

### PROGRESS OF THE PARIS EXPOSITION OF 1900.

It was a foregone conclusion at the close of the Exposition of 1889 that another great gathering beside the banks of the Seine would be held by the end of the century, and in a few months the Exposition of 1900 will have thrown open its doors, and for the eleventh time France will welcome the world to her exhibition. The Exposition of the year VI. was held on the Champ de Mars under the Directory in 1798; the Exposition of the year IX. (1801) was held in the Court of the Louvre; the Exposition of 1806 on the Esplanade des Invalides; the fourth was held in 1834 on the Place de la Concorde; the Exposition of 1844 on the Champs Elysées; the next Exposition was opened in 1849, also on the Champs Elysées; the Exposition of 1855 was held in the Palais de l'Industrie on the Champs Elysées, which has just been taken away to make room for the Grand Palais of the Exposition of 1900. The Exposition of 1867 was held on the Champ de Mars, as was also that of 1878 and of 1889.

Paris is unfortunately situated for the purpose of giving expositions on a large scale owing to the fact that about the only available spaces which it has are the Champ de Mars, the Esplanade des Invalides, and the park between the Trocadéro and the Seine, and the triangular bit between the Champs Elysées and the Avenue d'Antin. There is one advantage, however, for this valuable territory lies in the center of the city and is accessible from almost any point. For convenience it can be said that the Exposition of 1900 is made up of six sections. First, the Champs Elysées, which is connected with the second section on the Esplanade des Invalides by the Pont Alexandre III. The third and fourth sections lie on both banks of the Seine and make an unbroken line of buildings on both sides connecting with the fifth and sixth sections on the Champ de Mars and at the Trocadéro.

The Exposition of 1889, properly speaking, did not have any main entrance, but this has been remedied in the present instance by building an enormous construction on the Place de la Concorde end of the Quai de la Conférence. This triple archway will have a span of 59 feet and is 65 feet high. The sides have penetrations consisting of smaller arches. At both sides will be a large number of gates, arranged in a fan shape, which will permit of 60,000 persons per hour to pass through them. The entrance is built of light masonry and is covered with enameled sheet iron. The summit of the arch is surmounted by a gigantic statue of "Peace." Two large exedra join the great arch at the bottom, adding to its appearance of strength. Two lofty minarets flank the arch. From the illustrations which have been published of this entrance, it is doubtful if the effect will be at all good from an architectural point of view. The architect has thrown to the winds all of the canons of his art, and we should be surprised if the result is successful.

One of our engravings represents the Grand Palais of the Champs Elysées, which is not far from the monumental entrance. It occupies the site of the Palais de l'Industrie, which has been destroyed to give place to it. The architectural design was obtained after a severe competition, and M. Bouvard was selected as the architect. The result is that the building is a most handsome and pleasing one and is in marked contrast to most of the Exposition buildings, whose ephemeral character is no excuse for decorative aberrations. It will cost about \$4,000,000. The building is admirably arranged for the display of art collections, and access to the various halls is easily obtained by numerous stairways. The curved ends such as are shown in our engraving produce an excellent effect. The building will, of course, be permanent as it is being constructed of fireproof material and the workmanship is of the very best. Another art palace devoted to retrospective French exhibits faces it. This smaller palace of art will also be permanent. The grounds about the palace of art are being beautified in such a manner that the landscape gardening which is being done will connect naturally with the existing shrubbery and trees, which will give a park-like aspect which will harmonize with the famous promenade the Avenue Champs Elysées immediately to the north.

The splendid Avenue Nicholas II. brings the visitor to the Pont Alexandre III., which connects the second great section of the Exposition with the entrance and the art palaces. This bridge is one of the most beautiful, from an architectural point of view, which has ever been built. The corner stone of the structure was laid October, 1896, by the Czar of Russia. The bridge is 340 feet long and the width is 131 feet; the approaches are monumental. Two pylons will be placed at each end surmounted by statues, and statuary is freely used throughout the bridge, which is constructed of steel with stone approaches. This bridge will be illustrated at some future time. One of our engravings shows the present condition of the Esplanade des Invalides, looking down toward the dome of that building, which is directly over the tomb of Napoleon. These palaces will be largely devoted to exhibits in manufactures and the various industries and include the Palace of National Manufactures, the Palace of Miscellaneous Industries, the Palace of

Ceramics and Glass. There are two sections of each building, one on either side of the esplanade, one devoted to French products and manufactures and the other to foreign exhibits in the same class. These buildings will form a continuous group.

