

the evolution of the OFFICE of NAVAL RESEARCH

By The Bird Dogs

IT is not often that the birth of a Navy office, which certainly sounds like a cold, administrative affair, makes history worth recording. But the birth of the Office of Naval Research was such an interesting one, participated in by so many famous and brilliant personalities, that a record of the events should serve a useful purpose. It might even bring inspiration to those who daily continue the struggle to evolve constructive changes in large government departments.

Soon the Office of Naval Research (ONR) will be celebrating its fifteenth anniversary. If the celebration is anything like the tenth reunion affair, a banquet will be held and a number of speeches will be made extolling the aims, purposes, and accomplishments of this remarkable office. Included will probably be a few remarks concerning the history of the formation of ONR.

Any reference to the history of ONR excites in the authors two responsive chords. The first is one of nostalgia brought on by fond and fascinating memories. The second is one of frustration caused by the realization that an authoritative history of the evolution of ONR has not, heretofore, been made public. Hence this attempt.

The campaign to sell the concept of establishing a central office to foster basic research and research coordination within the Navy Department was a lengthy, and sometimes bloody, struggle. The story of the evolution of ONR is really the tale of an educational process carried on over a five-year span (providing we are permitted to ignore pre-World-War-II struggles). This educational process required the concerted efforts of many people to create an atmosphere in the Navy Department, in the Executive Branch, and in Congress, which was favorable toward long-range research. Key people had to be convinced that future military strength depends to an increasing degree on the rapid and effective development of new weapons and weapons systems through a strong, balanced research effort.

It is recognized that history must be recorded from several points of view before all the facts are exposed. The story here presented was that as seen by a small

group of Naval Reserve officers who were fortunate enough to have had a five-year worm's-eye view of the entire evolution of ONR from a vantage point within the Office of the Secretary of Navy. We were, in the parlance of the day, lowly skippers of LSD's (Large Steel Desks).

The Background

IT all began before the United States entered World War II, with the realization by such outstanding men of science as V. Bush, J. B. Conant, K. T. Compton, and F. B. Jewett, that this country was woefully weak in military research and development. Dr. Bush carried the idea of establishing a National Defense Research Committee "to coordinate, supervise, and conduct scientific research on the problems underlying the development, production, and use of mechanisms and devices of warfare (except problems of flight which were to remain under the NACA)" to President Franklin D. Roosevelt and Mr. Harry Hopkins early in June 1940. The White House acted rapidly and on June 15, 1940, the President signed letters appointing such a Committee with Dr. Bush as chairman. The Committee was to supplement rather than replace the activities of the military services so that links with the military were formed by the naming, as members, Brig. Gen. G. V. Strong of the Army and Rear Adm. H. G. Bowen of the Navy, in addition to K. T. Compton, J. B. Conant, F. B. Jewett, R. C. Tolman, I. Stewart, and C. P. Coe.

To further mobilize the scientific personnel and resources of the nation, President Roosevelt established by Executive Order on June 28, 1941, the Office of Scientific Research and Development. This group had as an Advisory Council Dr. Bush as Chairman, Dr. Conant, Chairman of the NDRC, Dr. J. C. Hunsaker, Chairman of the NACA, Dr. A. N. Richards, Chairman of the Committee on Medical Research, and one representative each from the Army and Navy appointed by the respective Secretaries.

The impact of this move led Secretary of Navy Frank



A recent photograph of several of those who took part in the early development of ONR. (The names of the original and second-wave "bird dogs" are italicized.) Front row, left to right: *Bruce S. Old*, *Ralph A. Krause*, R. Adm. Julius A. Furer, USN (Ret.), Jerome C. Hunsaker, *James H. Wakelin*. Back row: N. S. Bartow, Royal C. Bryant, *John T. Burwell*, *H. Gordon Dyke*, A. C. Body, *Thomas C. Wilson*, *James P. Parker*. The principal author of the present article is Dr. Old, who is now senior vice president of Arthur D. Little, Inc., Cambridge, Mass.

Knox to study what steps the Navy might take to increase its effectiveness in the prosecution and utilization of research and development.

