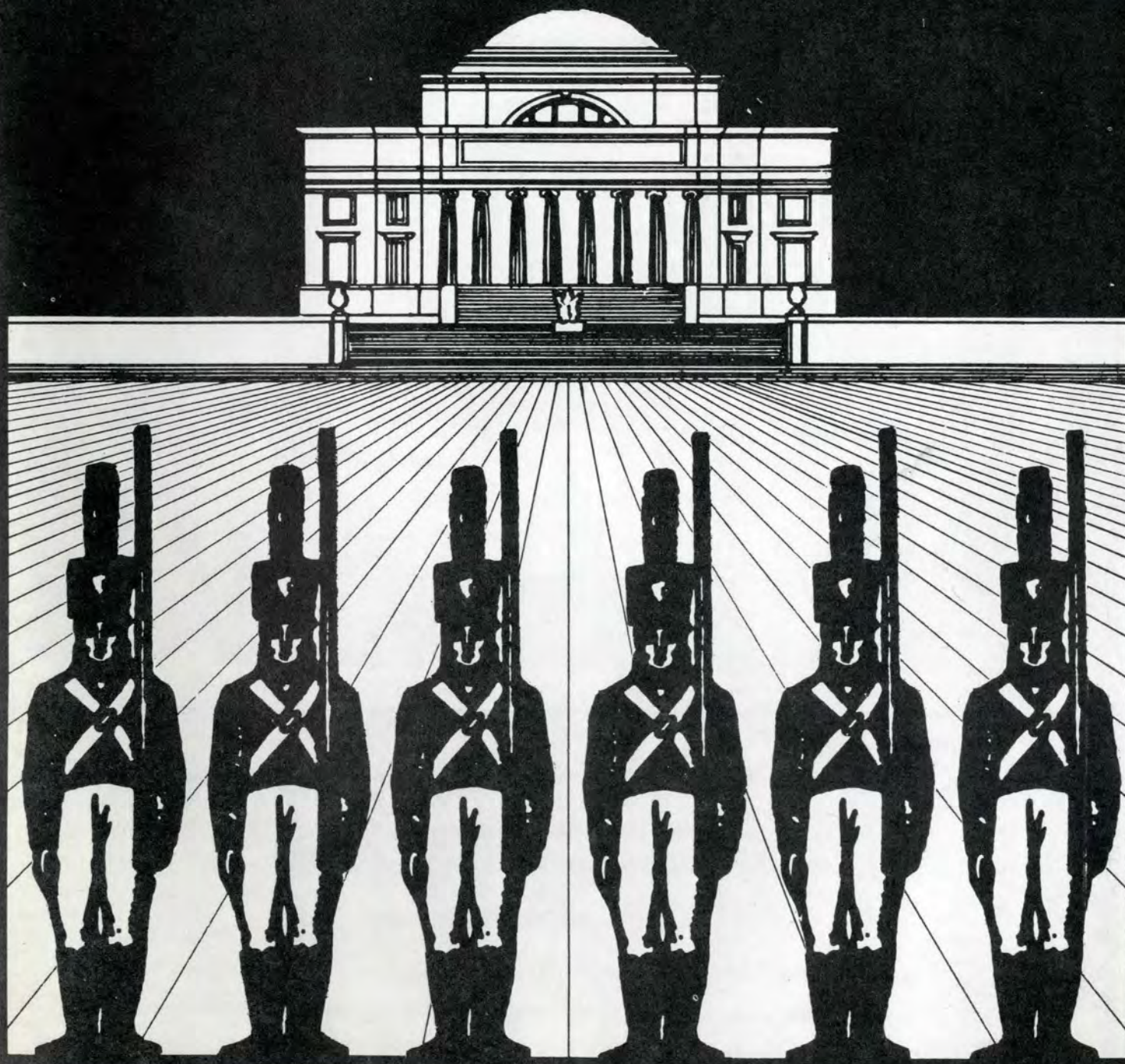


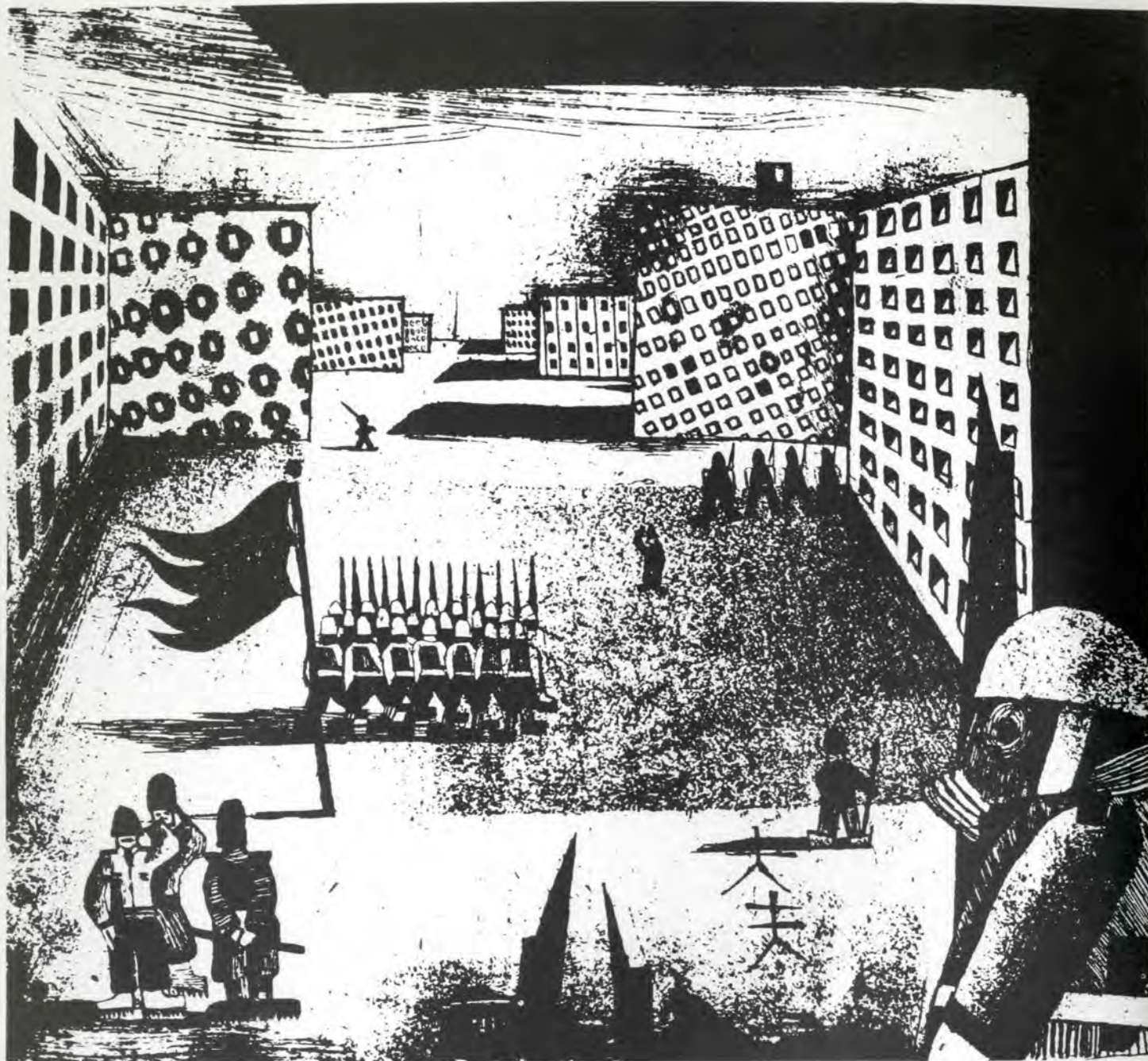
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# THE UNIVERSITY - MILITARY - POLICE COMPLEX

