



LIGHTNING NOT ZIGZAG.

Popular Errors Corrected by the Photographic Lens.

Several traits of lightning have been discovered by photography that were not previously suspected. This is particularly true of the course taken by a thunderbolt. So ephemeral is the flash—it seldom lasts over a two hundredth part of a second, and some authorities say that occasionally it endures only a millionth—that the eye can distinguish beyond the general route traversed. The poetic and popular conception of the path of lightning is that it is a series of zigzags much sharper than those of a Virginia rail fence. Photography, however, that the track does not contain a single angle, but is sinuous, like a river. It is a curious fact that in 1856, before this fact was thus established, Mr. James Nasmyth declared to the British Association for the Advancement of Science that he had never observed the zigzag form of lightning, but that to his eye the flash always appeared as in a diagram which he offered, showing only curves, and with or without branches or forks.

It is now evident that he was an exceptionally keen observer. Photographs reveal not only the sinuosity of the track, but also the ramified character of many flashes. Sometimes the filaments diverging from the main line are as numerous and delicate as the rootlets of a tree or the small tributaries to a river. Whether these branches flow into or out of the principal stream it is not easy to say; yet electricity often discharges itself by a number of routes, the quantity of fluid taking each one being in proportion to the conductivity of the air or other substance through which the current at that point passes. These photographs of ramified lightning reveal much more intelligible than was formerly the case in some of the stories of thunderbolt freaks. Unquestionably, instead of an solitary current skipping to and fro around a room or among several buildings, as has been supposed was the case in several instances, the stream has divided into several, each taking a tolerably direct course to the earth.

Besides the sinuous and ramified types, photography shows the existence of a ribbon-like streak, flat, thin and very quiet, quite distinct from other forms. Then, too, there is the "meandering" variety, which wanders all over creation without any distinct aim. Still another record made by photography is called "dark" lightning, because the streak produced, when a print is made from the negative, is black and not white. Precisely how this effect is caused has not yet been satisfactorily explained. One suggestion is that it is due to over-exposure of the photographic plate. A similar result is obtained with the sun sometimes, where the very intensity of the light reverses the effect. It might also, it is thought, be produced by a previous flash occurring just before the plate was exposed, and leaving a line of nitrous oxide in the air along its route. A subsequent flash, slightly fainter, would illuminate the whole field, but fail to penetrate this streak. Absorption of the rays would occur somewhat as in the case of a gas in the spectrum.

An interesting photograph is reproduced in Knowledge, a British scientific periodical. It was taken with a lens attached to the vibrating clapper of a small electric bell which made nine strokes to the second. The picture gives three distinct traces, sinuous but parallel, and indicating that within a twentieth of a second three discharges occurred over precisely the same route. To the observer these probably seemed to be one flash, possibly with a little quivering. The eye can, however, sometimes detect three or four separate flashes like these in close succession and following the same path. Neither those which this photograph records nor those distinguished by keen observers, however, are to be confounded with the electric oceanic flashes which strike and earth which sometimes occur. These latter, says Prof. Elihu Thomson, are too rapid to be perceived—New Haven Palladium.

A Turkish Baptism.

I was once present at the baptism of a Turkish child and will endeavor to describe this ceremony, though it is one with which many people dispense, and which is neither legal nor religious. The child was only seven days old, this being the age when it is thought necessary to name him, and was lying on a bed covered with gold wire, which was tied to the bedstead with diamond pins. Some salt and a little water, brought by the nurse, the mother took up the child and placed it in the sieve, and giving one end of it to the nurse, she took the other and shook it slightly, while the nurse placed her mouth to the child's ear and called it loudly by the name given to it. The salt was then sprinkled over it, and after a slight prayer the sieve was shaken once more, and while the salt fell to the ground the child was ordered to obey his father and mother, after which it was taken out of the sieve and placed again in its bed, the father entering at the same moment and presenting the mother with a pair of diamond earrings and the nurse with an Indian shawl.—Nineteenth Century.

