MME. CURIE'S WORK SHOWS ROMANCE OF SCIENCE

Discoverer of Radium, Soon to Visit America, Is Unassuming Woman, but Will Receive Nation's Highest Honors

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THE announcement that Mme. Marie Curie is to visit America has caused an unexpected amount of interest throughout the entire country. Her friends here in America have received letters from many of the leading educational institutions in the country inviting Mme. Curie to lecture to their professors and students. Academic honors will be bestowed upon her. Scientific societies are preparing to award her evidence of their highest esteem. No ambassador carrying all the honors that his country can bestow has been received with half as much enthusiasm as this simple and unassuming scientist.

Dr. F. C. Wood.

It seems strange that America, which has always been credited with the development of materialism to the nth degree, should desire to do honor to one who has cared nothing for the material things of this life. In France some years ago, it is true, when a referendum was taken throughout the country to decide who, in the opinion of the common people, had brought most glory to the nation it was not, strange to say, Napoleon they chose; it was not a statesman; it was not a man of affairs; it was a simple scientist who had worked in his laboratory for the love of work and without the expectation of any material reward. Pasteur was his name. He had conferred upon his country more fame than is given to most of the great ones of this earth.

Mme. Curie's Story a Romance Of Latter Day Science

Mme. Curie was born in Poland, educated in Paris in the famous institutions which have been in existence there for more than five times the life of the American nation and married to a French physicist, then utterly unknown to fame except to a select coterie of specialists. Suddenly this woman became world famous.

After the discovery of X-rays by Prof. Roentgen several French scientists attempted to see whether X-rays were given off by a great variety of chemicals. By a strange accident one of the chemicals first selected was an old specimen of a salt of uranium which had stood on the laboratory shelves in the Sorbonne for many years. It was found that this salt would give a picture upon a photographic plate, even through a sheet of black paper or a piece of thin wood. The source of this uranium salt was traced to a pitchblend mine in Austria, the property of the Austrian Government. Some of the original pitchblend ore was obtained and found also to be capable of acting on a photographic plate just as the X-rays did. Mme. Curie was well known as a competent chemist and her husband as a man of great scientific ability. To them Prof. Becquerel, who had made these experiments, turned for assistance. They first found that other substances—for instance, thorium—would do the same thing as uranium would.

As the uranium ore was very expensive, the Curies could not afford to buy any of it, nor was the Sorbonne any more wealthy than the usual educational institution. The Austrian Government, however, kindly presented to Mme. Curie a ton or so of the residues left after the uranium was removed, for while uranium has a moderate commercial value, chiefly in coloring glass and in certain processes of chemical analyses, the residues were of little value. Mme. Curie summoned to her assistance a number of chemists, and they analyzed this ton of ore residue with most minute care and patience. It was found as one metal after another was gradually separated from this extremely complex mixture that certain groups—for example, barium and bismuth—showed marked photographic and other effects which ordinary barium and bismuth did not show.

Looking for These Unknowns, Radium and Polonium Were Found

To the trained mind of Mme. Curie this was evidence that mixed with these substances and closely resembling them chemically there must be elements hitherto unknown which had powers of darkening photographic plates and discharging electrified bodies.

After months of careful labor a few crystals of purified substance were obtained, the whole amounting to not much more than could be held on the point of a knife, and these were the new elements in question. One of these elements Mme. Curie named polonium in honor of her native country, and the other, discovered later, was named radium. Polonium has since been found to be a product of the destruction of radium.

It is difficult for any one not acquainted with the exploring habit of the scientific mind to realize the amount of labor which went on in the dingy little laboratory, not much more than a cellar, where Mme. Curie worked. It is possible perhaps to understand why Peary struggled through frost and snow to the North Pole. It is easier to know what propels the miner to the gold field or the prospector to the diamond mine; the motive of the business man is simpler still. But what is it that keeps a frail woman working day after day, night after night, month after month and year after year in quest of something to her of no commercial value, of which she possesses at the present time not a fragment, but which has brought untold benefit to the human race at large?

