# Elements Can Be Transmuted

Dream of Scientists for a Thousand Years Achieved by Dr. Rutherford.

### FAR - REACHING POSSIBILITIES

Remarkable Result of Bombarding Nitrogen Gas With the Alpha Rays of Radium - May Supply Unlimited

New York.-The transmutation of elements, the dream of both charlatans and scientists for nearly a thousand years, has actually been accomplished by the recent work of Sir Ernest Rutherford, and his results are generally accepted by scientists and physicists, according to Dr. James Kendall, associate professor of chem-Istry at Columbia, who said, on the other hand, that there was not the slightest reason to believe that the Germans had accomplished their reported feat of making synthetic gold.

Nitrogen, sodium, nluminum, chlorine, oxygen and carbon have been transmuted, or broken up by Rutherford into hydrogen and helium, according to Dr. Kendall.

This was first accomplished, according to the claims of Rutherford, by bombarding nitrogen gas with the alpha rays of radium. These so-called rays are helium atoms which are flung out of the exploding radium atom with an energy incomparably greater than any projectile produced artificially. The velocity of this atom would take ft around the world in slightly less than a second, and the power of the exploding atom, in proportion to size, is something like a million times greater than that of trinitrotoluol,

Result of a Chemical Collision. The radium was placed so as to drive the alpha particles into nitrogen gas. When the alpha particle had a head-on collision with a nitrogen atom It tore it to pieces, so it is asserted. The atom supposedly has a structure somewhat resembling the solar system. Its center is a nucleus of positive electricity, resembling the sun of the solar system, and this is surrounded by electrons, or charges of negative electricity, presumably whirling about the nucleus, as the planets whirl about the sun.

The alpha particle is believed to produce such a disruption in the atom as might occur, for instance, if another star of the dimensions of the sun tore through our system, hit the sun directly and drove it off into space, causing the planets to shoot off

This occurs on a scale in the neighborhood of the billionth part of a billionth of an inch, but it can be partly measured. The alpha particles thrown off by radium produce scintillations when they strike a screen of zinc sulphide within a certain distance. When they were used to bombard nitrogen scintillations took place at greater distances from the radium than the alpha particle could alone produce.

By his study of these scintillations Dr. Rutherford was able to prove to the ratisfaction of men of science generally that new products were developed by the shattering of the nitrogen atoms and that these products were hydrogen and helium atoms, His experiments have all been in the way of disorganizing the more complex atoms into simpler ones. The transmutation of atoms with simple structures into those with more complex ones has not been achieved.

Dr. Kendall on Rutherford. "Rutherford has reduced nitrogen, aluminum, chlorine and sodium to hydrogen and helium," said Dr. Kendall. "He has also produced helium to pieces, but hydrogen has not re- choldal fracture (like the inside of a

sulted, I believe, from the disruption of these atoms.

"This is certainly the transmutation of elements, but it is done on an infinitely small scale, and is important at present only to the scientific man. It does not promise that elements can be changed from one type to another, except on the smallest laboratory scale. It does not suggest that the transmutation of metals may be developed from it."

The possible far-reaching results of Rutherford's discovery were discussed as follows by Professor O. W. Richardson in his recent presidential address to the Section of Mathematics and Physics of the British association:

"Rutherford has taken the direct method of bombarding the nuclei of the different atoms with the equally minute high-velocity hellum nuclei (alpha particles) given off by radioactive substances, and examining the tracks of any other particles which may be generated as a result of the impact.

The amounts of energy which have been thus far released by artificial disintegration of the nuclei are themselves small, but they are enormous in comparison with the minute amount of matter affected.

"If these effects can be sufficiently possibilities. Either they will prove they will not. If they can be both in- known."

Illinois Man Gets Credit as Only

Man Who Knows How

to Make Them.

INDIAN CHIEFS LOSE TRICK

Many of Them Confess Their Igno-

rance of Just How to Make Arrow

Heads-Are Identified by

Tribal Marks.

Springfield.-Making of Indian ar-

first principles here by Herbert Wells

Fay, custodian of the Lincoln monu-

ment, who has gained the distinction,

which it is said until now has been

undisputed, of being the only white

Indians are among the foremost in

crediting Mr. Fay with this ability.

