Radium's History Is As Wonderful As Its Properties Pinch Is Worth Fortune But None of It Is In Canada

The Romance of Polish Girl and the French Scientist Led to the Great Discovery.

[From Montreal Star.]

closed to Canadians. A pinch of radiworth a fortune. Ores from which it is obtained are found in the Western United States, and a former McGill professor added to its value by pointing out some of its wonderful properties. But it is said none of the precious substance can be obtained from the soil of Canada.

Since its discovery in 1898 the history of radium reads like a fairy tale as wonderful as the healing and other properties claimed for it.

radium is worth about \$2,500,000, and physics were begun. though new sources of mineral and improved methods of extraction may ultimately bring the price much lower, its rarity will always remain, because it occurs in nature in such infinitesimally small quantities.

Story of Radium.

The story of radium is a romance. It began with the love of a young Polish girl for a French scientist. She loved also his science and married him that she might help him in his work. He aided her studies and researches, and they lived together in a laboratory, seeking the undiscovered secrets of nature. In the opinion of many scientists it was only the gallantry of a loving husband that accorded to Madame Curie the credit for discovering radium, thus giving her the title of the greatest women scientist in the world. vindicated Madame Curie. Professor lost in thought, and ever since Madame of matter. Curie has carried on the work of the laboratory, with brilliant results, and discoveries at McGill attracted to which have compelled the admiration

Professor Rutherford's Work.

Year's Day of the present year be-One door to wealth appears to be came Sir Ernest Rutherford, is one of the world's greatest authorities on radium, and it is of interest here to note that some of his most important researches in radio-activity were conducted while he occupied the Macdonald chair of physics in McGill University, from 1898 to 1907. In 1907 Professor Rutherford was awarded the Rumford medal by the Royal Society of Great Britain; in 1908 the Bresa Prize of the Turin Academy of Science and in the same year the Nobel prize for chemistry, worth approximately \$40,000. A native of New Zealand, he is not yet 43 years of age. It was in the famous Cavendish laboratory at Cambridge that his researches in He came to McGill with a full and expert knowledge of all that had been discovered concerning radium-activity up to that time, opening before him a vast and virtually untrodden tract of ground for research, and he had laid at his disposal along with the Macdonald pro fessorship one of the finest physical laboratories that thought and money could equip. With opportunity and inclination thus hand-in-hand, great headway was made.

Important Results.

Of important results from Professor Rutherford's research in Montreal there were many: too many and complex to give in detail, but the chief of them may be enumerated. He found that thorium gave off what seemed a Those who took this view insisted kind of gas which had the remarkable that it was Professor Curie who dis- property of depositing an invisible film covered the new element, although they of matter on the surface of other subadmitted that he was aided in the lab- stances about it, rendering them oratory by his wife and by an assist- radio-active, too. To this he gave the ant, a young scientist named Beau- name emanation," and with the as-Professor Curie, however, al- sistance of Mr. Frederick Soddy, now ways maintained that to his wife the of the University of Glasgow, he succhief honor was due, and time has ceeded in measuring the rate of diffusion of the emanation from radium. He Curie was killed in the streets of Paris proved also that the emanation was a a year or two ago, while walking about gas and a separate and distinct form

Professor Rutherford's investigations the university students from all parts of the world

coveries of note which he might himself have claimed, shows his worthi ness of the reputation he has for open handedness in the matter of "sharing the credit." As Langworthy professor and director of physics at Man-chester University, Dr. Rutherford is carrying still further the investigahe made while in Montreal, drawing for the purpose on a large supply of radium which has been placed at his disposal for research work by the Austrian Academy of

Madame Curie has the highest admiration for the work of Sir Ernest Rutherford, and while in London las summer, said to an interviewer: the world keep its eye on Professor Rutherford. I have spent much time of late in his laboratory in Manchester, and I cannot express my admiration for his genius and his work. is my belief that he may yet bring forth some wonderful discovery concerning radium-a discovery that will

benefit the whole human race." Dr. Lazarus Barlow.

