staterooms, which is more than the Pilgrim contains, although the latter steamer is the longer.

The general design of the Plymouth was made by Mr. George Peirce, supervisor of the Old Colony Steamboat Company.

The contractors for the boat complete and builders of engine were the W. & A. Fletcher Co., New York.

The hull was built by the Delaware River Iron Ship Building and Engine Works, Chester, Pa., and the joiner work, including painting and plumbing, was in the hands of Wm. Rowland, New York. The designs for the decorations are by Mr. Frank Hill Smith, of Boston, Mass.

The electric lighting plant was put in by the Edison General Electric Co. under the special superintendence of Mr. W. H. Peirce, to whom our thanks are due for courtesies extended. Two dynamos, driven each by an independent compound Ball engine of 65 horse power at 120 pounds pressure, are used as generators. They are connected directly to the engine shaft, and run at 400 revolutions per minute. The field terminates in eight poles, four external, all of one sign, and four internal of the opposite sign. Within the zone marked by the eight pole pieces the armature, which is a Gramme ring, rotates. The core of the ring is of laminated sheet metal. Each dynamo has an output of 350 amperes at 115 volts potential, enough to supply 700 lamps. Each dynamo weighs 6,563 pounds, each armature 1,950 pounds, and the dynamo and engine and appurtenances about 13,000 pounds. The commercial efficiency is 89 per cent, and the heating is only 36° F. above the atmosphere. They are compound wound, and show a maximum variation in their characteristic curve of 1 volt. They are of a type conforming to specifications originally issued by the United States government.

The installation is on the two-wire system. The dynamos are connected in parallel so that one or both can be used to supply the current. From the generating plant double transit leads are taken fore and aft, and branching so as to terminate at four cut-outs. From these cut-outs the lamps are supplied directly or by feeders. The main leads are not tapped. As more work might be thrown upon one main lead than on the other, equalizing mains are carried from each forward cut-out to each of the after cut-outs. This gives four distributing points. Risers are carried through the decks to supply the lights at different elevations.

Below the main deck wherever moisture may be present lead-covered wires and water-tight brass junction boxes containing safety fuses are used. Elsewhere Habirshaw marine core wire is employed.

The staterooms are grouped in eight divisions. For each of these a marbleized slate tablet placed so as to fill an alcove transom is provided, on which the switch boxes and general branch connections are made. This is done not only for the decorative effect, but also to provide security from deterioration by moisture and from fire.

There are 1,250 16 c. p. 110 volt lamps. The maximum variation in potential will not exceed 1½ volts. Each lamp has its own switch, so as to be individually controllable. In the dining saloon the lamps are arranged in groups of ten, and connected with a main switchboard by which they can be turned off ten at a time as desired. The very elaborate electroliers and fixtures were supplied by the New York works of the Edison General Electric Co.

