- 11. DEBYE, P. Ann. Physik, 1926, 81, 1154.
- DESIRANT, M., and SHOENBERG, D. Nature, Lond., 1947, 159, 201.
- 13. DESIRANT, M., and SHOENBERG, D. Proc. roy. Soc., in press.
- 14. FRANKL, M. U. S. Patent 1,945,643 (1934).
- 15. GIAUQUE, W. F. J. Amer. chem. Soc., 1927, 49, 1870.
- 16. GIAUQUE, W. F., and MACDOUGALL, D. P. Phys. Rev., 1933, 43, 768.
- 17. GORRIE, J. U. S. Patent 8,080 (1851).
- GORTER, C. J., and CASIMIR, H. Physica, 1934, 1, 305.
 DEHAAS, W. J., and WIERSMA, E. C. Physica, 1935, 2, 335
- 20. KAPITZA, P. Proc. roy. Soc., 1934, A147, 189.
- 21. LANDAU, L. J. Phys. USSR, 1941, 5, 71.
- 22. LANDAU, L. J. Phys. USSR, 1943, 7, 99.
- LANE, C. T., FAIRBANK, H. A., ALDRICH, L. T., and NIER, A. O. Phys. Rev., 1948, 73, 256.

- LANE, C. T., FAIRBANK, H., SCHULTZ, H., and FAIRBANK, W. Phys. Rev., 1946, 70, 431; 1947, 71, 600.
- LAURMANN, E., and SHOENBERG, D. Nature, Lond., 1947, 160, 747.
- LONDON, F. Nature, Lond., 1938, 141, 643; Phys. Rev., 1938, 54, 947.
- MEISSNER, W., and OCHSENFELD, R. Naturwiss., 1933, 21, 787.
- 28. MISENER, A. D. Proc. roy. Soc., 1938, A166, 43.
- 29. PESHKOV, V. J. Phys. USSR, 1946, 10, 389.
- 30. PIPPARD, A. R. Nature, Lond., 1947, 159, 434.
- 31. RUTGERS, A. J. Physica, 1936, 3, 999.
- 32. SIMON, F. Z. Gas. Kalte Inc., 1927, 34, 12.
- TISZA, L. Nature, Lond., 1938, 141, 913; C. R. Acad. Sci., Paris, 1938, 207, 1035.
- 34. TISZA, L. Phys. Rev., 1947, 72, 838.
- WILHELM, J. O., MISENER, A. D., and CLARK, A. R. Proc. roy. Soc., Lond., 1935, A151, 342.

Loyalty Clearance Procedures in Research Laboratories

THE POSSIBLE MILITARY APPLICATIONS of scientific research have raised several serious problems for scientists in the past few years. Of these, the problem of clearance procedures and loyalty determination has proven one of the most vexing. It has involved not only scientists working in government laboratories but also those in university, industrial, and other private laboratories.

In the belief that sufficient information on present clearance procedures has not been readily available to most scientists, this Committee was formed to survey and report on the current situation in various types of research laboratories.

Sources of Information

In November 1947 a questionnaire was sent to the directors of 140 research laboratories throughout the United States. The Committee went over lists of research laboratories operated by universities, industries, and the Federal Government and selected at random a representative number from each group. The larger laboratories in the fields of physics, chemistry, and biological sciences were favored in our selection. A letter was enclosed which described the purpose of the survey and stated that the results would be published.

Replies were received from 57 laboratories, as listed in Table 1.

Although a number of the replies were incomplete or evasive, the questionnaire yielded considerable useful information.

The committee has collected many documents, articles, and newspaper clippings pertaining to clearance

SCIENCE, April 2, 1948, Vol. 107

Committee on Secrecy and Clearance, Federation of American Scientists

procedures. A number of selected references are listed at the end of this report.

In addition, members of the Committee have corresponded or had conversations with government and

TABLE 1

Type of laboratory	Questionnaires sent	Replies received	Percentage replying
Atomic Energy	7		al Manana (ayan di yan di yana
Commission	9	3	33
Armed Forces	25	4	16
Other governm	ent		
laboratories	19	10	53
Industrial and			
private	39	14	36
Universities	48	26	54
Total	140	57	41

laboratory officials, with about 15 scientists who have been denied clearance, and with other informed persons. We wish to thank all those whose cooperation has enabled us to collect and present this information.

