of what is commonly looked upon as a luxury, appears to have no unwholesome effect upon the system. On the contrary, the testimony of a late eminent physician authorizes the use of fruit ripe, fresh and freely as a trustworthy auxiliary in the treatment of chronic dyspepsia.

WORCESTERSHIRE SAUCE.—The *Canadian Pharmaceutical Journal* says that the following recipe gives a sauce closely resembling "Worcestershire." Vinegar, 1 qt.; allspice, powdered, 2 drams; cloves, powdered, 1 dram; black pepper, powdered, 1 dram; mustard, powdered, 2 oz.; ginger, powdered, 1 dram; salt, 2 oz.; shallots, 2 oz.; sugar, 8 oz.; tamarinds, 4 oz.; sherry, 1 pt.; curry powder, 1 oz.; cayenne, 1 dram. Mix all the ingredients together, simmer them for an hour, and strain. A little brandy coloring may be added to darken the sauce.

A CREAM TO EAT WITH FRUIT.—Boil half a pint of cream and half a pint of milk with a bit of lemon peel; add a few almonds beaten to paste with a drop of water and a little sugar. Take a teaspoonful of dry flour, rub it smoothly down with a little cold milk and a few drops of orange flower water; mix all together, and let it boil; let it remain till quite cold, and then add a little lemon juice.

CHOCOLATE.—In preparing chocolate for family use, cut off about two inches of the cake to one quart of water; stir it first in a little cold water till it is soft, then pour on the boiling water. After it has boiled a short time, add a pint of milk; boil up and serve; sweeten to taste.

THE MICROSCOPE IN BOTANY.

The microscope is constantly enlarging its field of usefulness, and is adding, day by day, new triumphs in the direction of original research. It has recently given to the world a new and more certain mode for determining the geological structure of rocks; and the fact is now announced of a discovery of equal importance in connection with the life and growth of plants. As, in the first case, many of the universally accepted theories of geologists were brushed aside, so, in the present instance, theories which botanists had supposed to be well established are completely overthrown. It appears that Prof. Prinzheim, of Berlin, has recently been studying the green coloring matter in the leaves of plants, known as chlorophyl, and the cells in which it is contained. Botanists have heretofore assigned to this substance the work of absorbing from the atmosphere, during the night, carbonic acid gas, retaining the carbon for the sustenance and growth of the plant, and returning the free oxygen to the air to make good the deterioration of that element through the respiration of the animal creation. Now Prof. Prinzheim has demonstrated, by the aid of the microscope, that chlorophyl does not perform that work, but that the carbon in the atmosphere is appropriated and assimilated through the medium of a balsam-like substance in the plant, heretofore unknown, to which he gives the name hypochlorine. This newly discovered substance, when under the influence of sunlight, has a strong affinity for carbonic acid; and it further appears that the heretofore supposed active chlorophyl is merely a passive agent—a sort of curtain, screening the hypochlorine from the direct or too powerful influence of the sun's rays, so that it may do its work with regularity and moderation. The Prof. has shown, by experiments, that if the intensity of the sun's rays is materially increased by any optical apparatus, the chlorophyl screen or regulator, is found too feeble to protect the hypochlorine in its proper work, and oxidation sets in so rapidly that both chlorophyl and hypochlorine are rendered inert, and the plant dies. This discovery opens an entirely new field for botanical research, and furnishes additional evidence that plants have a regulator of vital forces, corresponding more nearly than the simple chlorophyl to the heart and lungs of animals, and further proof is gained in the direction of a unity of life between the animal and vegetable kingdoms.

THE CIRCULATION OF HUMAN BLOOD MADE VISIBLE.—Dr. C. Huter, a German Microscopist, has constructed a simple device by which the circulation of the blood is made visible in a human subject. His method is as follows: The head of the subject is placed in a frame, with which is also connected a microscope. The head and instrument are so placed that the lower lip may be slightly drawn out, and its inner portion fixed uppermost upon the stage of the microscope. A strong light is then thrown upon the surface of the lip, the light being intensified by use of a condenser. Thus arranged, the instrument is properly focused upon a small superficial blood-vessel, when the observer may plainly see the endless procession of blood corpuscles passing through the minute capillaries, the colorless ones being distinctly identified as little white specks, more or less thickly dotting the main body of the red stream of blood. This device may often prove of considerable importance to the medical practitioner, by enabling him to carefully note the variations in the blood flow, and the relative proportions of the white corpuscles in that fluid. This is the first instance where the flow of the vital fluid of one human being has been made visible to another. Observations as to the character of the blood have heretofore been made upon that fluid after it has been drawn from the subject, and, of course, under circumstances very unfavorable for accurate determinations.

THE HOMESTEAD BY THE SEA.

In the chalk bluff, more than 40 feet from high-water mark, is the vertebrae of a whale distinctly outlined. This monarch of the seas selected his tomb with some reference to the fitness of things. The Egyptian monarchs built for themselves granite tombs; but the whale lay down on the ooze, and the infusoria of 5,000 years or more built around and above him. He was grandly inurned, and lifted up out of the sea by such a force as no living or dead Pharaoh could command. In the matter of royal sepulture, it is certain that the whale had an immense advantage. But after 3,000 or 4,000 years, the defunct monarchs of sea and land are mainly valuable for bone-dust, and are rather poor fertilizers at best. From the hill one may see whales gambol in the Bay of Monterey, in the early spring months. What a great laundry establishment these fellows might set up, if they only knew how to utilize their power! At present, these columns of spray blown into the horizon are only picturesque. There is a grave suspicion that the friend, whose Mongol servant blew the spray from his mouth into the sponge to be set for bread, would have much preferred that the whale had performed that office. Years ago, one of these monsters was seen floundering about in the bay all day long, as though in great distress. The following night he drifted ashore, dead. The great hulk had no mark of the sword-fish or the whaleman's lance. The sailors said that he was worried, teased, and, finally hunted to death, by a fish called a "bummer." How strikingly human-like was this experience of the dead mammal!

There was a strange fascination about two wrecked vessels, whose timber heads could be seen above the sand. Sometimes, in a storm, they would get adrift. So weird-like and mysteriously did they rise and fall on the surging sea, appearing and disappearing, thrusting their timbers out like arms imploring help, that one might fancy they were the spirits of these lost vessels coming back to protest against this broken rest. How strangely they accented the storm! When it subsided they would bring up at the old place, and the sand would bury them again. There was an odd genius in the town who claimed these wrecks by pre-emption. When his finances were low, and creditors pressed for small bills, he made his payments conditioned, as to time, on the coming of the next storm which would bury the wrecks. Providence saved him a deal of hard shoveling, by raising the wind for him. Then he drew out copper bolts enough from the wreck to liquidate his bills, but gathered no surplus. Hath not many a mine been exhausted by indiscreet development? As long as that copper lasted, "Bob" paid his debts periodically. If he has not yet drawn his last copper bolt, he is still entitled to the financial confidence of this trading and huckstering world.—*W. C. Bartlett in Californian for July.*

AVOIDANCE OF VIBRATION WITH MACHINERY. Mr. W. H. Delano, in a paper read before the British Institution of Civil Engineers, suggests the use of asphalt for the foundation of machinery, notably for those running at high speeds, the asphalt having the valuable quality of absorbing vibration. This was instanced in the case of a Carr disintegrator, which, being mounted in a pit lined with bituminous concrete, was worked at 500 revolutions per minute without sensible tremor, whereas with the former wooden mountings on an ordinary concrete base, the vibration was excessive and extended over a radius of 25 yards. In the Paris exhibition of 1878 there was shown a block of bituminous concrete, weighing 46 tons, forming the foundation of a Carr disintegrator used as a flour mill, and making 1,400 revolutions a minute, a speed which would have been impracticable on an ordinary foundation. Extensive applications of the material for this purpose are made in France, especially in connection with steam engines and steam hammers.

THE MYSTERY OF EXCHANGE.

We presume that most of our readers are aware that the quotation of foreign exchange represents a premium considerably in excess of the actual fact; but we doubt whether all of them know precisely what is the difference. By the usage of bankers, the old Spanish dollar is assumed as the par of exchange, £1 sterling being equal to 4 4-9 of these dollars. In point of fact, however, in the established moneys of Great Britain and the United States, £1 sterling contained as much gold as \$4.87 of U. S. money; and this is the true par of exchange or rate which must be used in converting the money of one country into that of another. For instance, if anything costs £100 in Great Britain, its true value expressed in the money of the United States is \$487. Accordingly, it is a fact, familiar to all bankers, that when exchange is quoted at 109½, there is no real premium, but the true par has been attained; because, if we multiply \$4.44 4-9, which is the nominal par, by 109½, which is then the quoted rate, we get \$4.87, which is the true par. We need scarcely add that it is owing to this circumstance that the exports of gold from the United States are not larger. If there really existed such a heavy premium on bills of exchange, as many persons suppose, it would be immensely profitable to export gold to Great Britain. In point of fact, in view of the necessary expenses of freight, insurance, and loss of interest, the margin does not more than cover the risk. The U. S. half-eagle, it may be added, contains 116 grains of pure gold, equivalent to \$5; the British sovereign, or pound sterling, 113 grains, equivalent to \$4.87 of United States money.—*The Economist.*

EXILE MINING IN SIBERIA.—The popular idea of the fate of prisoners sentenced to hard labor in the mines of Siberia is a somewhat exaggerated one. It is generally believed that a man condemned to work in the Siberian mines is virtually condemned to death; that when he descends into the mines he says good-bye to the light of heaven forever, being kept underground until he dies; and that living as he thus does, amid unhealthy fumes, death is not long in coming. A correspondent of the London *Times*, having heard these statements before he went to Siberia, appears to have taken some trouble to ascertain whether they are true or not, and, after many inquiries, "common fairness," he writes, "compels me to say that every one denied that there was any foundation for them." "Even," he continues, "the few Poles who spoke so bitterly of the Government did not bring this to their charge; nor did I meet any or the convicts who said as much." On the contrary, the silver mines were, so far as he could learn, worked on the 12, and sometimes even on the 8-hour system; while in the gold mines, which he himself visited, the men worked in summer from 6 in the morning till 7 at night, with intervals of rest for meals. In the coal mines, also, the men only worked for 12 hours a day, and an officer informed the writer that the amount of worked allotted to each man per day ought to be got through by an energetic workman in about two hours. On the other hand, it appears that flogging is not infrequently inflicted in a barbarous manner in Siberia. At three stations, but apparently at three stations only—at Kara-Nicolaievsk and Saghalien—an instrument called the "troichatka," or plait, is used. From 20 to 50 stripes are usually administered, though the number may be made a 100; and the writer adds that "when heavy numbers are inflicted, the punishment must be little short of an execution. Sometimes, in fact, the convicts do not recover from its effects."

STRUCK BY LIGHTNING WHILE UNDER WATER. At Halifax, N. S., May 29th, while divers were at work at Cole Harbor dike a storm came upon them, and the lightning striking an air pump passed down to a diver under the water. When brought up he was insensible, but his injuries are not serious.

BARNYARD OR COCK'S-FOOT GRASS.

Our illustration upon this page shows a luscious annual which is quite widely distributed over the Eastern States, and is known as "Barnyard grass" or "Cock's-Foot grass," its botanical name being *Panicum crusgalli*. It is figured and described in the "Report of the Depart-

otherwise smooth, with the sheath smooth or rough; spikes 1 to 3 inches long, numerous, crowded in a long raceme or a dense panicle, which is rough with stiff hairs; the glumes ovate, rough, abruptly pointed; lower palea of the neutral flower usually bearing a rough awn; varies greatly, sometimes awnless or nearly so, sometimes long awned, especially in the variety

makes a hay of good quality. It is justly regarded as an excellent grass, particularly before it ripens its seed, as in the later stages of its growth the long and stiff awns of its spikes tend to make it somewhat unpalatable. Mr. D. L. Phares, Woodville, Miss., says of the grass: "The hay is very highly esteemed by many farmers. In northeast Mississippi I have seen large fields of it mowed." This grass should be cut early, while it is juicy and palatable. This will be at the first appearance of the flowers.

GIANTS IN MUSKINGUM COUNTY, OHIO.

A correspondent of the Cincinnati *Enquirer*, in describing the mound in which the remarkable discovery of the gigantic skeletons were made, says it was about 64 ft. long and 35 ft. wide, top measurement, and gently sloped down to the hill where it was situated. A number of stumps of trees were found on the slope, standing in two rows, and on the top of the mound were an oak and a hickory stump, all of which bore marks of great age. All the skeletons were found on a level with the hill, and about eight ft. from the top of the mound. Now to a more particular description of these antiquated remains:

In one grave there were two skeletons—one male and one female. The female face was looking downward, the male being immediately on top, with the face looking upward. The male skeleton measured nine ft. in length, and the female eight ft.