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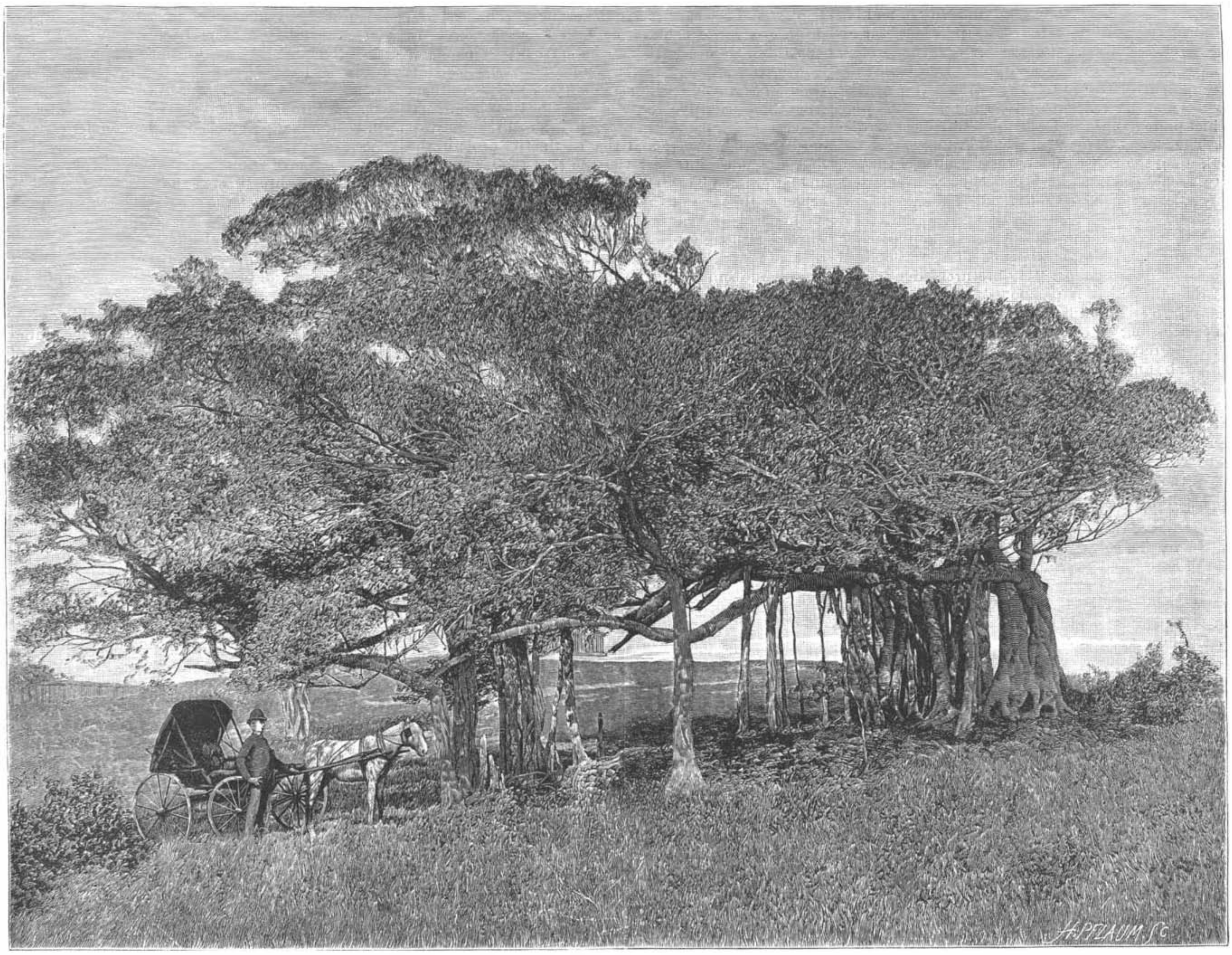
THE BANYAN TREE.

The Banyan tree (*Ficus religiosa* or *Indica*, Linn., *Urostigma Benghalense*, Gaspar.) is familiar to all from the pictures given in the geographies. In the school books it is shown spreading its branches far and wide, and sending down vertical depending rootlets, that, on reaching the ground, take firm hold and develop into large supporting trunks. There seems to be hardly any limit to the size it may attain. In Hindostan, where it reaches the greatest perfection, a famous tree stood on the banks of the Nerbudda. It was said that formerly 7,000 men could find shelter beneath its shade. It is supposed to be the tree which is described by Nearchus, the admiral of Alexander the Great. While greatly diminished in size by floods, what is left of it is 2,000 feet in circumference, and has over 3,000 trunks. (Forbes' "Oriental Memories.") Others are cited which cover over thirteen acres of ground.

It bears an abundant crop of small figs, not much larger in size than peas, insipid in taste, and possessing medical powers of rather low degree. The leaves, dark green in color, are so thick and cast so dark a shade that they prevent the growth of underbrush, thus, to an extent, favoring the attachment of the aerial roots. The fruit is devoured by the birds, who deposit the minute seeds far and wide on the ground and in crevices of stones or on trees. The seeds germinate, and the roots creep downward until the ground is reached. The tree then begins to take shape, and as it grows it sends down other roots from its branches. These develop until some of the new trunks are as large or larger than the original. In Hindostan, the vicinity of temples or suttee mounds, where Hindoo widows were formerly burned, are favorite localities for them, as the birds, the principal agents in their dissemination, were formerly attracted to these places.

