finely divided state which characterized the concentrates from the Edison plant. It was necessary to furnish the material to the furnaces in a condition which would allow the furnace gases to act upon it to the best effect. The Edison concentrates, on account of their fine subdivision would be apt to choke the furnaces and prevent the rapid reduction of the ore.

In order to meet this requirement, it was decided to compress the concentrates into briquettes and deliver them in this form to the blast furnaces. A complete briquetting plant was therefore designed, which has fulfilled all requirements. The concentrates are carried to a mixing house, where a suitable binding material is added, the mixture being carried by means of a trough conveyor in front of a series of briquetting machines. The mixture is forced into dies and compressed in them by means of three plungers, acting in rotation. The first fills the die under a pressure of 800 pounds to the square inch; the next plunger exerts a pressure upon the briquette of 14,000 pounds to the square inch; and the last plunger exerts a pressure of 60,000 pounds per square inch. Two sizes of briquettes are produced—3 inch and 2½ inch; the larger sizes weighing about twenty ounces each.

The briquettes are carried by a bucket conveyor to the baking furnaces, where the conveyor passes up and down through five vertical loops, the briquettes being retained in the furnace for one hour and nine minutes, and exposed to a temperature of 500°. After they have been thoroughly baked, they are unloaded onto a conveyor, which carries them to the railroad cars, by which they are taken direct to the blast furnaces.

The behavior of the briquettes in transit and at the furnaces has been eminently satisfactory. They do not absorb moisture, they do not break in handling and they present sufficient voids in the blast furnaces to insure a complete circulation of the gases around them for smelting.

An analysis of the briquettes shows the following results:

	Per cent.		Per cent.
Iron	67	to	68
Silica	2	to	3
Alumina	0·4	to	0·8
Manganese	0·05	to	0·10
Phosphorus	0·028	to	0·033
Binding material	....	to	0·075

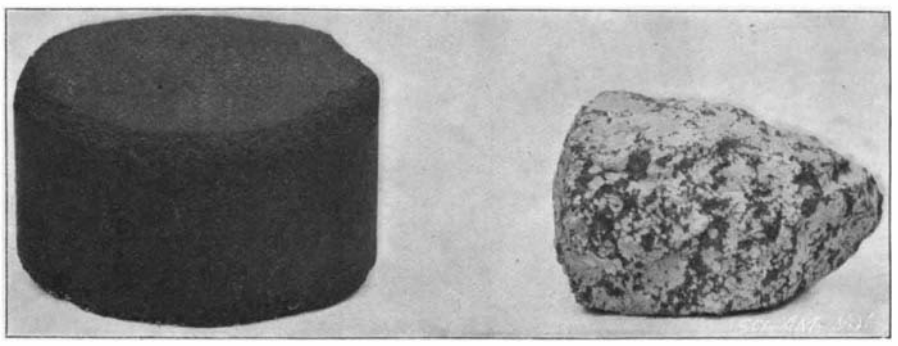
with traces of lime, magnesia and sulphur.

It will naturally be asked, What results have the Edison briquettes shown at the blast furnaces when tested in actual practice? This was determined in 1897 by a trial which was carried out at the Crane Iron Works, Catasauqua, Pa. In these tests various percentages of briquettes were tried in a furnace which produces an average of 105 tons of pig per day when using the ordinary burden. The test was started with 25 per cent of briquettes and extended over five days, 100 per cent of briquettes being used on the last day. With 25 per cent of briquettes the output was 104 tons of pig, and with 100 per cent of briquettes the output rose to 138½ tons per day.

From a study of these figures the reader will see that the yield of pig is largely increased by the use of the briquettes over that secured by the use of the usual ores. Moreover, the trial proved that the consumption of limestone is reduced from 30 per cent to 12 per cent of the charge of ore, with a corresponding reduction in the quantity of fuel used.

