

X-Ray Tube Is Aid to Science

Dr. Lilliefeld Discovers Principle That Puts Roentgenology on New Plane.

EXPERTS PLEASSED WITH IT

Scientists Who Have Experimented With New Tube Believe With Doctor Lilliefeld That It Makes Roentgenology Exact Science.

New York.—By the invention of an X-ray tube based on a comparatively simple principle, roentgenology promises, for the first time since Roentgen discovered the mysterious rays that bear his name, a quarter of a century ago, to be an exact science. The inventor is Dr. Julius Lilliefeld, professor of physics at the University of Leipzig. He is also inventor of the X-ray tube that has been in general use in Europe for the last decade, and which from now on will be superseded by his more recent discovery. Experts who have experimented with it believe as he does.

Doctor Lilliefeld is in New York, having arrived from Europe a few weeks ago. He has already given a public demonstration of his new tube in the presence of Prof. George Pegram and Professor Davis at the department of physics of Columbia university and before the New York Roentgen society.

Doctor Lilliefeld explained the principles of his invention to a Times reporter. He said his discovery was not only of interest to the medical profession and physicists, but to makers of wireless and all audion apparatus and amplifying devices.

"In order to explain the principle of this new tube," said Doctor Lilliefeld, "it will be necessary to recapitulate the history of X-ray tubes and to tell the manner in which X-rays are generated.

What Electrons Are.
"Let us begin with the electron: It is the smallest known component of matter and is always associated with an unvarying unit charge of negative electricity. The atom of hydrogen is the smallest atom known. Yet an electron is but 1-2000 part of the hydrogen atom. These electrons are always in motion. It is supposed by some that chemical atoms consist of collections of electrons having orbital motions in a sphere of positive electrification. Others ascribe them to disturbance of the ether.

"An electron striking any matter, target or surface produces X-rays. The electrons must have speed, and, indeed, they move with incredible rapidity. They are negatively charged particles of electricity. There are three factors, therefore, connected with the production of X-rays. They are electron, motion and the target."

Doctor Lilliefeld pointed to a knife blade.
"The electrons associated with that piece of metal," he continued, "are beneath its surface and are retained there by some superficial force. To produce X-rays we must get the electrons out of the metal through the cooperation of some additional force. Roentgen used gas molecules, which were imprisoned in his glass tube in a partial vacuum, to get the electrons out of the metal, which, in this case, was the cathode by which the electric current leaves, in contradistinction to the anode by which the electric current enters, a vessel. The molecule of gas impinged on the cathode free-

ing the electrons, which, in turn, flew to and impinged upon the anode or target, from which they were thrown off as X-rays which penetrated the glass tube and scattered.

"The method of producing X-rays by the gas tube did not prove satisfactory.

"In 1911 I made my first tube on a new principle. There was absolute vacuum in the tube, and I got the electrons out of the cathode by means of applying heat to it. With the combination of the heated cathode and the extremely high vacuum, the electrons would fly to the anode, or target, where they were given off as X-rays.

"In 1913, Coolidge, in this country, applied the same idea to the tube now in general use here.

New Method Discovered.

"Two years ago I discovered a new method of effecting the release of the electrons from the cathode. This method has nothing in common with either of the two older ones. I started the electrons from a cold, unheated cathode in the presence of a high electrostatic field. This actually pulls the electrons out of the cathode. The second distinctive characteristic of the new method is the shape of the cathode. I use a sharp-pointed or sharp-edged one, on the theory that the lines of electric force are concentrated on the sharp point or edge of the cathode. This proved to be the case

Where Railroads Are Not Wanted

Afghanistan Years Ago Put Up "Keep Out," "This Means You" Warning.

SEND ENVOY TO WASHINGTON

Believed That Policy of Absolute Isolation From Rest of World Long Followed by Moslem Kingdom Is to Be Modified.

Washington.—The arrival in Washington of an envoy from Afghanistan, now perhaps the most mysterious country in the world, seeking the recognition of his home land and the establishment of diplomatic relations with the United States, seems to indicate that the policy of absolute isolation from the rest of the world long followed by this Moslem kingdom is to be modified. Light on conditions in this little-known region is shown by the following communication to the National Geographic society from Frederick Simplic and Hajj Mirza Hussain:

"The buffer state of Afghanistan, historic shock-absorber between Great Britain and Russia in Middle Asia, years ago put up a 'Keep Out' sign, a 'This Means You' warning, to all white men and Christians. The land is 'posted'—to use a poacher's phrase—posted against trade and concession hunters, against missionaries, and against all military and political hunters in particular.