The specimen here illustrated is probably the best developed specimen of this curious tree on this side of the Atlantic. It is about two miles east of Nassau, N. P., on the road along the shore, one of the most picturesque drives out of the city. If it had been properly protected and trained, and the shoots left to drop to the ground and take root, instead of being cut off and carried away by visitors, and eaten off by sheep and cattle, there is no doubt it would have been a much larger and finer-looking tree than it now appears. It is to be hoped that such a finely developed specimen of so rare a tree will in the near future receive the attention it requires, and be assisted in its onward march in trying to spread itself. It is worth one or more visits, and is a decided curiosity to those who have never seen a forest of one tree. Our engraving is from a photograph by Mr. J. F. Coonley, of Nassau.



AN AMERICAN BANYAN TREE.—(From a photograph.)

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History of Electric Lighting.

Electric lighting, says M. Fontaine, did not make its appearance until near the close of the year 1873. It was in Paris, in November, 1873, in the workshop of M. Gramme, that the first installation on a really industrial scale of electric lighting took place, by means of a continuous current dynamo and Serrin regulators. It was also in Paris, in 1877, that the Jablochkoff candle was first employed; sixteen lights, distributed over a distance of about 1,100 yards, being supplied by a single alternate current Gramme machine. Paris, therefore, had the honor of possessing the first public and private lighting produced by means of electric currents. M. Fontaine thinks that in 1891 or 1892 the electric lighting in Paris will require for its production motive force equal, in round numbers, to 32,000 horse power.

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ANY mechanic who feels like despairing, because the world has not gone well with him, should try, first of all, to figure out to what extent the world is to blame for his failure, and to what extent he himself is to blame. If he has not fitted himself for success, it is his own fault that success has not come to him.

The End of the World.

It would seem impossible that, in our epoch of civilization and progress, there could still be found people to announce the approaching end of the world, and, what is much more extraordinary, that there could be found other people to give credence to them. Such is the case, however. A few charlatans, who perhaps descend from the middle age astrologers, whose ridiculous methods of divination they doubtless employ, have recently predicted that the world is shortly to come to an end, the date being fixed by some at 1898, and by others at 1901. These grotesque predictions, born of ignorance, have suggested to us the idea of succinctly presenting to our readers the rational causes that, according to the present state of scientific knowledge, might lead, not to the end of the entire universe, but only to that of our world—that is to say, to the disappearance of life from the terrestrial globe. We hope thus to reassure those, if there be any such, whom the predictions of sorcerers or jesters may have somewhat frightened.

At the present day, the public shows itself very incredulous upon this subject, but it was not always thus. In the past ages, when the absurdest superstition reigned, the astrologers found no difficulty in making people believe their idle tales. The year 1000, for example, is especially memorable for the great terror that extended over France and entire Europe, at the announcement of the end of the world. The advent of comets and the eclipses of the sun and moon were the chief pretexts for the frightful astrological predictions. The mortal terror with which France was seized in 1564, upon the news that a total eclipse of the sun was to occur, has remained particularly celebrated. The people, believing that the end of the world was at hand, ran to the churches in crowds to confess. A certain chronicler of the time tells us that a country curate, not being able to fulfill his task, was obliged to say to his parishioners: "My brethren, don't be in such haste; the eclipse is postponed for a fortnight!" In reality, there is nothing very alarming in the prospect of the ending of the world. That happens to every man on the day of his death, and the supreme event would not be any more terrible if it happened to all on the same day.

Terrestrial life depends entirely upon the light and heat of the sun, which is the sole source of its maintenance. It is therefore with the star of day that we have to begin the strange tableau of the probable causes of the end of the world.

THE SUN, ITS SPOTS AND ITS FINAL EXTINCTION.

The surface of the sun is often strewed with black spots, the smallest of which are as large as the diameter of the earth, and the largest of which are sometimes visible to the naked eye. These spots, which are variable in number and position, mark regions in which the luminous and calorific activity of the sun is in a state of temporary diminution. As the great radiant star is an incandescent mass (1,372,000 times more bulky than the earth) that unremittingly distributes its elements of life around it, it is continually losing (though slowly, it is true) the powerful energy that is stored up in it. A day will come in the distant ages when the spots that are already darkening the sun will cover its entire surface. A solid crust will afterward form, as one has formed upon the earth, which also traversed these phases of the life of a star, for our earth was a sun that had the moon for a planet, and perhaps even (according to Mr. Stanislas Mennier) a second satellite that is now broken up. The sun will therefore be extinguished some day for want of fuel, but that fatal date will be far in the distant future, for we can estimate the time necessary for the extinction of the sun at more than twenty million of years, and the time during which a state of life analogous to the present one will be able to exist upon the earth may be estimated at half that long period.

