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A BRAKE THAT WORKS.

The public is indebted to The Daily Mail, of London, for introducing, through its Geneva correspondent, an engineer, who is credited with an invention of a "mechanical brake" which stops a train that is running at 50 miles an hour within a distance of 20 yards. Good! But what about the passengers? A train running at the rate of 50 miles an hour covers 731.3 feet in a second; and to stop a train moving at this speed in 20 yards means that it must be brought to a full stop in 4.5 of a second. When we remember that, in an end-on collision, it takes several seconds for the momentum of the train to expend itself in telescoping car into car, one is moved to ask what would be the condition of the living contents of a passenger car that was brought to a stop in a fraction of the time that it takes to bring the last car of a telescoping train to rest?

WHOM THE GODS WOULD DESTROY THEY FIRST MAKE MAD.

The interference of the trades unions with the British workmen, with its consequent disastrous effect in the competitive market, has become such an old story as to render repetition unnecessary; but particular attention should be drawn to the latest testimony in this direction, which is given by Sir Hiram Maxim and relates to an occurrence in the Vickers-Maxim establishment. As related in The New York Sun, it seems that the organization had decided that a certain gun attachment should occupy a day and a quarter in the making. When the firm introduced a special machine to manufacture this piece, the men still continued to turn out only one attachment in a day and a quarter.

A German mechanic who happened to apply for work was placed in charge of one of the machines and turned out thirteen of the attachments in a single day. Verily Whom the Gods would destroy they first make mad.

THAT MESSAGE FROM MARS.

It has been stated by an authority, whose weight will be determined by the mental attitude of his readers, that the day is near at hand when we shall be able to communicate with the other planets and preferably with Mars. It seems that in searching for a suitable location for a laboratory in which to conduct experiments in the wireless transmission of energy, Nicola Tesla found the desired conditions at a point some ten miles from Pike's Peak, at an altitude of several thousand feet above the sea. During the eight or nine months wherein Mr. Tesla was busy in the rarefied atmosphere of his laboratory, he seems to have produced some very spectacular effects; for, whereas in his New York laboratory, he was able to produce electrical discharges only 16 feet in length, and of 8,000,000 volts pressure, he here gradually "learned how to confine electrical currents of a pressure of 50,000,000 volts; how to produce electrical movements up to 110,000 horse power," and that he finally succeeded in "obtaining electrical discharges measuring from end to end 100 feet and more." Yet, in spite of his familiarity with 50,000,000-volt currents, Mr. Tesla did not disdain to study "certain feeble electrical disturbances which, by their character, unmistakably showed that they were neither of solar origin nor produced by any causes known to him" "on the globe." After deep thought upon the subject, he has finally "arrived at the conviction, amounting almost to knowledge, that they must be of planetary origin."

It would be interesting, and possibly vastly entertaining, to be supplied with the process of ratiocination by which Mr. Tesla deduces from the existence of certain puzzling electrical disturbances his "conviction, amounting almost to knowledge," that these disturbances had been launched at our particular planet from some other planet (preferably Mars), that was desirous of intercourse. Signor Marconi has suggested that these disturbances (which seem to have worked with such brilliant results upon Mr. Tesla's imagination)

were due to atmospheric electricity which is especially active at such a high altitude as that of Mr. Tesla's laboratory; and Sir Norman Lockyer pertinently asks why, if electrical energy had been transmitted from Mars, it should have made its presence manifest in Colorado only; since all magnetic observatories in the world would have been simultaneously aware of it?

That some of the planets may be inhabited is possible, and there is nothing in our present knowledge of electricity absolutely to forbid the hope that in some future day we may learn how to fling forth intelligible electrical impulses into inter-planetary or even inter-stellar space; but it will certainly need something more than mere observations of some unexplained electrical impulses on a Colorado mountain to prove to a demonstration either the one proposition or the other.

CONTINENTAL CRITICISM OF THE 16-INCH GUN.

If we are to believe the artillery expert of the Krupps, and a German artillery officer who writes in a recent issue of La Revue Technique, American estimates of the extreme range of which the new 16-inch gun will be capable, are altogether too sanguine. The accepted maximum range of this weapon, as calculated by Major James M. Ingalls, the head of the Artillery School for Officers at Fort Monroe, is 20.9 miles; but the German expert denies that the gun can range further than 16 miles, while the writer in La Revue Technique claims that the maximum range of our new army gun is only about two-thirds of Major Ingalls' estimate, or from 14 to 15 miles. The latter estimate is arrived at by the "method of vertical speeds expressed as functions of the times of flight." With all due deference to these foreign criticisms, we pin our faith to Major Ingalls' estimate, for we cannot forget that, on a previous occasion, when the English artillery officers, before firing the celebrated "Jubilee" shot, invited the artillery experts of the world, including Major Ingalls, to estimate the exact range of the shell, it was found after the shot was fired that while the American expert had plotted the fall of the shot only a few hundred feet short of the actual distance, the other calculations placed the point of fall at a distance varying from 1,500 yards to some miles short. When the gun is finished, it will be interesting, as a verification of the theories of ballistics, to fire an experimental shell from this weapon, as was done with the 9.2-inch gun in England, and at a later date with the 9.45 Krupp gun at the Meppen proving ground.

