

New York Times for 25 January, the cost of this apparatus was \$28,000, much less than the costs of the apparatus used by the respective government agencies. Plumb also noted that the workers at Associated Electrical Industries are much more optimistic about developing higher temperatures within a reasonably short time than the AEC and the AEA: "... temperatures of ten to twelve million degrees are hoped for in a few months."

Columbus. Five papers by scientists from the United States were published in the 24 January issue of *Nature*. L. C. Bankhardt, R. H. Lovberg, and J. A. Phillips of Los Alamos Scientific Laboratory described measurements made in mid-1956 of the distribution of currents in a linear, pinched discharge in deuterium. The measurements provide a means for determining the effective temperature of the hot gas.

The production of neutrons in a straight pinch apparatus was described by D. C. Hagerman and J. W. Mather, also of Los Alamos. This apparatus, *Columbus II*, is 30 centimeters long and 10 centimeters in diameter; it began to yield results last summer. Under various conditions the tube can be made to yield between 10 million and 100 million neutrons per pulse, in a time of about 1 microsecond or less.

Tests were made to determine whether most of the neutrons are produced by thermonuclear reactions or whether they are emitted at the electrodes or walls, or from instabilities in the gas. It was found that the neutrons are emitted from the gas and that they come practically uniformly from all parts of the tube.

The third paper, by L. C. Burkhardt and R. H. Lovberg, dealt with another straight pinch tube, *Columbus S-4*. This tube is a porcelain cylinder 5 inches in diameter and 24 inches long. The paper showed that there can be circulating currents in the tube at certain times during the pinch process. Particle energies of 300 electron volts (or temperatures of about 3 million degrees) were attained, in spite of the fact that the tube was operated at voltages below 20 kilovolts. When the tube was started with pressures of 40 microns of mercury, the pressure became 12 atmospheres at the time when the diameter of the current column was smallest, about 6 microseconds after the current started. According to the AEC release, "Perhaps the most significant observation with S-4 is that the field produced by the pinch current is highly reproducible over several half-cycles of the applied voltage."

Perhapsatron. The fourth paper from Los Alamos was written by J. Honsaker, H. Karr, J. Osher, J. Phillips, and J. L.

Tuck. It described the production of neutrons from a stabilized pinch in a small doughnut-shaped tube, the *Perhapsatron S-3*. This tube came into operation in December 1957; it yielded as many as 1 million neutrons per discharge. The main burst of neutrons occurs in a time of about 2 microseconds. Smaller bursts continue to occur for several additional microseconds. The results are felt to be consistent with an effective temperature of about 6 million degrees. There is good evidence that the pinch is well centered while the applied current is high; the amplitude of the undulations of the pinch is about 2 millimeters, which suggests that the discharge is well stabilized.

Two other papers by scientists from the United States were released on 24 January. One, the fifth of the group published in *Nature*, was an analysis of the results obtained by the British workers with Zeta, by Lyman Spitzer, Jr., of Princeton University. The other described the production of neutrons in linear deuterium pinches. It was written by D. A. Anderson, W. R. Baker, S. A. Colgate, H. P. Furth, J. Ise, Jr., R. V. Pyle, and R. E. Wright, of the University of California Radiation Laboratories, Livermore and Berkeley, and was published in the 1 February issue of the *Physical Review*.

Cooperation in research. The British release stated: "Full collaboration in the controlled thermonuclear reactions field was established with the U.S. Atomic Energy Commission in October 1956."

Lewis L. Strauss, chairman of the U.S. Atomic Energy Commission, stated: "After the U.S.-U.K. decision to declassify results of work on controlled thermonuclear reactions (except for certain areas) and following necessary concurrence of the two countries on a revision of the Joint Classification Guide to accomplish this, conferences began with a view to releasing the newly-declassified information as early as possible in 1958. It was agreed that January 24, 1958, was the most convenient date.