Long before the end of these far distant epochs, the progressive decrease of the solar heat will cause the glacial zones of the poles to extend toward the equator. Man, remaining almost alone upon the debris of terrestrial life, after having reached a transcendent civilization, will employ all the resources of his vast genius to fight a supreme battle with death. Perhaps he will then descend, one by one, the steps of his physical and intellectual development, and lead the miserable life of the Laplander and Esquimo under the equator. Then, the last human family, exhausted by cold and hunger, will sleep its eternal sleep upon the frozen and depopulated earth.

Although the existence of animate beings is still far from being endangered upon our planet through the extinction of the sun, the terrestrial world is none the less exposed to

CATASTROPHES OF OTHER KINDS.

When a brilliant comet appears and grows in magnitude in the depths of the heavens, popular superstition beholds in it an omen of dire misfortune, without knowing the only danger that the haired star threatens us with—that of a collision.

We may find examples of this superstition in ancient as well as in modern times. Here is what we may read in Pliny, and which relates to the comet of the year 48: "In the war between Cæsar and Pompey, we saw an example of the terrible effects that the advent of comets carries in its train. Toward the beginning of this war, the darkest nights were illumined, according to Lucan, by unknown stars, the heavens seemed to be on fire, glowing firebrands traversed the depth of space in all directions, and the comet, that appalling star, which overthrows the powers of the earth, exhibited its terrible coma."

These superstitious terrors inspired by comets have exerted their influence in our own age. The famous Encke's comet, that appeared in January, 1819, was the cause of lively apprehension in France, where sinister prophecies had been disseminated. At Paris, the previsions of the end of the world were taken more pleasantly, and songs and caricatures were made concerning it.

Among the millions of comets that are submitted to the attraction of the sun there are relatively few that approach the radiant star as far as to the orbit of our globe. The majority of the immense comets that occasionally traverse the heavens should therefore leave timid people indifferent. Those which, in their trip around the sun, pierce the plane of the terrestrial orbit, can alone menace us with some danger. We know that these celestial bodies have a very irregular course, and a most erratic conduct, for the least attraction of a neighboring star suffices to swerve them from their primitive route and make them approach the disturbing mass. In order that a collision may occur between a comet and the earth, the orbit of the first star must intersect the orbit of the second, and the latter must be at the point of contact of the two orbits at the time of the passage of the comet. It will be understood that such a combination of circumstances, although possible, has few chances of occurring. In fact, when a comet appears that is to approach the sun as near as we do, a calculation of the probabilities demonstrates that out of 280,000,000 chances, there is but one that it will collide with the earth!

We can consequently remain very tranquil on this subject. Yet, since we are assured that such a collision is among the number of facts possible, let us see what might be the consequences of this celestial meeting of the earth (traveling 18 miles per second) and a comet that had at least an equal velocity. If the comet had a consistent nucleus, the terrestrial crust would be staved in by the impact, and the torrents of lava that it conceals would produce a terrible commotion in contact with the waters of the ocean. In addition, the axis of the earth would be abruptly displaced. This is the sole plausible hypothesis to explain the inclinations of the axis of planets upon their orbit; but it is only right to say that no comet with a consistent nucleus has as yet been observed.

Were the comet formed of dense gases, it would cause an enormous pressure upon our atmosphere, and would bring on a hurricane a hundred times more terrific than the great cyclones, and would level the surface of the earth. It might also render the air unsuited for maintaining life by altering its chemical composition through the introduction of a new gas, or kindle an immense fire, such as the temporary stars sometimes offer us the spectacle of.

It is difficult to imagine the frightful consequences of such cataclysms for the animate beings who would be liable to perish amid this chaos of unchained elements. Shooting stars, those strange meteors that shine for scarcely a second in tracing a line of fire upon the celestial vault, are now considered by numerous astronomers as having a cometary origin, they being, so to speak, the debris of the haired stars. There exists a convincing example of this that will prove to us the possibility of a collision between the earth and the erratic bodies under consideration.