A large number of visitors from out of town and outlying sections of the city will enter the grounds at this point from the new Gare des Invalides, the station being underground. On the Seine's north bank west of Alexandre III. bridge will be placed some of the most interesting and beautiful structures of the Exposition. On the south embankment will be constructed the Palaces of the Nations, in the midst of which our national building has a prominent position. A little further along on the southern side of the river is the building devoted to army and navy exhibits. Beyond this is the Palace of Commerce and Navigation. Then comes the Pont d'Iéna, connecting the Trocadéro ground with the Champ de Mars. Beyond this are the buildings devoted to forestry, hunting and fisheries. The Gare de Champ de Mars comes up directly to the buildings on the Champ de Mars and affords a third important entrance to the Exposition. The Eiffel Tower on the Champ de Mars has been left to form a salient feature of the entire group of buildings. The view from the foot of it, even at the present time, is most imposing. To the left rises a building devoted to mines and metallurgy, one section of which is shown in our engraving. Next comes the palace devoted to textile fabrics and cloth; then comes the huge palace devoted to mechanics, while directly in front is the Electricity building, whose façade is composed of an enormous Chateau d'Eau, while behind rises the large roof of the building which includes the agricultural exhibit, food products and a salle des fêtes. On the other side of the fountain there is another section of the Mechanical building, then comes the Palace of Chemical Industries, then the Palace of Civil Engineering and the palace devoted to education, letters, arts and sciences.

It is impossible at the present time to get an adequate idea of what the effect will be when entirely finished, as to color, etc., but we may safely trust the taste of the French to produce an ensemble which, while it may be very pure in details, will not be barbaric. In the grounds surrounding the Trocadéro will be the buildings forming the colonial exhibits. Along the north bank of the Seine will be buildings devoted to horticulture, arboriculture, the city of Paris, and a unique group of buildings representing Paris of the middle ages. This is probably the most important amusement section of the Exposition, and will be devoted to theaters, concerts, restaurants, cafés, etc., as well as to show the appearance of Paris in the fifteenth and eighteenth centuries. The studies for this most attractive and monumental group of buildings were made by M. Robida, well known as a draughtsman of the architecture and life of the middle ages. There are forty-two distinct sections in the group of buildings, each one representing a different phase of the life and activities of old Paris.

There is another section of the Exposition at Vincennes for agricultural machines, carriages, bicycles, automobiles, etc., and direct connection can be had from the Exposition proper by means of steamboats and trolley cars. The space to be occupied by the Exposition proper is 360 acres, and of this amount the French government has given about 60 per cent to other nations and reserved about 40 per cent for France. The Exposition will open on April 15, 1900, and there is every indication at present that it will be ready at that time.

### The Future of South Africa.—I.

BY EDGAR MELS, FORMERLY EDITOR OF THE JOHANNESBURG DAILY NEWS.

Much has been written of the past of South Africa—of its wars, its peoples, its peculiarities and idiosyncrasies. Little has been said of its future and its really marvelous resources. Chroniclers and historians have delved into its past for interesting material, and have found it. But to the practical American mind, the commercial and financial future of the southern end of the African continent will appeal with more force than the tale of battles with Dinizulu, or the discovery of diamonds on the Vaal River in 1869.

Civilization and commerce go hand in hand, and if the present war should lead to a more thorough civilization of South Africa and a greater opportunity for commerce, England would be entitled to the thanks of America, for America will profit more through England's victory than Britain herself. At first glance, this statement may seem preposterous, but a little study into conditions will convince any fair-minded reader that America will be the commercial paramount power in South Africa within another five years after peace shall have been declared.

