

## EDUCATION

**Typical Teacher Married,  
Well Qualified for Job**

► CONTRARY TO POPULAR opinion, the typical American teacher is not a pretty young girl fresh out of high school.

Most teachers are married. Most are well-qualified for the job. And most are themselves parents of children. More than half of all teachers are women teaching in the elementary grades.

These facts were revealed by a comprehensive survey conducted by the National Education Association.

The typical woman teacher, it was revealed, is older than the typical man teacher—45.5 years against 35.4. The woman teacher is also more experienced in teaching—15.4 years against eight years for the man teacher.

The typical man teacher, however, teaches in high school or in junior high and has 129.1 pupils in his classes. The typical woman teacher is in an elementary grade and has 30.8 pupils in her class. The man teacher's salary is \$4,374 while the woman gets \$3,932.

The typical teacher of both sexes is a college graduate with a bachelor's degree. A higher degree is held by 42% of the men and 18.1% of the women. More teachers have higher degrees than lack any degree.

The typical teacher is also an active member in a church and belongs to at least one or two community organizations. About 85% voted in the most recent election.

Science News Letter, April 13, 1957

## RADIO ASTRONOMY

**Exploding Star Is  
Giant Atom Smasher**

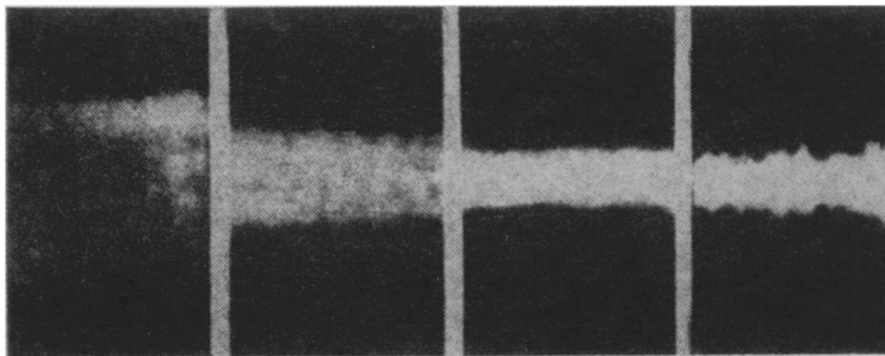
► AN EXPLODING STAR that suddenly became extremely brilliant on July 4, 1054, A.D., is now known to be an atom smasher in the sky so huge it dwarfs the entire solar system.

Debris from this heavenly cataclysm is called the Crab Nebula. It is visible through a telescope as a faintly glowing cloud of gas. Astronomers at Mt. Wilson and Palomar Observatories in California have found that light from this former supernova is nearly 100% polarized.

This indicates a very strong magnetic field and large quantities of very fast-moving electrons. Acceleration of electrons may also be responsible for the radio waves broadcast by the Crab Nebula, Drs. B. F. Burke and M. A. Tuve, director, Carnegie Institution's Department of Terrestrial Magnetism in Washington, suggest.

All sources of radio noise so far identified with visible objects in the sky appear to be composed of highly turbulent and ionized gases, they report to the Smithsonian Institution. Other requirements may exist, they say, which will influence theories of how an agitated gas emits radio waves.

Science News Letter, April 13, 1957



**RUSSIAN'S "PINCH EFFECT"**—Successive photographs at intervals of 0.5 microseconds taken from a moving picture of a pulsed discharge in heavy hydrogen. They show the first contraction, or "pinch."

## PHYSICS

**The AEC's Paper Curtain**

Most U. S. research on the possibility of controlling thermonuclear reactions to produce peaceful power is hidden behind the Atomic Energy Commission's secrecy regulations.

► A PAPER CURTAIN still hides most of the progress being made by the United States in harnessing the fiery heat of hydrogen-bomb reactions for peaceful power.

A slight tear in the curtain occurred when the Atomic Energy Commission announced plans to build a "Model C Stellarator," a large device for research in controlled thermonuclear reactions. However, as an iceberg is seven-eighths hidden under water, so the largest part of present work is hidden behind secrecy regulations.

