

# SCIENTIFIC AMERICAN

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## TESTING THE PARTS OF A MODERN BICYCLE.

The American bicyclist has become a most exacting judge of the qualities of a wheel. He insists on perfect finish, silent running, and lightness, and at the same time, on good roads and bad, gives the wheel the most severe trials imaginable. In England and on the Continent riders are perfectly satisfied with wheels weighing from 30 to 50 lb.; here bicycles must weigh from 18 to 26 lb. The consequence is that American wheels must be of the highest standard, or they will be accounted low grade by the rider.

To meet this condition of things, the Pope Manufacturing Company, the makers of the world-famous "Columbia," have established a system absolutely unique in the bicycle world; namely, a testing department, where every article which enters into the con-

struction of a bicycle can be tested with the highest degree of accuracy. Samples of the tubing are subjected to direct and vibratory strains to see if it possesses the desired mechanical qualities, and analysis of the same sample shows how far those qualities are determined by, and can be predicated upon, chemical composition. Steel balls are broken to test what they will stand; cranks, sprockets and chains are experimented with to ascertain the best shape and material for each. Spoke wire is fractured and its data are fixed.

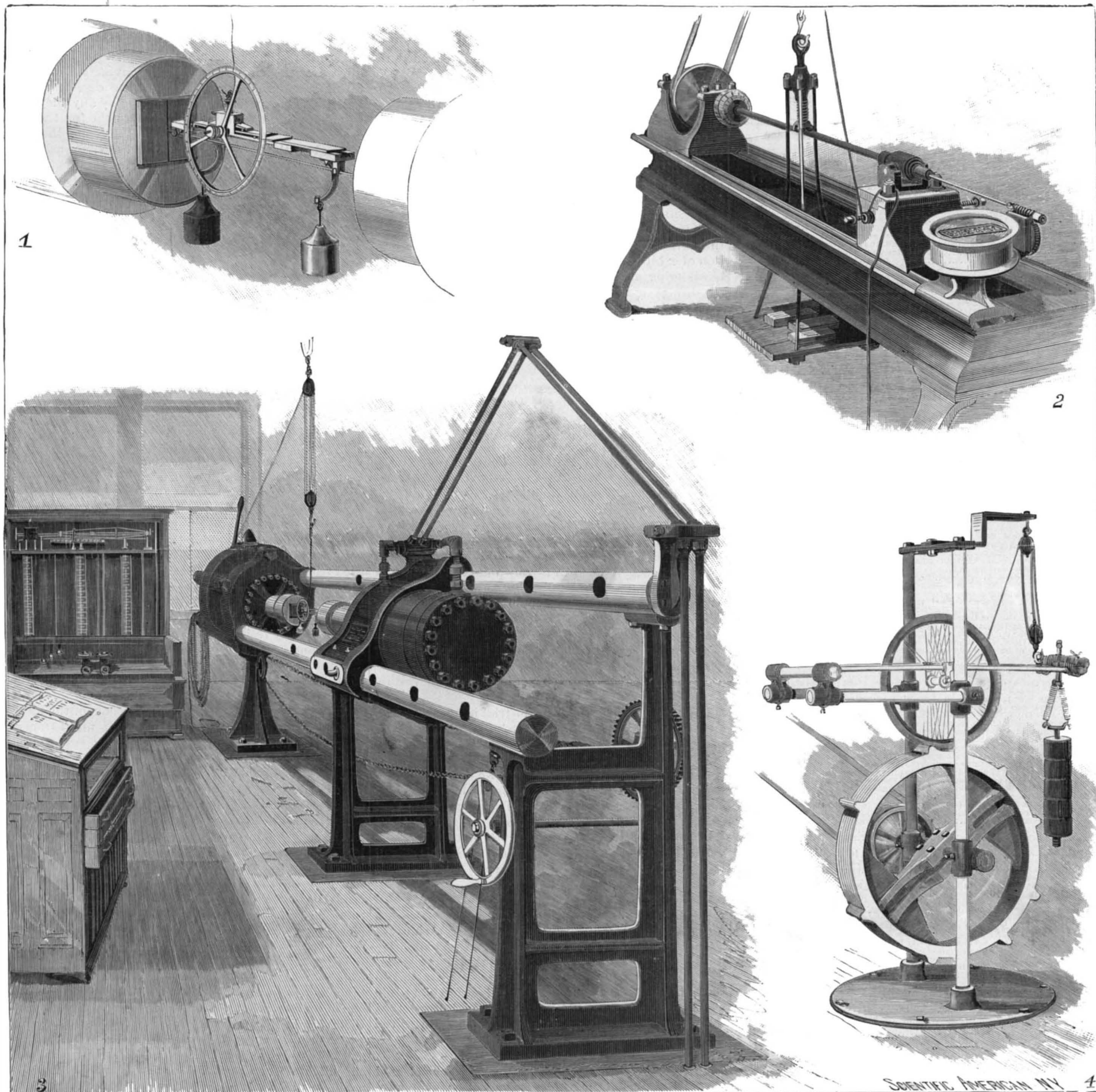
The greatest difficulty encountered in bicycle building is in maintaining the model originally designed in unvarying exactness of strength and material through hundreds and thousands of machines. It requires the highest engineering skill and the widest mechanical knowledge to design a bicycle that will run with

smooth accuracy under all sorts of varying conditions, but, when this is done, what assurance has the buyer that the machine he receives is an exact duplicate of the original so carefully designed? Only the most rigid testing of materials and sample parts through all the processes of manufacture can prevent the substitution of inferior material or variations from prescribed pattern. Of course no such test will be satisfactory which does not destroy the piece tested, and so samples picked at random are used for the purpose.

With the heavy wheels of a few years ago, such painstaking tests as are now deemed essential to determine the exact material and construction of every part were not required, but with the modern wheel the pleasure of the rider, and his safety, depend upon it.

The accompanying illustrations clearly show the de-

(Continued on page 23.)



TESTING THE PARTS OF A MODERN BICYCLE.

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(Illustrated articles are marked with an asterisk.)

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Price 10 cents. For sale by all newsdealers.

Table listing contents of the supplement, including 'I. ARCHAEOLOGY', 'II. AUTOCARS', 'III. CHEMISTRY', 'IV. CIVIL ENGINEERING', etc., with page numbers.

THE PRIZE ESSAY COMPETITION.

Our readers will be pleased to know that, judging from the number of essays submitted for examination, the competition has been a great success.

We would call the attention of our readers to the card published in another column concerning what invention introduced within the last fifty years has conferred the greatest benefit upon mankind.

THE PARIS EXPOSITION OF 1900.