Drawn to the last resting place of

Abraham Lincoln, various present-day

Indian chiefs have openly confessed

their ignorance of "just how" to make

their surprise at the excellent work-

Finding that his arrows have been

flint, but to prevent fraud uses only

Worked Near Dekalb.

at Dekalb, in which vicinity, he said,

Mr. Fny takes issue with other au-

thorities who say arrow heads may be

identified by their shape as the work

of a particular tribe. Years of study

and the actual making of arrows prove

otherwise, Mr. Fay declares.

there had been seven Indian camps.

manship of the white man.

man to make real arrow heads,

earns Secret

of Arrow Heads

ITALY'S WARM FRIEND



Mrs. John A. Drake of New York recently received a letter from Pope Benedict XV in which his holiness bestowed upon her his apostolic blessing for the work which she has done as head of the American Free Milk and Relief for Italy, Inc. She is wearing the many medals bestowed upon her in Italy.

intensified there appears to be two tensified and controlled, then we shall bave at our disposal an almost illimuncontrollable, which would presum- itable supply of power which will enably spell the end of all things, or tirely transcend anything hitherto

News of All Kinds Gathered From Various Points Throughout Nebraska.

The supreme court decided that the city of Nebraska City is entitled to the exclusive use of its 46-acre park, the Nebraska City Speed and Fair association being ousted therefrom by the terms of the opinion. The city through its officials, in 1908 leased thirty acres in consideration of the latter constructing and maintaining a race track. The tion was also circulated and sent to the association was to have exclusive control of the grounds during the meets and the fairs. Some time ago the city brought suit to regain pos-ession of be lawfully entered into by the municipality. The defendant claimed that the city was estopped from challenging the validity of its own contract but grant concessions in a public park with. command of two stickup artists, and out reserving to its officers supervision they fled without attempting to harm

A census of all ex-rervice men in the state, with a view to ascertaining the number of disabled and unemployed veterans and then procuring aid for one and jobs for the other, will be undertaken by the Nebraska department of the American Legion between February 12 and 22. Announcement was made by State Commander "Bill" Ritchie, at a meeting of post offices. The census will made through local posts. The period between February 12 to 22 has been designated by the legion as "Respect the Flag" week, and Commander Ritchie announced that every post would be asked to secure co-operation of schools and patriotic organizations to that end.

The city of Aurora secured an in junction in district court to prevent the Public Service company from charging and collecting for electricity according to its present rates were only allowed temporarily, during the peak of high prices. The injunction suit asks for a return to the regular rates provided by ordinance. The city also asks for an accounting to determine the net profits of the company. The franchise of the electric light company provides that 50 per cent of net profits above 10 per cent on invested capital shall be paid to the city.

Falls City defeated the city managership system by a vote of 693 to 216. About half of the normal city vote was cast. Every ward showed a majority against the proposal. A spirited but short camppaign was waged for the change but as the result indicates the voters who expressed themselves did not feel pursuaded to adopt the new system at this time.

A large coyote hunt was staged south of Lexington in which 1,000 men participated, forming a circle around thirty-two sections. When they gathered into the small round-up ring there were twelve coyotes and thousands of rabbits. A barbecue was held : fter the roun !-up. Everybody went away full of rabbit.

Confident that the Central City section presents good opportunities for small tract farming, Martin A, Larson has offered \$500 in prizes to the men making the best records in raising early potatoes in 1922 on five and tenacre tracts within two miles of town.

Walter O. Malley, alias Irish, alleged to be one of the men who robbed the State bank of Panama, Ill., of \$20,000 December 21, last, has been arrested an extradition warrant to an officer from Illinois who left for Bellevue.

Herbert L. Cushing of Ord, former county superindent, has been elected E. M. Hosman, selected as secretary of the state teacher's association.

Jacob Boesiger, 80, was so badly crushed by a tree, which he felled at his farm near Cortland, that he died a resident of Gage county since 1879.

Carl Jamison of Fremont, 30, narrowly escaped death when he swallowed a quantity of poison mistaking it for medicine. Neighbors were awakened paying quantity. by his cries for help.