The power of radium to help sufferers from cancer has been brought before the public very vividly during the last few months, and within the ments have been made about its effiwith radium on cancer patients make no such sweeping claims and are careful to point out that there is a long way to travel before we can claim radium is a "cure." One man who has recently come

prominently before the world in this work is Dr. Walter Sydney Lazarus-Barlow, director of the cancer research laboratories, in the Middlesex Hospital, London. The cancer department of the hospital admits only inoperable cases—that is, cases which have passed beyond the aid of the surgeon. From June to September, 1912, 24 such cases were admitted, and in the same time there were 24 deaths a mortality rate of 100 per cent. From June to September, 1913, 68 ases were admitted. In that time 36 deaths occurred, and 32 patients were in so favorable a state as to be discharged from the hospital-an unpreeedented event. Most of these patients were now going about their daily work. In one or two cases a recurrence has taken place, but Dr Lazarus-Barlow hopes that with fuller knowledge of the action of radium recurrences will be prevented.

Dr. Lazarus Barlow said that it was possible that in some cases they did of the world who were anxious to not at present give a sufficiently pow-work under him. And the number of erful dose of the remedy. If 150 milli-

up and disappeared. But it was suggested that occasionally a few cells were left unkilled and that these afterwards caused the recurrence by becoming active. Time was required to substantiate the remarkable results achieved, and no one should talk of an absolute cure until his results had been substantiated by time. Nevertheless there could no longer be any doubt as to the immediate effect of radium upon cancerous tumors. It was of the highest importance that they should have a sufficient supply of radium to effect thorough treat- of connective tissue).

Results Achieved.

Dr. Howard A. Kelly, the famous gynecologist of John Hopkins University, Baltimore, is another man who doing remarkable work in applying radium to the cure of cancer. "It is not a panacea," said Dr. Kelly in a recent address in Chicago, "but it is the most remarkable therapeutic agent which has ever been put into he hands of man."

Dr. Kelly insists, however, that recent work does not change the accepted procedure for treating the most malignant forms of cancer. The us of radium, remarkable as its effects last week or two, sensational state- are, has only begun: the scientists who are using it declare that they clency. These almost amounted to only faintly understand its workings, claiming that in a large number of and many years' experimentation will cases it performed absolute cures. It be needed to form general conclusions. has to be pointed out that the able No one, Dr. Kelly says, should nourish surgeons, both in Europe and America. false hopes or delay operations in the who are foremost in experimenting early stages. In this same lecture, under the head of "Radium Aphor isms," he succinctly phrased just what radium had accomplished so far. This part of Dr. Kelly's statement is as

"Does radium eliminate surgery?" "It does for practically all superficial cancers." (Superficial cancers, it may be explained, are malignant skin growths which affect external parts of the body, such as various parts of the face and head, the hands, "It will do better work than the surgeon where the disease has extend-

ed to the depths. "It will cure cancers of the nose eyelid, ear, and lips where surgery must mutilate.

"Even where there is ulceration there is often a remarkable and unexpected restoration to the normal. "It is peculiarly effective in tumors of the mixed type, represented by parotid growths (growths on the largest salivary gland).

"Here the inoperable is sometime rendered operable, and surgery is enabled to complete the cure. "Radium will cure some breast can diseases of the larynx, especially if they are taken early. "Radium will cure some breast can

cers, but surgery, followed by irradiation with radium, is safer here for the

cers, even those which have passed the operable stage.
"Where surgery has reached its limit and can go no farther, it is ye

cate the disease with radium. "Radium appears to be almost a spe cific for lympho-sarcomata (malignant growths of connective tissue resembling lymphatic glands in structure) sometimes causing a large mass to melt down almost visibly.

possible in some instances to eradi-

"Radium is peculiarly effective in all the sarcomata (malignant tumors "It will often, we believe, wipe out

microscopic elements left behind and so prevent recurrences. "There is good reason to believe that it may be used with advantage to irradiate the tissues before an operation, lessening the chances of a re-