Exhibitions have come thick and fast in the closing years of the nineteenth century. The more frequent industrial displays of States, cities, and provinces have been the background which has served to show up the stately splendor of the less frequent international fetes.

Yet, as a matter of fact, before the blackened remains of the Chicago Fair are well cleared away, it is announced that the arrangements are complete for what is to be the most elaborate and brilliant industrial display of the century.

It is to be hoped that our Congress will deal liberally with the question of a subsidy to cover the expenses incidental to a worthy national representation at the Paris Exposition.

The time has come in our industrial history when we are beginning to turn our eyes abroad and push out more actively into foreign markets.

Many distinctively American products, whose market is at present exclusively American, would be found to be equally adapted to European needs, if a trial were once made.

THE secretary of Smithsonian Institution has leased one of the tables at the Naples zoological station for another three years for the benefit of American students.

A Singular Mode of Incubation.

It is well known that the Australian megapod is a bird that is accustomed not to sit on its own eggs. In certain parts of Australia are found numerous mounds of considerable size and height, which the first explorers took to be burial mounds.

Experiment with Rotary Motion.

An interesting experiment described in Invention illustrates the stability given to a moving body by rotating or spinning it rapidly, as in the case of a rifle bullet. The experiment can be made by any bicyclist when cleaning his wheel.

How Colds are Taken.

A person in good health, with fair play, says the Lancet, easily resists cold. But when the health flags a little, and liberties are taken with the stomach or the nervous system, a chill is easily taken, and according to the weak spot of the individual, assumes the form of a cold or pneumonia.

Luxury is favorable to chill taking; very hot rooms, feather beds and soft chairs create a sensitiveness that leads to catarrh. It is not, after all, the "cold" that is so much to be feared as the antecedent conditions that give the attack a chance of doing harm.



**A New Secular Version of the Bible.**

A new English version of the Old Testament, from a text corrected by comparison of the best manuscripts, has for some years been in preparation by the Johns Hopkins Press, says the Baltimore Sun, under the supervision of Prof. Paul Haupt, of the Johns Hopkins University, and by the end of the present year a number of the books composing the Hebrew Scriptures will have been published. A feature of the enterprise is that it is not in the hands of theologians. It is purely a secular work, and the only aim has been to get, first, a correct text, and then a correct translation, without regard for its bearing upon any creed or scheme of unbelief. Since the time of King James, when the received version was made, many new helps to the right rendering of the Hebrew text have been discovered. Semitic scholarship has made great advances in methods as well as the acquisition of ampler materials for comparison, elucidation and study. By the coöperation of Semitic scholars of the whole learned world, Prof. Haupt has secured a Hebrew text which is being printed at Leipzig. It is printed in colors, the same page having sometimes as many as four colors, each color denoting a different element in the construction of the text. A single line may contain several colors to distinguish the undoubted original from portions that are in doubt. The fact that parts of the same book belong to different periods or authors will also be indicated. For example, in the book of Leviticus the "Priestly Code" will be in black letters on a white background. The parts added later will have a brown background and the Law of Holiness will be in yellow. Interpolations are indicated by overlining. Where the original is poetry this will be indicated in the translation.

After securing a perfected text the various books were allotted to the most learned Orientalists of this and other countries for translation, the book of Ecclesiastes being allotted to Prof. Haupt. In a recent issue of the New York Journal an article by Rudolph Block compares the new version of chapter xii of Ecclesiastes with the old with some interesting results. The chapter is chiefly an exhortation to the cheerful enjoyment of the good things of life, with an allegorical conclusion in which the decay of the several faculties is ingeniously depicted. Everyone recalls the familiar passage, "Remember now thy Creator in the days of thy youth, while the evil days come not," etc., and the following passage: "In the days when the keepers of the house shall tremble and the strong men shall bow themselves and the grinders cease because they are few and those that look out of the window be darkened." In the new version this runs:

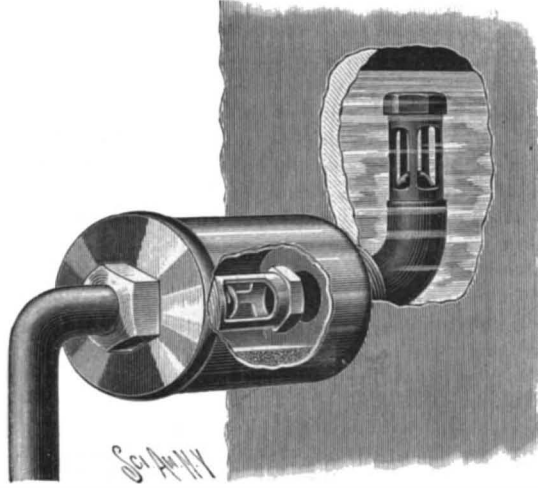
Remember thy wife in the days of thy vigor,  
Ere there come the days of evil,  
And the years draw nigh  
In which thou wilt say I have no pleasure.  
Ere is darkened the sun and the light of day,  
And the moon, and the stars,  
And the clouds return after the rain,  
When the keepers of the house tremble,  
And the men of power bend themselves;  
The grinding maids cease  
And the ladies that look out through the lattice are darkened.

The meaning is plainer in the new version. "Ere is darkened the sun," the professor says, refers to the sunshine of childhood, when all is bright. The "moon" suggests the tempered light of boyhood, while the "stars" indicate fewer moments of happiness in mature age. As age advances there are many days darkened with rain "and the clouds return after the rain," so that there are few bright moments. The "keepers of the house" are the hands. As age proceeds erectness of carriage is lost—"the men of power bend themselves." Man loses his teeth, which are "the grinding maids," and his eyes grow dim—"the ladies that look out through the lattice are darkened." The old man's sleep is short and "he rises at the voice of the birds." The "daughters of music are brought low" means that the sense of hearing is lost. The septuagenarian dislikes to go upstairs or climb a hill—he is "afraid of that which is high." His hair becomes white—"the almond tree blossometh." The pessimism of the chapter is intensified in the concluding line of the new version, "All is vanity and all that is coming is vanity."

THE College of Civil Engineering at Cornell University is engaged in the determination of the longitude of Cornell. They are working conjointly with the United States Naval Survey and Harvard University. Two officers of the naval survey are stationed at Washington, D. C., for accomplishing this purpose. The astronomical observations at the three places must be carried on simultaneously, and great difficulty is experienced in getting nights which are sufficiently clear at all three places. Twenty stars are to be observed, in sets of four each night, and ten nights of simultaneous observation will be required to complete the work. The Cornell observer will then go to Washington to correct his personal equation, after which all the three sets of observations will be reduced to a common standard of time, and the special relation of Cornell to the rest of the universe will be determined with final accuracy.

