

HELIOGRAPH IN WAR.

MESSAGES SENT BY A SYSTEM OF SUN FLASHING.

Little Instrument of Ancient Invention Has Played an Important Part in the South African War—Used by General Miles in Indian Campaigns.

The heliograph, or heliograph, has played an important part in the South African war. While this little instrument is turned by means of a Morse key, and in answering the key a dot or a dash, in the way of a long or short flash, is sent out. These flashes are read by the person at the receiving end with the ease of a telegraph operator taking a message. The heliograph was invented in 1821 by Gauss, who used it as a signal in the measurement of angles. The longer the line the larger must be the disk. The longest line thus far observed is 102 miles, which was observed in California, and required a mirror of seven-seventy square inches in area. Ordinary heliographs used on lines less than fifty miles in length are only about two square inches in area. For the successful operation clear atmosphere is necessary. Two hours before sunset is the most favorable time. The military value of the heliographic method of transmitting information may be readily imagined. Its first advantage is its extreme simplicity. It does not necessitate the keeping open of lines of communication, there are no wires to protect, no batteries to look



U. S. ARMY HELIOGRAPH CORPS.

How a Duke Earned Sixpence. How the Duke of Norfolk, one of the richest of England's peers, earned his first sixpence is related by his friends with a great deal of gusto. A few years ago a large English party headed by the Duke went on a continental tour. The Duke busied himself very much on the journey in a kind-hearted way about the welfare of everyone in the party. At every station he used to get out and go round to see if he could do anything for anyone. One old lady, who did not know him when she arrived at last in Rome, tired and hot, found great difficulty in getting a porter. So she asked on the Duke. "Now, my good man," she said, "I've noticed you at all these stations looking about. Just make yourself for once in your life. Take my bag and find me a cab." The Duke mildly did as he was bid and was rewarded with a sixpence. "Thank you, madam," he said; "I shall prize this indeed! It is the first coin I have ever earned in my life."

USE OF THE HELIOGRAPH IN SOUTH AFRICA.



after and no burdensome apparatus to carry about.

The Indians of America, like the old warriors of the Scotch highlands, realized the importance of signal fires in war time and made use of a code of fire flashes; but it was not until 1822 that Colonel Colby of the British Royal Engineers devised a more adequate system for transmitting messages by sun flashes. His method of doing this was by nailing a certain number of pieces of bright tin on a pole and exposing them to the sun's rays. Some time later this was improved on by the adoption of a plain mirror. In 1833 an English officer at Gibraltar used an ordinary looking glass to reflect flashes across the strait to Tangier, thereby carrying on a long distance conversation with other English officers in Africa.

This mirror system was experimented with and improved upon until the year 1878, when the United States government purchased the latest models and began the construction of a signal corps in heliography. The military value of such sun writing was well known when, in 1886, General Miles began his Indian campaign against Geronimo. If the truth were only known, it was the heliograph more than anything else that led to the capture and capture of the famous, blood-drinking red man. One can imagine the surprise of the Indians when they found that they could not move without the fact being known to the Americans and the movement mysteriously anticipated. Signal parties, in fact, were flashing hourly information from mountain peak to mountain peak, and the Indian warrior's headquarters were always known at Miles' camp. Through the use of the heliograph Geronimo was kept away from water by rapidly stationed and mobile bands of troops and was finally paroled into submission.

The English army had already been making use of the heliograph in Afghanistan, and during the Boer war of twenty years made effective use of the Morse heliographic apparatus. The great service this means of communication has been to the different British commanders besieged by the Boers in the present South African war is very well known.

The field heliograph apparatus, as used to-day, consists of a sole leather pouch containing a sun mirror and a station mirror, a small screen or shutter, a sighting rod and two small tripod stands for the mirrors. The entire apparatus does not weigh over ten pounds and can easily be carried over the arm. When the air is clear, signals may be easily taken by the naked eye at a distance of 100 miles, and by an expert at the rate of fifteen words a minute.

HIS IDEAL WOMAN.