The question has frequently been asked: How can this system of concentration be made commercially profitable with its elaborate plant and its frequent rehandling of the material? The answer is that the principle of labor saving, by the adoption of automatic appliances, which has enabled American industries to compete successfully against the world, is here carried out to its fullest development in every part of the works. In the mining, with its giant 93-ton-shovel; in the "giant rolls" crushing; in the elevators running at a speed of 250 feet per minute; and in the system of magnetic separation, there is a minimum of manual and a maximum of mechanical labor.

Costly and elaborate as the plant may be, it is noteworthy that about 5,000 tons of ore per twenty hours can be mined, crushed and concentrated with a working force of only 125 men per shift. From the time the deposit of ore is loosened by blasting ready for the steam shovel to the time when the concentrated result is shipped on the cars in the shape of briquettes ready for the blast furnaces, the material never once calls for manipulation by hand.



A BRIQUETTE, 68 PER CENT OF IRON. Fig. 3. A LUMP OF IRON ORE, 20 PER CENT OF IRON.

Herein lies the promise and potentiality of this latest and most radical development in the mining and metallurgy of iron.

THE FUR SEAL.

BY DR. BENJAMIN SHARP, ACADEMY OF NATURAL SCIENCES.

The fur seal, a century ago, was without doubt the most numerous mammal on the face of the globe. To-day, like the bison of our Western plains, it is fast becoming extinct. The rookeries of the north were small compared to the vast areas covered with fur seal in the southern oceans, yet we now hear only of the Commander and Pribylov rookeries, and a small one near the mouth of the Rio Plata, protected by the government of the Argentine Republic.

The history of the seal fisheries in the two polar oceans is interesting, as it shows the effect of lawless slaughter and careful protection. The destruction of the southern seal was accomplished when the Bering Sea fisheries were yielding without injury their maximum number of skins.

The habits of the fur seal* are so regular and so well known that, with intelligent care, the largest rookery could be made to yield a definite annual number of skins, with no diminution of the numbers required to keep up the supply, as nature always produces a large surplus, and from this surplus the skins could be drawn.

As soon as the winter snows have melted from the shores of the islands, the adult males assemble there to obtain a secure footing for the season. Now a fierce and continuous battle ensues for about a month, the "fittest" obtaining the best positions along the shore, the less powerful holding a station back of these, until the whole breeding ground is mapped out, with the strongest bulls of the rookery in definite positions, which they hold and never leave for two or three months. The weaker, generally those under six years, are driven from the rookeries, or not allowed to land, by their pugnacious elders, and are compelled to form a rookery of their own.

The fat, sleek bulls of five or six hundredweight and six or seven feet long, having gained their stations, await the coming of the cows. Nothing can drive these animals from their positions. They stand guard day night, without food,. without drink, and, it might almost be said, without sleep. When they return to the water at the close of the season they are thin and haggard, covered with honorable scars. Such endurance is unparalleled among warm-blooded animals.

Bears sleep for months during the dead of winter. Fattening in the fall, they creep to some cave or hollow tree and pass there into a state of hibernation, which reduces them, physiologically speaking, to the condition of cold-blooded animals. The vital activities of their bodies are reduced to a minimum, and yet they appear in the spring, lean and exhausted by this long fast. The bull seal, on the other hand, during his fast, is passing through the most active and violent period of his whole life, and were it not settled beyond question, these facts would scarcely be believed.

This long period away from their natural element is made possible only by the climatic conditions of their resting places. Dense fogs completely envelop the islands during the months when the seals are there, changing with violent winds and heavy rains. In a manuscript journal of a sealing voyage to Cape Horn in 1818, I find that there were only three pleasant days during three summer months. Rain with spits of snow, dense fogs, tremendous hurricanes, is the climate chosen by the fur seal for its breeding grounds, both in the north and in the south.

