the fabric on the very last roller disengages itself, passes into the reservoir of tepid water, and then goes to the squeezing apparatus.

The mechanical movement of the folding machine draws the fabric on to the table, where it is properly arranged in folds, and from whence it is next taken to undergo the operations of scouring, rinsing, mordanting, and dyeing.

The same machine, arranged with perforated rollers and a pump for the circulation of liquid through the fabric, serves likewise for the ungumming of silks and the rinsing and scouring of cotton and woolen fabrics.—*Revue Industrielle.*

Hints to Swimmers.

When a swimmer gets chilled the blood ceases to circulate in the fingers, the finger nails become a deathly white color, the lips turn blue, and should he persist in staying in the water after these symptoms develop he is sure to have cramps. So long as the swimmer can discern spots on his finger nails he knows that his blood is in good order, and that he is safe and free from chills. I have been remarkably free from chills, and feel most at ease when in the salt water under a hot sun. Salt water seems to attract the heat, and, no matter what the temperature of the water, under these circumstances I feel warm. I have on some occasions swum so as to keep my body under water, but even in such instances on coming out I have found my back and limbs blistered. This shows the penetration of the heat from the rays of the sun on the water. On one occasion, since I was here last, I swum for £400 at Scarborough, staying in the water seventy-four hours. I use a preparation of porpoise oil, which I rub all over my body, even my face. The oil fills up the pores of the skin and keeps the salt water from permeating my vitals. All professionals now use oil.—*Captain Webb, in Boston Herald.*

Albumen in Cows' Milk.

Dr. Schmidt, Mülheim, has been investigating the nitrogenous bodies in cows' milk, about which so much diversity of opinion has hitherto prevailed. He says that three albuminoid substances are regularly present in the milk, viz.: caseine, albumen, and pepton. The average of seven analyses gave 2·43 per cent of caseine, 0·38 per cent of albumen, and 0·13 per cent of peptons. Under certain circumstances the amount of albumen may increase until it equals that of the albumen. The pepton is formed from the caseine by a fermentative process; this ferment is destroyed by a boiling temperature, but its activity is not destroyed by salicylic or carbolic acid, so that in this respect it resembles the ferment that digests the albuminoids. Since milk, on long standing, may lose 10 per cent or more of its caseine by its conversion into peptons, it should be made use of as fresh as possible when employed for making cheese.

Sulphocyanide of Barium.

The adulteration of this substance is carried to such a degree that in some French specimens only 80 per cent of the pure salt, $Ba(SCN)_2 2H_2O$, was found, the impurities consisting largely of barium chloride.

Dr. J. Tscherniac gives the following simple test. The sulphocyanide of barium is completely soluble in absolute alcohol, while all the barium salts that can be profitably employed for adulteration are insoluble in it, or very slightly so. Hence it is only necessary to shake a sample of the salt with two or three times its weight of alcohol, and then wash, dry, and weigh the insoluble residue, to determine the quantity of impurities.

Remarkable Surgical Operation.

The Paris Academy of Medicine was yesterday informed by the operator that the young man on whom an operation was performed for the extraction of a spoon from his stomach has completely recovered from the effects of the hazardous operation, and is now enjoying his usual health. Interesting particulars are given of this operation, which was performed by Dr. Felizet. By the use of the Faucher tube introduced through the mouth the stomach was cleansed prior to the novel operation, which prevented the risk of peritonitis. An incision was then made in the epigastric region. In order to render the coat of the stomach easily accessible, M. Felizet employed the following contrivance: To the end projecting from the man's mouth he fitted a spherical vessel containing ether. This he heated by submersion in water of sixty degrees temperature. The ether vapor rushing through the tube filled the stomach, which, becoming distended, was brought forward to the wound effected by the operator's knife. The spoon was thus readily found and extracted. It measured over nine inches. It had been accidentally swallowed by the man, a waiter at a café, in the attempt to imitate the feats of the famous sword-swallower.—*Paris Correspondence of the London Standard, October 7.*

THE northernmost place in the world where rye and oats mature is at Kengis, in the Swedish province of Norrbotten, forty-nine miles to north of the Polar circle, whereas the northernmost spot where corn is grown is at Muoniovara, ninety-eight miles to north of the circle.

THE Bell patent would, it is considered by those competent to form an opinion, be cheap at $10,000,000. The consolidated telephone interests of the United States are estimated at from $100,000,000 to $150,000,000.

Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT

No. 261 BROADWAY, NEW YORK.

O. D. MUNN. A. E. BEACH.

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NEW YORK, SATURDAY, OCTOBER 28, 1882.

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THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 356,

For the Week ending October 28, 1882.

Price 10 cents. For sale by all newsdealers.

THE PAST YEAR'S WORK IN THE PATENT OFFICE.

The report of the work of the Patent Office for the fiscal year ended June 30, 1882, just submitted by Commissioner Marble, shows that there were received 27,622 applications for patents for new inventions; 854 for design patents; 407 for reissue patents; 737 for registration of trade-marks, and 442 for labels, a total of 30,062. There were filed during the year 2,455 caveats. The number of patents granted, including reissues and design patents, was 17,713. The number of trade-marks registered was 1,079; labels, 223; total, 19,015. The number of patents withheld for non-payment of final fee was 1,637; patents expired, 5,123. The receipts of the office from all sources were $930,864 14; expenditures (not including printing) were $651,719.50; surplus, $279,144.64.

The abridgment of United States patents was discontinued August 1 for lack of appropriations. The Commissioner asks that legislative action be taken to authorize the office to compel the attendance of witnesses to testify as to the use or sale of any invention before the two years' limit, when an application for a patent therefor is pending. He also expresses the opinion that the terms of patents issued should not be rendered uncertain by the operation of the laws of any foreign country, nor by the failure of the patentees or their assignees to do what such laws require. If the patent for an invention which has been first patented in a foreign country should be limited in its term, he thinks that a definite term should be fixed, and a time within which application must be filed in the Patent Office after the issuance of such foreign patent be prescribed. In view of the fact that the terms for which patents may be granted in foreign countries are shorter than that for which they may be originally granted in this country, he thinks that twelve years would be a proper term for patents where the invention has first been patented, or patent applied for, in a foreign country, and that the applicant should file his application within two years after the issuance of such patent or application therefor.

THE GARFIELD MONUMENT EXHIBITION.

Last summer Congress gave the Society of the Army of the Cumberland permission to use the rotunda and adjacent halls of the United States Capitol from November 25 to December 3, for a bazaar and reception, for the purpose of raising funds to aid in the erection of a monument in Washington to the memory of the late President Garfield.

The propriety of making a show house of the national capitol may be questioned; but since it has been allowed, it is to be hoped that the exhibition will be as commendable as its object and worthy of its unparalleled housing.

The Board of Directors comprises representatives of the executive, legislative, and judicial branches of the Government, the army and navy, the Society of the Army of the Cumberland and the citizens of the District of Columbia, assisted by State boards of commissioners. The exhibits will be shown in eight groups and sixty-four classes, and awards will be made according to the rules observed at the Centennial Exhibition of 1876. Applications for space for exhibits (loaned or donated) must be made before November 1; and the exhibits must be placed in the hands of the directors before November 11. Donated exhibits will be sold for the benefit of the monument fund.

The exceptional conditions under which the National Bazaar, Industrial and Art Exposition is to be held would seem to make especially inviting the opportunity offered to manufacturers and others to exhibit their wares. The headquarters of the Board of Directors are at the Ebbitt House, Washington.

QUEER DOINGS IN OIL.

The summer of 1882 must pass into history as having witnessed the most memorable doings in the annals of the petroleum trade of Pennsylvania. In the SCIENTIFIC AMERICAN for July 22, 1882, reference was made to the results which followed the opening, in May, of the new oil deposits in Warren county, Pennsylvania. A most ruinous policy was followed by the producers, who succeeded in obtaining a lease upon the prolific sand rock. Five wells to the acre were pierced in the heart of the rock, and when signs of weakness were noted in the flowing of these wells, nitroglycerine torpedoes, of 40 quarts each, were exploded in the bottom of the well. The latter, in a number of cases, yielded when first struck 2,500 barrels every twenty-four hours; at least one produced 3,000 barrels, and a 500 barrel well was regarded as a small affair. Other and older oil regions were comparatively deserted, and in August last the new field, from less than 200 wells, was yielding 25,000 barrels of oil daily, bringing up the production of the entire oil regions to the unparalleled figure of 105,000 barrels daily, and sending the price below fifty cents per barrel. But it was the fable of the killing of the goose that laid golden eggs modernized and enacted on a stupendous scale.