THE TUNNELING CRAZE.

For some occult reason the idea of tunneling beneath straits or estuaries possesses a strong fascination for a not inconsiderable section of the public. We are all familiar with the proposed English Channel tunnel, which for half a century or more has been a favorite theme of the financial promoter; and the proposed tunneling beneath the Irish Channel has been brought persistently into prominent notice, in spite of the fact that it is manifestly doomed to failure as a financial undertaking. The latest tunnel proposal is that of a certain M. Berlier, who believes that if a double track line, 25 miles long, were carried beneath the Straits of Gibraltar, at a cost of \$25,000,000, the outlay would be amply justified by the volume of traffic which would pass from continent to continent.

It is positively amusing to note the naiveté with which this gentleman assures the public that, as the depth of the sea at this point does not exceed something over a thousand feet, the construction would be perfectly feasible. Apart from the fact that from 160 feet to 180 feet is the limit beyond which it is impossible to carry on excavation under the compressed air system, a consideration which alone would prevent the construction of such a tunnel, there is the fact that the excessive grades which would be necessitated by the depth of the tunnel would render the cost of the operation abnormally high. This cost, taken with the heavy fixed charges, would render the scheme a losing venture from the very outset.

THE ENLARGEMENT OF THE WHITE HOUSE, WASHINGTON.

The American public is confronted just now with an architectural problem that calls for the exercise of rare judgment and good taste in its solution. We refer to the proposed enlargement of the Executive Mansion of the United States, which for a long period of years has been popularly and affectionately known as the White House. No architect is qualified to undertake the task of enlarging and improving this structure who is not fully alive to the historical and sentimental associations from which it takes much of its character. The building itself carries a dignity which is due to the fact that, architecturally, it is true to the period and taste of the age in which it was designed, and built; and any changes which are made, to be in perfect taste, should preserve this inherent simplicity and

dignity, and carefully avoid any of the meretricious embellishments which too frequently vulgarize our modern structures. If there ever was an architectural task that called in the highest degree for the truest artistic instinct, it is this work of remodeling and enlarging the home of our Presidents. The American Institute of Architects have sounded a note of warning, to which the nation will do well to take full heed. Without casting any reflections upon the architectural designs that are turned out by the army officers who are responsible for the government buildings, we must confess that the particular plan that has been drawn up for the enlargement of the White House conforms neither in general scope, nor in detail, to the requirements of the case as we have outlined them above. There is nothing to be lost and everything to be gained by moving slowly in a matter of this importance. The capital city of the nation is not so profusely enriched with evidences of the architectural genius of this country that it can afford to add one more to the many lost opportunities, of which too many of the buildings and statuary of the city are a permanent record.

SPEED RECORDS OF THE BICYCLE FOR 1900

Although we have, many of us, lost the old-time enthusiasm in the bicycle, the really wonderful performances last year of riders who were paced by motor-cycles, are well worthy of a passing notice. From a perusal of the record table lately issued by the International Cyclists' Union, the authority of whose timings is quite unimpeachable, we gather the following facts: Although none of the records made in 1899 for a distance of a mile or under were surpassed, except that of $\frac{3}{4}$ of a mile with a flying start, all the records for distances from 1 mile up to 634 miles have been exceeded by a considerable margin, the great increase in speed in the longer distances being due to the introduction of improved motor-cycles for pacing the riders. The record of a quarter of a mile with a flying start stands, as it did in 1899, at 20 seconds and for 1 mile at 1 minute 22.5 seconds. Late in October of this year a rider covered, for the first time, a distance of 40 miles within the hour, the exact distance ridden being 40 miles 327 yards. Another rider, in an attempt at the twenty-four hour record, covered 183 miles in six hours, 349 miles in twelve hours and 634 miles in twenty-four hours. The speed of a quarter of a mile in 20 seconds is equal to a speed of 45 miles an hour, which is higher than the average speed, including stops, of any but a few express trains running today in this country. Such phenomenal speeds as these are rendered possible only by the pacing machine, and that they are made at all, proves that on level surfaces, the atmosphere affords by far the largest of the resistances encountered by a bicycle at speeds of over 12 to 15 miles an hour.