Retics of the Clan, Easting Mass.

Near Astoria, Ore., there is a deposit of clam shells which cover an area of over four acres and which is piled up in some places to a depth of more than ten feet. The number of shells in this heap is simply incalculable. Thousands of wagon loads of them have been hauled away to make roads with, but even that amount is hardly noticeable as far as the diminution of the heap is concerned. This immense shell heap is one of the few of the relics of the clam-eating tribes which it was taken out of the Pacific coast. Many of their rude tools have been found round about the place, which must have been the headquarters of thousands of those unknown people for centuries. The chief tool used by the clam-eaters seems to have been clam-openers made of whales' teeth. There is from sixteen inches to two feet of soil on these shell beds, and trees supposed to be five hundred years old are growing upon them.—St. Louis Republican.

He Had Claims—"Hold on!"

exclaimed the policeman at the gate. "You can't come in here unless you're a reporter!" "I'm next door to being a reporter!" hotly answered the man who was struggling to get in. "Reporter lives in flat adjoining mine!" But he was carried out, still kicking.—Chicago Tribune.

MINING IN WASHINGTON.

Great Mineral Interests in the Evergreen State.

Mining in Washington, though its promises are vast, is in its veriest infancy. The production of metals is insignificant. The first discovery of the precious metals was made by placer miners along the Columbia river, and this ground is still worked, by Chinese now, with trifling results. Recent discoveries have been, first, in the Colville district, Stevens county. It is a mountainous region, an extension of the rich Kootenay country of British Columbia. Silver and lead are found there, but not yet in such large or promising leads as those north of the boundary. Development-work is being done there, the ores are being sent out, and concentrators are building. In the Okanogan country, east of the Cascades and west of Stevens county, silver and gold without lead are found. It is smelting ore, and cheap transportation facilities are needed for the development of the mines. One railroad operator is ready to build from Marcus on the Columbia, north of Colville, along the Kettle river, to the Boundary creek mines of silver and gold, which show splendid prospects. The Colville Indian reservation hinders him from tapping the Okanogan country, and, as we have seen elsewhere there are similar conditions in other states, there is a strong movement to have the reservation reduced, and the upper part thrown open. The railroad could be built across it as it is, but there is no money in a railroad on reservation land where settlers may not come nor towns spring up. It is apparent that the reservations must be reduced in response to this pressure, because it is a vast tract, bigger than some large countries in the states, and yet it contains but a thousand red men, remnants of several tribes. The notorious Chief Joseph, who harried several of our generals, is there, and so is Chief Moses, whose people once inhabited the Okanogan country before it was "bought," and President Grant set aside the Colville reservation for them. An argument used to help to open this land is that the reservation leaves sixty miles of our frontier unprotected. The Spokane chamber of commerce is headed by all its energy to the redemption of this border land, and what that body sets out for it generally obtains. The Lake Chelan prospects, so-called, are of argentiferous galeas. At least seven hundred claims have been taken, and this summer's work will prove the value of the district, though all miners qualified to judge of it express confidence in its great richness. The Stehagen belt of hills, where the ore is found, runs northeast beyond the British border. In addition to the galeas, other ores are found, though not yet in sufficient quantities to excite the cupidities of the prospectors. But the belt contains more limestone and white marble than the world can use. It is proposed to build a railroad to Lake Chelan, whereon the ore can be boated seventy miles, and then carried by short rail to the Columbia, and thence to the Great Northern railroad at Wenatchee.—Julian Ralph, in Harper's Magazine.

GRAY EAGLE'S DEBUT.

The Turning Point in the Life of a Horse That Became Famous on the Turf.