## A DIRECTORY AND RELATED DOCUMENTS







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# **THE UNIVERSITY - MILITARY - POLICE COMPLEX**

## **A DIRECTORY AND RELATED DOCUMENTS**

Compiled by Michael Klare

Published by The North American Congress on Latin America

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# introduction:

*"Our colleges and universities must be regarded as bastions of our defense, as essential to the preservation of our country and our way of life as supersonic bombers, nuclear-powered submarines, and intercontinental ballistic missiles."*

*—John A. Hannah, when President of Michigan State University, at a Parents' Convocation in 1961.*

## THE MILITARY RESEARCH NETWORK —AMERICA'S FOURTH ARMED SERVICE

By Michael Klare

The Military Unification Plan of 1947, drafted by Clark Clifford during his service as special counsel to President Truman, fixed the present composition of the U.S. Military Establishment. The Plan recognized three military services—Army, Navy and Air Force—which were made subordinate to the centralized command structure of the Department of Defense. A *fourth* armed service—as crucial to the national defense as the first three—was not given formal recognition under the Plan. This service is the nexus of university laboratories and research institutes which constitute the military research network. Without the support of this Fourth Service, the United States would not have produced the atomic bomb, would not have developed missile guidance systems, and would not have been prepared for the challenge of Vietnam.

Until the present century, new weapons were developed by hit-or-miss experimentation, or through continuous refinement of existing devices. It is only in the past three decades that instrumentalities of warfare have emerged from organized scientific investigations, in which the talents of many researchers are pooled in the quest for novel military systems. The Manhattan Project of World War II was the prototype for all such efforts—at its peak thousands of scientists were engaged in various subtasks of the project, many without being aware of the final objective of their work. In order to mount other large-scale research projects, the War Department found it necessary at the onset of the war to establish a network of mammoth laboratories devoted to intensive research on advanced weapons systems. Since the only reservoir of trained scientific manpower available for such work was the university community, it was inevitable that the nation's institutions of higher education be mobilized for the establishment of a military research service. Speaking of this wartime effort,

Gerard Piel of *Scientific American* wrote in 1965 that during World War II,

The universities transformed themselves into vast weapons development laboratories. Theoretical physicists became engineers, and engineers forced solutions at the frontiers of knowledge. MIT and Harvard undertook to create the strategy and tactics as well as the instruments of radar and counter-radar; from Johns Hopkins came the proximity fuse that brought the conventional high-explosive artillery shell to its peak of lethality, and Columbia, Chicago, and California joined in the successful engineering and manufacture of the most fateful weapon of all. The universities and the scientists then dealt with the military not as contractors, but as privateers bringing along their own novel weapons.

During the course of the war, a number of university laboratories developed into sizeable institutions, employing thousands of scientists and technicians. (Many of the research centers described below, including MIT's Instrumentation Lab, Penn's Ordnance Research Lab, and California's Los Alamos Lab, can trace their origins to this period.) The wartime mobilization of university resources was organized by the National Defense Research Committee (NDRC), the first body of academic scientists to have an important policy function in the administration of military research. Headed by Dr. Vannevar Bush of the Carnegie Institution, the NDRC was expanded into the Office of Scientific Research and Development, which coordinated the country's overall scientific effort throughout the war and supervised the initial development of the atomic bomb project.

The World War II military research laboratories had been organized on the premise of expediency, and had not been intended to outlast the war. As victory approached, however,



the military services and some of the universities sought to prevent the dissolution of these installations. With the dawn of the Cold War, a new era of university-government cooperation commenced, as the Pentagon found itself with the task of "containing communism" on a front that stretched from Berlin to Seoul. In succeeding years, the former imperial powers of Europe were separated from their colonies in Africa and Asia, and the U.S. theater of operations was expanded as we moved in to protect the new states from the threat of "internal disequilibrium"—i.e., from movements for national liberation. These enormous tasks required an unprecedented "peacetime" expansion of the U.S. military establishment, and the upgrading of its ability to engage in unconventional and counterinsurgent warfare. As a result, the Pentagon found it prudent to maintain, and ultimately to expand, the military research network.

