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TRUTH AND LIBERTY.

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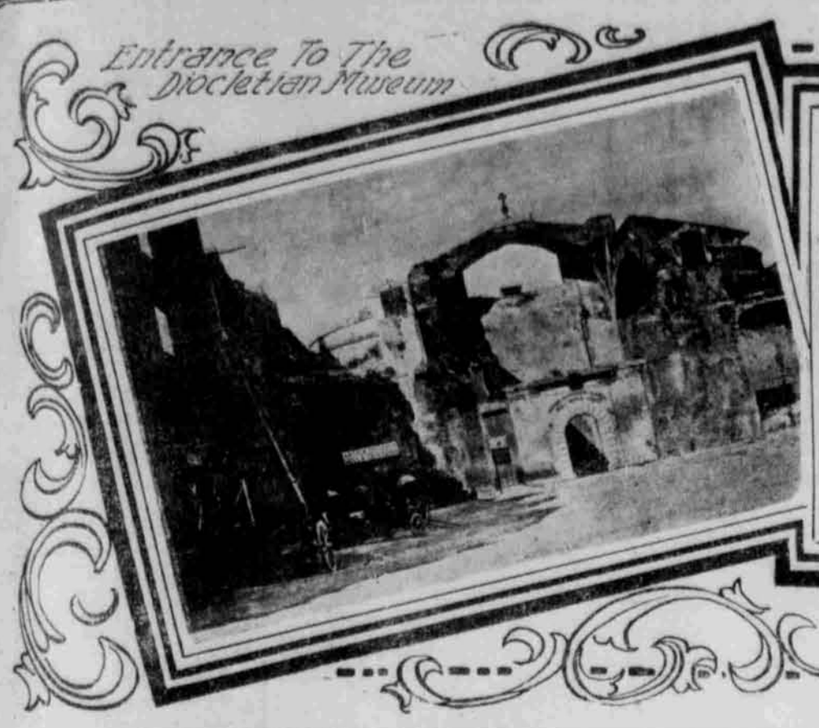
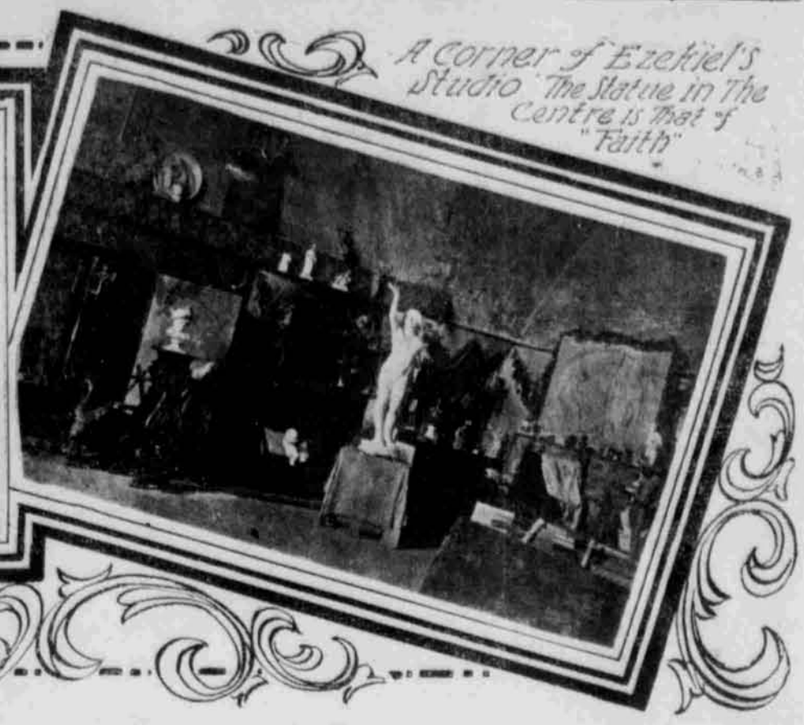


Entrance To The Diocletian Museum

Photograph Taken By The Ballistic Kinematograph Showing An Automatic Pistol Ejecting A Used Cartridge With Unburnt Grains Of Powder



A Corner of Ezekiel's Studio The Statue in The Centre is That of "Faith"

This Man Has Solved Problem Of Photographing the Invisible

(Special Correspondence.)