W. S. Powers, who carried messages for the union army to General Phillip raska City water and light company. Sheridan in the battle of Winchester during the civil war, is dead at his home at Rulox.

The Wells-Abbot- Nieman Mill of Schuyler, with a branch elevator at voke arrests in Jefferson county. Rogers, has been purchased from the County officials have decreed that creditors by some Schuyler people for the sum of \$337,000,

The farm house of S. R. Ayers, located east of Blue Springs, was destroyed by fire, with most of its contents. The loss of \$4,000 was partially covered by insurance.

The electric transmission line from North Platte to Paxton has been completed and twenty-four hour service is now being furnished the villages of time to save the lad from choking to

Hershey, Sutherland and Paxton. O. P. Fulton of Beatrice, who was injured some weeks ago when his auto Ruddek, has filed suit for \$1,500 dam-

ages against Gage county, Frank B. Knapp, of Fremont, former president of the Fidelity Trust com- Examiner G. S. Eastman is now in pany, convicted of embezzlement was sentenced to the state penitentiary for from three to five years. Attorneys for than 1915 costs, State Engineer Johnth defense immediately gave notice of appeal, when their motion for new trial itol commission with a house commitwas overruled. Bonds placed at \$6,000 pending the fight in supreme court, whether it will be expedient to delay were furnished by friends.

Deprived of telephone connection with the outside world since the first of January, the business men of Stapleton and a number of the patrons of the now delinquent Tri-County Telephone exchange held a meeting and organized a new company, Supplies were rushed from Kearney and work started one morning and by night work had gone along so smoothly that the three workmen from Arnold were almost ready to connect up with the farm lines. It is expected that no attempt will be made to install phone in the residence for some time as those in charge are in communication with several who may be induced to come in and start a first-class system. A petistate railway commission asking them to take steps to disfranchise the Tri-County Telephone company.

Bandits picked out the wrong man the ground, alleging that the contract for a victim when they tried to sepawas illegal and one which could not rate Miroslay Marek, one of the youngest veterans of the late world war, from his money at the point of a gun. Marek, who fought with the Czecho-Slovak army at the age of 12, and is the court finds other-wise. The high now a student in the state university bench says the city had no right to at Lincoln, calmiy refused to obey the him after studying his determined face.

General headquarters of the Nye-Schneider-Jenks Grain corporation will be removed from Fremont to Omaha ploft. March 4 next, according to information given out by Fremont officials. The organization, which is one of the largest of its kind in the world, was organized in 1887 and controls at present from the local offices alone 160 grain elevators in Nebraska and surrounding states.

Six valuable blooded brood sows were stolen from Nels K. Nelson, a farmer living northwest of Newman Grove while he was in Omaha. The hogs were driven across the pasture, their tracks showed, to a corner of the fence, where they were loaded in wagons. Bloodhounds from Fremont are here trying to track the thieves.

Robbers made a clean sweep of dental offices at Norfolk, netting about \$1,000 in cash and gold. Several safes were broken open. The offices were located in four separate buildings, the entrances of which were conspicuously marked with chalk crosses, indicating preliminary plans of what police say was an organized band.

Shelton has organized an indoor baseball association and has eight teams in the league. The games are staged in the hall of the American legion headquarters and the players are business men, professional men, high school students and boys. More than 100 men, young men and boys have joined the association.

D. D. Rowe, Fremont has been elected president of the Nebraska Building and Loan to relieve T. L. Matthews, who retires from active service as the head of the organization after thirty years. The new president joined the organization about twenty years ago, taking the job of janitor, clerk and stenographer.

William Stober, 60, of near Norfolk, lost in the terrific snow storm for seven hours, was found by a searching party after he had crossed the North Fork river in search of his home. His hands were frozen and he is in a serious condition.

The county campaign for Near East relief has resulted in three car loads citizens of Nuckolle county. Local committees have been named in each town in the county and the soliciting will be continued.

William Ritze, 25, farmer, of Wayne, drove his automobile to West Point, on November 6 last. He left his car in a at Bellevue. Governor McKelyle issued garage in West Point and has not been seen or heard from since. His father, Richard Ritze, will pay \$100 for information as to his whereabouts.