Up to the time of the declaration of war, ninety per cent of the mining machinery at the gold and diamond mines was of American manufacture. An even greater percentage of agricultural implements came from America. Vehicles of all kinds were American, and not so long ago, the mule-propelled cars along Dutoits-

pan road, Kimberley, bore the inscription "Broadway, from Battery to Central Park"—relics of the days of horse cars on Broadway.

American liquors, such as beers and whisky; American clothing; American wagons and American hardware have all been favorites in South Africa. Then, too, Americans themselves have been well treated. An American is the practical head of the De Beers diamond mines. An American was formerly the State Mining Engineer in the Transvaal, and fully one-half of the mine managers at the Witwatersrand gold mines are Americans.

This speaks well for America and augurs still greater things for our country in the future. We are friendly with all of the contending parties. England sees in us a moral ally. The Transvaal and the Free State look to us for moral aid in settling their difficulties with Great Britain. No matter which side wins, we will be the gainer. If England is successful, she will extend all possible favors to us. If the Boers should win, America, being a republic, would still be in favor, especially as the Boers are fond of America in the abstract, even though they may not fancy the individual American—for some of America's representatives in South Africa have not been all that could be desired.

So America will be the gainer unless, and that phase is one likely to come up at any moment, there is a rising of the natives. If that should come to pass, then South Africa will be a land of terror and desolation. Whether the eleven hundred and fifty-one tribes will remain quiet or not, it is impossible to predict. At this writing, they are still at peace with the white man, but any hour may bring a change. So long as either the Briton or the Boer shows decided supremacy in the field, so long will the native remain peaceable. But let the whites rend each other in death struggle, let them be so evenly matched in the game of war that both sides are decimated, and then the world will see a rising of natives compared with which the Indian mutiny will be insignificant.

The native fears the Boer, for the Boer has taught him many a bloody lesson. He respects the Briton also, and will not attack either while Briton or Boer is in condition to strike back. But let the white forces be grappled in death struggle, with thousands of homes and many towns unprotected, and then the native will arise in his might. Then blood will run as it did when the forbears of the Boers were slaughtered on St. Bartholomew's night. The native will avenge his wrongs, real wrongs too, in the blood of the white. Unkindness will be repaid with murder; kicks and lashings with rapine; injustice with death and desolation. It will be heaven's vengeance for years of outrageous wrongs, wrongs to which the grievances of the Uitlanders or the complaints of the Boers are mere bagatelles.

It would take more than one hundred thousand whites to suppress a universal uprising of the natives. The Matabeles, Mashonas, Basutos, Zulus, Bechuanas, Swazies, Amatongas, Khama's Men, and the other eleven hundred and odd tribes, could put two million men into the field, every one brave to the point of folly, every one fired with desperate hatred toward the white, every one fighting to avenge a personal wrong. Ten thousand killed in battle could not stop the avalanche of blacks; they would crush the white man, and white supremacy in South Africa would be again a thing of history if once the natives rise. It would take the better part of a century to restore the old order of things. That is why both the Briton and the Boer have so far refrained from inciting the natives to take arms.

Leaving aside the unpleasant possibility of a native uprising, South Africa will soon be the field for great commercial and financial advantages. Peace must come sooner or later, and then America will reap the reward of British aggression and Boer stubbornness. South Africa will need much mining machinery, corrugated iron houses, clothing, underwear, nails, hats—in fact, everything that a human being needs will be wanted.

South Africa has no manufactories; everything must be imported, whether it be whisky or clothing. Even agriculture has been neglected in the mad rush for wealth and, incidentally, ruin. Legitimate business has been abandoned for speculation, and commercial honesty has been on the verge of oblivion. When the war shall have cleared the atmosphere, business, as it is understood in this country, will once more take the place of scheming, and so good may yet come from bad.

But one thing Americans must heed, or they will regret their lack of sense; they must avoid gold and diamond and all other mines as they would the evil one. South Africa is too thoroughly in the clutch of the unscrupulous speculator and promoter to warrant the investment of American capital in anything save legitimate business. If speculative Americans must invest in mines, let them seek new ones (there are plenty to be had for the developing), and then keep absolute control in their own hands. For the South African promoter is first cousin to Bret Harte's China-

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Palace of Ceramics and Glass.



