

News and views

SOCIETY ACTIVITIES

NEW APS DIVISION OF CHEMICAL PHYSICS

In 1945 the Council of the American Physical Society appointed a committee to organize a Division of Chemical Physics, but for various reasons the committee did not act. At its February, 1950 meeting the Council again appointed the same persons (O. Beeck; F. G. Brickwedde; J. E. Mayer; O. K. Rice; R. S. Mulliken, chairman) as a new Organizing Committee. Subsequent to the recent greatly regretted death of Dr. Beeck, the committee has been enlarged by the addition of J. G. Kirkwood and H. H. Nielsen.

As stated in the draft of a set of Bylaws drawn up by the committee for submission to the Council at its next meeting: "The principal objective of the new Division shall be the advancement of understanding in subjects of chemical interest whose development depends strongly on modern physical theories or techniques."

The draft Bylaws further state: "The Members of the Division shall consist of those *Members and Fellows of the Physical Society* who have made written application for enrollment in the Division and have paid an initiation fee of two dollars. Application for membership together with initiation fee shall be sent to the Treasurer of the Division." Pending the appointment of a Treasurer, applications for membership accompanied by initiation fee may be sent to R. S. Mulliken, Physics Department, University of Chicago, Chicago 37, Illinois. Interested persons who are *not now* members of the American Physical Society should first seek the sponsorship of two members of the Society for nomination to membership. (Nomination blanks can be secured from K. K. Darrow, Secretary of the American Physical Society, Columbia University, New York 27, New York.) Members of the Physical Society are entitled to obtain the *Journal of Chemical Physics* at reduced subscription rates. For the present, no annual dues are contemplated for membership in the Division of Chemical Physics, but only an initiation fee.

The inaugural meeting of the Division will be held as a part of the Pittsburgh meeting of the American Physical Society on March 8th to 10th, 1951. It will comprise a symposium on molecular structure and valence theory, and symposia on other topics involving statistical mechanics. In June at Columbus, Ohio the Division will be joint sponsor of the symposium on Molecular Structure and Spectroscopy at Ohio State University.

Since the Division is in a formative stage, its precise scope is still under discussion. Proposals have been made that it should include "appropriate aspects of such subjects as the following: chemical binding and valence phenomena, intermolecular forces, chemical kinetics, chemical thermodynamics and statistical mechanics, optical, dielectric, and magnetic properties of molecules and crystals, molecular spectra of all kinds, mass spectroscopy of molecules, radiation chemistry, isotopic and other exchange phenomena, and

radiochemistry." Interested persons are invited to state their views on the proper scope and functions of the Division when they apply for enrollment.

PHYSICISTS IN TRAINING

ANNUAL SURVEY

The annual survey of physicists in training made by Marsh W. White, executive secretary of Sigma Pi Sigma, shows a continued increase in the numbers of students at all levels. During the 1949-50 academic year 12,670 students were registered as undergraduate physics majors and 5,560 were taking graduate work in physics. The total of 18,230 is 1,680 larger than for the preceding year and represents more than 100 percent increase over prewar numbers. During the 1948-49 year 3,500 bachelor's degrees in physics were awarded; 920 graduates received the master's degree and 275 the doctorate. Each of these figures will be substantially higher for 1949-50. The complete report of this study is to be published in an early issue of the *American Journal of Physics*.

STUDENTS AND THE DRAFT

A PREMIUM ON ABILITY

Two years ago Major General Lewis B. Hershey, director of the Selective Service System, appointed six scientific advisory committees (representing the agricultural and biological sciences, the engineering sciences, the healing arts, the humanities, the physical sciences, and the social sciences) to advise him on the question of how Selective Service should classify students in the "best interest of the national economy and the health, safety and interest of the Nation." The joint report of the advisory committees was submitted to General Hershey on October 5th with the request that the policies recommended therein be adopted at an early date and that local boards be issued instructions to put them into effect.

The six advisory committees were under the general chairmanship of M. H. Trytten of the National Research Council and the committee representing the physical sciences had as its members H. A. Barton of the American Institute of Physics, G. O. Curme, Jr. of Carbide and Carbon Chemical Corporation, R. C. Gibbs of the NRC, T. B. Nolan of the Department of the Interior, and S. S. Wilks of Princeton University.

In order to bring the committees' recommendations to the immediate attention of this journal's readers, the report is reproduced below in full. In reading the report it should be remembered that the recommendations were necessarily formulated to coincide with the Selective Service Act (Public Law 759), which requires that adequate provision be made for maximum effort in scientific research and development, that full use be made of scientific and other critical manpower resources, and that at the same time "an adequate armed strength must be achieved and maintained to insure the security of this Nation."

