

SCIENTIFIC AMERICAN

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ALASKA AND ITS RESOURCES.

To one whose attention has never been called to the fact, it seems rather surprising that San Francisco is on the meridian that divides the possessions of the United States into equal parts. The Alaskan archipelago extends as far to the west of San Francisco as Maine is east of it. We are furthermore not apt to realize that the coast line of Alaska exceeds that of the United States, and that its territory is equal in extent to the portion of the United States east of the Mississippi River. Its islands are some 1,100 in number, and its scenery is as grand and rugged, with its abrupt headlands, its gigantic ravines, its snow covered mountains and glaciers, and enormous rivers, as any on this continent. It has a population of about 32,000, only 3,000 of whom are whites.

The few towns that are to be found are scattered along the coast, and are principally trading and fishing stations. The most important is Sitka, formerly the seat of the Russian governor, and at that time called New Archangel. It has a population of about 1,500, and is the headquarters of the United States authorities. It has fortifications, magazines, and a magnetic observatory, and has a Greek church and bishop. It also boasts of a training school for Indian children, an

illustration of which is given herewith. The influences of civilization have wrought a great change in the natives, who were formerly very turbulent and savage. The Indian school is well attended, and the effects of education and the missionary have already been felt. The Greek church, which we have reproduced with its dome and graceful minaret, is the most foreign feature of the town, and is in fact the only edifice that has any claim to being an architectural production.

The Russian block house, which is also illustrated, was formerly garrisoned with a Russian force, but it is now abandoned. On a rocky point near Sitka is



THE GREEK CHURCH AT SITKA.



GROUP OF ALASKAN NATIVES.



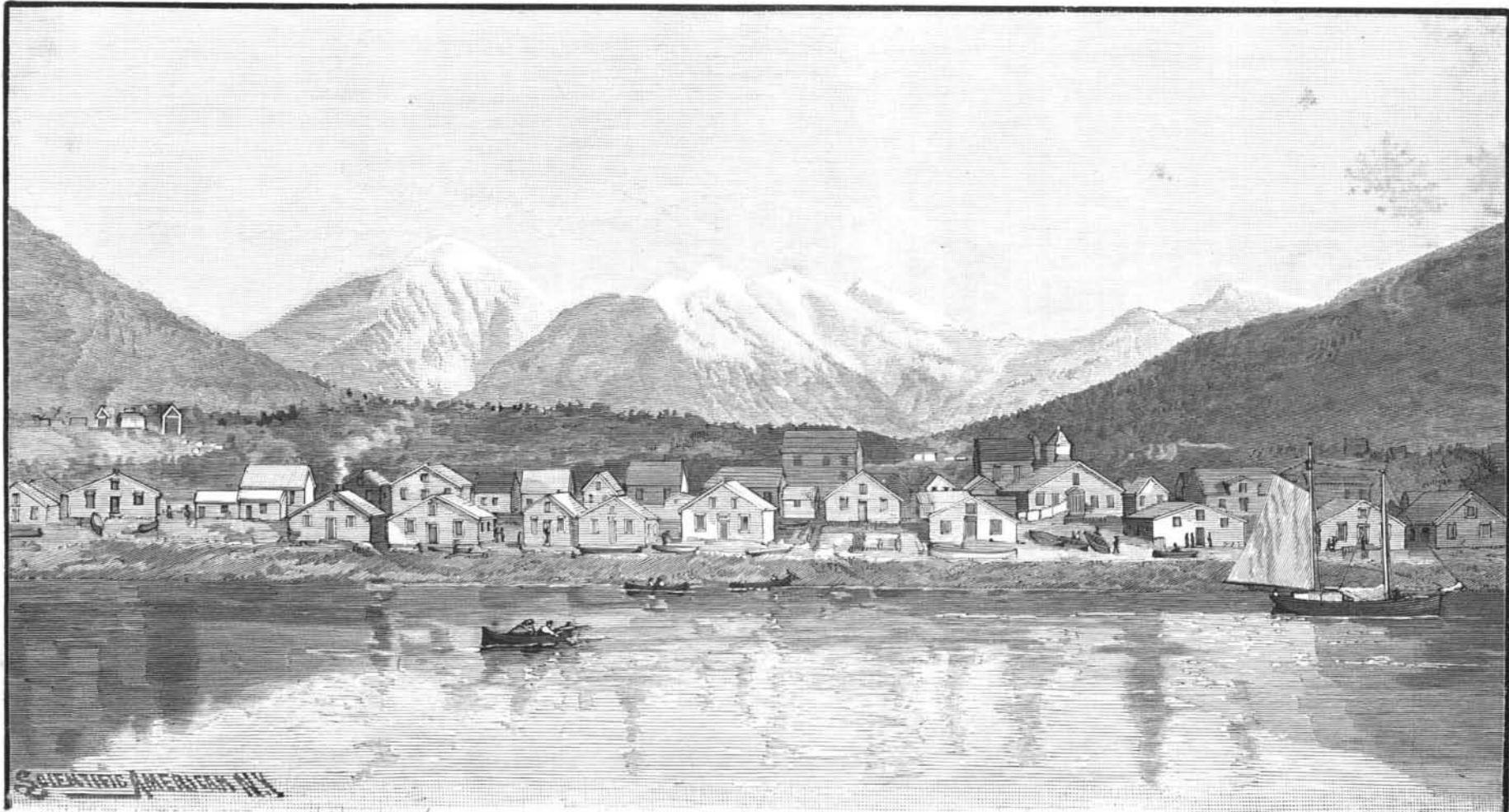
A NATIVE CHIEF.

situated the castle, which, in spite of its rugged walls and severe aspect, possesses its secrets and its romance. It was formerly the abode of a Russian princess who held sway in the Territory, and who was murdered in her own home in the midst of gay revels by a jealous admirer.