Of the many bits of unpublished romance, the natural history and jettison of the receding tide of war about the national capital during the close of the long, dark days, there is the following, lately come to light—almost a companion piece, in an humble way, to the now famous biography of Black Beauty. It happened late in the summer of '63 that a played-out looking confederate cavalryman—no uncommon sight—ambled into the quiet precincts of Georgetown astride of a flea-bitten, switch-tailed skeleton of a horse, and, stopping in front of Isaac's livery, called out the dealer in horseflesh, and opened negotiations for the sale of his mount. The American Tattersall ran over the points of the wreck with a careful eye, and at the end of the examination was less surprised than would have been a less experienced judge when the soldier fixed his price at one hundred and fifty dollars. Of course the figures did not pass without dispute, but after some chaffing the difference was split as one hundred and thirty dollars, and the dismounted ranger pursuing his way on foot toward Dixie considerably better fixed than before in the matter of incidental expenses, and the horse dealer leading his new purchase within, where he was groomed, fed and watered by the old black stable boss as he had not been before in many a day. The mare and attention she kept up till she fell into the trap when the crisp north winds fired the leaves of all the forest outside and sent the blood coursing faster in the veins of all creation, while the frost worked down into the ground and toughened up the roadbeds for speed. Then the old gentleman, who was then not so old as he is now, one day called an acquaintance and brought out the confederate gray for inspection. The inter-rib spaces of the skeleton had filled out until they were no longer mere ribs, and the switch tail had lengthened to quite respectable proportions, while about the whole frame there was a general springiness that might be laid to good currying and United States oats. Driving leisurely to the edge of the town, where there was a good level stretch of dirt road in view, the driver laid the whip knowingly around the lines which the bad road had round his hand and let the strange horse go, and he went. Road and fences turned to a blur, and the boy whistled through the furs. After a good mile the driver pulled up gently, sprung out and ran his hands over the silvery sides that were scarcely heaving, and patted the velvety nostrils, saying with a chuckle: "I thought I wasn't mistaken." And then they went home. Time passed, and the fame of the gray spread, till finally his owner parted with him somewhat regretfully for fifteen hundred dollars. That was the flyer afterward known upon the turf as Gray Eagle.—Washington Post.

HOUSEHOLD BREVITIES.

—Cayenne pepper is highly recommended for driving away ants. It should be sprinkled around their haunts.

—Rolled Sandwiches.—Easy made and very dainty. Cut with a sharp knife very thin slices of bread, spread lightly with butter, and put up with narrow ribbons in pink, blue, and yellow, and cut the desired length.—N. Y. Observer.

—To make a "toast poultice" for weak or inflamed eyes, cut a slice of stale bread as thin as possible; toast both sides well, but do not burn or scorch; when the toast cools lay it in cold spring or ice water. Put between a piece of old linen, and apply, changing when it gets warm.

—Omelet.—Six eggs, one cup of milk, one tablespoon of butter, one tablespoon of flour; melt the butter in the milk; beat the yolks with the flour thoroughly; add the milk and butter, then the whites beaten to a stiff froth, and add a little salt. Cook in a spider on top of the stove and turn very carefully.—Boston Budget.

—When, as sometimes happens, one is forced to wear an uncomfortably tight shoe, it may be of value to know that folded cloth wet in hot water laid over the pinching point will often speedily afford relief. Change the cloth several times to keep up the heat which shortly stretches the shoe and shapes it to the foot.—N. Y. Times.

—Tomato Salad.—Peel some good-sized tomatoes (not too ripe), cut them in slices and remove the pipes; season to taste with salt and pepper, a few leaves of basil finely minced, and a few onions very finely sliced. Make a dressing of two tablespoons of oil to one of vinegar, and pour it over the tomatoes. They should stand in this for a couple of hours before serving.—Housekeeper.

—Salted Almonds.—Blanch almonds by pouring boiling water over them; then soak in enough sweet cream to cover well for fifteen minutes; place on granite ware baking tins in the oven until dry; sprinkle with salt and turn frequently until they are sufficiently brown. If necessary, add more salt after they come from the oven. Serve in small salt-bags or china boxes.—N. Y. Observer.