BERLIN, Sept. 9.—All scientific Germany is engaged in discussing the wonderful invention by which Privy Councilor Cranz has succeeded in solving the problem of photographing natural and mechanical processes a thousandfold too rapid for perception by the human eye. Privy Councilor Cranz, who is a professor at the famous military technical high school of Charlottenburg, and a well known expert in ballistics, has long been perplexed by certain problems of the flight and action of projectiles, the clearing up of which was necessary before perfectly efficient firearms could be produced. Prolonged experiment led to the invention of the "ballistic kinematograph," an entirely new machine, the marvels of which are exhibited this year for the first time at the International Photograph exhibition at Dresden.

By means of the ballistic kinematograph Prof. Cranz is able to take absolutely clear single photographs in silhouette in the almost inconceivably short space of time of the one-ten-millionth of a second. The motion of the fastest bullet, the fastest moving machinery, or the fastest movements of nature can thus be clearly recorded for purposes of study. The mechanism of Prof. Cranz's apparatus works so speedily that, allowing for the working of the shutter and shifting of the films, no less than 5,000 separate and distinct pictures are taken in a single second.

By a new application of the electric spark, the details of which are at present a secret, the ordinary kinematograph, which gives at most some 50 pictures a second, is transformed into a miraculously delicate instrument which enables the scientific man to study at leisure such mysterious processes as the breaking up of targets by projectiles, the flight of insects whose wings vibrate invisibly and hundreds of other artificial and natural phenomena which have hitherto been mysteries to the keenest eyes and brains.

The ordinary kinematograph is useless for such purposes. It works too slowly. In the fiftieth part of a second, which is the shortest time it needs for a single picture, a rifle bullet will have covered some hundred feet, a wheel will have made several complete revolutions. But a photograph taken in the ten-millionth part of a second gives an absolutely clear outline of the swiftest phenomena known. On the films of the ballistic kinematograph, the bullet with the greatest attainable velocity taken in the ten-millionth fraction of a second appears not only with clearly defined horizontal but with equally clearly defined vertical outlines. The ordinary photographic camera would not yield a single picture during the time which is required for a projectile to splinter a bone or tear through a target. The ballistic kinematograph gives dozens of pictures, so that the whole process, which is in reality very complicated and comprised of different stages, is visible in every detail.

BULLETS ON BONES.

One of the first purposes to which the ballistic kinematograph was applied was the study of the effect of projectiles on human bones. Before Professor Cranz's invention practically nothing was known of this beyond the obvious fact that a bullet on striking a bone either penetrates it, making a fairly regular hole, or splinters it to such an extent that it is broken through. The ballistic kinematograph for the first time yielded a series of pictures showing every stage of the process. About 60 pictures, taken altogether in about the hundredth fraction of a second, are needed to show what takes place from the firing of the bullet to the clearing away of the smoke. In the first eight the bone is seen simply hanging free. In the ninth the bullet begins to impinge on the film, but despite the incredible velocity with which it moves, five clearly outlined silhouettes are taken before it strikes the bone.

From that state onward—until the bone is so splintered that it is broken in two pictures are taken showing every detail. On striking the bone it is seen that the first thing done by the bullet is to raise a tiny cloud of bone-dust on the side first struck. On the next picture, one five-thousandth part of a second later, the bullet has passed through the bone, carrying with it the cloud of dust but it would seem that merely a hole has been driven through as the bone has not yet had time to splinter. The bullet is now speeding on its way outside the field of the film, but the dust cloud grows, and is seen to be mixed with small but clearly defined splinters, the movement of each of which through the air can be traced in the successive pictures.

After this the smoke from the rifle partly obscures the process; and when the smoke thins, the bone is seen to be completely broken in two and the big splinters formed, though flying away at enormous speed, seem stationary and hanging to the bone like rags. How rapid is the action of the apparatus may be judged by following the position of a single splinter on 29 or 30 successive films. The splinter is really tearing swiftly through the air in a little tempest of gas and whirling fragments, yet on the films it seems hardly to have changed place at all.

EFFECT ON ARTERIES.

The ballistic kinematograph clears up one of the obscurest mysteries which have puzzled military surgeons and reformers in the domain of warfare. The theory that a bullet fired at great velocity makes the cleanest wound has, in recent wars, been shown not to be true, or to be true only under certain conditions. As a matter of fact, if a bullet strikes a blood-vessel, the more rapid its velocity the worse the wound. An explosive effect is produced. The theory is that the impact of the projectile sends the blood flying on all sides at tremendous speed, and that this makes a big and jagged hole, whereas a slowly moving bullet makes a clean and comparatively trifling wound. The ballistic kinematograph shows that this is true.

