



JULES VERNE'S TOMBSTONE AT AMIENS PORTRAYING HIS IMMORTALITY

AMAZING STORIES

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Our Cover

This month shows a view of the earth as seen from the moon, which Baron Muechhausen describes so well in the story, "Baron Muechhausen's Scientific Adventures," by Hugo Gernsback. For the inhabitants of the moon at this particular time, it is "The New Earth." The Baron is getting ready to make a landing on the moon in his marvelous space flyer.

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In Our Next Issue:

- THE RETURN OF THE MARTIANS**, by Cecil B. White. Being an astronomer, our author is well informed on this subject and in this sequel to *The Retreat to Mars*, he gives us a most unusual as well as powerfully written story, which is not too technical to hold the interest of any reader, no matter what his inclinations might be.
- THE ANCIENT HORROR**, by Hal Grant. Prehistoric monsters are no novelty in literature, but here is one so totally different and the story is so well written that by the time you are through reading the story, you will not be at all sure that it is not entirely truth that you have read. This is an excellent tale that is sure to give you half-hour's interesting reading.
- BARON MUECHHAUSEN'S ADVENTURE**, by Hugo Gernsback. In Installments 3 and 4 the wily Baron gives us in detail, a picturesque story and description of his space flyer, his trip to the moon, his landing on the moon and his views of the earth from the moon.
- THE MASTER OF THE WORLD**, (A Serial in Two Parts) Part II, by Jules Verne. In this installment, the uncanny appearances and disappearances of the mysterious thing that threatens the safety of the world continue until Strock, the Inspector of the Police and head detective, solves the mystery in an extremely unexpected manner.
- TEN MILLION MILES SUNWARD**, by Geoffrey Hewelcke. We wager that the interest that this story will arouse, will be as great as that of "Doctor Meuiresno." While it has nothing to do with the Fourth Dimension, it evolves a most novel point to change the axis of the earth by human energy. It is one of the cleverest stories of this kind that we have ever seen. And when you have finished the story, we will ask you what is wrong with it.

And others.

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The DISINTEGRATING RAY

by David M. Speaker



"—The atomic number of gold is seventy-nine and that of mercury is eighty, so they are only separated by the difference of one electron; consequently, I turn the dial to the number 'one'." The professor's hand went over to the switch, and with a loudly beating heart, I watched him close the circuit.



In the late spring of the year 1926, there was a great deal of excitement in the science division of the State College. It was based on the widespread rumor that Professor Clinton Wild, head of the physics department, had recently made an invention calculated to revolutionize the world. The exact nature of this invention was as yet in doubt, but it was much discussed, and everyone had his own ideas on the matter. It may seem strange to the reader that the professor himself was not asked about his invention, but he was a very grouchy individual who was hated by the students, whom in turn he cordially disliked. At this time I was taking a course in physics which was required for the completion of my course. It was a subject that had always interested me, and as I showed a certain aptitude for this branch of science, the professor gave me the benefit of his special attention. I do not mean to imply by this that he was fond of me; he simply seemed to like me more than he did the others.

In spite of the fact that I was his favorite, it was a great surprise when Professor Wild called me up at my home during the following vacation, and asked me to come over to his house immediately, as he had a matter of great importance to communicate. Instantly, I scrambled into my coat and made a rush for his residence, which was only a short distance away. I arrived in a few minutes, out of breath and keyed up to the highest pitch of excitement. I rang the bell and the professor opened the door. I was surprised to see that his countenance, which habitually wore a sullen expression, fairly beamed with triumphant smiles. However, I was left little time for contemplation, for he led me upstairs to his laboratory at once and showed me the great secret which he had hitherto so jealously guarded.

What I saw was a very large and elongated X-ray tube attached to a mercury exhaust pump. It stood upright and at the bottom was a small iron crucible containing a silvery liquid which I supposed was mercury. Connected with the apparatus was a cable which led to a box at an end of the table on which the tube rested. On one side of the box was a dial which gave it the general appearance of a radio set. Having seen this much, I turned to the professor for an explanation.

"You are probably aware," he began, "that all of my recent work at the college has had to do with the structure of the atom. All my labors tended toward a goal. This goal was the disintegration of the atom. My ambition is realized in the machine that you see here. The disintegration is accomplished by the action of a stream of electrons vibrating at an exceedingly high frequency. Before I go any further, it might be just as well to review your knowledge of the structure of the atom so that you may better understand my invention.

"An atom, as you should know, is composed of two essential parts. First, a nucleus which is principally a positive charge of electricity, called a proton. Second, a certain number of negative charges, or electrons, most of which revolve around the proton at a high rate of speed. Now the important fact for

you to bear in mind is that one atom differs from another only in the number of electrons it contains. When an atom has many electrons, it has a high atomic weight; when there are few electrons, the atomic weight is low. Now the interesting thing about it is, that when all of the elements are arranged in the order of their increasing atomic weights, each element has one more electron in one of its atoms than the one before it. This number of electrons is called the atomic number. For instance, silver has an atom of forty-seven electrons, so it has an atomic number of forty-seven. From all this we see that the nature of an element rests solely on the number of electrons in any of its atoms, so that if in any way we can alter this number, we can change its identity. After a great deal of experimenting, I found that this could be accomplished by subjecting the substance in question to the action of my high frequency ray."