Mme. Curie did not patent her discovery; she never tried to obtain a fee for information rendered; she never concealed any of her methods; everything was open and above board, so that any one could repeat all the work she had done as soon as her papers were published. She and her husband even sacrificed their small savings in order to obtain the necessary chemicals and glassware for the further pursuit of the work. Everything she had she gave to it, and she still sits in her laboratory in the Sorbonne with no source of income except the salary which the Government pays her, with no interests except the pursuit of science and the care of her two children. Pierre Curie long since ceased to aid her in her scientific work, for, dreamer as he was, he was killed by a taxicab while absent-mindedly crossing one of the crowded streets of Paris.

After all her years of work she does not possess any radium of her own, for that which she separated has long been consumed in the study of its properties. The French Government allows her to use some of its own, but this must be carefully conserved and cannot be risked in experiments.

The only desire she has expressed to her friends is that she may have some radium of her own. A committee of women and scientists has been formed to raise a sufficient fund to present her upon her arrival in America with one gramme of this precious substance. The committee has announced that it will welcome contributions of any size from the women of America and that the Equitable Trust Company of 37 Wall street, New York, has been empowered to receive donations for the Mme. Curie Radium Fund.

Not only have I gladly accepted membership on this committee to provide this self-sacrificing woman and great scientist with the only thing which she wishes in the world but every one whom I have approached to assist us in this matter has responded with equal enthusiasm. Only yesterday a clinic patient of mine, suffering from cancer, begged that she might be permitted to contribute $1, all that she could afford, in order to help the cause. Her name will rank high on the list which will be given to Mme. Curie when the radium is presented, as will those of the women of greater means, several of whom are giving $1,000 apiece and one $10,000.

Only those who have worked in a laboratory can know the fascination of discovery and can appreciate the motives which led these two people to devote their lives to the separation of radium and its allied compounds and the study of their nature. The children of one's brain are far more immortal than the children of the body. They, indeed, can never be taken from one. No one can injure them. No one can buy them; they remain always a monument erected by the brain to its capacity to reason. Even in its busy and multifarious life the world in a queer, dumb fashion appreciates occasionally one of these great research workers and attempts, in a clumsy way perhaps, to express its approval and to offer some reward. Usually the world is quite astonished and even pained to find that true science is its own reward and that nothing it can do, either by applause or by criticism, can in the least influence one of the great geniuses. The reason is very simple; the great genius is creative, and those who create have very little interest in material things.

She Comes to Study Amplifications of Her Method

And so Mme. Curie, after a long life of arduous labor, is to take a few weeks' vacation and come to a country she has long wished to visit. She will find here many friends and pupils, for her laboratory has long been a place to which ambitious students flock. She wishes to see some of the institutions in which her original discoveries were carried on and amplified, for the discovery of radium has led to the finding of many other curious new elements, some of which are as fugitive as the gnats of a summer evening, mere ghosts of matter whose life is a few seconds, while others are so stable that in 200,000 years no loss in weight will be appreciated by the finest balance of that far distant period. Yet by the delicate electrical tests devised by Mme. Curie we know these elements are slowly changing.

One of these elements lasts only five-hundredths of a second before it explodes into a descendant which lasts a little longer, and finally all of them stop when they get to lead, for, what most people do not know, there are two kinds of lead in the world. One kind of lead, of which there is very little, comes from radium, and another kind of lead comes from the plumber. Of the radium lead there is scarcely a pound in existence, but its cost is so high that even the plumber's lead seems cheap.

It is hoped that Mme. Curie when she reaches America will tell of some of the extraordinary discoveries which she has made; how radium is the realization of a part of the old alchemist's desire to be able to change one metal into another. It is true that the alchemist was interested only in changing ordinary metals into gold, and it is also true that Mme. Curie, the descendant of these alchemists, is not able to change radium into anything else, for it changes itself, and neither the hottest furnace nor the coldest liquid air makes any difference in the way or speed with which it changes.