ANOTHER EXPERIMENT.

Dr. Cranz has made experiments in firing at a bladder filled with water which show exactly the effect of projectile impact on a blood-vessel. When the bullet strikes the suspended bladder, it has much the same effect as with the suspended bone. It drives a little jet of water out on the side nearest the rifle, this water being seen in the pictures as a cloud-like spot. In the next picture the bullet has got through, and issues from the rear side dragging with it a pencil of water which is moving at great speed. After the bullet has got clear away this water pencil increases rapidly in length, thickness, and speed, and finally the bladder takes an elongated, fish-like appearance, while what remains of the liquid gushes out swiftly until the emptied bladder collapses. In about the hundredth part of a second the bladder is empty.

In the case of a blood-vessel being struck, the same effects are produced. The bullet, which itself makes only a small hole, carries the blood along with it with such force that the flesh and tissues are torn, and the result is a serious wound, all the worse if the velocity of the bullet has been high.

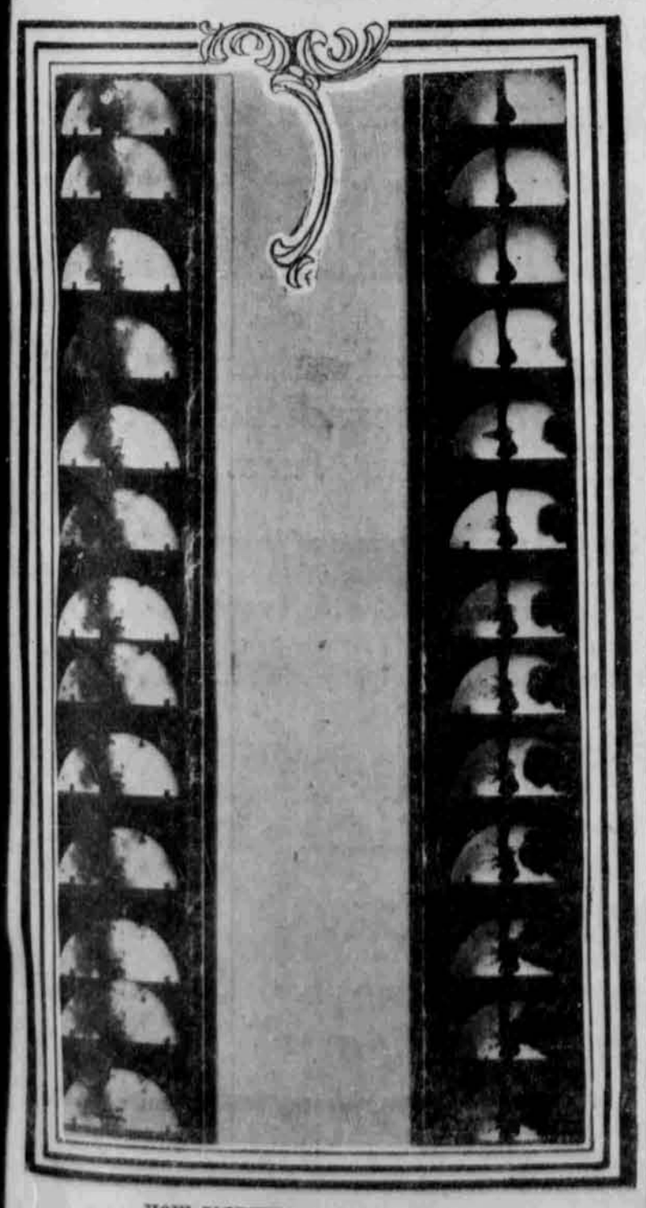
At present the ballistic kinematograph is mainly being used for the study of the operation of firearms from a purely military point of view. By the use of the apparatus, experts and manufacturers of arms can detect the slightest defect in the working of weapons. To prove this, Prof. Cranz has taken a remarkable series of pictures of the firing of a selfloading pistol. In these pictures the hammer is shown working with almost perceptible slowness, and of the smoke puff, which really clears away in an inconceivably small fraction of a second, dozens of pictures are taken before it diffuses. The used cartridge case rises, apparently slowly in the air, turns a somersault, and falls behind.

