and a complete index. At the end of each chapter where photographic processes are discussed there is a formulary, giving the recipes for the various developers, toners, intensifiers, bleachers, etc.

Finally, the illustrations should be commended. Many of these clearly show the techniques described in the text. Scattered throughout there are also a number of beautifully reproduced examples of the photographic art, some in color. Since these are not credited to any photographer, they are presumably the work of the author himself. As such they demonstrate that he can apply these methods as skillfully as he can write about them.

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THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

RESOLUTION OF THE COUNCIL ON THE SCIENCE MOBILIZATION BILL (S.702)

THERE is now pending in the United States Senate the Kilgore Bill (S.702), entitled "A bill to mobilize the scientific and technical resources of the Nation, to establish an Office of Scientific and Technical Mobilization, and for other purposes." This pending bill is so sweeping in character and will affect science and scientists in so many ways that it merits careful consideration by the American Association for the Advancement of Science, the most broadly representative scientific organization in the United States. In examining the purposes and provisions of Bill S.702 it will be convenient to follow the 12 sections into which it is divided, and to point out which of the provisions are to be effective in time of peace as well as in time of war.

Section 1 recites, first, the reasons for the bill, effective both in time of war and in time of peace. In enumerating the "serious impediments" to the "full development and application of the Nation's scientific and technical resources," the bill uses such terms as "unassembled and uncoordinated state of information," "unplanned and improvident training, development, and use, of scientific and technical personnel . . .," "delay and ineffectiveness in meeting urgent scientific and technical problems. . . ."

As to information about scientists, it is always available in the membership lists of scientific societies in every special field to a total of more than 500,000 names, in the membership list of the American Association for the Advancement of Science (25,000), in "American Men of Science" (28,000) and in the National Roster of Scientific and Specialized Personnel (500,000). As to information about scientific work, scores of scientific journals covering together every important field of science are published regularly in the United States. Moreover, abstracts and reviews of practically all the current literature of the world are available in a number of such publications as *Biological Abstracts* and *Chemical Abstracts,* each of which publishes about 25,000 abstracts annually.

As to "delay and ineffectiveness in meeting urgent scientific and technical problems," in 1863, at the instance of scientists of the United States, the National Academy of Sciences was established by an act of Congress which provided that the academy shall, without conpensation, advise the Government on scientific questions, an obligation that the academy has unfailingly fulfilled. The first world war began in August, 1914. Although President Wilson enjoined the citizens of the United States to remain strictly neutral in thoughts as well as in acts, in May, 1915, leading scientists of the country, realizing the nature of the storm in Europe, began to organize the scientists of the nation for service to the Government on a more comprehensive scale than could be provided under the limited membership of the academy. In March, 1916, a year before this country entered the war, President Wilson established the National Research Council by Executive Order as an agency of the National Academy of Sciences. It promptly effected an organization and prepared to respond to any calls the Government might make on scientists. The contributions of the National Research Council to the war in 1917–18 and to the national welfare during all the intervening years to the present have been enormous. It is now serving the Government through about 200 committees composed of more than 1,000 scientists. On June 28, 1941, President Roosevelt established by Executive Order the Office of Scientific Research and Development, completely under the administration of scientists. It has formulated plans for research on war problems and entered into contracts with university, research organizations and industrial laboratories which have entailed an expenditure of $188,000,000, all on a non-profit basis. The products resulting from these researches have been ordered through regular governmental channels under contracts amounting to $2,000,000,000. All this has been accomplished without discord, reorganization or the necessity of executive intervention. In addition to these activities, the principal scientific societies have appointed special committees for the investigation of war and defense problems in their respective fields and through which governmental agencies at any time can promptly obtain scientific information and competent personnel. In the face of such achieve-

ments the words "delay and ineffectiveness in meeting urgent scientific and technical problems" in Section 1 of S.702 are not appropriate.