"Radium is valuable to irradiate the issues after an operation either by its insertion immediately at the close or later on"

How To Get Radium.

turn

There are various sources for obtaining radium, for it occurs always in a fixed proportion with the metal uranium. Wherever we find uranium we are sure to find the one-millionth part of radium with it. Pitchblende is the richest mineral, but certain other substances as autunite, torbenite, and carnotite contain small quantities of uranium, and it is from these three poorer minerals that the future supply of radium will very largely come, unless, of course, unforeseen fresh supplies of pitchblende are discovered. The chemist finds himself with one ton of ore, and he knows by measurement with delicate instruments that it way of overcoming the difficulty of contains about ten milligrams, or less than the sixth part of a grain, of the dose day by day, so that if you radium! Imagine trying to extract a were to start today taking doses of a grain of something from six tons of tablespoonful, on the fourth day you solid rock! But modern chemistry, to would take two tablespoonfuls. which the name of radio-chemistry has now been given, has enabled this problem to be solved with such complete that by the most recent methods hardly any of this grain is that spring waters, which may give cess of extraction. The result is that ome months later nearly the whole of the priceless grain of radium is extracted in an almost pure state, and perhaps weeks afterwards, the radioits purity can be measured against a active properties have vanished. special standard sample prepared by Madame Curie which is kept fealously guarded at the international bureau of their wounds with dust which they veights and measures at Sevres, near got in the neighborhood made with Paris. This standard sample of pure water into a kind of poultice, and radium chloride contains nearly recently it was discovered that there

Academy of Sciences in Vienna.

Up to the Present Time In Its Treatment of Cancer It Has Proved Very Beneficial.

international standard specimens. RADIUM 8

Radium Water Used

Radium water is being largely tried now in the treatment not only of cancer but of various rheumatic and gouty troubles, and this water consists of ordinary water charged with gas given off by radium and known as "emanation." If some radium salt be dissolved in water and left in a sealed vessel, in about a month the 'emanation" gas which it produces reaches a state of equilibrium, and it can be expelled by boiling and passed into water, which then possesses radio-active qualities. This "emanation water" only retains its activity for a short time, and in less than four days has become impoverished to less than half its original value.

At the Radium Institute two lots of radium are kept continually in use for making the water, and while one is resting, so to speak, for its month the other has produced enough water to go on with for this month. One the lessening effects is to increase after the fourth day the radio-activity diminishes so rapidly that the water is of little more use, and fresh must be secured. This is the reason beneficial results on account of containing radio-activity, must be drunk at the spring, as if bottled and drunk Many years ago the natives in some

South American district used to cover twency-two milligrams sealed up in a was radium in the locality, so that turned to the avoidance of war just thin glass tube, and three other inter- years ago, quite ignorantly the curanational standards are kept at the tive effects of radium were already being employed. The residues obtain-It is quite a common thing when ed after all the radium has been exbuying a large quantity of radium- tracted, still contain minute traces of by this is meant a grain or two-to radio-activity and are used a good orado and Eastern Utah, produced

Shackelton's Plans for Antarctic Journey

first tested against one or other of the ers and baths. One of the uses to which they are most likely to be put nowever, in the future, is the acce! eration of the growth of crops. British experimenter recently describ ed at the Royal Society of Arts, ex periments in which he had obtained 400 per cent, increase of weight in radishes, and the surveyor to the British Board of Agriculture a Truro, in Cornwall, Mr. Henderso repeated these experiments with, i one case, even better results. Furthe experiments made with wheat, oat and barley have already given evidence of the good effects of radium and one of the most remarkable features of its action is that such exceedingly minute traces of it are re quired. Thus two milligrams of radum to twenty tons or more of so will give excellent results, and as the life of the radium is over two thousand years, one treatment ought to g a very long way!