In 1832, Biela's comet, which accomplishes its revolution around the sun in the short period of six years and a half, intersected our orbit on the 29th of October, at the point that the earth reached on the 30th of November, say a month later. At the time of its appearance in 1846, the comet had divided into two, and in 1852 the twin comets were observed traveling together. Since this last passage, astronomers have not seen Biela's comet, but on the 27th of November, 1872, at the epoch that it crossed the terrestrial orbit, we traversed a mass of cosmic dust, which, on penetrating our atmosphere, gave rise to a true shower of shooting stars. On the 27th of November, 1885, we beheld a new conflagration of the heavens. Here, then, we have a demonstrated collision between the earth and the debris of a comet—a collision that will be repeated under the same conditions in 1898, a fact that has furnished an improvised scientist an occasion to announce the end of the world at that date. Let us hope that fate will protect our globe for numerous ages by preventing it from running against a good, healthy comet, and let us see what are the

OTHER DANGERS THAT THREATEN TERRESTRIAL LIFE.

Before reaching the present period of its history, the earth passed in succession through great geological phases, during which its continents and seas were several times deranged by the internal forces that its nucleus of matter in fusion developed. None of these revolutions has been able to destroy the powerful germs of life, and it is to-day more impossible than ever for a geological cataclysm to cause such a result.

The most important of the historic catastrophes of this kind is contemporaneous. We refer to the gigantic eruption of Krakatoa, in 1883, which claimed 50,000 victims, and totally transformed the configuration of the strait of Sunda. Despite their great violence, such phenomena are always local, and consequently without untoward influence upon animate beings collectively. The internal activity of our planet is now greatly reduced. So the earth has entered upon the calm period of its existence. A rapid examination of this progressive diminution of internal energy is to lead us to a particularly rational solution of the problem of the world's end.

When the solid crust of our globe formed, it surrounded an incandescent fluid spheroid, which afterward condensed toward its center under the action of cooling. In measure as it contracted this nucleus diminished in volume, and the external covering gave way in places, and cracked in order to follow the motion of shrinkage. It is in this way that were produced the large folds that formed the principal reliefs of the surface. Consequently, the terrestrial crust, having become thicker, will be covered with enormous crevasses through which the oceans and atmosphere will be gradually absorbed in the numerous internal spaces.

The surface of the moon, deprived of air and water, with the immense furrows that traverse its plains and mountains, presents the spectacle of this beginning of rupture, for our satellite is more advanced in development than the terrestrial globe.

Having passed this stage, the dead star, cracked in all directions, will break in pieces, and the fragments will be scattered along its orbit.

This destiny of the earth is still a thing of a very remote future. Yet it seems as if the natural evolution of our globe will cause the disappearance of life long before the extinction of the sun. It is, moreover, easy to see that in the geological epochs lost in the night of ages the vital forces were more powerful than those of our day. We have a proof of this in the exuberance of life that then gave birth to animals and plant beside which the present gigantic beings are but dwarfs.

The day on which, through such general weakening of vitality, man will have fallen into a physical decadence that his refined intelligence will not be able to supply the place of, will probably be also the day on which the last representatives of our race and of the entire creation will have to live in the bowels of the earth in the pursuit of air and water, which will slowly descend toward the center of the earth.

Deprived of atmospheric fluid, the surface of the globe will thereafter have for temperature only that of interstellary space, say a hundred Centigrade degrees below zero! And while our human race will be reimmersed in the nihility from which it had emerged for a few thousands of centuries, other humanities will succeed one another upon the innumerable stars that people infinite space.—*Jacques Leotard, in La Nature.*

Climbing Snakes.