**SAFETY CHECK FOR BOILERS.**

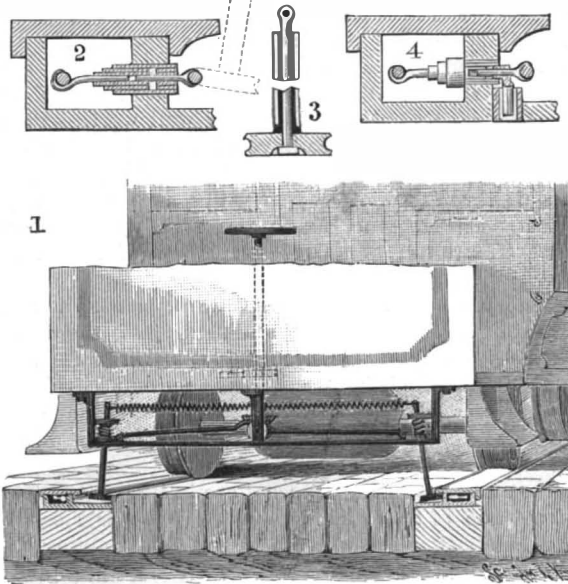
The safety check shown in the illustration has been patented by Mr. Frank Albin, of Dodge City, Kansas, and is especially intended for use on locomotive boilers. It consists of an exterior mud pocket, which is threaded into the shell of the boiler, and receives at its outer end the injector pipe. The mud pocket is closed by a threaded cap which is perforated, and on the inner side is extended to form a valve cage in which is located a ball valve. The passage from the mud pocket to the boiler terminates in a short elbow which is screwed into the neck of the pocket and extends upward within the boiler, where it terminates in a ball valve similar to that in the pocket. The feed water, in passing through to the boiler, will deposit any solids and foreign matter which it may contain, within the mud pocket, where it will collect and settle. It

**ALBIN'S SAFETY CHECK FOR BOILERS.**

will be seen that the ball valves will prevent the return of water from the boiler, and should the mud pocket be broken off, the valve on the inside of the boiler will effectually prevent the terrible effects which ordinarily follow from the escaping water and steam in the event of collision. The inner ends of both the valve chambers are closed by spanner nuts, and the various connections are threaded, so that the device is easily taken apart for inspection. The valve in the interior of the boiler, moreover, enables the mud pocket to be opened and cleaned at any time when the boiler is under steam.

**THE DUCT TROLLEY RAIL.**

The device shown in the accompanying illustration is intended to dispense with overhead conducting wires, or the underground duct, as commonly used on electric railroads; and its construction is such that leakage of electricity is prevented, and the danger of accident to persons or horses in crossing the tracks is entirely removed. It has been patented by Mr. Charles Sill, of 301 West 12th St., New York. Each rail contains a continuous longitudinal duct, in which is carried the

**THE DUCT TROLLEY RAIL.**

conductor, and on the inner side of the rail is formed a recess, in which is carried a sectional trolley wire which is engaged by a trolley wheel, whose rod is adjustably mounted in a bracket attached to the under side of the car. The upper ends of the trolley rod are drawn together by the tension of a coil spring, and they terminate in wires which lead to the motor, the action of said spring serving to keep the trolley wheels in contact with the trolley wire. The conductor and the trolley wire are normally disconnected, and they are automatically connected as the car passes along the track. This is done by means of a contact making and breaking device, which is adjusted in the inner web of the rail and consists of two rods, one of which carries the conductor and the other the trolley wire, said rods being normally held apart by the tension of

a rubber spring. These rods are carefully insulated from the rail, which carries them, so that only upon their being brought into contact with one another by the pressure of the trolley wheel as it passes can any circuit be formed between the conductor and the trolley wire. The transversely extending rod which carries the trolley wire is slidably supported at the upper end of a vertical rod, which is carried by the base of the rail, and carefully insulated therefrom. The whole of the insulation is carried out with great care, and the construction is such that all moisture is excluded from the conductor and leakage prevented. The trolley rod is hung pivotally on the upper arm of the above mentioned bracket, and has a rocking motion transversely to the car, in a slot in the lower arm of said bracket. The trolley rod is joined by a connecting rod to a crank disk, secured on a shaft extending longitudinally to the car, which is connected at each end by bevel gear wheels with the controller shaft on each platform.

By turning the controller in one direction, the crank disks operate to press the trolley rod wheels against the trolley wire, and thus push its carrying rods into electrical contact with the carrying rods of the conductor within the rail duct, thereby forming a temporary circuit on that particular section of the track, during the passage of the car. A coil spring, engaging the trolley rod and the two carrying brackets, allows sufficient vertical adjustment to meet the irregularity of the track or the passage of the car wheels over an obstruction.

**The Heat Conducting Power of Metals.**

After a thorough investigation of this subject, Herr W. Beglinger has arrived at the following conclusions: The results show that the heat conducting power of the different kinds of iron is altogether different. It is, therefore, of the greatest importance to know the coefficient of the inner heat conducting power. Steel and wrought iron show a more uniform behavior in this matter than cast iron. It is not confirmed that hardening reduces the conducting power of steel by almost one-half, though it may be conceded that hardening will reduce it slightly. The difference in working, by forging or rolling, showed only in one case, with wrought iron, considerable differences for the conducting power. Casting seems to cause far more irregularities.

Wrought iron showed generally better conducting power than did steel. Herren L. Holborn and W. Wien have compiled a table showing the heat conducting power of the different values. The average value for the different kinds of iron and steel is given. The factor, R, indicates that through a plate of 1 centimeter thickness at a difference of temperature of 1°, for 1 square centimeter each, a quantity of heat passes which will increase the temperature of R gramme of water by 1°:

Copper.....	R = 0.918
Iron.....	R = 0.156
Steel.....	R = 0.062 to 0.111
Zinc.....	R = 0.292
Tin.....	R = 0.150
Lead.....	R = 0.079

**Aluminum Glass.**

M. Leon Appert, the distinguished glass expert, has contributed to the *Moniteur de la Ceramique et de la Verrerie* an able article in which he discusses the prominent part which, he thinks, alumina is destined to play in the manufacture of glass. "After having made numerous analytical tests of ancient window glass," says M. Appert, "I have arrived at the following conclusions, which appear to be of practical industrial value. The introduction of alumina into glass prevents or at least retards devitrification, which will occur always by the slow and repeated lowering of the temperature. The presence of alumina makes it possible that a part of the alkaline bases, soda or potash, may be replaced advantageously by an equal quantity of lime. Glass thus modified in its composition is more solid, less changeable and more elastic. The alumina can be added to the silica without any inconvenience in a proportion not exceeding 7 to 8 per cent. The fusibility of glass is slightly increased thereby, while its ductility is not sensibly diminished. The only inconvenience that can arise from the use of aluminum is that it will color the glass to some extent. This coloring does not result from the alumina itself, but from the action of the iron oxide, which is always found in it when in an impure condition. To sum up, the use of alumina, which permits its introduction only into bottle glass containing larger proportions of sand bases, should be extended equally to glass destined for other purposes, such as mirror glass, window glass, and especially drinking glasses. The quality of such glass would be greatly improved thereby. In the latter case the addition of alumina could best be accomplished if pure clay or, still better, if feldspar is used, which can be obtained at a low price. For the batch the purest materials possible should be selected among those destined to furnish the silica, soda and lime bases."