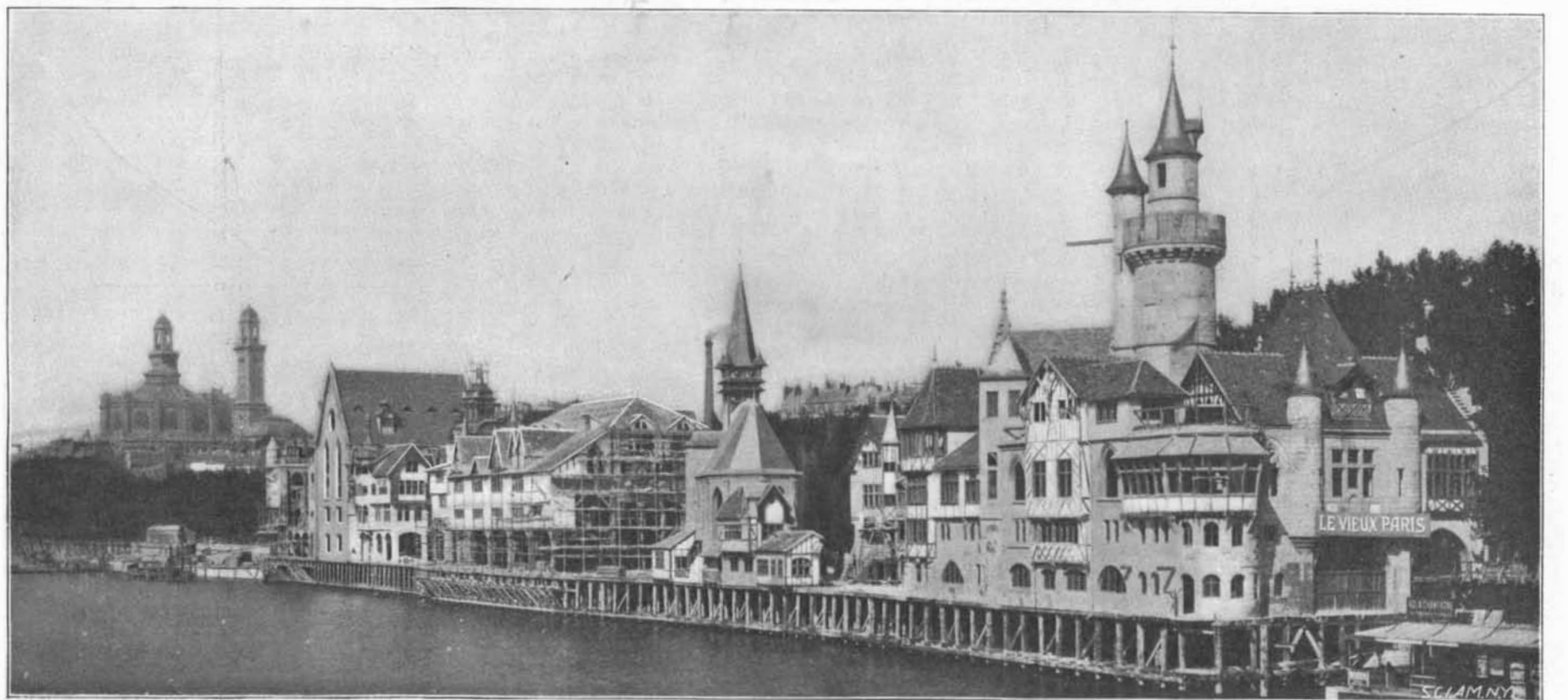
Side of Grand Palace of Fine Arts.



Present Condition of Esplanade des Invalides.



Palace of Mines and Metallurgy, Champ de Mars.



Ancient Paris, on the Northern Bank of the Seine.

PRESENT CONDITION OF THE PARIS EXPOSITION OF 1900.—[See page 342.]

man—childlike and bland, but with sundry and various financial tricks that are delightfully ingenious, even though they are apt to impoverish those who are foolish enough to be ensnared.