—Lead Almond Tarts.—Two pounds of flour, one pound of coarse powdered sugar, one pound of butter, twelve ounces of ground almonds, twenty egg-yolks, almond flavoring. Whisk the egg-yolks and sugar to a light frothy batter, melt the butter and whisk it in; add the ground almonds and flavoring, sift the flour and work it lightly in; spread the mixture on a baking tin previously buttered and covered with a sheet of paper; make a hole in the center an inch in diameter. Bake in a moderate oven; cover the top of the sheet of cake with hot-water icing, and thicken it with white sugar. Cut into pieces three inches long and one inch wide.—Good Housekeeping.

OUT-DOOR LIFE.

What It Has Done and is Doing For the City-Bred Children.

At first it was the boys who exhibited the good effects of the social revolution. Time was, and not very long ago, when the sturdy boys of the metropolis were found in the greatest numbers in the public schools and the districts inhabited by persons in middling circumstances. The boys in the well-to-do families were apt to be spare, narrow-chested, and of such appearance that the more rugged city children called them "corkers" or "nicknames," all implying that they were weaklings. Such puny lads are not now anything like being numerous enough to represent a class. The once derided "mother's apron-strings" have been woven into tennis nets, and the hands of the "girl-boys" now grip baseball and cricket bats. Three months of country life with "city improvements," and nine months of "cycling, boxing, sprinting and gymnastics," have given them muscle and lungs, until the juvenile crowd in town accept it as an axiom that a well-dressed lad is worth avoiding when persecution or mischief is intended. The girls, too, are obviously a better sort; not better than their mothers were, necessarily, for New York is forever freshened and strengthened by country-bred women, who draw in country-bred women for their wives. But the born city girls are distinctly finer women than their mothers, and the very best of the city girls are now as much as they would weigh if taken to Mars. For example, our standard silver dollar of 4 1/2 grains would weigh but 45.8 grains in Mars, and would doubtless be refused by the Martians if tendered in the payment of debts, public or private. It follows, however, from the lesser power of the force of gravitation in Mars that it is a paradise for fat men. The reason that the earthy person gets tired sooner than the small boy is not that the muscles of his legs are inferior, but that they have more to carry. The fat person here has as powerful muscles as he had when lean, but they have a greater weight to bear and they tire under it. In Mars it is different. There our stout person of 300 pounds would weigh but 28 1/2, legs and all, so that he could trip along with his present muscles as lightly as a kitten. Even the "fat lady" of the museum could easily do her twenty miles a day and not feel it. Agility, we may assume, with vivacity as its accompanying virtue, is a characteristic of the people of Mars. Doubtless the Martians, owing to the light burden on their legs, grow taller than we do, and are larger and more powerful every way. Weight restricts development. The strength of muscle and bone may be exceeded if an animal exceeds a certain size. In the sea the whale grows larger than any terrestrial creature, because the water bears him up. Like the bicyclist, he has his own propeller himself by moving his legs—that is to say, his fins. If man lived in the sea he might grow much larger than he does. In Mars he could, with the same strength of muscle and bone, grow nine times as large as he does here. A man fifty-four feet in height, with a corresponding development in other directions, would be a powerful animal. He would be capable of doing an incredible amount of work per day. Citizens of such proportions might very well undertake the colossal canals with which the surface of Mars is so strikingly marked. These canals signify the astonishing strength and energy of the Martians. They are supposed to point also to a pathetic necessity. Their planet, weak in gravity, is weakening now in all the natural forces. Its heat is rapidly departing. Its crust is cooling, and as it cools its strata, like those of our moon, absorb the water of its oceans. The astronomers of Mars foresee a coming time when all the water and atmosphere of their planet will disappear, being absorbed, as in the case of our moon, by the chilled material of its interior. They have dug their canals in large part, it is believed, to bring the water of their shrinking oceans to their fast lands. Originally undertaken, perhaps, as water-ways, these canals are supposed to be now vastly deepened channels for the transportation of the water required for irrigation and for

