

—Dietz on Science—
**ATOM SMASHED
UNDER IMPACT
OF COSMIC RAY**

Force Most Destructive
Yet Discovered by
Savants.

BY DAVID DIETZ
Scripps-Howard Science Editor
When a cosmic ray makes a direct hit upon the nucleus of a heavy atom, the result is the most destructive event known to the world of science.

Physicists, to date, have made considerable progress in the disintegration of the atom. Originally, radium rays were their only weapon. Lord Rutherford began the work, using the alpha particles released by radium to bombard the atoms of other substances.

More recently, gigantic vacuum tubes operating at electrical potentials of millions of volts, have been used to furnish streams of swiftly moving electrons to bombard atoms.

But so far scientists have succeeded only in knocking a few particles out of atomic nuclei. They have not been able to accomplish the sort of wholesale destruction that a cosmic ray can do.

Studies within the last few weeks have revealed that when a cosmic ray collides full force with the nucleus of a heavy atom, more than a hundred particles are knocked out of it.

Lead Atom Is Broken

This should not surprise us, since the electrical potential of a cosmic ray is a billion volts, or more. Consequently, the ray possesses a thousand times more energy than the bombarding forces which scientists have had at their disposal to the present.

Undoubtedly much new information about the structure of the atom will come out of the study of these wrecked atoms.

As a matter of fact, the most recent discovery in the field of atomic structure came about as the result of cosmic ray studies. That was the discovery of the positron.

Dr. Carl D. Anderson of the California Institute of Technology found the positron while making photographs of cosmic rays. Apparently, they were knocked out of the nuclei of the atoms of a block of lead in the apparatus which he was using.

Many Particles Unknown

Scientists have reason today to suspect that there are a number of particles in the atom which are yet unknown. Let us review the known particles and see why the existence of others is plausible.

First of all, there is the electron, electrically negative. It is sometimes called the unit of negative electricity. Every atom consists of a nucleus with which is associated one or more electrons.

Next, there is the proton. It is electrically positive. It is 1850 times as heavy as the electron and about as many times smaller. The simplest known atom is that of hydrogen. It has a nucleus consisting of one proton around which one electron revolves.

Until last year, it was supposed that the nuclei of all atoms heavier than hydrogen were made up of combinations of protons and electrons.

Combination Is Neutral

Now, however, we know it is not as simple as all that. Two other constituents of atomic nuclei are known. They are the neutron, discovered last year, and the positron, discovered this year.

The neutron, as its name suggests, is electrically neutral. It has been suggested that the neutron represents a close combination of a proton and an electron, far closer than the mere association which forms the hydrogen atom.

Since the proton is positive and the electron negative, such a combination would be neutral. Recently, however, many scientists have thought it more likely that the neutron is a distinct particle, as individual in its way as any of the others.

The newly discovered positron is electrically positive. It is like the electron in size and weight but opposite to it in electrical charge.

Exhibits Positive Charge

Perhaps we should add the alpha particle to this list. The alpha particle also is the nucleus of the helium atom. It has been supposed that it consisted of four

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Such a combination would furnish an object like the alpha particle, for the alpha particle is approximately four times as heavy as a proton, but exhibits a positive electrical charge only twice that of the proton.

But since we have found a multiplicity of fundamental particles, it may be that the alpha particle also is fundamental.

The next particle which scientists think may turn up is a neutral one equivalent to the combination of a proton and an electron.

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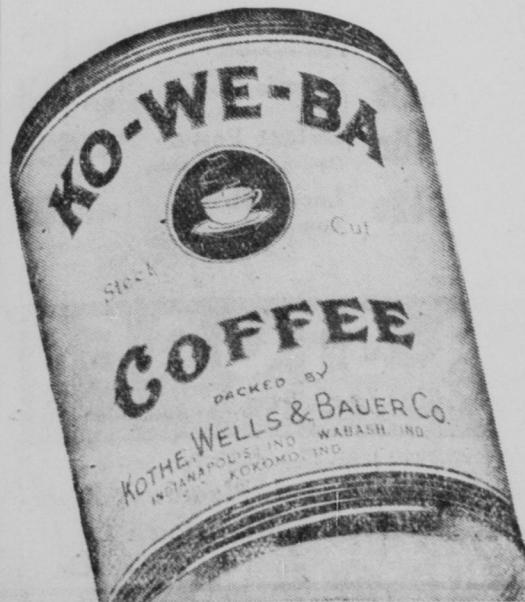
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**342 BOY SCOUT
MERIT BADGES
ARE PRESENTED**

Five Given Eagle Rank at
Annual Court of
Honor.

Boy Scouts from Marion county troops Thursday night attended the annual court of honor, held in the Knights of Columbus auditorium, Thirteenth and Delaware streets.

Many of the boy's parents and friends attended the court and entertainment which was arranged by Wallace O. Lee, Scout commissioner, Irving Williams, chairman of the court of honor, presided.

During the ceremonies, ranks of eagle, star, life, tenderfoot, first and second scouts were presented. Many scouts who have attained special

honors in the last month were presented with merit badges.

A total of 342 merit badges were presented. This brings the total since Jan. 1 to 947 merits awarded, a new record for the year in this branch of scouting.

Five boys received the eagle rank, highest Scouting honor. They are: Kenneth Young of Troop 15; Winfield Yaeger, Troop 47; Thomas Crosley, Troop 67, and Jack Brock and John Ross of Troop 82.

Eagle palms for advanced work in Scouting were given to John Tearney, Troop 9; Howard Reynolds and Herbert Skillman, Troop 21; William R. Evans, Troop 23; Marion Disbrough, Troop 60, and Theodore Feucht of Troop 82.

Special local recognition was given to Marion Disbrough who has qualified for his fifteenth merit badge, and Alfred Kuerst, of Troop 3, who has completed the requirements for forty-five merit badges.

A. L. Houckshell, scout master of Troop 76, with headquarters at the state school for the deaf, was given the ten-year veterans' badge. Five-year badges were given to Jack Hallatt, Troop 7; William Grepp, Troop 28; Lester Tavel, Troop 65; Donald

Shaffer, Troop 82, and Fred Grumme, Troop 90.

The degree of life scout was conferred on Fred Cretors, assistant scout master of Troop 21; John Cros, Frank Tinsley and James Zink, Troop 71; Jack Messick, 72, and John Thompson, Troop 78.

Will Remy to Give Talk

William H. Remy, former prosecuter, will speak at the regular

monthly meeting of the board of can Revolution, at noon Tuesday,

managers of the Sons of the American Revolution, at the Spink Arms.

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