This report does not attempt a complete presentation of all the data collected, but will merely summarize the salient points. The Committee hopes to publish additional detailed information in further articles. The results of the survey will be reported under the five headings named in the above table.

ATOMIC ENERGY COMMISSION

According to the Atomic Energy Act of 1946 (5), no individual may be employed by the Atomic Energy Commission or have access to restricted data "until the Federal Bureau of Investigation shall have made an investigation and report to the Commission on the character, associations, and loyalty of such individual." After receiving this report, the Commission itself has the responsibility of evaluating and interpreting the report and of deciding whether to grant or withhold clearance. It should be noted especially that the law indicates that the Commission should consider "associations" as well as "loyalty" in making this decision.

Since the Commission must rely almost entirely on the FBI to obtain facts about a given individual, there are likely to be cases where it is difficult to make a decision. These may arise from false information given to the FBI by persons who dislike the scientist concerned, from possible cases of mistaken identity, from mistaken interpretation of actions which appear questionable, or merely because the available facts put the case in the "borderline" region. It then becomes important to know what procedures the Commission has set up to safeguard loyal scientists against unnecessary clearance denial, with its attendant stigma and possible restrictions on ability to obtain another position (2, 8, 11, 12).

Since it took office in January 1946, the Commission has been attempting to devise procedures which would safeguard restricted data to the maximum extent and at the same time protect its employees from unfounded accusations. This task has not been simple. The interim procedures followed by the Commission have usually included some type of interview with the individual when requested. However, such issues as providing a specific detailed statement of charges and permitting cross-questioning of witnesses have yet to be resolved. In many cases the Commission and FBI feel unable to permit these for "security reasons." The accused, on the other hand, have claimed that they cannot prepare an adequate defense against unnamed charges nor against investigations which cannot be independently checked.

Furthermore, there have been made public no criteria for judging such cases beyond the words "character, associations, and loyalty." Meanwhile, a number of cases arising in various laboratories operated by the Commission have aroused widespread discussion, both at those laboratories and elsewhere. We have learned that many loyal scientists, lacking either knowledge of the criteria for elearance or confidence in the fairness of their application, have considered leaving the employ of the Commission for positions where they would be secure against unfounded accusations. Others, not now employed by the AEC, hesitate to apply for such positions for similar reasons. To the extent that this has occurred or may occur, the Nation's atomic energy research will be impaired.

These problems are especially acute in those AEC laboratories where unclassified (nonsecret) research is

carried on. Our survey indicates that some type of clearance is required in these laboratories even of scientists who have no access to restricted data.

These provisions apply, of course, to employees of contractors and licensees of the Commission as well as to the employees of the AEC itself.

The tremendous expansion which atomic energy research is likely to undergo in the years to come, and the exclusive control held by the Commission over many aspects of nuclear research, both testify to the great importance of establishing proper precedents in this area.

In addition to injury to innocent individuals, there is another factor which has concerned various groups of scientists. They feel that the atmosphere of fear and uncertainty engendered by the occasional unfounded clearance charges may cause many scientists to withdraw entirely from any type of civic responsibility. In the field of social implications of atomic energy, in particular, it is of extreme importance that scientists continue their efforts to inform the public of all facts needed for sound policy decisions.

In order to help resolve these problems, the Atomie Energy Commission appointed, in January 1948, a "Personnel Security Review Board," headed by Owen J. Roberts, former associate justice of the U. S. Supreme Court. The other board members are Karl T. Compton, president of Massachusetts Institute of Technology; Joseph C. Grew, former Undersecretary of State; George M. Humphrey, president of the M. A. Hanna Company of Cleveland; and H. W. Prentis, Jr., president of the Armstrong Cork Company of Lancaster, Pennsylvania, and former president of the National Association of Manufacturers. At this writing the Board has not yet made public any statement of policy.

MILITARY LABORATORIES

Under Public Law 808 (5), approved on December 17, 1942, any civil service employee of the Army, Navy, or Coast Guard may be summarily removed if the Secretary concerned considers such immediate removal "warranted by the demands of national security." Persons so dismissed are entitled to "be fully informed of the reasons for such removal" and may submit statements or affidavits in their own defense. They are not entitled to confront witnesses or to appeal a case outside the Department concerned (17).

According to the New York Times of November 21, 1947, over 75 civilian employees of the Army and Navy have been dismissed since 1942 on charges involving disloyalty. A much larger number, "under suspicion of disloyalty," were earmarked for release "for reasons of payroll cutbacks."