Not So Much of an Angel as a Sympathetic, All-Forgiving Human. "Man has a number of fixed, old-fashioned notions about the ideal woman which are quite apart from questions of complexion and dress," writes Carrie E. Garrett in the Woman's Home Companion. "The sober truth is that while men may seek diversion with the more showy, flirtatious type of girl, and are often captivated by mere glitter, they have an ideal far, far above this cheap type which is imperishable. A man does not picture a completely limp and characterless creature as his ideal, however sweet. Yet the woman as he appears in his dreams is not too clever. It is a pleasure to him to be a little superior to his mate—to be looked up to—and as the true woman desires to

GREAT DREAM OF THE FRENCH NATION.

look up. It is clear that Nature's arrangement in these matters are not without design. The most charming woman of all is she who has the consummate wit to seem to 'look up' when really she stands on a level with the man who loves her, or perchance a little above him. "One thing imperatively demanded in the make-up of the ideal woman is sympathy—that all-divining, all-forgiving quality which makes the whole world akin. Sympathy is one of the prime factors of charm. So is humor. A man is fearfully lonesome when his wife cannot see his jokes. She could hardly offer him a more deadly affront than to laugh in the wrong place at one of his pet stories. The ideal woman is religious—has the wise, sweet, old-fashioned notions about right and wrong. A man is quite capable of making merry over his wife's scruples of conscience, but I think he would be rather disappointed if she had no scruples—if in his worldly way she was guided chiefly by expedience. He may say many prayers himself, but he likes to know that his children pray at their mother's knee. Perhaps he sometimes reflects that the nightly petition from innocent lips, 'God bless father,' may not be quite empty of meaning."

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Useful Caterpillars. It is now said that the cocoon of the tent caterpillar can be carded, if not reeled. The tent caterpillar is the great pest of the apple tree, and it may be that the apple tree will take the place of the mulberry tree as food for the silk worms. It is estimated that an average tree will support ten or twelve tents of caterpillars, yielding 3,000 makers of silk, and representing a

yield of three pounds of silk, worth \$1 per pound. It is further said that with proper appliances attached to the trunks of the trees for the worms to spin their cocoons in, not much time would be expended in gathering the product, which would equal the apple proceeds of a tree at 75 cents a barrel. Hook, who has written on the subject, says to produce a finer grade of silk, and in the end the result would be that the silk would be more profitable than the apple.

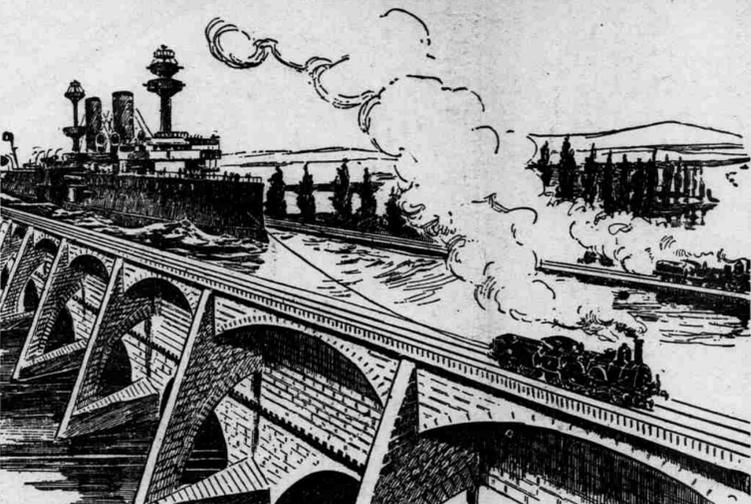
How Far Noises Travel. When the alkali works at St. Helens, England, were blown up by the explosion of eighty tons of chlorate of potash, the noise was heard at Marple, twenty-eight miles away. At the battle of Corunna 1,500 barrels of gunpowder blew up, causing the ground to rock for miles. The blast at Her Gate, New York, 130 tons of dynamite was exploded 183 miles away by the vibrations of mercury. The shock of the dynamite explosion, fifty tons, at Johannesburg was felt at Pretoria, thirty-three miles distant. The naval magazine of Lagouban, Toulon, was heard at Nice, eighty-four miles distant, and even at Ventimiglia, in Italy, 100 miles distant. The country for a radius of nearly two miles was blown bare, houses knocked to pieces and trees uprooted or bent into fantastic shapes.