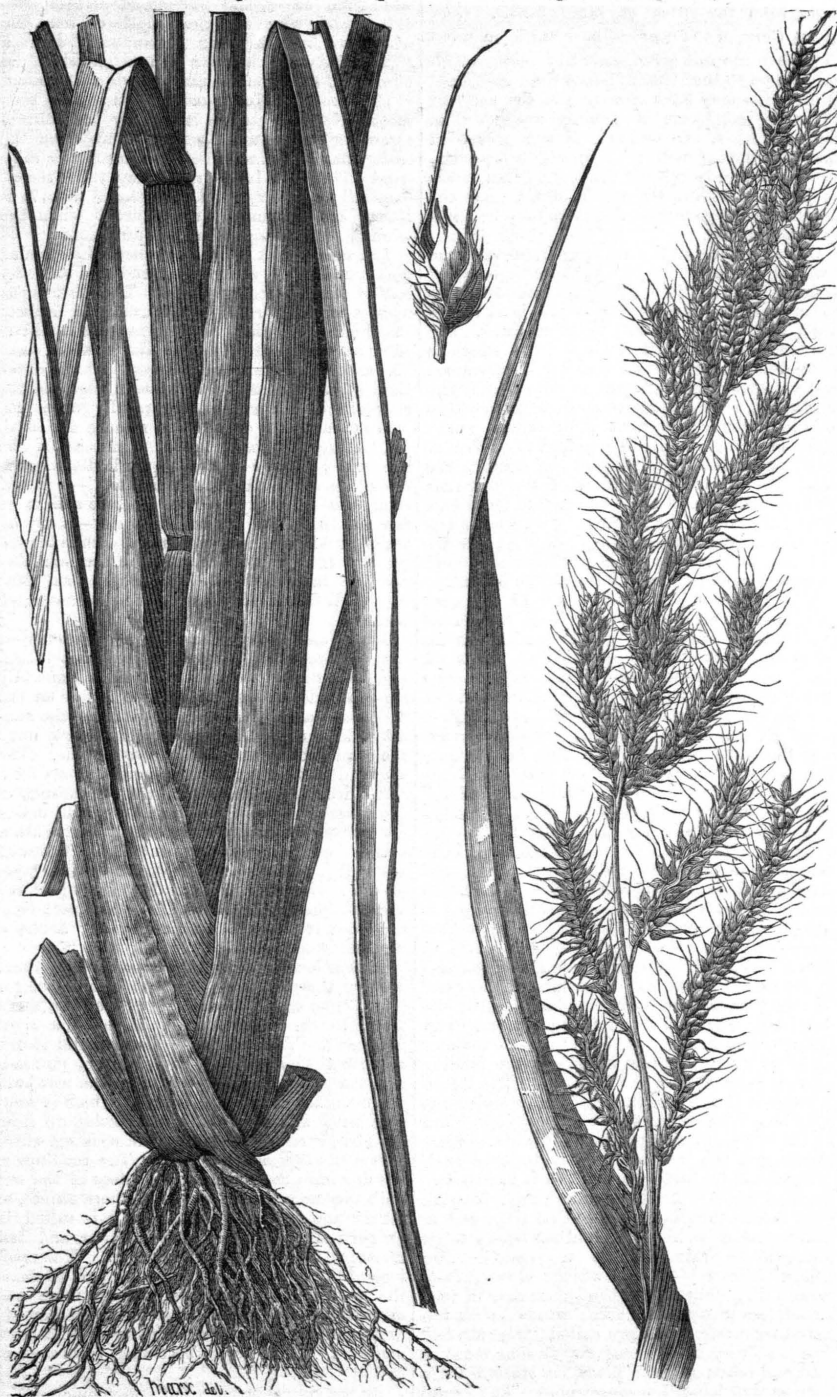
In another grave were also found two skeletons—male and female—with the female face looking upward and the male face looking downward. The male frame in this case was nine ft. four inches in length, and the female eight ft.

In another grave was found a female skeleton, which was incased in a clay coffin, holding in her arms the frail skeleton of a child three ft. and a half long, by the side of which was an image, which, upon being exposed to the atmosphere, crumbled rapidly.

The remaining seven were found in single graves, and lying on their sides. The smallest of the seven was nine ft. in length, and the largest ten. One single circumstance connected with this discovery was the fact that not a single tooth was found in either mouth, except in the one incased in the clay coffin.

On the south end of the mound was erected a stone altar, four ft. and a half wide and 12 ft. long, built on an earthen foundation nearly four ft. high, having in the middle two large flagstones, upon which sacrifices were undoubtedly made, for upon them were found charred bones, cinders and ashes. This was covered by about three ft. of earth. This excavation was made under the direction of the Muskingum County Historical Society, and the things alluded to in this letter, or dispatch, can be verified by a number of witnesses who were present and watched the work as it progressed. It was pursued with great interest and diligence, there being the strongest incentive to prosecute the investigation, for such remarkable developments in mound-opening are very rare, and are therefore fascinating in the extreme. Their future labors were also rewarded with additional developments, which, if they do not throw additional light upon this giant race of people that once inhabited this country, will at least stimulate research.

What is now a profound mystery, the result of this excavation may in time become the key to unlock still further mysteries that centuries ago were commonplace affairs. I refer to a stone that was found resting against the head of the clay coffin above described. It is an irregular-shaped red sandstone, weighing about 18 lbs., being strongly impregnated with oxide of iron, and bearing upon one side two lines of hieroglyphics.



COCK'S-FOOT GRASS—*Panicum Crusgalli*.

ment of Agriculture for 1878" as one of the grasses worthy of test in the Southern States. We take from the report a description of the plant and some record of its valuable properties, as learned by its growth in Alabama and Mississippi. It is an annual grass, with thick, stout culm, branching from the base, 2 to 4 ft. high; leaves long, $\frac{1}{2}$ inch or more wide, rough on the margins,

hispidum, a very large and coars: form of the species, with the sheaths of the leaves rough, hairy; another variety, muticum, is destitute of the awns and is smooth throughout. Very common in waste places in all parts of the country.

Of this grass Dr. C. Mohr says: It grows luxuriantly, particularly in the lowlands of the coast, is greedily eaten by horses and cattle, and

RAILROAD CAR WHEELS.

There appears to be no record which shows the first form adopted for the flanges of railroad wheels, nor of the shapes which they have gradually assumed. Wood's treatise on railroads and Pambour's book on locomotives contain sections of tires, the form of which does not differ materially from those now in use. These were published in 1836 and 1838. The fact seems to be that the present shape of flanges and also of rails has been assumed to be right without any good or sufficient reason for it, excepting that it worked well in practice. In other words, there are no adequate reasons for inferring that the present form of wheel flange is the best that is possible. It has been adopted empirically, and there is no sound theory to recommend it. It seems quite within the range of possibility that an elaborate investigation might indicate some important and valuable modifications in the form of these very important parts of all railroad vehicles.

There are more than 10,000,000 car-wheels in use in the United States, the average life of a wheel is eight years, and it requires a little over a ton of pig iron to make four wheels. Hence, assuming that the number of wheels in use is even 10,000,000, it requires 1,250,000 new wheels to replace those worn out each year, and to make these over 312,500 tons of pig iron are required. As 1,250,000 wheels are worn out each year, and as the average weight of a worn out wheel is about 515 lbs., something like 287,389 tons of this old material are available for remanufacture. The difference between this sum and 312,500—the approximate weight of the new wheels—shows pretty correctly the number of tons of new material consumed per year in the manufacture of car wheels, assuming that all the old wheels are manufactured into new ones. The difference is 25,111. The life of a car wheel is, however, growing shorter, for two reasons: 1. The increasing weight of a carload, the load on some roads now being double what it was a few years ago; and second, better management and improved loading and unloading facilities, by which the wheels are kept moving more continuously than formerly. As an instance, a train loaded with petroleum can be unloaded at New York in a very small fraction of the time required before the excellent facilities for discharging were provided. Manufacturers guarantee wheels to run from 50,000 to 60,000 miles, but they not unfrequently greatly exceed this.

DEMAND FOR GAS ENGINES.—Those connected with the manufacture of illuminating gas in this country appear to be gradually coming to a sense of the necessity of building up additional markets for their product. They are now making strong efforts to aid the introduction of gas engines. At a recent meeting of the Western Gas Association, at Indianapolis, Mr. J. O. King, president, in his address stated that the demand for gas engines is so great that manufacturers are unable to meet it with any promptness. Mr. Ramsdell, of Vincennes, Ind., speaking on the subject, gave a brief account of the experience which he had had with the Otto silent gas engine. A 17-horse power engine operated two elevator belts, lifting the grain in 8 and 12-inch buckets 60 ft. high, 10-inch conveyers 135 ft. in length, one wheat cleaner and fan and one pump. To do this it consumed 200 cubic ft. of gas per hour. The chief advantage brought out was that it is admirably adapted for light and intermittent work. In addition to this wheat machinery there was complete machinery for handling corn, besides the elevator and conveyers, used also for the wheat, one No. 2 corn sheller and machinery, etc. Another, a 1½-horse power engine, operated the machinery of a local newspaper, from three to four hours a day, at a consumption of 1,000 cubic ft. of gas per month. The gas engineers, it seems, are considerably impressed with the importance of the subject.

SIGNAL SERVICE WEATHER CASE.

The extension of the U. S. Signal Service has proved of great value to all our outdoor industries. The great trouble in bringing its results to bear upon agriculture has been the difficulty of making known forecasts, etc., to those remote from the cities or large towns. Gen. Myer, Chief of the Service, now has it in mind to issue a compact arrangement of meteorological devices so that those distant from centers of information may have some means for arriving at better judgments of coming weather than they now have. Of course it is not pretended that any device will give infallible forecasts, but the design is to bring the best modern means of judging within the reach of all, that the benefits of the government service may be widely disseminated.

Our engraving on the next page represents the "weather case or farmers' weather indicator," which will be set up ere long in rural postoffices throughout the country. The case is 31 inches high, 13½ inches wide and 4½ inches thick. The front is covered with a glass door, which is kept closed except when making observations and adjusting the different instruments. The engraving, which of course presents the weather case in miniature, is worthy of careful study and a leisure hour will be required to arrive at a full understanding of its plan and details. We shall give as full a description of the different parts and their uses as we have space for at this time, as we deem the subject one of general importance. We understand that the cases are not for sale, but are to be erected here and there at government expense for the public benefit.

The pointer or index at the top of the case (No. 1) slides on the brass arc; it is known as the "sunset barometer index," and indicates, when set, by the figures to which it points on the "main barometer scale," which is just below it, the reading of the barometer at the time of the sunset yesterday. The "main barometer scale" (No. 2) exhibits all the barometric readings likely to be used with this instrument. The pointer (No. 3) just below the "main barometer scale" is called the "reference index," and indicates by the figures to which it points on the main barometer scale, when the instrument is set, the mean or average reading of the barometer at the place at which the instrument is set and for each separate month. When the barometer reads above or below this reading at any place, such reading is said to be "above the mean" or "below the mean" for that place in that month. This reference index is established in the exact central line of the face of the case. The long brass hand over the glass face of the barometer is known as the "long pointer," and indicates, by the figures of the "main barometer scale" to which it points when set, the reading of the barometer when last set. The black pointer on the face of the barometer under the glass face is known as the "short pointer," and indicates the existing pressure of the atmosphere at any time the instrument may be examined.

There are for each place and each month two kinds of winds: First—Winds which, blowing from certain directions, are at that place and in that month more likely than other winds to be followed by rain. These are called "rain winds." Second—Winds which, blowing from certain directions, are at that place and in that month less likely than other winds to be followed by rain. These are called "dry winds." The wind direction for any day or time must be seen and taken at each place or station by a vane as well located as practicable. The "wind disk" (No. 8) consists of a brass circle, on which slide freely two arcs—a red arc, called the "dry wind arc" (No. 9), and a blue arc, called the "rain wind arc" (No. 11). In the center of the disk is a pointer turning with a turning-screw, and called the "wind disk pointer" (No. 10). Around the disk are letters to show directions, as N. for north, E. for east, NE. for northeast, etc.

The pointer and scale (No. 5) on the right of and below the barometer are called the dry-

wind time record, and the pointer (No. 7) is called the "record pointer," and indicates, when set, the length of time the wind has been blowing continuously from a "dry" direction, by the figures showing the number of hours on the scale to which it points.

