

GENERAL SCIENCE

Plan for Brainpower

Six Scientific Advisory Committees to Selective Service offer recommendations for best utilization of scientific and technological skills and continuance of training.

► **MANPOWER PLANS** — and specific plans for scientific, technical and engineering manpower—are legion around Washington. The plans which many men have proposed, Congress and the President will dispose after Jan. 1.

Since scientific and technological skills are the most critical of all our skills, planning for them has come first. It is considered likely that whatever plans for the utilization of these skills are adopted, they will be adapted for all personnel whose skills take two years or more to acquire.

After Jan. 1, Congress proposes to amend the current draft law. The legislators then will decide whether to make deferments—either for training or for critical work—part of the new law—or leave the spelling out of these matters to the Executive.

One plan, based on two years of work, was presented recently in Washington. It was the work of the six Scientific Advisory Committees to Selective Service Director Lewis B. Hershey, Dr. M. H. Trytten, chairman.

This presentation was made at a meeting to which were invited more than 300 college presidents, scientists and government officials. Since Harvard President James B.

Conant's plan for Universal Military Service for all 18-year-old men had just previously been launched with considerable publicity, the committees felt it advisable to explain to the public the facts on which they worked and the line of thought they followed. Science News Letter herewith presents condensations of the four presentations:

The Facts

By E. LOWELL KELLY

*Professor of Psychology
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► **THE COMMITTEE'S** objective is the objective of every thinking citizen: let us move as rapidly as possible to make our nation strong in all ways and let us plan so as to maintain that strength through the many uncertain years ahead.

We wish to call your attention to a series of facts these Committees were forced

to consider. Furthermore, they are facts which dare not be overlooked by anyone making recommendations or decisions with respect to manpower utilization.

Our total population is about 150 million. It is anything but large when compared with the population and manpower resources of our potential enemies. Something less than half is gainfully employed. The other half is composed of persons too young or too old to work or busy as housewives and mothers.

At the maximum during World War II, only about 11,000,000 men were in uniform. This figure could probably be exceeded somewhat but it does serve to remind us of a definite limitation on the maximal size of a military force.

The second fact concerns the supply of new manpower each year. This figure is largely determined by the number of male babies born 18 or 19 years before, currently, about one million males. Even with reasonably liberal physical standards, it seems unlikely that more than 800,000 of the one million might be acceptable for military service.

The actual number of men to be drafted and the length of time they will be required to serve is primarily a function of the size of the armed force to be maintained.

Assuming a defense force of three million and assuming a million newly available men each year, a continuing force of this size could be maintained only if each

ENGINEERING

Alaskan Outposts Get "Northwind" Delivery

See Front Cover

► **BRINGING SUPPLIES** and fuel oil to lonely outposts in Alaska is a U. S. Coast Guard job that can be both wet and hazardous.

The Coast Guard's \$10,000,000 icebreaker "Northwind" has just finished the annual delivery to the country's most remote military installations, tiny stations scattered along the rockbound Alaska shores from the Canadian border to the Bering Sea.

Oil for an entire year must be delivered to each installation. To do it, the icebreaker carries a 10,000-gallon barge on her deck where a helicopter would normally ride.

The barge is loaded with oil from the ship's tanks and towed ashore by a landing craft. Sometimes, where there is no beach, the barge must remain offshore and the oil is pumped through hundreds of feet of hose.

Science News Letter, December 30, 1950



BATTLING WAVES—Coast Guardsmen fight the elements for nearly half a day during refuelling operations at Cape Hinchinbrook Light Station, Alaska.

young man served for three years. Many people have concluded that our problem can best be met by requiring a period of two to three years of military service for all men shortly after becoming 18 or 19. Attractive as this solution is by virtue of its simplicity, it fails to take into consideration additional facts which our Committees believe to be demanding of attention.

The first of these is that the free nations of the world are not able to match their potential enemies on the basis of manpower alone. This means that our hope for survival must depend not on numbers alone, but on the superior utilization of manpower. To our Committees this means that every person must serve his country in a capacity which permits him to make the greatest contribution to the national welfare.

Modern society is becoming increasingly complex and so is modern warfare. The cold war has emphasized the importance of technological developments such as psychological warfare which are based on fields of specialization other than those ordinarily regarded as contributing to the direct military application. This rapid increase in the role of scientific and technological devices and services has been paralleled by a mounting demand for scientists, specialists, and other professional personnel in the military services, in government agencies, and in the civilian economy. *We dare not overlook the fact that these specialists cannot be trained in a matter of a few months.* For many fields of specialization the training of personnel must be planned in terms of four to eight years. There are simply not enough trained scientific specialists and professional personnel to meet the nation's need for even a short period of large scale mobilization.