Scientists who have been denied Army, Navy, or Air

Force clearance have made the following assertions to this Committee:

(1) They have sometimes been unable to obtain either a statement of charges or a hearing.

(2) When charges were stated, they sometimes con_{f} sisted only of membership in liberal, non-Communist groups, or similar reasons, indicating that the statement was either incomplete or insufficient. The accused were sometimes not even permitted to make a written copy of the charges.

(3) Prospective employers were told that such discharge was for loyalty reasons, although these employers had no connection with military or secret work.

(4) Laboratory officials have urged scientists to "resign" without statement of charges or a hearing, on the grounds that an appeal will be fruitless, and that, if unsuccessful, this will look bad on the man's record. The scientists consider this tantamount to pressing them to admit guilt concerning charges of which they are ignorant.

(5) Many of those refused clearance have been cleared for highly secret work during the war and do not know why they should suddenly be accused of disloyalty.

(6) Sometimes a new employee is not refused clearance, but is not permitted to start work "pending complete investigation." This indeterminate condition may last for over a year, by which time the scientist is likely to have given up and found a position elsewhere. This mechanism permits the military authorities to avoid statements of charges or hearings.

In view of the serious nature of these charges made by dismissed scientists, we were especially interested in learning from the directors of military laboratories what their official procedures are. Of all types of laboratories we surveyed, however, the military laboratories were least cooperative in replying to our questionnaire. In fact, only a few of the smaller laboratories sent in replies which were not completely evasive. It may be assumed that military officials have little interest in safeguarding their employees or employees of their contractors against unfounded charges. This may help to explain why these laboratories are having increasing difficulty in obtaining and holding scientific personnel.

OTHER GOVERNMENT LABORATORIES

President Truman's Executive Order 9835 of March 21, 1947—the so-called "loyalty order"—applies to all 2,000,000 employees of the executive branch of the Federal Government and hence includes the many scientists which staff research laboratories financed by the Department of Agriculture, the National Bureau of Standards, the Smithsonian Institution, the Bureau

SCIENCE, April 2, 1948, Vol. 107

of Mines, the Food and Drug Administration, etc. In general the work of these laboratories is not secret.

It may be of interest at this point to summarize the major features of this loyalty order (15).

All present employees are to be investigated. Any employee charged with being disloyal is entitled to an "administrative hearing" before an agency loyalty board and has the right to appeal to the 20-member Loyalty Review Board, headed by Seth W. Richardson (13). However, the finding of either board is to be merely advisory; the department or agency head may dismiss an employee even if he is acquitted by such a board.

The charges shall be stated to the employee "as specifically and completely as . . . security considerations permit." The FBI or Civil Service Commission "may refuse to disclose the names of confidential informants" even to the Loyalty Review Board. The defendant, therefore, may have considerable difficulty in proving his innocence (1, 4, 6, 7, 9, 14, 16, 18, 19).

The standard set up for refusal of employment or removal from employment is that "on all the evidence, reasonable grounds exist for belief that the person involved is disloyal to the Government of the United States... Activities and associations of an applicant or employee which may be considered in connection with the determination of disloyalty may include one or more of the following:...."

After listing such standard items as treason, espionage, and sedition, the list concludes with "membership in, affiliation with or sympathetic association with" any organization designated as subversive by the Attorney General. In regard to such designation, the order does not require that this list of organizations be made public. The present Attorney General did, however, publish, on December 4, a list of about 90 groups (3). There is no provision for such organizations to appeal the decisions of the Attorney General.

In the case of all *applicants* for employment, an extensive investigation of loyalty is also required, but here the order fails to provide for any statement of charges or appeal.

Over \$10,000,000 has been appropriated to carry on the extensive investigations required by this order.

INDUSTRIAL RESEARCH LABORATORIES

Of the 14 leading industrial and private laboratories which answered this Committee's questionnaire, 9 do part of their research work under contract with the Army, Navy, or the AEC. Of this latter number, 8 of the contracts (57%) involve projects classified as secret. The personnel involved in this work are, of course, subject to the same clearance procedures as outlined above for the AEC and military laboratories. An issue which has caused considerable discussion in the case of such contracts involves clearance of scientific personnel engaged solely in nonsecret research, not connected with government contracts. Certain laboratory administrators advocate requiring clearance for all their employees as a condition of employment, to permit free discussion of secret work between those actively engaged in it and their colleagues who are not. Groups of scientists have objected to this procedure, maintaining that:

(1) Under present clearance procedures, a man may be denied clearance by error or because he is considered a poor "security risk" through no fault of his own.