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drinking purposes. The extent and extreme width of the excavations staggers belief, but it will be remembered that Mars is much older than the earth, and that with the Martians it is now dig or die. So they dig, and they dig double lines. They parallel every waterway, possibly to avert the calamity of want of water over their vast continental areas in case one of the canals should get stopped up by a landslide. It has been doubted whether the canals of Mars are really double, but the astronomers of the Lick observatory say they observed them on the night of August 17 with their incomparable telescope, and testify that they are "distinctly double." They add that they are "perfectly straight lines passing through the continents from sea to sea." As a canal in Mars would have to be twenty miles wide to be visible with our best telescopes, it is evident that the Martians must have given much attention to engineering. There is no evidence that they have used steam or electricity for transportation or for industrial purposes. Being under the necessity of having a large water supply, it is possible that they have not found it to pay to use powers other than water power. Besides, a land much intersected by canals of vast width and depth could not well develop an extensive railway system. Without coal—there is no evidence that Mars had a carboniferous period—the manufacture of steam engines could make but little progress. As respects electricity, the thinness of the atmosphere of Mars would, it is believed, interfere materially with the efficiency of dynamos. The electricity could be dispersed somewhat, as it is in a vacuum tube, before it could do useful work. There could be little magnetism, it is plain, because the planet, being frozen at both ends and cold in the middle, gets few rays of the sun—the source of all energy in our system. It is improbable, in fact, that the Martians have ever given much attention to the subtler sciences. They have given their minds wholly to canals, and canal digging is not an elevating employment.—Baltimore Sun.

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drinking purposes. The extent and extreme width of the excavations staggers belief, but it will be remembered that Mars is much older than the earth, and that with the Martians it is now dig or die. So they dig, and they dig double lines. They parallel every waterway, possibly to avert the calamity of want of water over their vast continental areas in case one of the canals should get stopped up by a landslide. It has been doubted whether the canals of Mars are really double, but the astronomers of the Lick observatory say they observed them on the night of August 17 with their incomparable telescope, and testify that they are "distinctly double." They add that they are "perfectly straight lines passing through the continents from sea to sea." As a canal in Mars would have to be twenty miles wide to be visible with our best telescopes, it is evident that the Martians must have given much attention to engineering. There is no evidence that they have used steam or electricity for transportation or for industrial purposes. Being under the necessity of having a large water supply, it is possible that they have not found it to pay to use powers other than water power. Besides, a land much intersected by canals of vast width and depth could not well develop an extensive railway system. Without coal—there is no evidence that Mars had a carboniferous period—the manufacture of steam engines could make but little progress. As respects electricity, the thinness of the atmosphere of Mars would, it is believed, interfere materially with the efficiency of dynamos. The electricity could be dispersed somewhat, as it is in a vacuum tube, before it could do useful work. There could be little magnetism, it is plain, because the planet, being frozen at both ends and cold in the middle, gets few rays of the sun—the source of all energy in our system. It is improbable, in fact, that the Martians have ever given much attention to the subtler sciences. They have given their minds wholly to canals, and canal digging is not an elevating employment.—Baltimore Sun.

A Cherry Seed That Cost \$25,000. In a museum of curiosities at Salem, Mass., there is preserved a common cherry seed or stone, hollowed and fashioned like a basket. Within the basket are twelve tiny silver spoons, the shape and finish of which cannot be distinguished with the naked eye. Dr. Peter Oliver, who lived in England during the early part of the eighteenth century, tells of seeing a carved cherry seed which would be a wonder even in this age of fine tools and fine workmanship. The stone was one from a common cherry and upon it were carved the heads of 124 popes, kings, queens, emperors, saints, etc. Small as they must necessarily have been, it is announced with the authority of Prof. Oliver that with a good glass the heads of the popes and kings could readily be distinguished from those of the queens and emperors by their miter and crowns. The gentleman who brought this little wonder to

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England purchased it in Prussia, allowing the original owner \$5,000 for his treasure. Think of it, \$25,000 for a cherry seed!—Chicago Herald.