The facts to which our Committees have given serious and recurring attention are those all too often overlooked in considering the problem of manpower utilization. We tend to overlook the incontrovertible evidence concerning the ways in which men differ with respect to the manner in which they can best serve the nation.

The known differences among men are related to their ability to perform useful functions in our society. For example, although the average child develops mentally at a rate which permits him to learn to read at the age of 6 or 7, there are other children whose mental development never proceeds far enough for them to learn the meaning of printed symbols. At the other end of the human ability scale, we find children whose mental development is accelerated as that of the feeble-minded child is retarded.

It is a fact that later ability to perform in complex adult situations is closely related to ability to perform in our typical American schools. Psychologists who have studied the problem in considerable detail refer to this ability as "scholastic aptitude."

It seems to be primarily a matter of ability to manipulate words and numbers and to think in terms of abstract relationships.

The distribution of human ability in our male population is measured by the Army General Classification Test. The scale, ranging from 40 to 160, represents the range of human ability as measured in AGCT units. This is an arbitrary scale which has been developed by assigning a value of 100 to the test score made by the average male adult and the other values were determined by the actual distribution of scores made by large numbers of Army personnel. Slightly over two-thirds of all men make scores falling between 80 and 120.

Persons scoring below 70 are not currently subject to induction under the Selective Service Act. Such persons are usually illiterate, and typically have much difficulty in adapting to military life. Some 7% of any adult age group will score below this point.

Only 16%, or one out of six men score above 120. However, it is a relevant fact that four out of five college graduates exceed this score—even though the test is taken before entering college! Now since practically all scientists, doctors and professional men are persons who stood in the upper half of their college graduating class, we can see at once that this upper region, representing scores of say, 135 or above, contains a small but very important segment of our population, although amounting to but 5% to 10% of the total population of any age group. It is from this segment of our manpower distribution that the nation must recruit practically all of its research workers, scientists and other specialized and professional personnel.

It is true that a man with a score of 135 or above can become a good soldier. It is also true that he owes as much to his country as the lad with a score of 80 to 110. But, can we as a nation, faced with the necessity of developing and maintaining our technological and military supremacy, afford to utilize these two men in the same manner? These facts concerning differences in human ability must be allowed for if we are not to squander one of our most precious national resources. We doubt that a nation can afford to have certain young men spend two years in military service if the same nation is likely to need them even more a few years later as high level specialists in either a military or civilian organization.

These are the facts to which our Committees wish to call your attention as demanding consideration in arriving at wise policy decisions concerning manpower utilization.

Science News Letter, December 30, 1950

The Line of Thought

By CHARLES E. ODEGAARD

*Executive Director,
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►OUR discussions quickly brought to the fore three major considerations: First, there were two phases to the problem of proper handling in the national interest of scientific, professional and specialized personnel, the training phase and the utilization phase, but these are directly related.

Second, any plan should be capable of adjustment to meet varying degrees of national emergency from a small military force in being, to a large standing army, or a full-scale war. Even in full-scale mobilization, there will continue a need for selection for different kinds of service which set up different requirements in training which even during war will have to be provided.

Third, Uncle Sam can no longer advisedly play the role of Mr. Big. In sheer manpower he cannot match the Soviet Eurasian giant. Our ultimate defense rests in the skill with which we use ourselves. Our manpower plan should respect the fact that our nation must now fight as a whole with everyone obligated to service, yet the civilian and military must be knit into one articulated plan. National defense is now more than a military affair. Both essential military and civilian activities are dependent as never before upon a wide variety of highly developed skills and knowledge. Yet there is still a dangerous tendency to think of manpower as though it were made up of identical and interchangeable units, a tendency which obscures the many kinds of service necessary to national defense and the human variations in capacity to render these services.

The committees assert that it is now an absolute requirement for the safety of the nation that our manpower plan provide for the maximum use of highly trained manpower as an important component of defense itself. The training of such persons is, therefore, not to be viewed as a privilege for the individual but as a national necessity. How much provision should be made is a matter for determination according to the absolute necessities of the moment.

Proposals affecting the training of specialized manpower fall into a limited number of possibilities. There is first the idea which can hardly have many defenders, that there should be no induction of college students.

Far more serious is the proposal that all undergraduates should be subject to induction on the theory that after 21 months or some such period they could return to college for training. Mr. Conant's recently announced proposal covering the induction of the entire 18- and 19-year-old age groups is a variant of this theme. Even assuming that this plan would produce

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sufficient manpower for the military, and that this mass levy of relatively untrained manpower along with the regulars and the reserve components could meet for some years in succession the military *varied* manpower requirements for a force in being, assumptions which certainly require closer scrutiny, the committees cannot accept this proposal. The nation is already faced with a serious shortage of scientific, professional and specialized personnel. Full-scale induction of college students and the 18- and 19-year-old age groups, would virtually stop for a period of at least two years the production of critical scientific, professional and specialized personnel. Furthermore, many of those entering military service might not have opportunities to return to institutions of higher learning for further training if an intensification of the emergency resulted in a prolongation of their term of military service. The committees have little confidence that any moral commitments to release men after two years service can be effective after they have once been trained for military duty. One can easily imagine the pressures which would work to keep these men in uniform on military duty when they constitute already the force in being. The committees believe this proposal constitutes a great danger to national security.