A portrait is reproduced of Kitch Konk, a native chief, in full dancing costume. His mantle is brilliantly colored, while in his hand he carries a rattle. A group of Alaskan ladies is also given. They are not in their war paint and best linen, but in their every-day clothes; while their faces are simply daubed with a mixture of spruce gum, grease, and lampblack, put on, it is said, to preserve the complexion.

One of the most curious practices of the natives is their method of disposing of the dead. The bodies of the departed are cremated and deposited in log houses, which are surmounted by some carved object in wood, which is supposed to guard the ashes of the deceased whose bones lie beneath. One might mistake the creature in the accompany-

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GENERAL VIEW OF SITKA, PRINCIPAL TOWN OF ALASKA.

ALASKA AND ITS RESOURCES.

(Continued from first page.)

ing illustration to be an alligator, but it is a howling wolf singing his requiem over the charred remains of some departed chieftain. Its companion lying on the ground by its side is a wooden whale, whose sepulcher has collapsed under it. These figures are the totems of the families whose bones repose in the houses beneath. Cremation has been generally abandoned since the arrival of the missionaries. Totems of a different type are represented in another view. These poles are very tall, and are elaborately carved with stone hatchets, and are considered great works of art by the natives. The carvings are emblematic of important events in the history of the chief in whose honor the totem has been raised. Each family or subdivision of a tribe has its own totem, and these monuments serve to distinguish between families much as armorial bearings did in the middle ages. Each child belongs to the tribe and family of its mother, as the father is not considered in the light of a relation.

Gold is found in some quantity, and we give an interior view of the Treadwell stamp mill, which is quite extensive. The concentrators and stamps are shown in the cut. The free gold is caught in the trays with quicksilver. The machinery is run by water power. Fishing, however, is a more important industry and one which is being very rapidly developed. Nineteen salmon canneries are now in operation in Alaska, and very few realize how the waters of Alaska abound in salmon. They are much more numerous than they are in the prolific waters of California, Oregon, and Washington Territory. Thousands have been taken, so we are informed in a recent government report, by a single haul of the seine. We quote the following from this report:

"On the southeast shores of the Alaskan peninsula, in the bays with small streams entering into them, the salmon are crowded so thickly that the progress of the boat is impeded by them, and should a southeast storm suddenly arise at such seasons, the fish are driven on the beach in innumerable quantities. One of the Russian navigators assured us (1867) that under such circumstances he has seen the beach strewn two or three feet deep with stranded salmon. Vancouver has recorded that he saw them in Burrrough's Inlet cast up on the beach in great numbers." This all sounds indeed like a fish story, but we must not look upon it askance, as it appears in government records, advance sheets of which have been received by us from the San Francisco Bureau of the United States Coast and Geodetic Survey.

The salmon fisheries have increased very rapidly. In 1887 eighteen vessels were engaged in the traffic and 190,000 cases of salmon were exported. In 1888 the number of vessels had increased to twenty-eight and between 300,000 and 350,000 cases were exported.

Whaling is also extensively carried on in Alaska, and in 1887 forty vessels were engaged in this business, six of which were steamers. The total catch yielded 33,268 barrels of oil and 642,200 pounds of whalebone. As was mentioned in a previous article on Alaska,* one of the greatest resources of this vast region is its forests, which are practically virgin. The value of these is not appreciated so much now as it will be later, when the wood supply of the Pacific States, which is being so wantonly wasted now, has begun to give out. Then Alaska with its great supply of hemlock, spruce, and cedar trees, will be sought to supply the devouring hunger of advancing civilization. Our views were prepared from photographs furnished us by Mr. George W. Weister, who has recently returned from an extended tour through Alaska.

