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# THE NATIONAL ROSTER OF SCIENTIFIC AND SPECIALIZED PERSONNEL: A PROGRESS REPORT

By Dr. LEONARD CARMICHAEL

PRESIDENT OF TUFTS COLLEGE, DIRECTOR OF THE NATIONAL ROSTER OF SCIENTIFIC AND SPECIALIZED PERSONNEL

IN a previous communication (SCIENCE, August 16, 1940, Vol. 92, No. 2381, pages 135–137) a preliminary report was made of the plans for the National Roster of Scientific and Specialized Personnel. The roster, although still far from complete, is now actually in use. Each week it is called upon by an increasing number of defense agencies to provide lists of names of individuals with special qualifications. As stated before the roster is jointly administered by the National Resources Planning Board and by the United States Civil Service Commission.

The general questionnaire, the projected form of which was described in the first report, has been made. This questionnaire is broken into 30 elements, the information asked including: (1) Name; (2) Date of birth; (3) Place of birth; (4) Citizenship status; (5) Marital status; (6) Race and sex; (7) Military service; (8) Reserve membership; (9) Foreign language proficiency; (10) Federal service; (11) Federal Civil Service examinations taken; (12) Foreign travel and residence; (13) Physical condition; (14) Height and weight; (15) Names of persons for reference; (16) College and university education, including the special honors received and membership in honorary academic or scientific societies; (17) Important hobbies; (18) List of significant full-time positions held; (19) The five most important fields of specialization listed in order of significance (these five fields are taken by the individual filling out the questionnaire from the technical checklist described below); (20) The individual's

own naming of his professional field (that is, "radio physicist" or "electrical engineer"); (21) The individual's competence with unusual apparatus; (22) Part-time and temporary positions held; (23) List of publications, patents, etc.; (24) Description of research in progress; (25) Description of restricting conditions making part-time or full-time government work difficult; (26) Disadvantage to important research if the individual is called for service; (27) Committees and research organizations with which the individual is associated; (28) Society membership; (29) General field in which the individual would be of special service to the government; (30) Agency to be applied to for release if the individual is to be queried concerning possible government service.

The questionnaire including these items was formulated after consultation with many academic and government specialists in the construction of such instruments. Supplementing the general questionnaire, a series of technical checklists has been drawn up and is still being formulated in special fields. At the present time checklists have been devised and mailed in the following fields: aeronautical engineering; anatomy; anthropology; automotive engineering; bacteriology, immunology, and pathology; botany; chemistry; chemical engineering; civil engineering; electrical engineering; forestry; genetics; geography; geology; heating, ventilating, air conditioning, and refrigeration engineering; history and political science; mathematics; mechanical engineering; mining and metallurgical engineering; physics and astronomy; physiology; plant pathology; horticulture, and agriculture; psychology; sociology; statistics; testing materials; and zoology. These checklists have been devised by specialists in each field and in many instances their development has been much more than a mere mechanical operation. For example, Dr. Carl Brigham, of Princeton University, the official representative of the Social Science Research Council, working with a series of economists, has brought out a basic checklist in economics which is supplemented by a checklist in statistics and in raw materials. These combined lists are even said by certain economists to be the most effective analysis of that field so far devised. Dr. John S. Nicholas, of Yale University, the official representative on the roster from the National Research Council, working with a whole series of scientific societies has done really creative work in making analyses of special sciences which are both logical and practical from the standpoint of the placement purposes of the roster. Dr. William H. Cowley, president of Hamilton College, representative of the American Council on Education, and Dr. Waldo G. Leland, representative of the American Council of Learned Societies, have also contributed much work to the development of the roster.

It is too early yet to give an estimate of the complete returns received in relation to the number of questionnaires sent out. The first field circularized, that of physics and astronomy, may give an index of the returns that are to be expected. In all 7,424 questionnaires were mailed out in this field, and so far 6,045 of these have been returned fully filled out.

The complete operation of the roster under the able direction of its executive officer, James C. O'Brien, promotions officer of the U. S. Civil Service Commission, and of the office of the roster under the chief of the project, W. E. Workmaster, has been most effective during the months of its existence. The fundamental problem of the whole staff of the roster has been the completion of a series of intricate steps which must be taken in each field. First, the technical checklist has to be drawn up. Second, the mailing lists must be secured. Third, procedures must be developed by means of which the qualitative information in the questionnaire can be reduced to quantitative terms. This latter work has required the development of some elaborate new techniques. For example, the roster has developed the work of certain other federal agencies in devising a plan for numbering the questionnaires as they are returned. This operation involves the use of what we call the alpha numerical index. Briefly, this index makes it possible to assign each individual a questionnaire number such that his alphabetical place and his numerical place will be identical in the total list of questionnaires when the project is complete. That is, the files may be searched for "John X. Doe" either under the D's, the Does, the John Does, the John X. Does, or under a special number. In the case of John X. Doe this number would be 1,882,005. All individuals before John X. Doe in the alphabet would have lower numbers and all above him would have higher numbers. The assigning of each number is accomplished by the use of large log books which have been prepared to make this procedure possible.