TRANSMITTING SIGNALS THROUGH THE SEA.

Experiments have recently been carried out by Prof. Elisha Gray, the object of which was to devise some apparatus by which the well-known power of water to transmit sound might be turned to practical account in the transmission of signals. The investigation was suggested to Prof. Gray by Mr. A. J. Mundy, of Boston, who collaborated in experiments, which have apparently culminated in a highly successful test, made on the last day of the century. This test was carried out in a vessel, which was especially furnished for the purpose with a well-hole opening directly through the center of the boat, and extending 20 feet below the sea level, in which was suspended an 800-pound bell of the kind that is used for ordinary fog signaling. Suitable mechanism was provided to enable the operator to ring the bell, making as many strokes as he might desire. It was found that at distances of a mile, or slightly more, the sound of the bell could be distinctly heard without the use of a receiving apparatus, the sound traveling through the water and passing through the sides of the ship into the hold of the vessel. An ear trumpet, the mouth of which was sealed by a tin diaphragm, was attached to the lower end of a length of gas pipe, and submerged 6 feet beneath the water, the inner end of the pipe terminating within the vessel; and with this receiver the submerged bell could be heard at a distance of 3 miles. For distances beyond this a special electrical receiver was used, the submerged part of which was connected with a common telephone receiver, installed within the ship. In a signed statement, to which were attached the names of the inventors, and of representatives of the navy and the merchant marine, it is stated that when the submerged bell was struck, the sounds were heard through the electrical receiver at distances of from $1\frac{1}{2}$ to 12 miles in the open sea.

The value of this invention is readily perceived. Its first application undoubtedly would be in such dangerous localities as are now provided with the ordinary fog signal which, although it has been heard at as great a distance as 15 miles, may at times be inaudible at short ranges, because of the unfavorable con-

dition of the atmosphere. It is proposed by Prof. Gray to station a series of submerged bells at regular intervals along the coast, which will be rung electrically from a shore station. It is claimed that a vessel provided with receiving instruments would be completely safeguarded against running ashore during foggy weather. The device may also exercise an important influence on the future of submarine warfare, for the reason that, even in the case of the ordinary torpedo boat, running at the surface, the throb of the engines may be distinctly heard with this device at a considerable distance. It is claimed, moreover, that the sounds will be even more distinct in the case of a completely submerged vessel.

SOME OF THE SINGULAR FOODS OF THE FILIPINOS. BY GEORGE D. RICE.

Your correspondent having had the privilege of investigating the kinds of foods eaten by the native people of the Philippine Islands, some interesting information may be given concerning the way in which the Filipino makes up a good dinner at low cost. Probably the most common article of food that would not be desired by Americans or others than the Filipinos is the grasshopper. In these islands the grasshoppers not only grow in great numbers, but the size of the insect is large. There are those who make a business of catching the grasshoppers during the best season for them, which is in May, June, July and later. At first the grasshoppers begin to appear in swarms, but of small size. As the grasshopper grows the proportionate increase in size of the swarms is noticeable. At first the clouds of hoppers passing overhead seemed something like a hazy atmosphere; after a few weeks growth the clouds of hoppers become dark and heavy. They fly in large numbers, and the day is darkened as soon as swarms of hoppers appear in any vicinity. They usually light in the pastures, where they live on the smaller insects, the grass, the vegetation in general. When a swarm of full-sized grasshoppers lights on a farm or other productive land the vegetation is almost completely eaten off. In the meantime, however, the owner of the land, with all his neighbors, have been hard at work catching the grasshoppers.

The mode of catching the grasshoppers in the Philippines is interesting. There are always two or three bellboys stationed in the towers of the big church of each city, town or barrio of the Philippine group, these boys being there for the purpose of sounding the various signal bells. There are certain strokes for funerals, others for births, and at present there are signals for the approach of an army. These boys in the tower keep a sharp lookout for indications of the approach of grasshopper swarms. During the hopper season they are particularly active, and announce the approach of the swarms as soon as seen, for the grasshoppers often merely pass over a town, but usually low enough to permit the natives to catch many of them. As soon as the bellboys see that there are some scattering grasshoppers in the air, as an advance guard to the main body, they sound the hopper signals on the bells and hundreds of expert grasshopper catchers with their nets turn out.