FILMS TELL THE TALE.

By examining these records, or projecting them slowly on a screen, the slightest defect in the weapon or ammunition is betrayed; and the speed by which the mechanism of each particular arm works, can be judged and compared with that of others by the number of photographs taken. The imperfect combustion of powder is also betrayed. The ballistic kinematograph yields a distinct record of every separate particle of unburnt powder. The powder used in one case was supposed to be particularly efficient, and to yield perfect combustion; but when examined in the films of the ballistic kinematograph, it was shown that unburnt grains of powder of considerable size were ejected with the cartridge case.

At the present time the pictures taken by the ballistic kinematograph are all in silhouette. But for the particular purposes for which it is intended this is no drawback.

ROBERT CROZIER LONG.



HOW SOLDIERS ARE WOUNDED.

Some of the Sixty Pictures Taken in the Hundredth Part of a Second Which Illustrate the Action of a Bullet Striking a Human Bone. The Series Starts from the Top Right Hand Corner.

Will America Help England to Free the Congo?

Sir Arthur Conan Doyle Makes an Appeal to the Readers of This Paper to Stir Up The National Conscience in Behalf of King Leopold's Victims.

To the Editor of the Deseret News:

THERE are many of us in England who consider the crime which has been wrought in the Congo lands by King Leopold of Belgium and his followers, to be the greatest which has ever been known in human annals. Personally I am strongly of that opinion. There have been great expropriations like that of the Normans in England or of the English in Ireland. There have been massacres of populations like that of the South Americans by the Spaniards, or of subject nations by the Turks. But never before has there been such a mixture of wholesale expropriation and wholesale massacre, all done under an odious guise of philanthropy, and with the lowest commercial motives as a reason. It is this sordid cause, and the unctuous hypocrisy which make this crime unparalleled in its horror.

The witnesses of the crime are of all nations and there is no possibility of error concerning the facts. There are British consuls like Casement, Thesiger, Mitchell and Armstrong, all writing in their official capacity with every detail of fact and date. There are Frenchmen like Pierre Mille, and Felicien Challage, both of whom have written books upon the subject. There are missionaries of many races, Harris, Weeks and Chalmard (British), Morrison, Clarke, Shepherd (American), Sjoblom (Swedish), Father Vermeersch the Jesuit. There is the eloquent action of the Italian government who refused to allow Italian officers to be employed any longer in such hangman's work, and there is the report of the Belgian commission, the evidence before which was suppressed because it was too dreadful for publication. Finally there is the incorruptible evidence of the kodak. Any American citizen who will glance at Mark Twain's "King Leopold's Soliloquy" will see some samples of that. A perusal of all these sources of information will show that there is not a grotesque, obscure or ferocious torture which diseased human ingenuity could invent which has not been used against these harmless and helpless people.

AMERICA'S RESPONSIBILITY.

This would, to my mind, warrant our intervention in any case. Turkey has several times been interfered with, simply on the general ground of humanity. But there is in this instance a very special reason why America and England should not stand by and see these people done to death. They are in a sense their wards. America was the first to give official recognition to King Leopold's enterprise in 1884, and so has the responsibility of having actually put him into that position which he has since so dreadfully abused. She has been the indirect and innocent cause of the whole tragedy. Surely some reparation is due. On the other hand England has, with the other European powers signed the treaty of 1885, by which each and all of them makes itself responsible for the condition of the native races. The other powers have so far shown no desire to live up to this pledge. But the conscience of England is uneasy and she is slowly rousing herself to act. Will America be behind? At this moment two American citizens, Shepherd and that noble Virginian Morrison are about to be tried at Boma for telling the truth about the scoundrels. Morrison in the dock makes a finer statue of liberty than Bartholdi's in New York harbor.

Attempts will be made in America (for the Congo has its paid apologists everywhere) to pretend that England wants to oust Belgium from her colony and take it herself. Such accusations are folly. To run a tropical colony honestly without enslaving the natives is an expensive process. For example Nigeria, the nearest English colony, has to be subsidised to the extent of $2,000,000 a year. Whoever takes over the Congo will, considering its present demoralized condition, have a certain expense of $10,000,000 a year for 20 years. Belgium has not run the colony. It has simply sacked it, forcing the inhabitants without pay to ship everything of value to Antwerp. No decent European power could do this. For many years to come the Congo will be a heavy expense, and it will truly be a philanthropic call upon the next owner. I trust it will not fall to England.