**THE SHEFFIELD MOTOR VELOCIPEDE CAR.**

This device is essentially a double gasoline engine, mounted on the Sheffield velocipede car, that is so familiar to all railroad men. To adapt the car to the purpose advantageously, some changes were of course necessary, but the general features of the car are retained.

While the car is light, the weight being under 250 pounds, it is exceedingly powerful, the motor being amply strong to carry a load of two men up any ordinary grade, and will run at a speed of 15 to 20 miles per hour. This, however, is not the limit of speed, as it can easily be run faster than is safe for so light a car.

The engine is a double one and has cylinders of proper size, fitted with trunk pistons, and is so arranged that an impulse or propelling movement is given the axle at every revolution. This impulse comes from the explosion of the proper mixture of air and gasoline vapor in the cylinders by an electric spark.

The gasoline is carried in a sealed copper reservoir, which will contain enough to run 75 miles of average road, though, of course, the conditions of grade or strong head winds may make it necessary to replenish sooner, a supply being carried in additional reservoir for the purpose. Proper mechanism regulates both the admission of gasoline and air to the cylinders, so that the proportion of each can be varied, which is important, and the device is therefore so constructed that the operator can see exactly how much of each is being used and can control them separately by suitable levers within convenient reach.

The spark is supplied by hermetically sealed chemical batteries and increased by suitable developing coil.

A hand switch makes the connection, closing the circuit at will. The mechanism operating the sparking or contact points is exceedingly simple, and made of casehardened steel.

It is, therefore, hardly possible for it to get out of order, and the wear on these parts will be very slight.

In starting, gasoline is turned on, the air valve is opened, and the switch closed. It is necessary to run with the car a few steps to get it under motion, when the mechanism becomes automatic and the operator, stepping aboard, has only to regulate the proper amount of gasoline and air, to bring the speed to any desired point. The valve and other mechanism is carried directly upon the cylinders, thus making the engines and their parts self-contained, which is quite important in point of wear.

The leading and driving wheels are equipped with the Sheffield concave steel tires, which constantly tend to hold the car upon the track, even at high speed, although it should be always remembered that there is comparatively but little weight to hold the car down, and it is, therefore, not advisable to run the car at the top of its speed at any time. All wheels have forged steel hubs, wood centers, and steel tires.

The cars will carry two persons with ease, and can carry three in case of necessity. They are designed for the use of roadmasters, for track inspection, telegraph repair work, and whenever there is need for long trips and frequent stops between stations.

The cars are manufactured by the Sheffield Car Company, of Three Rivers, Mich.

ANOTHER powerful illustration of the constant tendency of the mountains to take a lower seat was afforded on May 30, when the village of Veinholz, near Brienz, in the Bernese Oberland, was partly destroyed by subsidence and landslips, caused by natural springs. The roads were destroyed, and railway communication has been interrupted.

**The Influence of Glass on Wine.**

Probably ninety-nine persons out of every hundred, taken at random, would ridicule the idea that the quality of the glass of which a bottle may be made can have any influence on the taste or keeping qualities of its contents. And yet that it does do so we have the best of evidence. We are not alluding to the influence of light shining through the flasks and its action on the substance contained, but the direct

bottles were handed over to a chemist, along with one of the lot purchased for bottling the wine, which had never been used. This is what the chemist found in the glass of the unused bottle: Silicic acid, 52.4; potash and soda, 4.4; lime, 32.1; argillaceous matter, iron, etc., 11.1. In the examination of the bottles that had been used, while the silicic acid and argillaceous material remained constant, or nearly so, the lime, potash, and soda were very much diminished, and it was made evident that they had passed into solution, forming compounds with the acid ingredients of the wine, decomposing the latter and rendering it unfit to drink. There is now a suit pending against the maker of the bottles.—National Druggist.

**Waterways in Germany.**

The interior canal in Germany proposed to connect the rivers Rhine, Weser, and Elbe, according to government investigation, will have a freight traffic of 3,000,000 tons per kilometer (0.625 mile). This insures 3 per cent interest on the investment. The cost of maintenance will be covered by a toll of 1/2 cent per ton-kilometer. Preliminary work has been done on this project for more than thirty years. The construction of the canal is now assured; yet not all opposition has been overcome. The latest protest comes from the Silesian coal mines. Freight on coal from Westphalia to Berlin via canal is figured at 6.96 marks per ton, while the combined rail and water freight from Upper Silesia to Berlin amounts to 9.35 marks, and from Lower Silesia to 7.15 marks per ton. It appears that Berlin consumes 1.5 million tons of coal a year, supplied as follows: By Silesia 1.2 million tons, by England 200,000 tons, Westphalia 90,000 tons, Saxonia 15,000