Early in September, after the best wells had been "shot" by torpedoes repeatedly, they suddenly ceased producing in a way that caused a revulsion of feeling and intense excitement among all interested in producing petroleum. By October 1st the daily production had, in all the regions, fallen off nearly 25,000 barrels, and for the first time in five years, production and consumption nearly approached each other, namely, 70,000 barrels per day. Prices advanced, and the excitement at the Oil Exchanges of Pittsburg, Oil City, Titusville, Bradford, and New York City was so great,

and the activity so intense, as to be phenomenal. The sales at Oil City during September reached 153,000,000 barrels. On one day alone, Sept. 18, the sales were over 11,000,000 barrels. Meanwhile 70 wells in the choicest territory ceased producing, and early in October the new territory was not yielding over 5,000 barrels daily, and the price had mounted to one dollar. The records of the oil trade, show but feeble parallels to last summer's development, and the rise and decline of the Cherry Grove, Warren Co., Pa., regions is a unique bit of oil history.

SPEED IN WAR VESSELS.

The French have lately launched a new turreted ironclad, the Arethuse, carrying four steel guns in her turrets, besides a battery of twelve smaller guns. Her engines are intended to develop as high as 4,200 horse-power, giving her an average sea speed of 16 knots an hour. Her length is 296 feet 8 inches between perpendiculars, and her displacement about 3,360 tons.

It is but a few months since our Naval Advisory Board recommended the building of unarmored cruisers to have a speed of 15 knots. The inability of such cruisers to cope in speed with unarmored vessels like the Arizona and the Alaska, which would be promptly converted into cruisers in case of war with a commercial power, was pointed out the moment the recommendation of the Advisory Board was submitted.

In the Arethuse the proposed cruisers would meet an antagonist which they could as little fight as run away from with any hope of success; and the naval constructors of other nations are not likely to rest until still higher speeds are attained by ironclads, as they have already been by lighter vessels.

It would be consistent with the general conduct of our naval affairs to go on with the building of 12 knot cruisers, admirably appointed to secure the comfort of officers on official picnics and practically useless in time of war; but it may be questioned whether the people, who have to foot the bills, will be at all pleased to have it done.

If the navy department cannot design or get designed a cruiser capable of making or approaching twenty knots, the reconstruction of our antiquated navy had better be postponed until the department itself has been reconstructed.

MORE RAILROAD INVENTIONS WANTED.

With the rapidly increasing traffic on American railroads there is a demand for greater facilities for loading and unloading freight. It would seem that an improvement in the construction of warehouses might be made that would render the rapid handling of heavy freight an easy matter, as compared to the present clumsy and inconvenient structures.

There is hardly any country station but has more or less heavy freight to handle, and frequently much trouble is experienced for the want of proper appliances for the work. Of course at terminal stations something has been done by way of cranes and derricks, hoisting machinery, etc., but even the best regulated warehouses are open to radical improvements in apparatus and appliances for moving heavy as well as light and bulky freight. This is worth the study of inventors.

There is also a chance for improving platforms, so that moving goods from the cars to the warehouses may be an easy matter, without the use of the ordinary trucks.

Another thing that interferes with the rapid handling of freight is the location of the doors of freight cars mid way between the ends. Ordinarily, this is the proper place for the door, and is preferable for a single door. But if a car were so constructed that goods could be loaded in any part of its length, it would certainly be more convenient than with the central door. This might be accomplished by constructing the car with a system of slide doors the entire length of its sides, so that a car might be loaded in sections and much sooner than if loaded from the middle. This would also facilitate unloading. Appliances for loading and unloading goods from platform cars are nearly satisfactory, but may be improved.

This is an inviting field for the inventor. But if any American inventor would reach the top of the ladder of fame at a single bound, let him produce a station indicator that will inform railway passengers where they are when they arrive at a station. How well the human machine fails to do this is well known by every railway traveler. For a brakeman to speak the name of a station so that any human being can understand it seems to be one of the lost arts, and it remains for the inventor to produce a substitute to perform this duty. This has already been accomplished so far as "braking" is concerned. Now let us have a *reliable* station indicator.

Then there is a want of a humane invention to prevent people being caught in frogs and switches, guard rails, etc. Hundreds of people are killed or maimed every year by being caught in the "boot-jack" portion of frogs and held fast, and run down by cars or locomotives. This trap is a peculiar one. A person slides his foot into the wedge-shaped opening, where it is held in horizontally, while the rail heads prevent his lifting his foot vertically, and before he can extricate himself he is a mangled corpse. Some devices have been tried to prevent these horrors, but none is effective. It will not do to fill this space with any rigid substance, for the wheel flanges must have room. Some yielding substance, as a spring, may be made to fill the space, so as to keep the feet out of the trap and yield to the pressure of wheel flanges. This is a serious evil, and there is no doubt that the railway community will reward the inventor who will produce an effective remedy.