There existed some controversy on this point. Rear Adm. H. G. Bowen, Director of the Naval Research Laboratory, had recommended on January 29, 1941, the centering of all research for the Navy in that Laboratory, giving it Bureau status; whereas the General Board in a rebuttal on March 22, 1941 had recommended that no change in Bureau cognizance for research be made and that the Chief of Naval Operations be made responsible for all research policies, including the operation of the Naval Research Laboratory.

Secretary Knox, at the suggestion of Rear Adm. J. H. Towers, therefore enlisted Prof. J. C. Hunsaker, the Chairman of the NACA as well as a member of the OSRD, and a graduate of the Naval Academy, to advise him. Out of this advice arose the first step in the long road to ONR. At the suggestion of Hunsaker, Knox issued General Order 150, July 12, 1941, which established the Office of the Coordinator of Research and Development in the Office of the Secretary of the Navy. This order provided that the Coordinator advise the Secretary broadly on matters of Naval research, and placed the Naval Research Laboratory under the cognizance of the Bureau of Ships.

The Office of the Coordinator of R & D

AT the urgent request of Secretary Knox, Dr. Hunsaker agreed to serve as the first Coordinator of Research and Development on an interim basis in order to get the Office organized and functioning. He was named Coordinator on July 15, 1941, and immediately

selected a small staff consisting of two highly capable regular officers, Capt. Lybrand P. Smith and Comdr. E. W. Sylvester, and four young Naval Reserve officers having technical backgrounds. Hunsaker then proceeded to inspire these young men, whom he called "bird dogs," and train us in his effective manner in the basic elements of sound research program planning, administration, evaluation, and coordination. Another important facet of this training concerned the ways and means of getting things accomplished in wartime Washington in the face of odds, or even open opposition. With tongue in cheek, Hunsaker often asked the "bird dogs" to investigate situations and prepare brief memoranda. These he then waved around in the stratospheric secretarial or bureau-chief level to show that his position was obviously correct if even green reserve officers could quickly reach the same conclusion. (This procedure had a remarkable effect on the care with which memoranda were prepared, and on the morale of the staff through the display of confidence it represented.)

In order to carry out more efficiently his prior commitments to the NACA and OSRD, Hunsaker resigned the position of coordinator and turned it over to his carefully selected choice, Rear Adm. J. A. Furer, USN, on December 15, 1941. However, Hunsaker's superb advice and counsel always were, and at this writing still are, available to and continually utilized by the Navy Department. Other changes included the naming of Furer to the OSRD, Smith to the NDRC, the acquisition of Comdr. R. D. Conrad, USN, a truly brilliant technical man, as a replacement for Sylvester, and the addition of two more technical Naval Reserve officers.

During the first three years of World War II the work of this Office was aimed almost entirely at liaison

between the NDRC and the Navy, assisting in the planning and establishment of research projects, following the progress thereof, and aiding in bringing about the utilization of the results by the Navy. (The effectiveness of this work under Adm. Furer's guidance is noted by J. P. Baxter in his history of the OSRD and NDRC entitled *Scientists Against Time*.) In addition, the Office coordinated Navy research efforts with the War Department, War Production Board, Coast Guard, National Advisory Committee for Aeronautics, National Research Council, and the United Kingdom and Canada.

However, from the very outset another important subject occupied the thoughts of the personnel of the Office of the Coordinator of Research and Development. All of us knew that the excellent OSRD-NDRC civilian research groups would probably evaporate as soon as the war ended. Therefore, at each step of the way, a gnawing thought occupied the minds of all: how could the Navy better organize and administer its *own* research? The Navy must be capable of developing the impressive and awful strength required to discourage any potential enemy to the end that the Navy could assist in avoiding further wars, or, at a minimum, avoid entering any future war without having all the advantages effective research could provide in modern weapons and weapons systems. Hunsaker sparked this thinking in 1941 within a matter of days after establishing the Office. One of the first tasks he assigned the group was a study of various Navy laboratories in order to determine wherein the Navy might be able to handle research work effectively so as to lessen the burden of the NDRC, and to determine wherein its research capabilities were lacking.