"Keep Out" Sign Up.
"And the 'Keep Out' sign is still up. Today the foreigner is no more welcome in Afghanistan than he was a hundred years ago. Forbidden Lhasa

in actual practice and the electrons were readily pulled out. I might add that in this method the electrodes (cathode and anode) are brought very closely together.

"The application of the principle is not limited to the production of X-rays. It can be applied to all amplifying and audion devices and for generating electro-magnetic waves for wireless. The tube is less expensive than the heated ones because it contains no hot filaments and, therefore, no transformer is needed to supply heat."

Lay Bandit's Career to Slant in Skull

Tacoma, Wash.—Roy Gardner, mail train robber, in the federal penitentiary after two very sensational escapes from guards, may be operated on to "reform" him, according to "Mother McColl, woman agent of the Department of Justice. "I want to be operated on and lead the life God intended me to lead," Gardner told Mrs. McColl.

"Gardner is a wonderful specimen of manhood," Mrs. McColl continued. "His tendency to crime is caused by a deflection of the cranium, and it is possible that surgical care will eliminate it.

"He is to be X-rayed, and the physician at the prison will send to Los Angeles for X-ray plates which are said to show the seat of his trouble."

itself is no more exclusive than brooding, suspicious Kabul, the capital of this isolate, unfriendly realm of fanatic tribes, of rocks, deserts, irrigated valleys, and towering unsurveyed ranges.

"For reasons of foreign policy, the amir has long left the necessity of secluding his little-known land to the greatest possible extent from the outside world. Only a few Europeans, mostly British, but occasionally also an American and now then a few Russians or Germans, have had permission to come into this country and to sojourn for a while in its curious capital. But even on such rare occasions as when a foreign engineer, or a doctor whose services are badly needed, is admitted by the grace of the amir, the visitor is subject to a surveillance that amounts almost to imprisonment.

"No ambassadors or ministers, not even missionaries, are permitted to reside in this forbidden Moslem land. "Today no other monarch anywhere wields such undisputed authority or is in closer touch with the everyday life of his subjects. He personally runs his country's religion, its foreign affairs, and he even supervises much of its commerce. He also owns and controls the only newspaper printed in all Afghanistan.

"From the World war, though he took no active part in it, the amir emerged with singular profits. His old and once rival neighbors, Great Britain and Russia, drawn together as allies in the world conflict, left him a free hand, and in 1919 Great Britain officially recognized the political independence of this much-buffeted buffer state, to whose rulers she had so long paid a fat annuity.

"With an area of 245,000 square miles, Afghanistan is, next to Tibet, the largest country in the world that is practically closed to the citizens of other nations. But political life at wary, alert Kabul is in sharp contrast to the meditative seclusion and classic aloofness of the pious imams at Lhasa. Amir Amanullah Khan, through his agents in India and elsewhere, is in close touch with the world's current events; and, as the last remaining independent ruler of a Moslem country, now that the power of the Caliph at Stamboul is broken, he wields a far-reaching influence throughout the Mohammedan world; also, because his land happens to lie just as it does on the map of the world, it is plain that for a long time to come he will be an active force in the political destinies of middle Asia.

Wives Distributed as Gifts.
"From the Persians the Afghans got the idea of marrying more than one wife; but, like the Persians, too, they have found, to their dismay, that polygamy is nowadays more expensive than exciting.

"Sometimes, when the amir wants to favor his faithful officials with presents, or perhaps to play practical jokes in certain cases, he distributes women among them; but these 'gifts' often prove so troublesome that no great degree of gratitude is apparent among the recipients.

"Amir Habibullah Khan (who was assassinated in 1919) had a harem of over 100 women, and among these, strangely enough, were a few Europeans. The present amir, Amanullah Khan, has but one wife.

"The trade of Afghanistan is moved entirely by caravans and is largely in the hands of Hindus and Tadzhiks. There is not a mile of railroad in the kingdom, the amir fearing that steel highways would make isolation impossible.

CORNHUSKER ITEMS

News of All Kinds Gathered From Various Points Throughout Nebraska.