## THE INSTITUTIONALIZATION OF RESEARCH

The outstanding characteristic of university warfare laboratories—the concentration of scientific personnel under conditions of relative autonomy (and freedom from ordinary teaching responsibilities)—make them particularly attractive to the Pentagon as performers of military research work. University research centers have grown in importance in direct proportion to the increasing value placed on this country's "technical intellectual resources"—the scientists and engineers whose intellectual efforts lie at the root of all technological advancement. The increased value placed upon these human resources can be detected, according to the Stanford Research Institute (SRI), in the concern "expressed by many countries over the loss of their engineers and scientists through the 'brain drain,'" and in "the efforts of aerospace companies to sell their technical intellectual capability rather than their technology."<sup>2</sup>

Since there is a limited supply of this highly marketable commodity, the motivations, incentives and working conditions which determine the employment patterns of the technical workforce are matters of great concern to Pentagon research administrators—who naturally seek to employ the best minds available on any given project. Studies of the attitudes of professional research personnel indicate that *organizational* incentives (such as opportunity for advancement into management) and *material* incentives (higher salaries) are not closely related to technological productivity. In contrast, *professional* incentives (e.g., allowing the individual a high degree of freedom and flexibility in choosing his own work assignments in terms of what he feels will be professionally challenging) are "likely to be associated with higher levels of both professional and organizational productivity among scientists and engineers."<sup>3</sup> In one survey of work attitudes, research professionals indicated that they were highly motivated by the "opportunity to contribute to scientific knowledge," and by "association with other professionals of recognized ability," and were poorly motivated by "membership in a company producing reputable goods and essential services."<sup>4</sup> It is not hard to deduce from this data that

universities provide the environment most likely to assure high technological productivity. In confirmation of this view, Dr. Frederick Seitz, past President of the National Academy of Sciences, told a Senate committee in 1963 that:

... a certain fraction of the best minds find the type of freedom and flexibility peculiar to the university best suited for their work. In addition, the presence of many inquiring young minds in the formative period, particularly the research students, adds a particular freshness and vitality to research. I do not mean to say that excellent work is not done elsewhere... What is important is that any program which does not take maximum advantage of the capability of the university will not advance in the most effective way possible.<sup>5</sup>

This analysis has prompted the Defense Department to establish military research centers at selected universities, to enlist the help of university administrators in the creation of independent research organizations (as in the case of the Institute for Defense Analyses), and to offer financial incentives to universities which agree to adopt an existing facility (as witnessed in the University of Rochester's agreement to administer the Center for Naval Analyses). Where direct university participation has not proven feasible, the Pentagon has found it expedient to create a network of para-universities—*independent research organizations* which boast a "campus-like environment" and adhere to the many rituals of academic life (the most famous example of this kind of institution is the RAND Corporation). The network of non-profit research organizations identified in part 2 of this directory should be viewed, then, as an extension of the university world and not as a unique phenomenon.

In its postwar effort to reconstitute the military research network, the Pentagon was able to count on the enthusiastic cooperation of many university scientists and administrators. The causes of such cooperation are not hard to determine; for the first time in American history, scientist and academicians had come to enjoy positions of considerable prestige and influence in Washington. Experiments that would have been prohibitively expensive before the war now enjoyed abundant government financing. Moreover, the establishment of large research organizations had freed many professors from the restraints of conventional academic procedure and permitted them to pursue laboratory studies without being accountable to their colleagues in tradition-minded university departments. For some scientists—more interested in the application of their research to the "real world" of industry and national security than to the advancement of higher education—this development was most welcome. In a Senate speech on "The War and Its Effects," Sen. J. William Fulbright commented that, "Disappointing though it is, the adherence of the professors [to the military-industrial complex] is not greatly surprising. No less than businessmen, workers, and politicians, professors like money and influence. Having traditionally been deprived of both, they have welcomed the contracts and consultantships offered by the Military Establishment."<sup>6</sup>





The Cold War also provided a new impetus on the part of the universities to engage in defense work. Participation in military research not only provided the reward of being part of the "stirring events of the time," but also, in the feverish days of Cold War hysteria, constituted a demonstration of one's loyalty. Thus even in 1967, when a special faculty committee was established to examine Princeton's ties with the Institute for Defense Analyses (IDA), some professors argued that affiliation with IDA "symbolizes a choice by the University to integrate itself into the life of the nation . . . and to acknowledge its obligations to the defense of the society of which it is a part."<sup>7</sup>

For this combination of reasons, scores of semi-autonomous military research organizations were established by American universities in the postwar period. Some of these installations have come to enjoy a special relationship with the government as "Federal Contract Research Centers" (FCRC's), also known as Federally Funded Research and Development Center (FFRDC's). These institutions receive at least 70 percent of their income from Federal agencies, and work "under the direct monitorship of the Government." According to National Science Foundation nomenclature, FFRDC's are "organizational units associated with universities and colleges whose creation and operation are not primarily related to the main function of the administering universities and colleges."<sup>8</sup> FFRDC's receive a substantial portion of the Federal research-and-development (R&D) funds available to the university community: in fiscal 1967, university-administered FFRDC's received \$907.5 million from the government, compared with the \$1,324.1 million awarded directly to the universities for R&D activities.<sup>9</sup>

Even when not recognized as FFRDC's, campus research centers can be found on most university campuses.<sup>10</sup> Most of these institutions engage in research on military and space "hardware"—the mechanical equipment need to outfit an army or launch a space vehicle. Increasingly, however, such organizations are devoting their energies to the development of "software" systems—the mathematical and analytical models used in systems analysis, operations research, and related methodologies. University research centers have played an important role in the development of military software systems, and many of the organizations described in this directory—particularly the para-universities like RAND and IDA—have become noted for this kind of work. University social scientists, foreign area specialists, and educational researchers also found it profitable to establish autonomous research centers when the R&D budgets of non-military Federal agencies exploded in the 1960's. The development of foreign affairs research centers is documented in the State Department document reproduced later in this pamphlet. Gerard Piel discussed the growing proliferation of university-based software research institutes in a 1965 talk to the American Philosophical Society as follows:

The new science of "human engineering" at the "man-machine interface" has brought psychology into the circle of disciplines favored by the project contract/grant. Regional research institutes, organized at the primary initiative of the Department of State and the

great private foundations to illuminate hitherto dark regions on the world map, have brought sociology and anthropology into the ambience of the Department of Defense. Lately, even the humanists, who had previously been confined to such servile chores as consulting on official histories of the last war, have found more positive assignments in "area and language training for military personnel and studies of certain strategic peoples." With funds abounding for projects in every field of learning, the university campus has come to harbor a new kind of condottieri, mercenaries of science and scholarship hooded with doctorates and ready for hire on studies done to contract specification.<sup>11</sup>

## WAR RESEARCH IS GOOD BUSINESS

As Cold War defense appropriations soared, ambitious researchers—many of them associated with the Defense Department as consultants—were able to secure substantial research contracts from the government. Most of these contracts went to the autonomous research organizations like Michigan's Willow Run Laboratory and the Cornell Aeronautical Lab which could meet the Pentagon's strict security requirements. Today, some of these organizations enjoy the budget and facilities of a large university. The University of California, for instance, operates the Lawrence Radiation Laboratory and the Los Alamos Scientific Lab—installations which have a combined staff of 11,850 scientists, technicians and support personnel, and an annual operating budget, in 1968, of \$288 million (an amount that exceeds the higher education budget of most states). Many of the scientists associated with these institutions have been able to further augment their income by setting up defense-oriented "spin-off" companies which market the products developed in university laboratories.