It goes on quietly exploding and sending off big bombshells of a gas known as helium, which, as every one now knows, comes out of some gas wells in Kansas in large amounts and was to be used for filling dirigibles if the war had lasted longer. Most people do not know, however, that helium was first discovered in the sun by the spectroscope and for for many years remained undetected on earth.

But when the radium atom blows up it sends off great bombshells of helium, at the rate of 10,000 miles a second, and these go shooting through the air until they strike an air molecule and are checked.

The great force which they possess has been used in a very extraordinary way of late by one of Mme. Curie's pupils, Sir Ernest Rutherford, to show that by bombing ordinary nitrogen gas—atoms of the same kind of nitrogen that we breathe—an atom of hydrogen can be knocked out of it. Thus again is the alchemist's dream fulfilled, for, as he probably guessed, all of the substances that we know are composed of a few elements, of which hydrogen is one, and possibly the only one. When radium explodes it sends off not only the big bombs but a lot of little, very high velocity shells, some of which go nearly as fast as light—and light travels faster than anything else can ever travel. As these little electrons shoot madly out through space they give such a kick to the atom that is left that it wabbles frantically, and, lo! a beam of X-ray is produced. The X-rays from radium we call gamma rays.

Sir Ernest Rutherford's Experiments Interest Her

How do we know all these things? Because we can see many of them. That is, the eye of the camera can see them, and after all it seemed ridiculously simple when it was really thought out by a bright Englishman. He put the radium in a glass bottle filled with damp air and then by changing the pressure a little made a fog, and the fog settled on these minute shooting stars, just as it settles on the spider webs on damp autumn mornings. Then as these fog laden particles shot through space at the rate of thousands of miles a second he photographed them by flashlight—not the ordinary flashlight, which would never have stopped them, but the quickest flashlight which we know (that is, an electric spark, which is only 1-300,000th of a second). And so we have actually made visible particles smaller than what we used to think was the smallest thing known, and that is the atom. These little particles weigh but 1-1,800th as much as the atom weighs.

Now, all this may seem very uninteresting and theoretical, but every one to-day knows that radium is used to treat cancer, and the reason why we use radium to treat cancer is due to an unfortunate accident which occurred to Prof. Henri Becquerel. After he had carried in his pocket a tube containing a little radium he had for a few weeks a bad burn on his stomach. As the older physicians were used to burning out cancers with caustics, the idea occurred to them that radium was perhaps a magic caustic, and so it has proved to be, for when suitably used radium benefits and in a few instances cures tumors.

A diamond as it comes from the mine is an uninteresting, dull lump that looks like dirty glass, and no one would suspect its beauty as it finally leaves the hand of the cutter. So, too, radium is disappointing. It looks like a little tooth powder enclosed in a glass tube. Ten thousand dollars' worth can be put into such a tube about the size of a coarse pencil lead and not more than an inch in length. The glass tube is very thin and is enclosed in a silver one so as to prevent breakage in handling. The bare tubes must always be picked up with forceps, for about a minute's contact will in a week or so be followed by a sharp burn which will render the tips of the fingers useless for practical purposes for a month or more.

In treating cancer a burn is to be avoided, so the radium is enclosed in a metal tube about an eighth of an inch thick, which absorbs both kinds of projectiles of which we have spoken and allows only the invisible X-rays of radium to pass. For the actual treatment a sufficient number of tubes are wrapped up in a surgical gauze or stuck into a piece of dentists' moulding wax so as to keep the tubes from direct contact with the skin, and the whole package is strapped over the tumor with adhesive plaster.

Radium Gives Off Its Rays in Breaking Down Other Substance

If an internal tumor is to be treated the tubes are surrounded by thick rubber or wax and held against the tumor. In treating some cancers, for instance one in the tongue, it is difficult to keep the radium in place for the necessary number of hours, so another method is used. Radium only gives off its rays because it is breaking down into another substance just as coal only gives off energy, which is really stored sunshine, when it is burnt. Now one of these breakdown products is a gas which can be pumped off from the radium and collected in small steel or glass needles. These needles can be stuck into the tumor and left there until the tumor cells have had a proper dose. This does not hurt, as might be thought, for a tumor has no nerves.