The pointer and scale (No. 4) on the left of and below the barometer are called the rain-wind time record, and the record pointer (No. 6) indicates, when set, the length of time the wind has been blowing continuously from a "rain" direction, by the figures showing the number of hours on the scale to which it points.

The record pointer on the rain-wind time record (No. 6) is always turned by the thumb-screw, and set pointing at the figure 0 on the scale when the wind is not blowing in the rain-wind direction. In the same way the "record pointer" on the dry-wind time record (No. 7) is always set pointing at the figure 0 when the wind is not blowing in the dry direction.

The sunset disk (No. 12) consists of a circular disk one-half of which is colored red and one-half of which is colored blue. The disk turns upon a central turning screw in such a manner that half of the disk shows through a semi-circular opening in the face of the weather case. The sunset disk is set as follows: At the exact time of every sunset the western sky and the character of the sunset is carefully observed. The examination ought to be minute and careful, lasting for about fifteen minutes. If the sunset sky is clear or red, or markedly what is known as a "fair weather sunset"—a sunset such as is generally held to indicate a clear or fair day to follow on the next day—a day on which it will not rain—the sunset disk is turned by the turning screw until the semi-circular opening shows all red. The sunset disk, thus turned, is described as set for a "fair weather sunset."

If the sunset sky (the western) is cloudy or foul, or markedly what is known as a "foul weather sunset," a sunset such as is generally held to indicate foul weather to follow on the next day—a day on which it will rain—the sunset disk is turned by the turning screw until the semi-circular opening shows all blue. The sunset disk thus turned is described as set for a "foul weather sunset." If the appearance of the western sky and the character of the sunset are neither markedly those of a "fair weather sunset" nor of a "foul weather sunset," but such as to leave the observer in doubt how to style it, the sunset disk is turned to show half red and half blue, or "doubtful." The sunset disk, thus set, is described as set for a "doubtful weather sunset."

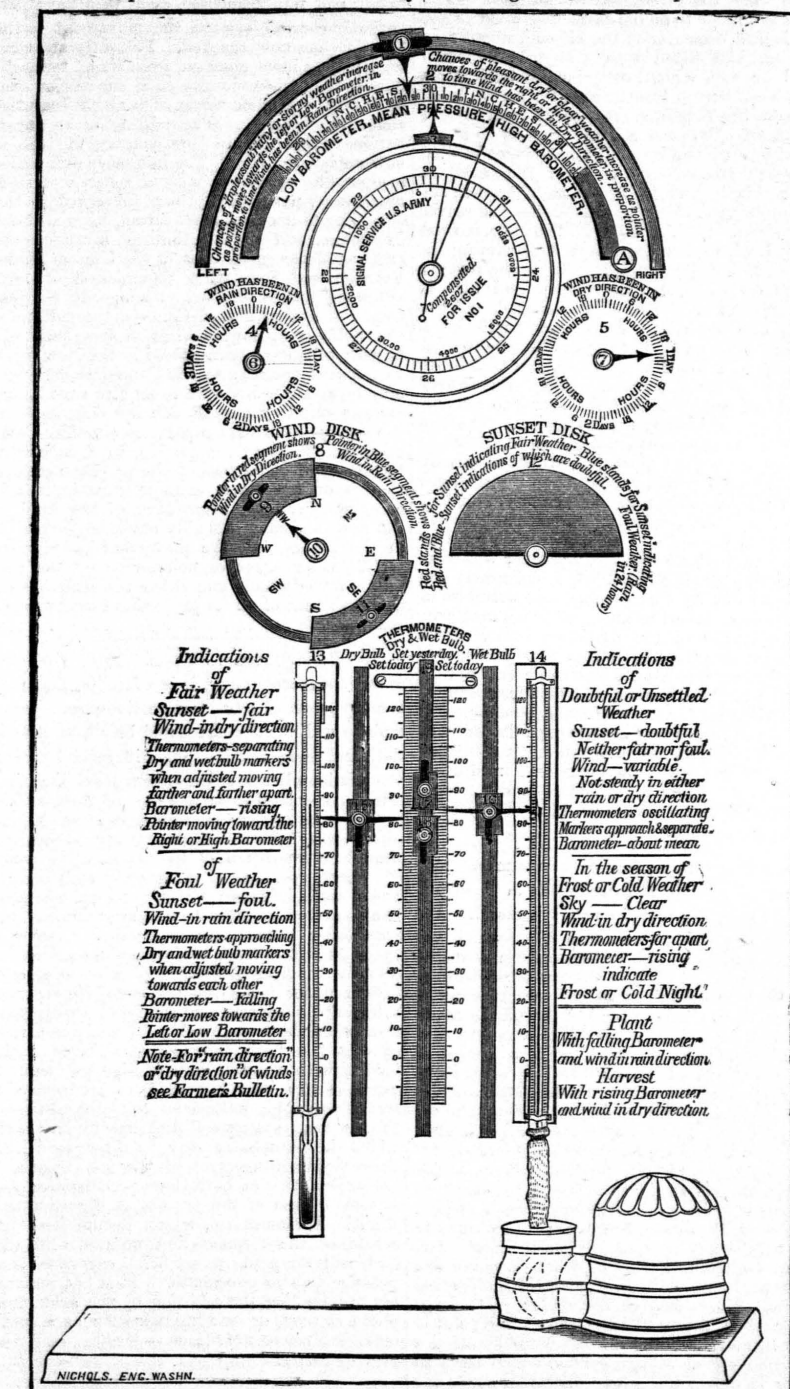
In the lower part of the weather case there are two thermometers, a dry bulb thermometer (No. 13) on the left hand side of the case, and a wet bulb thermometer (No. 14) on the right hand side. The dry bulb thermometer is like any other thermometer, and shows by its readings the temperature of the air. The wet bulb thermometer is one, the bulb of which is kept constantly moist by the water passing up from the glass reservoir, through the wicking which covers the thermometer bulb. The readings of the dry bulb thermometer and those of the wet bulb thermometer are more and more unlike, or farther and farther "apart," as it is called, in proportion as the air contains less and less moisture, that is, is becoming drier. The readings of the dry bulb thermometer and those of the wet bulb thermometer become more and more alike—are nearer and nearer together—in proportion as the air contains more and more moisture. That is, is becoming saturated or wet.

By the side of the dry bulb thermometer (No. 13) is the dry bulb pointer which slides on the brass slide (No. 15). By the side of the wet bulb thermometer is the wet bulb pointer which slides on the brass slide (No. 16). In the center of the case is the "dry and wet bulb scale," marked on the paper on which is the central brass slide bar (No. 19), and on this slide move the dry bulb keeper (No. 17) and the wet bulb keeper (No. 18). To set the thermometers examine first the dry bulb thermometer and move the "dry bulb pointer" (No. 15) on the slide

until the outside point is exactly level with the top of the mercury in the thermometers—as near to it as practicable. Examine next the wet bulb thermometer, and move the wet bulb pointer (No. 16) on the slide until the outside pointer is exactly level with the top of the mercury in the wet bulb thermometer, or as near to it as practicable, then turn to the dry

scale” the number of degrees between the keepers.

When the thermometers are examined and set again, following the same plan, it will be easily seen whether the “keepers” are, when set, farther apart than they were at the previous setting, or whether they are, when set, nearer together than at the previous setting.



A WEATHER INDICATOR.

and wet bulb scale, and on the “central brass slide bar” (No. 19) move one of the keepers until it touches as nearly as possible—is on an exact level with the inside pointer of the “dry bulb pointer,” then move the other keeper until it touches, as nearly as practicable—is on an exact level with the inside pointer of the “wet bulb pointer.” The thermometers are now set and the difference between their readings can be

known by counting on the “dry and wet bulb scale.” If they are further apart, the thermometers are said to be “separating”; if they are nearer together, the thermometers are said to be “approaching.” Other things being equal, the thermometers show, when they are “separating,” that the air is becoming more dry, one sign of approaching fair weather. The thermometers show, when they are “approaching,” that the air is becoming more moist or damp, one sign of approaching rain.

The weather case is not intended to be used independently of the official weather reports. It is to be used always in connection with them. The weather case is for the purpose of supplementing the official reports by showing the local instrumental indications and giving other information. It is intended especially for use at farmers’ postoffices and places reached with difficulty by the printed reports. It will supplement often whatever knowledge there be of local signs, with the indications of the instrument. Its careful use, taken either with the furnished reports or even without them (if they chance to fail) will often enable the character of the coming weather on the coming day to be so judged as to determine what kind of work or undertaking it is wise to plan for or to omit. The case gives the local instrumental indications, and will frequently aid in making fair forecasts for the next day.

MOTIVE POWERS OF THE FUTURE.—A suggestive paper was recently read before the Liverpool Engineering Society on “The Utilization of the Tides,” by Mr. Oates, of Bradford. Mr. Oates was of opinion that although the coal supply of England would last for a long time to come, yet that ultimately the power of the tides would outrival all other sources of mechanical power. After pointing out that the ways of utilizing the tides were innumerable, and describing the construction of the tidal dam with suitable converters of the power, such as turbines in openings of the dam, working air-compressing or magneto-electric machines, he stated that the necessity for large conservators for storing the power between the tides would be the greatest difficulty in utilizing their power. A brief description of how this could be done and the power rendered constant was given. The means of conveying the power to a distance was then considered, air and water pressure and electricity being suggested. With regard to the latter, Mr. Oates believed that the “age of steam” had reached its zenith, and that the “age of electricity” had dawned; but should there be difficulty in conveying the power to a distance, he suggested that manufacturing towns might be built adjacent to suitable sites for utilizing the tides.

TO KEEP WAGON TIRES ON THE WHEEL.—A practical mechanic suggests a method of so putting tires on wagons that they will not get loose and require resetting. He says he ironed a wagon some years ago for his own use, and, before putting on the tires, he filled the felloes with linseed oil, and the tires have worn out and were never loose. This method is as follows: He used a long cast-iron heater made for the purpose; the oil is brought to a boiling heat, the wheel is placed on a stick, so as to hang in the oil, each felloe an hour. The timber should be dry, as green timber will not take oil. Care should be taken that the oil is not made hotter than a boiling heat, or the timber will be burned. Timber filled with oil is not susceptible of injury by water, and is rendered much more durable by this process.

AN AMERICAN SCIENTIST HONORED.—At Berlin recently the prizes to exhibitors at the International Fishery exhibition were distributed. The first honorary prize was awarded to Prof. Baird, of the Smithsonian Institute, United States. He will receive a gold medal and an address. At the distribution of the prizes Prof. Baird, of the Smithsonian Institute, spoke, eulogizing Emperor William, who, he said, was to be found in every place where there is an opportunity for promoting goodness and truth.

HONORING WOMAN.—The first woman who has had entire charge of the female department of Pennsylvania’s new hospital for the insane, Dr. Alice Bennett, wore a cap and gown at the recent commencement of the University of Pennsylvania, held in the city of Philadelphia, and received the degree of Doctor of Philosophy.

A WONDERFUL LITTLE STEAMER.

A St. John's (N. F.) dispatch, dated the 22d of June, says: The little steamer *Anthracite*, which left London, via Falmouth, England, 18 days ago, on a voyage across the Atlantic, arrived at this port yesterday. She is the smallest vessel that ever steamed from Europe to America. Her total length is 84 ft., beam 16 ft., and depth 10 ft., her engine and boiler room being 22 ft. 6 inches. Her gross tonnage is 70.26 tons. The voyage was undertaken for the purpose of testing the capabilities of the Perkins system of high pressure engines, and the success that has thus far been achieved by the little vessel is likely to lead to a revolution in marine architecture. Throughout the entire passage the weather was unusually boisterous, and there can be no doubt that under more favorable circumstances the time of the little ship would have been much better.

The economy in the consumption of coal and water affected by the use of the Perkins system of boilers is something wonderful. Only 20 tons of coal were consumed by the *Anthracite* on the trip across, and 436 gallons of water. The Perkins system consists of a tubulous boiler, in which the steam is generated at an exceedingly high pressure. By means of a special system of engine this steam is used and reused over and over again. The boiler is constructed of horizontal tubes, welded up at each end. These horizontal tubes are connected by small vertical tubes, and the boiler is proved to 2,500 lbs. per square inch. In the engine there are three cylinders, of different diameters: 8-inch, 16-inch, and 23-inch diameter respectively, with 15-inch stroke. The smallest one is placed over that of medium size, and worked from the same piston rod. The engines are of 20 horse-power nominal, and 168 horse-power indicated. The high-pressure and medium cylinders are single acting, the low-pressure one being double acting.