"Assertions that U.S. pressure was used to persuade the U.K. authorities to suppress publication of the results of their research are contrary to the fact and have been refuted by Sir Edwin Plowden, chairman of the United Kingdom Atomic Energy Authority, and by me.

"Furthermore, certain comparative observations which have been published in recent weeks about British and U.S. progress in this field will be seen from today's British and U.S. papers to have been not only misleading but lacking in any foundation of fact.

"Today's announcements make it

clear that fruitful and promising results have been achieved in the laboratories of both countries but we should not expect early harnessing of fusion for the production of power. In the field of fusion, we are not yet at a point comparable to December 2, 1942, when the first self-sustaining fission reaction was obtained.

"Our research efforts and those of the United Kingdom are at a point where it occurs, periodically, that first one laboratory and then another will make a useful and illuminating advance. This has happened in the past, and no doubt will occur in the future, as our two countries pursue their studies . . .

"We congratulate the United Kingdom Atomic Energy Authority and its scientists and engineers for the notable advances which they have made. We are happy with the cooperation which we have established with our British friends in this field of science, and we confidently expect it to expand the frontiers of knowledge."

Petition Urging Agreement To Stop Nuclear Tests

Linus Pauling announced on 20 January that 9235 scientists in 44 countries have signed a petition to stop the testing of nuclear bombs by international agreement and that he had presented the petition to the United Nations. The petition bears the names of 36 Nobel laureates, 101 members of the National Academy of Sciences of the United States, 35 Fellows of the Royal Society of London, and 216 members and correspondents of the Academy of Sciences of the U.S.S.R.

A total of 2705 American scientists signed the petition. There were 216 Russian names, 304 from the United Kingdom, 65 from France, and 1141 from Japan.

The petition was prepared by Pauling as an individual scientist and was signed by other scientists as individuals. No organization was involved in the formulation of the petition or in the collection of signatures.

The petition resulted from an address on "Science in the Modern World" given last May at Washington University, St. Louis, Missouri. In the address Pauling discussed the damage that is being done by the testing of nuclear bombs and expressed his conviction that a stop to the testing through international agreement would be an effective first step toward averting a cataclysmic war, and that international problems should be solved not by war, but by the application of man's power to reason, through arbitration, negotiation, international agreements, and international law.

Within 2 weeks the signature of 2000 American scientists had been obtained, and on 4 June 1957 the statement was submitted to President Eisenhower [*Science* 125, 1190 (14 June 1957)].

In July Pauling received a statement of adherence to the petition signed by all of the professors of science in the Free University of Brussels, as well as similar statements from scientists of other countries. He then wrote to a few scientists in each country, asking that they obtain signatures. In some countries no effort was made to obtain signatures except from a few leading scientists.

Pauling has stated that he does not believe that the problem of bomb tests and disarmament is one that should be settled by scientists; it is instead one of importance to every person in the world. Scientists, however, have some measure of understanding of the complex factors involved, such as the magnitude of the damage done by radioactive fallout, and he believes that scientists have an obligation to express their opinions in order to help their fellow citizens. He also has said that he advocates an agreement to stop bomb tests and that such an agreement would benefit all nations and all people equally and not one nation or group of nations preferentially.

Sun Spot Theory

A new theory about sun spots has been advanced by Donald H. Menzel, director of the Harvard College Observatory, in the annual report of the Smithsonian Institution. Heretofore, the spots were assumed to indicate the existence of solar storms, or the vertices of cyclones. However, in the report, Menzel says the small, dark regions are "islands of intense calm floating in the otherwise turbulent sea of the sun's atmosphere."

The report on the new theory states: "We are now in a position to understand the darkness of the sunspot relative to the surrounding photosphere. In a region where magnetism has not inhibited convection, the outer layers are hotter than they would be otherwise. They are, consequently, more luminous than the spots, where convection does not occur. In the region immediately surrounding the spots, the convective layer must rise higher."