That is about all there is to radium treatment, but the proper dose and the time that the radium must be left on the tumor can only be determined by long experience. Excessive treatment may result in very painful burns, injury of the healthy tissues surrounding the tumor and in some instances in the severe illness and even the death of the patient. Undertreatment may stimulate the tumor to grow faster. So it is evident that the use of this powerful remedy should be only in experienced hands.

Radium does not do what we all hoped at one time it would do; that is, cure all tumors, but it has brought freedom from pain and comfort and prolongation of life to many thousand suffering human beings.

So we welcome to our shores Mme. Marie Curie—perhaps the greatest scientific mind the gentler sex has produced—and we welcome her here because she has not only discovered a new element and opened to our gaze a universe of infinitesimal things and changed all our views of the constitution of the atom but most of all because she has brought comfort to human souls.

Here is one of the latest pictures of Mme. Marie Curie, noted French scientist. She will visit America soon and be an honored guest in many cities.

Mme. Marie Curie, the discoverer of radium and one of the world's greatest benefactors, will visit the United States in May. She has never worked for the sake of money. Now, at the age of 56, she has nothing but the salary of a teacher at the Sorbonne University. She would not take more than that. She says her only desire is for a gramme of radium—for strangely enough the woman who gave this precious substance to humanity has none for experimental purposes. The gramme is to be presented to her, in the name of the women of America, when she arrives here. A committee of women and of scientists is now raising $100,000 to this end.

The writer of the subjoined article, Dr. Francis Carter Wood, director of the George Crocker Special Research Fund, willed to Columbia University by the late George Crocker for the study of cancer, is a distinguished pathologist now acting as chairman of the Mme. Curie Radium Fund. He speaks of Mme. Curie as perhaps the greatest of women scientists, and says she will be welcomed in America "most of all because she has brought comfort to human souls."

Untold Benefit to Humanity Has Resulted From Her Labors and Our Women Plan Unique and Worthy Testimonial

Quenching the Thirst of Georgia Is Reduced to a Science

Southern Section of State Well Supplied From the Bahamas and North Section Gets Enough From Mountain Moonshiners

DOWN in Georgia some wag with a nimble brain, a fountain pen and three drinks produced this masterpiece:

We know a little section of the country
Where they make a better drink than rye;
They'll give you a drink for the asking
If you only let 'em know that you are dry.

We get corn liquor from the mountaineers,
And we'll buy every day until we die;
That's what we'll do down in Georgia
When the whole darn world goes dry.

This inspiring ditty apparently has retired permanently "In Dear Old Georgia," and now wherever the faithful are gathered, be it stock room, office, attic or the hotel where the commercial traveller from the North is buying for his customers, the grand rhythm of the song rings out and offends the horror stricken ears of those who have not been invited to the party.

Of course the underlying reason for the popularity of the song is that it is fundamentally true.

Bootlegging in Full Swing From Tybee Light to Rabun Gap

The papers say that an effort is being made to reduce the size of the standing army of the United States. It had better not be done. They should double the size of the army, bring all the boys back from the Rhine, declare them all to be military police and string them out between Tybee Light and Rabun Gap, if it is really the intention to put any curb on the fine art of bootlegging in Georgia.

Let it be understood at the outset that this story deals with North Georgia. Down in South Georgia they use mostly red liquor and imported stuff that comes in by ship, for which they pay from $8 to $15 a quart, according to the degree of thirst acquired by the purchaser before he decides to align himself permanently with the criminal classes of the State. However, after he has demonstrated that the Government's expenditure of some hundred million dollars or so to keep him from taking a drink did not accomplish its purpose, he finds that the liquor he has bought is very good indeed. There seems to be very little adulteration. Also they make a type of moonshine liquor in South Georgia that is distilled from sugar cane, but it manages to catch in one's throat some way or other, and it is not much in demand except among the negroes. But enough about South Georgia. We are dealing with the profession of bootlegging as it is practised in Atlanta, 1,050 feet above sea level in the Piedmont section, and from there to Rabun Gap on one side and Chattanooga on the other.