Attempts have been made too (for there is considerable ingenuity and unlimited money on the other side) to pretend that it is a question of Protestant missions against Catholic. Anyone who thinks this should read the book (a Question Congolaise) of the eloquent and holy Jesuit Father Vermeersch. He lived in the country and, as he says, it was the sight of the "immeasurable misery" which drove him to write.

We English who are earnest over this matter look eagerly to the westward to see some sign of moral support or material leading. It would be a grand sight to see the banner of humanity and civilization carried forward in such a cause by the two great English-speaking nations.

Yours faithfully,

ARTHUR CONAN DOYLE.

London, Eng., Sept. 9, 1909.

LONDON CLOCKS AT ODDS.

Authorities Being Urged to Have Public Time Pieces Synchronized.

A letter has been sent by the British Science Guild to London local authorities urging the necessity of the synchronization of all clocks exposed to public view in London. The London County Council act, which gives borough councils power to provide, repair, maintain, and wind public clocks, does not refer to their synchronization. Since 1903 it has been a condition that all overhead clocks in the city should record Greenwich mean time, but only four clocks have been licensed since then.

Only 28 of 86 clocks fixed above the public ways are synchronized. None of the 29 church clocks—not even that of St. Paul's—is synchronized.

WOMEN BY MAIL.

The parcels post system of Great Britain is certainly a comprehensive one, for recently two ladies of the suffragette persuasion were addressed, postage prepaid, to Premier Asquith, and delivered by the postal authorities. The premier's servants, however, refused to receive this human mail (perhaps on the ground that it was explosive or dangerous), and the ladies were removed by the police. This opens delightful possibilities for the reform of hardened politicians. Once give us an effective parcels post, and when Congressman So-and-so refuses to obey the wishes of his constituents, they may stick a stamp on Farmer Smith and send him down to Washington to remonstrate with the recalcitrant representative in person.—Rural New Yorker.

American Sculptor May Lose Studio in Old Roman Baths

(Special Correspondence.)

ROME, Sept. 9.—There is a struggle constantly going on in the Eternal city between the party which claims "progress" as its watchword, and that which wishes to preserve "old Rome," and, as might be expected, they both do a great deal of harm and some good, while occasionally they find themselves in accord. An instance of this accord which has just happened has a special interest for Americans as it will remove one of the shrines at which every American who comes to Rome worships.

As one leaves the railway station he has his first thrill on seeing a huge pile of masonry, of uncertain outline, covered with green creepers. "Oh! what is that?" is an exclamation I have heard hundreds of times in voices, full of excitement, and at the answer, "The Baths of Diocletian," the exclamation points become very thick, if unspoken, and the Thermae ever afterwards, in the midst of much more beautiful and characteristic things, stand out clear in the memory as having been the first realization of the lifelong dream of seeing Rome.

What remains of the baths is scattered over many square feet of the most expensive land in the city, and comprises an orphanage, a church, a monastery, one of the most magnificent museums in the world, a coal merchant's depot, several wine shops and a sculptor's studio. It is with this last that the particular American interest lies.

WHY CHURCH WAS BUILT.

The church is noteworthy because it occupies the tepidarium of the baths, which was adapted by Michael Angelo for the purpose. Like many of the Roman churches, Santa Maria degli Angeli owed its erection to the piety and visions of a priest. Antonio del Duca was accustomed to pray before an altar in Palermo over which hung a picture of the "Seven Angels." He came to Rome and in a dream the angels pointed out to him a spot for his church, which investigation proved to be the baths of Diocletian. He began with altars only, and at last, after 33 weary years, looked on the consecration in 1550 of his church, designed and carried out by no less a person than Michael Angelo himself. In it is a statue by Houdan of St. Bruno, of which Clement XIV said, "He would speak if the rules of his order (the Trappists) did not forbid."

In our days this was the only church of any importance in old Rome which would open its doors for the marriage of the present king of Italy, then Prince of Naples. At that time Leo XIII was alive, and he absolutely closed all the other churches to the hated "usurper," but Santa Maria degli Angeli could be "commanded" by the royal family as it is maintained by the state. Very beautiful it looked that day, the transcript, 298 feet by 91, being magnificently decorated, and crowded with representatives of all the royal houses of Europe.