Section 1 contains also a declaration of policy, using such terms as "appraise," "mobilize," "assemble," "coordinate," "promote," "aid," "encourage," "discover and develop substitutes," "promote interest in scientific and technical education," "provide guidance," "standardize" and "establish a national scientific and technical office." These words express worthy objectives. But these objectives have already been realized by science and technology to such an amazing degree that within a century living conditions have been more completely changed than in the preceding thousand years.

Section 2 defines terms used in the act. "Scientific and technical facilities shall include all real and personal property, . . . programs, projects, . . . methods, processes, procedures, . . . patents, inventions, . . . information or knowledge of every description used or intended to be used for scientific or technical purposes in research and development or in the production or supply of war or civilian goods or services." "Scientific and technical personnel shall include all persons, excepting physicians and dentists, who have completed any course of study in any college or university in any branch of science or its practical application or who have had not less than an aggregate of six months' training or employment in any scientific or technical vocation." "Agency or establishment" means any Federal or State agency or other body or any "local government, person, firm, or partnership engaged in business for profit, or any corporation, profit or nonprofit, association, school, college, and university." In short, "scientific and technical facilities," as used in S.702, includes every means useful in any way for the production of "war or civilian goods or services"; "scientific and technical personnel" includes every person, except physicians and dentists, who has completed a college course in any branch of science or who has been employed for six months on any kind of work that may be called technical; and "agency or establishment" includes every agency, corporation, person, partnership, association, school, college and university, whether or not organized for profit and whatever its purposes or activities may be. It would be difficult to make more inclusive definitions. Moreover, in giving to an agency under the President powers over broadly general things the act violates the spirit of the Federal Constitution which grants powers over specific things to the Federal Government and declares that those not so delegated nor prohibited by it to the States "are reserved respectively, to the States or the people."

Section 3 defines the organization of the "Office of Scientific and Technical Mobilization." It is to be under the direction of an "Administrator" appointed by the President to serve at the pleasure of the President, and of a salaried "National Scientific and Technical Board," also appointed by the President, but whose duties are to be defined by the Administrator. This Board is to consist of six members, besides the Administrator, one to represent industry, one to represent agriculture, one to represent labor, one to represent the consuming public and "two additional members at large who shall be scientists or technologists." By previous definition in the bill, to be classed as a scientist or a technologist it is sufficient to "have had not less than an aggregate of six months' training or employment in any scientific or technical vocation." The Administrator will appoint all other employees, and he may waive the provisions of the civil-service laws and regulations if he determines it is necessary to do so.

Provision is made also for a non-salaried "National Scientific and Technical Committee," consisting of the Board previously mentioned, a representative from each of such Federal departments as the President shall designate, four additional representatives of the consuming public, six additional members representing labor, six representing management (including small business) and three additional scientists or technologists. That is, the Technical Committee will consist of twenty-five to thirty members, of whom five must be scientists or technologists in the sense that each of them shall "have had not less than an aggregate of six months' training or employment in any scientific or technical vocation." This committee is to be appointed by the President to advise and consult with the Administrator at least once a month upon basic policies of the Board.

In order that it might reasonably be hoped that any considerable fraction of the purposes of the act, as set forth in the latter part of Section 1, might be realized it would be necessary that the Administrator and the Board be men of the highest integrity, ability, experience in science and devotion to public welfare. Instead of insuring that the Board shall have these essential qualities the act provides for a primarily political Board of seven members, only five of whom need be scientists or technologists even in the extraordinary sense in which the term "scientific and technical personnel" is defined in Section 2.

Section 4 defines the powers of the proposed Office, effective in times of peace and of war. Blanket authority is given for many purposes, including the powers to formulate, finance, control, contract for and operate all undertakings or projects that the Administrator shall determine fall under the broadly inclusive definitions of "scientific and technical facilities," "scientific and technical personnel" and "agency or establishment" previously given. This section

explicitly provides that these sweeping powers are to be exercised in accordance with rules and regulations prescribed by the Administrator and that they "shall have the force and effect of law" of Congress. That is, in passing this act the Congress would delegate to the Administrator appointed by the President law-making powers, relative to this subject, that are vested, in general, in the Congress by the Constitution of the United States.