Furthermore, the proposal to induct entire age groups emphasizes a principle opposite to the principle that in this crisis each person should serve where he can best contribute. If this principle is once established it would almost inevitably be extended to all age groups and tend to withdraw specialized personnel from industry, education and the government at the very time when the need for these persons is more crucial than it has ever been.

If there were a mass levy of age groups the very necessities of the situation would soon require the return of some of them to college for training. If so, the problem of selection for further training still has to be met (indeed, it is one from which we cannot escape). Is it best to burden the military organization with the educational problems more familiar to the civilian university, and is it best to ask the military to determine entirely the programs of training to be pursued when civilian as well as military components are now fully involved in defense?

What other alternatives are there? We might select among age groups certain individuals whose active service in the national interest is postponed during a period of training. The common denominator in some of these proposals is that those students who are preparing for "essential" sciences and professions should be permitted to continue their training.

However, there are the difficulties—and the dangers—in identifying in any rigorous way the essential sciences or fields of spe-

cialization as the bases for deferment. If one knew the exact character of the particular emergency which the Nation might face at a given period in the future, one might hazard some guesses as to essential fields—but then one would also have to know the nature of coming developments in the sciences themselves. Fifteen years ago nuclear physicists and professors of Japanese language would have been dismissed as a luxury. Such proposals are to be viewed as somewhat irresponsible until their proponents are willing to state and document the essential fields of learning and the nonessential. The very list would 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. It will also predetermine the sciences and skills available to us for our defense. The nation which has guessed wrong could easily be all wrong if this policy is followed.

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. This, with intelligent imagination and specialized competence, enables men to meet new situations and to devise new techniques of control. Loss of adaptability will come inevitably with a narrow range of training, and the nation cannot now afford to lose ingenuity in planning and research.

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The Plan

► THE COMMITTEES' recommendations to General Hershey were divided into two parts, training and utilization.

Under training, they recommended a special classification for students. Young men could enter this classification provided they received higher than a to-be-determined cut-off mark on a national college aptitude test. (Equivalent of 120 on the Army General Classification Test has been suggested.) They could stay in throughout college if, within the group at the registrant's college of so-deferred men, they stayed above a rank to be determined. (90% after freshman year, 95% after other years has been suggested.) Checks on continuance of good work would be made on graduate students.

At the end of training, the registrant would be liable for military duty even though he had passed statutory draft age.

Under utilization, they recommended that a graduated student should hold such classification for four months after graduation. If he gets an essential job utilizing his training, he can then be deferred for reasons of the national health, interest or safety. Other draft age men of similar training could qualify for deferment in the same way.

They also recommended setting up in Selective Service special advisory committees in major areas of training. The committees would advise Selective Service on specialized personnel needs of civilian and

military and make recommendations to local and appeals boards. The committees would also define functions within their fields and needs for specialized personnel.

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Training

By HENRY A. BARTON

Director,
American Institute of Physics

► ANY PLAN for training specialists must recognize the need for military manpower. This means that only a limited number of persons can be channeled into the lengthy courses of training required by modern specialization. This limited number will have to be selected.

If there is to be war, it will probably be a short war only if we lose. It is inevitable that provision for training specialists will have to be made eventually no matter what plans are adopted for national service for youth. Any such provision will involve selection. Our mandate was to propose a plan which could operate through the Selective Service System. Our plan is designed to achieve three major objectives:

1. To postpone the period of service in the national interest of selected individuals in order to prepare them for those responsibilities which require education and training.

2. To select for such education and training those individuals whose demonstrated aptitude offers a high probability that they will successfully achieve the competence which the nation requires.

3. To provide a system in which the number so postponed may be flexibly adjusted to produce the optimum balance between the immediate needs for military manpower and the longer term needs of

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both civilian and military activities for specialized manpower.

We believe that an adequate minimum flow of specialists in the sciences, engineering, and other fields can be provided by this procedure. It is presumed that an R. O. T. C. program in the colleges will be continued. Also, a certain percentage of young men of college age will not satisfy physical requirements for military service. Neither of these groups would be subject to Selective Service. Of the remaining young men subject to Selective Service and who would expect to go to college, a minimum score of 120 would screen out well over half of these. If at the end of the freshman year 90% of these selected individuals were continued into the sophomore year, 95% of the sophomores continued into the junior year and 95% of the juniors continued into the senior year, about 65,000 young men in this class would graduate from each age group. This would be a small number. However, it is our hope that the productivity of this selected group will be at a high average.