Originally the baths of Diocletian, which date from 302 A. D., covered an area of 450,000 square feet, furnishing 3,200 baths at the same time, and becoming one of the worst sinks of licentiousness in Roman history. They were built with the sweat, blood and lives of 40,000 Christian martyrs, innumerable men and children finding their graves there. Among the debris of the falling walls, bricks have come to light bearing a rude cross drawn by these martyrs as a symbol of their faith and steadfastness even in the midst of great suffering.

FESTIVITIES IN 1911.

In 1911 there are to be great fetes all over Italy to celebrate the proclamation of Rome as the capital of United Italy, each big city in the peninsula having a separate program of festivities. Rome will do many things, and not the least will be what is called the "redemption" of the baths of Diocletian, which in simple words means that all shops and inhabitants will be turned out, and the room thus gained will be used for a permanent museum. During the fetes it will contain an exhibition of Roman antiquities, lent by those countries which comprised the ancient Roman empire. There will be one of the most antique Roman maps from Liverpool, statues from Greece, architecture from Africa, while Germany, Spain and Portugal, France, Austria, Hungary, etc., not to speak of other parts of Italy, will all contribute, forming a unique collection, and an overwhelming and irrefutable demonstration that Rome is "Mother of the World."

In a corner of these great and awe-inspiring ruins an American sculptor has lived, dreamed, and accomplished for about 40 years. Chevalier Moses Ezekiel is one of the most characteristic personages in the Anglo-American art world of Rome. Short, with white hair and mustache, which once were coal black, he possesses a pair of dark eyes, whose penetrating and at the same time kindly quality have lost nothing in the passage of time. Those eyes proclaim eternal youth together with the wisdom which age brings.

ROME'S TRANSFORMATION.

Mr. Ezekiel has seen Rome smile, heard her growl, and smelled her breath of gunpowder. In his time she has changed from the mediaeval, picturesque and therefore dirty little town of the popes into a great capital of a great people, and in the transition has shed blood, made mistakes, and filled the ears of the onlookers with lamentations and bursts of joy. During all this time the American sculptor has calmly and serenely occupied his quarters, looking out on the bustle below, philosophically reflecting that evolution must take this form, and that everything will come out right if you only wait long enough. Meanwhile, he has absorbed the "atmosphere" of his particular corner of old Rome to such good purpose that his work is known all over the native land and all Americans want to see his studios.

The question now is whether he will be allowed to retain them. Although large, they are only a small portion of the whole baths, and after all a sculptor's studio does not clash with the museum idea as coal depots and wine shops do, although without doubt the latter were to be found in the same spot at the time of Diocletian.

WORKS OF ART.

The entrance to the lower, or working studio leads directly into a large hall with domed roof, 50 feet above, which was one of the dressing rooms of the baths. As you enter your first sensation is bewilderment at the combination of magnificent works about you and their environment. You are perhaps attracted by a lifelike head of Liszt, also one of the Princess Wittgenstein, his famous friend, who recognizing her own ugliness recommended Ezekiel to reproduce her back as her face was so hideous. In a corner once stood the sculptor's idea of Shelley, now the property of the Keats-Shelley Memorial house, a gift of its originator. On a raised platform is Mr. Ezekiel's celebrated "Napoleon," the great soldier's empty hands clasped over a walking stick, of which an eminent American said, "That stick, in the place of a sword, is in itself a tragedy!" At one side gleamed the white form of the Christ, now decorating the tragic "Carity Bazaar," in Paris; in a corner is a replica of the monument to Mrs. Fisk which is in the Cornell university. It is a portrait figure and represents her lying with crossed hands in which is a laurel branch. She is clothed in the simple drapery of the tomb with her head slightly inclined to one side, giving a perfect view of her magnificent brow head and handsome features. She seems to have fallen asleep and thus passed to the fuller life.

The most beautiful and important work in the studio is the monument to Thomas Jefferson for the University of Virginia, the celebrated American standing, an imposing figure, on a base formed of the old Liberty bell.

The upper studio is not for work. It is here he receives his guests and gives his famous musical parties. It is filled with all the lovely things his brother artists have given him. It is not as left as the other and is vaulted. Once across the threshold the nineteenth century has flown and you expect dancing girls and strange music to greet you, and what is more remarkable, the spell lasts until you are out in the open again.

CONSTANCE HARRIMAN.