The *Anthracite* intends to leave as soon as possible for New York, in order to give a practical exhibition to the engineers and others interested in such matters in the United States of the benefits and advantages of the Perkins system. The captain and officers of the little craft profess to be abundantly satisfied with the results of the voyage.

THE HEART AS A MACHINE.—The heart is probably the most efficient piece of physical apparatus known. From a purely mechanical point of view it is something like eight times as efficient as the best steam engine. It may be described, mechanically, as little more than a double force pump furnished with two reservoirs and two pipes of outflow; and the main problem of its action is hydro-dynamical. The left ventricle has a capacity of about three ounces; it beats 75 times a minute; and the work done in overcoming the resistance of the circulating system is equivalent to lifting its charge of blood a little short of ten ft. (9.923 ft.) The average weight of the heart is a little under ten ounces (9.39 oz.). The daily work of the left ventricle is, in round numbers, 90 ft.-tons; adding the work of the right ventricle, the work of the entire organ is nearly 125 ft.-tons. The hourly work of the heart is accordingly equivalent to lifting itself 20,000 ft. an hour. An active mountain climber can average 1,000 ft. of ascent an hour, or one-twentieth the work of the heart. The prize Alp engine, "Bavaria," lifted its own weight 2,700 ft. an hour, thus demonstrating only one-eighth the efficiency of the heart. Four elements have to be considered in estimating the heart's work: (1) the statical pressure of the blood column equal to the animal's height, which has to be sustained; (2) the force consumed in overcoming the inertia of the blood-veins; (3) the resistance offered by the capillary vessels; (4) the friction in the heart itself. This, in a state of health, is kept at its minimum by the lubricated serous membrane of the pericardium.—*Scientific American*.

DYNAMITE FOR REMOVING STUMPS.

A correspondent of an English agricultural journal gives the following account of his use of dynamite for removing stumps of trees felled in a park at Mentmore, Bucks, in order to improve the landscape and leave more room for the rest of the trees to develop themselves:

The only tools required are an earth auger, which is similar to an old-fashioned wood auger, two inches diameter at the bit end, about four ft. long, and fitted with a slightly hollowed shield or cap, which the man fits against his chest when boring (this is used for boring holes between the fangs), a crow-bar, a grafting and a stock ax. Suppose a large root is to be removed out of the ground: a hole is made with the earth auger between two of the strongest fangs; this is put in at an angle, so that the bottom of the hole is as near under the center of the root as is possible. The hole is then charged with a few cartridges of dynamite; according to the size and strength of the root; a primer cartridge, containing cap and fuse, is then inserted on the top of the charge, and the whole rammed down with loose earth by a wooden rammer. The end of the fuse is then lighted; this explodes the cap, and that in its turn the dynamite, and the whole mass is usually blown out, breaking the root into convenient pieces for loading up or burning. The fuse is cut off at sufficient length so as to allow the workmen to get out of danger, which is usually from 50 to 100 yards, according to the strength of the charge. After the charge has exploded, seldom anything remains but a large hole, much resembling the bed of a boiler. I took particular notice that no damage whatever was done to the surrounding trees. We had nearly 400 roots got out by this process, and with two of our common laboring men, with one man sent by the agents of the dynamite company, we have been able to remove from 25 to 30 per day of roots averaging from a foot and a half to four ft. and a half in diameter. I find from careful calculations made that we have been enabled to remove the roots in a far more expeditious manner than hitherto, and at from 50% to 60% less cost. No one need be prevented from using dynamite on the score of its being dangerous, for with ordinary care it is, in my opinion, as safe to use as gunpowder.

AN IMPROVED system of constructing and driving piles, lately introduced in London, seems to have proved quite successful. According to the *Engineer*, these piles, which are tubular, can be made of either cast or wrought iron, and the thickness of the metal can be proportioned to suit the varying circumstances of construction; the lower end of the pile is made solid and pointed, is generally of wrought iron and steel tipped; the piles are also formed in sections, screwed together by strong steel sockets or joint covers, which are barrel-shaped on the outside, in order to diminish friction when being driven. Instead of blows being delivered on the head of the pile, the driving force is expended just where it is needed, namely, at the point, and this result is attained by using an elongated cylindrical driving weight, which travels easily inside the tube; the weight is raised by means of ropes or rods, and is allowed to fall on the flat head of the solid point, the pile thus forming its own guide for the driving weight. The effect of each blow is to drag, rather than drive the pile down; the point is swelled, and of sufficient diameter to effect a clearance for the joint covers, which have to follow it down, the whole operation being one of entire simplicity.

MINERAL-tanned leather is impervious to water, and is said to be much more durable than leather prepared in the ordinary manner. Tests have been made, which show that belts of mineral-tanned leather are not only 30% cheaper, but are stronger than common belts. The mineral process of tanning is reported to have been introduced into eight tanneries in Germany.

A GRAND WORLD'S FAIR IN NEW YORK.

For two years a constant agitation has been kept up in New York for the holding of an international exhibition in this country in 1883. The dwellers in towns remote have, during this period, heard but little of the labors of the handful of public-spirited men who have persistently carried forward the movement to the point it has now reached. Patiently and prudently they have gone on from stage to stage, having the satisfaction at each successive step to witness a decided advance in all the essential elements of success. The holding of an international exhibition in this country in 1883 is now an assured fact. The initiatory difficulties inseparably connected with a scheme of such magnitude, particularly those in regard to the obtaining of necessary legislation, have all been overcome, and the preliminary arrangements and complete organization of the United States International Exhibition Commission of 1883 are being pushed forward to a speedy completion. A special act of Congress providing for the holding of such exhibition has been obtained; bills have been passed in the New York Legislature granting to the Commissioners who may be appointed powers to acquire such lands, etc., as may be requisite, and the Governors of the several States are rapidly nominating Commissioners to assist the project to a successful termination. The plan of the proposed exposition is on a scale of such magnitude that it completely eclipses everything of the kind in the past, and may probably never be surpassed in the future, and the movement has now entered upon a career of popular recognition and public favor which guarantee the ultimate accomplishment of all its projectors have hoped to realize.

THE PHOSPHATES IN FOOD.—Prof. Horsford says, in a recent paper, it is a familiar fact that some persons of a feeble digestive power prefer embrowned meats and toasted bread, to undone flesh and plain bread. The difference between them is mainly due to the effects which incipient burning has produced; and one of these effects is the more or less perfect separation of the phosphates from the organic radicals entering into the composition of the tissue. The ashes of wheat, rye, oats, Indian corn and barley, and of seeds in general, contain phosphoric acid. It also occurs in the ashes of most animal tissues other than bones or teeth. In some of them, as in fish meat, the phosphates are feebly combined. A mere soaking of a piece of cod-fish in water for a few moments will separate sufficient phosphoric acid to yield a ready reaction with the usual tests. Fish as an article of diet has been commended, because of the facility with which it may be digested, and because it has been supposed to be especially suited to supply nutriment to cerebral tissue. It has been suggested that the facility with which the phosphates may be disengaged from the complementary part of the fish tissues, is the explanation of both these peculiarities, and in some degree of the process of digestion as a whole. The emulsion, which results from the action of the ferment and mineral acid, like hydrochloric acid in artificial digestion, is to produce an acid phosphate. It is but reasonable to infer that the addition of the acid phosphate to food, or its administration as a medicine, will prove nutritious.—*Medical and Surgical Reporter*.

ECONOMICAL ENGINEERING IN THE ST. GOTTHARD TUNNEL.—Colladon enumerates the following advantages from the use of his compressors: 1. A saving of more than 600,000 francs (\$120,000) in the simple purchase of compressors. 2. The reduction of the cost of buildings to about one-tenth of what would otherwise be required. 3. A ventilation so complete that the ventilating fans, which had been previously purchased, are entirely useless, and their whole cost might have been avoided.

THE IMPROVEMENT OF MERINO SHEEP.

The time is approaching when the wool-grower's mind turns naturally toward the increase of his flock. The improved wool prices have brought new life to the industry, and this should furnish ground for adopting measures of improvement.

We have it in mind to emphasize this point by showing, both by illustration and text, the gratifying results which have been attained by careful and persevering effort toward producing a higher type of a wool-yielding animal. The lesson which we would enforce could be well learned by anyone who would take the pains to compare the ordinary grade Merinos of the State with the thoroughbred Merinos on our leading sheep-breeding farms, and we hope all who are interested in the subject will apply this test for themselves. But for accurate data of the steps in the development of the wool-qualities in the Merino, we can best go to the National sheepfold, of Rambouillet, where for nearly 100 years systematic effort for improvement of sheep has been put forth under the supervision of the French government. The enterprise at Rambouillet was begun in 1786, and the stock was procured from ten of the best Spanish flocks, selected under the authority of the King of Spain. The style of ram which was then secured in Spain is shown in the engraving, Fig. 1. The engraving, as also its companion, Fig. 2, was made from drawings executed by the order of the French government to enable the managers of the sheepfold to have constantly in mind the forms and characteristics gained in the successive steps of their breeding. We reproduce them from the Report of the U. S. Department of Agriculture. Fig. 2 shows the style of ram attained in 1873, and as one views the two engravings in contrast, it is clear that a most wonderful development of wool-yielding surface has been secured. Not only has the form been well expanded, and the length of wool increased, but the nearly bare belly, legs and face of the old sheep has been turned into productive territory in its remote offspring. These are the chief traits in the improvement of the Merino, whether gained by the French or by the breeders in our own country, and added to them is the not less valuable triumph in the securing of a quality of wool far superior to ancient styles. Much better wool and much more of it: more pounds to the sheep and more money to the pound—these are the practical results of Merino improvement.

The latest information concerning the achievements in sheep breeding at Rambouillet is published in the *Bulletin of the National Association of Wool Manufacturers*, Boston, 1880. It was secured by W. J. Markham, President of the New York State Wool Growers' Association, who has just returned from a tour around the world and a visit to the famous flocks abroad. Mr. Markham obtained from the Director of the National French Sheepfold an accurate statement drawn from the well-preserved records of the establishment. From this we shall draw points by which to measure the improvement which may be seen at a glance in the engravings upon this page.

The weight of the rams in 1787, being of the style shown in Fig. 1, was 50 to 55 kilograms*, with the wool on. The weight of the ewes at that time was 30 to 40 kilograms. In 1878, the weight of the rams was 72 kilograms; that of the ewes, 52 kilograms. Reducing to pounds avoirdupois, it is seen that the rams had gained nearly 50 pounds, and the ewes about 35 pounds in weight.

The fleece of the rams in 1787 weighed about four kilograms; the ewes three and one-half kilograms. In 1878, the rams' fleeces averaged seven and one-half kilograms; the ewes five kilograms. Reducing again to pounds we find that the ram fleeces had gained seven pounds and the ewes more than three pounds.

Concerning the length and waviness of the wool there is also data for comparison. In 1787, the wool of the rams was 55.9 milli-

meters† in length; in 1878 it was 66.23 millimeters. Reducing to inches, we find the rams' wool was 2.3 inches long in 1787 and 2.7 inches in 1878. Account was also taken of the undulations or waves in the fiber. In 1787, there were 15.35 undulations to the centimeter; in 1878, 15.73 in the same length.