My farmer friend, Hiram Carpenter, who lives three miles out of town, invited me to call at his place and see where he found a snake four feet and three inches in length and one and a half inches in diameter. The swallows nest under the eaves of his barn, which project some twenty inches from the building. The rafters do not run out more than one-half or two-thirds of this distance, the space between them being quite thickly studded with the mud nests of the swallows. One pleasant day in June his son noticed quite a commotion among the birds, and called him to the spot. They were amazed to see a large snake clinging to the end of a rafter, with its head in one of the nests, evidently devouring the young birds. The reptile was able to cling to the end of the rafter by hugging it tightly, and was only dislodged after some effort. It had swallowed two young birds, and another was part way down its throat. The young man had not "believed in killing snakes," but on this occasion he dispatched the reptile forthwith. The barn is sheeted up with rough pine boards, upon which there are two coats of paint, and from the ground to the point whence the snake was dislodged the distance is nineteen feet and four inches. How it managed to get to the spot seems altogether a mystery. There was no hole through the side of the barn nor under the roof boards, nor did it seem possible for it to have worked its way from the top of the roof. Then, it was quite as difficult for it to have found a way to the roof. Mr. Carpenter is a most reliable observer of all natural phenomena—an investigator, really—but he was unable to form any opinion as to how the reptile reached its prey. He described it as resembling the common garter snake, except in the matter of its great size, hence I could form no idea as to the species to which it belonged.—*Charles Aldrich, Webster City, Iowa.—American Naturalist.*

Our Great Debt to Science.

There are many thousands of short-sighted people that raise a utilitarian cry against the investigators in pure science. Yet these people use the telephone, the telegraph, the electric light, ride on electric cars, and sigh for further applications of electricity to the needs and uses of everyday life. But they never think of Galvani and his frogs' legs. Take out of the world all that science—studied for the pure love of it—has done, and the habitable globe would be in just the state of uncivilization that Central Africa is to-day. Science does not create labor, nor the industries flowing from it. On the one hand, science is the progeny of the industrial arts; on the other, of the experiences and perceptions that gradually attach themselves to these arts. Industrial labor is one of the parents, and science is the child; but, as we often see in the commercial world, the son becomes richer than the father, and raises his position. Man is the ward of science, and from his necessities spring the industrial arts; the mole can mine and tunnel under the ground; the tailor bird can sew; the fishing frog can throw out a line and bait that nature gives him; the beaver can plaster his house; the spider can spin and weave; but neither in his hands nor feet has man the tools for such work as he must perform in order to live. How have the arts received their great impulses from science? In the early ages the raw material at hand led to its industrial application; and later on the country possessing the raw material became impressed with the character of its industries. The mound builders of America became coppersmiths, because they found native copper, which they considered a variety of stone, and chipped and hammered it into tools without knowing how to forge it hot. Savages living out of the region of native minerals became workers in stone, flint, horn, bone, or shell.

As civilization advanced and commerce became established, the mere possession of raw materials was not the only condition of industry. Possessed of what they considered good weapons, barbarous nations broke through the barriers that shut them from the outside world. While the Thracians were scalping their enemies, and spending much time in tattooing their bodies, their neighbors the Phenicians, sailing the Mediterranean as the Tyrians had done before them, found their way out into the Atlantic, and thence to the British Isles. The natives of these isles, dressed in skins, and with their bodies daubed over with yellow ocher or woad, were living and fighting over mines of tin and other minerals that they knew not of. The Phenicians found these mines, took back tin and other minerals with them, and established metallurgic industries. They were acting under the guidance of an infant science. As intelligence rose in the British Isles, and an initiatory science was developed from industrial pursuits, the people no longer sold their raw mineral material to distant nations, but manufactured it for themselves. So long as the growing intelligence of a nation equals or exceeds that of any neighboring nation, its prosperity is secure. The moment any nation allows the intellectual element of production to fall below that of its neighbors, a mere local advantage no longer insures superiority. Science and commerce having opened up paths of rapid intercommunication around the globe, the cost of carrying raw material is lessened; and, given an intellectually inferior nation with raw material, the intellectual superiority of another nation far outbalances the possession of that raw material. Intellect is the great factor in commercial success, whether of individuals or nations. Take the case of the skilled bricklayer and of the hod carrier; the first is using brains in his work, the second is using brute force. When he goes up the ladder with his hod of bricks, he has to carry also his own weight—thus wastefully expending force. Some one notices this, and substitutes for the brute force of the human that of the horse; then the horse is displaced by the mechanical force of a steam engine, which can do the work of fifteen men or of two horses in the same time. Coal converted into heat is doing all the work. The coal mined each year in the United States represents in actual work more than the sum of the force of the total population of the globe, assuming all to be strong men. Thus the substitution of a natural force for human power vastly increases the productive capacity of the human race. Guided by an intellect taught by science, the natural forces can do in a few hours what the unaided labor of many men could not do in a lifetime. It was not prophecy, but a flash of genius, that drew from Stephenson the assertion that it is the sun that drives the locomotive engine, by being liberated from the coal in which it has been stored for ages. But man can neither create forces nor endow anything with properties; all that he can do is to convert and combine them into utilities. The man that does this with knowledge is spared the dismal failures of ignorance, but he that tries to use powers without understanding them is inevitably punished for his rash presumption. It is this presumption that causes the mortality and disease that follow in the wake of civilization. Natural law, like the civil, never admits ignorance as an excuse.