Paid Duty on a Mouse. Uncle Sam is a stern stickler for form and the amount of red tape employed in the custom house is really remarkable. It was demonstrated the other day that not even a tiny mouse can creep into our domains from foreign shores without paying duty. A gentleman returning from Europe brought with him a Philadelphia pet white mouse, of which he had grown very fond. His "mouselets" was assessed at 20 percent, which so enraged the owner that he vigorously protested. This case was appealed, and the board of classification of revenues, after mature deliberation, solemnly conclude, handed down a decision in which the protest was overruled.

Queen Victoria's Three Crowns. Queen Victoria has three crowns, none of which is used except on extraordinary occasions. The crown which she wore in the last grand reception weighs eight ounces. It is of pure gold and set with 2,673 diamonds and with 523 rubies. The other two crowns are simple bands of gold, each set with gorgeous jewels. It is one of these latter crowns which was worn at the coronation of Queen Victoria. When she appears in the House of Lords the large crown is taken from its place among the crown jewels in the tower of London and borne on a velvet cushion ahead of the Queen.

Domination of Latin Races. One leading result of the struggle for supremacy among the Western nations has been the gradual ascendancy of the Anglian, Teutonic and Scandinavian over the Latin races. Dublin an Unhealthy City. Dublin has the unappreciated prominence of being at present the most unhealthy city in the United Kingdom. Our idea of bravery and unexemplated heroism is for a poor preacher to differ in opinion with the most generous contributor of his flock. A bachelor says that marriage and the colic both double people up, but, fortunately, the colic is only temporary.

WARSHIPS WILL BE WHIRLED THROUGH FRANCE WHEN THE GAUL'S LAST DREAM IS FULFILLED.



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TO CONNECT the Atlantic with the Mediterranean by a ship canal capable of floating a modern man-of-war is the dream of the French nation. It is proposed to take advantage of the present waterways in the interior of France, and by deepening and supplementing them by others, fit them to the purpose.

Contrary to what would seem the natural Atlantic terminus, says a correspondent of the New York Press, it is proposed to neglect Bordeaux in favor of what will be practically a new port, Arcachon, with its great natural basin, lends itself ideally to the kind of fortification that would be demanded by a canal. There will be one at the top of the necessary canal and security to a war fleet, will remain the great commercial port.

Another advantage of the canal as planned by the effervescent Gaull will be to furnish work for years to the French workmen, to the calming of the laboring mind and the security of the republic, the calculations being for a permanent force of 30,000 laborers. At the beginning it was seen that ordinary locks would not serve; with them the passage would require at least six days. One way of diminishing this number—it is estimated that 200 would be necessary—would be the old-fashioned plan of keeping the canal to the low altitude of the plains and then, arriving at the Col de Narrouze, to pass through it in a giant cut. It would be a cut 500 feet deep. To avoid the necessity of this

almost impossible engineering feat, they have imagined a prodigious novelty, the ship elevator and the moving lock. The ship elevator is a great metallic reservoir that moves up and down hill on a great number of railway tracks, operated much after the manner of a funicular. There will be one at the top of the slope, another at the bottom. Each will receive a ship. The weight of the lighter will be balanced by the addition of water. Then, the equilibrium being attained, a comparatively moderate force will be sufficient to disturb it. Up will

go one reservoir, and down the other. Nothing could be simpler. When ordinary locks are to be used the same principle of metallic basins balancing each other, side by side, is to be exploited, for the sake of expedition. They are to be such locks as the water never sees. Once through them and into the Ande river, it will be plain towing straight to Narbonne, which is almost on the Mediterranean. Here is another naturally protected port, like Arcachon, a great basin, impenetrable by a hostile fleet.