TO TEST MILK FOR WATER.—A German

HEATING CITIES BY STEAM.—The Boston *Journal of Commerce* is in favor of steam heating, and for these among many other reasons: "The cost of it, as compared with the present so-called system, is insignificant, being anywhere from one-twelfth to one-quarter. For power, it has been proved that it can furnish it from 25% to 50%—anything up to 25 or 50-horse—for what a man can keep his own engineer and

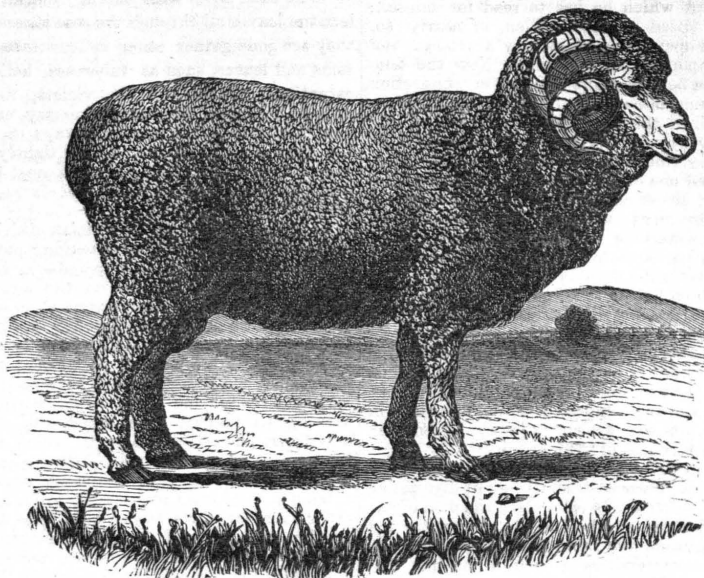


FIG. 1. RAMBOUILLET RAM OF 1787.

chemist furnishes a very simple procedure for testing the amount of water in milk, which can be applied by anyone. All that is required is a small quantity of gypsum (plaster of Paris), say one ounce. This is mixed with the milk to a stiff paste, and then allowed to stand. With a milk of 1.030 specific gravity, and a temperature of 60° Fahr., it will harden in 10 hours; if 25%

furnish his own fuel for, and the steam is always ready, night or day. The gas companies, horse railroads, and the property owners—some of them—are always found to be ready to fight any innovation on their 'rights'; yet we presume the people of Boston, as well as of many other cities, will sooner or later come to this common-sense way of doing business. Baltimore is already

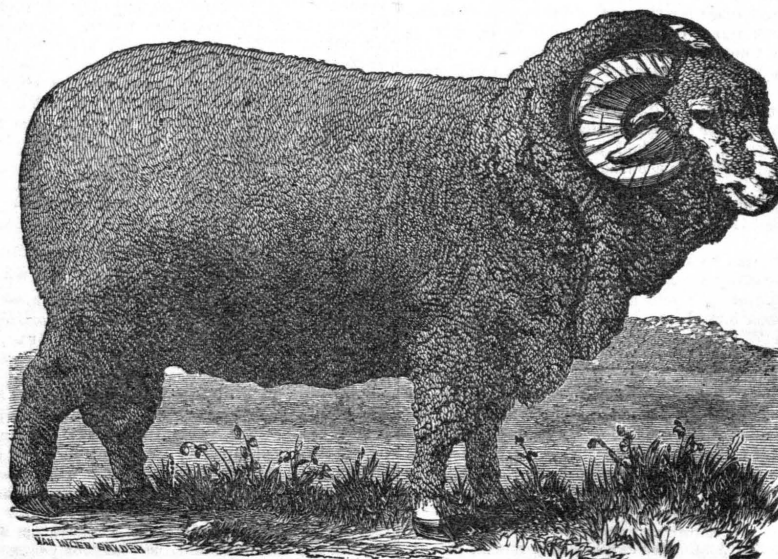


FIG. 2. RAMBOUILLET RAM OF 1873.

of water is present already, in two hours; if 50%, in one and a half hours; and with 75%, in 30 minutes. Skimmed milk which has been standing for 24 hours, and is of 1.033 specific gravity, sets in four hours; with 50% of water, in one hour; and with 75%, in 30 minutes. Heat should not be applied, as then the use of the thermometer would be required. This test is certainly very simple and not costly.

putting in these works, and estimates and specifications are made for two other cities which we are aware of, and we hope sooner or later to see the conservative men of Boston take the matter up and make a business of it."

THE new breed of whales reported to have made their appearance in the Arctic seas are larger and tamer than the old whales.

*A kilogram is two and one-fifth pounds avoirdupois.
†One millimeter is .0993 inch.

REPORTING BY TELEPHONE.

The method of reporting late debates in the House of Commons by telephone, lately adopted by the *London Times*, is thus described by that journal. A type-setting machine has for some time been used in the office, by which a fair workman can attain an average speed of 100 lines an hour, even when composing from manuscript which he has to read for himself; and this speed can be doubled, or nearly so, when the operator is assisted by a reader, and thus composes from dictation. Now the telephone has been brought into use in connection with this machine in the following mode. Having obtained the permission to lay down the necessary wires we formed a new connection between the House of Commons and the office, and placed one of Edison's loud speaking telephones at either end. The immediate result of this arrangement has been to bring the compositor at the machine into direct communication with the parliamentary reporter at the House and to enable the debates to be reported and printed from half to three-quarters of an hour later than had previously been possible. The notes made by the reporter can be read directly into the telephone-receiver in a room adjoining the gallery either by the reporter himself when relieved or by another person employed for the purpose, and the compositor at the machine, in the office, sits with his ears in juxtaposition with the other terminal of the instrument.

The plan which has been found the most efficacious for the purpose of shutting out distracting sounds of other kinds is to place the disc of the telephone above and behind the compositor and then to arrange two tubes, each with two trumpet-shaped extremities in such a manner that these extremities are applied at one end to the two sides of the telephone disc and at the other end to the two ears of the compositor. The compositor is also furnished with a speaking instrument, with a key for ringing a bell and with a bell which is rung from the House—a simple code of bell signals, consisting of one, two, or three strokes, sufficing for the ordinary requirements of each message. The compositor announces by the bell that he is ready, receives a sentence, strikes the bell to indicate that he understands it, sets up the type with his machine, strikes the bell again for the reader to continue his dictations, and so on until the work is carried as far as time will allow. If there is any doubt or difficulty about the words a bell signal will cause them to be repeated, or explanations can be sought and received by direct vocal communication. In this power indeed resides one of the chief advantages of the method, and one which ought to lead to greater accuracy than has ever previously been attainable. The names of people, places, etc., can be spelled out letter by letter if there is any doubt about them.

HONORS TO AN AGED CHEMIST.—The chemists of Germany are collecting money for the purpose of presenting a gold medal to Prof. Woebler on his 80th birthday, which will be July 31, 1880. Prof. Woebler is one of the most distinguished, as well as the oldest, of living chemists. Himself a pupil of old Berzelius, a contemporary of Liebig, and the loved instructor of many of our best chemists, his name is equally respected on both sides of the Atlantic. Profs. Jay and Chandler, of Columbia College, New York City, two of his former pupils, are receiving contributions from those who wish to join in this well-deserved memorial.

HIGH RAILROAD SPEED.—In a recent discussion of the question of high railroad speeds, at the Franklin Institute, Prof. Marks stated that he had made some calculations as to the maximum speed at which locomotive engines could be driven before the centrifugal force on the tires of driving-wheels would become so great as to cause them to burst. These calculations, which were approximate only, gave a limit of speed in the neighborhood of 150 miles per hour; of this, 78 miles, or more than half, has already been attained.

SWEET JARS.

Collect the rose leaves on fine sunny days, after the dew has dried off and when the flowers are fully expanded or just ready to fall. Strip the leaves from the calyx, pack them in a large glass or earthen jar in alternate layers with a third the quantity of fine salt, and sprinkle each layer with strong vinegar. Collect the leaves all through the rose season; after they are gone gather other sweet-scented blossoms and leaves, such as tuberose, heliotrope, carnations, lemon verbena, violets, rose and nutmeg geranium, lavender, rosemary, etc. Use only the petals and leaves; always make the top layer of salt, and keep the jar tightly closed except once a day, when the mass must be thoroughly mixed and turned, and fresh leaves added if you have them.

As soon as the leaves look moist, which they should do in a week after packing, put some bruised allspice and stick cinnamon in the jar. The quantity will depend on the amount of leaves you have. Three-quarters of an ounce of allspice, and a quarter of an ounce of cinnamon to every quart of fresh petals. The spice may be added once in a week or two, as occasion requires. When the last leaves have been put in let them remain for three days, stirring and turning twice a day, after which this "stock" may be transferred to the jar in which it is to be kept, and the balance of the ingredients added. Supposing that the stock consists of three quarts of fresh rose leaves, and a quart of other varieties, three ounces of allspice and one of cinnamon, it will require a mixture in the following proportions: One ounce each of cloves and stick cinnamon, two nutmegs, half an ounce of ginger root, half an ounce of anise seed, and two ounces of orris root, all coarsely powdered or bruised. Sprinkle these ingredients over each layer of the stock as it is placed in the jar, and also add orange and lemon peel, cardamon and fennel seeds (bruised), cedar chips, sage, thyme, spearmint, a tiny bit of camphor, or in fact any sweetly-scented material that may suggest itself and be convenient. An atom of musk, sachet powder, perfumed water and fragrant oils are all fine additions. Whenever the mixture becomes dry it should be moistened with scented water. Keep the jar tightly closed for a month after mixing. Then open only when the perfume is desired. The jar must be frequently shaken and stirred. Open it for 15 minutes every day and the house will be filled with a delicious perfume, like the breath of a thousand flowers.—*Clara Francis in Prairie Farmer.*

A NEW SKATING SURFACE.—An English inventor, after much study and experiment, has, quite recently, devised an entirely new skating surface, which he calls "crystal ice," and which consists of a mixture of various salts, mostly, however, sulphate of soda, which crystallize at ordinary temperatures. This preparation, which is comparatively cheap, is simply spread out, in a plastic condition, from an excess of water, upon an ordinary floor. As soon as the excess of water evaporates the substance becomes crystallized, presenting a surface much resembling ice, quite as hard, and upon which ordinary ice-skates may be used with about equal facility as upon a water-frozen surface. When "cut up" by skaters, its surface can be readily smoothed by a steaming apparatus, and the floor, when once laid, will last for years. It is obvious that such a floor must have many advantages over artificial ice and floors for roller-skating. It is said that the mixture of salts used contains about 60% of water of crystallization; hence, after all, the floor consists mostly of solidified water. The above facts are obtained from *Nature*, of June 5th, in which it is further stated that a small experimental floor has proved such a complete success that a large skating rink is to be immediately constructed upon this principle.

A "FILLER" OR POLISH FOR WOOD.

(1.) Four parts of white wax are added to 3 parts of oil of turpentine, and the whole is heated in a flask or bottle, immersed in hot water, until the wax is liquefied and almost dissolved. It is then allowed to cool, and when it begins to turn white and to harden 2 parts of strong alcohol are added, under stirring. This mixture is applied by means of a woolen cloth and thorough friction. The alcohol may be increased to 4 parts, but the friction must then be continued for a longer time.

(2.) One pint of linseed oil, together with $2\frac{1}{2}$ oz. of alkanet root, are heated to boiling in a clean pot over a slow fire, and kept at a gentle boil for about two hours. When cool, the mixture is applied in a thin layer to the wood, and after the lapse of 24 hours well rubbed in.

(3.) The best polish, particularly for fine wood, is milk! After all dust and dirt have been carefully removed, good fresh milk is applied to the wood and well rubbed in with a woolen rag, until all moisture has disappeared. This must be repeated several times, and in the case of new utensils should be done once a week. Milk has this advantage that its fatty substance answers the same purpose as linseed oil, and its other constituents act as a filler while it leaves no disagreeable flavor. For some light-colored woods sublimed sulphur with boiled oil makes very good filling.

One ingredient, however, is necessary in all of the above processes, without which success will not be attained, and this ingredient is *adepe cubitalis*, vulgo "elbow-grease."

THE ABSORBING POWER OF EARTH.—Without obtaining a practical test one can hardly appreciate the absorbing power of dry earth, or the leeching effect of some kinds of soils. A writer says: "We once deepened a manure pit that had a blue clay bottom. This pit had been used for years, there was never less than a foot of water in it. After emptying we commenced to deepen it, expecting to find a rich black earth for a foot or two, but to our astonishment, the clay two inches below the bottom was not soiled, but looked as pure and blue as it did two feet deeper. But all kinds of soils are not as impenetrable to liquids as blue clay. By actual experience we have found that dust an inch thick over a dead animal will prevent the escape of bad smells. In hen-houses the effect is magical, preventing not only bad odors, but vermin as well. Even for old running sores and ulcerated wounds when chemical disinfectants could not be had, dry earth or dust has proved highly beneficial. The fact seems to be that neither the liquids nor gases of decaying matter can pass through two inches of earth without losing the greater part of what constitutes its peculiar characteristics, that is, its offensive or valuable portion, as the case may be. Properly used in the stables, cesspools, sink-drains, etc., dry earth will save a vast amount of valuable fertilizing matter, and prevent expensive and life-destroying disease."

CHINESE SHIP-BUILDERS.—It has been something of a mystery to Americans in the light of the remarkable depression of the carrying trade in the recent years, that British ship-builders should continue to turn out so many iron steamships. A convention of American ship owners has been proposed, to be held next October, with the view of agreeing, if possible, upon what legislation is required to place our merchant marine upon a basis that will enable it to compete successfully for ocean commerce. But the seeming mystery is largely explained by the fact that a firm of Scotch ship-builders are said to have established themselves at Shanghai, and are turning out iron steamers of the largest size. All of their 1,100 workmen are Chinese, who labor for a few cents each per day. Notwithstanding nearly all the raw material used in those yards has to cross oceans, nowhere in the world can a ship be built more cheaply. The *London Times* sees in this fact something seriously ominous to the shipwrights on the Clyde and the Tyne.