In this century three scientists have revolutionized commerce—Oersted, of Copenhagen, and Faraday and Wheatstone, of London. It was of Faraday that Huxley said, in effect, that any nation would do well to spend $500,000 in discovering such a man, and an equal amount in educating and setting him to work. Bessemer, studying away at steel, has revolutionized ship building. Dr. Joule's studies in the mechanical equivalent of heat produced the compound engine, by which the necessary amount of coal for carrying a given cargo has been reduced more than forty times; that is, a steamship that in 1850 carried a cargo at an expenditure of 14,500 lb. of coal to a ton now does the same work by burning about 350 lb. Joule's studies in heat have made it possible for a cube of coal that will pass through a ring the size of a 25 cent piece to drive one ton of cargo for two miles in one of the most improved steamships. In 1880 the rate on grain from New York to Liverpool was 9¼d.; in 1886 it was 1d. a bushel. The reduction was primarily due to the scientist Joule. Every time we strike a match we are indebted to the men that have studied science for the mere love of it. The men that worked away at coal tar "just to see what was in it" made the whole world their debtors by discovering alizarin, the coloring principle of madder. And to these men the world is indebted also for aniline, antipyrine, and more than a hundred other coal tar products. Scientists, wondering what was in crude petroleum, found paraffin and vaseline. Pasteur wondered what caused fermentation; he found out, and brought a new era to wine making. The singing and dancing of a tea kettle attracted the attention of a brain, and we have as a consequence all the applications of steam. The swinging of a chandelier in an Italian cathedral before the eyes of young Galileo was the beginning of a train of thought that resulted in the invention of the pendulum, and through it to the perfecting of the measurement of time; and thus its application and use in navigation, astronomic observations, and in a thousand ways we now pass by unnoted, has been of such practical and unceasing value that the debt to scientific thought, even in this one instance, can never be known. Science, in its study of abstract truth, is ever giving to man new beginnings. While the devil is engaged in finding mischief for idle hands to do, science is eternally at work finding something useful for them to do. Perhaps not eternally, but so long as there is an earth, so long as there is a human race, and so long as there remains unrevealed one secret of nature, there will be the scientist studying for the pure love of investigation, and discovering abstract truths that shall benefit humanity. If the world shall ever be at peace in a brotherhood of mankind, that peace will owe its existence to the student of nature—the scientist. Science is knowledge; art is skill in using it. A principle of science is a rule in art. Art may make mistakes by wrongly applying or by ignoring the truths of science. Railways, ocean steamships, all the uses of steam and electricity, gas, our huge buildings, our manufactories, and all that adds to our material comfort, are due to the practical application of scientific principles.—*Chicago Herald.*

A Precocious Musician.

A remarkable young musical wonder has just been brought to the notice of the music-loving public of Chicago. She is little Elsa Breidt, the five year old daughter of Julius Breidt, of 2510 Cottage Grove Avenue, a jeweler and watchmaker. Her mother says that when she was two years old, the child began to sing airs that any one might be playing at the piano. When the little girl grew larger, she used to climb up on the piano stool and strike the keys as if she had been taught how to do it a long time ago. She immediately learned to play chords, and before she was three years of age could carry parts of airs correctly. Half a year later she played accompaniments to the violin, and when she was little more than four years old she began to compose or improvise. Her mother says: "One day there was a terrible rain and thunder storm, and when it was over Elsa went to the piano and played the wildest sort of an air, that almost brought the storm and its music back to me. She will get up on the piano stool and begin singing softly some measures or strains that have come into her head, and after humming it over several times she plays it. That is the way she composes her pieces. If I play sentimental or lively music, it affects her strangely; in fact, we cannot play pathetic airs, as the tears come to her eyes, and she is much agitated. She enjoys herself much as other children do, but if she hears the sound of music she will stand listening with mouth, eyes and ears wide open. Any ordinary composition she can play almost absolutely correct after having heard it once."