In fact, as one penetrates further and further into the military research network, the more the distinction between academic and non-academic functions disappears. The trustee or administrator of a university research institute is more than likely the executive of a spin-off company located in the nearby industrial park, and at the same time a consultant to the Pentagon bureau which monitors contracts in his field of research. The independent "think-tanks" like RAND and IDA often act as middlemen in these consortia. Through such a system, the government can buy top scientific talent while by-passing low civil service salaries and avoiding accountability to Congress. Defense industry corporations, whose executives often dominate the boards of trustees of the research institutes and think-tanks, gain access to classified information and have the opportunity to "evaluate objectively" the projects they are trying to sell to the government. The universities, in return for their participation in the consortia, receive large research contracts and lucrative consulting fees for their professors. Examples of this arrangement can be found in most university communities, and are especially prevalent at the large research-oriented campuses like MIT, Stanford and Johns Hopkins.

The spirit of cooperation that unites the components of America's military research network is not surprising when one discovers that more often than not the universities themselves





are governed by men representing the corporations that stand to profit most from the university's research activities. An investigation of the board of trustees of almost any college or university will uncover at least one or two entrepreneurs associated with a major defense contractor—and in some cases the number will be considerably higher. Using Columbia University as an example, we find a total of five trustees who occupy positions of authority in the defense industry. Columbia trustees include William A.M. Burden and Maurice T. Moore, directors, respectively, of the Lockheed Aircraft Corporation and General Dynamics—the first and third largest Defense contractors in fiscal 1969. Burden is also President of the Institute for Defense Analyses, whose ties with Columbia helped sparked the 1968 student uprising at that university.<sup>12</sup>

The Massachusetts Institute of Technology has become so thoroughly linked to the Department of Defense that no fundamental changes can take place at the Institute without altering its corporate entity. MIT has, in fact, become fixed in the popular imagination as the very paradigm of university-military collaboration. This image is nurtured by the Institute itself: in 1966 MIT spokesman Edward B. Hanify told Cambridge residents at a public hearing that:

MIT it in the front rank of the forces of Science dedicated to the essential research which the Government of the United States considers indispensable to the National Defense. It is a scientific arsenal of democracy. From its halls and laboratories come the knowledge and technique, the brain power and the resources which contribute to our national survival in an era where the laboratories and technicians of our enemies work sleeplessly to outdistance us in the race to harness the latent secrets of nature as tools of their supremacy.<sup>13</sup>

All of the phenomena associated with the military research network are most pronounced here: of the top 75 Defense contractors in fiscal 1968, officers from 19 are represented on the MIT Corporation (the governing body of the Institute); if multiple directorships and memberships are taken into account, there are a total of 41 "crossovers" between MIT and these companies.

The extraordinary concentration of scientific and engineering talent at MIT—the "technical intellectual resources" described above—has inspired the formation of hundreds of research-oriented "spin-off" companies in the greater Boston area. (So many of these firms have located along Route 128, the circumferential highway that connects Boston's suburbs, that this phenomenon has come to be known as the "Route 128 Complex.") In order to understand the dynamics of the spin-off phenomenon, the National Aeronautics and Space Administration commissioned MIT's Sloan School of Management to conduct an investigation of the Route 128 Complex.<sup>14</sup> The Sloan project has identified a total of over 160 new companies formed by people who had been full-time employees of MIT. Some of these firms, like the ITEK Corporation and Teledyne, Inc., have become giant enterprises with thousands of employees and annual sales in the hundreds of millions of dollars. Also included among the spin-offs are a number of military research organizations that continue to maintain close ties with the Institute; of these, the foremost is the MITRE Corporation, set up by MIT in 1958 to take over work being done by the Institute's Lincoln Laboratory on the SAGE air-defense system.<sup>15</sup> (MITRE's Chairman is the same as that of the MIT Corporation: James Killian.)

The pattern of university-military-industrial cooperation evident at MIT can be detected at many other large universities, although naturally on a smaller scale. Thus an investigation of Columbia University, sparked by demonstrations against the university's affiliation with the Institute for Defense Analyses, revealed that the Director of Columbia's Electronic Research Laboratory (ERL), Lawrence O'Neill, had

served, simultaneously, as (a) a professor and associate dean of the Columbia School of Engineering; (b) head of ERL; (c) a consultant to the Department of Defense and IDA; and (d) an owner of the Federal Scientific Corporation, an R&D firm set up to market research performed at ERL.<sup>16</sup>

## THE WAR PROFESSORS

America's Fourth Armed Service, the military research network, is not represented on the Cabinet with its own Secretary; this Service, nevertheless, has its representatives at the highest levels of policy formation. In the past quarter-century the U.S. government has created a network of scientific advisory panels with the aim of opening up new lines of communication between the Pentagon and the R&D community. These panels, composed of some of the nation's outstanding scientists and engineers, provide the Defense Department with instantaneous access to the university scientific community when help or advice is needed on the development of new weapons systems.