A searching analysis of Navy research strengths and weaknesses was actually a continuous task which came into consideration in practically all the work of the Coordinator's Office. In establishing liaison with the Bureaus, Offices, and Laboratories of the Navy Department, and in naming Navy liaison officers to the numerous NDRC projects, a rapid evaluation of the attitudes and capabilities of people was obtained—whether they were civil service, ensigns, or admirals. In a remarkably short time it was possible to categorize those persons who would do everything possible to stimulate better research programs, organization, and utilization of results, and those who stood firm upon the twin, and usually backward, defenses of cognizance and entangling red tape.

Fortunately within the Navy there arose almost immediately a solid core of highly intelligent people who welcomed and assisted the drive to push research on all frontiers. This was in part a tribute to the well-established Navy system of postgraduate study in various universities which had developed in many officers an understanding and appreciation of science.

This is not to say that all was peaches and cream. Well do we remember the time early in the war when we called in a top submarine officer and pointed out to him the magnitude of the US and UK antisubmarine

research effort. We postulated that the enemy was also doing work and out of it would come developments, like a homing torpedo, which would make life miserable for the submarines. Would he help us spark some pro-submarine research? Absolutely not—the subs in the Pacific were having a field day. This type of short-sighted thinking we paid for dearly later. We also remember probing into touchy areas, such as out-dated torpedo power plants, only to have officers rise in indignation based on rights of cognizance or secrecy. In fact, we had to develop a defense technique. Whenever we ran into a particularly salty, operational type who was bellying in a manner destined to hold up the progress of research, we took out notebook and pencil and asked dutifully, "Would you mind repeating that statement so I could be certain to quote you correctly to the Coordinator of Research? He will be interested in your view, sir." This technique worked wonders.

We continually sought out and nurtured the progressive, intelligent core group. One of the first persons to be uncovered who showed vital interest in the postwar reorganization of research in the Navy was George B. Karelitz of Columbia University, a former Russian, who was working with the Bureau of Ships.

Two of the "bird dogs" began in 1942 to meet bi-monthly at home in the evening with Karelitz. Tragically, Prof. Karelitz died in 1943, but fortunately not before he contributed immensely to the shape of things to come. Out of these sessions the initial pattern of ONR was almost completely conceived—the essential elements consisting of establishing a central research office in the Office of Secretary of the Navy, headed by an admiral, receiving funds from Congress for research projects, and having a powerful research advisory committee made up of top scientists, were actually all drawn up and recorded as early as November 1, 1943 by two "bird dogs." Of course much ground work involving numerous persons both within and outside of the Navy remained to be accomplished before any such plan could become a reality.

Since any research organization requires a sympathetic atmosphere in which to live, if it is to survive and be productive, the work of a large number of people during the first three years of World War II must be credited for setting the stage in the Navy Department for the later establishment of a central research office. Among the scientists who helped so materially in "selling" the importance of continued research to the Navy during this time were: Bush, Conant, Compton, Jewett, DuBridge, Adams, Rabi, Tuve, Tolman, Hunsaker, Terman, Loomis, Tate, Zacharias, Hunt, Kistiakowsky, Lauritsen, Morse, Stevenson, Suits, Ridenhour, Alvarez, Land, Kelley, Buckley, and Wilson.

And among those most receptive officers in the Navy Department who were sold and in turn helped to prepare the Navy for subsequent reorganization were: Briscoe, Bowen, Furer, L. Smith, Solberg, McDowell, Tyler, Schuyler, Entwisle, Bennett, Sylvester, Conrad, Lee, Hull, Dowd, Baker, Low, Cochrane, Mills, In-

gram, Rickover, Piore, Bollay, Thach, de Florez, Strauss, Berkner, Teller, Lockwood, Kleinschmidt, Hatcher, Pryor, and Schade.