There are several methods used by the natives for catching grasshoppers. The most effective is the net. This is a large butterfly net, arranged with netting placed over a hoop, and to the latter is fixed a long handle. The native takes this handle, and with the mouth of the net toward the grasshoppers he rushes forth, bagging considerable numbers at each run. The grasshoppers always go in swarms, except the advance guard and the stragglers, and if anything occurs to disturb their flight they get confused and tumble into bags readily or fall into the open mouths of nets. They fly so closely that they cannot well escape, as when they turn slightly out of their course they come into contact with other grasshoppers next to them.

The paddle method for catching the hoppers consists in using a long stick to the end of which is fixed a piece of flat wood, about ten inches in diameter. If the grasshoppers pass over one's own property, then it is safe to use this affair, for then all of the grasshoppers which are killed by swinging this instrument through the clouds of insects as they pass, are dropped to the ground, where they may be selected and picked up later on after the sun has thoroughly dried them out. Another method consists in exploding cartridges in the midst of swarms of the insects, for the shock stuns quantities of the grasshoppers, and after an effective explosion the ground is covered two or three inches deep with the grasshoppers for a distance of from twenty-five to thirty feet square.

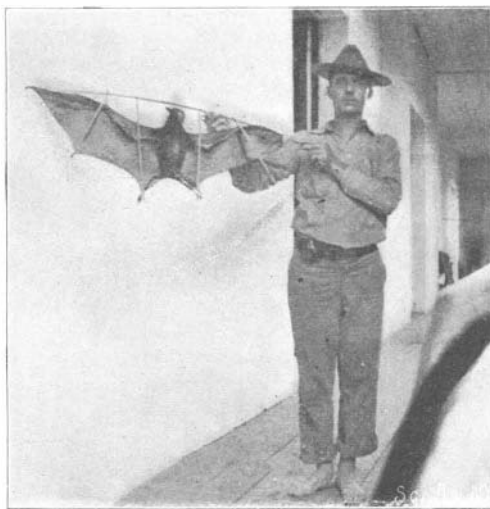
Grasshopper catching is a profitable business in the Philippines. Grasshoppers sell at \$2 per sack, gold, in the larger cities of the islands, where the people do not have a chance to get at the insects in the fields. The sacks of the islands hold about a bushel. The grasshopper is a regular article in the markets for the entire year, as after drying out the hopper can be kept indefinitely. It is in the operation of drying that

the grasshopper is made eatable. I never saw a native eat a green grasshopper, but I have seen them eat the dried ones by the pocketful on the street or in company at entertainments, and by the dish at the table at their homes. Your correspondent has tried the prepared grasshopper, and has experienced no serious results. The hopper is first so thoroughly dried out in the heat of the sun or in the bake oven that there is nothing left that is really objectionable, and a nice, crispy article of food results. This tastes sweet of itself, and something like ginger snaps. The natives usually sweeten the grasshoppers more by using a sprinkling of brown sugar. Then the confectioners make up grasshopper with sugar, chocolate trimmings and colored candies in such a way that a very nice tasting piece of confectionery is obtained.

The housewife of the Philippines takes considerable delight in placing before you a nice grasshopper pie or cake. The grasshopper pie is the most wonderful dish, as the big hoppers are prepared in such a way that they do not lose their form or any of their parts. Care is taken to keep the grasshoppers intact, and they are artistically arranged on the top crust of the pie, while on the interior are some of the broken hoppers mixed with special foods. The grasshopper cake has the grasshoppers sprinkled through it, and resembles plum or raisin cake.

In some sections of the islands the natives grind the crispy hoppers into a fine powder, and this powder is used for making articles of food, and in some places it is reduced to liquid form and taken as an article of drink.

Another article of food which is relished by the natives is procured by collecting large quantities of moths from the rocks of the mountainous regions. In several spots in the mountains in Panay and other islands of the southern portion of the Philippine group I saw moths existing so thickly in the rocky tissues that they could be scraped off into buckets by the quart. The moths seemed to mass in the crevices, and there hang. One could get a barrel of the moths



GIANT BAT OF THE PHILIPPINES.

in a very short while. The natives have not failed to investigate the worth of the moth as an article of food, and they use the insect in large quantities. Their mode of catching consists in going to the hills in parties of a dozen or more with the proper bags and articles for collecting the moths. The scraping process is used in some sections of the islands, while in Negros Isle particularly I noticed that they adopted a different scheme. Here they spread a bamboo mat on the ground beneath an overhanging colony of the moths, and then proceed to disturb the insects with the point of a spear or piece of bamboo. The little insects lose their hold and drop to the mat. They are slow of action and before they can crawl away the game is bagged.