A recent survey by *Armed Forces Journal* determined that there are some 105 defense R&D advisory boards and committees, of which the senior boards are: the Defense Science Board (DSB), Air Force Scientific Advisory Board (SAB), Army Scientific Advisory Panel (ASAP), and the Naval Research Advisory Committee (NRAC). Another 132 advisory boards are associated with other government departments. The whole scientific advisory complex is supervised by the President's Science Advisor, Dr. Lee A. DuBridge. As head of the President's Science Advisory Committee and of the Office of Science and Technology (part of the Executive Office of the President), Dr. DuBridge is in fact the Cabinet representative of the Fourth Armed Service.<sup>17</sup>

University scientists, according to a Stanford Research Institute report, supply a majority of the members of these panels (current members of the senior panels are identified below). Actually, most of the panelists have multiple associations with university, industry and non-profit organizations. Because these men are active in both the scientific and military communities, the advisory panels constitute the "infrastructure" of the military research network. Thus the Pentagon describes the function of the DSB as follows: "Through its membership of distinguished men representing industry, government and the academic world, the Defense Science Board serves as the connecting link between the Office of the Director of Defense Research and Engineering and the scientific and technical community of the United States."<sup>18</sup>

The Defense Science Board was established in 1956 "to advise the Secretary of Defense, through the Director of Defense Research and Engineering (DDR&E), on scientific and technical matters of interest to the Department of Defense." The Board was created in response to a recommendation of the Commission on Organization of the Executive Branch of the Government (Hoover Commission) that a committee be appointed to "canvass periodically the needs and opportunities presented by new scientific knowledge for radically new weapons systems."<sup>19</sup> The DSB consists of 28 members, eight of whom serve ex-officio as representatives of government R&D agencies or of the other military advisory panels.

The President's Science Advisory Committee (PSAC) originated as the Science Advisory Committee of the Office of Defense Mobilization. The PSAC was reconstituted as a presidential agency on Nov. 22, 1957, a few days after the Soviet Union launched its second satellite. *The New York Times* reported in 1968 that during the Eisenhower Administration, "the committee spent 90 percent of its time on secret military matters, chiefly missiles, space, and the first step toward a nuclear test ban."<sup>20</sup> Civilian work was given somewhat more emphasis under Presidents Kennedy and Johnson, but the current administration has chosen to reemphasize military concerns.



The oldest and largest of the Service panels, the Air Force Scientific Advisory Board (AFSAB), was established in 1944 to assist the Army Air Force, and reorganized in 1946 to "advise the Chief of Staff, U.S. Air Force, on all scientific/technical matters relevant to the mission of the Air Force."<sup>21</sup> The AFSAB is composed of some 75 members, who serve on one of nine sub-panels on such subjects as Nuclear Warfare, Aerospace Vehicles, and Missile Guidance and Control. The Naval Research Advisory Committee (NRAC) and Army Scientific Advisory Panel (ASAP) were founded in 1946 and

sity social scientists for U.S. counterinsurgency operations in that country.<sup>25</sup>

The basic function of the scientific advisory committees is set forth in Department of Defense (DoD) Directive 5030.13 of April 20, 1962, "Regulations for the Formulation and Use of Advisory Committees." According to the Directive, advisory committees are formed "to provide a means of obtaining advice, views, and recommendations of benefit to the operation of the Government from industrialists, businessmen, scientists, engineers, educators, and other public and private citizens whose experience and talents would not otherwise be available to DoD."<sup>26</sup> Specifically, the advisory panels provide essential services to the government by:

- informing the Pentagon of new scientific discoveries applicable to weapons development;
- finding the scientists best able to accomplish a specified research task;
- recruiting talented graduate students for careers in military research work; and
- providing a reservoir of scientific manpower available for work on crash military projects.

Activities of these panels are not normally publicized by the Defense Department or the participants themselves; nevertheless, it is sometimes possible to detect their influence. When former Defense Secretary Robert S. McNamara initiated a crash program to build an electronic anti-infiltration barrier across the Demilitarized Zone of Vietnam, he persuaded members of the DSB and the PSAC to head the effort.<sup>27</sup> The thorny problems of chemical and biological warfare (CBW) have been the subject of several studies by the advisory panels: Nobel laureate Dr. J.D. Watson told reporters from the *Washington Post* that he had served on a special CBW subcommittee of the PSAC from 1961 to 1964; members of the ASAP attended a meeting on CBW strategies at the Army's Edgewood, Md. Arsenal on Feb. 16-18, 1969.<sup>28</sup> The Vietnam war and its effects on military doctrine has not surprisingly been the subject of many research projects undertaken by the panels. Thus the 1967 Annual Report of IDA notes that "Jason continued work on technical problems of counterinsurgency warfare and systems studies with relevance to Vietnam."<sup>29</sup> These problems evidently had not been solved by the end of the 1960's, for in February 1970, Presidential Advisor Henry Kissinger met with officers of the PSAC to ask for help "in ferreting out problems and new approaches" to the Vietnam war effort.<sup>30</sup>

### RESEARCH VS. EDUCATION: THE CONFLICT IN PRIORITIES

In the summer of 1965, a subcommittee of the House Committee on Government Operations held a series of hearings on "Conflicts Between the Federal Research Programs and the Nation's Goals for Higher Education." The committee subsequently issued a report to the Congress in which it was argued that, "While both research and higher education share the common goals of extending scholarship and developing the intellectual resources of the Nation, the *immediate interests of one are not necessarily those of the other.*"<sup>31</sup> [Emphasis added.] Federal research programs, the committee explained, are designed to advance the nation's technological capabilities—particularly in the areas of defense, atomic energy and space—while our goals for higher education call for the maximization of opportunities for all Americans—regardless of race, nationality or income—to obtain a college education. On the basis of the testimony and reports it examined, the committee concluded that, "Our Federal research programs, on the one hand, and the Nation's goals for higher education, on the other, are in increasing conflict."<sup>32</sup>

1951, respectively, and perform the same duties for the research chiefs of their respective services.<sup>22</sup>

One non-governmental advisory group has come to occupy a particularly influential position in the military research network: the Jason Division of the Institute for Defense Analyses. Jason was established in 1958 with the encouragement of the Pentagon's Advanced Research Projects Agency (ARPA), which continues to provide financial support. The group consists of some 40 "outstanding university scientists who devote as much of their available time as possible to studies in the vanguard of the scientific aspects of defense problems."<sup>23</sup> In the first years of its existence, Jason members reportedly concentrated on "theoretical analyses of ballistic missile defense and exoatmospheric detonations." In 1964, however, "a new excursion was made. Increased Government attention to such problems as counterinsurgency, insurrection and infiltration led to the suggestion that Jason members might be able to provide fresh insights into problems that are not entirely in the realm of physical science."<sup>24</sup> As part of this "excursion," Jason in 1967 held a secret conference on Thailand with the intent of mobilizing univer-