VALUE OF POULTRY MANURE.

The following report to Mr. L. Wright by Dr. A. Voelcker, F. R. S., appears in the *London Live Stock Journal*: Enclosed you will find analyses of the two samples of chicken manure which Mr. O. E. Cresswell, of Hereford, sent me on March 19, 1880:

	Fresh Manure.	Partially dried Manure.
Moisture	61.68	41.06
*Organic matter and salts of ammonia. 20.19		38.19
Tribasic phosphate of lime (bone phosphate).....	2.97	5.13
Magnesia, alkaline salts, etc.	2.63	3.13
Insoluble silicious matter (sand).....	12.58	12.49
	100.00	100.00
*Containing nitrogen.....	1.71	3.78
Equal to ammonia.....	2.09	4.59

You will notice that in a fresh condition the sample of chicken manure analyzed by me contained 61½% of water in round numbers, and 12½% of sand, while the sample of partially dried manure contained 41% of water, and about the same proportion of sand as the fresh dung. Judging from the appearance of the manure, the greater proportion of the sand, it appears to me, arises from earthy matter which the fowls picked up with their food, and is not due to sand merely adhering to the excrements externally.

I need hardly say that the large proportion of moisture and the considerable amount of useless silicious matter in fresh chickens' dung, detract much from its value as a manure. However, chicken dung, although greatly inferior to Peruvian guano, is a much more concentrated fertilizer than the best description of ordinary farmyard manure, which seldom yields more than three-fourths per cent. of ammonia, whereas the sample of fresh chicken manure analyzed by me contained an amount of nitrogenous organic matter and salts of ammonia, capable of yielding, on final decomposition, 2% of ammonia. The agricultural and commercial value of the dung of horses, cows, sheep, pigs, pigeons, fowls, and of concentrated artificial manures, such as Peruvian and other varieties of ammoniacal guanos, depend mainly upon the percentage of phosphate of lime and of nitrogen, or its equivalent of ammonia, which these various fertilizers contain.

In former years, when Peruvian guano was exclusively imported into England from the Chincha islands, in the north of the Peruvian coast, the guano deposited on these islands in a rainless country and rapidly dried by a boiling sun heat, generally yielded from 16% to 18% of ammonia. The southern Peruvian guano deposits, from which our supplies have been drawn for the last few years, vary much in composition. The best cargoes of Peruvian guano at present seldom contain more than 10% or 11% of ammonia; those of a medium quality from 6% to 8%, and cargoes selling at about £8 per ton, from 3% to 4%. The latter, however, are much richer in phosphate of lime than high ammoniacal Peruvian guanos, and not infrequently contain over 40% of phosphate of lime.

Compared with Peruvian guano, and adopting the same rates by which the official price of different cargoes of Peruvian guano is regulated, I find fresh chicken manure of the quality of the sample analyzed by me is worth, in round numbers, about £2 a ton, and the sample of partially dried manure about £4 4s. per ton. Pigeon dung, I find, is rather more valuable than fowls' dung.

With regard to the application of chicken manure, I would observe that the least expensive, and probably the best way of using it is to make it with dry earth, burnt clay, wood ashes, and such like matters, into a compost. Mixed with about twice its weight of dry earthy matters of this kind, it will soon be reduced into a fairly dry and powdery state, in which it may be readily spread broadcast on the land, or be sown by the manure drill, and be found a useful general manure for every kind of garden produce.

For root crops—turnips, carrots, kohl rabi, mangels—chicken manure, reduced into a dry

and powdery state, should be mixed with an equal weight of superphosphate of lime, and the mixture be drilled in with the seed at the rate of 5 cwt. per acre. In making the earth compost, quicklime, in my judgment, should not be mixed with the chicken dung, for the effect of quicklime upon fowls' excrement is to liberate ammonia, which would escape and be lost in a great measure. On the other hand, there is no harm, but every advantage, in mixing good soot with chicken dung, for unadulterated soot generally contains from 3½% to 4% of ammonia, or nearly twice as much as I found in the sample of fresh chicken dung which Mr. Cresswell sent me.

Soot, when it can be procured, is a good drier for chicken manure, and at the same time adds ammonia to it. In the absence of soot, I would recommend to mix the fresh chicken manure with some burnt gypsum, to which a small quantity of superphosphate of lime may be added, the free acid of which will effectually prevent the escape of ammonia from the chicken dung. A mixture of two parts of burnt gypsum and one part of mineral superphosphate may be kept ready for the purpose of absorbing the excess of moisture in fresh chicken dung, and facilitating its reduction into a fairly dry and friable manure. Three parts of fresh chicken manure and one part of the preceding mixture of burnt gypsum and superphosphate, when kept for a short time under cover, and turned over once or twice, and finally passed through a screen or sieve, I believe will be found a useful and good manure for most crops, when used at the rate of 8 or 10 cwt. per acre.

PREPARATION OF MANURE.

We find in the *American Cultivator* the following account of experience:

I took my shovel and spread a thin layer of the manure on the barn floor and thoroughly wet it; then another in the same way on top of that, until I had the whole in a compact pile, and, as I thought, perfectly wet. The next morning I began to turn it over to see the result. I found a great part of it dry, but I liked the way it was working, so put on more water. After working it over three or four times, and applying water as needed, I had a pile of as nice looking fertilizer as you would wish to see, almost as fine as powder. In 48 hours it was very hot, requiring to be turned over every 12 hours until used. I dropped a large handful in each hill for corn, covering it with a hoe as I would corn, then planted the corn in the hill thus made. Not one hill on the piece failed to come up, and it is growing the best of any corn I ever had.

You may ask the use of the water. Why not put the manure in the hill dry and cover the same? The reason is, it won't accomplish its object. I have tried it and know. The corn will come up all right, but after a little time it ceases to grow. Dig to the root and you will find it completely eaten up by the manure. The reason everyone can understand by a few moments of thought. I used some mixed with meadow mud, about three parts mud to one manure, using a little more to each hill, and dropping the corn upon it without covering it (the manure). The result was that nearly one-half of the seed never came up.

CONDITIONS INJURIOUS TO SIGHT IN SCHOOL CHILDREN.—Prof. Raux mentions the following:

Air vitiated by animal emanations, vegetable or mineral dust, the smoke of various combustibles, especially tobacco, in which nicotine exists. Temperature too high or too low, and sudden changes or drafts. Clothing too tight, particularly at the neck or waist. Position with the head and body too much bent forward during labor with the eyes. Premature study, excess of reading, etc. Alcoholic excesses. Use of the eyes and brain immediately after eating. Habitual constipation, cold feet, and everything which tends to produce congestion of the head. Immorality, especially during childhood and youth. We might assign a cause still more potent than any of the foregoing, viz: a deficiency of light.—*Detroit Lance*.

NEW INVENTIONS.

We publish descriptions of the following new inventions, obtained through Dewey & Co., *Mining and Scientific Press Patent Agency*, San Francisco:

BREECH LOADING FIREARM.—Wm. R. Finch, Eureka, Cal. Patented June 22, 1880. No. 229,035. This invention relates to certain improvements in the construction of magazine firearms of that class in which a vertically-running breech-block is operated by a lever and serves as a carrier to transport the cartridge from the magazine to the rear open end of the barrel, into which it is forced by mechanism for the purpose. It consists in a novel construction and combination of a solid breech-block which is moved vertically in the frame at the rear of the barrel with a swinging arm, by which the cartridge is forced into the barrel, so that the breech-block is allowed to move up and close the breech. The whole is operated by a single lever beneath the gun, and the same action cocks the gun and locks the breech-block when closed, so that it cannot be opened.

BALING PRESS.—John Cook, Healdsburg, Sonoma Co., Cal. Patented June 8, 1880. No. 228,515. This press consists in the employment of a horizontal box having a follower operated by a peculiar windlass or capstan and ropes and pulley, which are placed along the sides of the box; and it also consists in a novel method of holding and tightening the baling ropes while the follower is moving up, so that they are all ready to be tied when the bale is pressed. A lever is fitted to the press by which the bale may be ejected as soon as finished. This press is economically built and operated, and material is easily introduced, and bales removed without supplemental doors or severe labor.

MAGAZINE FIREARM.—A. Schneider, 24 Erie St., S. F. Patented June 8, 1880. No. 228,560. This invention relates to certain improvements in breech-loading magazine firearms, and it is especially adapted to be used in cases where the magazine extends beneath and parallel with the barrel of the arm. And it consists in a vertically-moving breech-block in combination with an operating lever, provided with means for giving the block an intermittent movement, whereby the breech-block is made to pause when opposite the barrel while the cartridge is forced home, the operating lever moving continuously.

GRAFTING TOOL.—Charles W. Hoit, Petaluma, Sonoma Co., Cal. Patented June 22, 1880. No. 229,040. This device consists in the employment of a pair of pivoted handles, one of which is fitted to receive a curved wooden block or bed with an elastic surface, upon which the cutter acts, while the other operating arm moves the cutter which is pivoted to it. The upper end of the cutter is also pivoted to the end of a supplemental arm which extends back and unites with the handle upon the opposite side of the pivot, so as to produce a parallel motion of the cutter, which insures its making a straight clean cut whatever the thickness of the scion or stock to be operated upon.

TURBINE WATER WHEEL.—Wm. Hacheney, S. F. The wheel is made in a frame so as to be easily portable, and is intended particularly for running with a small head of water, so as to utilize all the supply without waste of power. It has peculiarly-operating gates for controlling the admission of the water to the scrolls, and in a peculiar construction of the step or bearing for the reduction of wear.

HORSESHOE TOR-WEIGHT.—Wm. H. Hulings, Menlo Park, San Mateo Co., Cal. Patented June 8, 1880. No. 228,533. The shoe has a weight attached by means of a dovetailed shank, fitting in a correspondingly shaped slot in the shoe and secured by a screw. When this weight is removed the shoe becomes a plain, ordinary shoe, with no projection or addition to interfere with the horse's action.

THE MANUFACTURE OF PARMESAN CHEESE.

According to an interesting paper on Parmesan cheese, written by Dr. Prato for the Italian *Annali dell' Agricoltura*, the process of manufacturing the popular dairy produce is as follows:—The cows are milked by women and girls at evening, and the milk carried in wooden or tin pails to the cheese-room, a sort of shed enclosed with walls on two or three sides, and having in the center a furnace with its copper. The milk is measured, strained through a cloth, and placed in flat, shallow dishes ranged round the wall of the cheese-room. There is another delivery of milk in the morning, which is measured in the same way. When all the cream has been removed, the milk is placed in the copper, and raised to a temperature of 89° Fahr., which is considered best. The fire is then drawn, and rennet added. Natural rennet from the calf is always used; it is stirred in and left for an hour. Next, the curds are reduced to a state of even and uniform comminution with the aid of a long stick provided with projecting points and a brush-like end of wire. This operation having been carefully performed, a small quantity of whey is added, and good saffron, in the proportion of half a drachm per 20 gallons of milk, is well stirred into the mass. The fire is again set going, the contents of the copper being now maintained at 113° Fahr., and kept well stirred until it is known by the feel that the cooking has proceeded far enough, when the copper is lifted off, and the contents are allowed to cool, so that the casein may be precipitated. To facilitate the process a little cold skim-milk is added, and at the end of a quarter of an hour precipitation is complete. The curds accumulate in the middle, and are removed with a cloth. The cheese is lifted out in a cloth and pressed under a thick wooden plate weighted with a heavy stone. When the whey is well squeezed out, the linen cloth is replaced by a hair cloth, fresh weights are added, and the cheese trimmed round from time to time. After this, it is carried to the salting-room where it is covered with salt. Here it remains three weeks, being constantly turned over and salted on each side in turn during that period. Lastly, it is carried to the drying-room, well scraped and brushed, and the surface oiled. The whey from the cheese is made into *ricotta*, which is eaten, salted or baked, by the peasants instead of cheese. It is heated to a temperature of 176° Fahr., stirring constantly. A little fresh milk or buttermilk, or, if the milk be not sour enough, a little sour milk, is sometimes added. In time, the *ricotta* or curds form on the surface and are collected and pressed in molds. The refuse is given to the pigs. The cream removed at the commencement of cheese-making is made into butter.