M. Mendel continues these injections daily for a month at least. The daily dose is ten cubic centimeters. He has tried the treatment on fifty patients, of whom forty-five were tuberculous and the rest non-tuberculous (bronchitis, asthma and pulmonary congestion), and obtained numerous as well as lasting successes in the form of the cessation of coughing and expectoration, the return of appetite, sleep and strength, and an increase in weight. What is especially curious and upsets

is established an inhalation of an exceptional intensity, because the center of inhalation, instead of being outside, is in the midst of the respiratory organs. At the end of a few hours the medication injected is absorbed, enters the blood, and leaves the system by the lungs, influencing them for the second time. M. Mendel continues these injections daily for a month at least. The daily dose is ten cubic centimeters. He has tried the treatment on fifty patients, of whom forty-five were tuberculous and the rest non-tuberculous (bronchitis, asthma and pulmonary congestion), and obtained numerous as well as lasting successes in the form of the cessation of coughing and expectoration, the return of appetite, sleep and strength, and an increase in weight. What is especially curious and upsets

Science and Invention

A cobra that measured somewhat over seven and one-half feet, taken at Jaffa, Ceylon, is stated to be by far the largest ever recorded. A French naturalist asserts that if the world should become birdless, man would not inhabit it after nine years' time, in spite of all the sprays and poisons that could be manufactured for the destruction of insects. The bugs and slugs would simply eat up all the orchards and crops in that time. Eryonotes are the opera or small leuculent footdoer of a small marine shell, family Turbellidae. They are a calcareous body. The removal of foreign substances was performed by picking one in the inner corner of the eye and allowing it to live across the eyeball, under the lid, bringing the foreign substance with it.

In France a system, invented by Monsieur Dubois, is used to preserve telegraph poles from rotting. The bottom of the pole up to, and a little above, the surface of the ground is incased in an earthenware pipe. The space between the pipe and the pole is filled with a mixture of sand and resin, which, on solidifying, becomes waterproof. Prof. Spring reports on his experiments of many years to explain the color of the water. He has come to the conclusion that a pure blue is the natural color of water, for when he took through a long tube filled with distilled water against a brilliant white surface, a pure blue is seen, such as shown by the Lake of Geneva in quiet weather, a color which is not influenced by superficial or interior reflection.

A writer in the Contemporary Review urges the need of a new class of educated physicians whose business shall be the cure and cure of diseases threatened and disseminated plants. "The time will come," he says, "when every agricultural district will have its plant doctor." He even foresees the development of specialties by plant doctors just as by other physicians, so that in many difficult and obscure cases of disease affecting valuable plants, the services of such specialists will be employed. The foundation of schools of practical plant pathology is urged as a matter of national importance.

It has been noticed that many plants, not natives of the locality, are to be found growing in the neighborhood of great railroad yards. Sometimes the seeds of these plants have been brought thousands of miles from their natural habitat. Often they flourish amid their new surroundings, and gradually spread over the surrounding country. Thus the railroads carry unsuspected emigrants, which travel to and from every point of the compass. In the Mississippi Valley are to be found plants which, within a few years past, have been thus brought thither, some from the Atlantic seaboard, some from the Gulf region, and some from the other side of the Rocky Mountains.

Payta, in Peru, about five degrees south of the equator, has the reputation, according to Prof. D. G. Fairchild, of being the driest spot on the globe. On the average, a shower of rain occurs at Payta only once in two years. But the interval between showers is often much longer. In February last, when Prof. Fairchild visited the place, the first rain fallen in eight years had just wetted the thirsty soil, having lasted for 10 p. m. until the following noon. Yet in that arid climate seven species of annual plants manage to exist, and the natives earn a livelihood by growing a species of cotton which requires little moisture in the bed of a dried-up river. This cotton is readily marketed. The coast at Payta has risen forty feet within historic times.

THE WOMEN OF SPAIN. Interesting Statistics as to Their Social and Intellectual Condition. A great deal has been written about Spanish men, but I think one may find a truer key to Spanish character by taking a glimpse of the misery of the Spanish women. I doubt if the Spanish woman is any better off than the Turkish woman, and while American women are not clamoring for a conflict, the fact remains that Spain is a land of woe from the European geography might give a great step in advance for the women of that land.

It appears from an official document which came my way the other day that but 2,686,615 Spanish women can read or write. This fraction was taken as a whole by the male army that knows its own language. It is a pitiful showing, but it is only the beginning of the table of female wretchedness. The municipalities list 51,946 professional beggars who wear petticoats. There are 828,331 women who earn their living by working in the farm fields. There are 319,506 women rated as day servants, who get but little more than board and shelter for their work, and in all the dying dynasty there are but 719,000 girls in the schools of any kind, public or private. There are twice as many female mendicants as male. The census shows that 6,764,406 women have neither professions nor trades, and are altogether dependent upon charity, the possibility of getting married or hard labor at starvation wages.