Certain official acts also occurred which spread the word on research in a fairly effective manner to the various Bureaus and Offices of the Navy Department. One mechanism was the establishment of the Naval Research and Development Board, headed by Furer, which consisted of the various Bureau research heads and the Readiness Division of Cominch, and had a "bird dog" as secretary. An interesting aspect of this work which soon arose was the need for better technical intelligence in order to aid in the rapid development of countermeasures to new enemy weapons. A new group was quickly established in the Coordinator's Office with two additional "bird dogs" to assist in this important work, and liaison was established with the Office of Naval Intelligence, G2 of the Army, and the Office of Strategic Services. The group performed outstanding work in piecing together data on German torpedo, ram jet, and guided missile work which resulted in the initiation of important new projects in the US. Out of this grew an awakening in the Navy to the important part scientists could play in intelligence. As a result the Navy sent one of the "bird dogs" on the first famous Alsos Mission, and later set up the highly successful Navy technical intelligence mission to Europe.

Plans for the Postwar Era

RECOGNIZING fully the almost total dependence of the Navy on NDRC research at this time, Rear Adm. Furer, as early as the fall of 1943, began to worry about what would happen to research in the Navy if the war suddenly ended. The first trial balloon was hoisted by him September 22, 1943, when he sent a memorandum to Vice Adm. F. J. Horne, Vice Chief of Naval Operations, suggesting a revision of General Order 150 giving a few expanded coordinating powers (but no money) to the Office of the Coordinator of Research and Development. Also he proposed that the Naval Research Laboratory be transferred back to the Secretary's Office. In this memo Furer invented the term "Chief of Naval Research" which was ultimately adopted as the title for the head of ONR. However, at this time the several Bureaus raised a large howl based on cognizance, and Admiral King was in no mood to favor any more power in the Secretary's Office, so the whole matter was dropped like a lead balloon.

Other factions were also beginning to awake. Mr. James Forrestal, Under Secretary of the Navy, on October 2, 1943 requested R. J. Dearborn, President of Texaco Development Corporation, to "make an extensive survey of Navy patent practices and the research situation of the Navy." Mr. Dearborn reported his findings on March 10, 1944 in which he recommended the "establishment of an Office of Patents and Research to be headed by a Coordinator of Patents and Research (which does not conflict with the present activities of

the Coordinator of Research)." Mr. Forrestal was reluctant to take immediate action.

The Pot Begins to Boil

BUT, the lid could not be kept on the pot much longer. Dr. Bush warned the military members of the OSRD Advisory Council in the Spring of 1944 that, "The OSRD is a temporary war organization which automatically goes out of existence at the end of this war; so that in planning for peacetime research and development, we plan without that organization, which will presumably turn its affairs over just as soon as the war begins to end." This official warning note was a loud reminder that the scientists would in all probability flock back to their own laboratories as soon as the war appeared to be definitely won.

Furer immediately got busy and organized a large conference in the Navy Department on April 26, 1944, to discuss the problem. To this conference were invited all the top Army, Navy, and OSRD research personnel, some 43 in number. There was general agreement that the military would probably not be able to retain the interest of top scientists or obtain funds necessary for a vigorous research program. It was decided a committee should be established to study and recommend a proper organization for postwar military research. In retrospect, one of the most important points of the entire conference was one of omission. Not one person in the course of the meeting hinted in any way about the tremendous revolution soon to be thrust upon military research requirements by the advent of guided missiles, complex weapons systems, and the like.

As a consequence of this meeting Secretaries Stimson and Forrestal appointed a Committee on Post-War Research composed of Charles E. Wilson, chairman, four civilian scientists (Jewett, Hunsaker, Compton, and Tuve), four representatives of the War Department (Echols, Waldrin, Tompkins, and Osborne), four representatives of the Navy Department (Furer, Cochran, Hussey, and Ramsey), and two secretaries, including one of the "bird dogs". At the first meeting on June 22, 1944, Chairman Wilson read to the press and news reels the following statement:

The purpose of the Committee is to prepare a plan and organizational procedure which will insure the continued interest of civilian scientists after the war in scientific research for the Army and the Navy. The nation's scientists have been doing a splendid job since Pearl Harbor, and our task is to evolve a plan which will assure their continued interest in meeting the research needs of our Armed Forces after the War. In this way only can the United States keep ahead of all possible future aggressors in preparedness for National Defense.