So completely are the northern seal islands veiled in fog that it took Pribylov eighteen years to find them. After the hunters had exhausted the sea otter on the shores of Kamtschatka, and the fur seal about the Aleutian Islands, this hardy son of one of Bering's crew set about the discovery of new haunts of the fur seal, knowing them to exist from the vast numbers which he had seen about the waters of this part of the world. He finally discovered them in 1786 by means of the seals themselves. Hearing the roar from the enormous rookeries through the fog, he was led to the islands which now bear his name, close to which he had often undoubtedly been. He endeavored to keep the discovery secret from the world, but he was followed and soon the rookeries were common property. Even to-day steam vessels provided with the most improved instruments for

SEAL FISHERIES, PRIBYLOV ISLANDS—BACHELORS ON THE BEACH—ST. PAUL IN THE BACKGROUND.

* The northern form is Callitaria (Callorhinus) ursina; the southern, Arctocephalus australis and other species.

navigation find it difficult to come in with these islands during the time of one of these heavy fogs.

At the arrival of the cows, about a month or six weeks after that of the bulls, the war of the males is at its height. Before this it was a struggle for the most favorable position, now it is for the largest family.

Soon after the arrival of the cows the "pups" are born. A view of the rookeries at this time is one of the greatest sights of the world. Thousands upon thousands of black bodies, in constant motion on the black volcanic shore, give the effect of the whole coast being alive. The ceaseless, hoarse barking of the seals fills the air with a continuous roar, while the sea beyond is alive with the dark, lithe forms of these graceful animals. On closer inspection a certain regularity will be observed on the rookeries at this time; at each station is a bull surrounded by a family of cows, one-third his size. These families are distinct, with an open space about them, which allows the passage of the cows to and from the water, for, unlike the bulls, the cows pass to the sea and feed there during the whole of their stay in the region.

When about six weeks old, the pups establish a rookery for themselves and commence the arduous task of learning how to swim. Although aquatic animals, living most of their life in the water, the young at this time are as helpless in the water as a child would be. Not like the duckling, which takes to the water by instinct, upon the breaking of its shell, the pup seal must learn slowly and laboriously this intricate art. From simply wetting themselves at first, to playing in the shallow water, they by degrees learn the movements and finally gain the strength to leave in the fall with their parents for the North Pacific Ocean. The antics during this part of their education are very amusing. Their plays, their duckings of one another, remind us of boys, and when one has hauled out" to rest, if he dozes for a moment upon a polished bowlder, we may almost hear the laugh of merriment of his companion as he shoves him off into the water and gains the comfortable place for himself.

The young males, from one year to six years of age, the so-called bachelors, which have been unable to land upon the breeding grounds, establish their rookery and then lead an idle, peaceful life of feeding and sleeping. They take to the water in common with the cows for food. By this arrangement the growing males and sleek females scour the waters for miles about their "hauling out" grounds, and, being voracious beasts, the fish or squid, if there be any near the islands, are soon eaten, and further and further to sea must they go in search of food.

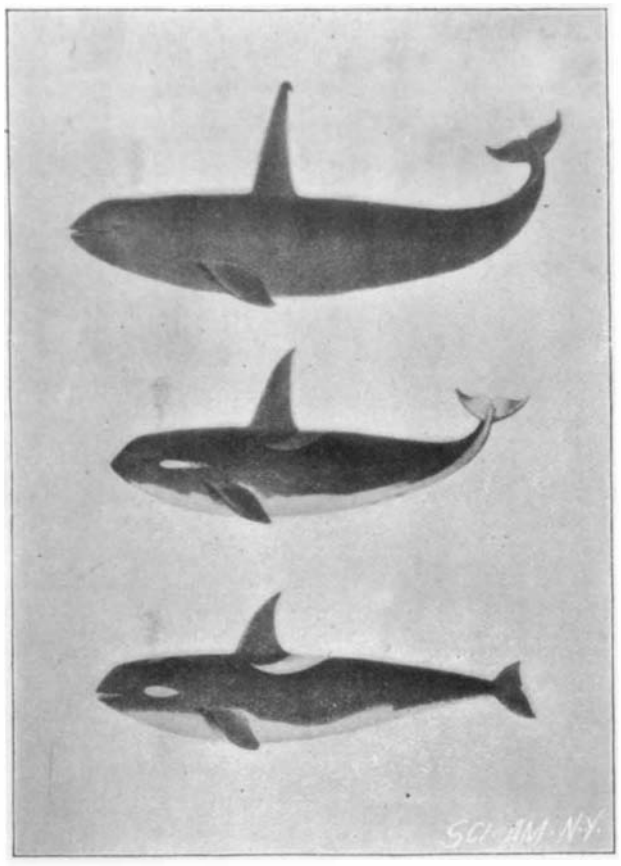
The "sixty mile" limit, within which no pelagic sealing is allowed, is soon too small for these active animals to obtain their food, and they are compelled to go beyond this narrow limit to feed, and there they fall an easy prey to the expert rifleman.

From the bachelor rookeries at the Pribylov and Commander Islands are drawn the seals which give the skins to commerce. No others are taken. When the killing season arrives, herds are cut off from the sea at the rookery, and are driven to the killing grounds. Any female which happens (but this is rare) to get into these herds is allowed to escape back to the shore. The herd is driven on, they arrive at the killing grounds near the village and are allowed to cool off, for skins would not retain their fur if the animal be killed when overheated. They are killed by a deft blow upon the head, then dexterously skinned; the skins are then salted, stored and are ready for shipment.

Such is the method pursued on the rookeries which are under government protection. When Elliot studied the seals on the Pribylov Islands, during the years 1872 to 1874, he estimated that from the four and a half million of seals frequenting the islands of St. Paul and St. George, one hundred thousand skins could be taken annually from the bachelor rookeries, without injury to the islands. He says: "Provided matters are as they are today (1872) one hundred thousand male seals under the age of five years and over may be safely taken every year from the Pribylov Islands, without the slightest injury to the regular birth rate or natural increase thereon; provided that the fur seals are not visited by any plague or pest, or any abnormal cause for their destruction which might be beyond the control of men; and to which, like any other great body of animal life, they must ever be subjected to the danger of."

To-day ten or fifteen thousand is the greatest number which can be taken from the bachelor rookeries, so greatly have the seals diminished in numbers. What has caused this falling off?—for we know that no epidemic has visited these islands.

To-day one of the most pitiful sights is a view of a pup rookery on the Pribylov Islands. The shore is dotted with pods of pups, fat, sleek and pugnacious; sleeping, scratching, at times fanning themselves with their large leathery flippers. But among these we see wandering some mere skeletons covered with harsh, unkempt skins, crying piteously, starving. Mothers giving rich food to their happy young; the starveling wailing for its mother who will never return, who has been shot at sea by the pelagic sealer. For a month or more the miserable, starving creature wails among its vigorous companions; weaker and weaker it becomes, the cry dies to a moan, and then it festers upon the black volcanic shore of the rookery.



THREE SPECIES OF THE ORCA OR KILLER WHALE.

Of course accidents will, in the course of nature, cause the death of the mothers, but these will not account for the thousands of dying pups upon the shores. The orca or killer whale and the shark are the only natural enemies of these animals, and these are rarely, if ever, found about the waters of the Pribylov Islands.

From the habits of the seal it will be seen that the only animals which fall into the hands of the pelagic sealers are the females and bachelors, and consequently every mother killed means the death of a pup upon the shore. In this sense, much more humane is indiscriminate sealing—wholesale slaughter—as it was carried on in the south, leading, it is true, to the extermination of the seal in the locality.

PUP ROOKERY GROUP OF STARVING PUPS.

In 1774 Captain Uriah Bunker, of Nantucket, first led the American whaling fleet across the equator into the South Seas. This led to the discovery of the enormous seal rookeries about Cape Horn, the Falklands, and the islands of the Antarctic continent. Many of these whalers took "elephant" and seal oil to make up their "voyages," as no extra apparatus was necessary. On the authority of A. H. Clark, the first vessel which sailed especially for fur seal was fitted out shortly after the close of the Revolution by a lady of Boston of the name of Haley. This vessel brought to New York 13,000 skins, which sold there for fifty cents apiece, as neither their value nor their nature was known. They were later sold in Calcutta for five dollars. Just one hundred years ago, the "Neptune" cleared $200,000 on fur skins taken in the Southern Ocean. These southern voyages were generally from a New England port. Getting their cargo near Cape Horn, they then sailed for China, where the skins were exchanged for teas and silks.

The value of the fur seal skin in the Orient was so great that many vessels fitted out for the lands of the Antarctic Ocean and to the southern coasts of South America. Seals were discovered in incredible numbers in this new region. For instance, it is estimated that over one million seals were taken on the coast of Chile, from the island of Masafuera alone, which is but twenty-five miles in circumference.

As the rookeries in one place were destroyed, new ones were discovered and soon swept of their valuable inhabitants. Many of these sealing voyages were almost as much voyages for discovery as for wealth. The rediscovery of Pitcairn's Island was made by Mahew Folger, of Nantucket, who was cruising in the South Pacific in search of new sealing grounds in the ship "Topaz," of Boston. His surprise at finding a colony here, and a colony founded by the supposed lost mutineers of the "Bounty," is well told in his log of this voyage, which is still in existence.

Between 1820 and 1821, 300,000 skins were taken from the South Shetlands, and in a few years nothing remained but a history of the millions of animals which yearly resorted to these islands.

Some of the vessels fitting for the South Seas had such inexperienced crews that the voyages were unsuccessful or the cargoes ruined. There is on record a vessel which took 100,000 fur seal skins to London in bulk. On arrival they were found to be utterly ruined and were dug out of the hold and sold as manure.

This form of sealing was at one time carried on at the Aleutian Islands, where 200,000 skins found their way yearly to the Chinese market. This led to the extermination of the seals on these islands, and when the Pribylov Islands were discovered, the rigid laws framed and carried out by the Russian government alone saved the fur seal from total destruction.

By 1830 the enormous rookeries of the Southern Ocean were practically destroyed.

When the sealers first visited the southern rookeries the seals were so tame that they played fearlessly about the men who were skinning those which they had killed. The seals, however, became acquainted with their destructive visitors and soon learned to escape to the water on the approach of a boat. Sentinels, it is stated, kept watch on high points of the rookeries and gave warning; when instantly the whole rookery was in motion, making for the water. The mothers, seizing their helpless young by the napes of their necks, dashed through the surf, coming frequently to the surface to allow the pups to breathe.

The killing of animals by aborigines is never of such a nature as to cause their extinction. The numbers of seals about the islands of Cape Horn and the adjacent continent, although used for food and clothing by the Patagonians, never decreased the number of seals any more than did the natives of the Aleutian Islands before their discovery by the Russians.

The tabooing of fish at certain times by the Polynesians shows the care with which the natives study nature and carefully protect their food supply.

Wholesale slaughter is the most effective method of extermination, while careful preservation will keep the seal at its full breeding capacity for an indefinite period.

When this protection is interfered with, in other words, when the capital is drawn upon, it is only a question of a few years when the animal will become extinct.

It may be taken as a general rule that the number of young born to an animal stands in definite relation to the dangers to which they are subjected while passing from birth to maturity. Thus small animals, as mice, rabbits, etc., which form the food of so many carnivorous birds and beasts, are more or less individually defenseless. The defense of the species, therefore, is the large number of young born to the parents. The murres and petrels lay but one egg, but they are so well protected by nature that they are the most numerous birds in the world. So it is with the seal. It is settled that never more than one young is born to any mother in one season, and before man appeared upon the scene their numbers were legion.

Ample evidence upon all these points is at hand. "Game laws" have existed and have been tried long

enough at the Pribylov Islands to show that they are thoroughly effective. As soon as the pelagic sealing became lucrative and was allowed, drawing as it did upon the principal of the estate, and thus infringing upon the preserve, the seals rapidly diminished in numbers, and at the present rate, if nothing is done to prevent it, will, without the slightest question of doubt, leave the Pribylov Islands as bare of seals as the lands about Cape Horn.

Tapping the Rock for Water.

Baron Nordenskjöld's system of boring for fresh water through the granite rocks of Sweden has now been in operation for two years. The Geographical Journal says that forty-four wells have been bored. This is not alone a question of finding water, but of the discovery of a new and important principle.

The difficulty in obtaining good drinking water at many of the pilot and light stations on the rocky islets off the Swedish coasts first induced Nordenskjöld to consider the subject. He believed from his researches in Spitzbergen that a horizontal crack would generally be found to exist in all solid rocks at an insignificant depth beneath the earth's surface. Consequently, in the Swedish rocks, he concluded that water would be found by boring to this crack. The only places where there was any prospect of such borings being undertaken were on out-of-the-way rocks and islets, where water was so much needed.

In order to solve the problem, Baron Nordenskjöld, as early as 1885, inquired respecting the saltness of water in wells or mines near the seacoast, and collected some important information. He was told that several wells, in sedimentary strata, near the seacoast, yielded water free from salt, although the springs are at a depth of 100 to 250 feet below sea level. The information he collected, though far from conclusive, appeared to point to the fact that water obtained by boring on rocky islands would not be salt or brackish, but fresh drinking water.

Nordenskjöld, therefore, proposed to the chief of the pilot stations that he should allow an attempt at boring to be made at some suitable station. The first boring took place in 1891, on the little island of Svangen, south of Kosterfjorden. It was abandoned after reaching a sufficient depth, because a long crack was reached extending from the sea to the boring hole. It was next taken up in May, 1894, by Baron Ruuth, the General Director for Pilots, who, regardless of the unsuccessful boring at Svangen, caused a second experiment to be tried at Arko. The site selected was a flat place near the pilot station, the rock being composed of hornblende, gneiss and diorite. The results were very satisfactory. As soon as a depth of about 100 feet was reached they came to excellent water, yielding 600 quarts an hour. At first the water was a little yellow, owing to the clay in the cracks of the rock, the stone dust and oil from the boring, but it soon became perfectly clear. Water has always been found at a depth of 90 to 125 feet, and similar borings have since been carried out successfully at forty-four different places. At first the water is mixed with the clay from the cracks, the stone dust and the oil from the machine, and it is some time before all the dirty water is pumped away; but soon it becomes as clear as crystal. At Stockholm it has a temperature of about 43° to 45° F.

The boring in hard, close rock would probably have the same results in other countries. Baron Nordenskjöld is convinced that wherever hard, close rock exists, with variations in temperature and not permeable, water will be found in the same way as in Sweden, and in the same quantity, that is, from 600 to 2,000 quarts an hour, with moderate pumping. Sites for such borings could be found, for example, on many parts of the north coast of Africa, in Abyssinia, in South Africa, in Spain, and other parts of the western Mediterranean, at the foot of Mount Sinai, in Greece and Asia Minor, and in the dry watersheds of the canyons of the Colorado. In the tropics, where there are dry seasons, such wells cannot supply water for extensive cultivation. But they will spring forth, free from all bacteria and impurities, and will suffice for household purposes, for small villages and for gardens. The practical importance of Baron Nordenskjöld's discovery entitles it to special attention.

DR. ARTHUR Y. BENNETT, of Erie Co., recently read a paper before the New York State Medical Association upon "Massage as an Occupation for the Blind," in which he called attention to the large and increasing number of blind persons, most of whom are dependent upon others for their support, and said that the estimated number in this country is 56,000, of which 4,398 are in this State. In order that many of these may become self-supporting, he advocates that they be taught massage in the State institutions, being trained in the anatomy and physiology of the body before they learn the practical work. He considers that the peculiar delicacy of touch which the blind possess makes them especially fit for this kind of work.

SPINNING AND BALANCING TRICKS.

BY W. B. CAULK.

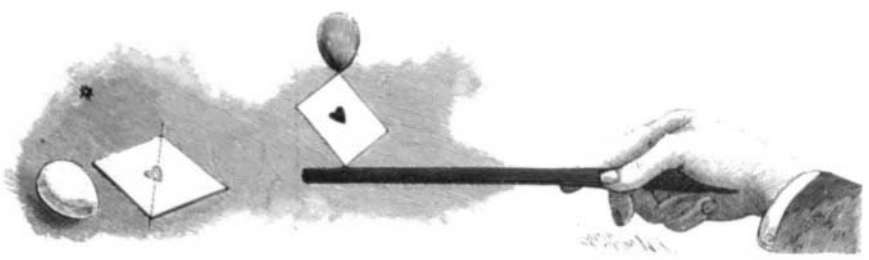
The spinning handkerchief is a great favorite with jugglers. A handkerchief is borrowed, thrown in the air and caught on the end of a whirling stick held by the juggler, when the handkerchief spreads out to its full size and commences to rapidly spin around. The secret is that in the end of the stick a needle is inserted about one-quarter of an inch, leaving the sharp end out. When the handkerchief is caught on the end of the whirling stick the needle point passes through it, thus preventing it falling off the stick, which is rapidly whirled around, and the handkerchief will spread out and spin about on the end of the stick.

Jugglers are very partial to tricks performed with eggs, and spinning an egg on its smaller end is a trick they are almost sure to perform. It is impossible to spin a raw egg; so our juggler uses a hard boiled one, and spins it on its small end in a shallow japanned tray. If the tray is kept gently moving in a small circle in the opposite direction to that in which the egg is spinning, the latter will continue to spin as long as desired.

THE SPINNING HANDKERCHIEF.

The egg spinning trick is usually followed by a balancing trick in which a playing card is balanced upon a small wand, and an egg is then balanced on a corner of the card. This trick usually calls forth a great pretension of skill on the part of the performer, when in reality no skill whatever is required.

The wand is of ebony, or some dark wood, and about three inches from one end is a small hole. The egg is made of wood, painted white, and with a small hole in one end. The card is composed of two cards glued together, with a fine steel wire between them, running diagonally from corner to corner of the card, with the ends of the wire projecting about a quarter of an inch. The prepared egg is on a plate with several ordinary eggs, and the card is placed on a pack of common cards. The wand is held in one hand, the card taken in the other and apparently balanced on one corner on the wand, but in reality the wire point is placed in the hole in the wand. Now the assistant passes the prepared egg to the juggler, who carefully balances it upon the corner of the card, that is, slips the hole in the end of the egg over the wire point projecting from the card.



BALANCING CARD AND EGG ON WAND.

A fitting finale to such a juggling act is that in which a potato is placed on the hand of the assistant and cut in two with a sharp sword, without leaving any mark upon the skin. As a general thing, a second potato is then cut upon the throat of the assistant. This apparently marvelous mastery of the sword always brings forth great applause.

Among the several medium sized sound potatoes on a tray are placed two potatoes prepared as follows: Insert a needle crosswise of the potato near the bottom. After showing the sword to be really sharp, by cutting paper and slicing one or two of the potatoes, the performer picks up one of the prepared potatoes and places it on the assistant's hand; but apparently it does not lie to suit him, so he slices off one side of it, using care to cut away the side just under the needle and as close to it as possible, then places the potato once again on the assistant's hand. After making a few flourishes with the sword, he cuts through the potato, dividing it in half.

In striking the potato with the sword he makes sure that the sword will come exactly crosswise on the needle; consequently, when the sword reaches the needle it can go no farther, and the brittle nature of the potato will cause it to fall apart, the very thin portion below the needle offering no resistance to the separation. The second potato is then cut in the same manner on the assistant's neck. There are many other false juggling tricks, but the above will suffice to show that "there are tricks in all trades but yours."

Street Washing in Oldenburg.

Undoubtedly one of the best methods of keeping streets clean is that of frequent flushing with water, says The Electrical Engineer, especially when the sewer outlets are so planned as to permit all the solid refuse to be washed out through them along with the water. In many cases, however, the supply of city water does not permit the liberal flow necessary for a thorough flushing, so that this luxury can be permitted only when an excess of water is on hand. The city of Oldenburg, near Lubeck, has provided an independent water supply for the especial purpose of keeping the streets washed, this being one of the numerous sanitary improvements which have resulted from the cholera epidemic of 1892 in the north seaports. In order to avoid the cost of new buildings, the pumping plant is placed in one of the electric stations where space was available, the water being taken direct from the river Hunte, the pumps being driven by belts from turbines. A system of high-service mains, altogether distinct from the regular water supply, is connected with this pumping plant, and a pressure of 65 feet head is maintained by an automatic regulator, permitting the excess of water to be returned to the river whenever the demand is reduced. This high-service pumping system supplies thirty-seven flushing hydrants, placed at such points of elevation as to permit the streets to be cleared by the slope. The hydrants are so arranged that their ordinary discharge is through openings in the curb at the gutter line, but they can also be immediately converted into fire plugs for hose attachment, either for street sprinkling or for fire engine supply. Since the river water at Oldenburg is unfit for household use, the plant above described is available only for the special purposes for which it was planned, but the expense of thus using a local supply of brackish water for purposes of street washing and fire service is so moderate that the method is worthy of consideration in other localities. The entire cost of the Oldenburg plant was less than $7,000—that is, less than $200 per hydrant—while the economy in street cleaning alone would soon repay this, after which the cost of operation would be much less than by any other method, not to mention the superior sanitary advantages.

Pneumatic Sleeping Cars.

Sleeping on air is the latest innovation in railway travel, says The Sanitarian. The use of compressed air for this purpose will, in the estimation of railway men, eventually revolutionize railway travel, and relegate the familiar and somewhat clumsy Wagner and Pullman sleeping cars to the background

At present the only car completely fitted with compressed air cushions and beds is the private car of Vice President J. N. Schoonmaker, of the Pittsburg and Lake Erie Railroad. These have been found, however, to be not only practicable, but to possess so many advantages over the accommodations of ordinary sleeping and parlor cars that a number of roads are having similarly fitted ones constructed, and before long they will be in general use on many of the great trunk lines of the country.

Colonel Schoonmaker's car in appearance does not differ externally from the ordinary private car of railroad officials. The interior by day is that of a handsomely fitted up parlor car. The customary chairs are seen on each side of the car, and they are covered with plush. When one sits in them, however, a marked difference is noticed from the ordinary car chair. This is explained by the fact that, instead of the usual upholstering, the chair cushions are filled with compressed air, which lessens, in a great degree, to the occupant, the jolting and jarring of the car when in motion. During the day no one would for a moment suppose that he was riding in a sleeping car, and it is not until the day coach is transformed into a sleeper that the possibilities of the use of compressed air in this direction are fully realized.

The transformation is effected in this wise: First, the air in the chair cushions is exhausted, the light framework folded up and slipped into an opening in the side of the car. Thus all the seats in the car are disposed of and it is ready for the beds.

The panels on each side of the windows open outward like a door. On the inside of these panels is a metal track, over which is drawn a steel, springlike arrangement which supports the bed. Fitting closely against the sides of the car and concealed during the day by the closed panels is a rubber bag, folded after the fashion of an accordion.