Radium Disintegrates

Radium is known now gradually to disintegrate and give rise to other products and to give forth energ which, though not unending, lasts for thousands of years. One day the se cret may be discovered of means to force the radium or any other elemen to disintegrate very quickly, with the result that energy of explosive violence would be evolved. ledge of radium is increasing very rapidly, and even to the trained physi cist the mass of the facts contained in Sir Ernest Rutherford's last treat ist on radio-active substances seem almost appalling in view of the fev years during which there has been time to study it. Radium is looked upon as an evil influence by certain paschologoists, so that we may hope that even if some new and super violent agent of destruction be ultimately evolved, its discovery may be as huge armaments are supposed to do at the present time. In the United States is the greatest

storehouse of radium-bearing ores The carnotite fields of Western Colbuy it on condition that its purity be deal in Continental Europe for plast- three times as much radium last year

Sir Ernest Shackleton

perial Trans_Atlantic Expedition.

CENONES

The venture to be known as the Im-

Sir Ernest has enough money to start

The total outlay estimated at over 50,000. "We shall have 120 trained

dogs, used to post work in Alaska or Siberia," said Sir Ernest in discussing his

plans, "and as we go along the dogs will eat each other so that we shall probably

be reduced to 50 dogs when we reach th

Pole. "The main object of the expedition,"

says Sir Ernest, "will be the crossing of the Polar continent. The crossing of the continent will be the biggest Polar

fourney ever yet attempted. The mimi-mum distance from sea to sea is about

,500 geographical miles—that is, rough y, 1,700 statue miles. More than half o

he distance will be on a positively new With good fortune it is probable

view the complete continental nature of the Antarctic can be absolutely solved

by such a journey. No one know whether the great plateau dips gradually

from the Pole towards the Weddell Sea

no one knows whether the great Victoria Chain of mountains which has been

From a geographical point

No one know

the expedition through a friend's gener

Professor Rutherford, who on New his pupils, who have while working grams of radium were buried in a present. MR. BALFOUR ON THE DIFFICULTIES THAT THE PLAIN MAN ENCOUNTERS AND THE GREAT QUESTIONS OF LIFE

[From Public Opinion.]

How Philosophy Fails

scheme of belief or disbelief

to all the great problems of life.

plain this extraordinary failure

What the Plain Man Wants

The politician as Gifford lecturer | ter wisdom, standing apart from the is not a common occurrence. But Mr. general crowd, and seeking wisdom Balfour adopted the part on Monday in ways difficult to understand, and if they could show that, from the when he gave at Glasgow University generally quarrelling with each very notion of experience, the idea the first of twenty lectures (in two other in an unknown tongue?" years) to which a Gifford lecturer is committed when he accepts the post.

A Great Reception "Mr. Balfour had a receptionso wildly enthusiastic," says the times that in scknowledging it he remarked that it was more gratifying to himself than consonant with the great theme to which he proposed to draw the attention of his audience. The precise nature of his subject had not been revealed, and he did not at once announce, but from the first moment he riveted the sympathetic attention which a Glasgow audience so generously bestows, and the undergraduates did not fail to respond to the few opportunities of expressing their approbation, as, for example, when the lecturer incidentally remarked that if Bacon took all knowledge for his province he was a very young man when he did so."

For his Gifford lectures Mr. Balfour receives about £500 from the funds which perpetuate the lectures. longest report of the first lecture was itself given in the Morning Post, which gave two columns, from which we quote. The Telegraph gave one column, and

A Great Theme

"When I speak of God,' he said, 'it

is not the Absolute of which I am solute. He was quite ready to adspeaking. It is the God Whom a man mit that these might suggest probmay easily love and adore, not merely the end or conclusion of a logical process.
"'A God of Whom it is utterly in- the problems for him.

adequate but not untrue to say that He takes sides; that He works for great ends.
"'A social God, a God Who asks us

to work for Him. Great Moments in Life "There are moments at which and not simply did each man and woman turns round that what and asks for some assistance in dealing with the aspect of the everything that had happened perennial problems by which man-kind has been perplexed in the form

or her. plenty of ready to solve their problems in the name of science, in the name of religion, and in the name of philoso-

suppose that of these three it would | modest line, but one which he hope always be to philosophy that a man he could possibly in the course would turn in such difficulties, be- these lectures make interesting cause, after all, it is the business of philosophy to try to look at these tention to these profound metaphycosmic problems in their entirety. Few people make a worse hash of it was more anxious to make his own than those who try to talk with them point of view clear than to show about religion in the name of science, and those who try to talk to view of other people; but he might