Judging from the information so far re-

leased, considerable progress is being made in the five laboratories involved in Project Sherwood, the AEC's name for its controlled thermonuclear program. It seems to be only a matter of time, brains and many dollars to wrest power from fusion reactions.

The amount of money devoted to research on harnessed fusion in the current fiscal year ending this June 30 is more than 20 times the amount spent in 1953, Rear Admiral Lewis L. Strauss, AEC chairman, reported. From 20 scientists and engineers studying the problem in 1953, the figure has



**EARLY U. S. "PINCH EFFECT"**—This photograph shows the "pinch" going around a curve in xenon gas in an early Perhapsatron torus, which is a doughnut-shaped apparatus, the Atomic Energy Commission explains.

jumped to 250 this year, with another 250 as supporting personnel.

These figures, however, do not include the many people not on the AEC's payroll who are contributing ideas, time and research effort. Achieving power from fusion would solve the problem of mankind's expanding need for energy sources and is a dream that has captured the imagination of many scientists.

Among the several light elements that could be used as fuel, the deuterium in the world's oceans alone would sustain an energy production rate 1,000 times the world's present capacity for more than a billion years.

The facts revealed (April 1) by the AEC concerning Project Sherwood do not yet match those given out (April, 1956) by the Russians, who have said they have reached temperatures of about one million degrees in their laboratory experiments.

In answer to a question concerning what temperatures the U. S. had reached, Adm. Strauss said, "I think one might say that very high temperatures have been achieved, but not high enough."

As to the British, he said, the U. S. was sometimes ahead in the race to be the first to tame fusion reactions, then a few weeks or month later would lag behind the British. He stated that judging the final winner would be like predicting the winner of a race when entrants had not yet reached the quarter mark.

The problem of achieving a controlled thermonuclear reaction is one of heating and confinement. It is necessary to heat a

suitable nuclear fuel to temperatures of a hundred million degrees, then confine it at that temperature long enough for fusion to take place. The energy resulting must be larger than the losses to be harnessed for useful power.

One of the most promising methods of doing this is to make use of the so-called "pinch effect," the contraction of an electric current due to a magnetic field. This shrinking occurs in any liquid or gas carrying a current, such as the familiar neon tube, but is usually much too small to be noticeable.

When large enough currents are used, however, the current will pull itself into a thin thread, shrinking from the walls until the thinning column is its own container. So far scientists have been able to maintain the pinch effect for only a few millionths of a second before it becomes unstable and breaks down.

The AEC's first device for studying the pinch effect, operated at the Los Alamos Scientific Laboratory, was known as the "Perhapsatron." In it, and its successor, the Columbus, xenon and krypton were used to examine in detail the increased density and temperature under the maximum compression in the pinch.

Decision to build at Princeton, N. J., the Model C Stellarator, a coined word from stellar and generator, is the biggest forward step yet taken to control fusion reactions.

The program is under the direction of Dr. Lyman Spitzer Jr., director of the Princeton University Observatory, with general supervision by a committee headed by

Dr. H. D. Smyth, former AEC commissioner who wrote the Smyth report, a factual account of the development of the atomic bomb.

Many scientists and such organizations as the Federation of American Scientists have called for the equivalent of a Smyth report on the taming of hydrogen-bomb reactions. They believe progress in the U. S. would be much faster if most or all of the studies made so far were given the widest possible circulation among scientists, thus greatly spurring interest in the problem.

Science News Letter, April 13, 1957

## SCIENCE NEWS LETTER

VOL. 71 APRIL 13, 1957 NO. 15

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N.W., Washington 6, D. C., North 7-2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Copyright © 1957 by Science Service, Inc. Reproduction of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicated services issued by Science Service. Science Service also publishes CHEMISTRY (monthly) and THINGS of Science (monthly).

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283) authorized February 28, 1950. Established in mimeograph form March 13, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Reader's Guide to Periodical Literature, Abridged Gu.de, and the Engineering Index.