Some two thousand million dollars have been invested in South African mines. English, French, and Germans have furnished the money. Alfred Beit, J. B. Robinson, the Barnato Brothers, Wertheim, S. Neuman & Company, Cecil Rhodes, and half a dozen more, are worth close to a thousand million dollars between them. Every bit of this stupendous sum was made through the flotation of mines. All of the mines, with two exceptions, are greatly overcapitalized. About forty of them have paid dividends ranging from fifteen per cent to six hundred and seventy-five per cent; but as only those within the sacred circle know whether these huge dividends were honestly earned, it is advisable that American investors should leave all speculative investments to the less careful Briton, Frenchman, and German.

(To be continued.)

#### The Vienna Meteorite Collection.

BY OLIVER C. FARRINGTON.

At 6 o'clock on the evening of May 26, 1751, a number of people in Hraschina, near Agram, Austria, saw a fire ball suddenly appear in the sky. It advanced rapidly from west to east, drawing a trail of smoke behind it, and after a mighty detonation there fell from it to the earth two masses of iron at places about half a mile apart. The smaller of these, weighing about 20 pounds, was broken in pieces by curiosity hunters, some of it forged for iron and all lost. The larger, weighing about 90 pounds, was sent to the imperial treasury of Austria and kept there until 1778, when it was assigned to the imperial mineral collection at Vienna then in process of formation. This was the beginning of the collection of meteorites of the Vienna Natural History Museum, a collection which is to-day not only the greatest of its kind in the world, but is considered the most valuable, as it is the most celebrated, of all the treasures of that truly imperial museum.

In looking at this collection, made up of specimens of falls which have taken place at more than five hundred localities in all parts of the world, one finds it hard to realize that it has all been built up practically within the present century, or to appreciate the still more striking fact that only within the same period would a collection of bodies claimed to have fallen from the sky have been tolerated in a museum of scientific repute. Up to the beginning of the present century scientific men heard with scorn and incredulity reports of the fall of stones from the sky; the French Academy, after a sitting on the stone which fell at Lucé in 1768, decided it to be a terrestrial stone struck by lightning, and threw away the specimens sent them. Hence, meteorites at that time were to be found only in the hands of private individuals, who preserved them as curiosities, regarding which extraordinary stories were told. But the powerful philosophic mind of Chladni, reasoning in regard to the masses brought by Pallas from Siberia, reached the conclusion that they must be of extra-terrestrial origin, and the weight of his arguments, together with evidences gathered by many scientific individuals or societies in the careful investigation of a number of reported falls, led, at the beginning of the century, to a revulsion of feeling. Scientific men became as eager to collect and study the "sky stones" as they had been scornful of them before. The stones were sought for all over the world, and the knowledge gained from their study soon formed a science of its own. Of the fruits of a century of such efforts the Vienna collection is, perhaps, to-day the best exponent.

It was on a specimen of the Vienna collection too that Alois v. Widmannstätten, Director of the Vienna Industrial Museum, and an experienced student of the structure of iron, in 1803 made the remarkable discovery that by heating the iron regular figures were developed. These were soon found to characterize meteoric irons in general, and they have ever since been called by his name. In other ways the growth of the Vienna collection has paralleled to a large degree the growth of the science of meteorites. In 1805, but 8 localities were represented in the collection; in 1835, 56; in 1863, 245; and at the present time there are 502, a number which falls but little short of the whole number known. The whole weight of the meteoric matter now in the collection is 3,510 kilogrammes. As at present installed the collection occupies one hall of the Natural History Museum. The specimens are placed for the most part in low desk cases, but the larger ones have individual mounts with or without cases. The collection is divided into a terminological and a systematic series. First in the former comes a collection illustrating the history of meteorites. Ancient coins from Macedonia, Cyprus, Sardis, Sidon and other countries are shown which bear images of meteorites and legends indicating that such bodies were held sacred at different times in those countries. A specimen of the Kesen, Japan, meteorite, worshiped until within a few years by the Japanese, illustrates the same practice in modern times.