Quarrelling Philosophers ontiosophic study to help him to deal reality logically reaching up until those fundamental problems a thousand men go to theology, a lute, all-inclusive, all-containing thousand men go to science. It is and this absolute they described as not to philosophy that men go, and God. He did not feel the force of this raises an interesting quest-

"Why is it that to ordinary men had to add that the conc hilosophers seem to be seekers af-

The Idea of God "He was not prepared to say that

of God as the all-inclusive whole could be abstracted by some irrefut-Mr. Balfour, who admitted that able, logical process, he for one his sympathies were all with the would be satisfied with that result. philosophers, declared that even No doubt all the greatest religious these young people, who as part of teachers of the world had been able their academic training learned the to join together-he would not say modes of thought of the great lead- the notion of the Absolute exactly, as ers of the great schools forgot by it was conceived by, let them say, middle life, what they had learned, some recent philosophers or even as and even those who remembered nevit was conceived by the Neo-Platoner thought of modifying on account lists or any other of the great systemof those studies and the general makers-had been able to associate together this metaphysical idea of guided and regulated their attitude God, if he might so describe it, with the idea of God as it appeared in Mr. Balfour then went on to exmore ordinary popular theology. "He thought the two notions were really to be found lying side by side, philosophy to be of use to men in and in one sense bound absolutely the teaching, for together example, of Plato, of Philo, the Platonistic Jew, of St. Paul, the Christian Apostle, and of St. Augus-

"Let it be understood then that

when he spoke in these lectures of

God-and it was Theism which he

was going to deal with throughout-

God which man might easily love and

was something apt at all events to

appear at the end or conclusion of

"Perhaps some would object and

ask if they really understood him to

put aside in favor of what might be called a popular view the really

great thoughts of philosophers, theo-

logians, and mystics. They would say

-Was that not mere anthropo-morphism? Was the God of whom

he spoke anything more than the old

tribal deity improved in character

and relieved of local limitations? He

the lectures were over to commit worse crimes than that in the eyes

he had in view.

of a particular class of critic which

The Proof of the Ages
"And if it were true and he was

quite prepared to say in a sense it was true—that by the modern idea of God of which he spoke he meant

that the ordinary man's idea of

God, when he worshipped and when he prayed, was descended from those ancient and crude myths, the obser-

vation moved him exactly in the

opposite direction from what those critics supposed, because the very fact that an idea had been found that was useful—or, it might be, necessary—in changing form

was quite indifferent to the charge of anthropomorphism. He hoped before

an inevitable, logical process.

It was not the God which

it was not the Absolute: it was the

"The plain man wants to know whether he is to count God in his own soul; and though these were tine, the great patristic philosopher problems to which philosophy had The addressed itself, and rarely addressed and theologian. He was ready to admit not only that these two ideas from the main point view of the plain man. They would came together in all the greatest teaching of religion, but that never get the ordinary man living neither mystical insight, poetic inthe ordinary life in ordinary cirthe Times a summary of less than a cumstances to start an investigation tuition, or even feelings of natural piety found difficulty in practically of these kinds of discussions-about associating the two points of view. that one and the many, about sub-But, while that was so, as far as he Mr. Balfour spoke some time before stance, about the evolution of the he said that his "great theme" was subject, objective degree of reality, was able to judge, he still thought transcendence, immanence, the es- that philosophic metaphysics had not sential nature of an all-inclusive ab as yet been able permanently to bridge the chasm which divided them and which it seemed so easy to the higher imagination to overpass. lems of the highest moment and im-God Men Might Love portance, but at the same time he

felt instinctively that they were not Mr. Balfour's Belief

"Mr. Balfour confessed that up to certain point he sympathized this respect with the plain man. He had no such great scheme of thought to offer for their he he had to . would fail of that ideal because our limited intellects must fail, but because the point of view he was in which they most press upon him going to ask them to accept carried with it essentially, as part of itself. this conception of limitation.