The dainty natives will not eat the wings or the heads of the little moth, and so they now take steps to remove these objectionable parts. This operation consists in creating heat to such an extent that the tissues in the heads and wings become baked and crumble off. The natives accomplish this end by cutting holes in the earth, in which hot fires are burned until the earth is quite hot. Then the hot coals are taken away and the moths are put into the highly-heated openings. The intense heat crisps the head and wings to ashes, so that when removed from the hole and subjected to a sifting operation through netting, the powdered parts are sifted off, leaving only the body. This process also does away with the legs. Often the moths in their present stage of preparation are eaten with some sugar or with other articles of food. Again the moths are used in conjunction with other mixes of food in the form of pudding and prepared dishes. The coconut is liberally used in mixtures with the moth and coconut cake and pie, and moth fillings are common. Then in some instances the moth is again baked and reduced to powder by

pounding in rice pounding bowls. The powder obtained in this way is sweetened and used in various forms.

The horrible bat of the islands, which here grows in many cases to the size of the American chicken hawk, is also eaten in some sections of the Philippines. The best classes of natives, however, do not eat the bats. The mode of catching the bats is peculiar. The cities towns and barrios of all of the islands of the Philippine group are quite overrun with bats, which fly through the streets at night in large numbers. They fly slowly and seem incapable of dodging articles in their path. Therefore, the native takes a long pole, puts a sort of combination hooked arrangement at the top and takes position in a street, and with the pole held erect waits for bats to come along and bump into the hooked portion. As the native sees a bat coming he plans to have the hook in its path, and as he moves the pole, so as to bring the hook into contact with the head of the bat, the latter usually strikes it with a bang and drops to the earth stunned, when the native proceeds to promptly put the bat to death. After standing in his position for an hour or more, the native has a little pile of bats at his feet. These he takes to the market the next day and receives about two cents each for them. The bats are eaten only in small part. The wings, head, and, in fact, all but a small portion of each side is thrown to waste.

Iloilo, Isle de Panay.

SCIENCE NOTES.

Sixteen hundred persons in the crowds which assembled in London on the return of the volunteers from South Africa received injuries which required medical attendance.

A magnificent marble sarcophagus has been unearthed at the village of Anhar, which is situated near the site of the ancient town of Iconium. The tomb is freely sculptured with flowers, animals and figures of exquisite workmanship, and is stated to be far superior to another similar one at present treasured in the Stamboul Museum. The period to which it belongs has not yet been determined. It weighs nearly thirty tons, and is to be conveyed to Stamboul as soon as suitable transportation facilities have been organized.

The establishment of a royal mint in Canada will make the fourth branch of the English mint in operation outside London. The other three ramifications are located in Australia, at Melbourne, Sydney and Perth respectively. According to recently published returns, the value of the gold coin output from these four mints during 1899 was as follows: The Royal Mint, London, \$12,601,555; Melbourne, \$28,138,835; Sydney, \$16,620,000; Perth, \$3,458,530. It has also been mooted that the government proposes ultimately to establish another branch in the Transvaal.

The solution of the sugar bounties problem which has been such an acute question among certain of the European powers for some time past appears to be in sight. It is stated that as a result of the negotiations between France, Austria and Germany, the two latter countries will renounce their bounties if France, whose bounties are greater, will consent to a commensurate decrease. Further negotiations will be suspended until England consents to give up all compensating taxes, in which event the conference will resume its work at Brussels, in order to formulate a scheme to control internationally the sugar tariffs.

The prizes in connection with long distance ballooning in Paris have recently been awarded by the Aerostatic Society. Comte Henri de Vaulx was awarded the grand prix for his two lengthy excursions into Poland and Russia respectively, while he also carried off the gold medal for record ballooning. The second prize was secured by M. Balsan, who followed very closely behind the first prize winner, while he also secured the silver clasp. The competition was adjudged carefully by a number of aeronautical specialists, including Major Bourgeois, an expert from the War Office, and the distances were rigorously calculated.

At the Anthropological Institute in London Prof. E. B. Tylor recently lectured upon the existing native race in Tasmania, and formulated evidence for the purpose of showing that it represents a period contemporaneous to the stone age, but below even that of pre-historic man in Europe, at the period of the mammoth. He stated that the natives are contemporary with the lowest available record, but they possess the arts of house and boat building, fire making and cookery, basket and leather work, rude tools, and weapons, combined with a mythology including star myths and nature spirits—an animistic religion culminating in polytheism. Prof. Tylor considers from the results of his investigations and study of the race that the Tasmanians present a picture of man's life on earth which, although not primitive, is probably the earliest that is based on direct anthropological evidence.