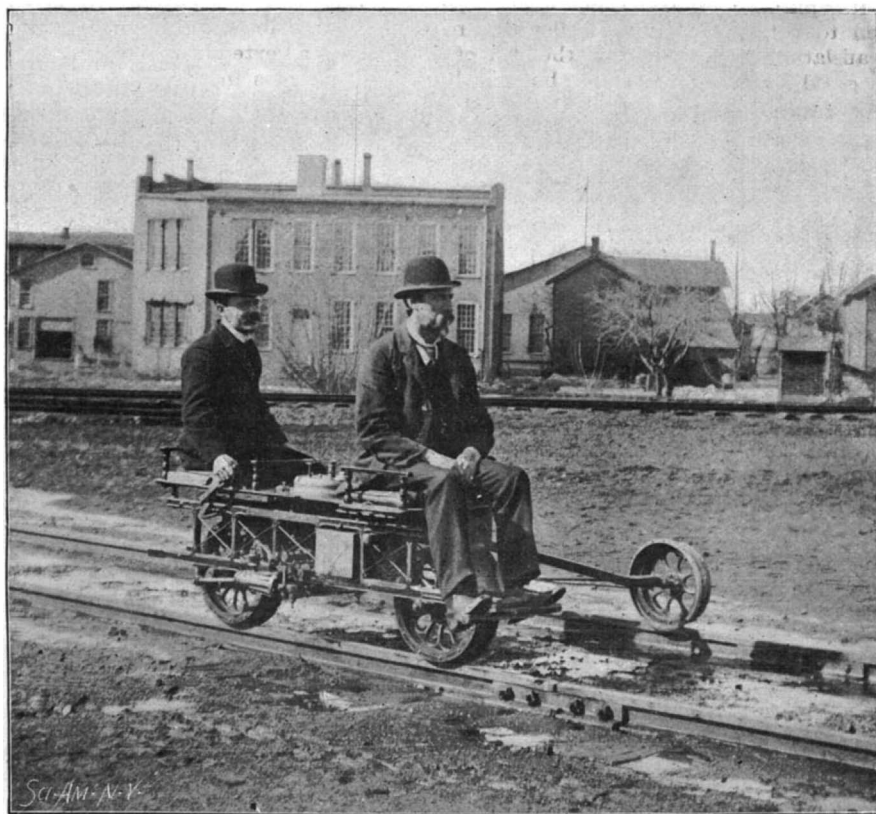
tons. The first effect of the canal would be the exclusion of English coal, so that an increase of the Westphalian business to 290,000 tons would not affect the Silesians. Again, an increase of 20 per cent in coal consumption is expected at Berlin by the industrial development fostered by the canal, where then the waterways from the industrial west will connect with those from the farming districts of the east. Of this increment of 300,000 tons, 200,000 would likely come from Westphalia and 100,000 tons from Silesia, so that the Westphalian coal importation into Berlin might reach 500,000 tons before it would hurt Silesian interests.

On the other hand, the improvements in Silesia of the upper Oder River are now completed, and for the first time, on November 18, 1895, three vessels, carrying 200 tons of coal each, passed the locks at Kosel. It is expected that by the end of 1896 vessels carrying 400 tons will navigate the 40 mile stretch, Kosel-Stettin.—Railroad Gazette.

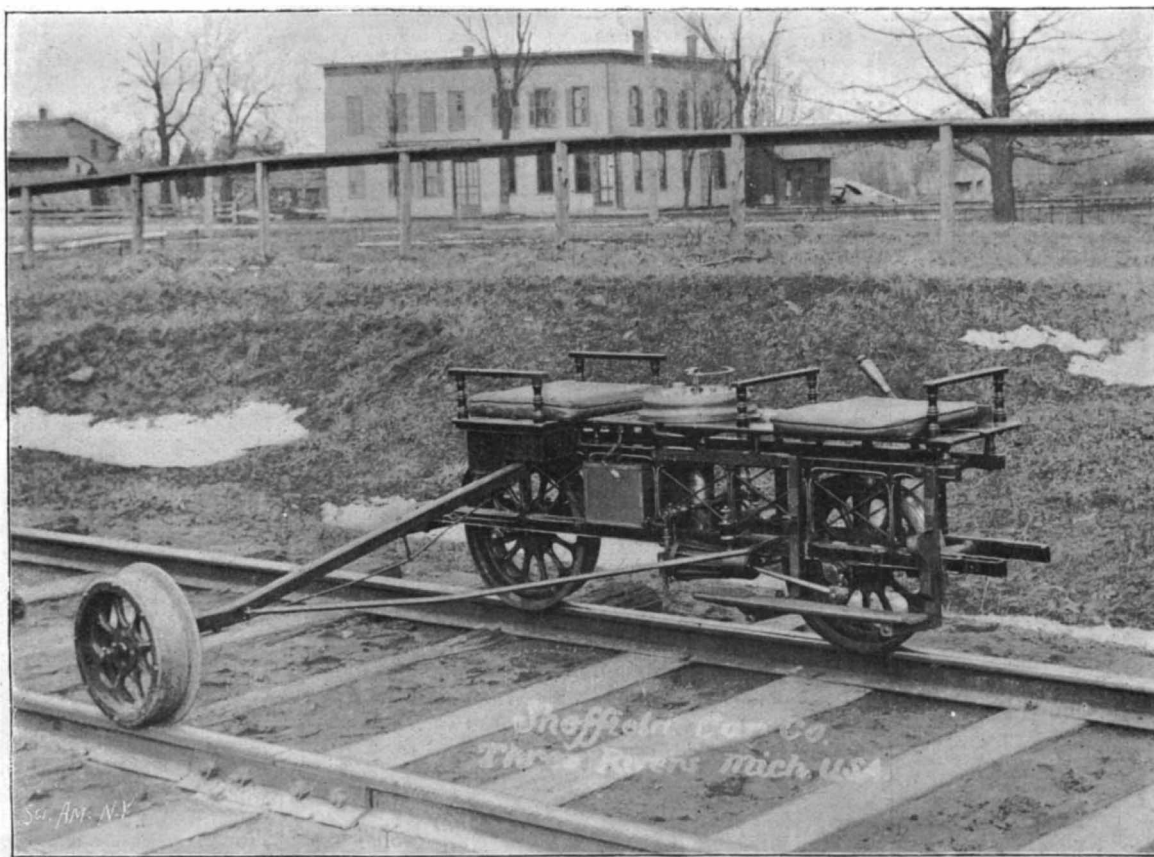
**Thunder Storms at Sea are Nocturnal.**

The greater frequency of thunder storms in the winter and at night around the coast of Scotland has been shown by Buchan, says Science. When thunder storms occur in New England in winter they are generally observed along the coast and after nightfall, as has been shown by records of the New England Meteorological Society. Now Meinardus, of the Deutsche Seewarte at Hamburg, finds even the thunder storms of the Bay of Bengal to have a distinct nocturnal

maximum (Annalen der Hydrog., 1895, 506-511). It has been suggested by Grossmann and others that the cause of this contrast with thunder storms on land probably arises from the dependence of the maritime storms on instability produced by radiation and cooling of the upper surface of cloud sheets, which proceeds best at night, especially in winter nights; while local storms on the land arise from the overheating of lower layers of air close to the hot ground, and this condition has its maximum on summer afternoons.