The first conflict, according to the committee, "is in the present use of scarce manpower." We return, therefore, to the question of the utilization of America's technical intellectual resources: "scientists and engineers are indispensable to research and development. They are also indispensable as teachers in the expanding higher education system. Since their numbers cannot be greatly increased over the short run, too much diversion into the one means deprivation of the other." A second conflict arises between the present use of manpower resources and the need for investment in future manpower resources: "research demands *performance* now. . . . [whereas] education by its nature demands *investment* now in training young people so that the Nation can have the benefits of performance later."<sup>33</sup>

In its report, the House committee indicated that Federal expenditures on R&D grew at the rate of 20 percent per year in the period 1950-65, and concluded that "any demand on the economy, public or private, of the size of Federal spending for research and development [amounting to \$16 billion in 1965] is also a demand for manpower on a large scale."<sup>34</sup> Using National Science Foundation (NSF) figures, the committee estimated that two-thirds of all scientists and engineers engaged in R&D work were employed on Federally-funded projects. Since almost 90 percent of all Federal R&D funds are contributed by either the Department of Defense (\$7.3 billion in fiscal 1965), the National Aeronautics and Space Administration (\$5.4 billion), or the Atomic Energy Commission (\$1.5 billion), it is safe to assume that a majority of these scientists and engineers were committed to defense-related work. This diversion of scientific manpower to military work has meant that an inadequate number of qualified scientists are available for college teaching positions (particularly at the smaller colleges). Since the scientists engaged in defense R&D tend to become specialists in narrow fields of particular interest to the military, this diversion of manpower has also meant that when defense R&D spending is curtailed (as it was in 1969-1970), these scientists often lack the broad background that would enable them to switch into teaching work or non-military research.

The committee found the same kind of skewed priorities *inside* the universities:

Federal competition for scientific manpower has not stopped at the gates of colleges and universities. Of the \$16 billion in Federal Government obligations for research and development in fiscal 1965, about \$1.1 billion was farmed out directly to colleges and universities, and an additional \$700 million to research centers and laboratories operated by them. [The equivalent figures for fiscal 1968 are: \$1.4 billion for R&D at universities, and \$945 million for R&D at university-operated laboratories.] With these funds, constituting about 70 percent of all research funds received each year by educational institutions, and perhaps 15 percent of the Nation's total annual expenditures on higher education, the Federal Government reaches within the higher education system to claim a substantial share of the working time of college and university faculties, and a very high share of the time of science faculties.<sup>35</sup>

The consequences of this phenomenon are as obvious to the committee as they are to most other observers of university education: "colleges and universities have responded to Federal demands for research by channelling an increasing number of professional employees into research work, by reducing teaching time of research-performing faculty, and by offering such reductions as inducements to attract new faculty."<sup>36</sup> The resulting downgrading of undergraduate education—manifest in huge lecture classes and the use of poorly-qualified teaching personnel—has become a fact of life at every large university.

Federal research programs—concentrated as they are in the physical sciences—have created a deepening split between science and nonscience departments within the university. The government's priorities are eloquently expressed in the distribution of R&D funds: in fiscal years 1963, 1964, and 1965, the physical sciences received 68 to 69 percent of all Federal support of basic research; the life sciences, 26 to 28 percent; the social sciences, about 2 percent; and all other fields, less than 0.5 percent.<sup>37</sup> (The comparable figures for fiscal 1967 are: physical, environmental and engineering sciences, 60 percent; life sciences, 30 percent; social sciences, 3 percent; all other fields, 3.5 percent.<sup>38</sup>) The abundance of Federal funds for research in the physical sciences has naturally created vast imbalances within the university. Grants for summer research, consulting fees, and other extracurricular research work give a monetary advantage to the scientist. Following the 1969 student disorders at Harvard University, the campus newspaper published a "Report on the Future of the University," which contained the following warning:

A chasm is developing between science and non-science that is splitting many universities apart. Scientists have a high turnover rate; they participate less in university-wide decision-making. Their commitment is more to their research and whoever provides them with money to do that research than to whatever university they happen to be doing the research in. Data shows that the more research a faculty member does, the less time—by far—he spends on administrative duties. Scientists are becoming less and less members of the academic community.<sup>39</sup>

While this statement represents the biases of the non-scientist, it is a good indicator of the divisions that have occurred within the university community as a result of Federal programs.

The most conspicuous result of the conflicts between Federal research programs and the nation's goals for higher education is unquestionably the concentration of Federal funding in a small circle of what Clark Kerr calls "Federal grant universities." These favored schools receive up to 85 percent of their income from Federal research funds, and up to 100 percent of their research budget from this source. The number of such institutions is not large. Using fiscal year 1967 figures, we find that the top 100 recipients of Federal obligations for higher education received 69 percent (\$2,278 million) of all such funds, and 88 percent (\$1,166 million) of all Federal R&D funds. Fifteen universities alone captured 38 percent (\$507.9 million) of all R&D funds available directly to universities; these same fifteen schools received 49 percent (\$447.4 million) of Federal funds going to university-administered Federally Funded Research and Development Centers (FFRDC's). If one subtracts the funds going to FFRDC's administered by university consortia (e.g., the Argonne Universities Association, Oak Ridge Associated Universities), one discovers that these fifteen universities share 47 percent (\$955.3 million) of all Federal R&D funds going to universities and university-based FFRDC's, while another 2,100 universities must compete for the remaining 53 percent of Federal R&D funds.<sup>40</sup>

This pattern of concentration is even more pronounced in the distribution of defense/space/atomic energy R&D funds. In fiscal 1967, the Department of Defense awarded \$264.1 million in R&D funds to universities, the National Aeronautics and Space Administration awarded \$109 million, and the Atomic Energy Commission \$89.7 million (these figures exclude awards to FFRDC's). The top 100 recipients of Federal R&D expenditures received 89 percent of DoD funds, 94 percent of NASA funds, and 92 percent of AEC funds, while the top 15 universities received 52 percent, 39 percent, and 51 percent respectively of these funds. DoD/NASA/AEC



awards to university-administered FFRDC's are overwhelmingly concentrated in a few hands: five schools (CalTech, Stanford, California, Johns Hopkins, and MIT) administer 74 percent (\$647.9 million) of all such funds going to the FFRDC's. These same five schools share 25 percent (\$116.4 million) of DoD/NASA/AEC R&D funds going directly to the universities; their combined income from these agencies, then, is \$764.3 million, or 57 percent of \$1.3 billion annual outlay for military, space and atomic energy research at the universities.<sup>41</sup>