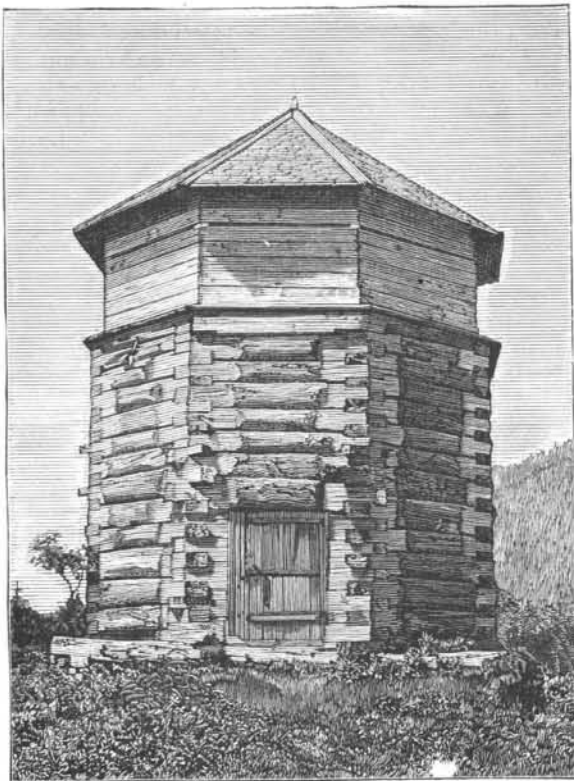
The Life History of a Marine Food Fish.

A lecture was delivered recently at the Royal Institution, by Professor W. C. McIntosh, on the life history of the principal edible sea fishes. It is only within the last few years that the subject has been properly understood, very erroneous ideas respecting it having prevailed up to a recent date. For instance, it was thought that sea fishes sought shallow water in the spawning season in order to deposit their eggs on the bottom, but there is no reason whatever to lead to the supposition, the probability being that the eggs are ejected wherever the fish happens to be. The life history and development of fresh water fishes, such as the salmon, have been pretty accurately known for some

* See SCIENTIFIC AMERICAN, April 13, 1889.

time, owing to the greater facilities for observing them, but the observation of marine fishes has presented greater difficulties, necessitating the employment of more expensive methods.

The lecturer explained and illustrated the methods employed and apparatus used for capturing the eggs and young fish. Nets with very fine mesh are employed, and are chiefly of three kinds, one for use near the surface, another for sinking to a considerable depth, and a third for attaching to the beam of a



RUSSIAN BLOCK HOUSE.

trawl to catch those at the bottom. Unlike those of the fresh water fish, the eggs of the majority of marine fishes are not deposited on the bottom, but float freely about in the ocean wherever the currents carry them, and are therefore called "pelagic." The cat fish forms an exception, its eggs being deposited in masses at the bottom. The "pelagic" eggs are small, transparent, glassy spheres, which can scarcely be seen when floating in the water; their specific gravity is almost the same as that of sea water, so that they float about at various depths beneath the surface and are carried up or down by the slightest current. Many of them have a globule of oil in them which has been supposed to have something to do with their floating, but this is probably not the case. The number produced by a single fish is enormous, being about nine millions in the case of the cod. Their vitality is very great and withstands a considerable amount of heat, eggs which had been heated to a considerable temperature in a test tube having afterward unexpectedly shown signs of life and motion: they are more readily killed by cold.

The egg gradually develops into the embryo fish, which at first has no mouth, but lives on nutriment derived from the yolk sac of the egg, which remains as

ing itself to be carried about like the egg, but it soon begins to develop patches of pigment and fins, although these are very different from those found in the mature fish.

The color and form of most sea fishes vary very much at different stages of growth, and in many cases they could not be recognized as the same fish; the young ling for instance, besides being very different in color from the adult, has two very long pectoral fins, which caused it at first to be taken for a new kind of fork-beard. These differences in the young and adult stages are probably to be attributed, as in mammals, to the survival in the young of ancestral peculiarities, which have become modified in the adult to suit different circumstances. These differences are very remarkable in the flat fishes, such as turbot, flounder, etc., where the young fish is nearly round and has the eyes symmetrically placed on each side of the head; at this stage it does not lie on the bottom, but swims freely in the upper water. As it gets older the fish seeks the bottom and exhibits a tendency to lie constantly on one side, and one eye works round from the lower side to join the other on the upper. The eye may pass round over the top of the head, or in some cases it may pass through the soft tissues; in the young stage the body is so transparent that the fish can probably look obliquely through its own body and see what is passing on the other side. At the same time that the eye passes round, the under side loses its color and becomes white, the upper side remaining pigmented. It sometimes happens, however, that from some unknown cause a young flat fish does not go to the bottom but remains swimming in the upper waters, and then both sides remain colored and symmetrical.