**RAILROAD INSPECTION CAR PROPELLED BY GASOLINE.**



**RAILROAD INSPECTION CAR PROPELLED BY GASOLINE.**

with the same result. An examination of the stock in the cellar developed the fact that every bottle of the recent purchase was spoiled. A suit was brought against the wine merchant, who declared that he had delivered the article exactly according to the samples furnished. On examining these latter they were found in excellent condition. It is unnecessary to go into details, but during the course of the action at law some of the bottles were produced in court, when it was found that the glass had become opaque. The





## An Inscription on the Parthenon.

Consul Horton, of Athens, writes to the consular department, March 5, 1896: I have to report an archaeological discovery of extreme interest recently made by a student in the American School of Classical Studies, of this city. I refer to the deciphering of an inscription on the architrave at the east end of the Parthenon. The face of the eastern architrave is thickly dotted with small holes, and for many years scholars have been under the impression that these holes were the traces of nails which had once held fast the letters of an inscription. It had also been suggested from time to time that a study of the nail holes might give some clew as to the letters themselves, which long ago were torn down, doubtless for the sake of the metal which they contained.

The difficulty of such a task, which has defied the archaeologists until now, is evident. The architrave is about 100 feet long, and the holes extend over 90 feet of its length. They dot thickly spaces from 3 to 4 feet in length, between which are circular blanks, where shields about 4 feet in diameter hung at intervals. Various attempts have been made, chiefly by German archaeologists, to "read the nail holes." The most notable of the methods employed have been photography and transcribing with the aid of magnifying glasses.

No attempt met with any success until Mr. Eugene Plumb Andrews, of the American School, hit upon a practical method. He threw a rope over the eastern end of the ruined building, and pulled up a rope ladder. Then he suspended a swing in front of the architrave 37 feet from the marble step below, and took what is known as a "squeeze" of the holes. His method was ingenious. Damp "squeeze" paper was first applied to the surface of the stone, and patted well down with a brush. The paper broke through over the holes. Mr. Andrews then forced extra strips into each of the openings and lapped their ends down on the large sheet. When he had thus treated all the holes, he laid another sheet over the first to hold the ends of the strips in place, and pounded all together into one solid sheet, on which the exact position of the nail holes was represented by protuberances.

Mr. Andrews was about one and a half months making his squeezes, twelve in all, representing the twelve spaces between the shields. Then he arranged them in order and began studying them. His greatest difficulty occurred at the start. He did not know whether the inscription ran straight across all the squeezes or whether the squeezes were to be read separately, as the pages of a book.

Moreover, the ancient workman who had nailed up the letters had made numerous mistakes, so that many of the holes were treacherous and confusing.

Mr. Andrews, however, persisted, and light began to dawn. He found, for instance, that three holes placed thus ° ° indicated either a  $\Delta$  or a  $\Lambda$ , the metal letter having been nailed at its three corners, and that three holes placed thus ° ° ° showed where an O had been nailed.

He made a transcript of the squeezes on a long strip of paper, marking the locality of the protuberances with dots, and then attempted to form the ancient letters by drawing lines from dot to dot. Finally, he deciphered the word "Autokratora," which proved that the inscription had been Roman, and not, as formerly supposed, of an earlier date. The word "Nerona" threw further light on the matter.

Here was evidently the dedication of a statue to the Emperor Nero, and the reading was simplified by a study of other similar inscriptions, as the same phraseology is used in all. The inscription, as Mr. Andrews reads it, is translated substantially as follows:

"The council of the Areopagus and the council of the six hundred and the people of the Athenians erect this statue of the Very Great Emperor Nero Cæsar Claudius Sevastos Germanicus, the Son of God, during the generalship over the hoplites for the eighth time of Claudius Novius, the overseer and lawgiver, son of Philinos, during the priestess-ship of . . . daughter of . . ."

It appears, therefore, that the inscription recorded the erection of a statue to Nero, probably in the Parthenon.

As it is known from another inscription that Claudius Novius was general for the eighth time in the year A. D. 61, we have the exact date of this inscription.

Mr. Andrews graduated at Cornell in 1895, and holds the university fellowship for one year. There are at present twelve students in the American School.

## RECENTLY DISCOVERED BUST OF LOUIS XVII.

BY HENRI MORAND.

During the "Reign of Terror," it will be remembered that Louis XVI and Marie Antoinette, as well as their son, the Dauphin, were held prisoners in the Temple. On the 21st of January, 1793, the King was beheaded, and the Queen met with the same fate shortly afterward. The Dauphin was intrusted to the care of the cruel shoemaker jailer, Simon, who made the child the



BOURBON WAX DOLL OF THE LAST CENTURY IN NANTUCKET MUSEUM.

subject of his ill treatment, and, it is said, caused his death on the 8th of June, 1795.

Many, however, believed that the body of a poor boy was substituted for that of the Dauphin, and that, with enormous sums, the Emperor of Austria, his grandfather, succeeded in bribing Simon, who allowed the child to escape to that country, where he was brought up by a village watchmaker, of the name of Neuendorf, who taught him his trade. At the age of twenty, having obtained cognizance of his high birth, he tried to have himself recognized by the court of Austria, but was ignored.



CONTEMPORANEOUS PORTRAIT OF LOUIS XVII.



BUST OF LOUIS XVII RECENTLY DISCOVERED.

He then returned to the village of his youth, married, and later removed to Holland, where he and his family were protected by a

secret hand. The sons of Neuendorf entered the Hollandish army and became officers. In the cemetery of Maestrecht his tomb bears, it is said, the following inscription: "Ici repose Louis XVII, roi de France, né à Versailles le 1785, mort à Maestrecht. Priez pour lui."

A book was published, years ago, by Harper & Company, the title of which was: "Have we a King Among Us?" The story tells us that the Dauphin was taken to Florida and brought up by an Indian family. One day, as the Dauphin was taking a bath, he struck his head against a rock. This accident made him forget

his past history. Later he was adopted by a missionary among the Indians, followed the same profession, and was known as Rev. Mr. Williams.

Nantucket, Mass., has also its "Dauphin" in the "History Rooms," which is supposed to be a facsimile of Louis XVII when a baby. It is a wax doll, natural size, brought back from France by Captain Coffin, to his daughter, in 1789. There seems to be no doubt that the features are those of the Bourbon family.

A few months ago, as some workmen were making room for some improvements in the palace of Versailles, they discovered the defaced bust of a child. The nose, mouth, and chin broken, undoubtedly by the vandals of the French revolution. After many researches by scientific people, Monsieur de Nolhac, the custodian of the Musée de Versailles and author of "La reine Marie Antoinette," discovered, beyond doubt, that it was no less than the Dauphin of France, or Louis XVII, and the work of one of the most distinguished French sculptors of the time, Deseine.

The French government had the mutilated parts restored and it is now in the above named museum.

