

Encouragement of the free interchange of nonclassified scientific information is an important part of the Atomic Energy Commission's responsibility, as shown in the following article.

DISSEMINATION OF

By Dwight E. Gray

ONE of the less publicized but very important phases of the Atomic Energy Commission's over-all activity is its extensive program for making nonclassified atomic energy information widely available to the scientific world in general. The importance of such dissemination was recognized both by the framers of the Atomic Energy Act of 1946 and by the Congress that enacted it into law, as evidenced by the following quotation from the Act, "That the dissemination of scientific and technical information relating to atomic energy should be permitted and encouraged so as to provide that free interchange of ideas and criticisms which is essential to scientific progress". The purpose of the present account is to provide readers of *Physics Today* with a concise summary of this part of the AEC operation in the form of answers to the following questions:

1. *What kinds of technical information are widely disseminated by the AEC?*
2. *How is the existence of this information made known?*
3. *In what forms is the information made available and how may it be obtained?*

SCIENTIFIC information falling within the scope of this discussion may be defined in one way by dividing it into categories of "unclassified" and "declassified"—where the former deals with subject matter which never carried a security classification and the latter is information which once was classified but from which security restrictions subsequently were removed.

To promote the development and interchange of scientific information to the greatest degree compatible with national welfare, the AEC has designated certain subject areas of research as *unclassified*. In these it imposes no security restriction on the publication of research results obtained in its contractor and associated laboratories. Subject fields so specified include, briefly, pure and applied mathematics (except that concerned directly with specific classified projects); theoretical physics (except theory of fission, of reactors, of neutron diffusion, and of weaponry); all physical properties (except nuclear) of elements of atomic number less than 90 and nuclear properties of most isotopes; basic chemistry and physical metallurgy of all elements of atomic

number less than 83 (except the technology of the production of fissionable materials); instrumentation, including circuits, counters, ionization and cloud chambers, neutron detectors (except fission chambers), electronuclear accelerators, and so forth; medical and biological research and health studies (except where elements of atomic number above 90 are involved); and the chemistry and technology of fluorine compounds (except for specific applications in AEC installations).

Deciding whether any given bit of scientific information should be classified or unclassified is always a matter of balancing the importance of keeping it from some people against the advantages to be gained by circulating it freely to many people. The very nature of defense-related scientific research usually causes this balance to shift with time so that much of what must be classified at one stage of a development, at some subsequent time should be given the widest possible dissemination if maximum benefit is to be gained from the money that went into the work. The AEC has been perhaps the most foresighted of the various government agencies concerned with military research in recognizing this fact and establishing report declassification machinery. The system provides a centralized means of authorizing the release of technical information after appropriate review and evaluation, and operates as follows:

A project scientist wishing to have a certain document declassified submits it to a designated official in his establishment who checks to see whether the release would be in line with that organization's policies. If so, he forwards the report, together with his recommendation, to one of approximately 100 specialists called Responsible Reviewers. The Reviewer examines the report, attaches his opinion and sends the material on to the AEC Declassification Officer who alone has the authority to certify declassification of the paper. If this officer desires additional advice, he can obtain the recommendations of one or more of four so-called Senior Responsible Reviewers, all of whom are prominent scientists delegated to advise on policy matters and resolve borderline cases of declassification. Declassification is carried out only to satisfy some specific purpose and is not done on a blanket basis.

Much of the nonclassified scientific information arises

TECHNICAL INFORMATION BY AEC

ing from AEC-supported research is published in the conventional form of papers in technical journals and in books. A considerable quantity, however, sees the printed light of day first, and frequently solely, in the technical report—that relatively new medium of scientific publication that has become so important since the war. Several thousand of these unclassified and declassified technical AEC reports have been made generally available to date.

RESPONSIBILITY for carrying out essentially all of the activities connected with making known the existence of the AEC's available technical information lies with the AEC's Technical Information Service, headed by Alberto F. Thompson. This office performs the technical information functions which can best be handled centrally with a trained professional staff, and concerns itself almost entirely with technical information which has wide utility throughout the AEC and the scientific community in general. Its principal responsibilities are disseminating (by means of abstracts, references service, and primary publications) the scientific information generated within AEC and procuring and processing all similar information from non-AEC sources which is pertinent to the Commission's research and development programs. The Technical Information Service maintains a headquarters staff in Washington and an operational group at Oak Ridge, Tennessee.

The principal medium employed by this group in making known the existence of nonclassified AEC nuclear science information is the semi-monthly journal *Nuclear Science Abstracts*. This abstracting publication which has proved so valuable to scientific workers in the atomic energy field carries informative abstracts of all unclassified and declassified AEC technical reports and, as extensively as possible, also of conventionally published papers and books, both domestic and foreign. Quarterly subject and nuclide indexes are issued and a cross-referenced cumulative index is published for each annual volume. Thus the journal serves both as a prompt announcement medium and as a permanently useful bibliographic tool for retrospective literature searching. An important corollary value of *Nuclear Science Abstracts* is as a vehicle for exchange which brings to the AEC a great deal of important scientific informa-

tion that might not be available to it otherwise. To date, over 175 domestic and almost 350 foreign exchange agreements—the latter with the assistance or approval of the State Department—have been completed. During the first half of 1951 *Nuclear Science Abstracts* carried a total of 3284 abstracts; currently, 4700 copies of each issue are being printed.