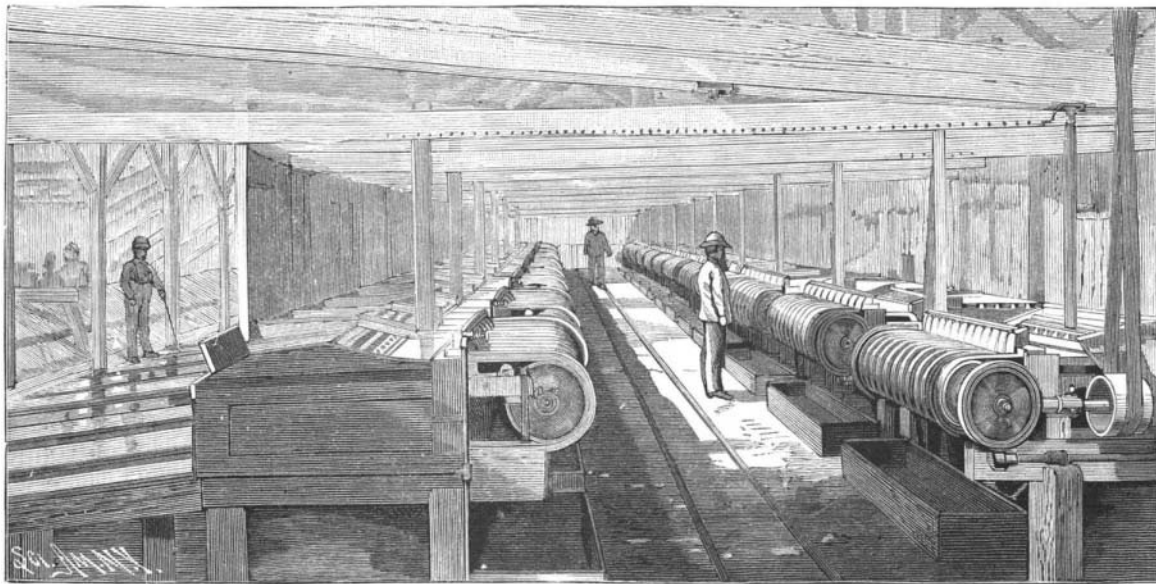
The food of the young post-larval fish consists of minute crustaceans, etc., which are present in large quantity in the ocean, and nearer land, at the mouths of estuaries, etc., the spawn of mussels and similar mollusks which feed on microscopic plants affords a plentiful supply. At a later stage they are very voracious, and many specimens were shown of fishes which had attempted to swallow others nearly as big as, or even bigger than, themselves, with fatal results. The general tendency among marine fish is to sink down toward the bottom as they get older, the younger ones keeping nearer the surface; near land, the younger ones seem to find their way toward the shore, but migrate outward again as they get older.

The lecturer touched on the point of providing a close time for sea fishes during the spawning season, and thought that although it might easily be done in the case of any special fish, it was scarcely feasible to make it general, as the spawning period varied so much among different species as to stretch it over a great part of the year for the whole. He did not think that the ravages of man made a very great impression on the numbers of fish, but urged the importance and utility of studying their lives and habits. A good deal had been done in the last few years, and he hoped that the government, which had been so generous in sending out the Challenger expedition, would also help in this direction.

Lost Arts.

Wendell Phillips, in his lecture on the "Lost Arts," in speaking of malleable glass, tells of a Roman who, in the age of Tiberius, had been banished, and returned to Rome, bringing a wonderful cup. This cup he dashed upon the marble pavement, and it was crushed but not broken by the fall. Although somewhat dented, with a hammer he easily bent it into shape again. It was brilliant, transparent, but not brittle. He further states that the Romans obtained their chemistry from the Arabians, and that they brought it into Spain eight centuries ago. In the books of that age there is a kind of glass spoken of that, if supported by one end, by its own weight in a day's time would dwindle down to a fine line, so that it could be curved around one's wrist like a bracelet.

The art of luminous painting was known to the



STAMP MILL—THE GOLD CONCENTRATORS.

a large lump on the under surface of the anterior part. In the embryos of most mammals and fresh water fish the nutriment is absorbed from the yolk sac, by blood vessels sent down into it; but in the cod and other marine fishes, although the heart is present and beating in the embryo, no blood vessels are sent down into the yolk sac, and the nutriment is probably absorbed directly by the tissues. After about ten days the mouth opens and the yolk sac gradually disappears. At first the embryo is transparent and passive, allow-

Japanese nine hundred years ago, and an extract from one of their old writers has been translated as follows: "One Su Ngoh, many years ago, had a picture of an ox. Every day the ox left the picture frame to graze and returned to sleep within it at night. This picture came into the possession of the Emperor Tai Tsung, of the Sung dynasty (A. D. 976-998), who showed it to his courtiers, and asked them for an explanation, which none of them, however, could give. At last a certain Buddhist priest said that the Japanese

found some nacreous substance within the flesh of a certain kind of oyster they picked up when the rocks were bared at low tide, and that they ground this into color material and then painted pictures with it which were invisible by day and luminous by night." The secret simply was that during the day the figure of the ox was not visible, and it was therefore said that it left the frame to go grazing.

Many instances of remarkable mechanical ingenuity are related by various ancient authors. In the year

says an old author, "was very pleasant and diverting."

Proclus, whose fame in mathematics equaled that of Archimedes, is said to have made burning glasses in the reign of Anastasius Dicorus, of such wonderful efficacy that at a great distance he burnt and destroyed the Mysian and Thracian fleet of ships that had blockaded Byzantium. The Damascus blades, as marvels of perfect steel, have long been famous, and even those used in the crusades are as perfect to-day as they were

of by the funny man of the *Times*, falling from a hoistway. A rickety sign endangers our head or a low wire our thought.

"We stop to chat with a friend, and lean against a deadly charged electric pole and it is all over with the conversation. A passing plumber burns our coat with his unextinguished hand furnace. A passing carpenter lacerates our trousers with a saw; a passing porter imperils our head with a long piece of gas pipe on his shoulder.