This plan will provide the desired flexibility. Adjustments can be made by adjustment of the cutting score and the percentage carried over from year to year. No legislation is necessary to provide authorization for this procedure.

We not only recognize, but call attention to, the fact that opportunities to go to college have not been available heretofore, nor are they now to all elements of our population. However, this is a social problem which the nation must solve. 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.

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Utilization

By ALEXANDER C. MONTEITH

Vice President, Westinghouse
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► THE TRAINING program will only be of lasting value to the nation if such highly selective and trained manpower is properly utilized.

Basically behind these deliberations is the full realization that these young men, trained in qualified institutions, are our only long range supply of technical, professional, and specialized leadership.

It therefore becomes clear that if we are to face years of preparedness, rapid development and careful conversion of such personnel is imperative.

The pool of men includes those men who have completed their training some time in the past and, too, who are becoming available through the completion of current training.

Four months should be sufficient to allow for transition from academic life to an

occupation which affords the beginnings of professional life. Reclassification implies that these men in common with others will be subject to general military service unless there is a higher priority for their services in other essential activity.

The registrant or his employer must prove that his training is not just utilized but in an essential activity as well.

During the past three years we have experienced the largest college graduation in history. This reservoir of trained men should be looked upon as indispensable. Thousands of these young men who have entered their professional life since World War II are already contributing constantly to highly essential activity.

As an example in Westinghouse in War Specification Technical Department, whose work is totally on the development of secret military apparatus, 85% of the professional manpower, 67 out of 79, completed their formal education since 1946 and the majority are under 26 years of age. In addition rapidly changing circumstances have rendered the existing classification of numerous registrants obsolete. A review of the classification of trained registrants is currently in order to prevent dissipation of selective manpower.

We view the creation of an advisory committee as a major step in favoring the effective administration of our highly successful selective service system.

Each group of experts forming an advisory committee will continuously survey the essential industries and occupations within its field and advise the local and appeal boards. Guidance, current and authentic, is thus provided in the National Headquarters structure.

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GENERAL SCIENCE

Compulsion Doesn't Cancel Individual Responsibility

► DR. ALBERT EINSTEIN believes that "external compulsion can to a certain extent reduce but never cancel the responsibility of the individual."

Discussing how a person should act if his government prescribes actions which his own conscience considers wrong, Dr. Einstein made a statement to the Society for Social Responsibility. (SCIENCE, Dec. 22).

"It is easy to say that the individual cannot be held responsible for acts carried out under irresistible compulsion," Dr. Einstein said, "because the individual is fully dependent upon the society in which he is living and therefore must accept its rules."

"Institutions are in a moral sense impotent unless they are supported by the sense of responsibility of living individuals," Dr. Einstein observed.

In our times scientists and engineers carry particular moral responsibility, he said.

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Snowbirds

► WHEN icicles hang from their tailfeathers, the tiny tumbling birds of winter are in their element. Let the big, honking geese, the toothsome mallard, the strutting robin fly far to the south to palmlands under tropical suns. Snowbirds do not flee the wintry blasts. They revel in blizzards, sing in sleet, sweep snow-covered fields in open defiance of the coldest weather.

The name snowbird has been applied rather indiscriminately to a large number of small winter birds of gray, brown and white. Sparrows and finches, chickadees and nuthatches stay with us from the time of red leaves until the first white flowers of spring. From polar islands north of Alaska and Hudson Bay come the snow buntings, or snowflakes, to haunt snow-swept hillsides or bleak and ice-covered shores. Wherever are cool summers and freezing winters, there are slate-colored juncos, true birds of winter and one of the most common sparrows in America.

These hardy Vikings will spend the coldest months of the year flying over white-coated fields and lawns or clinging to weed stalks which stick up through the snow. It is the weed stalks which give clue to the snowbirds' presence. Without such remnants of harvest crop and garden, ditches and field-corners, the birds could not live through the winter.

Their appetites are highly beneficial to the farmer, for they consume vast quantities of weed seeds. They also gobble harmful insects, eating caterpillars by the droves. The amazing acrobatics of the nuthatcher and chickadee are performed as they search inch by inch over bark and twigs for the sleeping eggs and pupae of the next summer's borers and biters.

Any and all snowbirds are glad for occasional human assistance, however, in warding off winter's hunger. Crumbs from feast-day tables are banquets for them. A lump of suet nailed to a post or limb (with a tin guard beneath it to keep away the cat, an incorrigible heathen even at Christmas) is a veritable barbeque.

Given an occasional helping hand when the snow is deep and even the thermometer