The father and mother of the little girl have been unwilling to have her obtain notoriety, but some music teachers who know of the little one's genius have told others about her. Lily Lehmann, D'Albert, and most of the local musical world have heard the child play. D'Albert wants her to go to his home in Germany and receive a thorough musical education. When he was here, Elsa played for him. The great musician declared that her genius was wonderful. The other day she played for a party of critics. First she gave a selection from Schumann. The execution was pronounced marvelous, and after the child had finished with an improvised little melody of her own, the musicians went into an ecstasy of praise. One of the best things she did was to play an "Ave Maria." Although it had been weeks since she had touched the Bach-Gounod composition, she gave it without missing a note or sounding a false one.—*N. Y. Sun.*

The Decay of the Mechanic.

The good machinist is in demand, and the situation seems to indicate a majority of vacancies and a minority of men. The particular type of skilled article that is wanted is hard to find, and the difficulty increases rather than diminishes. One of the causes lies in our modern methods of industrial education. The subdivision of labor, for the purposes of increased production and a cheapening process, has sectionalized our skilled industries; each man has his place in the alignment, and becomes just what the manufacturer wants to make him—a specialist in a certain department. His skill is consequently limited, and his knowledge of a trade confined to the hole in which he acts as a stationary peg. The effect of this, in a general sense, degenerates the tone of industrial ambition, and the man that can command good wages with but one qualification is not likely to double the original stock. In our present system of industrial economics the specialist may be indispensable, but the all-round and thoroughly instructed artisan will always be in demand, and the perpetuation of this rare article be an industrial policy. This can be best secured by an improvement in the system of apprenticeship and less of the shop legislation that in some cases interferes with the rights both of the employer and the apprentice. The attempt to run a young hand in the old rut of skill and product is not wise. A trade is best protected by the excellence of its work, and that mechanic is the most independent who is the best master of his business. A botch workman is an incubus on master and man, and his protection by the union to which he may belong has involved the trades in bitter strikes and much loss.

Our industrial development has made such rapid strides and assumed such enormous proportions that it has necessarily incorporated many incompetent and untrained workmen, who under other circumstances would not have found their way into the higher departments of skilled industries. The consequences are apparent, and the complaint of inefficiency is general. We note some wise and weighty words on this subject in an address delivered by President Penton at the convention of the Brotherhood of Machinery Molders, held in Indianapolis, August last. He says: "It is to be hoped that this convention will see its way clear to take some action toward the establishment of a more regular and uniform apprentice system. Employers in all directions are complaining of the difficulty of obtaining competent mechanics, a trouble arising mainly through the entire lack of any system of educating or teaching apprentices. Large numbers of the so-called molders in the country have picked up a few ideas here and there, and after a brief experience, perhaps in a stove or bench shop, undertake 'to travel,' filling the places, in some instances, of more competent workmen, thus injuring the standing of the trade, and preventing its being learned by those who would develop into good workmen under proper training. An effort should be made to secure the co-operation of employers in the adoption and enforcement of some general system."

This advice is sound and the counsel wise, and its industrial indorsement is the only practical escape from a threatened evil. The younger and coming type of mechanic must not be less than his predecessor in skill, or the pre-eminence of America in mechanics will be a thing of the past, and the art that commanded good wages will be so fractionalized and limited that the less of skill the less of pay, etc.—*Age of Steel.*

Botanical Notes.

Influence of Altitude on the Development of Plants, M. Gaston Bonnier.—The author has observed that the amount of carbon dioxide decomposed by plants increases with the altitude. Plants cultivated in an Alpine climate undergo a modification of their functions such that the chlorophyllian assimilation and transpiration are augmented, while respiration and transpiration in the dark appear little modified or slightly diminshed.

Chlorophyllian Assimilation, M. Henri Jumelle.—The author has investigated the difference of physiological functions in the leaves of the green and red type of such trees as the beech, sycamore, elm, etc. He finds: 1. In trees with red or coppery-colored leaves the chlorophyllian assimilation is always more feeble than in trees of the same kind having green leaves. 2. The intensity in the copper beech and purple sycamore is only about one-sixth that of the ordinary types of the same trees.