"One is annoyed if not endangered by the servant washing the sidewalk by a hose, or a fireman carrying his wriggling serpent up a ladder. A fresh young Italian maid from Cork, with a white muslin nightcap on her head, runs us down with a baby carriage, scarring our shins or necessitating a visit to the chiropodist.

"Then there is the woman's umbrella that wasteth at noonday, scooping us up after the manner of a drag net, or impaling us in its blind and headlong charge. All these are sidewalk perils. If we undertake to cross the street, dangers multiply. The pedestrian has no rights which the driver is bound to respect, and the footfarer, unless a handsome woman personally conducted by a big policeman, will be subject to being run down by the driver of a beer wagon, or a physician in a hurry, or the chief of the fire department on his 'golomping' way to a conflagration, or a coroner intent on beating a rival, or a belated voter standing out till



INDIAN TRAINING SCHOOL AT SITKA.

1578, the twentieth of Queen Elizabeth's reign, one Mark Scaliot, a blacksmith, made a lock consisting of eleven pieces of iron, steel, and brass, with a hollow key to it that altogether weighed but one grain of gold. He also made a gold chain, composed of forty-three links, which he fastened to the lock and key. In the presence of the Queen he put the chain about the neck of a flea, which drew it with ease, after which he put the lock and key, flea and chain, into a pair of scales, and they together weighed but one grain and a half. This almost incredible story is vouched for by an old writer.

Myrmecides, an ancient carver, was also so proficient in microscopic mechanism that he made an ivory chariot with four wheels, and as many harnessed horses, in so small a compass that a fly might have hidden them all under its wings. The same artisan made a ship with all her decks, masts, yards, rigging, and sails, which took up scarcely more room than the chariot.

The silver sphere, "a most noble and ingenious performance," which was presented to Sultan Solymán the Magnificent by his Imperial Majesty Ferdinand, is mentioned by Paulus Jovius as showing and keeping time with the motions of the celestial bodies in their various configurations. It was carried to Constantinople by twelve men, and there put together by the artist that made it.

An artificer named Cornelius van Drebbel once made an instrument like an organ that, being set in the open air, under a warm sun, would play airs of itself without the keys being touched, but would not

eight centuries ago. One on exhibition in London could be put into a scabbard almost as crooked as a corkscrew, and bent every way without breaking. The point of this sword could be made to touch the hilt.

The poets have celebrated the perfection of the Oriental steel, and many famous writers have sung its praises. Scott, in his "Talisman," describes a meeting between Richard Cœur de Lion and Saladin. Saladin asks Richard to show him the wonderful strength for which he is noted, and the Norman monarch responds by severing a bar of iron which lies on the floor of the tent. Saladin says, "I cannot do that," but he takes an eider down pillow from a couch, and drawing his keen blade across it, it falls in two pieces. At this feat Richard says: "This is the black art—it is magic; you cannot cut that which has no resistance." Saladin, to show him that such is not the case, takes his scarf from his shoulders, which is so light that it almost floats in the air, and, tossing it up, severs it before it can descend. That Scott's story is not an exaggeration is proved by a traveler who once saw a man in Calcutta throw a handful of floss silk into the air and a Hindoo sever it into pieces with his saber.—*Pittsburg Dispatch*.

Risks Encountered on the Streets in Cities.

The *Albany Law Journal*, usually devoted to stern legal lore, thus facetiously enumerates some of the dangers incident to metropolitan life:

"Instead of snow balling there is the base ball nuisance, maintained by small boys, without pay, in imitation of men who play ball for salaries larger than those allotted to most of the judges. Instead of coasting or 'bobbing,' there is the swift and stealthy bicycle, as deadly as the ancient war chariot, running people down, or at least causing the nervous man to jump to one side like a tarantula. Then a school of sweet little girls on roller skates swoops down upon us, making it dangerous to turn either way, and compelling us to stand still and see our salvation. Our neighbor's coal hole is open or insecurely covered, and one leg slips in or both heels fly out, with woe to brittle bones. There is the peel of orange or banana dropped upon the flagging in disregard or defiance of our statute in that case made and provided.

"There is the danger of the whip-lash, flourished by the profane driver of an

over-freighted wagon, or stuck out at conventional right angles over the sidewalk by the liveried lackey upon the carriage box, threatening loss of eyesight or a mark on the cheek like a saber slash in a German student's duel. We bruise our legs in climbing over skids stretched across the walk, or we barely dodge a box or barrel, or one of those pasteboard safes spoken