"He did not pretend to be able to embrace in one logical whole, like some great systems of idealism, or "One would be inclined first to could happen. He took a much more those who had given very little sical propositions in the past. where it differed from the point of them about science in the name of make this reference to the great religion. Idealist systems. They professed to be able to discover from the very "For one man who really goes to nature of experience the degrees of self a disciple of such schools but he

that we held it in the right form Nevertheless it could not be ignored, and when the full truth was known—as it never would be known in this life-it would be seen that there had been a core of real truth in all those superstitions, in all whole history of mankind had supported and animated it. A Social God

"What was the God, then, that he wished to talk of? It was a God of whom it would be utterly inadequate but not untrue, to say that He took sides, that He worked for great ends, that He was a spirit communicating with other spirits, that He was in that sense, which was the only true sense, what he should not think it profane to call a social God, a God who asked us to work for him, a God therefore, who, in all these respects was to be distinguished, if only provisionally, from the sort of Absolute to which everything, including even its boundless limits, was equally indifferent, to Whom the good and the bad, all we admired and all we dewere equally necessary. form elements in the perfect whole.

FLAPPER GIRL THE NEW DESPOT OF OLD ENGLAND

Vast Upheaval in Society as Result of the New Type, Declares Jas. Douglas.

[By James Douglas.]

The wise man fears all women, for n woman is harmless until she is dead. It would be a pity if women were at any period of life quite safe to handle. It would be exceedingly bad for men if they could find a woman so young or so old that she might be regarded as being tame and docile. There is a blessed devil in woman that invests her mildness with incalculable potentialities of revolt. This blessed devil may be detected in the small soul of the small girl who still wears nursery ringlets and short socks. It may also be surprised in the spirit of the greatgrandmother who is forced to keep up her end against the inscience of two generations. Once a woman always a woman.

The victorious advance of woman during

CONTINENT

Reproduction of Map Drawn by Sir Ernest Himself of His Proposed Route.

gained by Sir Ernest on previous trips has proved of tremendous value. Sir Ernest proposes to start from a South American port, probably Buenos Ayres, cross the almost unexplored South Polar continent from sea to sea, and re-turn by way of New Zealand. The princiturn by way of New Zealand. The principal features of the expedition may be

Trans-Antarctic march with 129 dogs, two aeroplane sledges, and an aeroplane wenty-one, and even after that she re-

mained green and gawky for years. She was pathetically reluctant to grow up, nd a man could marry her up to the age

Preparations of the most complete with clipped wings to "taxi" over the character have been made for Sir Ernest ice.

Shackleton's proposed dash across the Antarctic continent, and the experience over absolutely unexplored land, and the March from Weddell Sea to the Pole over absolutely unexplored land, and the whole march probably over new ground.

Total land journey at least 1,700

Two ships, driven by oil, and a total complement of 42 men.

One ship to leave England in August for New Zealand, and the other to sail from South America two months later. Expedition to be equipped for two years, and work to be done in all branches of science.

Ia Chain of mountains which has been traced to the Pole extends across the continent and links up with the Andes. The solving of this problem is naturally of intense interest to geographers all over the world, and the discovery of the great mountain range, which we assume is there, will be one of the biggest geographical triumphs possible."

of 3) without having any rause to once were the livery of the unemancipated dread her capacity for self-realization and chit. Not for her the atroctties of the

spectators of her insurrections.

In nothing is her empire more absolute than her raiment. The merry flapper has long ago cast off the horrible clothes that once were the livery of the unexperience. everything. As for the ignorance of girl-hood, it no longer exists. The flapper knows all there is to know about life long the victorious advance of woman during the twentieth century has stimulated the activity of the biessed devil aforesaid. He is busy in more ways than are visible to the watchmen on the towers of publicity. Servicity and sliently he is transforming all our values and attering any transformin