

PHYSICS

Atomic Era: 25 Years Old

An anniversary story of the epochal discovery a quarter of a century ago—the splitting of the uranium atom that began the atomic age—By Watson Davis

► RELEASE of atomic energy and the possibility of the atomic bomb became known a quarter of a century ago. The atomic era had begun.

It was then that a scientific conference in Washington received the first news of the German experiments demonstrating that splitting the uranium atom with low energy neutrons yielded more energy than was put into the atom-splitting.

A SCIENCE SERVICE story sent to newspapers, Jan. 30, 1939 (see SNL, 35:86, Feb. 11, 1939), asked:

"Is the world standing on the brink of the release of atomic power?" The opinion was expressed that "perhaps these experiments are more important than the discovery of radioactivity itself," just before the turn of the century, one of the epochal events in man's scientific history.

Scientists were anxious, the report continued, that there should be no public alarm over the possibility of the world being blown to bits by their experiments. There was fear, then, not of gigantic bombs but that chain reactions would be set up in the rocks of the earth, which was an idea that fiction writers had popularized.

It was pointed out that very pure sub-

stances would be needed for a chain reaction and, in fact, much of the work in producing the fission bomb during the war involved the separation of not just uranium from its ores, but the separation of the fissionable uranium isotope, 235, and the production from uranium of a new element, plutonium, also fissionable with neutrons. This was not known until later.

This atomic energy saga began with researches in Berlin by Prof. Otto Hahn, under the unseeing eyes of the Nazis. He observed the strange action of uranium under neutron bombardment but could not quite account for it. Dr. Lise Meitner, long associated with Prof. Hahn, and Dr. R. Frisch of Copenhagen, suggested the idea of uranium splitting into other elements, which although unheard of previously proved to be the case. Ironically, Dr. Meitner was even then an intellectual refugee from Germany, temporarily working in Stockholm.

This work was reported in *Die Naturwissenschaften*, German science journal, and became known first by private communication from Prof. Hahn and later through publication.

The Hahn-Meitner-Strassman paper was

the sensation of the theoretical physics conference in Washington.

Atom smashers were rushed into service to confirm or deny the German work, and independent confirmations were obtained in Denmark and America.

The SCIENCE SERVICE coverage of these epochal discoveries foresaw the use of the conversion of matter into energy for the production of commercial power but carefully discounted any immediate impact upon the financial structure of power companies.

• Science News Letter, 85:85 Feb. 8, 1964

BIOCHEMISTRY

Seek Anti-Acid Hormone To Treat Stomach Ulcers

► A SEARCH has begun for a hormone which, if it can be isolated, may prove to be an effective agent for treatment of ulcers. The hormone is the one that has the job of turning off acid production in the stomach.

The search is being made by Dr. James C. Thompson, a surgeon at the University of California, Los Angeles, Medical School and Harbor General Hospital.

Dr. Thompson has obtained evidence of a naturally occurring substance that appears to inhibit acid production in the stomach. There is an indication that the substance may be produced in the lower portion of the stomach, known as the antrum.

It is known that when the antrum becomes distended because of food in the stomach it begins to secrete a hormone known as gastrin. This hormone causes the upper part of the stomach to produce acid.

As the antrum becomes acidified, it stops producing gastrin, Dr. Thompson's research suggests. As a result of this acidification, the antrum may also release a hormone which inhibits acid production.

The investigation will be aimed at identifying such an inhibitory hormone. If it can be identified, the next step would be to purify it for use in treatment of peptic ulcers.

Although acid alone does not cause ulcers, it is an irritant that contributes to the distress of an ulcer and perhaps helps to perpetuate the condition.

The John A. Hartford Foundation, Inc., of New York has awarded a \$129,718 grant to the Medical School to support the program.

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PSYCHOLOGY

Treatment Reconciles Mind and Body

► PSYCHOLOGICAL GUIDANCE, drug treatment and surgical operations are proving successful in reconciling warring bodies and minds.

The combined approach has helped many transsexuals, whose anatomical sex and psychological sex are in opposition, to become unified individuals and to lead normal lives.

Dr. Harry Benjamin of New York reported on the treatment of transsexuals at a meeting of the Society for the Scientific Study of Sex in New York.

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PUBLIC HEALTH

Smoking Effects on Heart

► THE EFFECT of smoking on heart disease could turn out to be far greater than on lung cancer, Dr. Ralph E. Knutti, director of the National Heart Institute, Bethesda, Md., said in Washington, D. C.

Dr. Knutti told the Washington Heart Association's annual meeting that "if future research confirms certain evidence that we have at the present time," the relationship of smoking cigarettes to heart and vein diseases will be seen more definitely "causal" than the Surgeon General's Advisory Committee Report indicated.

The report "linked" smoking and heart disease without being able to clarify cause and effect.

The actual number of deaths involved in studies of smokers and nonsmokers is about three times higher for coronary artery disease than for cancer of the lung, Dr. Knutti pointed out.

Using the 1962 mortality figures, he said as many as 90,000 coronary artery deaths among men age 25 and over might be associated with cigarette smoking.

Cigarette smoking is one of the "risk" factors mentioned in the National Heart Institute Study in Framingham, Mass., in which 5,128 adults are being followed for eight to 12 years to find out what makes them develop heart disease.

The Framingham study has shown that among cigarette smokers the risk of subsequently developing coronary heart disease is two to three times higher than among nonsmokers, but Dr. Knutti said "we still do not understand the mechanism of this action."

Voluntary contributions are still needed in addition to the large amounts in Government funds going into research on heart diseases, Dr. Knutti said. Nearly a million Americans will die this year from heart disease, and many more millions will be suffering from various kinds of diseases of the heart and blood vessels.

Heart disease, the speaker explained, covers a group of more than 20 kinds of diseases of the heart and blood vessels. It includes congenital, rheumatic fever and rheumatic heart disease, high blood pressure, hardening of the arteries that may involve strokes, heart attacks and other bad effects.

"Heart disease" can involve not only every part of the heart itself but also can affect every organ system, every tissue and even every cell. Other factors besides smoking predispose a person to coronary disease, but for some years evidence linking cigarette smoking and heart disease has been mounting.

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