BISMARCK.—The Chancellor of the German empire is unquestionably the most astute politician of our time. But he differs in one important particular from the current type of the European diplomatist. The Metternichs, Gortschakoffs, Beusts, *et id omne genus*, with all their imitators big and little, look on diplomacy as a sort of legerdemain, or, perhaps we should better say, as a game of cards, where the player must under no circumstances "show his hand." The diplomat must use language to conceal his thoughts, and he must never commit himself to anything. But Prince Bismarck has repeatedly proclaimed his purposes in advance with the greatest candor. As for his fellow diplomatists of other governments, they have never yet grown accustomed to the great Chancellor's frankness, and still persist in reading only between the lines of his manifestoes. The reader who is curious to obtain an inside view of Prince Bismarck's character as the genius of Statecraft, will find much to interest him in a paper contributed to the *North American Review* for July, by the great Chancellor's Boswell, Moritz Busch, entitled "Bismarck as a Friend of America and as a Statesman."

CARE OF THE HANDS.—A writer for an Eastern exchange says: It does not follow that hands which look the worst do the most work; but it may prove that the hands have been treated carelessly, and I might say, cruelly. For instance, when a woman plunges her hands into hot water till they look like boiled lobsters, or taking hold the handles of hot kettles, or flat-irons, causing them to become like some people's conscience, "seared as with a hot iron." How it looks to see a well-dressed lady, with hands all scratches, burns, or scars! I have wondered if they did not almost wish they could take them off and leave them at home whenever they went in company. Have plenty of soft, thick holders near the stove to take hold of the handles of kettles or pans. Keep a pair of gloves near your sun-bonnet to bring in wood, work in the garden, or to put on when you sweep, that your hands may not become callous. If they are liable to chaps, use plenty of glycerine, or wash them in vinegar, and when you sit down to your sewing, and your hands feel like a nutmeg grater, rub them with camphor, and it will make them feel so soft and pliable that you will be enabled to handle the finest of fabric without its adhering to your fingers. If you are troubled with salt rheum, use juniper tar soap, which is an almost infallible remedy. Keep a bottle with a few cents' worth of oxalic acid dissolved in it, and marked poison, somewhere handy, and when there are fruit stains, or you have been coloring carpet rags or old garments, use a few drops on the stained parts and they will soon disappear. If you are in the habit of scraping the pans or kettles with your finger nails, don't do it—never again; but keep an old knife for that purpose. Sisters, take good care of your hands for your husband's sake, for your own sake, for your comfort and your convenience.

CAPT. EADS' SHIP CANAL.—A late Washington dispatch says: Capt. Eads arrived here this morning, and after a conference with his friends has decided to continue the perfection of his arrangements for carrying out his great project of connecting the two oceans. From conversation with the members of the committees of both houses, he is satisfied that next December they will be ready to take definite action respecting this great enterprise. In the meantime the government will be in possession of more satisfactory information from the United States of Colombia, and will have doubtless succeeded in completing negotiations which will enable the government to extend such aid as may be necessary to insure the completion of the work. Capt. Eads goes from here to New York, where he will confer with a number of prominent capitalists, who are entirely willing to embark in the project, being satisfied that Capt. Eads' experience and great engineering skill is a sufficient guaranty that the work can be accomplished at a cost less than that asked for by his bill.

ON THE USE OF PLASTER OF PARIS.—The plaster may be made to "set" very quickly by mixing it in warm water to which a little sulphate of potash has been added. Plaster of Paris casts, soaked in melted paraffine, may be readily cut or turned in a lathe. They may be rendered very hard and tough by soaking them in warm glue size until thoroughly saturated, and allowing them to dry. Plaster of Paris mixed with equal parts of pumice stone makes a fine mold for casting fusible metals; the same mixture is useful for encasing articles to be soldered or brazed. Casts of plaster of Paris may be made to imitate fine bronzes by giving them two or three coats of shellac varnish, and dusting on fine brenze powder when the mastic varnish becomes sticky. Rat holes may be effectually stopped with broken glass and plaster of Paris. A good method of mixing plaster of Paris is to sprinkle it into the water, using rather more water than is required; when the plaster settles, pour off the surplus water and stir carefully. Air bubbles are avoided in this way.

MAKE YOUR OWN TOOLS.

This ambition to individualize tools and to adapt them to their users is a characteristic of skillful workmen, and makes a broad line of distinction between the mechanic and the mere laborer. A kit of tools made by the mechanic himself is a recommendation of the mechanic. Few intelligent foremen sneer at this professional pride, or ridicule its visible products. And the possession of a kit of his own tools, made by himself, is not only an evidence of the honorable pride of the workman, but is frequently a guaranty of his ability. A workman who can make a good kit of tools, who can shape a cold-chisel, construct a gauge, hang a hammer, or fashion an elegant and handy scratch-awl, and do other good jobs, evidences a pride in his own handiwork that will not be satisfied with half-done jobs.

The desire of the mechanic to have *his own* tools made, or at least adapted, by himself, is perfectly natural. With the knowledge of the fact that individuals differ, comes the evidence that what suits the mass is not adapted to the one; that what is for all is not for this particular one. How many machinists are at home in handling a strange hammer? How often the workman drops a hammer he has picked up in haste, and delays an instant until he can reach for, or go for his own! This is not foolish fastidiousness; for those who most stick to their own tools are old, experienced workmen, who have outgrown the false pride which would make them insist on their way as the only right way. The fact is that the workman is the best judge of the adaptability of a tool for himself, and if he does not make and fashion his own, he at least chooses and modifies those produced by others.

This necessity, or the advantage of adaptability, received an illustration recently, when a smith, an expert forger of iron and steel, with 20 years' experience, showed the writer a hammer with a split handle, saying, "That is the best hammer in the shop to finish off a forging handsomely." The fact was that he had not dared to shave down the hickory small enough in the neck of the handle to give it the "feeling" spring to his hand, for fear of breaking it in use, when a foul blow in the hand of an apprentice split the handle, and made it the *handiest* one in the shop.—*Exchange*.

DUST FIRES.—A gentleman at Appleton, Wis., communicates to the *American Miller* his experience, which shows, as we all know, that other kinds of dust besides flour are explosive under certain conditions. He says: The loft of my spoke mill, in this city, was wholly used as a finishing room, where the spoke was finished, and polished by contact with rapidly revolving sanded belts. In it was a square or box stove, used for warming purposes. The light, fine dust would accumulate in every crack and crevice of the room, requiring cleaning off every day. One day some of this dust was seen to fall from a rafter upon some live coals that had accidentally got out upon the hearth of the stove. Instantly there was a flash that filled the whole loft, and it was on fire in a hundred different places. It was with the most active exertions that the fire was subdued, and not without a considerable damage to the building and stock. I believe the air was strongly impregnated with gas evolved by friction; and that the explosion and fire occurring in flour mills are precisely of the same nature and due to the same causes.

BESSEMER steel is now produced of so good a quality, that competent judges assert that ere long it will supersede crucible steel, even in the cutlery manufactories of Sheffield. Already, as it appears, they are making the cheaper grades of cutlery, edge tools, etc., from this product, some 50% to 75% in value of goods produced being accredited to the use of the best quality of Bessemer.

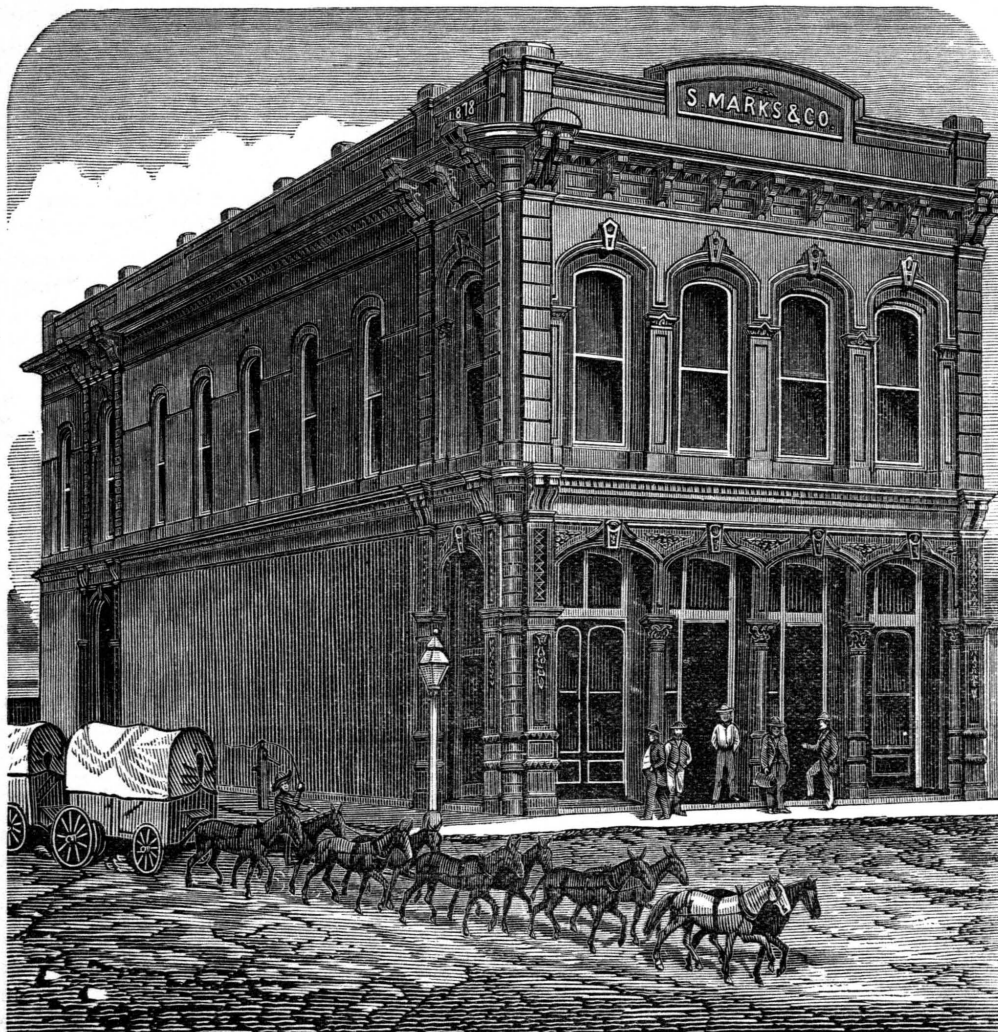
S. MARKS & CO., ROSEBURG.**A Historical Sketch of the Largest Business House in Southern Oregon.**

The firm of S. Marks & Co., with Samuel, Saul and Asher Marks as partners, established their Roseburg business in 1856, and the following year opened a branch house at Oakland, Or., with Samuel Marks in charge thereof. The Oakland house was continued until 1863, when it was sold to H. Zelinsky and S. Selig. S. Marks & Co. in the

dissolved. Mr. Samuel Marks also withdrew from the firm about two years since. The firm now consists of Samuel and Asher Marks and Wm. I. Friedlander, the latter being admitted into the firm in 1868. Independent of merchandise, S. Marks & Co. also operate in land and in the live stock business. The business, generally speaking, is under the management of Asher Marks and Mr. Friedlander, the former attending to all outside business, and the latter to the office work and

another one as the depot for wheat and wool, with a capacity of 2,500 tons.

The store is well fitted up; has neat shelvings, fifteen counters, and handsome plate glass show-cases. The offices are roomy, well furnished and contain a mammoth Macneale & Urban safe, with fireproof vault. All the conveniences necessary for transacting so extensive a business have been carefully studied and brought into requisition, and the firm do, without doubt, a larger business than any other house in Southern Oregon.



meantime having acquired the townsite of Canyonville, the senior of the firm associated himself with Mr. Sideman, and established there the firm of Marks, Sideman & Co. This firm continued until about two years ago, when they disposed of their mercantile business to F. Toklas, retaining, however, all their real estate and other property. Mr. B. J. Sideman withdrawing this spring, the firm of Marks, Sideman & Co. was

general superintendence over matters connected with their business of acquisitions and disposals. The beautiful brick building which the firm occupy, was erected by them in 1878 at a cost of \$18,000, and is, without a doubt, the most substantial structure in Southern Oregon. The iron front alone weighs 42,000 pounds. It is virtually fireproof. Besides the store they have a receiving warehouse in the rear, 26x100 feet, and

A PLEASANT SUMMER RESORT.