Bryan Berry, 13, of Lincoln, died superintendent of schools to succeed from injuries received when he was run over by a coal wagon. His face was crushed and he suffered internal in-

Paying bonds of the Village of Clarks have been sold and the work at a hospital in Lincoln. He had been on the paving will be commenced as soon as weather will permit.

> A four-inch vein of coal was discovered on a farm east of Butte, It is not known if the fuel is present in

Dunbar, is enjoying electric lights with current furnished by the Neb-A large stock pavilion in which sales

of thoroughbred stock will be held, is being erected at Minden. Last year's auto licenses will proplenty of time has elapsed for equip-

There are 3,200 cars in the county; 2,000 have new licenses. Lyle Johnson, 12, of Lincoln, had a narrow escape from death when a piece of butterscotch candy became todged in his throat whae he was attending a movie, City Physician W. H. Slattery extracted the candy just in

ping machines with new numbers.

death Closing of the Farmers' State bank at Bayard, by the state department of collided with a car driven by Clarence trade and commerce was necessitated directly by shrinkage of deposits from \$225,000 to \$150,000 in less than a. month, Secretary J. E. Hart announced

> Nebraska's proposed new state capitot cam be built for 3 per cent less son reported at a meeting of the cap-Committee is considering building.

## LAND GROWS RICH

Wonderful Development of Canada in Forty Years.

Four Decades Ago Little Considered, Today One of the Greatest Granaries and Dairying Centers.

The recent announcement that the sale of the first section of Canadian Pacific land was sold forty years ago, and when you read that the first carload of wheat was shipped from Winnipeg forty years ago, the changes that have taken place since then are matters of reminiscence, but yet of interest. What forty years ago was an unknown quantity, barren because but little production was attempted, is today one of the greatest granaries in the world. Then there was scarcely any farm live stock in the West. Dairying was not engaged in at all. Today there are 6,998,317 farm animals on the prairies, of which 881,899 are milch cows; and dairying is only second in importance to grain growing, in the West.

Forty years ago the shipment of one carload of grain was a notable ex-

Today, Canada ranks as the second largest wheat-producing country in the world, with 329,185,300 bushels, 90 per cent of which was grown in the three prairie provinces, of which the province of Saskatchewan produced more than half. The Dominion is today the second largest producer of oats, with 530,710,000 bushels, of which 60 per cent was grown between Winnipeg and the Rocky mountains; and the fifth largest producer of barley with 63,311,-000 bushels, of which the prairies yielded 65 per cent.

Forty years ago scarcely any of the rich soil had been brought under cultivation. The farm machinery of the time was crude; there were no competent advisers; government experimental farms were a blessing that came years later.

Yet these hardy pioneers stuck it out, and in forty years numbers of them are enjoying their declining days. in the communities they wrested from the wilderness, prosperous, contented, with their children's families gathered about them or seeking their own fortunes still further westward or northward. They have seen civilization step in to the West and the wilderness lwept out. Today are thriving cities and towns where bleaching buffalobones marked the ox trails of forty years ago. Today are mighty freight trains, each with its thousand-ton cargo of wheat or merchandise, roaring down the roads where the old carts creaked. Today are schools within walking distance of every farmhouse, churches within driving distance of and every modern convenience finking communities over vast distances by the common bond of the spoken word.

Forty years ago the Rockies were practically an impenetrable barrier, the Pacific coast being reached from the east by ships sailing round Cape Horn. The province of Manitoba had a population of 62,260, compared with 613,008 in 1921. Winnipeg was then a frontier town with 7,987 people, and Brandon, which was regarded as a of corn contributed to the cause by far-flung outpost of the West, boasted of a few hundred in population. In 1891 it only had 3,778. Such places as Calgary and Edmonton were mere trading posts in the Northwest territories. Buffalo roamed the prairie in their native state.

Today on these plains are to be seen berds of cattle, bands of horses and droves of sheep, from any of which can ensily be selected stock that can carry off premiums, sweepstakes and championships in competition with the best in any other part of the world.-Advertisement.

All He Asked.

Old Crusty--You ask for my daughter? Why, young man, at your present salary you could not even dress

Sultor-Oh, yes, sir! I could keep her in gloves, Old Crusty-Gloves! Do you mean to insinuate that my daughter would

wear only gloves? Suitor-Pardon me, sir; I asked only for her hand.