REPORT TO THE DIRECTOR OF THE SELECTIVE SERVICE SYSTEM
BY THE SIX COMMITTEES ON SCIENTIFIC, PROFESSIONAL, AND
SPECIALIZED PERSONNEL

A. RECOMMENDATIONS

I. Recommendations concerning the training of scientific, professional, and specialized personnel.

These recommendations are intended to protect the national interest by providing for the further training of those

students whose potential ability is attested by a superior score on a general aptitude test and whose educational progress to date is established by a superior academic record. No attempt is made to designate any specific college curriculum or graduate program of instruction as essential or as warranting consideration over and above that given any other curriculum.

1. There should be established within the present Selective Service regulations a special class of registrants (perhaps designated Class II-A (s)) in which there should be placed any registrant whose demonstrated educational aptitude is such that it is deemed necessary that his pre-professional or professional training program be continued in order to increase his potential value to the national health, safety and interest.

2. *Educational aptitude* should be defined as a specified minimum score on a general classification test and a record of previous educational accomplishment sufficiently high to indicate special promise of eventual scientific, professional or specialized competence.

For the present, the Committees recommend the following specific provisions:

a. To be eligible for classification in the proposed Class II-A (s), a student must have a score on a general aptitude test equivalent to a score of 120 or above on the Army General Classification Test.

b. To be eligible for such classification he must also be certified by the school, college or university authorities as giving promise of definite progress in higher education; such certificates may be issued only in the following cases, the certificate stating in each case the relevant limitation:

i. If the registrant is a student in high school or preparatory school, his record to date must be acceptable for admission to one or more accredited colleges or universities. (An accredited college or university, as herein interpreted, is one which offers an educational program leading to an academic degree at the end of four years and which is approved by the Department of Education in the state or territory in which it is located. Teachers colleges and junior colleges are included within the meaning of this recommendation when their students conform to the limitations set herein.)

ii. If the registrant is a full-time first year student (freshman), he must be enrolled in a curriculum which leads, either in the same or, after transfer, in another institution, to a degree granted normally at the end of at least four years of college work.

iii. If the registrant is a full-time second year student (sophomore), in an accredited college or university, and is enrolled in a curriculum as defined in "i" above, he must have maintained a scholastic record which placed him above the 50th percentile of the first year class in the university or college (or in a school or curriculum thereof) in which he was previously enrolled.

iv. If the registrant is a full-time third year student (junior), in an accredited college or university, and is enrolled in a curriculum as defined in "i" above, he must have maintained a scholastic record which placed him above the 33rd percentile of the second year class in the university or college (or in a school or curriculum thereof) in which he was previously enrolled.

v. If the registrant is a full-time fourth year student (senior) or a full-time fifth year student in those five

year programs which lead to a baccalaureate degree, and is enrolled in a curriculum as defined in "i" above, he must have maintained a scholastic record which placed him above the 25th percentile of the class in his previous year in university or college (or in a school or curriculum thereof).

vi. If the registrant is enrolled as a full-time student in the first year of a graduate or professional program leading to a graduate or professional degree in an accredited college or university, he must have maintained a scholastic record in his last undergraduate year which placed him above the 50th percentile of his class in an accredited college or university (or in a school or curriculum thereof). (The meaning of a full graduate status shall be determined by the existing rules and regulations of the college or university concerned. These rules are based upon the general recognition in American graduate education that part-time assistantships in teaching or research are a normal part of the graduate educational process.)

vii. If the registrant is enrolled as a full-time student beyond the first year in a graduate or professional program leading to a graduate or professional degree in an accredited college or university, he must be certified by the college or university as making satisfactory progress and as likely to complete all degree requirements for the degree program in which he is currently enrolled.

c. Whenever a student who has been classified II-A (s) under the above provisions fails to pursue his course in a manner justifying this classification, the college or university shall immediately notify his local board of that fact.

3. Classification of students between academic years. Prior to the completion of his course of training, a student who has been classified in II-A (s) should be retained in that class in the established interval between academic years only if:

a. He presents evidence of his intention to continue full-time training the following year;

b. He has been certified by the testing agency and by a college or university as provided above; and

c. He presents evidence that the interval between academic years will be utilized in a manner which has been approved by the college or university as forwarding his training program.

II. Recommendations concerning the utilization of scientific, professional and specialized personnel.

The pool of scientific, specialized and professional personnel includes those who have completed their training at some time in the past and those who are becoming available through the completion of current training. The following recommendation by the committees covers both groups:

1. A registrant who has been classified in II-A (s) should be retained in that classification for a period of four months after he has completed his training.

2. He should then be considered eligible for classification in Class II-A if (a) he is fully engaged in a professional pursuit in an activity for which generally the nature and degree of his training are requisite and (b) the activity itself is one that is essential to the national health, safety, or interest.

3. A registrant who was graduated in 1950 or before and has specialized training, similar in character and quality to

that covered by Class II-A (s), should be considered eligible for classification in Class II-A, if he satisfies the same two conditions.