Section 5 transfers to the Administrator, by amending the Selective Training and Service Act of 1940, control over the deferment from military service of persons who, under the definitions of the act, are classed as "scientific and technical personnel." In view of the inclusive definition of "scientific and technical personnel," this provision would seriously impair the functioning of the already complex manpower control machinery.

Section 6 gives the Administrator, in time of war, the right to requisition, subject only to review by the President, the stupendous means of production that, under the act, are classified as "scientific and technical facilities," and to represent before the War Production Board "any application for allocation of, and priority for, any critical material and equipment in scientific and technical research and development." The exercise of such a power would severely handicap the functioning of such efficiently managed and highly successful agencies as the Office of Scientific Research and Development, referred to in comments on Section 1.

Section 7, "any provision of law to the contrary notwithstanding," vests the Office with "the exclusive right to use, and with the exclusive right to license others to use, (1) any invention, discovery, patent or patent right which has heretofore resulted, or shall hereafter result, from research or invention for the carrying on of which the United States or any department, agency or establishment thereof either has heretofore contributed at any time since the declaration of national emergency on May 27, 1941, or shall hereafter contribute any money, credit, physical facilities or personnel; and (2) any invention, discovery, patent, or patent right which is at the time of the enactment of this act, or shall hereafter become, to any extent the property of the United States or of any department, agency or establishment thereof." These broad powers are vested in the Office however small the contribution by the Government or a governmental agency may have been. The Administrator is "authorized and directed to prescribe and promulgate rules and regulations which shall thereupon have the force and effect of law for the enforcement of the provisions of this section, . . ." This delegation of power giving the Office the exclusive right to use patents and to license others to use them opens the door to abuse in time of peace and adds nothing to the powers of the Government in time of war.

Section 8 gives the Administrator the power to require all information he may desire "concerning scientific and technical facilities during the existence of a state of war and concerning scientific and technical personnel at all times." "Any person or establishment [possibly a university] refusing or wilfully failing to furnish the . . . shall, upon conviction thereof, be fined not more than $5,000 or imprisoned for not more than one year, or both."

Section 9 authorizes the appropriation of $200,000,000 to carry out the provisions and purposes of the act. This section also authorizes the Administrator to organize corporations and to make loans to, or purchase all or part of the capital stock of, corporations whenever he deems it necessary to do so for the more effective exercise and performance of his own powers and duties or of those of the Office. The appropriation provided would be wholly inadequate for the purposes set forth.

Section 10 gives the Administrator important powers usually lodged in courts, and it provides that "any person who wilfully violates any order, rule or regulation promulgated by the Administrator under the authority of this act shall, upon conviction thereof, be fined not more than $5,000 or imprisoned for not more than one year, or both." In giving the Administrator, a representative of the President, quasi-judicial powers the act departs from the distribution of legislative, executive and judicial powers as defined in the Constitution of the United States.

Section 11 requires the Administrator to render annually to the President and to Congress a written report, summarizing the activities of the Office and the status and progress of science affecting the public interest.

Section 12 provides that if any clause, sentence or paragraph of the act is invalidated by any court action it shall not affect the validity of the remainder of the act.

After careful consideration of the purposes and provisions of the Science Mobilization Bill (S.702), the American Association for the Advancement of Science, an organization having nearly 25,000 members (and having 187 associated and affiliated societies with a combined membership of over 500,000 persons whose interests cover broadly all the natural and social sciences) now, through its Council of about 250 members chosen from among the leaders of American science, respectfully recommends to the Senate and to the House of Representatives of the United States that the Kilgore Bill (S.702) be not passed either in its present form or in any other form containing similar provisions.