(2) If many laboratories adopt such a policy, the scientist's entire field of specialization may be practically closed to him, despite his desire to do no work connected with military or secret matters.

(3) It has been charged that some laboratories have used this approach to eliminate unwanted personnel.

At present this issue has not been wholly resolved. Among three leading research laboratories in the electrical industry, for example, one requires clearance for all scientific personnel, although less than half its work is secret. Another has decided to isolate its secret work and not subject its other employees to any clearance procedure. The third requires clearance of all new employees and attempts to get it for all old employees; among old employees denied clearance, some have been dismissed and some have not. The policy in that laboratory seems to be still in the formative stage.

UNIVERSITY RESEARCH LABORATORIES

Replies to this Committee's questionnaire were received from 26 laboratories representing the fields of physics, chemistry, and biological sciences in the country's larger universities. Of these, 23, or 88%, do part of their research under contract with the Federal Government, mostly Army and Navy, and 11 derive over half their research funds in this manner.

Six of these laboratories (23%) indicated that part of their research involved work classified as secret and consequently required personnel security clearance by the appropriate government agency.

In this connection it may be of interest to quote from the report issued on August 27, 1947, by the President's Scientific Research Board, headed by John R. Steelman. The reports recommends: "As a matter of policy, no secret or confidential research or development projects should be placed with universities in time of peace. Every effort should be made to transfer these projects to Federal establishments."

Because the traditional freedoms of thought, expression, and research have long been cherished in universities, it is of special interest to investigate the extent to which "loyalty" and "security" problems are affecting our campuses. One question asked by this Committee concerned the attitude of the laboratory director or department chairman toward employing scientists to do nonsecret research for which they were well qualified, but who had been previously denied security clearance elsewhere. "The previous clearance refusal would not effect the likelihood of our employing him," was the answer from 16 laboratories. Four directors indicated that they would be very hesitant to hire such a person. In the case of two of these, the universities had contracts for secret work; in the other two cases, no secret work was being done in the laboratories.

CONCLUSIONS

Our investigations have shown that large numbers of scientists have become concerned over allegedly arbitrary dismissals of certain of their colleagues. Scientists who used to consider that their positions depended only on the value of their scientific work now find that their political beliefs are also being investigated, even when their research has no connection with the government. Upon examining the laws and regulations under which clearance procedures are administered, they find few safeguards against mistakes or arbitrary abuses.

The files of this Committee contain many letters from biologists, chemists, engineers, and physicists unable to learn why they are subjected to the financial loss and personal embarrassment of clearance denial. The letters often contain lengthy introspective passages on their belief in democracy and their frustration at being unable to speak in their own behalf.

It has been repeatedly emphasized by government officials that, when doubt exists as to the loyalty or even the probable future behavior of an employee, the doubt is resolved in favor of the Government. Hence, it is argued, no stigma should be attached to a person denied clearance, since it may not have been his fault at all. The dissemination of such an attitude has indeed much to recommend it.

As a practical matter, however, it seems evident that most persons do hold such a record against a man, and that his personal reputation and often his ability to obtain another position are seriously jeopardized. Therefore, every effort should be made to make clearance procedures as fair and just as possible in those fields where they are necessary and to restrict these procedures to those fields. The accomplishment of this aim will require continuing careful study and wholehearted cooperation on the part of both public officials and scientists.

It is pertinent to quote the following resolution on clearance procedure, which was passed on December 28, 1947, by the Council of the Federation of American Scientists:

"There should be separate policies for classified (secret) and unclassified research, as follows:

"Policy A, for unclassified work.

"There should be no type of 'loyalty check' either for employees or applicants for employment. If an applicant had previously been refused security clearance for classified work, this should have no effect on whether or not he is employed.

"This policy should be held by all laboratories doing no classified work, including university, industrial, and government laboratories. Laboratories engaged partly in secret work should apply this policy to their entire unclassified program, and isolate their secret work from employees who are not cleared.

"Policy B, for classified work.

"1. Although general criteria for clearance are difficult to set down precisely, we object to unreasonable criteria, such as 'guilt by association' or use of rumors not substantiated by full investigation.