The often heated deliberations of this committee finally resulted in the recommendation (drafted by Hunsaker) that an interim organization be established in view of the fact that Congress was considering several bills to create a new independent research agency



The first meeting (June 22, 1944) of the Committee on Post-War Research. Those present, left to right, were Col. R. M. Osborne, R. Adm. G. F. Hussey, Jr., K. T. Compton, Brig. Gen. W. F. Tompkins, R. Adm. J. A. Furer, F. B. Jewett, Charles E. Wilson, J. C. Hunsaker, Maj. Gen. O. P. Echols, R. Adm. E. L. Cochrane, M. A. Tuve, Maj. Gen. A. W. Waldon, and R. Adm. D. C. Ramsey. *US Navy photo*

to which the functions of the interim organization might better be transferred later. Accordingly, in a joint letter on November 9, 1944, Secretaries Stimson and Forrester requested the National Academy of Sciences to establish the Research Board for National Security. F. B. Jewett, President of the Academy, proceeded immediately to organize the Board under the chairmanship of K. T. Compton. The Navy assisted materially in getting the RBNS organized and projects established with R. Adm. Furer taking the lead and the "bird dogs" helping in various secretarial and committee tasks. However, the RBNS was destined to enjoy but a brief existence, as President Roosevelt directed the Secretaries of War and Navy in March 1945 (with Bureau of the Budget urging) not to transfer funds for the use of RBNS pending a thorough review of the several bills before Congress for the organization of postwar research. The RBNS was finally killed by a joint letter from Secretaries Patterson and Forrester dated October 18, 1945. Despite its short life the ill-fated RBNS served a very useful role in educating top people in the military services and Congress, thus preparing the way for more successful future actions on research organization.

In the period between the birth and death of the RBNS things were moving rapidly on other fronts.

In the summer of 1944 the "bird dogs", stimulated by the work of the Committee on Post-War Research, further developed their plan for a Navy office to key in with whatever outside agency Congress might establish. It was on September 6, 1944, that two of the "bird dogs" first set down a new organization chart for an Office of Naval Research which entailed the naming of

an Assistant Secretary of the Navy for Research with broad powers, an Advisory Committee, a Rear Adm. Chief of Naval Research, program emphasis on basic research work, and the transfer of the Naval Research Laboratory to the Office. This was a vitally important improvement over their earlier plan which had called for a rear admiral as head of the Office. This plan for an Assistant Secretary of the Navy for Research was discussed with Dr. Hunsaker and Dr. Bush who enthusiastically supported the idea. The whole scheme was then recorded by three of the "bird dogs" on September 23, 1944 as a beneficial suggestion to the Secretary of the Navy. But this mechanism was not needed, as Adm. Furer, Capt. Smith and Capt. Conrad all quickly endorsed the thought. Thus, Adm. Furer sent a memorandum to the Secretary of the Navy on October 11, 1944, recommending immediate implementation of such a move.

This was received coldly by Mr. Forrester, who was considering only one new Assistant Secretary, and had him pegged in the field of supplies and logistics. Also he was about to spring a surprise which would soon lead to the replacement of Adm. Furer. In just eight days, on October 19, 1944, he established the Office of Patents and Inventions, with Vice Adm. Bowen in charge, as a first step in implementing the previously mentioned Dearborn report. This was followed by a series of moves which made it obvious that another change was coming.

This maneuvering became of concern to the "bird dogs" as we thought it might ruin our plans for an effective postwar organization. An incident which occurred caused us to take a rather desperate chance. By

happenstance we came into possession of a comment made by President Roosevelt on a fat report by Adm. E. J. King concerning a suggested postwar reorganization of the Navy Department. The terse comment, handwritten on the cover, went something like this: "Ernie—I made you Cominch to fight the war, not to reorganize the Navy Department—FDR." This made it painfully clear that the President intended to control postwar departmental changes. We believed so strongly in our method of organizing research in the postwar Navy that we decided to take the risk of getting our USNR necks chopped off by putting our plan before the President. Evening meetings were held with some of his bright young men, who became most enthusiastic, and arrangements were set for a presentation upon the return of the President from his 1945 spring vacation. But, tragically, FDR died while still in Georgia on April 12, 1945.