The making and selling of whiskey in this section is as perfectly systematized as ever it was in the pre-prohibition days before a few thousand persons organized and decided that everybody would have to stop drinking. The only difference is that greater profits are taken by every one who handles the stuff from the manufacturer to the retailer (sometimes called the moonshiner and the bootlegger) and the consumer is limited in his choice of brands.

Time was when they were very fussy in Georgia about their liquor. They not only demanded bourbon or rye as their fancy dictated, but a certain brand of bourbon or rye, and they even declared what kind of water they elected to use as a chaser. That was then. Now they merely inquire about the responsibility of the bootlegger and don't even ask for ice.

Now here is the method by which corn liquor passes from the moonshiner, who makes it, to the consumer, who drinks it:

The mountaineer at a cost of 75 cents or $1 (it can't possibly be more than that) produces what is known as "double and twisted." Unless new liquor is "double and twisted" it is not good. Let's digress briefly to ascertain what this more or less mysterious phrase means.

Of course, "double" means double distilled, or run twice through the worm. "Twisted" has yet another meaning. This is it: The mountaineer has discovered that no whiskey is more than eight years old, so far as the bettering of the whiskey is concerned. In other words, twenty year old whiskey may be thicker, but it is no better than that which is only eight years old. He has also discovered that whiskey which trickles down a charred willow pole is given one year of age by every two feet of the pole. Therefore he cuts a willow sapling sixteen feet in length, chars it over an open fire, throws it into the branch to clean it, places one end at his worm and the other over the mouth of his jug or bottle. By the time the corn liquor, double distilled, has trickled and twisted down the charred willow pole, through the sunlight and the air, and dropped into the jug it is "double and twisted," eight years old.

His part of the operation of quenching the thirst of Georgia having been completed, the moonshiner returns to his cabin on the hillside and awaits the arrival of the whiskey runner. This latter individual has an automobile. Invariably he travels in a high power car. The runner pays the moonshiner $5 a gallon for his "double and twisted," a clear profit of $4 a gallon. The runner transports the whiskey to the edge of the city only. He has come through the country. His car is muddy or dusty or out of repair. His car on the city streets would be instantly an object of suspicion. Therefore he sells direct and outright to the station agent at the edge of the city and goes to have his car washed or repaired, preparatory to making another trip.

This station agent may be a negro who has a cabin in the suburbs, or he may be a garage owner, or even a truck farmer on a good road, but he is decidedly among those present in the deal. The runner receives $11 per gallon for what he has brought in, a profit of $6, but he is considered to be entitled to the largest share because he really is the man who has borne the heat and burden of the day.

After the station agent next appears on the scene the bootlegger, who buys from the agent outright for $14 a gallon and who sells to the regular consumer for prices that vary from $16 to $20 a gallon, according to the condition of the market and the place of delivery. Of course, the bootlegger sometimes gets as much as $30 or $35 a gallon for his liquor, but not from his regular customers.

Naturally this means that down in Georgia they are quenching their thirst by the gallon. The stuff is delivered in turpentine cans, since these make a square, neat package, free from all suspicion. It must be emptied as soon as possible from these cans, else it will acquire a dark color, which is not harmful, but which necessitates straining through filtering paper or charcoal to restore its pristine clarity. These turpentine cans are all delivered to one man's office, which is known as the Clearing House, and there the consumers repair, each to get his gallon. The manager of the Clearing House, who is himself merely a consumer and a friend who gets no profit out of the liquor, telephones some such message as:

"The four-forty train will not be in until five-fifteen," by which it is known that the distribution of the gallons will take place at his office at 5:15 o'clock in the afternoon; or he will say:

"I can't keep that appointment with you to-day until six-twenty"; or perhaps:

"You can see those fittings to-day at my office at three-thirty"; and then sometimes will come the more mournful message:

"Jim's hens haven't been laying recently, and it has been absolutely impossible to get that dozen eggs I promised you to-day."

All of which cryptic messages have a meaning if you will study them out.