The state has declared war on the Nebraska grasshopper. Leo J. Stuhr, secretary of the department of agriculture, returned to Lincoln from a trip to Morrill and Scottsbluff counties where he laid out pest eradication districts authorized by the last legislature. The plan for killing the grasshoppers, which have made Kansas and Nebraska infamous for an agricultural standpoint for many years, is to spread poison around every field of alfalfa in the district. The poison will be distributed a width of eight feet, which, it is believed, is a greater distance than the "hoppingest grasshopper" in Nebraska can hop.

The farmers north and east of Barada, an inland town about twelve miles from Falls City, desire a more feasible way of getting their grain and stock to market than the long haul to Shubert or Falls City and are considering a plan of establishing a sort of ferry across the Missouri where they will have close connections with a couple of Missouri towns. The expense of such an undertaking is being investigated.

A report circulated throughout Nebraska by the daily and weekly papers that the difficulties between the Union Telephone Company and its patrons at Bloomfield has been settled and services again resumed is denied by officials of the company and others in close touch with the situation. At a mass meeting held August 4, patrons of the company voted to stick and present prospects for calling off the 'strike' appear unlikely.

A \$25,000 bond levy has been voted for the riprapping of the Missouri river at the Peterson bend district, east of Tekamah, where hundreds of acres of valuable land has slid into the river since the first of the year. The work will begin soon and many acres of good farm land will be saved for the farmers in that district and perhaps check the river from cutting its way, in time, clear through to the Nebraska bluffs.

An average yield in Nebraska of winter wheat, a corn condition 14 points above the 10-year average, lowered condition of oats and potatoes and a barley crop second in the state's history are forecast in the August crop report issued at Lincoln by A. E. Anderson, federal crop statistician and the Nebraska department of agriculture, co-operating.

Nebraska state taxes for 1921, based on the levy of 3.3 mills on actual valuation, will amount to \$10,108,075, as compared with a total of \$7,532,575 in 1920 according to figures given out by the state tax commissioner's office. This represents an increase of \$2,575,500, or approximately 37 1/2 per cent.

Arcadia patrons, mostly rural, have requested that the telephone rates be lowered and have backed the request up with an agreement between 150 of the patrons to have their phones disconnected providing the decrease is not granted.

Chris Fishline, a farmer living six miles east of Lexington, while driving some hogs in his yard and carrying a stick, stumbled and fell, running it into the side of his face. The doctor did not get all the stick out and lockjaw set in.

C. W. Pugsley of Lincoln is in Washington to take up some special work requested of him by Secretary of Agriculture Wallace in the line of reorganizing the department's division of publications.

Over 100 disabled veterans from 15 different counties in central and western Nebraska registered at Grand Island at the Y. M. C. A. headquarters for the government's cleanup squad to adjust compensation cases.

Dodge County Bankers' association will hold its fifth annual convention in Fremont on August 24 when the banks of the entire county will declare a legal holiday on the afternoon of the conference.

The Nebraska Cement Plant at Superior shut down for the first time in over three years. They have stored about a million sacks of cement during the past six months.

Damage estimated at \$5,000 by Superintendent Charlton was caused to the old power plant at the state hospital for the insane at Norfolk by a fire.

The members of the Evangelical church at Dawson held a meeting Sunday and raised \$21,000, with which to build a new church to replace the one which was destroyed by lightning a few weeks ago. It was voted to build a \$30,000 structure on the present site.

Deer are becoming plentiful in Thomas county, according to a letter received by State Game Warden George Koster from Jay Higgins, forest supervisor at Halsey. Higgins declares that it is a common sight in the woods there to see does and fawns running about.

Plans for reclaiming 108 acres of swamp land lying north of Carter lake, to be converted into another Omaha Park are being considered by the Omaha Park commission.

Miss Pearl Freeman of Columbus received from relatives in Venango, Pa., a family heirloom, which she prizes highly—a spinning wheel which her great-grandmother used more than 100 years ago. Through all the years that have elapsed the device has been kept in the family. It is in a perfect state of preservation and serviceable still.

The Chapin-Colglazer Construction company has appealed to the district court from the order of the board of equalization assessing it for \$50,000 worth of brick which lay on the streets of Aurora, April 1 ready to be placed in the pavement. The company, which had the big paving contract, alleges that the brick are the property of the city and not taxable to the contractor. The question is an interesting one to all contractors in the state and they are watching the attempt to tax the Chapin company. They declare that this never has been done before, and if the Chapin company is taxed they will all have to figure on taxes on material on all future jobs.