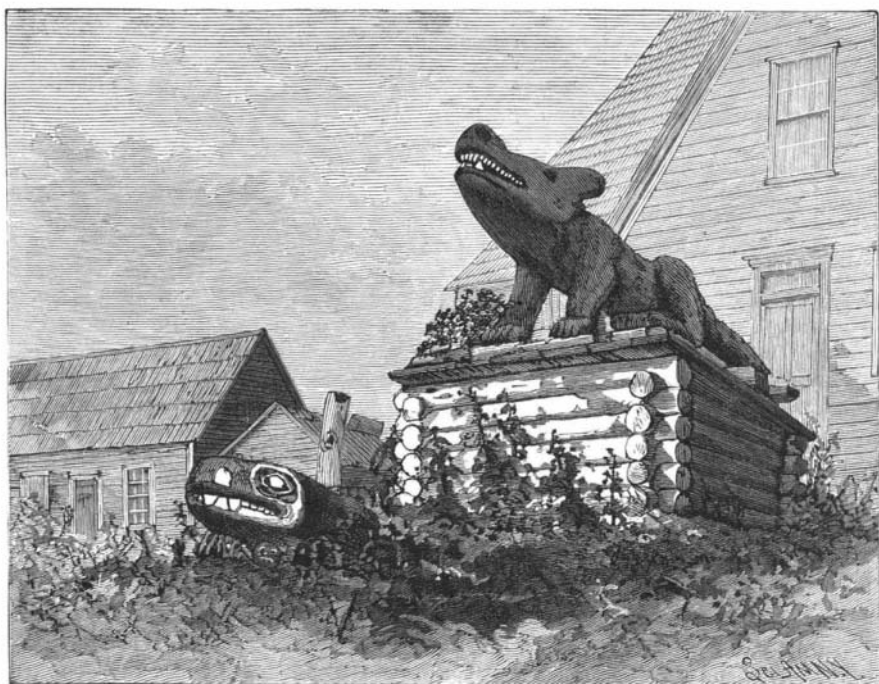
of by the funny man of the *Times*, falling from a hoistway. A rickety sign endangers our head or a low wire our thought.

"Runaway horses are another source of midway perils, and so are wagons turning around corners with long irons or beams projecting from behind. This list might, perhaps, be increased, but these common instances show that man walks the city amid perils scarcely less than those of the desert, the sea, the forest, or even the battlefield; almost as deadly as those encountered and enumerated by St. Paul.

"Most of them, indeed, are 'perils by false brethren,' against which the injunctions and penalties of the law are futile. To avoid misapprehension, we will add that these lines are not written in the interest of any particular accident insurance company."

A Remarkable Fistula.

In the *Deutsche Monatschrift für Zahnheilkunde* for December, 1888, Dr. Nicolai, of Stuttgart, gives the history of a case in which a fistula opening at the nipple was found to be connected with a diseased molar tooth. According to a summary in the *Centralblatt für Chirurgie*, the connection was first inferred from the fact that the discharge from the opening just above the left nipple ceased at once after proper treatment of the diseased left lower first molar, and it was afterward proved by an injection of cochineal into the alveolus of the tooth, which caused a red coloration of the pus discharged at the nipple. Further examination showed that the pus had made its way through the maxilla, descended along the border of the sterno-cleido-mastoid muscle, perforated the fascia of the platysma myoides, and coursed over the pectoral muscle into the substance of the mammary gland. The fistula closed in twelve days after the removal of the diseased tooth.—*N. Y. Medical Journal*.



FAMILY TOMBS SURMOUNTED BY TOTEMS.

play in the shade. For this reason it is supposed that it was inclosed air, rarefied by the sun, that caused the harmony. George Whitehead an Englishman, made a ship, with all things pertaining to it, to move as if it sailed upon a table. "All hands were aloft, a woman made good music on a lute, and a little puppy cried in the midship, all of which variety," quaintly

The Patent Office the Friend of the Inventor.

In the recent case of Donovan, on appeal, the Hon. Benson J. Hall, Commissioner of Patents, laid down the following excellent doctrine, which it is hoped the examiners will keep in mind:

"The rules of the office, particularly rules 68 and 139, point out that at all times in the investigation of an application, and in the progress of appeals, it is the duty of each tribunal having jurisdiction of the case to see to it that the inventor shall secure a patent for whatever patentable matter may be shown in his application. As has been frequently stated by me in decisions, the office must put itself in the attitude of a friend, and not of a litigant with the applicant, and see that he secures every right that belongs to him. Not only is this true of the rules cited, but Congress has seen proper to take especial pains to provide that whenever an applicant, in consequence of any inadvertence or mistake in the framing of his specification or claim, has failed to secure that to which he is entitled, or his patent is inoperative or invalid either by reason of having claimed too much or too little, he may have the proper correction made by a reissue, which will secure him the precise invention to which he is entitled.

"Now, unquestionably, if under rules 68 and 139 it is the duty of examiners-in-chief and the Commissioner to suggest and recommend, in order that an applicant may receive letters patent for subject matter not involved in the appeal, it must be the duty of the primary examiner in the examination of the case made by him to point out and recommend the same thing. I do not mean by this that it is the duty of the examiner to become an agent or an attorney for the applicant; but I think in all cases when he is satisfied or believes that the application contains patentable matter which is not claimed, but which he has reason to believe the applicant is seeking to cover, it is his duty to advise the applicant briefly and specifically, precisely as the examiners-in-chief and the Commissioner are authorized to do, as above stated. By acting upon this principle, all of the tribunals of the office become friendly to the applicant, and enable him to clearly see and understand the views of the office as to the nature and patentability of the invention described. Such practice would undoubtedly tend to lessen the correspondence and conflicts which arise between applicants or their counsel and the office."

The Soda Fountain.

BY JAMES VERNOR.