Georgians Have Promising Ways When Talking About Liquor

So that's the way it's done in Georgia, and that's the way they are quenching the thirst of the Empire State of the South.

All the consumers are now saying that they hate liquor as a mortal enemy and deplore that they ever so far forgot themselves as to press a foot on a brass rail and keep it there until the porter came around with a broom at closing time to sweep the place out. They tell each other between drinks and tears about the pitiful case of "Old Sam," who never touched liquor in the old days, always drank beer until they took it away from him, and absolutely compelled him, yes, sir, forced him to drink liquor. They are all saying that if they could just get light wines and beer back they would never touch another drop of liquor.

Georgians have mighty promising ways when they are talking about liquor, but it is all promises. There was once a time when they said in Atlanta that they had no objections to Statewide prohibition, but that this thing of having Atlanta dry and Jug Tavern (which has since adopted the more dignified name of Winder) and Griffin wet and getting all the money was wrong. So the prohibitionists took them at their word and gave them a Statewide drought.

Immediately the Georgians loudly cried that they would not object to a dry State if the rest of the United States suffered also. "National prohibition," that dream of the dreamer, they would agree to. They would keep the law and love it and embrace it if it were made to apply to all of the United States. Evidently some one believed them, because they got their national prohibition. Now they protest that they will observe the law if they can get back "light wines and beer."

The truth is that neither Georgians nor any one else can be believed on this liquor question. Ninety-nine men out a hundred will stop and help pick up the coins that have spilled from a blind beggar's tin cup and return every one to him, millions of men can be trusted with money unlimited, with the integrity of a home or the honor of a friend, but where is the man who can be trusted with a half pint of liquor?

City's Rat Hunt Takes in Entire Waterfront

IN its efforts to prevent typhus and other ship borne plagues from gaining a foothold here the Health Department has made New York's entire water front the scene of a great rat hunt. While always under the ban as disease carriers, it is doubtful if the rodents ever faced so intensive a campaign as the one now directed against them to offset increased dangers to public health arising from the influx of immigrants from countries where post-war conditions have fostered plagues of all kinds.

The great rat hunt is by no means restricted to water front districts. It is along the docks and piers, in warehouses and on incoming ships, however, that the work of the hunters is most vital. Some of the chief measures in the anti-plague campaign are described in the *Weekly Bulletin* of the Health Department.

Poison gas (hydrocyanic acid) is proving one of the most effective means of exterminating vermin. The Health Department is experimenting also along the lines of another war method. "While it has been accepted as an established fact," says the *Bulletin*, "that the ridding of a community of rats through the use of a virus—by inoculating or feeding some material which causes the development in them of a disease contagious to other rats—is impossible, still this department is now experimenting with a culture obtained from Germany which, it is claimed, was used by the Germans to clear their trenches of rats."

The quarantine station notifies the Health Department of the arrivals of ships from any infected port. An inspector is immediately sent to the docking pier to compel the placing of rat guards on the hawsers extending from the ship to the shore, and fenders or pontoons to breast off the ship at least six feet from the dock and to take all reasonable precautions to prevent rats from coming ashore. The inspector also requires the consignee to forward the health pratique received at Quarantine to the department, in order to place responsibility for the compliance with orders upon such consignee. To prevent the loss of merchandise overboard in the unloading of such vessels, due to the open water between ship and dock, the consignee has the option of fumigating the vessel with hydrocyanic acid gas instead of complying with these regulations.

The piers themselves next receive attention. The presence of rats thereon is proved by actual trapping. Accepting as a fact the theory that plague will appear among the rats of a city six months before its communication to man, these trapped rats are taken to the laboratory and examined for the presence of disease. All of such examinations so far have proved negative.

All dunnage, old material and refuse upon the dock which might form a harborage for rats is ordered removed. Materials to be left on the dock, unmoved for some time, are ordered elevated, placed in ratproof enclosures and so arranged as to permit of ready inspection. The lessee or the department itself spreads poisoned bait—barium carbonate mixed with flour being selected as the most easily handled and the least dangerous to man or pet animals.