The Ocean House, at Newport, on Yaquina Bay, one of the pleasantest watering places on the North Pacific Coast, is now under the proprietorship and personal supervision of J. B. K. Irwin, Esq., favorably known in this city. Mr. Irwin informs us that large numbers of visitors are already encamped on the beach, and more are daily en route. The hotel has been greatly improved, and nothing left undone to make a stay at Yaquina Bay one of pleasure, profit and recreation. By rail to Corvallis, and from there less than one day's staging to the Bay, the trip can be accomplished with but slight fatigue and at very reasonable rates.

BRITISH COLUMBIA.

VICTORIA, B. C., July 20, 1880.

EDITOR WEST SHORE:

I wish it were possible for me to write in a hurried communication a detailed account of what one sees in this beautiful city. As it is, however, I must be content in talking to your readers in general terms. Unlike many other towns of the Pacific Coast which date their inception from some gold mining excitement, the career of Victoria is still a marked and progressive one. While many once embryo cities have subsided into the last throes of dilapidation, if not utter extinction, this place has been steadily growing in commercial and social importance, until, now, like the glorious eve of Her Majesty's eventful reign, it has attained a niche in historic lore from which it can never be removed by the political convulsions of the world. It is true that there is a large element of American population here, and yet, everything is so thoroughly Anglicized that the oldest Puget Sounder cannot come here on the merest business trip without feeling that he is verily in a foreign land. This is in every sense of the word right and proper, for we believe that the lines of national demarkation should be strictly drawn and sacredly cherished, how near soever our borders may approach those of other and more foreign neighbors.

Much has been said and written about the delightful climate of Vancouver Island. To what is known, in nautical circles, as the Japanese oceanic current, I believe, is generally assigned the greater part of this credit. Geologically speaking, the whole island is unquestionably of volcanic origin, a fact which has much to do with the mildness and salubrity of its climate. The reported rigor of the winter, just past, is no criterion from which prospective emigrants from the mother country should judge when halting between two opinions.

Rough and forbidding as some portions of the island may now appear, we believe the time is only in the near future when millions of hardy settlers are destined to hew out and build up for themselves happy and abiding homes, here, when flocks and herds shall graze upon its thousand hills, and its valleys teem with the fruits of honest toil. We have often said that we

believed God knew what He was about when He made all countries, and His watchful care is exercised no more lovingly over one portion of His extended domain than another.

A just idea of the natural scenery, here, is not to be conveyed by a mere pen-and-ink description. The devoted lover of the beautiful must come and see for himself; and then, if seeing is believing, he will be convinced that this westernmost portion of the British possessions in North America, is not long to remain the ill-conceived and sparsely settled region it now appears to be. A steamer trip up the Frazier river is brimming full of interest to the pleasure-seeker, the farmer and business man. Thousands of acres of the richest land have lately been reclaimed by dyking and draining in this valley, and these lands are now offered at a fair price to incoming settlers. For grazing purposes, these tracts cannot be excelled by the finest soils of California, Oregon or Washington Territory; while most kinds of grain, and the hardier fruits and vegetables, can be raised in abundance on the uplands and in the valleys. As for water and timber, there is no prospect of anything like a dearth in the next ten thousand generations.

It is only a few years ago, that every pound of beef consumed in these colonies was imported from the Sound country, at enormous prices. The same might be said of hay, feed of all kinds, and most vegetables and fruits. But the indefatigable energy and determination of English agriculturists are rapidly turning the tables. A large influx of the finest breeds of stock has worked wonders within the last five years. Farmers have also carefully studied the adaptability of the various cereals, until, at the present time, that part of Vancouver Island contiguous to Victoria, as well as a great portion of Frazier river valley, may be safely put down as self-sustaining districts. It would require a second article to properly set forth the mineral wealth of British Columbia, limited as have been all explorations in this direction. Nanaimo coal is known from one extremity of the coast to the other, while the gold which has been brought down from the Cariboo diggings can only be estimated by millions of dollars.

But the one absorbing epoch toward

which all eyes now seem to be turning, is the final completion of the great Canadian Continental Railroad. A few years more, and four Grand Trunk lines will span the continent; taken in the order of their completion and operation, the Central-Union Pacific, the Northern Pacific, the Southern Pacific, and, lastly, the Canadian Pacific road.

It is plain, that posterity alone can reap the full benefits of what we now can only conceive, as hinged upon these gigantic public enterprises now being so largely discussed by the business men and political economists of the United States and Canadas.

WHAT IT IS DOING.

We disclaim all business fraternity with those conceited and officious individuals who are forever crying out against the princely corporations of the land, solely on account of local animosities and personal grievances.

The same line of railroad cannot equally enhance every man's interest by running through his farm or making a stopping place and erecting its buildings near his residence. The mission of these great thoroughfares is widespread and far-reaching; too grand and noble for the narrow-minded speculator or small business man to justly contemplate and understand, and hence he denounces the company as a horde of soulless capitalists and votes their road a positive detriment to the country. A railroad company that is scattering millions of dollars, every year, among the working classes cannot and should not be held amenable for the thousand and one petty mishaps and annoyances which it is not in the province of human foresight to prevent.

If, by dint of sheer force of fortuitous circumstances, a railroad levels one town, it is sure to build up another; if it removes old, moss-grown landmarks and diverts the tide of passenger and freight traffic from their wonted and circuitous ways, it is only to send the same trade, double augmented, booming by more direct and often by air-line routes, to the crowded metropolises of the land; if, for the time being, it seems to blockade one sparsely settled valley, it opens and develops a richer and far more extensive one to the commerce of the world.

Thus, while it affects to minister to the abiding weal of millions, it never fails to ultimately pay interest and principal for whatsoever subsidies may have been extended to it, and compensates a thousand fold the accidental and minor inconveniences it may have caused in such affairs as are merely of a local character and appertaining only to individuals and not to communities.

The man of broad and liberal views sees in these great industrial confederacies only so many instruments in the hands of Omnipotence for carrying out the great programme of human elevation and happiness. There is not a well informed statesman, political economist or ecclesiastic in the land who would not subscribe to the principles here enunciated, well knowing that "*Pro bono publico*," should be the true shibboleth in these days of electricity and steam.

Many uncharitable things have been said about the Pacific Division of the Northern Pacific Railroad Company, and yet that corporation is one of the great commercial thews of the Pacific Northwest, and it has done more to promote the substantial welfare of the Puget Sound country and British Columbia than all the other transportation lines in the Territory. The work now being prosecuted by that company east of the mountains is destined to culminate in an achievement for Oregon and Washington which will be second only to what the discovery of gold achieved for California and Nevada in 1849 and '50. All along the line of the road now in process of building, the whole country is literally undergoing a business revolution; while an impetus has been given to immigration never before known in the annals of Idaho, Montana, Eastern Oregon and Eastern Washington.

The rush to the Skagit gold fields has been as nothing compared with the tide which has been setting in, for more than a year, to Yakima, Walla Walla and Spokane counties and the adjoining country. The former was, in the main, a rush of penniless adventurers; the latter, a rush of solid business men and well-to-do emigrants.

Nothing but the extension of the Northern Pacific Railroad has caused this mighty uprising among the people; and here we have a glimpse of the efficacy and potency of great railroad

corporations as modern civilizers and humanizers. A few years ago, it required two days of dreary stage traveling to go from the head of Puget Sound to the Columbia river. The regular fare was fifteen dollars, exclusive of what was paid for a night's lodging and five meals, making the total cost of a trip from Olympia to Portland about twenty dollars. Now, the journey is made in ten hours, at a total cost of seven dollars and seventy-five cents. Thus, it will be seen that, through the agency of railroads, old things have passed away and all things have become new.

Judging by the strides now making by the Northern Pacific Railroad Company east of the Cascade Mountains, coupled with the facilities offered by the Oregon Railway and Navigation Company, the time will not be long before we shall have a direct steamer and railroad route from Portland to Chicago and thence to the Atlantic seaboard. It will soon be an old-fashioned thing for Puget Sounders and Oregonians to go by steamer to San Francisco in order to reach the Eastern States by an overland railway route.

We have thus endeavored to answer the oft-repeated question, "What has the Northern Pacific Railroad Company done, and what is it doing?" And we trust that in another issue, we may be enabled to give a similar showing relative to the importance of other transportation lines along this part of the coast, both railroad and steamship companies. All honor to these noble corporations.

Decker & Son Pianos.

Established in 1856.

Acknowledged to be the Best Pianos manufactured in the United States.

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Also, agent for the Celebrated Mason & Hamlin Organ Co.

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One of the oldest established Watchmakers and Jewelers on this Coast.

His stock of Fine Watches, Jewelry and Silverware is most complete.

Repairing of fine Watches a specialty.

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In the prices of his immense stock of

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For the Largest Variety of
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Wholesale and Retail,

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Oregon Railway and Navigation Company.

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 PASSENGERS LEAVE PORTLAND FOR DALLES, UMATILLA, WALLULA and WALLA WALLA—Daily, (except Sunday,) at 5 A. M.

FOR LEWISTON and points on Snake River—Monday, 19th; Tuesday, 20th; Friday, 23d; Saturday, 24th; Wednesday, 28th; Thursday, 29th, at 5 A. M.

FOR KALAMA, TACOMA and SEATTLE—Daily, (except Sunday,) at 6 A. M.

FOR VICTORIA—Wednesday and Saturday at 6 A. M.

FOR ASTORIA—Daily, (except Sunday,) at 6 A. M.

For Cathlamet, Bay View, Skomokoway, and Brookfield—Monday, Wednesday and Friday, at 6 A. M.

For Westport, Clifton and Knappa—Tuesday, Thursday and Saturday, at 6 A. M.

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STEAMERS leave PORTLAND from the Central Wharf, between Washington and Alder Streets, as follows:

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For Lightering and Towing of Vessels Between Portland and Astoria apply at the office of the Company, near corner of Front and Ash streets. GEO. J. AINSWORTH, Steamboat Agent.

Oregon Railway and Navigation Company, Pacific Coast Steamship Company

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Connecting at Portland with the Oregon and California and Western Oregon Railroads for all points in the Willamette, Umpqua, and Rogue River Valleys and Southern Oregon. With the Oregon Railway and Navigation Company's boats for all points on the Upper Columbia River, Eastern Oregon, and Washington and Idaho Territories, also, with a regular line of Steamers to Victoria, V. I., Fort Wrangel and Sitka, Alaska Territory. Tickets to all points on the O. & C. R. R. and W. O. R. R. sold at reduced rates.

To save expense and detention, parties should be careful to ask for tickets by this route.

G. W. WEIDLER, Agent O. R. & N. Co's S. S., Front St., near Ash. Portland, Ogn.

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OFFICE—Stowbridge Building, corner First and Alder.

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OFFICE—Northwest corner First and Morrison streets.

Residence—Corner East Park and Yamhill.

E. P. Fraser, M. D.,

OFFICE—Northwest corner First and Stark streets—Union Block.

Residence—274 Second street.

R. Glisan, M. D.

OFFICE—Stowbridge Building, corner First and Alder streets.

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For admission apply to the Principal, Miss MARY B. RODNEY, or to BISHOP MORRIS.

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**The Annual Exhibition
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Portland Mechanics' Fair Association
WILL BE**

Opened on the 7th and Close on the
23d of October.

The Pavilion is being enlarged by the addition
of two wings. The south wing is destined for
the Floral Display, and the north wing for the
Machinery exhibit.

Intending exhibitors will please file applica-
tions for space at an early date, by applying to
the Superintendent, Room 26, Union Block,
where all information concerning the Fair will
be cheerfully given.

By order of the Board of Directors.

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Special attention given to orders
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N. B.—We do not retail goods at less than
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CITY RETAIL TRADE, and our prices will be
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Highest price paid for Gold Dust.
Tests made with care, and Analysis of all
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DRESS HATS
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Ask for Gosnell's own Home-cured Hams and Bacon.

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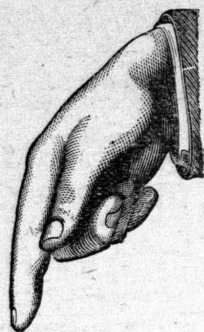
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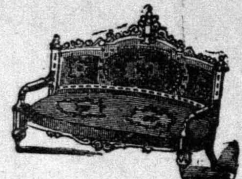
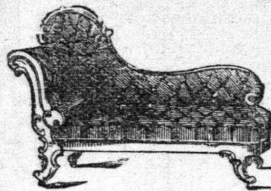
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Headquarters for Elegant Toilet Articles, Surgical Instruments, Select Fancy Goods, Dentists'
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Sole Agents—"ROSE PILLS."

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TO THE TRADE:

The constantly increasing demand for our goods during the last year induced us to greatly en-
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