Approximately 121,000 automobile license tags were issued to automobile owners in Nebraska during the first seven months of the current year with fees aggregating \$2,727,886, according to figures on file with the state registration bureau. This number, officials said, is almost equal to the entire amount of 1920, when \$2,760,192 was collected from automobile license fees. Taking the number of license tags already issued upon which to base their calculations, officials of the bureau predict that the number of tags issued for 1921 will be in excess of 200,000.

Appointment of the American Legion relief fund committee to supervise the distribution of proceeds from the \$2,000,000 investment fund allowed by the last session of the legislature for sick and disabled soldiers, sailors, marines and nurses of the world war has been announced by Eugene Holland of Lincoln, chairman. The committee includes L. E. Chadderdon, Holdrege; W. R. Gilchrist, Grand Island; W. R. McGehehin, Lincoln; P. R. Harrington, Wayne, and Irl Stryker, Omaha.

"Fire bugs" are responsible for 11 incendiary fires at Benkleman, according to a statement appearing in a letter written by David Hines, county attorney of Dundis county, to Attorney General Clarence A. Davis and State Fire Marshal Hartford. Hines asks for an investigation by state authorities of the fires. He says in his letter that Benkleman has been a favorite resting place for I. W. W. this summer.

Hundreds of acres of the best pastures in Greeley county are lying idle this summer on account of scarcity of cattle. The grass is heavy and knee deep in most of the pastures and meadows for miles around. Ranchers and farmers have been unable to obtain money or credit to buy cattle to feed, although many of them have abundance of alfalfa and corn on hand.

Martin L. Friedrich, resident of Cass county for over 50 years, died from the bite of a horse which he received several years ago. The horse was suffering from rabies. Mr. Friedrich had served in the legislature for a number of terms and had held several county positions.

Figures showing that railroads are deriving more comparative revenues on freight rates on wheat and corn in the middle west than on other products were made public by C. A. Ross, rate clerk for the state railway commission at Lincoln.

The executive meeting at York of the 19th annual state convention of the Nebraska rural mail carriers endorsed the resolution relative to the purchase of the R. F. D. news publication and its operation under the association name.

The Fremont Commercial club has purchased the site for the Fremont live stock pavilion to be completed by October 18—the date of the big Hampshire sale at that place. About \$10,000 will be spent on the pavilion.

The Ak-Sar-Ben festivities, September 13-24 are expected to bring not less than 100,000 visitors to Omaha this fall. As usual, there will be the three parades, each and all having numerous new and unique features.

Fire of unknown origin completely destroyed the Jerry Pelseta's barn near Ord. Several loads of hay, some corn, an automobile and all of Mr. Pelseta's tools were burned. The loss is estimated at \$2,500.

A \$10,000 Duroc Jersey hog, "Sensation Leader," by Old Sensation, owned by John Baber of Scribner, died from intestinal trouble. No insurance was carried on the valuable animal.

Six hundred acres of wheat raised on summer fallowed ground by Schmidt brothers south of Oskosh is making about 42 bushels an acre. This is the record yield in this vicinity for the year.

The Baptist church at Fairbury is installing a \$4,000 pipe organ. This is the fifth Fairbury church to be equipped with pipe organs.

Farmers about Paxton are up in arms all because prairie chickens are becoming too numerous in that locality and are eating up the wheat.

The most destructive hailstorm in years has just visited Cheyenne and Kimball counties. Some late wheat was destroyed and corn stripped. A twister accompanied the hail, and some buildings were unroofed west of Sidney.

Too many flies, rugless floors, muddy walks, shabby buildings, broken bridges and rotten porches are indictments charged against the state home for soldiers at Millford by W. J. Hunt of Millford in a letter written to Gov. S. McKelvie.

The first rural paving contract in Jefferson county was awarded to Berge & Gardner of Lincoln, at \$2.94 per square yard. The work included a distance of about 800 feet, and eighteen feet wide, along the state highway a mile west of Fairbury. The material used will be cement.

IMPROVED UNIFORM INTERNATIONAL

Sunday School Lesson

By REV. P. B. FITZPATRICK, D. D., Teacher of English Bible in the Moody Bible Institute of Chicago. (©, 1921, Western Newspaper Union.)

LESSON FOR AUGUST 28 FROM ASIA TO EUROPE.