W. S. H.

THE EDUCATIONAL WANT OF THE SOUTH.

It is not many years since the young men of the South were studiously instructed to despise mechanical employments. The "greasy mechanic" of the North was an object of Southern scorn, and the true Southerner was expected to thank God that few of that class were ever likely to venture south of Mason and Dixon's line.

An amazing and most encouraging change has been wrought in the popular sentiment of the South on this score during recent years. Factories are springing up; undeveloped resources are being turned to use and profit; and almost everywhere the feeling is coming to be, if it has not already become, one of respect for and desire for a rapid development of mechanic arts. As an expression of this feeling we have seen nothing more significant than a recent article in the Atlanta (Ga.) *Constitution*, from which the following is eminently quotable. It is a lesson which young men of the North as well as of the South may profitably take to heart:

"We have an over-supply of clerks, lawyers, and politicians, and we always will have; but we are sadly deficient in men whose hands are cultivated as well as their brains. We lack intelligent mechanics and civil engineers, and foremen, and managers of machinery. If we gather enough money to start a factory, we have to send to other States to get men competent to guide the machinery and conduct the inside operations of the factory. If we build a railroad, we must at the outset import engineers, and afterward men skilled in operating a railroad.

"This is all wrong. The young man of the future in the South—the best in the land—should study, as soon as he leaves school, some department of manufacturing. He must first, of course, make himself a skilled mechanic—learn a trade, in other words—and he need not and should not dislike the phrase. It is certainly as honorable and as pleasant to set a horse's shoe as to pettifog a case in a justice's court, or sell ribbons in a retail store, or serve in any other half paid and precarious employment. We must get rid of the sham gentility that despises labor, and especially labor in which brain and skill are harmoniously and effectively united. If the South is to become independent—if her industrial interests are ever fully developed, her young men must abandon old time notions of labor, and prepare themselves to take charge of matters that are now necessarily the spoil of strangers. The best and most inviting places in the southern country now go, as they do in Mexico and Egypt, to skilled men from other and more sensible States. The better the boy is educated, the better mechanic, or superintendent, or engineer, he will make. The high school is as useful to the future mechanic as to the future lawyer or merchant. All boys need all the schooling they can get; but, after they leave school, let them turn to industrial rather than professional avenues.

"To effect this we need, as in all other reforms, a change in public sentiment. We need a sentiment that will condemn the folly of the past in this respect. We need a sentiment that will recognize the fact that the great industries furnish the best field for the young man who has a career to make—that in them is to be found both good wages and the most promising and desirable employment that the land affords. If we can once secure such a public sentiment, we can safely trust the remainder of the problem to the courage and good sense of the young men of the South."

CHEAPER MEAT FOR NEW YORK.

The shipment of dressed meat from Chicago to this city continues, and a sharp fall in prices has resulted. Other and larger firms have taken up the business, and the entire slaughtering interest of this city is threatened with extinction, together with several trades depending largely if not wholly upon it—hide salting, glue making, soap making, and the manufacture of oleomargarine. The public gain in lower prices promises to much more than offset these losses.

It is said that several of the largest slaughterers of this city have resolved to transfer their slaughterhouses to Chicago, and ship their dressed meat here for sale, as it is not thought possible to bring western cattle here to kill in competition with the sellers of beef dressed in Chicago. The expense of killing in Chicago is no greater than here, while the hides, fat, and offal are worth about the same in both markets, the advantage, if any, being with Chicago. A car that will accommodate fifteen live steers will carry nearly three times as many dressed cattle; and the saving in shrinkage and loss through accident is very great. The time of transmission is reduced to forty hours. If the railway companies do not interfere by putting up the rates for dressed meat the new venture cannot fail of success. Hitherto from eleven to thirteen thousand cattle have been slaughtered in New York every week. For three years or more Chicago killed beef has been regularly shipped through this city to the London market, arriving in good condition.

Professor Haeckel in Ceylon.