The same lamentable condition of the Spanish woman is shown by a glance at another side of her life. The kingdom has but seventy-four women classed as literary writers. There are but seventy-eight women of letters in the mother country and all the provinces. The women school teachers number only 14,490, as compared with 24,612 men, but this does not include the nuns, who are classed by themselves, and number 28,549. Spanish women make the fortunate live in the most magnificent homes and seem never to bother their heads about the poorer sisters at their doors. The favorite resort for the grande señoras is San Sebastian, and the lives the careless Spanish women of fashion lead there during the summer is said to be a scandal over all Europe. There is scarcely a pretense at propriety or even ordinary conventionalities. As in France, a majority of the young girls of the best families are educated in the convents. Their greatest accomplishment is embroidery, and they sit and knit and sit at their knitting until some man from an ancient and bankrupt house or a bull-racing plantation comes along and marries them. Club life is unknown. Marriages are celebrated very early in life, and but few people who get weary of these early alliances ever go to the trouble and formality of getting a divorce. The unhappy couples simply divide up the household things and live the balance of their lives the best way they can.

Spanish women, so I have found, have very little outdoor amusement. The bicycle is just beginning to be admitted, but under protest. The young women love their queen next to pretty frocks and glittering fans and bright ribbons. They sock to the cruel shows in the bull rings and laugh and cheer at the horrible spectacles. They show no sympathy that an American girl bestows upon the average tennis player or the golfer underdogs when he performs in a broiling sun to amuse her.—Chicago Times Herald.

NEW CRIMES.

Tapping a Telegraph Wire or Stealing a Lamp. The theft of a lamp is larceny; it may be a Roman lamp or a Greek lamp, an oil lamp or an electric lamp, says the Forum. Whether it constitutes grand larceny or petit larceny will in certain States of the Union depend, not upon its age or newness, but upon its market value. On the other hand, there are a great number of modern crimes committed which could not have been committed in ancient days because the instruments for their perpetration did not exist. They are the outcome of modern civilization and they require new legislation.

The tapping of a telegraph wire is a modern form of highway robbery. In the old days the method was to waylay the courier on the road and to rob him of his purse or of his message. The formula of the modern highway man is not "Stand and deliver," but simply "Deliver," and he may get a message from the calculating courier which may be worth more to him than a well-filled purse. But there is nothing to be gained by indiscriminate tapping. It is some special message or information that the thief is looking for, possibly for its effect on the stock market, or on other business ventures; but by the use of the cipher code tapping of telegraph wires is of little avail even in time of war, unless the code as well as the message has been stolen. For tapping of power or light lines the modern highwayman comes in out of the rain. He can do his business better by attacking the electric meter, cutting the cable, and thus getting more current than he pays for. Such at least seems to be the implication of recent statutes.

Decorates His Burial Lot. Probably the strangest hobby in the world is that of Henry Woodruff, of Mayfield, Ky., who devotes all his money and time to developing his plot in the local cemetery in a way which is as grotesque as it is, happily, original. His first modest and laudable effort was to erect a plain monument to mark the family resting-place. Not satisfied with this, however, he added to it a white marble shaft, bearing on its face a relief presentation of himself on horseback.

Having thus struck the personal note, "Uncle Henry," as he is familiarly called, had a life-sized statue of himself erected at a cost of \$200. He then introduced statues of his mother and eldest brother, to be followed shortly by similar statues in Indiana limestone of a favorite niece and of a young girl who had brought him down during an illness. His next ambition was to see himself on horseback, and the family gathering was augmented by a life-sized statue of "Uncle Henry" on his favorite horse. These following monuments in stone of his favorite deerhound, "Fog Head," chasing a deer; another of a fox pursued by his foxhound, "Bob," and a marble sarcophagus with a carved representation of his favorite gun.