Member Audit Bureau of Circulation. Advertising Manager: Fred A. Mouton, 1719 N St., N. W., Washington 6, D. C., ME 8-2562.

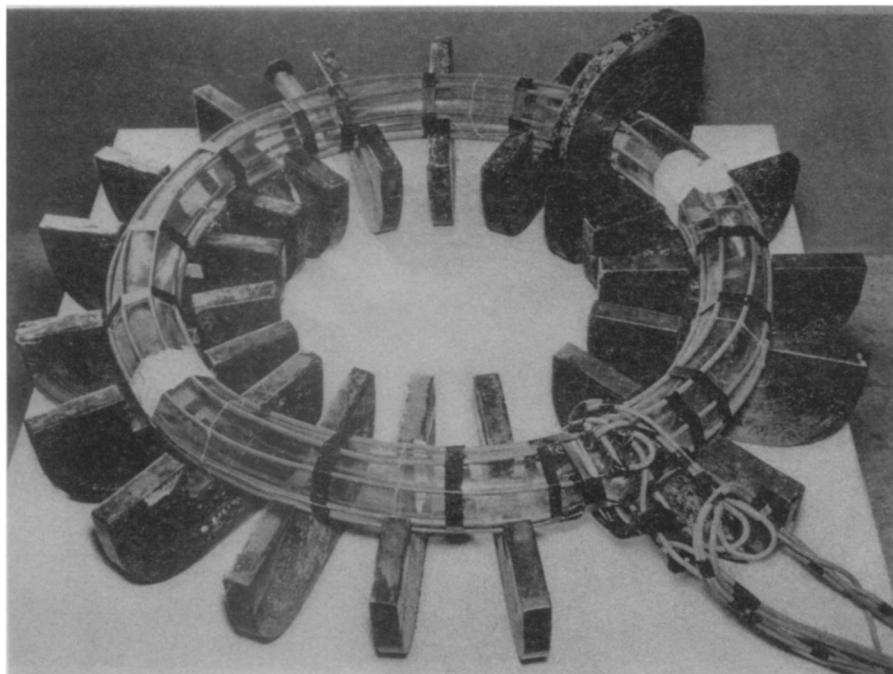
### SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Karl Lark-Horovitz, Purdue University; William W. Rubey, U. S. Geological Survey; Wallace R. Brode, National Bureau of Standards. Nominated by the National Academy of Sciences: George W. Corner, Rockefeller Institute for Medical Research; Edward U. Condon, Berkeley, Calif.; Harlow Shapley, Harvard College Observatory. Nominated by the National Research Council: Jerome C. Hunsaker, Massachusetts Institute of Technology; I. I. Rabi, Columbia University; Leonard Carmichael, Smithsonian Institution. Nominated by the Journalistic Profession: Neil H. Swanson, Ruxton, Md.; O. W. Riegel, Director, Washington and Lee University; Michael A. Gorman, Flint Journal. Nominated by the Scripps Estate: Charles E. Scripps, Cincinnati, Ohio; Edward J. Meeman, Memphis Press-Scimitar; Frank Ford, Washington, D. C.

Officers—President: Leonard Carmichael; Vice President and Chairman of Executive Committee: Charles E. Scripps; Treasurer: O. W. Riegel; Secretary: Watson Davis.

Staff—Director: Watson Davis. Writers: Marjorie Van de Water, Ann Ewing, Howard Simons, Dorothy Schriver, John W. Robinson. Science Clubs of America: Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Production: Priscilla Howe, Marcia Nelson. Sales: Hallie Jenkins. Interlingua Division in New York: Alexander Gode, 80 E. 11th St., GRamercy 3-5410.



**PERHAPSATRON TUBE**—Primary windings and iron cores of the magnets used to heat gases for studies of the "pinch effect" are shown going around the Perhapsatron discharge tube, developed at Los Alamos Scientific Laboratory. Aim of the studies is to investigate the feasibility of controlling fusion reactions for peaceful purposes.