"2. Procedures should ensure that if an employee or applicant for employment is refused clearance, this fact cannot be learned by the public or by future employers unless (1) such employer does classified work which requires clearance, or (2) the employee himself chooses to reveal the clearance refusal.

"3. In all challenged cases of clearance refusal there should be a hearing before a jury selected from a panel of working scientists within the area of secrecy. The employee should receive a detailed statement of the charges against him. There should be an effective means for an independent check on evidence presented at the hearing, including the right of the accused to cross-examine witnesses, and adequate provision for appeal."

References

- AMERICAN CIVIL LIBERTIES UNION. Statement on Loyalty Tests for Federal Employment, adopted April 7, 1947. (Obtainable from ACLU, 170 Fifth Avenue, New York City.)
- ANDREWS, B. A State Department Security Case. New York Herald Tribune, November 2, 1947, p. 1. (A detailed documentation of one dismissal case. Later this employee was permitted to "resign without prejudice.")

- CLARK, T. C. Letter from U.S. Attorney General listing "subversive" organizations. New York Herald Tribune, December 5, 1947, p. 20.
- COMMAGER, H. S. Who Is Loyal to America? Harpers Magazine, September 1947.
- CONGRESS OF THE UNITED STATES. Act of December 17, 1942: Public Law 808, 77th Congress; Atomic Energy Act of 1946; Public Law 585, 79th Congress; Hearings on H.R. 3588 by House Committee on Post Office and Civil Service, June 3-10, 1947; H.R. 3813 of 80th Congress, passed by House of Representatives on July 15, 1947; Senate Report No. 850, dated January 30, 1948, p. 7. (Each obtainable from Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)
- CUSHMAN, R. E. Civil Liberties in the Atomic Age. Ann. Amer. Acad. polit. soc. Sci., January 1947.
- CUSHMAN, R. E. The President's Loyalty Purge. Survey Graphic, May 1947.
- ENGEL, L. Fear in Our Laboratories. The Nation, January 17, 1948, p. 63. (Eight case histories of scientists from whom clearance was withheld.)
- HASBROUCK, J. J. Edgar Hoover's Gossip Mill . . . An FCC Official Speaks Out Boldly. The New Republic, December 15, 1947, p. 20.
- KILPATRICK, C. Washington Worry-go-round. '48, The Magazine of the Year, March 1948, p. 126. (A Washington reporter presents 8 case histories of loyalty investigations of government employees.)
- MILLER, B. S., and BROWN, H. S. Loyalty Procedures of the A.E.C.--A Report and Recommendations. Bull. atomic Sci., February 1948, 4, 45. (Suggests that in challenged cases a hearing be held before a jury of scientists.)
- PIKE, S. T. Witch-Hunting Then and Now. Atlantic Monthly, November 1947, p. 93. Partial reprint in Bull. atomic Sci., January 1948, 4, 15. (A member of the U. S. Atomic Energy Commission defends civil rights of scientists.)
- RICHARDSON, S. W. A statement on aims and procedures by the chairman of the President's Loyalty Review Board. New York Times, December 28, 1947, p. 28.
- SCHLESINGER, A. M., JR. What Is Loyalty—A Difficult Question. New York Times Magazine, November 2, 1947, p. 7.
- TRUMAN, H. S. Executive Order 9835 Prescribing Procedures for the Administration of an Employees Loyalty Program in the Executive Branch of the Government. Fed. Reg., March 25, 1947, p. 1935. (Obtainable from Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.
- WECHSLER, J. A. How to Rid the Government of Communists. *Harpers Magazine*, November 1947, p. 438.
- 17. WHITE, S. How the Navy Decides Loyalty. New York Herald Tribune, December 13, 1947, p. 1. (Includes excerpts from official code for clearance procedures.)
- WILSON, C. E., et al. Report of the President's Committee on Civil Rights, especially p. 49 ff. (Obtainable from Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. \$1.00.)
- Let's Make It a Professional Red Hunt. (Anonymous editorial.) Business Week, March 29, 1947, p. 108.

The Committee of the Federation of American Scientists which has prepared this preliminary report consists of S. H. Bauer (chairman), H. A. Bethe, L. M. Brown, P. J. W. Debye, G. K. Fraenkel, A. R. Moore, P. Morrison, R. S. Rochlin, and R. R. Wilson.