The expected change in the Navy Department then happened, and on May 19, 1945, the Office of the Coordinator of Research and Development was swallowed up by the Office of Research and Inventions (ORI). Also the Naval Research Laboratory and the Special Devices Division of the Bureau of Aeronautics were also transferred to ORI. Adm. Furer was out and Admirals Harold G. Bowen and Luis de Florez took over with a bang. At the very outset it was a dreary time for Capt. Conrad and the "bird dogs" as we feared our dreams for the future would go down the drain. But we had miscalculated. In a very short while Admirals Bowen and de Florez took up the cudgels for an Office of Naval Research with great vigor. They solicited the powerful backing of men like Commodore Lewis Strauss, Under Secretary of the Navy W. John Kenney, and Assistant Secretary H. Struve Hensel. In June 1945 Dr. Bush's report to President Truman, entitled *Science, the Endless Frontier*, appeared and had great impact in Congressional and military circles. By September 1945 the "bird dogs" had a Congressional bill all drafted for the establishment of an Office of Naval Research to be headed, in deference to Mr. Forrestal, by a Rear Admiral. This draft, which included the establishment of a Naval Research Advisory Committee composed of eminent scientists, was to become known as the Vinson Bill.

There remained one serious hurdle, outside of Congressional action, before the establishment of ONR could become meaningful. This was to get the Universities, where the majority of basic research is performed, to be willing to accept Navy contracts. In this struggle Capt. Conrad became the recognized leader. Accompanied by various "bird dogs" Conrad visited many top universities in the winter of 1945. There was a definite feeling on the part of the scientists after four years of war to wish to forget the Navy and return to former pursuits. But Conrad was able to crumble all opposition by making superb speeches around the country, and by working with legal and contract people to pioneer an acceptable contract system. This would permit one over-all contract with a university with new

task orders to be attached as agreed upon, permit basic research to be contracted for, and permit the work to be unclassified and publishable. Once the legal eagles got this worked out, there was no holding the persuasive Conrad, and he was quickly able to get such institutions as Harvard, Chicago, University of California, California Institute of Technology, and MIT to agree to accept Navy work. Tragically, he contracted a lingering but fatal case of leukemia at his moment of triumph.

With Adm. Bowen and his influential partners and Capt. Conrad maneuvering effectively, the Vinson Bill passed with flying colors and became Public Law 588 on August 1, 1946. It turned out to agree almost verbatim with the 1945 draft by the "bird dogs". This was indeed a day of rejoicing, culminating some four years of effort entailing long hours of teaching, lots of perseverance, and even a little intrigue. As stated at the outset, the victory belonged not to a few, but to many scientists, naval officers, and political figures, some of whom are still unrecognized.

Unexpected Contribution

THE impact of this victory was destined to go far beyond the expectations of the authors. By dint of this far-sighted planning, coupled with favorable action by Congress, the Navy found itself the sole government agency with the power to move into the void created by the phasing out of the OSRD at the end of the War. While Congress still debated what to do about a national agency, Forrestal, Bowen, now Chief of Naval Research, and de Florez arranged for war-end money transfers, and ONR moved forward aggressively to bridge the gap. Sound policies set by the Naval Research Advisory Committee were admirably carried out under the guidance of Capt. Conrad and Dr. Alan Waterman. The world leadership of the United States in basic research in the decade following World War II has been largely credited by many experts to the timely and effective work of the Office of Naval Research.

Surprise Ending

IT was previously stated that the "bird dogs" suggested and worked for, even at some risk, the appointment of an Assistant Secretary of the Navy for Research as representing the ideal organizational solution to assure research the representation and emphasis it deserves in the development of a Navy second to none in this age of science. Continued education and pressure by many people finally brought about such a move in 1959. Perhaps it was a case of poetic justice, but, at any rate, the rest of the "bird dogs" are happy and proud to report that the very first man appointed to the office of Assistant Secretary of the Navy for Research was one of us.

If the recording of this brief history will but inspire continued constructive efforts by other lowly "bird dogs" in government, we will feel more than amply rewarded.