The favored status of the Federal grant universities, which can in most cases be traced back to World War II, has become a self-perpetuating phenomenon. The objective of federally-funded research, according to the House committee, "is the most research at the least costs." Since the government is most likely to entrust its R&D funds to scientists with considerable research experience, "the objective of buying research to the exclusion of other considerations will lead inexorably to the concentration of Federal research funds at the major universities." This system works as follows:

If proposals are judged on the basis of the previous research experience of investigators, scientists affiliated with major institutions will tend to be selected. Because of their lighter loads, they will have had greater opportunities to engage in research. Moreover, they will have had a more compelling experience record for, as senior investigators, they will have had previous grants accepted; or, as younger investigators, they will have had opportunities to work on projects headed by luminaries in the field.<sup>42</sup>

This principle operates even with non-military research programs: in fiscal 1967, for instance, the top 100 university recipients of Federal R&D obligations received 88 percent of all National Science Foundation research funds and the same percentage of Health, Education and Welfare Department funds.<sup>43</sup> As in the case of military research expenditures, a handful of big universities capture the lion's share of NSF funds—despite the fact that this agency is specifically charged to assist science education on a national scale.

The concentration of Federal R&D funds at a relatively small number of universities has created severe inequalities in the distribution of scientific resources in the nation's higher education system:

The pattern of concentration of research funds has meant a similar concentration of research opportunities and incentives for scientists and engineers. Favored universities have been able to attract and keep the best scientists and graduate students. Institutions not so favored have lost many of their ablest professors, and are unable to compete on equal terms for replacements. *Thus, the Federal research programs have not only made already strong institutions stronger. They have done so partly at the expense of the weak.*<sup>44</sup> [Emphasis added.]

The ability of top universities to attract the best scientists has in fact created a "brain drain" from poorer institutions—four-year colleges, junior and community colleges—and from certain sections of the country—Appalachia, the Deep South, the Plains and Mountain states. A 1965 survey of the top 25 recipients of R&D funds from key government agencies indicated that all were Ph.D.-granting institutions or advanced institutes of technology. With a few exceptions, all of these schools are located in the Northeast, Middle-Atlantic, Great Lakes, or Pacific Coast areas. Six states (Massachusetts, New York, Pennsylvania, Illinois, Michigan, and California) received 43 percent of all Federal funds going to universities and colleges in fiscal 1967, and Federal R&D expenditures at schools in these states were even more concentrated.<sup>45</sup>

## PROJECT THEMIS

Since many communities—not without justification—believe that research-oriented universities serve as magnets for advanced-technology industries seeking new locations, inequalities in the distribution of Federal R&D funds have frequently provoked criticism in the Congress. In 1966 and 1967, the Subcommittee on Government Research of the Senate Government Operations Committee held a series of hearings on the "Equitable Distribution of R&D Funds by Government Agencies," which were designed to allow witnesses from the "so-called have-not universities" in the "have-not areas" to testify on the effects of government R&D spending.<sup>46</sup>

The resulting testimony did not entirely fall on deaf ears: the Department of Defense, which relies upon the cooperation of key Southern Congressmen for its mammoth appropriations, in 1967 instituted Project THEMIS, "A Program to Strengthen the Nation's Academic Institutions." The project's ostensible goals were formidable:

Through Project THEMIS, the Department of Defense intends to meet part of its long-term research needs, strengthen more of the nation's universities, increase the number of institutions performing research of high quality and achieve a wider geographic distribution of research funds, and thus enhance the United States' academic capability in science and technology.<sup>47</sup>

Under the project, universities "not at present heavily involved in DoD-supported programs" would be awarded 50 percent of the costs of new research programs. Any project selected for funding by the Pentagon would have to demonstrate its relevance to the "Defense mission;" prospective applicants for such funds were warned that "THEMIS is not an 'institutional development program,' but rather a Department of Defense research program. There will be detailed annual technical reviews of the progress made by each THEMIS project. There is no guarantee of funding beyond the initial 3-year commitment." It was made abundantly clear that the Pentagon's motive in developing THEMIS was to expand the sources of technical intellectual resources that it could draw upon in future weapons programs:

[THEMIS-funded] programs should develop the potential of groups and individuals, including young faculty members, for research of high quality leading to results of significant value to Defense agencies and departments.

It is anticipated that, as a THEMIS research activity gains a higher degree of competence, it will become increasingly active in the regular research programs of the DoD and other agencies.<sup>48</sup>

It is questionable if THEMIS has had much effect on the present uneven distribution of Federal R&D funds. Only universities with doctoral programs in the sciences and engineering were eligible for THEMIS grants, and an examination of THEMIS funding (see Appendix) discloses many awards to universities which already enjoy substantial Federal support. Moreover, in 1970 the THEMIS program was reduced from \$20 million to \$12 million annually as a result of R&D cutbacks imposed by Congress.

## WAR MOBILIZATION AND THE UNIVERSITIES —AN ASSESSMENT OF THE CONSEQUENCES

At this point in our narrative, it is appropriate to draw some conclusions of the effects of university-military collaboration in the postwar era. The data presented above suggests that American colleges and universities have become divided



into two camps—with the big R&D performers on one side, and those with few R&D contracts on the other. As we have seen the large research-oriented universities are able to maintain their favored status by “bleeding off” the intellectual resources of less-favored schools. This process tends to perpetuate the underdeveloped condition of the “have-not” schools, which consist of women’s colleges, black colleges, four-year liberal arts colleges, state and municipal schools attended by working class and lower-middle class youth, agricultural schools, and other non-Ph.D. granting institutions. These schools lack adequate equipment and facilities, are unable to attract outstanding faculty members (particularly in the sciences), and cannot offer opportunities for faculty and students to engage in advanced research projects. These schools cannot, in sum, provide their students with a first-rate education.<sup>49</sup>

The big R&D-oriented universities are, of course, strong where the have-not schools are weak—they can boast ultra-modern facilities, star-studded faculties, multiple research opportunities. But by becoming dependent upon Federal research contracts for their operating expenses, these schools have lost any claim they might once have enjoyed to be called “independent centers of knowledge.” As we have seen, the patterns of cooperation between university R&D performers and Federal R&D consumers tends to become self-sustaining. This phenomenon is admirably summarized in this passage from the *Harvard Crimson’s* 1969 “Report on the Future of the University:”

The government, to a large degree, has created its own need for itself among the universities. It is not merely a case of the universities needing money and the government providing it; the government has built up large-scale scientific research as an almost totally new function for universities, a function that only the federal government can finance. . . .