The main points upon which the success of a soda water business depends are few in number, but although apparently trifling, they are in reality of the most vital importance.

First, we must be able to offer the public a beverage that the great majority will really like. It must not only be palatable, but satisfying, and the more satisfying it is, the better the result will be on the business. No matter how pleasant or palatable a beverage may be, if the public decide that it is "thin" or that it has "nothing to it," its sales will be limited. The day of "sweetened wind" has gone by, and the failure of many a fountain to pay may be accounted for by the fact that nothing but that article was ever drawn from it. There are dozens of good beverages offered by manufacturers in the form of "extracts," any one of which will yield handsome profits, and the man who is unwilling to purchase those extracts because the manufacturer makes a profit on them, and because he imagines that he can make something similar which will do just as well, while costing but a trifle, might in ninety-nine cases out of a hundred just as well give up the soda water business, for he will rarely make a success of it. I grant that an occasional success may be attained, but the risk is a very great one, and at the best it will require years to arrive at the point where, had the other plan been pursued, a single season would have found him.

No matter how many special drinks are drawn, every fountain should, as a basis, draw soda water, and it should be something more than "sweetened wind." The water should be perfectly filtered and thoroughly charged with carefully washed carbonic acid gas, until, after plenty of agitation, the gauge indicates 100 pounds pressure. The sirup should be heavy with pure cane sugar (12 pounds to the gallon of water). Fruit sirups should be made from pure fruit juices, which, if you are too indolent to make for your own use, you can always buy, although not quite as good nor quite as economical. The vanilla should not be tainted with tonka bean, nor the ginger with capicum, the coffee should be a very strong decoction of the most fragrant berry, in each gallon of which should be dissolved while still hot 12 pounds of granulated sugar. The chocolate should be made from the very best cocoa, and should be free from fat and rich in sugar. All sirups should be dispensed in connection with good, plain, pure, rich cream, whether called for or not, and ice cream should be relegated to the "ice cream parlors," where it more properly belongs, and where it will not spoil a good glass of soda nor the genial disposition of the gentleman who is endeavoring to place before the public something better than "slops" and

"sweetened wind." Cases will occur where customers cannot take cream in any form. Experience has shown that with such customers a little dash of vanilla sirup, added to any order they may give, usually elicits a remark complimentary to the beverage drawn from that fountain, showing the wisdom of the French makers of chocolate, who realize the importance of the vanilla bean as a valuable adjunct to their products.

The next point is the temperature at which the drink is to be dispensed. Experience has shown that the public desire an extremely cold drink, and the dispenser should see to it that they have what they want. It is poor economy to save on ice or block tin pipe. Buy all required of both to have every glass of the beverage that crosses the counter uniformly cold. A thermometer plunged into a glass of it during your busiest moments, that will not fall to 45°, should be accepted as evidence that more cooling facilities are necessary, and the same should be procured with the least possible delay. The necessity for uniformity in temperature, as well as taste, of any beverage cannot well be overestimated. Attendants should be trained to use an exact amount of sirup and cream, coarse stream, and fine stream, each and every time that they wait upon a customer. A standard should be established, and every attendant should be expected to live up to it, the object being to thoroughly impress upon the mind of the customers that when they come to that fountain they will get just what they call for, and can be certain that it will taste just as they expect and desire it to. The result will be that, other things being equal between two stores, the one in which the customer knows such a state of things to exist will get the benefit of his patronage every time. Next in order is the glasses. They should be just as fine in quality as possible, and always scrupulously clean. The use of thin glassware necessitates a considerable expense, not alone in breakage, but also in the help necessary to keep them clean, but in my opinion it is much more than counterbalanced by the increased business induced by their use. It is a popular belief that all beverages taste better when drank from thin containers. How long would champagne retain its popularity if served in thick coffee cups? or the popularity of the after-dinner coffee, were it not for the dainty china used? The wise man takes advantage of these little things that have such a hold upon the public and turns them to his own benefit. Another nice point is the cleanliness of the glasses. It is not sufficient that a glass after use be washed around in a pail of water and then turned upside down upon a drain until it is to be used again. The very sight of a dozen or two glasses in the various stages of the drying process, from the one dripping with moisture and clouded with cream to the one dried till it looks as if it were afflicted with leprosy, is enough to turn the stomach of a strong man, to say nothing of the ladies. There is but one way to wash a glass and have it clean, and the sooner that every soda water dealer realizes that fact, the better will it be for him and for all concerned. Take the matter to yourselves and your own homes; your wife or child uses a glass and places it upon the sideboard, and yet, although you know that none but them could have used it, should you desire a drink you will take a fresh glass, and notwithstanding that fact, the public at a soda fountain are expected to use a glass after every one, although the last lips that pressed its edges may have been smeared with tobacco juice or festering with disease, and what excuse have you to offer for it? Custom, custom and nothing else, but it is a custom that has done more to drive people away from a healthful and pleasant beverage than any other one thing. Let us have a grand reform in this particular, and let us in the future give no one cause that likes them to refrain from indulging in harmless drinks.