I thought by this time that the lecture must be over, but it was nothing to that which followed.

"Having taken a course in physics," he continued, "you should be familiar with radioactivity and alpha, delta, and gamma rays. Of these the alpha ray is the weakest and least penetrating, while the gamma ray is strongest and will penetrate one foot of iron. Also, these rays differ from each other in their compositions. The alpha ray is a stream of positively charged helium ions, the beta rays are simply a flow of electrons moving at a high velocity, and the gamma rays are waves in ether. The X-ray is similar to the gamma ray, but is not nearly so penetrating. Now to explain my machine: First of all, I had an X-ray tube of special construction made for this experiment. In this tube I produce an X-ray of an infinitely greater frequency than the ordinary one. If you look carefully, you will see two extra electrodes sealed into the glass. A current with high voltage is made to go across the gap between them. This results in an electrical discharge like the one in a Geissler tube, as they both consist of a high frequency discharge in a vacuum. This discharge, or stream of electrons, goes before the X-ray. The electrons are swept from their path by the ray and move along with it, and at the same time

a high vibratory rate is imparted to them, so what we have now is a sort of super beta ray."

"But," I asked, "I was under the impression that an X-ray tube did have two electrodes across which passed a high tension current under high potential."

"Well," he answered, "it

has but this ray is known as the cathode ray. The X-ray is caused by the impact of this cathode ray on some substance in its path called an anticathode. The X-ray is famous for its ability to penetrate some organic substances, but my ray will penetrate any substance, organic or inorganic, and more than that, it is of so high a frequency that it will penetrate an atom!"

The professor having made this amazing declaration, drew himself up to his full height and regarded me triumphantly.

"What do you think of it?"

"It's great! But I fail to see what relation it bears to the structure of the atom."

HERE is a short story of the atom, which will be of more than passing interest to you. Science teaches us that all materials, no matter what they are, are essentially of the same substance, with the exception, that a piece of metal, for instance, has more electrons than the gas hydrogen; otherwise, the two substances are the same. This fact has inspired The Disintegrating Ray, which gives you a good deal of instruction in a palatable manner.

"You see," said the professor, "that my ray, which from now on I will refer to as the epsilon ray, is composed of a stream of electrons vibrating at a high frequency. When this ray is directed toward a substance, it penetrates each atom. The electrons of the ray meet the electrons in the atom and there is a collision, which results in the atom losing some of its electrons. This loss changes the identity of the substance. After several months of experimenting, I found that the strength of the epsilon ray depends entirely on the voltage of the secondary discharge. Now I have it regulated so that the ray will remove just one electron per second. I have also discovered another interesting fact, namely, that iron is not affected by my ray. I am not sure just why this is so, but I think it is due to the fact that the magnetic flux set up within the metal counteracts the action of the epsilon ray. Consequently, I can take the heaviest element known to exist on the earth, uranium, and reduce it to iron. Then I can take the element with an atomic number just below that of iron, the metal manganese, and reduce it to hydrogen, but I cannot reduce uranium directly to hydrogen. In a way, this is an advantage, for I can make the apparatus that will be exposed to the ray out of iron; almost any other substance would be disintegrated."

"What," I asked, "is the purpose of the pump?"

"That," he explained, "is to extract the air, otherwise it would disintegrate when I turned on the ray."

"You said that the epsilon ray was of an exceptionally high frequency?"

"Oh, yes! Extremely so."

"How is this accomplished?"

"Well, that is a little invention of my own. I use a radio tube specially connected with a coil system in which there is a set of coils, each of a higher inductance than the one before it. I cannot give you the details now, as it is not yet perfected. The whole is kept in that box with the dial. That dial, or rather the switch that it controls, is another invention of mine made for the machine. It is really a sort of time switch which controls the length of time that the machine is in action. As I said before, the ray will take off one electron per second. If you will notice, the dial is numbered. The numbers refer to seconds and when I wish to reduce a substance to another element of a lower atomic weight, I calculate the atomic numbers between them and turn the dial to that number. At the center of the dial is a small button which starts the machine. When the dial has been turned to the correct number, I press the button and the ray acts for the required time. As soon as it is over and the transmutation has proceeded sufficiently, the instrument automatically stops the ray and the action ceases. Now perhaps you would like to see my machine in action?"

I replied in the affirmative.

Professor Wild walked over to the tube and made some preliminary adjustments.

"Now what shall I turn the mercury into?" he asked, turning to me.

"Try gold," I suggested.

"All right," agreed the professor, "the atomic number of gold is seventy-nine and that of mercury is eighty, so they are only separated by the difference of one electron; consequently, I turn the dial to the number one." The professor's hand went over to the switch, and with a loudly beating heart, I watched him close the circuit.