The scientific history of meteorites is illustrated by a fragment of the Lucé stone, so scornfully rejected by the French Academy, by the section of the Hraschina iron etched by Widmannstätten, by a piece of the Pallas meteorite which Chladni proved to be of extra-terrestrial origin, and by stones of the fall of L'Aigle, which was the first meteoric fall to be generally accepted as of extra-terrestrial origin. In connection with these are shown materials which have fallen from the atmosphere at different times but which are doubtless of terrestrial origin. Some of these are red dust from a red snow which fell in Switzerland in 1818, crystals of marcasite which formed the kernel of hail stones that fell in Russia in 1824, fragments of calcite the size of a pea that fell on the deck of a ship near San Domingo in 1822, and last of all a series of so-called pseudo-meteorites, i. e., bodies which have for some reason been claimed to be meteorites but which do not satisfy the tests in all points. The pitted surfaces are similar to those found on the surfaces of large gunpowder grains picked up after the firing of heavy cannon. The shell-like forms of some meteorites are shown to be due to their having scaled off from some larger spherical mass. The hollow or ring-like shape of others is shown to have been produced by the melting out of a nodule of the easily fused troilite (iron sulphide). The constituents of meteorites are illustrated by fragments of each, naturally or artificially separated. There are large and perfect crystals of troilite from several meteorites (one from the stone of Juvinas being the size of a hazel nut), of olivine from the Pallas meteorite, of altered diamond (cliftonite) from the Magura iron, of crystallized diamond from the stone of Urej, and many specimens of the well-known meteoric minerals, schreibersite, taenite, graphite, and cohenite. In another case are shown etched sections of many iron meteorites, illustrating the great variety of structures and figures which they exhibit.

In the systematic collection the specimens are grouped according to a classification proposed by Tschermak and somewhat modified by Brezina. Its leading divisions are (a) stone meteorites, divided into polyhedrites, chondrites, and siderolites, and (b) iron meteorites, divided into litho-siderites, hexahedrites, and ataxites. Here most of the specimens are placed included under their group character. The qualities and features of any of these groups would furnish study for a lifetime. Many are fragments, such as the custom of meteorite collecting has made to constitute a specimen. Of others, such as De Cewsville, Calderilla, and Lucé, the collection contains all, or practically all, known to exist. It is remarkable how many of the best known American meteorites of the past century are to be found here. The meteorites of Mount Joy, Estherville, Cabin Creek, Chulafinnee, Babb's Mill, and many others belong to this collection either entire or in larger quantity than any other. This is less likely to be true of American meteorites in the future, for several collections in our own country are now sufficiently well established to be able, we hope, to keep American meteorites at home.

At either end of the main collection are cases containing the largest and most valuable "uniques." Many of these have great interest for their terrestrial as well as for their extra-terrestrial history. Among them is the iron weighing about 9 pounds which fell at Mazapil, Mexico, in November, 1885, during a star shower. By those who believe in the cometary origin of the meteorites, this iron is supposed to be a part of Biela's comet, since the comet was due at the time of the fall. Another interesting specimen is the iron weighing 107½ pounds which fell at Cabin Creek, Arkansas, in 1886. Besides being interesting as one of the few irons ever seen to fall, it shows upon its surface beautiful lines of flow, caused by the melting of the metal as it passed through the atmosphere. The meteorite has a typical conical shape. Another is the iron of Hraschina, already mentioned, and another large section of one seen to fall at Braunau, Bohemia, in 1847. The iron of Babb's Mill, Tennessee, in size and shape resembling a roll of Vienna bread and about as hard, is here shown too. Two other meteoric irons shown—those of Kokstadt, South Africa, and Hex River Mountain, South Africa—have a remarkable shape, resembling an underjaw of some large mammal.

Here too is the principal mass of the Elbogen iron, a mass preserved for more than four centuries in the town hall of Elbogen and known as the "Enchanted Burgrave." The tradition held among the people regarding it was that if it were thrown into the fountain at the castle, it would come back again to its former location. The tradition proved true, for in 1742 the French, to test the saying, scornfully threw it into the fountain, but in 1776 the citizens brought it back to its former place. Another specimen here shown, which must have fallen at an early period, is a mass of iron weighing 42 kilogrammes found at Catorze in the State of San Luis Potosi, Mexico. In one side of it is seen a copper chisel of ancient manufacture evidently driven in by some of the aborigines in an attempt to sever a piece of the iron. Besides these smaller specimens, three iron meteorites of greater weight occupy separate pedestals in the hall. One of these is a mass weighing

about a ton, found in 1884 in Youndegin, Western Australia. Its surface is penetrated with funnel-shaped holes made undoubtedly by the erosive action of the air as it fell, while the coarse crystalline structure of the iron is marked by external lamellæ. The two other large irons on pedestals are one weighing 198 kilogrammes from the State of Coahuila, Mexico, and the other weighing 177 kilogrammes from Cañon Diablo, Arizona.