LESSON TEXT—Acts 16:13. GOLDEN TEXT—And they said, believe on the Lord Jesus Christ, and thou shalt be saved, and thy house.—Acts 16:31. REFERENCE MATERIAL—Rom. 15:13-21.

PRIMARY TOPIC—A Wonderful Dream.
JUNIOR TOPIC—Paul Crosses Over Into Europe.
INTERMEDIATE AND SENIOR TOPIC—Beginning Work on a New Continent.
YOUNG PEOPLE AND ADULT TOPIC—Paul Carries the Gospel to Europe.

I. Forbidden by the Holy Spirit to Preach the Word (vv. 6-8).

We have here a lesson on divine guidance. The inclination of Paul and his companions was to tarry in the provinces of Asia preaching the word, but contrary to their inclination they were hurried along. They might have reasoned "What difference would it make as to where we preach, just so the Gospel is preached?" Though seemingly small, the question as to whether the Gospel should be preached among the people in the East or in the West has determined the entire history of the church. Had they preached among the people in the East, Christianity would never have become worldwide. On the other hand, by laying hold upon the Grecian intellect and combining with it the push and energy of the Romans, it became worldwide. In the guidance of the Spirit we find Him just as active and as faithful in closing doors as in opening them. "The stops as well as the steps of a good man are ordered of the Lord." We ought to as truly recognize God's hand in the "shut-ins" as well as in the "open-outs."

II. Called to Macedonia (vv. 9-12).

A vision was given to Paul of a man from Macedonia pleading for help. This was the solution of the mystery of closed doors about them. There is a negative and a positive side to the Spirit's guidance. If we will note both we shall be able to determine with a surety the proper course of action. In order to be led aright we must be sure that we are willing to be led, pray definitely for leading, and then render willing obedience as fast as the light comes. As soon as the divine way was known they rendered immediate obedience.

III. The First Convert in Europe (vv. 13-15).

The missionaries went to Philippi. The Jewish element in this city was very insignificant; so much so that they could not afford a synagogue; therefore the devout people were accustomed to worship at the river side. To this humble gathering Paul came and preached to the women gathered there. A certain woman from Thyatira believed his message, and was baptized. Lydia was a woman of wealth, culture, and wide experience, and yet she had need of Christ. The steps in Lydia's conversion are worthy of note:

1. Attendance at the place of prayer (v. 13). This is the case with most people who are saved.

2. Listened to the preaching of the word of God (vv. 12-14). The instrument used by the Holy Spirit in the conversion of sinners is the word of God. "Faith cometh by hearing, and hearing by the word of God" (Rom. 10:17).

3. Her heart was opened by the Lord (v. 14). Regeneration is a supernatural work. When the Gospel is preached the Spirit of God makes it living and active, opening the sinner's heart for the reception of Christ.

4. She was baptized (v. 15). It is natural for the one who believes in Christ to desire to be baptized.

5. Her household also believed (v. 15). Thus we see that her's was a typical conversion.

IV. A Spirit of Divination Cast Out (vv. 16-18).

As the missionaries went out from day to day to the place of prayer they were accosted by a young woman possessed by a spirit of divination. She was owned by a syndicate of men who derived large gains from her soothsaying. This act of the woman became a great annoyance to Paul who, in the name of Jesus Christ, commanded the evil spirit to come out. Here is a case of a spiritual medium, a fortune-teller, being freed from demoniacal possession. Many men today are making money by the degradation of womanhood, and they resent all efforts to destroy their infernal business, even try to destroy those who interfere with their business. Here as everywhere Satan blocks the way as the Gospel of Christ is carried into new fields, but the Lord is again triumphant.

The Multitude of His Mercies.

For the Lord will not cast off forever; but though he cause grief, yet will he have compassion according to the multitude of his mercies. For he doth not afflict willingly nor grieve the children of men.—Lamentations 3:31-33.

Word of Lord Was Precious.

And the child Samuel ministered unto the Lord before Eli. And the word of the Lord was precious in those days; there was no open vision. —I Samuel, 3:1.

Trying to Get Jobs for Ex-Fighters



The Aviation Club of Chicago is making a desperate effort to secure employment for ex-soldiers, sailors and marines. At the Princess theater four ex-service men occupied a box upon which was a sign stating that the men were looking for work. A speaker appealed to the audience to try and secure work for these patriots. Many of the audience were moved to tears and those who could not offer any suggestions as to where work could be secured offered money to the men.