### DYED HER BABY'S COAT, A SKIRT AND CURTAINS WITH "DIAMOND DYES"

Each package of "Diamond Dyes" con-tains directions so simple any woman can dye or tint her old, worn, faded things new. Even if she has never dyed before, she can put a new, rich color into shabby skirts, dresses, waists, coats, stockings, sweaters, coverings, draperies, hangings, everything. Buy Diamond Dyes—no other kind—then perfect home dyeing is guaranteed. Just tell your druggist whether the material you wish to dye is wool or siik, or whether it is linen, cotton, or mixed goods. Diamond Dyes never streak, spot, fade or run .- advertisement.

"What did Mrs. Horner say after her maid-of-all-work departed?" "Help! Help!"-Wayside Tales.

Important to Mothers Examine carefully every bottle of CASTORIA, that famous old remedy for infants and children, and see that it

Signature of Children Cry for Fletcher's Castoria

How Now? Following the birth notices in a paper there is a line: "Our Ads Bring Results."-Exchange

### His conclusions as to arrow-making are outlined as follows: "Indians first atoms by tearing oxygen and carbon tried stones that break with a con-

Wireless Phones for Commuters



Chicagoans who reside in the suburbs may soon find their trains equipped with the wireless telephone so that they can talk with their homes while going to or coming from the city, and can even enjoy grand opera in the evening. The system was tried out recently, and the photograph slows a passenger using the radio phone on a car.

spoon). They found that the deeper the break at the top of the flat-surfaced stone the longer would be the break in the stone, but it would be correspondingly wide. They wished, however, a long, narrow piece as more suitable for an arrow head.

"They then found that by breaking the stone at a corner they could produce such a 'flake' (raw arrow head) one, two, or even five times its width, according to the skill of the artisan. Such an arrow head always has a ridge on one side and the other side smooth. The ridge is the corner of the stone from which the flake was row heads has been reduced to its broken.

"Next, the Indian found that in finishing the arrow head, if the stone the top, it would break just as easily, from the other on the bottom. This gave rise to the belief that arrow heads were made to revolve. Such was not the intention of arrow makers, as the same natural peculiarity appears in spear heads, which are too heavy to revolve, as spears were seldom expected to go more than a few times

arrow heads, and then have voiced their length. "These principles being true of all stone used by the Indians, it is an evident impossibility for any collector to taken for the work of real Indians, tell what tribe made certain arrow or Mr. Fay no longer makes arrows of spear heads. The width, depth and thickness, determined by the depth of the fracture of the stone, determine the shape and appearance of the fin-His study of arrow heads was ished product." gained largely near his former home

Chert Center in Illinois. Most of the arrow heads of the north Mississippi valley, Mr. Fay said, were made of chert, a chalky flint, taken from the quarries in Union county, Illinois, near Cairo. The bluffs at that place along the Mississippi river show outcroppings of this chert and prolific evidences of the activity of Indians, who went there from all parts of Illinois, Indiana, Iowa and

Wisconsin, he added. "Less than 1 per cent of the arrow heads found in this wide territory," Mr. Fay continued, "seem to have been made from local stone. The Union county quarries have been determined as the principal source because arrows found throughout that region correspended exactly to the quality of the Union county stone. It is not known whether expert 'flake' makers held the quarries in Union county and distributed material to tribes as they came down, or whether each tribe had its flake makers and visited the quarries periodically.

Implements used by Indians in making arrow heads, according to Mr. Fay, were made with one tool, a piece of bone somewhat like the handle of a toothbrush.

WILL BAN GRADE CROSSINGS

United States Will Construct Bridges or Underpasses on Federal Highways.

Washington.-Grade crossings will be eliminated wherever possible and replaced with bridges or underpasses on all roads of the federal aid highway system to be constructed under the federal bighway act, the bureau of public roads of the Department of Agriculture announces.

Important roads, many of which at present cross and recross rallroads at grades, hereafter will be built entirely

on one side of the railroad. In the three years ending with 1920, according to records available to the bureau, 3,636 lives were lost and 10,644 persons were injured at grade crossings in the United States.