OF GENERAL INTEREST. —The \$250, \$5, \$10, \$20 and \$25 gold pieces made from 1849 to 1851 by private firms and assay offices in California, Colorado and Oregon, because they do not come up to the mint standard of purity, are mostly below par. —Why is the word "bald-headed" made to do so much service, when the shorter and simpler "bald" expresses the full idea and fills the bill completely? By the way, a bald woman is a rarity, a circumstance which must be attributed to the feminine habit of wearing hats that allow free access of air to the hair. If the masculine part of the race become ultimately bald, the stiff and poorly ventilated hats which they wear will be largely, if not principally, responsible for it. —Virgil and Horace are supposed to be represented by two medallions lately found in a small house in Pompeii. The St. James Gazette says that they resemble in almost every particular the miniatures of the twelfth century which are to be found at the head of the manuscripts of the works of the poets, and adds: "This goes to prove that the miniatures were made from similar originals. It is an interesting fact that the two poets should thus early have been placed on a similar pedestal of honor." —A document found among the duke of Rutland's papers at Belvoir castle throws a curious light upon the mode of getting private bills through the house of commons in the days of King Charles II. The case in hand was the divorce bill of John, Lord de Roos, an affair that caused a great deal of gossip in its day. One of his lordship's agents wrote in January, 1667: "On Wednesday last I got six-and-forty of the house of commons to the Dog Tavern, in the Palace yard at Westminster, when were present Mr. Attorney-General and Mr. George Montagu. As soon as they had dinner, we carried them all to the house of commons and they passed the bill, as the committee, without any amendments, and ordered it to be reported the next day."

—Hieron, of Syracuse, 478 B. C. invented a piece of money called drachm, with his picture on one side and a chariot driven by a man with four horses attached to it on the other, in the Bankers' Monthly. About this date came into existence the first bank of which we have any record, that was a bank established at Babylon, B. C. 516, which was in existence for one hundred years as shown by its records, and its name was Light's bank. This bank probably used coinage of this period which was in circulation, and we think that it had considerable Macedonian, Hebrew and coinage of its own country, Babylon, in its vaults. Some of the bills, receipts or notes due this bank are now in the British Museum at London. The notes were written on little round slip

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THE CIGARETTE EVIL. Its Worse Phase is the Habitual Inhalation of the Smoke. Considering what very poor things cigarettes are, it is surprising that they should have got such a hold on the community. But, bad as they are, they are extremely fascinating. The use of them, when carried to excess, becomes a habit that is most difficult to break, while they are so cheap and so convenient that it takes exceptional discretion to smoke them at all without smoking them to a deleterious extent. Of course it is primarily because they are so cheap that they appeal so generally to boys, but even with boys, who ought not to be allowed to smoke at all, it is not so much the tobacco in the cigarette that does the mischief as the pestilent and insinuating practice of inhaling the smoke. An ordinary boy of wholesome appetites won't smoke cigars or pipe tobacco enough to do him serious damage, even if he can get them. Not would the cigarettes he might smoke be so serious a menace to his welfare if he would only smoke them as he would smoke cigars. The trouble is that as soon as he gets used to cigarette-smoking he begins to inhale the smoke, and presently is fixed in a habit that plays the mischief with him. Whether anything besides tobacco goes into ordinary cigarettes is a much-discussed question. The effect they sometimes produce on the brain is so different from that due to tobacco in other forms as to favor the theory that many of them contain opium or valerian; but this the manufacturers deny, usually asserting that such drugs are too expensive to put into cheap cigarettes, even if it helped their marketable qualities. One thing besides the tobacco obviously goes into them, and that is the paper, the fumes of which are doubtless bad for the throat and lungs as far as they go.—Harper's Weekly.

—Mother—"My little girl goes to sleep so nicely every night when I sing to her. Don't that so, Mam