Tariff-Free Instruments

A bill to permit certain educational organizations to import free of duty scientific and laboratory apparatus for educational or scientific purposes was introduced last August in the House of Representatives by Congressman Anton N. Sadlak of Connecticut. It was re-

ferred to the Committee on Ways and Means. The bill, H.R. 9349, proposes that the Tariff Act of 1930 be amended to permit the free import of "scientific or laboratory instruments, apparatus, utensils, or appliances (including surveying and mathematical instruments), or parts thereof, imported by a tax-exempt educational organization for its own use in scientific research or in the instruction of students, and not for sale (including sale to students) or for any commercial use."

Standard Inch

Standardization of the inch among friendly nations in an age of increasing weapon precision was urged recently by A. V. Astin, director of the National Bureau of Standards. He asserted that the fractional differences between the inches used in the United States, the United Kingdom, and Canada have created critical problems in technological cooperation.

Astin said there were 129 calibration centers throughout the Soviet Union for passing on the accuracy of instruments in weapons and missiles plants and in military installations. The United States probably has superior tools of standardization, but the Russians appear to have superior means of distribution in that field.

Astin proposed that the appropriate agencies of the United States, the United Kingdom, and Canada negotiate an international yard of 0.9144 of an exact international meter. This would yield an international inch equal to 2.54 centimeters. This is exactly the Canadian standard and about midway between the United States and British standards.

Tenth Anniversary of the American Heart Association

Marking its first decade as a national voluntary health agency, the American Heart Association has announced that, by the end of the current fiscal year, the association and its affiliates and chapters will have channeled a total of \$29 million into research studies. Research allocations for the current fiscal year total nearly \$7 million, the highest annual amount since the awards were first made in 1948. More than 60 percent of the awards are for basic research.

In noting the 10-year gains in cardiovascular research, the anniversary issue of the association's *Heart Research Newsletter* states:

"Outstanding have been the dramatic achievements of surgeons in repairing previously hopeless heart defects. New drugs have appeared to help those with

high blood pressure. Improved drugs and diet therapy have helped heart failure patients. Rheumatic fever seems to be yielding to prevention. Anti-clotting drugs have been shown to reduce the death rate after the first heart attack and long-term anticoagulant therapy has been extensively studied.

"The application of electronics and the use of radioactive tracers have given investigators important new tools and provided physicians with improved methods of diagnosis. The catheter, a long thin tube pushed up through the veins into the heart chambers, has become widely used as a method for diagnosing heart and circulatory malfunctions. The value of regular exercise, the need to keep down weight, and sensible diet precautions have been affirmed."

News Briefs

An information exchange program linking Fordham University and the Catholic University of Lublin, Poland, has been announced. Heading the program at Fordham is the Rev. Walter C. Jaskiewicz, director of the Institute of Russian Studies. He will direct the exchange of photographs, books, special editions of student newspapers, art exhibits, tape recordings, and newsletters. The program was arranged with the cooperation of the Department of State.

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The first issue of *Ergonomics: Human Factors in Work, Machine Control and Equipment Design*, has been announced by Academic Press Inc., distributors of the journal in the United States and Canada. The term *Ergonomics* was coined to denote an approach to the problems of human work and control operations which came into prominence during the second world war in relation to equipment for the armed services. The general editor of the journal, the official publication of the Ergonomics Research Society, is A. T. Welford, Psychological Laboratory, Cambridge University, Cambridge, England. Subscription orders originating in the United States and Canada should be addressed to Academic Press Inc., 111 Fifth Ave., New York 3, N.Y.

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The University of Michigan will build an 85-foot steerable radio telescope next June at Peach Mountain, 16 miles from Ann Arbor.

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The National Bureau of Standards has developed a simple, fast-acting, precision instrument to measure the speed of sound in nondispersive liquids—liquids in which the speed of sound is essentially independent of frequency. M. Greenspan and C. E. Tschiegg of the