Instantly the silvery liquid hardened and turned to gold. Professor Wild disconnected the epsilon ray tube from the pump, took out the gold and handed it to me. As he did so, one of his peculiar smiles overspread his face. I took the gold and examined it. It seemed to be pure, for it was very soft, so soft, in fact, that I could easily scratch with my finger nail. When I took it, I noticed that it was rather warm, so I asked the professor the reason for this.

"When these electrons were put together, it was done at the expense of a great deal of heat and energy. Now that I tear them apart, this heat is liberated and leaves the element so it becomes cold. But the collision between the electrons that results when I turn on the ray causes a vast amount of heat which more than equals the cold. Or, in other words, the endothermic reaction in which heat is taken in or absorbed from the collision, counteracts the exothermic reaction in which heat is given off due to the disintegration." For a few minutes I stood still, lost in the contemplation of the wonderful machine, when suddenly I had an idea.

"Couldn't you prepare the undiscovered elements that way?"

"Yes, but that idea occurred to me before, and I have done so already." He went to a nearby cabinet and returned with a few bottles.

"You see," said the professor, "that they are only some more metals of the rare earths, all of which are very much alike." He submitted the bottles to my inspection and I saw that each contained a piece of whitish metal that resembled aluminum. He again went over to his cabinet and this time brought back a lead casket.

"The contents of this box would have been worth six or seven million dollars. Now it is worth approximately fifty dollars." He must have read my mind. "Yes it is radium which I can now make at will from uranium."

"By the way, professor," I broke in, "is there any practical use to which you can put this machine? I mean could you possibly make it do anything and be subject to your control?"

"Theoretically, it is possible, but the main difficulty lies in the fact that once the sudden disintegration is started, it will spread and the whole world will cease to exist. So that you may better understand, let me liken the case to an immense pile of gunpowder. If you apply a spark to any point, the whole will go off. But if some is separated from the rest and then is lit, it will not affect the rest of the pile. Now, I cannot separate the substance that I use from the rest of the world, but I can insulate it in an iron sphere, which metal, as I have told you, is not affected by the epsilon ray. Of course, there is another puzzle that confronts me. I have no way of knowing how much power I will get from the particular substance I may use to disintegrate, so there is the danger of the whole thing blowing up and wrecking the laboratory."

"I don't see why there should be an explosion," I said.

"To do so, you must first understand the principle of the thing. In the process of releasing atomic energy, the atom is subjected to a powerful discharge, which instead of merely taking off a few electrons, completely blasts the atom to pieces so that all of the electrons are left flying around. This gives rise to great pressure which can be used for

many things. It is this pressure that may cause the explosion. Of course this is not the ideal way of getting atomic energy, for this would cause a great deal of waste. The best thing to do would be to destroy the atom in such a way that all of the energy that originally went into its making would be available. However, that is only a dream at the best. The other is the only practical one that I can see just now. I intend to work on the problem tonight."

"That atomic energy is a great idea, but do you think that you can make it into a commercial product?"

"Undoubtedly so. Just for one minute pause to consider the enormous possibilities of atomic energy. Everyone would be able to have his own power plant, which would supply all of the energy needed for the day. Houses would be lit and warmed by atomic energy machines. Automobiles would be run by atomic energy. The probability that our supplies of anthracite coal and oil will only last for about one hundred years and fourteen years respectively, is a matter of grave concern, but with the key to atomic energy discovered, all of these fears will be dispelled. My idea is to make a machine something like my element-disintegrator, only I will greatly increase the power, so that it will be able to blast the atom completely, instead of just removing a few electrons, as I explained before. Then I will have to develop a machine in which to use the atomic energy. Of course the disintegrator will have a device with which to control the strength of the ray so that it will be able to do anything from disintegrating lead to lighting New York for a week. Isn't it stupendous?"

"It is certainly the most wonderful creation of the age, but don't you see that if you put this invention out on a large scale, you will destroy the exchange system of the world?"

"Why no!" he said in a surprised tone. "How?" "How?" I echoed, amazed at this scientific blindness to practical facts. "How? Don't you understand that if these machines are distributed, gold, silver, and other precious metals will be manufactured galore?" At this, some of his former enthusiasm took to flight, but after a moment's thought he said:

"Oh, well, that is a very small matter, for I can fix the machines so that they will deliver a large quantity of epsilon rays which will be too powerful for partial disintegration. If the machine is turned on at all, it will result in the complete destruction of the atom; but, of course, this quantity will have to be slightly variable to produce different amounts of energy. Now I fear that I have taken too much of your valuable time, so I will say good night. However, do not imagine that I am driving you away, I wish to make some experiments in an effort to produce atomic energy, which may involve some risk and I do not wish to expose you to any danger that might arise."

I took my coat and went, with the professor escorting me to the door. I was not at all hurt or mortified at my sudden dismissal, for abrupt terminations were characteristic of Professor Wild.

That was the last that I ever saw of the professor, and this newspaper clipping will explain his disappearance:

COLLEGE PROFESSOR KILLED IN EXPLOSION AT HIS HOME.

July 21.—Professor Clinton Wild, noted college professor, was killed in a blast that wrecked his home and broke the windows of several nearby houses. Details have not yet been ascertained.

THE END.