Among the large stone meteorites may be noted many of great size from the fall of Knyahinya, Hungary, which took place June 9, 1866. A large painting decorating the wall of the hall represents the surroundings and appearance of the fall. Over a thousand stones fell in this shower. One of these stones weighs 650 pounds and it was until recently the heaviest meteoric stone mass known to have reached the earth. The Long Island, Kansas, stone, now in the collection of the Field Columbian Museum of Chicago, is, however, larger, its weight being fully a thousand pounds. Other important stones shown nearly entire in the Vienna collection are the Lancé, a carbonaceous meteorite, the Tabor, which fell in 1753, and was one of the first meteoric stones to be studied by Howard and Chladni, the Tieschitz and the Wessely.—Field Columbian Museum, Chicago.

#### Automobile News.

The postmaster of Brooklyn, N. Y., is planning to use automobiles for the delivery of mail in that borough. If the experiments are successful, the use of the trolley mail cars will be abandoned, and probably smaller automobiles will be used for collecting the mail. At present curious little two-wheeled carts drawn by horses are used.

There was recently an extraordinary parade of traction engines at Aldershot, fifteen engines and forty trucks. They were inspected previous to their departure to South Africa. A stretch of sandy road was selected for the test, and the country gave an excellent opportunity for observing the practical points of the engines. They will be dispatched to South Africa at once.

Dr. R. J. Gatling has just invented an automobile plow. It is built on the principle of the ordinary automobile with disk plows so arranged as to do the work of the implements now in use. The idea is to operate a machine by a single man. It is claimed that it will do the work of eight men and twelve horses. Either gasoline or kerosene may be used. It can also be used in driving a thrasher, shelling corn, or for other purposes. Another machine is for the cotton fields, and is designed for "thinning out" cotton plants in their early growth.

There is every indication that in a short time drivers of automobiles will be allowed to run their vehicles through Central Park if they are competent to manage them with safety to other users of the park. President Clausen made two trips through the park in an electric automobile, one on Sunday afternoon and one Sunday evening. The trips were an entire success in every way, and demonstrated that if the vehicles are run with caution, there is no danger of frightening horses. The trip was an interesting one. First came the sergeant of the Park police squad, followed by the automobile carrying the president of the board and Mr. R. A. C. Smith, the owner of the automobile. Mounted policemen rode at either side and three more officers on horseback brought up the rear. The policemen were ordered by Mr. Clausen to accompany the carriage, in order to be on hand should any runaway occur. The vehicle behaved admirably and Mr. Clausen promptly issued a permit to Mr. Smith to operate his automobile in the park whenever he pleased. It may seem hardly fair that only one man should have this permission, but owners of horseless vehicles will not be disposed to grumble very much, as this is a great step toward securing the end desired. No one ought to desire proper regulations for the use of parks more than automobile drivers. Incompetent persons should never be allowed to drive vehicles of any kind through the park when they are liable to injure many persons.

In the United States the first-class passenger fares last year averaged 2.14 cents per mile, although on some large railways the average was several mills less than 2 cents per mile. In England the first-class fare is 4 cents per mile; the third-class fare for vastly inferior service is 2 cents per mile; in Prussia the fare is 2.99 cents per mile; in Austria 3.05 cents per mile, and in France 3.36 cents per mile. George H. Daniels' interesting and important address, from which we extract the above, is concluded in the current number of the SUPPLEMENT.

NEAR a station in Utah a car loaded with powder was blown up while in transit. The force of the explosion was so great that, according to The Railway Review, it tore up 90 feet of track. It shook the whole freight train and broke glass in the engine cab windows and caboose. The powder car and two adjoining cars were burned up.