4. To facilitate classification by the local draft boards of trained scientific, professional and specialized personnel, it is recommended that the Selective Service System expand its central administrative organization to include special advisory committees. Each of these committees, of which there should be five or more covering the major areas of specialized training, should consist of six qualified members, including at least one member familiar with the specialized needs of the armed services in the fields covered by the committee.

5. Each committee should be assisted by a full-time executive secretary qualified in the field of the committee and attached directly to the office of the Director of Selective Service.

6. It should be the responsibility of these committees (a) to advise the Director of Selective Service and through him the State Directors and local draft boards on specialized personnel needs of military and essential civilian activities; (b) to make recommendations to local and appeal boards on the disposition of cases involving specialized personnel.

7. It should be the responsibility of each advisory committee continuously to define the functions within its fields and to evaluate the needs, both civilian and military, for personnel with specialized training within those fields.

8. The chairmen of the several committees should constitute a coordinating committee to review frequently general procedural problems relating to the activities of all the committees.

B. BASIS OF THE COMMITTEES' RECOMMENDATIONS

The Committees take for granted the now generally accepted conclusion that modern nations, to survive in peace or war, must have an adequate number of scientific, professional and specialized personnel in both civilian and military pursuits. Therefore, suitable steps must be taken to recruit, train and maintain in professional activity an adequate flow of competent individuals. Furthermore, the composition of these Committees is testimony to the fact there is now a larger recognition than formerly of the wide variety of fields of higher learning which were called upon in World War II. The engineering sciences, the physical sciences, the biological sciences, the social sciences, the humanities, and the healing arts all made significant and essential contributions to the successful prosecution of the last war and will continue to be vital to the national defense as well as to the national welfare. If we are to maintain our civilization, we cannot permit any one of these areas of knowledge to be seriously crippled. If we are to maintain our nation's security and to defend it in extreme emergency, we must not allow any of them to become undermanned.

The two sets of recommendations presented above grow out of these basic principles. Both permit flexibility and discretion in the distribution of specialized personnel and take cognizance of the wide variety of training required for the maintenance of essential civilian and military activity.

The recommended plans for training and for utilization are adaptable to changing circumstances, so that in increasing emergency more manpower could be utilized, if necessary, for immediate military needs. The training plan calls for two cut-off points in the classification of students for

further training which may be raised or lowered by modifying the standards on either or both of the two variables: the minimum score on a general classification test and the requirements for certification of academic progress. The utilization plan similarly provides for variations in the distribution of trained personnel through the continuing policy recommendations of the Advisory Boards which would take account of changing relative needs of the essential civilian and military services.

The recommendations with regard to the utilization of specialized personnel recognize that those who have received special training have a continuing responsibility to put that training to effective use in the national interest. Their reclassification after a four month period implies that they, in common with others, will be subject to general military service unless there is a higher priority for their service in other essential activity.

It is recognized that in addition to those persons trained in ROTC programs and therefore immediately available to the military services, there will be needs within the armed services to be met from the pool of specialized personnel. The presence on the advisory board of members familiar with these needs of the armed services insures the consideration of military needs by the boards. As a matter of policy it is recommended that whenever possible these military requirements be met from among those who become available at the conclusion of their training.

The principle of selection which underlies the Committees' recommendation with regard to training may be stated briefly. Men vary in their aptitudes and in their interests. Scientific and professional ability is only one of many kinds of competence needed by a people, but it can be developed only by a long period of training. The purpose of the Committees' recommendations is to keep in training persons who, by reasonably objective standards, demonstrate their probable capacity to reach the level of scientific, professional or specialized competence.

The bare minimum of training necessary for such competence is the completion of the usual four year college or university course; in almost all fields, however, additional years of graduate or professional training are required. Any policy which stops the flow of persons to the higher levels of learning and skill is extremely hazardous, since our national security and welfare depend upon the maintenance of a supply of persons equipped with highly specialized learning and skill.

The Committees also recognize that the immediate manpower needs of the military may require the induction of a large portion of the student age groups. The policy recommended by the Committees would make considerable numbers of students immediately available for induction, while others would be classified for further training, thus maintaining a needed flow of scientific, professional and specialized personnel. It is estimated that the Committees' recommendation would result in the additional deferment of not more than 3% of the men in any age group. In a nation whose security has come to depend upon essential civilian as well as military personnel, this group could be logically considered as the civilian counterpart of the military ROTC groups.

The Committees' plan would not produce major or undesirable dislocations in the educational system; it permits the continued development of the wide variety of fields of learning and science associated with the maintenance of our civilization and of our security, and it does not encourage

the development of too narrow curricula. The Committees call attention to the fact that opportunities to go to college are not evenly distributed in our population. The Committees also call attention to the following two observations:

1. Any analysis of the manpower problem reveals the Nation's need of constant recruiting and training of scientific and specialized personnel. Such persons cannot be made available for service to the Nation unless opportunities for training in colleges and universities continue to be available. The Selective Service System must therefore allow for a continuing flow of persons through our colleges and universities.