THE several forms in which the unclassified nuclear science information developed by the AEC and its contractors becomes generally available include, principally, papers published in conventional journals; AEC-sponsored periodicals, books, and reports; and document collections placed in a series of depository libraries.

The Atomic Energy Commission has always encouraged the scientists associated with it to publish the unclassified results of their research in the established journals and has considered such publication one of the most important mechanisms for the dissemination of AEC-developed scientific information. To promote this activity the Commission often accepts published papers as adequate official reports on work it sponsors and authorizes certain of its research organizations to pay page costs and similar expenses associated with publishing the results of work done in their laboratories. Such papers, of course, are covered by the standard abstracting and indexing services, as well as by *Nuclear Science Abstracts*, and can be obtained by such conventional methods as journal subscription, microfilm or photostat purchase, reprint solicitation, and so forth.

Nuclear Science Abstracts is the only widely distributed unclassified journal published by the AEC. In addition to being officially distributed to all AEC installations and contractor laboratories, the journal is offered for sale on a subscription basis through the Office of Technical Services, Department of Commerce, Washington 25, D. C. The same agency also has for sale some of the technical reports abstracted in the journal and will supply a price list upon request.

By far the most ambitious of the book-publishing ventures which the AEC has sponsored is the group known as the National Nuclear Energy Series. These are written for the most part by scientists who were in the forefront of the wartime nuclear science develop-

ment and, when completed, will constitute a selected permanent record of the original research in this field performed by the Manhattan District. The unclassified portion of this series, which is being printed and sold by the McGraw-Hill Book Company, will number some 40 volumes; of these, 21 volumes have been published to date.

Both *The Effects of Atomic Weapons* and the *Fermi Lecture Series in Nuclear Physics*, printed and sold by the Government Printing Office, have enjoyed relatively large sales. The former, prepared jointly by scientists in the Department of Defense and in the Commission's Los Alamos Scientific Laboratory, has sold over 100,000 copies; the latter, a highly technical AEC publication, has had a sale of more than 18,000 copies. The most recent AEC-sponsored book is the *Sourcebook on Atomic Energy* by Samuel Glasstone; this comprehensive volume of more than 500 pages was published by the D. Van Nostrand Company and to date has sold almost 20,000 volumes.

The generally available media mentioned thus far—published papers, abstract journal, reports offered for sale, and books—encompass a considerable fraction of the unclassified scientific information coming out of the research and development programs supported by the Atomic Energy Commission. There remain, however, an appreciable number of technical reports which, although unclassified and therefore open to general use as far as security is concerned, contain information that has not been incorporated into one of the forms of publication described above. To make this material also generally available, the AEC Technical Information Service about a year ago organized a system of depository libraries where essentially complete collections of AEC unclassified and declassified reports are maintained. These collections are located in 40 major university and research libraries which were selected with the assistance of the American Library Association to effect optimum nation-wide coverage. Each such institution is supplied with an AEC card catalog and has agreed to provide its geographical area with adequate library service on these documents, including the supplying of microfilm and photostat copies. In addition, over 150 college and public libraries receive the AEC sale documents mentioned previously.

More detailed information on AEC nonclassified information is given in a pamphlet titled "The Availability of AEC Research and Development Reports" which may be obtained upon request from the Technical Information Service, Atomic Energy Commission, P.O. Box 62, Oak Ridge, Tennessee.

In summary, it may be said that the Atomic Energy Commission is making every effort to take full advantage of all possible channels of dissemination in carrying out the policy expressed in the Atomic Energy Act with respect to nonclassified scientific information. In so doing, it is playing a major part in maintaining that atmosphere of free interchange of knowledge which is essential to healthy scientific development and hence to the preservation of a vigorous and secure nation.

News and views

German Science

Reconstruction in the West

The last war had a disastrous effect upon the intellectual life of most European nations, and research in the natural sciences suffered crippling blows in spite of the temporary stimulus of military-sponsored research and development. In Germany, the loss of large numbers of outstanding scientists who either died during the Nazi regime or emigrated had especially damaging consequences, particularly since these individuals were never successfully replaced. Another factor working against any very immediate postwar recovery in Germany, moreover, was the virtual isolation of German scientists during the blockade, a period marked by the full mobilization of science for the war effort. International communication, the life-blood of scientific progress, was made all but impossible, and the violence of the Allied air bombardment was felt by many German research laboratories. The final and somewhat anticlimactic blow was delivered at the end of the war when research laboratories in the East were systematically stripped of their equipment and trained personnel by the Russians. The nation was partitioned into zones governed by the several victorious powers, and in the West the Allied High Commission established a rigid list of rules and prohibitions determining the regions of research in which German scientists were permitted to work.

Against this background it is of interest to note two survey reports issued during the past year by the European Affairs Division of the U. S. Library of Congress. The first of these, *A Statistical Postwar Survey on the Natural Sciences and German Universities*, was prepared by Kurt Ueberreiter, associate professor at the Technical University of Berlin and head of the department of physical chemistry at the Kaiser Wilhelm Institute. Professor Ueberreiter's survey of German science and education is mainly a statistical inventory of the postwar conditions of teaching and study in institutions of higher learning, including both the universities and the natural science research institutes. The outstanding feature of the report is the remarkable number of students now enrolled in universities compared with enrollments during the period immediately preceding the war. In 1950, five years after the end of World War II, the number of students had reached a total of 150,000, which is about 170 percent higher than the corresponding figures for 1939. Prewar enrollment