"My frugal dinner at an end, I usually took a solitary walk on the shore, or delighted my eyes with the sight of the illumination of the palm woods by myriads of fire-flies and glow-worms. Then I made a few entries in my note book, or tried to read by the light of a cocoanut oil lamp. But I was generally quite tired enough to go to bed soon after nine o'clock, after another careful shaking of the clothes for the expulsion of scorpions and millipeds.

"The great black scorpion (nearly a foot long) is so common in Ceylon that I once collected half a dozen in the course of an hour. Snakes exist also in great numbers. Slender green tree snakes hang from almost every bough, and at night the great rat snake (*Coryphodon blumenbachii*) hunts rats and mice over the roofs of the huts. Although they are harmless and their bite not poisonous, it is by no means a pleasant surprise when one of these rat snakes, five feet long, suddenly drops through a hole in the roof into one's room, occasionally alighting on the bed.

"On the whole, however, my nights in Belligam were but little disturbed by animal intruders, although I was often kept awake by the howling of jackals and the uncanny cry of the devil bird (a kind of owl, *Syrnium indrani*) and other night birds. The bell-like cry of the pretty little tree-frogs which make their dwelling in the cups of large flowers, acted rather as a slumber song. But I was far oftener kept awake by the whirl of my own thoughts, by the recollection of the many events of the past day, and the anticipation of that which was to come. A brilliant succession of lovely scenes, of interesting observations, and varied experiences mingled in my brain with plans of fresh enterprise and new discoveries for the morrow."

A Poison for Tubercular Bacteria.

A paper was recently communicated to the Paris Académie des Sciences, by M. De Korab, on the action of helenine on the bacteria of tuberculosis. The facts mentioned deserve notice, although we fear that the hopes suggested are too bright to be realized. The bacilli were cultivated in bovine blood serum, which was daily heated for a week to effectually sterilize it, and was then coagulated by a temperature of 65° C. A guinea-pig having been rendered tubercular by inoculation and inhalation, small tubercular masses were taken from it, introduced into ten tubes containing the tubercular serum, and the tubes plugged after some helenine had been poured into three of the tubes. All were kept at a temperature of 37° C. for a week, and at the end of that time inoculation experiments showed that the organism in the tubes to which the helenine had been added no longer caused tuberculosis, which was readily produced by the contents of the other tubes.

Railway Photography.

Instantaneous photography, in its more familiar aspect, supposes motion of the objects photographed; but another form of it is that in which it is the camera, more especially, that has motion of translation, as in photographing from balloons or trains. The practicability of photographing landscapes from the window of a train running at a rate of even forty miles an hour has been recently proved by Dr. Caudèze, who uses what he calls a gyrograph for the purpose. The apparatus comprises a copper tube similar to that which carries the lenses in ordinary cameras, but the lenses are placed on opposite sides parallel to the axis. Within is a shutter similar to the box of a stopcock; it presents two quadrangular apertures, which, according to the position of the shutter, do or do not let pass the light rays in making a quarter of a turn. This rotatory movement is obtained by means of a spring liberated from a catch. An exposure of only one one hundredth of a second may be had. With a little practice wonderfully distinct views, it is said, can be obtained with the apparatus.

The New York Elevated Railroads amenable for Damages to Property.

Five years ago, Rufus Story, of this city, sued to restrain the New York Elevated Railroad Company from constructing and operating its road through Front street, opposite his premises. The action was tried in the Court of Common Pleas, in October, 1877, and resulted in a judgment for the railroad. The case was carried to the Court of Appeals, and the final arguments were made last June in Saratoga, John E. Parsons and William M. Evarts appearing for Mr. Story, and David Dudley Field for the railway company.

The Court of Appeals rendered its decision Oct. 17, reversing the decision of the lower court, and practically declaring that the owners of property along the lines of the elevated roads have a right to recover damages where their property has been injured in value by the construction and operation of such roads.

Fatal Accident in Splicing Electric Conductors.

The killing of a lineman while splicing an electric light wire in this city was noticed a few weeks ago. A correspondent, "A. P. v. R.," writes us from Vienna that a similar accident occurred at Triest, September 15. The Industrial Exhibition Building there had been partially unroofed by a storm, and in the fall of a pavilion the wires leading from a dynamo machine to lamps used in lighting the park around the exhibition building were broken. The engineer in charge, without stopping the dynamo, went to repair a broken connection, and, on grasping the two ends of the severed wire, received a shock that killed him. The victim was accounted a capable electrician, and was one of the firm of engineers who had introduced the lights and exhibited electric lamps and machinery in the exhibition.