As the sale of the research product became more and more profitable to universities (especially after Sputnik in 1957), the universities began to reorient their resources—and their own concept of their function—to be able to provide the product more easily. The universities developed a deep dependence on the government, which caused them to anticipate what the government wanted from them and brought them to believe the government’s interests were the same as their own.<sup>50</sup>

It is quite clear that by orienting its activities so as to anticipate the research needs of the government, the universities have by default neglected those areas of inquiry that might embarrass the government or threaten its prerogatives. This fact has been noted by many critics of the government-university relationship, including Sen. J. William Fulbright, who, in a major Senate speech on “The War and its Effects,” commented:

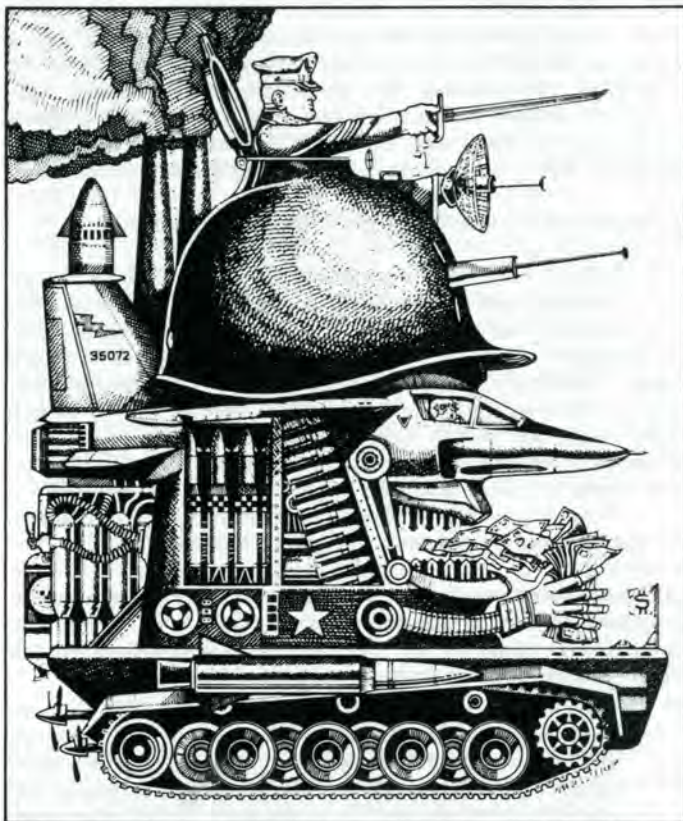
The universities might have formed an effective counterweight to the military-industrial complex by strengthening their emphasis on the traditional values of our democracy, but many of our leading universities have instead joined the monolith, adding greatly to its power and influence.<sup>51</sup>

Federal R&D funds do make some contribution to higher education, Fulbright conceded, but they do so at a price:

That price is the surrender of independence, the neglect of teaching, and the distortion of scholarship. A university which has become accustomed to the inflow of government funds is likely to emphasize activities which will attract those funds. These, unfortunately, do not include teaching undergraduates and the kind of scholarship which, though it may contribute to the sum of

human knowledge and to man’s understanding of himself, is not salable to the Defense Department or the CIA.<sup>52</sup>

Fulbright concluded that the current wave of student unrest is due not to inferior education but to “the student’s discovery of corruption in the one place . . . which might have been supposed to be immune from the corruptions of our age.” While one may not agree with the Senator that the universities are “the last citadels of moral and intellectual integrity” in this



country, we can hardly question his assertion that they are “lending themselves to ulterior and expedient ends,” i.e., have ‘sold out’ to the Military Establishment.

## MILITARY RESEARCH AND THE CAMPUS REVOLT

For the past two years, student opposition to university-conducted military research has been a major issue on campuses all over the country. Efforts by student radicals to “move beyond protest” in the struggle against U.S. intervention in Vietnam led to campaigns against local manifestations of the “War Machine”—ROTC, Armed Forces recruiters, Dow Chemical Company representatives, and military research projects. As campuses became mobilized behind concrete demands—“ROTC Off The Campus,” “No More War Research”—symbolic protests and vigils gave way to mass civil disobedience and ultimately to violence. Opposition to Columbia University’s membership in the Institute for Defense Analyses culminated in a strike which effectively paralyzed the school for two months. The Columbia action, which occurred in April and May of 1968, was followed a year later by a “spring offensive” against military research that led to sit-ins, strikes, and in some cases, violent confrontations with police, at many of the large research universities. Finally, the Cambodian invasion of April-May 1970 precipitated a nationwide wave of protests against war research and military ROTC training. These successive campaigns have produced a number



of conspicuous realignments in the military research network. Several prominent research centers have lost their university affiliation (American University's Center for Research in Social Systems, George Washington's Human Resources Research Office, MIT's Instrumentation Laboratory, and the Stanford Research Institute), and several others have been compelled to restrict their military research activities.

Because of the controversy which now surrounds the subject of university-military collaboration, it would be worthwhile to conclude this essay with a discussion of some of the questions which have arisen in the past few years as a result of the student revolt. Among the most frequently asked questions are: (1) Is university research *really* important to the Pentagon? (2) granting that *secret* research is "bad," why object to *unclassified* military research? (3) Has the campus revolt had any effect whatsoever on the functioning of the War Machine? Provisional answers to these questions appear below.

### 1. Is university research important to the Pentagon?

This question has been answered in the affirmative by the Pentagon itself on many occasions. When some conservative Congressmen recently proposed in budget hearings that the Pentagon terminate research contracts at universities which cancel classified contracts, the Director of Defense Research and Engineering, Dr. John S. Foster, Jr., replied that "I do not think that this would help us. We need their help. I am disappointed that we cannot get as much as they could give us, but I am grateful for that which they are willing to do."<sup>53</sup>

Over and over, the advocates of university participation in the Pentagon's research programs have argued that the advancement of weapons technology requires access to the intellectual resources of the academic community. