## IN AIR AND WATER.

Stories of Birds and Fishes as They Appear in the Elements to Which They are Native.

NEW GUINEA BOWER BUILDERS.

The Experiment of Stocking the Inland Lakes With Toothsome Beauties is a Failure.

MOTHER LOVE OF THE WOODCOCK

A Rock Bars Lives Four Hours & Close Prisoner in Big Pickerel's Stomach.

In an official publication referring to New Guinea, a catalogue of the birds discovered in that country is given. Amongst them is a very distinct kind of bower bird, obtained on Mount Knutsford at an elevation of 11,000 feet, and rivalling the Regent bird in beauty. Nothing in the history of this remarkable race of birds is of greater interest than the specific modifications developed in that strange instinct whence they derive their popular name. From its rudimentary indications in Scenopœus, which merely deposits and rearranges a few leaves and twigs on the bared ground, to the elaborate structure of Amblyornis inorndia continuous steps of progress in the art of bower-building are recognizable.

The bower of the species discovered in New Guinea departs widely from the ordinary plan of a more or less completely roofed gallery or tunnel through which the birds run to and fro. Around a young tree growing on the slope of a bank or ridge a circular mass of sticks intermingled with moss, and 45 luches in diameter, is built with perpendicular sides, to a height varying from 9 inches to 2 feet, the moss being used so copiously that externally it alone is visible. On the upper surface a circular channel, 9 inches in depth, is left between the tree and the outer edge of the pile. The outer edge of the channel is 9 inches in breadth; so also is its inner wall or the raised boss, from the center of which the tree protrudes.

All around the tree itself to a considerable height above the platform are fixed short sticks, interlaced at one end, protruding at the other, as though to form a protection against the approach of an enemy from above. The depressed channel of the upper surface is the playground of the bird, and in it several individuals of both sexes may be seen pursuing each other round and and round. The operation of building was air. watched in several cases, and in each instance all the materials were selected and conveyed by the males to the females, who alone are the architects.

A VERY FISHY YARN.-"Yes, I was a Express states three young ladies, resident at Sutton, were enjoying a sea bath, when the attention of some gentlemen was attracted by a series of piercing shricks irom the group. One of the ladies appeared to be struggling with a large jelly-fish, which the united efforts of the party could not shake off. Fortunately, however, a younger lady seized a stick which was on the shore, and, dashing into the water, attacked the creature with it, beating it off and killidg it. The elder lady was severely stung, and remains in a precarious condi-tion. The jelly-fish measured nine feet in

sny during the war, and if I do say it. I uncaptured," said a small, inoffensive, commonplace looking man in a Chicago botel to a Post reporter. "I was in the Rebel service and so was my brother. When Porter was shelling New Orleans I was with his fleet as a spy. And, thanks to a game my brother and I used to play before the war, I was able to send accounts from the fleet to my brother in New Orleans of everything that was going

Porter knew from the way in which he was frequently forestalled that there was a spy in the fleet, and he tried hard to catch him, but he never succeeded. And I kept right along until New Orleans surrendered, er was taken prisoner. "How did I send my accounts across?"

You see when Bob and I were boys-we were both under 20 when the war broke out -we used to train fishes to carry message: across the river. We took brook troutthey are the most intelligent-when they were young, tamed them, and by smearing a fly or piece of meat with asafetida could eatch them whenever we wanted to. Other kinds of flies smeared with a certain kind of oil we gave them, but that made them sick, and after a while they wouldn't touch anything but flies with the asafetida on.
"We taught them that by swimming

straight ahead in any direction we turned them, they would find a fine fly at the other end of the tub; then we tried them in a pond and then the river. They swam with the accuracy of a bullet, never deviating a hair's breadth, and in a thin little tube, fastened to the under part of the fish with two copper wire rings, we were able to send messages to

"You see one of us would fix a fish, set him in the river carefully pointed to the spot across the river where the other was, and let him go. Off he would swim like a flash. I would signal to my brother, and he would drop a line with flavored fly or meat on the end into the water, and in a few moments he would feel a bite, and up he would pull our finny messenger. My brother would cut the string in the fish's mouth, read the message, answer it, and put the fish back in the water and steer it for me. By that way we had lots or fun. You catch the idea? Well, when I was with Porter that's the way I did. He saw me fishing, as did his officers. But they saw nothing suspicious in that. Would

A DUCK IN A TREE .- A South Weymouth man has displayed in his store a very curious freak of nature. It is the section of the butt of a tree sawed off, say two inches thick, and which has the perfect profile of a duck. Many who have seen it were of the opinion that it was painted, and could not be made to believe otherwise until they closely examined it.

PLANTING FISH A FAILURE-"So far as stocking the inland lakes with fish is concerned, the hatching experiment in this State is a flat failure," says H. W. Welcher, ex-Superintendent of the hatcheries, in the Milwaukee Wisconsin. Mr. Welcher is a practical fish hatcher, having been connected with Seth Green's establishment years ago. He came to Wisconsin to hatch fish for W. K. Fairbank, at Lake Geneva, and was finally induced to take charge of the State hatcheries. He was

State Superintendent for five years. "After 15 years of experimenting," he ntinued, "and after putting millions of continued. fish in the lakes, not a single specimen can be caught, and not a single specimen ever has been caught. I stocked 640 lakes while I was connected with the hatcheries, and many more have been stocked at a great cost, but the fish have never matured. filled Third and Fourth Lakes at Madison with fish nine inches in length, and I have received hundreds of letters asking why they are not found. I think the young fish do not mature because there is a lack of proper food, and because the temerature of the water is not what it shold be. Brook trout have been a success, but they have been planted for the most part in pri-

ers will say that the German carp has been a success also. It has, but the carp is a very inferior fish. It does not flourish in the clear streams of the North, preferring the warm, sluggish rivers and bayous of the South. "But, granting that carp and trout are a success, the original intention has not been carried out. It was to stock the lakes with trout and whitefish, and thus furnish food for the millions. The lake trout and whitefor the millions. The lake trout and white-fish will not grow, and the brook trout is mostly out of the reach of the public, so we are getting for the thousands of dollars ex-pended a few of the inferior carp. The State has quite a capital invested and ap-propriates \$12,000 a year for defraying the expenses of the hatchery. The sporting clubs are getting almost the sole benefit of the outlay."

QUAIL HUNTING WITH POLES-"Did you ever hear of catching partridges with pole?" said a sun-browned business man to a New York Tribune reporter. "I nevet did myself until last summer. A party of us were up above Three Rivers. Canada, surveying a tract of wild land, and one day after a long tramp we came to the top of a mountain where we scared up a whole let of partridges. They were those little black Canadian fellows, you know smaller than ours-and were so tame that a man could almost catch them with his hands. No one of us had thought it worth while to bring along a gun from the camp. Our guide, a 'Canuck,' proved equal to the

emergency, however.
"Whistle and watch me catch him, said he to one of the party. He then went and cut a stout pole about 12 feet long, while the other continued to whistle. The birds cocked their heads first on one side and then on the other in a way to make us laugh, but they stood still and 'faced the sic,' while the guide stole up unnoticed and was thus enabled to kill three fine ones with his pole before the rest took to flight.

MAN ON THE WING .- The giant birds of geology, such as the dinornis, the extinct mon of New Zealand, some of which stood more than ten feet high, were most of them wingless, just as still the great ostrich is a running, not a flying bird. The albatrosses and the condors, giants among the winged fowl of the present day, are only relatively gigantic, says the Edinburgh Review, since the weights of their bodies are trifling compared with those of human beings, and their lofty flights, even if matched by the ascending powers of balloons, are unsuited to the respiratory faculties of man.

Helmholtz observed that, though many

small birds which are granivorous fly swiftly the great birds that are potent on the wing are fish and flesh eaters, not needing exten sive organs of digestion for their concen-trated food. He thinks it therefore probable that in the model of the great Alpine eagle nature has attained the utmost limit that can be attained, with muscles for the working organs and conditions of nourishment as favorable as possible for the size of a creature which is to raise itself by wings and maintain itself for any time high in the

that it is scarcely to be considered probable that man, with the most skillfully contrived mechanism, to be moved by his own muscular power, would ever be able to raise his own A VERY FISHY YAEN.—"Yes, I was a weight into the air and sustain it there for LADY AND JELLY-FISH—The Dublin any time worth speaking of. When vessels filled with gas lighter than air are em-ployed to supply the lifting power, and yet other vessels are employed with some stored force to take the place of our own muscular resources, the consequential increase of bulk and weight in the complex machine must indeed greatly discourage human aspirations and longings for the invention of artificial wings.

CONNECTICUT DUCK SHOOTING - A boat-builder named James Hurlbut looked out of his kitchen window across the Connecticut river the other morning and saw that a cove across the river was black with ducks. He got into his kip boots hurriedly and, gun in hand, went on the run. Enreckon I was the most successful that went | sconced in the bush there he didn't have to wait long for a shot, for a squad of the got up in a moment, and James gave them both barrels of big shot together. He brought down the whole line of ducks that first quit the water, and then had business enough gathering the spoils. He got seven or eight ducks with the double shot. John Phelps, E. Decker, and Joseph Lane, of Hartford, put in one day of good

sport at duck shooting. They bagged 20 black ducks, and all of them were tender and plump. The duck shooting in Connecticut this fall promises to be fine enough to suit anybody.

HOOKING A MUSKALLONGE-The doctor was filling his pipe and quoting Virgil in the same breath, when I felt a tug that electrified every nerve in my body and almost jerked me out of the boat, says a writer on muskallonge fishing in Outing. I can imagine nothing resembling it, unless it were within the possibilites of modern surgery to have an arm extracted in the same instantaneous fashion with which dentists jerk out a tooth. "Great Jehosaphat!" roared the doctor, as

he felt the boat thrill, "what was that?" That very instant a solash was heard be hind the boat, and looking back we saw a magnificent muskallonge, as long as a 10-year-old child, leap his full length above the water, and then turning in mid air, while every scale of his sinuous form glittered resplendently for a single glorious second, he made a fierce plunge and dove out of sight. Suddenly the strain on my line relaxed and for a moment I felt my heart crawling up my windpipe. My fish was of! But I was quickly recalled to consciousness by John's impatient "Wind up, quick! He's coming," and began to take in the slack in a style that made my

Just then I caught a glimpse of a dark shape coming up toward the boat. John quietly drew out a revolver and bent over the side. Nearer and nearer grew the shadowy mass; it reached the top.

"Crack!" and with a few convulsive shudders my big fish lay motionless upon the water, with a bullet hole through his head. My! but he was a monster! Forty-nice inches long, and registered full 40 pounds.

THE MOTHER LOVE .- The woodcoo makes a very shabby attempt at nest building; a slight depression in the fallen leaves of some shadowy wood or thicket serves as a receptacle for the eggs, generally two in number, says a writer in Outing. The young are at first queer-looking, tottering, nelpless things enough, but the mother bird takes rare good care of them. It surprised when the young are helpless she will simulate lameness fairly well in her efforts to draw off the attention of the intruder from her precious charges. At times, too, she will utter a hollow, bleating note totally unlike the cry of any other bird that I know. Surprise her and pretend to be misled by her seigned lameness for awhile and then conceal yourself, keeping a sharp watch on the spot where the young are crouched, and you may see a very touching illustration of bird love. She will return cautiously to her little family, and presently take wing again, fluttering heavily away to a more secluded nook, and if your eyes are keen you may see one of the young-sters held closely between her legs, for so she will surely bear them from the place where you discovered them.

THE PHEASANT .- The pheasant is an artificial production and not a bird of the wilderness, says a writer in Outing. He is an importation, not only into England, but into Europe. Whether he came into En-gland through their Roman conquerors, whose aviaries he adorned, or through France, where he has always been widely spread, is matter of little or no moment Suffice, as the Americans say, he got here all the same, as he would, it carried, get into and thrive in any country where the tem-perature is not too low and where there are silent woods with a thick undergrowth for shelter, for he is a ready colonizer.

vate streams, where they cannot be caught by the public. And the Fish Commissioners will say that the German carp has been suffice him; but if these fail he is quite ready-nay, more than ready-to take from the hands of man the fruits of artificial culthe hands of man the fruits of artificial cultivation—the barleycorn, the buckwheat, the fragrant pea, or even the ubiquitous potato. The difficulty with him as an adult is not to rear him in plenty, but to keep him at home, so that he may be there when he is wanted; for he is a very gregarious bird, especially fond of company, a bird of many wives (relic of his Eastern origin) and much given to wandering abroad to find them. Many are the shifts to which the keeper is put to repress this wandering instinct. wandering instinct.

FISHING WITHOUT BAIT .- Quite a novel mode of catching fish was invented by a youth in Michigan one day last week. He was bathing, when he perceived in the water, a little way beyond him, a fish of unusually large proportions swimming along within a very short distance of the bank, and rapidly approaching him. As he saw the magnificent specimen of the sturgeon species, the thought of securing it without the usual implements flashed across his mind, and he determined to make one effort to secure the "monarch of the lakes." As boy was standing, the latter prepared to dive, and before the sturgeon was quite opposite the youth gave a leap, a plunge and dived beneath the water. Ere the astonished sturgeon could either escape or recover from the consternation caused by the sudden disturbance of the waters he was a prisoner in the arms of the youth, who could with dif-ficulty retain his hold of the slippery cus-

The struggles of the now desperate sturgeon were pertinatious and nearly crowned with victory, though they became almost entirely ineffectual and were finally rendered completely so by the aid of a compan-ion of the boy, who ran to his assistance. Their united efforts soon completed the vic-tory over his sturgeonship and laid him panting on the bank, a triumph of muscle, After resting awhile from the fatigue cause by the combat under the water they carried the sturgeon home, where it was weighed, turning the scales at just 70 pounds.

A MONTANA TROUT CATCH .- Thomas Fletcher, the nimred of the Bitter Root mountains, returned from Frenchtown, near Missoula, last week with 1,437 brook trout, says the Butte City Miner. These, he says, were all caught in a very peculiar manner. The fish in the stream, he says, were playing suiter, and the first one, or leader, taking hold of the hook and being drawn up, the others, in one long string, caught each other's tails and hung on, while Tom walked out across the adjoining flat, drag-ging the long line of fish, until the stream had been entirely divested of its finny tribe. This story may sound a little fishy; but it is true, just as Tom told it.

VITALITY OF A BASS-At Hammondsport, N. Y., the other day, says the New York Sun, Frank Griswold carried home a fish he did not know he had caught. On his string was a two-pound pickerel he had caught at 2 o'clock in the afternoon. At 6 o'clock, while a crowd was admiring his string, he noticed that the pickerel's stom-ach was puffed out abnormally. Aftera few minutes' speculation as to what caused the swelling the pickerel was cut open. A rock bass about four inches long was found snugly enveloped in the big fish's stomach. The membrane that tightly bound the bas was cut away from it, and as John Freidill held it in his hand and the crowd wondered at the voracity of the pickerel in swallowing a fish like that the bass opened its mouth, gasped, and began to move its gill covers.

The sudden appearance of life in the bass after having passed at least four hours in the pickerel's stomach scared John Freidill, and, with a yell, he threw the bass on the ground. The con-cussion seemed to help the fish along toward resuscitation, for it moved its gills livelier than ever and flopped its tail. It was some time before the crowd recovered from its surprise sufficiently to remember that this if it were placed in the water, and it was thrown in the lake. It wasn't long before it lelt the influence of its natural element and began to move about on its side. Grad ually the bass came to itself, and at the end of a quarter of an hour it dove off into deep water and disappeared.

ROASTING THE QUAIL.-The royal game in France is quail or partridge. The new way to eat the latter is to make a stuffing of the liver, etc., perfectly and smoothly, mixed with fine butter and truffles, previously cooked in champagne. You then roast the birds, covering them securely with This is customary in roasting all kinds of game, in fact, and it concentrates the juice. When the partridge is about half cooked, you must take it off very carefully and gently raise the wings and legs with a sharp knife. Between these and the body of the bird introduce a paste, composed of bread crumbs, chopped onions, pepper, parsley and nutmeg.

STORIES OF PARROTS-We can easily believe that some parrots are as good as policemen. Not long ago two young men sold a parrot to the wife of a night watchman in New York, A few days afterward they visited the house, with dishonest intention, about 3:30 o'clock in the morning; but the bird shrieked out "Papa! papa!" until it woke its mistress and frightened the rob bers away. "Papa" was the watchman who was absent from the house on duty. A Chicago parrot also scared a burglar. He was trying to gain an entrance into the house by the dining room window, when he was startled by a voice that asked him to "come off the perch." Long silence ensued and the burglar began work again. Once more he was ordered in sepulchral tones to "come off the perch." This strange voice at dead of night bidding him cease his evil doing was more than the man could stand, and he hastily left the scene.

Cuvier, the great naturalist, was well looked after by his parrot. It kept watch at the study door, and asked every stranger, "What do you want with my master?" After receiving an answer his next piece of advice was, "Don't talk too much!

JACOBIN PIGEONS-Few pigeons can claim greater beauty than can the Jacobin, which is embraced among what are called the standard varieties. The name is derived from the fact that on the back part of the head or neck some of the feathers lie in the opposite direction to the rest on the body, and encompass the head like a monk's hood when he puts it back to uncover his head. This hood is one of the chief points in the Jacobin, and perfect specimens as to shape and size are very valuable. We have seen birds that could completely hide their heads in the hood, and for evenness of feather were really remarkable, though they owed

something to art as well as nature. Another property is the chain of frill, which is a continuation of the forward growing hood feathers down each side of the neck. The rose is the name given to the clean division of the feathers at the back of the head between the hood and the shoulders; and the mane are the feathers which fall below the hood at either side. The combination of all these points make the Jacobin one of the most artractive

pigeons extant.
There are several colors, all of which are The chief colors are red, yellow and black, in each of which the head and tail are white. There are also blue, silver and mottled Jacobins, but there are not of the same quality as those first named. Pure whites are often bred, and, when perfect in color and points, are very beautiful indeed.

Lovers Are Like Politicians. "Is this ink indelible?" "Yes, sir." "Are you sure?" "Yes, sir."
"Then I don't want it. Give me some

## AN ELECTRO-MAGNET.

A Very Familiar Application of the Mysterious Current.

HOW IT STORES UP ENERGY So a Great Amount Can be Utilized in an

Instant of Time. GAS - LIGHTING BY ELECTRICITY

(WRITTEN FOR THE DISPATCHAL Telephones, telegraphs: annunciators, electric bells and a host of other useful things depend for their action upon the fact that a piece of iron becomes magnetic when an electric current is passed through a coil of insulated wire surrounding it. Under those circumstances the iron is called an electro-magnet. If the core be a piece of steel it will retain its magnetism, even though the electric coils be removed-and it is then called a permanent magnet. If, however, the iron core is made of soft annealed iron, it will only be magnetic so long as there is current flowing through the coil,

An electro-magnet has two poles; a north and a south, just like a permanent magnet. Surrounding every magnet there are what are called, "lines of force." We cannot see these lines of force, nor can we touch them. We know of their existence by experiment only, and study them by their effects. If we cover a bar magnet with a piece of glass and then silt fine iron filings into the glass, the filings will arrange themselves in curved ines reaching from pole to pole.

DIRECTION BUT NOT MOVEMENT. These lines form closed circuits, and are supposed to have direction, but no motion or flow like a current. That is, the lines of force are supposed to have an outward direction from the North Pole and then curve, through the space surrounding the magnet, to the South Pole, and, returning again to the North Pole through the body of the magnet, thus close the "magnetic circuit." An electric current is also said to have a An electric current is also said to have a direction, and, although we use the expression "current," there is no actual flow that we know of. The expression is simply a matter of convenience and is used for lack

of something better.

Now, if we reverse the direction of the current in an electro-magnet, the poles of the magnet will be reversed, and so, of course, the direction of the lines of force. If, looking directly at the end of an electromagnet, the electric current has a direction from right to left around the iron core, that is, in an opposite direction from the hands of a clock, the near pole will be positive and the other negative. If, looking at the pole as before, the direction of the current is from left to right, that is, having the direction of the hands of a clock, the near pole will be the negative pole and the other the positive. In short, with an electro-magnet we can interchange the poles of the magnet by chang-ing the direction of the electric current, and we can remove its magnetism by removing or turning off the electric current. ELECTRICITY AND MAGNETISM.

Magnetism is a form of energy, and elec-tricity is a form of energy, and further the two are directly interchangable. In fact, the core of an electro-magnet will store electric energy much as a storage battery does. In a previous article we have explained how that energy is a condition of things. That is, it a weight is raised, it represents energy by virtue of its position. The condition of things here is the separation of two things—the earth and a weight -that have a strong attraction for each other. However, energy had to be expended in lifting the Weight, and the same energy will be returned by the falling of the weight. And so it is with electricity and elec-tro-magnets. If we send a current of elec-tricity through the coils of an electro-magnet, its iron core will be energised, that is, the condition or character of the iron will be so changed that it will have "lines of force." From the above we might reasonably expect that, if those lines of force should in any way be made to disappear, they would give back their energy to the wire coil. And this is in fact found to be the case, and can be proved in a great many

different and very interesting ways. How-TRANSFORMATION OF ENERGY. Take an ordinary electro-magnet, such as we have described, and over this other coil, having its ends connected to a galvanometer or other current-indicating instrument. If then the current flowing through the electro-magnet coil is suddenly opened, the iron core will lose its magnetic properties and surrender or transfer its energy to the second coil, that we have slipped over the magnet, and a momentary current of electricity will be induced in this coil, as will be seen by the current indicators or galvanometers, that was placed in the

In this case we have transformed electric energy into magnetic energy, and then this magnetic energy back into electricity again. However, this storage and transformation of energy differs from the storage of energy in a wound-up spring, for with the spring there is a catch to hold the spring in 1ts strained condition after it is wound up. But with the electro-magnet we have no catch, and the moment the magnetizing force-that is the current-is removed o stopped, the magnetism, that is the strained condition of the iron, ceases, the lines of force disappear. However, in ceasing, the magnetism, like the spring, will give up its ergy in some other form

PROOF BY SENSATION. Another very forcible way of demonstrating this storage of energy in the electro-magnet is to open the circuit of such a magnet with the hands, keeping hold of the bare ends of the wire. A very severe shock will be experienced, caused by what is called "the extra current" or "the discharge current." This extra current that is sud denly generated when the circuit of the electro-magnet is opened, is simply the energy of the magnet suddenly transformed and concentrated into a very intense current, having short duration. With powerful magnets this discharge current is very dan-

gerous, if not fatal.

In the industries the most powerful electro-magnets are found in dynamos, motors and converters and in those machines electro.magnets of smaller sizes are also used. The magnetizing power of an electro-magnet coil is measured by its ampere turns—that is the magnetizing power is proportional to the number of turns of wire, multiplied by the units (amperes) of current flowing. For example, eight amperes with two turns of wire would give just the same magnetizing power as four amperes with four turns, and in each case the magnetizing power would be called 16

ampere-turns. The smaller electro-magnets are found at every hand. It is by their means that we are able to communicate at a distance with the telegraph, telephone, annunciator and other such like instruments. In the electric gas-lighter we have a practical and interest-ing application of the smaller electromagnets, or "induction coils," as they are often called. Here a small electro-magnet is placed in an open circuit. The circuit is closed only at the instant of turning on the gas, and it is done in such a way that the two ends of the circuit are brought just over the burner. The current is furnished by a

small battery.

Now, when this contact is made and the circuit thus closed, the electro-magnet in the circuit is at once energized by the flow of current. The circuit then being immedi ately opened, the flow of current ceases. That means removal of the energising power suit. This extra current makes a much more intense spark at the joint when the cir-cuit is opened, which in this case is in the jet of gas, than the battery alone could have

possible to make a sufficiently intense spark to light a gas jet, at the same time using a much smaller battery force than would otherwise be necessary. The action of an electro magnet in this case is then very much like that of the fly-wheel of a steam

engine. If a heavy fly-wheel is set in rapid motion, it will absorb the power from the engine, that is the power of the steam will

have been transformed into that of a mov-ing mass—the rotating fly-wheel.

And if the steam power is shut off, the fly-wheel can be made to do the same amount of work that it took to set it in motion. It has thus stored some of the energy of the steam power, but this energy remains stored only so long as the fly-wheel is kept revolving by the engine, for if the steam is shut off, the fly-wheel will slowly come to rest and its energy will be

TRANSFORMED INTO HEAT, due to the friction of the journals and the air. The value of this temporary storage of energy lies in the fact that it can overcome any sudden load that might be thrown on the engine. In other words, it is capable of furnishing, for a moment of time, energy greater than that of the

driving engine.

And so it is with an electro-magnet. As long as the current is kept circulating through its coils, the magnet is kept energized, but the moment that this supply of current—that is, power—is cut off, the stored energy of the magnet is given up and an intense spark, due to the discharge at the int where the circuit is opened, is the result. And the extra intensity of this spark over and above what the dynamo or battery could have given alone is due to the stored energy in the electro-magnet or induction SCIRE FACIAS.

## THE ELECTRIC WORLD.

A Penny-in-the-Slot Device to Furnish Light for Reading in Public Places-Applications to Fire, Watchmen, Warfare and Census Returns - Training

I WRITTEN FOR THE DISPATCH. An important addition to the number of electric devices designed for communicating with more or less distant points in case of fire is a most handy arrangement of bell, thermostat and battery, which has the advantage of being portable, so that it can readily be moved from one apartment to the other. An ordinary dry battery furnishes the necessary current. Such a battery, besides requiring no attention and lasting a long time, obviates all danger of leakage or spilling of liquid; but any other form of battery will serve the purpose. When the temperature reaches a certain point a yibrating bell is sounded, and the alarm convibrating bell is sounded, and the alarm continues as long as the temperature remains high enough to keep the circuit closed. Such a device will be appreciated in cases where it is desirable to provide means for giving a local fire alarm in buildings which are not wired or connected to the engine stations of a city, as when a building is used temporarily for storage of like purposes, or in buildings outside of the fire department's limits. It will also be used in the manufacture of many articles involving the application of heat, as, for instance, in drying rooms, where a regular temperature must be maintained.

ELECTRICITY is now employed for keeping a record of the movements of the watchman in public buildings and hotels, and this it does with relentless certainty. The watchman can report himself by an arrangement connected report himself by an arrangement connected with a watchman's clock or otherwise, at any specified time, and thus his whereabouts at any particular hour of the night is made known at the office. An adaptation of this system is also made in hospitals for the purpose of preventing surreptitious snoozing on the part of nurses. Time indicators are placed in the wards, and once every hour the nurses are required to report to the doctor over the electric wire.

A SOMEWHAT remarkable installation has been made in France, which shows how a comparatively insignificant body of water can be utilized in the supplying of a whole community with electric light. This luxury fell last week for the first time to the experience of the little commune of Collias (gard) a village of 645 inhabitants, about 11 miles from Nismes. It seems there is a small stream with a fall of It seems there is a small stream with a fail of four feet, which produces an effective nine horse-power. This waterfail drives a small turbine, which runs a dynamo to supply 100 lamps of 10 or 16 candle-power. The streets are lighted by 25 lamps of 16 candle-power. The turbine runs till 11 o'clock at night, and during the day it is used to work force pumps, which supply the village with water.

An electrical company of Antwerp has dispatched by the last steamer which sailed for the Congo all the material necessary for the installation of the first telephone line be placed along the Congo railway.

THE public is already familiar with some forms of Lieutenant Bradley Fiske's range finders, but a new form of this valuable instrument has been brought out which gives the readings direct on a graduated dial. The principle involved is that of the Wheatstone bridge, and not the least notable point in connection with the adaptation is that the errors due to the variation of the conditions from actual the variation of the conditions from actual theory are compensated for by the very construction of the apparatus. The results of the application of the new range finder to the working of the dynamite gun are most remarkable, and the accuracy of firing secured by its aid is marvelous. The full equipment of generators which the introduction of the electric light on board ships introduction of the electric light on board ships has necessitated, has paved the way for the employment of a large number of electrical devices. This is especially noticeable on war vessels, where electric motors are used for ventilation, for the training of guns, for the hoisting of shot and for many other purposes, and recently a telephone service has been established on board the United States ship Baltimore so as to enable the commander to com-

municate from the conning tower with the various parts of the ship. THE penny-in-the slot system of electric light is now in use on some English rairroads. A reading lamp is fitted into each carraige, and for the sum of 1 penny a traveler obtains a soft, clean light, which lasts for a quarter of an

more, so as to enable the commander

Many of those who were interested in the manufacture and sale of gas in this country have been much exercised by the threatened supersession by the electric light of the older illuminant; but there is now every reason to believe that instead of injuring the gas industry, the introduction of electricity for illuminating purposes will stimulate it to an unlimited extent. Not only has the fact been established that the superior brilliance of electric light in streets and stores where it is used calls for more light in competitive situations, where gas alone is employed, but it has tions, where gas alone is employed, but it has been demonstrated that the use of gas in en-gines as a motive power to drive electric light machinery will produce from five to six times the light that could be obtained by burning the same amount of gas in the ordinary way through a burner. A new field has thus been opened up for gas companies to work, in which the electric light will be their ally instead of their competitor.

THE electrical industry now offers such inducements to the steady, hard and faithful worker that a large number of young men are entering its ranks, and the question is fre-quently asked: "How can I become an electrician?" In response to this query, an electrical journal lays stress on the advantages of a me-chanical training in conjunction with electrical studies. It recommends a firm superstructure of electrical knowledge upon a foundation of of electrical knowledge upon a foundation of mechanical ability as a combination most likely to insure success. To the young man who determines to enter the promising field of electrical engineering, it says: "First study the general principles involved in applied electricity and the theory on which they are founded. There are any number of elementary works on the subject which may be studied with profit. It is highly important that the student should be grounded in this general theory, for, though it may not give him an insight into any particular system, he will have obtained a firm grasp of the principles that will enable him to size up the details of any system that may present itself. Then put a few years of thorough mechanical training in the workshop, both at engine work and electrical machinery. These two requisites being an accomplished fact, intelligence, sound common sense, a modicioun of modesty, and plenty of hard work will do the rest."

THE English electrical papers, in comment ing on the great success achieved in Washington by the electrical census tabulating machine, which enabled the authorities to deal with the That means removal of the energising power in the magnet, and the magnet then surrenders its momentarily stored energy to the coil, and a sharp extra current is the result. This extra current makes a much more intense spark at the joint when the circuit is opened, which in this case is in the jet of gas, than the battery alone could have produced.

LIKE AN ENGINE PLY-WHEEL.

So that with a small induction coil it is large returns with such admirable expedit

EVERY DAY SCIENCE

Precious Stones and the Money That is Expended for Them.

ICEBERGS AS CRUISER TARGETS.

Lightening the Load to be Forwarded by

the Carrier Pigeon. TELEPHONES AT THE BIRCHALL TRIAL

(WRITTEN FOR THE DISPATCH.) What is a precious stone? The answer to this question is not easy, for the value of a particular kind of stone is often due in great

measure to the caprice of fashion or some adventitious circumstance of time or place, and some stones that are to-day of small value have, during certain periods in the past, almost displaced the diamond or ruby in public estimation. Beauty of color, hardness and rarity are the essential qualities which entitle a mineral to be called precious. Strictly speaking, the only precious stones are the diamond, ruby, sapphire and emerald, though the term is often extended to the opal, notwithstanding its lack of hardness, and to the pearl, which is no mineral, but a strictly animal product.

> precious stone when cut or polished for ornamental purposes. The epithet phenomenal is used in regard to stones which exhibit an unusual or singular play or color, such as opal, moonstone, sunstone and Labrador spar, or which change their color by artificial light, like alexandrite; or show a line or band or bands of light, as the line in the cat's eye, and the star in the sapphire and ruby asteria. Ten years ago \$100,000 was an unusual amount for even the wealthy to have invested in diamonds, whereas to day there are a number of families each owning diamonds to the value of \$500,000. Earrings worth from \$5,000 to \$8,000 a pair excite no wonder to-day; for-merly they were seldom seen. Of the French crown jewels sold in Paris a little over three years ago, more than one-third, aggregating over \$500,000 in value, came to the United States. The customs import lists show that import duty was paid on about \$120,000,000 worth of cut diamonds in the last 24 years, of which \$90,000,000 worth were imported during the last 12 years. In 1868 \$1,000,000 worth were imported, and about \$1,200,000 worth in 1867, but about \$11,000,000 in 1888, and the same amount in 1889, or ten times as many in the latter year as 20 years previous. These are evidences of the increase of wealth and the great popularity of the dia-mond among Americans. The foregoing figures represent the import prices exclu-sive of mounting of dealers' profits. A single firm now sells yearly more than the annual import of 1867. In addition to the growing demand for diamonds, public inter-est in semi-precious stones has increased greatly within the last ten years. Formerly ewelers sold only diamonds, rubies, sap phires, emeralds, pearls, garnets and agates,

Popularly, a gem is a precious or semi-

but now it is not unusual to have almost

any of the mineralogical gems, such as zir-con, tourmaline, spinel or titonite called for, not only by collectors, but by the pub-

lic, whose taste has advanced in the matter

of precious stones, as well as in the fine

Electricity and Insurance The Canadian Board of Fire Under writers are said to have under consideration the compelling of electric light construction companies to pay the cost of a special inspector to look after properties in which electricity is used as an illuminant. Their arguments in favor of this course are scarcely logical. They say that they con-sider electric lighting, when properly installed, to be the safest known mode of ar-tificial illumination, yet they are willing to permit to anyone the use of gas, coal oil or benzine without special inspection, or at any rate without insisting in such cases on the payment of inspection expenses. It appears that the total amount paid in the city of Toronto for losses by the insurance con panies on account of electric lighting during the past seven years has been \$10; \$2 of which was refunded with exceptional honesty by a client because his repairs cost him only \$8. During the same time losses caused by magnets, coal oil and gas hav eaggregated many thousands of dollars. The point at issue is one of not a little importance, and one which will have to be placed beyond the region of future uncertainty. In view of the fact, however, that in the New En pland States a reduction in insurance rates is made where electric light is used exclusively, it is regarded as probable that the Canadian board will reconsider its idea of raising the rates if the electric companie refuse to pay its inspector, and at least place the consumers of electric light on an equality with those who use other methods of illumination.

Manual Training for Women.

One of the most significant signs of the times is the progress being made in the manual training of woman. The public School of Art for women at Bloomsbury. England, holds a high rank in its instruc tion in art and mathematics, and is entirely in the hands of women professors. In South Kensington more pupils in proportion to their number carry off prizes in the yearly national competitions than in any other institution. In Belgium there is an Ecole Professional, numbering 770 pupils, and its object is to give women a thorough professional manual education simultan ously with theoretical teaching. In Holland similar schools exist, which admit to their classes young girls of every rank in society, and not only teach every sort of handiera suited to professional work, but also furnish excellent opportunities for liberal culture to those who do not need to make of art a means of support. In Denmark the professionally artistic education of women is of a yet more advanced character, and the Govrnment school of decorative art is attender by 120 women pupils, who are admirably trained to take up art in its various branches rofessionally.

Novel Use of the Telephone. One of the most novel uses to which the elephone has been turned is reported at Woodstock, Ont., during the progress of the trial of Birchall for murder. The courtroom is very small, and could hardly accommodate the court attendants, attorneys, reporters and witnesses, much less the eager rowds which the sensational character of the trial drew to the town. A smart public housekeeper, however, saw the chance of doing a good stroke of business, and he very effectively carried out his ideas. On the wall, over the Judge's head, he managed to have fixed a large telephone receiver, which he connected with 20 instruments at his place of business. Here the tubes were rented for a certain time at 25 cents a head, and four of the tubes were placed in a private room for ladies. It is needless to say that all day long, each day of the trial, the hotel tele-phone was in requisition, and every word that was said in the court was thus carried to the ears of the distant listeners.

Commerce of the Great Lakes A recent article in Bradstreet's gives some surprising statistics of the commerce of the great lakes. During 234 days of navigation last year, tonnage passed through the Detroit river to the amount of 10,000,000 tons more than the entries and clearances of all the seaports in the United States, and 3,000,000 tons more than the combined foreign and coastwise shipping of Liverpool and London. This does not include traffic netween Lakes Superior and Michigan or Lakes Erie and Ontario or local traffic between ports on these lakes. The growth of shipbuilding on the lakes has been very marked in the last few years. In 1886-87

000; and in 1889-90 there were 56 built, valued at \$7,866,000, the tendency being, as elsewhere toward iron and steel for large

Photography in War.

The recent organization of regular carrier

pigeon services for military purposes in

Europe recalls the wonderful ingenuity

and completeness with which the French

effected the transmission of dispatches during the siege of Paris. These birds, however strong they might be, could carry with them through the air only very light burdens. A thin sheet of paper two or three inches square, was all the load that could be in-trusted to these winged messengers. But how write orders, send dispatches, give precise instructions in such a minute letter? Microscopic photography came to the assistance of the besieged; it solved the difficulty as no other art could have done; it eproduced on a film of collodion weigh reproduced on a him of collection weigh-ing less than a grain, more than 3,000 dispatches, that is to say, the amount of 16 pages of folio printed matter. Several of these films, represent-ing a considerable number of dispatches, rere rolled and inclosed in a quill about the size of a toothpick. This light and novel letter box was attached to the tall of a pigeon. Each pigeon could carry 20 films in a quill, the whole not weighing more than 15 grains, and 30 or 40 copies of the miscroscopic dispatches were usually printed and sent by as many pigeons. More than 100,000 of them were thus sent to Paris during the siege. As soon as the small tube was received at the telegraph office it was opened with a knife, and the photograph films were carefully placed in a basin of water, in which were put a few drops of ammonia. In this liquid the dispatches unrolled themselves. They were then dried and placed between two plates of glass. It then only remained to lay them on the stage plate of a photo-electric microscope."

Fire-Escape Drills in Schools. The practicing of pupils in the fire drill, in order to prevent accidents from the alarm of fire, is now regarded as a most important part of school training. In the schools of Vienna, the fire-escape drill is executed in three different ways. In the case of a fire in the neighborhood (Signal No. 1) the pupils place their books in their satchels, put on their outer garments, and leave the class room in groups of four. If the danger is imminent (Signal No. 2) the books are left, the outer garments rapidly put on and the class room is vacated. In case of ex-treme peril (Signal No. 3) the books and clothing are left, and the exit is made immediately in groups. In the fire drill at Hamilton, Ont., arrangements are also made for each class to keep its own side of the stairway, and move on independently of other classes preceding or following. In this school 600 pupils have vacated their class room in less than two minutes. The fire drill is not only an effective safeguard against the danger of panies, but is also a good gymnastic exercise.

How to Get Rid of Icebergs

One of the greatest dangers to Atlantic navigation, and therefore of great practical interest to seamen, passengers and owners of ships, is the possibility of collisions with icebergs. This year these huge products of Arctic winters have been unusually common and it is stated that more than 20 have been been sighted in the course of 24 hours in the track of steamers plying from New York to Liverpool on the Ciyde. A correspondent in the London Times makes a suggestion that these icebergs might be used as targets by cruisers, and thus broken up and dispersed. The suggestion is well received in England, and it is urged that the British meteorological department follow the example of that of the United States, and mark charts the area within which icebergs are to be expected. The captain of a cruiser setting out with such charts in his possession would have a com-paratively easy task in finding where the target floated at which he was to fire.

Vocal Culture in America. Edmund J. Myer, in a recent paper, read at Detroit before the convention of the Music Teachers' National Association. draws attention to the rapidly improving standard of vocal training in this country. He says: "We have as good teachers in this country as can be found in the world. Yet we are suffering from that influence of the past which gave rise to the impression which has so long prevailed, that the best voices, in order to receive the most complete training, must go to Europe. Do the facts justify this prevalent impression? The tide must and will turn. There is no doubt that the day is rapidly approaching when those who desire the best possible vocal culture will seek for it and find it here in our own country."

Best Fodder for Cavalry Horses A series of experiments, made with riew of discovering the best fodder for French cavalry horses, has established the fact that straw and oats are, in season, preferable to hay. It appeared that when the ration of hav was reduced, and that of the straw and oats proportionately increased, the staying power of the borses was much improved; they sweated less and bore fatigue better. These experiments have excited much interest in military circles, and it is very generally recognized that there is imperative need for a complete and careful study of the question of cavalry forage.

Artificial Celluloid Eves. Dr. Meurer, a French physician, ha issued a warning to physicians against the use of artificial eyes made of celluloid. They are cheap and of good appearance and for the first three or four months ren der good service. After this, however, they undergo chemical changes and set up a high degree of irritation. Dr. Meurer ha repeatedly overcome the resultant inflammation by antiseptic treatment and by sus-pending the use of the artificial eye. So soon as the old eye was again used the in-flammation returned, but if a glass eye were used the parts remained normal.

New Use for Buttermilk. Dr. Stanley M. Ward states that he has

found fresh buttermilk very serviceable in relieving vomiting of various forms, even at times, the vomiting of pregnancy. The remedy is administered ice cold, in doses of about half a teaspoonful, repeated every

there were 31 boats built, valued at \$4,074,- 15 or 20 minutes. In the case of children with cholera infantum, he has often sue ceeded in quieting the stomach by interdicting everything else, and using a few drops of fresh ice cold buttermilk at intervals varying in length according to the severity of the case.

Metal Cellings.

One of the most excellent of recent innovations is the introduction of metal ceilings in place of wood and plaster These ceilings do not shrink or burn like wood; they will not stain, crack or fall off like plaster, but being permanent, durable, fireproof and ornamental, will eventually supersede both wood and plaster, besides being in the end far more economical than either.

A Novel Leech Jar.

A novel leech jar has been brought out in Germany, the innovation consisting of a vertical partition dividing the vessel into two equal compartments, to be filled respectively with pure water and with moist peat, so that the inhabitants may change their abode at pleasure.

MEN MUST EAT GRASS.

Ravenstein's Conclusion That the Earth Can't Produce Enough Food.

Soston Traveller.] By the way, I nearly forgot to mention the terrible deductions Mr. Ravenstein recently made at the meeting of the British Association. He says that 182 years hence and we will have to munch grass for our dinner! Gracious powers! we have not got over yet the scare that by and by we will all have to freeze to death from the exhaustion of coal, and here we are threatened scientifically to be left without food, owing to the limited capacity of the earth's produce and to our own unlimited capacity of increasing the popula-tion. In view of this we hope M. Juliens will desist from his contemplated tax on celibates.

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c, refined lady than this growth of facial hair. Nearly every lady with hair on her face knows at the use of depilatories, heated wax, the tweezers, scissors, or rasor all make the hair on her face knows at the use of depilatories, heated wax, the tweezers, scissors, or rasor all make the science of the hair on her face knows at the use of depilatories, heated wax, the tweezers, scissors, or rasor all make the science of the hair on her face knows at the use of depilatories, heated wax, the tweezers, scissors, or rasor all make the science of the hair on her face knows at the use of depilatories, heated wax, the tweezers, scissors, or rasor all make the science of the hair one search again.

re has operated for litteen years, has recated annual and a remarkable skill in the treatment of redness of the nose, which kundreds of both sexes are afflicted with. His treatment is original, scientific, painless and successful.

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