The latest additions have been statues of three of his brothers in the stiffest of poses and the most prosaic of dress. As "Uncle Henry," although 75 years old, is still hale and more enthusiastic than ever, it is certain that this strange mania will receive many more additions before he sleeps in the oddest environment with which eccentricity ever surrounded a dead man.—Tid-Bits.

First Coaches in London. Riding was the only alternative to walking at the beginning of Elizabeth's reign, and a lady never rode without six or seven serving men to carry a toilet suitable to all contingencies, and the most of the money they carried might suffer on the journey, says the Bishop of London in the Cornhill Magazine. To diminish this cost coaches came into use. They were introduced in 1564 by a Dutch coachman of the fact remains that the bears came of a strange monster in those days, and the sight of it put both man and horse into amazement; some said it was a great crabshell brought out of China, and some imagined it to be one of the pagan temples in which the cannibals worshipped the devil. But at length these doubts were removed, and conchoking became a substantial trade. So rapid was the increase of coaches that in 1601 an act of parliament was passed "to restrain the excessive and superfluous use of coaches within this realm."

In spite of this innovation, no method could be devised which made locomotion pleasant through streets which were alternately torrents of dirt and thick deposits of black mud, which furnished a ready weapon to any one who wished to express disapprobation. It is difficult for us to picture London without either cabs or omnibuses.

Mutilation of Teeth Among Savages. It is curious to what an extent the mutilation of teeth goes on among savage nations, and even among certain civilized people, such as the Japanese. With them a girl is never married without first having her teeth broken with a pointed instrument of war, and the custom is especially adhered to among members of the richer classes. On the west coast of Africa a large proportion of the teeth are deliberately broken when children reach a certain age. Both in the new world and in the old the custom exists of extracting the two front teeth of domestic servants. In Peru the custom has existed from time immemorial, and used to be a sign of slavery in the days of Incas. This is also the custom on the Congo and among the Hottentots. Teeth are stained in various colors among the Malays. A rich colored and bright blue are not uncommon, and a bright green is produced with the aid of arsenic and lemon juice. Livingstone related that among the Kafirs a child with a prominent upper jaw was looked upon as a monster and immediately killed. On the Upper Nile the negroes have all their best teeth extracted in order to destroy the value in the slave market, and to make it not worth while for the slave-traders to carry them off.

Status of the Buller. It is said that Sir Redvers Buller is the wealthiest general (among commoners) in the British army. Admiral Sir Alexander Buller the wealthiest admiral. People are very patient, considering that the end of every day only finds them one day nearer their graves. Parsley Neutralizes Onion Odor. Parsley should always garnish a dish containing onions, as it takes away the onion odor. Parsley also prevents the after taste if eaten by the individual who loves onions and must have them.

JOKE BOOK

"Did you say the man was shot in the woods, doctor?" "No, doctor; I said he was shot in the lumbar region."—Yonkers Statesman.

The hostess—I want you to meet Mr. Cawker. So interesting, you know. He believes in nothing. The blase one—What enthusiasm!—Life.

"Diamonds are getting higher and higher." "Yes, dearie, but we can fix that all right." "How?" "We won't buy any."—Indianapolis Journal.

"Can you give me no hope?" "No, my dear," "Yes," sweetly smiled the young girl; "if you go out very quietly papa may not hear you."—Exchange.

Sunday school teacher (in Chicago)—Why did the wise men come from the East? Bright schoolmen—Because they were wise men.—Philadelphia Record.

Percy—Where were you on your vacation last summer? Harold—Oh, I went to Niagara Falls. Percy—What is that place running yet?—Chicago Journal.

First M. D.—What a lot of things have been found in the verminiferous appendix. Second M. D.—And look at the money that's been taken out of it!—Life.

A life of terror: "What is a bachelor, Aunt Martha?" "Oh, he's a man who thinks every girl that looks at him intends to marry him."—Indianapolis Journal.

Hogan—Do you believe in dreams, Mike? Dugan—Faith an' I dot! Last night I dreamt I was awake, an' in the mornin' me dream turn thrue.—Princeton Tiger.

"What is bad form?" "It is doing things in a way other people have quit doing them, or doing them in a way they have not yet heard of."—Indianapolis Journal.