2. The Committees do not believe that an unwise manpower and Selective Service policy should be adopted because of an inadequate national policy with regard to the distribution of educational opportunity. The Committees urge in the strongest possible terms that the Director of Selective Service recommend to the appropriate agencies a national scholarship program so that any individual who has the educational aptitude required for classification by Selective Service for further training as here proposed, and who has the desire to procure such training by attendance at a college or university, would be given, upon successful examination, scholarship support by the Government. The evil of unequal educational opportunity for men of ability should be faced directly and cured within the limits of the national capacity rather than permitted to push the Nation into a use of its manpower which is unwise and unsafe for the future of the United States.

C. ALTERNATE PROPOSALS CONSIDERED AND REJECTED BY THE COMMITTEES

No Induction of College Students

To insure that there shall continue to be an adequate supply of scientific, professional and specialized personnel, some have advocated publicly that *all* college students should be exempted from military training or service during their college course. The Committees are opposed to such a recommendation. Any plan adopted by Selective Service should be capable of ready adjustment to make possible the induction of larger and larger numbers of the student age groups in case of increasing emergency. This plan is inflexible, is regarded as inflexible and unrealistic and, therefore, impracticable.

No Exemption of College Students

Others have proposed publicly that all undergraduates should be subject to induction on the theory that after twenty-one months of military service the former students could return to college. The Committees are unable to accept this plan for the following reason among others. Our Nation is already suffering from a serious shortage of scientific, professional, and specialized personnel resulting from constrictions applied during World War II. Full scale induction of college students which would result from this proposal, would virtually stop the production of superior scientific, professional and specialized personnel for a period of at least two years. Furthermore, many of those entering military service would not return to institutions of higher learning for training, especially if an intensification of the emergency resulted in a prolongation of their military service. This proposal would lead to a serious hiatus in the continuing supply of critically needed specialized personnel and thus constitutes such great danger to the national security that the Committees cannot subscribe to a policy of no deferment for college students.

Exemption of Students on the Basis of "Essential" Occupations

A frequent proposal has been the recommendation that those students who are preparing for "essential" sciences and professions be permitted to continue their training. The Committees declare that there are two fallacies which underlie this recommendation.

1. The first fallacy is the idea that one can identify the "essential" sciences. If one knew the exact character of the particular emergency which the Nation might face at a given period in the future, one might be in a position to hazard some guesses as to essential fields of knowledge—but then one would also have to know the nature of coming developments in the sciences themselves. It is quite possible that fifteen years ago nuclear physicists would have been dismissed as a scientific luxury—as a group of theoreticians not essential to the national defense. The professor of Japanese language and literature who served in combat intelligence during World War II would certainly have been viewed earlier as a luxury. Fortunately for our own safety in the future, the experiences of World War II have changed our perspective. Proponents of the plan of preserving a flow of personnel for the "essential" sciences are quick to state the essentiality of the fields of learning with which they are themselves concerned, though as reasonable men they generally recognize that there are other fields which may also be essential. Even so, such proposals are to be viewed as somewhat irresponsible until their proponents are willing to state and document that "these are the essential fields of learning," and "those are the nonessential fields." To prepare such a list calls for an omniscience which sane men hesitate to claim. If any group elects to present such a list and it becomes the basis of national policy, it must be remembered that the very list will form the shape of things to come, largely extinguishing some fields of knowledge or stopping their growth, and predetermining the lines of the nation's scientific and cultural development in the coming years. The nation which has guessed wrong will be all wrong if this policy is followed.

The arbitrary limitation of the fields of learning with the branding of certain fields as essential is likely to result in a narrowing of curricula at an even earlier phase of education than now exists. The Committees are convinced that highly specialized persons, to be useful in the national welfare and defense, need in addition to their specialty a broad basis of knowledge of men, things and affairs. It is this broad range of information, combined with intelligent imagination and specialized competence, which enables men to meet new situations and to devise new techniques of control which will work in nature and in human society. Loss of adaptability will come inevitably with a narrow range of training, and if there is anything a nation cannot now afford to lose, it is ingenuity in planning and research at a higher level.

2. The second fallacy underlying the suggestion that only those students who are preparing for essential sciences and professions should be permitted to continue their training has to do with the students themselves. Very few college freshmen know with an exactitude which could be of use to Selective Service which science, profession, or special field they wish to enter or for which they are best qualified, and still fewer subsequently enter the fields they may have chosen as freshmen. Therefore, college students in the first and second years can rarely be expected to make intelligent choices among specific fields. There is little reason to believe that university authorities can choose correctly for them.