## Recovery of Silver and Gold from Photographic Residues.

The American Druggist translates from the *Neueste Erfindungen und Erfahrungen* an original contribution by Weidert as follows:

Analysis of finished photographs shows that only a very small portion of the gold and silver used in their preparation remain in the finished print, by far the greater portion of the metals being retained in the baths.

The methods of recovery of silver residues vary with their character. The silver from old fixing baths can be recovered in the simplest manner. By hanging strips of copper or zinc in the baths the silver will be deposited on the strips in a grayish black powder or in small leaflets of a metallic luster. This method, however, is tedious and extravagant, since a large portion of the silver remains in this solution. A somewhat better method is to agitate the bath after the addition of zinc dust, and then filter off the precipitate, wash, and then treat with diluted sulphuric or hydrochloric acid in order to dissolve out the valueless zinc. This process also is not particularly to be commended.

It is generally customary to precipitate the silver with an aqueous solution of potassium sulphide, and drain the brownish black sulphide of silver on a muslin filter and dry it. In order to reduce this to silver, it is fused with calcined soda in a porcelain or graphite crucible and poured upon an iron or marble slab.

The sulphide of silver can also be roasted in the atmosphere, then mixed with three or four parts of potassium nitrate and introduced carefully in small portions into a glowing crucible.

In order to recover the silver from the paper clippings, etc., which have not been "fixed," the paper residue should be cut into small pieces and put for two hours into a bottle where the old fixing bath is kept. This bath is then filtered and treated as above directed.

Since all photographic silver paper contains, in addition to the silver chloride, easily soluble silver nitrate, the first wash water from the toning in particular should be collected and the silver precipitated by the addition of hydrochloric acid and sodium chloride. After drying, this should be reduced in the same manner as the silver sulphide, by the means of potassium or sodium nitrate. One may also pour over this precipitate a five per cent solution of hydrochloric or sulphuric acid, and then hang in the solution a piece of zinc, whereupon the silver is thrown down in the metallic form.

Gold is generally precipitated from the baths by addition of hydrochloric acid and a solution of ferrous sulphate. The gold is thrown down as a brownish

red powder, which should be washed well and fused. Occasionally ammonium chloride is added in excess to the toning bath with some hydrochloric acid. The gold then precipitates out after a short time (if in a warm place and particularly in light) in the form of metallic glistening scales.

A CRUSADE against hokey-tokey has been going on in London for some years past, shocking accounts of the millions of microbes found in the mixture being published from time to time. A member of the health board, however, analyzed a strawberry ice cream bought of one of the most fashionable West End caterers recently, and found that it contained from eight to fourteen million bacteria to the cubic centimeter, among them the bacillus coli, which is a worse record than that of the Italian street venders.



**FIREWORKS AS AN ADJUNCT TO DRAMATIC ENTERTAINMENT.**

The love of show and the spectacular is inherent in human nature. Games and entertainments on a large scale always have appealed to the popular taste. An important factor in such spectacles now is the display of fireworks, in the love of which the American can sympathize with the Oriental. As far back as 1879, Mr. James Pain gave his first spectacular production at Manhattan Beach, one of New York's most popular resorts, and since that time their popularity has greatly increased. It is perhaps more proper to speak of these entertainments as fireworks with dramatic accessories than to call it a drama with fireworks as an accessory; for the raison d'être of the entire performance depends, not on the loosely hung together plot, but on a gigantic display of fireworks, which should be accompanied by enough of realistic stage setting and dramatic performance to give a good excuse for the display. The Pain Pyro-Spectacle Company, of New York City, have a large number of these productions, of which

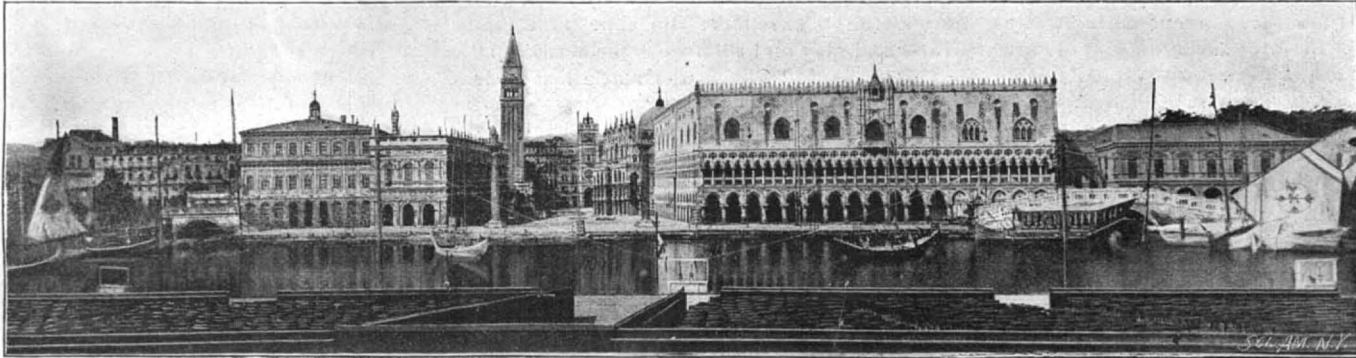
about seven are in use at one time. These are moved about from place to place, so that, in the course of the season, some thirty or forty cities are visited, the length of the stay varying from one week to a whole season. Strange as it may appear, these mammoth plays, as regards their scenery, are interchangeable as in any theater, the grounds in which the scenery is installed being of the same general dimensions in all cases. This, of course, greatly simplifies a change of performance.

An amphitheater is provided for the spectators in a rectangular inclosure which may seat as many as 10,000 persons. These inclosures are usually open to the sky, thus adding to the illusion. The seats slope away until the water is reached. Here will be found an artificial lake, usually 318 feet long and 150 feet