What applies to soda water applies with equal force to every beverage that is dispensed at the fountain, and while "soda" is an absolute necessity in a successful fountain business, it is frequently an item of minor importance as a source of revenue, being outsold by a special popular drink like ginger ale, mead, celery phosphate, koumiss, etc. Experience seems to indicate that each dealer should have a specialty, and the phenomenal success of some of the above certainly speaks volumes in favor of specialties, and that success again emphasizes what the writer has already stated, that uniformity in beverages is of the utmost importance. Uniformity can only be attained approximately where a beverage is drawn with a sirup, as the eye is depended upon to measure the sirup, and it simply insures less uniformity in proportion to the increased number of attendants at the fountain. On the contrary, a special beverage, like ginger ale, is made by weight and measure, then charged in the fountain and drawn complete, and uniformity is of necessity attained. Ginger ale becomes more popular each season, while the lives of sirup-made drinks like the moxies and the maltos are principally distinguished by their brevity and their lack of ability to fill the bill.

There is another feature of the soda water business that unfortunately is almost universally overlooked, and that is the metallic contamination liable to occur

in the carbonated water while standing in the fountains and coolers. We buy these containers lined with tin in some shape, and that tin will not last forever. Do not leave the discovery to your customer that it has given out. Do not wait until he tells you that your soda leaves a queer taste in his mouth. Do not wait until he tells you that your soda water made him ill. Do not wait until you are sued for damages, but rather be ever on the alert, make weekly or monthly inspections, drawing a little carbonated water and dropping into it a crystal of yellow prussiate of potash. A change of color will satisfy you at once that something is wrong. Search for it, find it, or stop drawing soda water, as you will have otherwise attained the highest point you will reach, and your trade, instead of increasing, will certainly and rapidly leave you. I have known instances of copper contamination in an apparatus that was supposed to have no brass or copper about it. Once it was a copper cooler tinned outside and inside, and sold as a solid block tin can cooler, a thing that does not exist. Again, the contamination was traced to a brass coupling, originally tinned, but from which the tinning had been worn off. I have known new apparatus to yield contaminated water through one of the parts having been put in without tinning, undoubtedly unintentionally, but the result to the business would have been just as disastrous had it not been for proper care and watchfulness.—*Pharmaceutical Era*.

Is the Earth in Danger from the Drill?

Prof. Joseph F. Jones answers, in a recent issue of the *Popular Science Monthly*, the question, "Is it safe to drill the earth too much?" The professor assumes the earth to be a hollow sphere filled with a gaseous substance, called by us natural gas, and he thinks that tapping these reservoirs will cause disastrous explosions, resulting from the lighted gas coming in contact with that which is escaping. He compares the earth to a balloon floated and kept distended by the gas in the interior, which, if exhausted, will cause the crust to collapse, affect the motion of the earth in its orbit, cause it to lose its place among the heavenly bodies, and fall in pieces.

Another writer thinks that drilling should be prohibited by stringent laws. He, too, thinks there is a possibility of an explosion, though from another cause. Should such a disaster occur, "the country along the gas belt from Toledo through Ohio, Indiana, and Kentucky will be ripped up to the depth of 1,200 ft. or 1,500 ft., and flopped over like a pancake, leaving a chasm through which the waters of Lake Erie will come down, filling the Ohio and Mississippi valleys, and blotting them out forever."

Still another theorist has investigated the gas wells with telephones and delicate thermometers, and he announces startling discoveries. He distinguished sounds like the boiling of rocks, and estimated that a mile and one-half or so beneath the Ohio and Indiana gas field the temperature of the earth is 3,500°.

The scientist says an immense cavity exists, and that here the gas is stored, that a mile below the bottom of the cavity is a mass of roaring, seething flame, which is gradually eating into the rock floor of the cavern and thinning it. Eventually the flames will reach the gas, and a terrific explosion will ensue.

An Evil under the Sun.

The *Southern Lumberman* thinks that one of the most prolific sources of patent lawsuits is the use of mechanical or technical terms and expressions by alleged patent attorneys that may mean nothing or may be construed two or more ways. As a general rule, mechanics and inventors are not thoroughly versed in law English as it is written, and will sign specifications containing words and expressions the legal meaning of which they do not fully understand. Many of the so-called patent attorneys, who write the specifications which form a part of every application for letters patent, are not at all familiar with the real meaning of the terms they use, and not one in a dozen is a practical mechanic. A few years' experience as an "examiner" in the Patent Office is considered equal to a graduating diploma from the greatest technical school on earth. A sap-headed son of a politician may get a situation as "examiner" and be discharged for incompetency, but, all the same, he will advertise himself as a "solicitor," and the most prominent line in his "ad." will be: "formerly examiner in the Patent Office." This fellow might, perhaps, have presided for a while as "examiner" of "hay rakes" in the division of agricultural implements, and yet he will charge and collect a fee from a poor inventor for writing the specifications for the most complicated woodworking machine or the latest electrical invention with fewer conscientious scruples than an army mule would feel in eating a peck of stolen oats. Some philanthropist could do the mechanical world a favor and win a claim to a starry crown in glory land by publishing a dictionary of mechanical terms in handy, cheap, pocket style, giving brief and accurate definitions of every word and term as construed by the courts.