Reducing the qualitative information concerning geographical area, linguistic ability, educational level and the like has also required the development of many code sheets in the office of the roster. For example, the geographical regions of the world have been divided into what seemed to be the 999 most important regions from Crown Princess Martha Land to the South Felix Islands. Benjamin Wermiel and Robert Shosteck, of the staff of the roster, have been especially active in the organizational work that has made possible the development of these code lists.

It is of course obvious that all the qualitative information in the questionnaire can not be reduced to quantitative terms. The names given as references can not of course be placed on an individual's punch card nor can the bibliography or patents of the individual be so recorded. For these reasons as well as

for others the fundamental operation of the roster involves only the use of the cards to a certain point. As soon as the appropriate cards are sorted out the questionnaires from which they were made are once again taken from the files. The agent of the defense agency which has asked for some particular group of individuals is then allowed to go through the basic questionnaires of the individuals who fit his needs.

Actually in completed form each individual is allotted five 80-column punch cards in the catalog. These cards are used to record the basic information of the questionnaire and the special information secured from the technical checklists. The large number of cards is necessary because the individual's special skills are punched not only in the order in which he gives them but also with what the individual characterized as his second skill punched as the first skill, and so on. The last card of the five is used to provide the full name of the individual in alphabetical rather than numerical code, his roster number, and some other identifying characteristics. By the use of this last card it is possible to print automatically a list of names of those selected. For example, if a request comes to the roster for physicists who have specialized in the study of ultra high frequency radio circuits, of a certain age, in a special army corps area, it is possible to set the selecting machine in such a way that a list will be printed of these individuals and of no others.

Those connected with the administration of the roster are increasingly impressed by the fact that the list that is being developed not only is invaluable in the present emergency period, especially in those fields in which real shortages of trained personnel have already developed, but also that it has potentialities for normal periods as well. If Civil Service procedures are a little modified the recruitment of technical personnel for the government might well involve the use of the roster to the real advantage of the government. That is, if mailing lists could be secured of properly trained physicists when an opening occurred in this field at the Bureau of Standards it would be possible by sending out a card of information to tell all individuals in this field in the country that an examination was about to be held. Similarly, after the present emergency is over slight adaptation would be required to make the roster available as an agency to assist in the proper recruitment of college faculties, personnel of industrial research organizations and the like. For these reasons every effort has been made to plan the roster so that it can be kept up to date as a continuing census of America's specialists.

Those concerned in the development of the roster have been strikingly impressed by the patriotism of America's scientists as displayed in the practical work of developing the roster. Busy men engaged in important work have almost without exception been willing to undertake the difficult problem of assisting in the development of the particular segment of the roster related to their own special fields. There is no doubt in the minds of those who have been associated with this project from the first that America's scientists are actively willing to serve the nation. Above all there seems to be little doubt that America's greatest resource in the difficult period that lies ahead is the brain power—if a non-psychological term may be used—of its highly trained scientists and other specialists. It seems impossible to the present writer as he views the growing lists of the roster that the rest of the world together could provide a register of highly trained men comparable to this list of citizens of the United States.

# REPORT OF THE PRESIDENT TO COUNCIL OF AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE[1]

By Dr. ALBERT FRANCIS BLAKESLEE

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TO-DAY is the first opportunity to express my appreciation to the council for their confidence in electing me president of the American Association for the Advancement of Science. I realize that responsibilities go with any office and have tried therefore to do some thinking about the problems of the association. Perhaps the chief value, if any, of this report which I have prepared will lie in its offering a precedent with expectation that some future president will give birth in *his* report to a bright idea, and bright ideas are precious. In considering what might be said concerning the state of the association I began to realize that the American Association for the Advancement of Science occupies a unique position. Organizations with restricted membership like the National Academy of Sciences with its related National Research Council serve a purpose, as do also the various societies devoted to special fields of science. There is no other democratic organization in the world, however, covering the whole field of science which compares with the American Association in the number of scientists which it serves. The present membership is slightly over 21,000. The first table of the Appendix shows the

[1] Philadelphia, December 27, 1940.