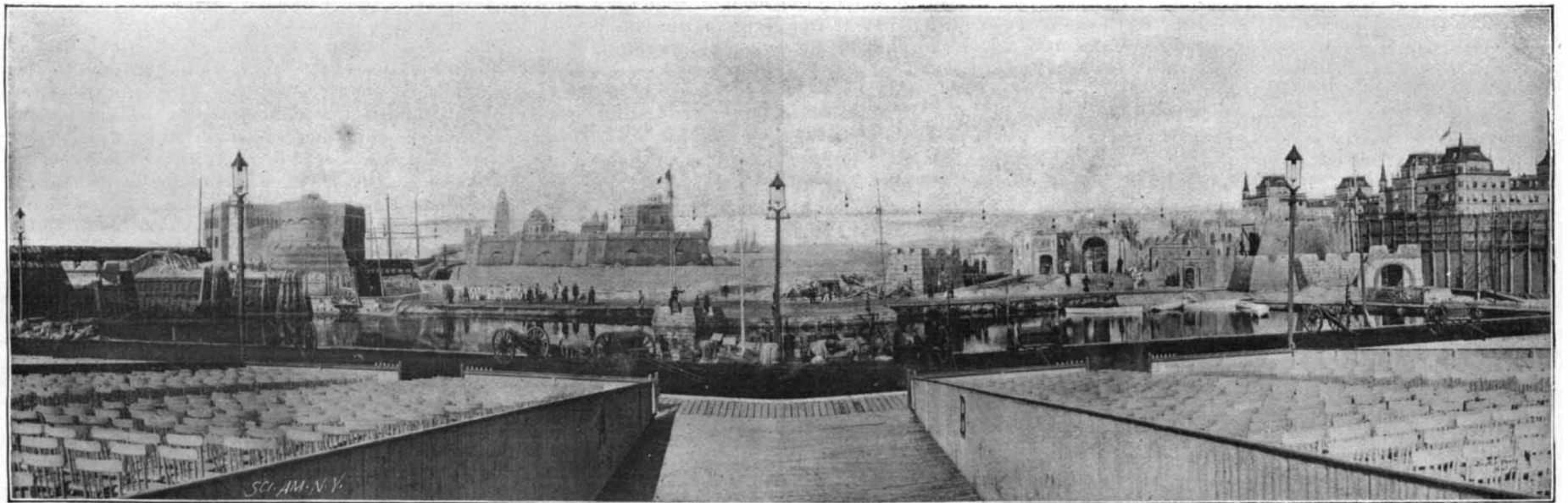
wide, the width of the entire stage being about 350 feet. Behind the pond is a stage mounted with set scenes. Of course, owing to the distance and darkness, the refinements of acting would be entirely lost. The management, therefore, depends almost entirely upon the spectacular, the cast including hundreds of performers, including companies of clever gymnasts and acrobats.

The clever manner in which the scenery is prepared may be judged by examining the engraving showing the Grand Canal at Venice, which is an exact reproduction of the original in every detail. The canal is filled with gondolas and with the gayly painted sails of the Adriatic, and the dome of St. Mark's may be seen in the background, with the graceful campanile at its left, while the center of the scene is filled with the delicate

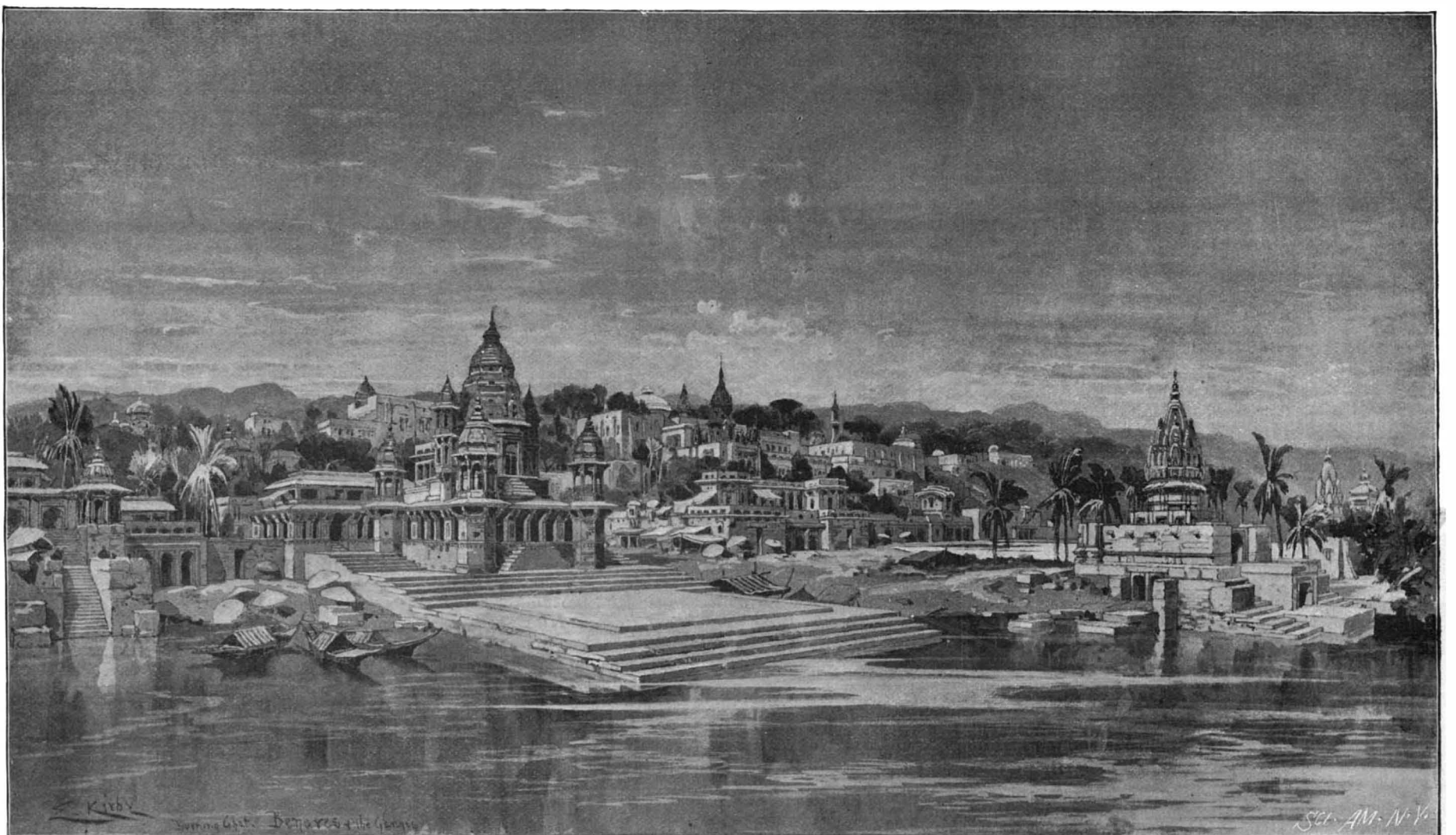
detail of the Doge's Palace. The performance is so arranged as to lead up to some stirring catastrophe. The climax is generally some awful cataclysm or some blood-curdling war scene or a great conflagration. In the Last Days of Pompeii, Vesuvius begins to belch forth flame and



CARNIVAL OF VENICE,



SIEGE OF VERA CRUZ.



BENARES, THE SACRED CITY ON THE GANGES.

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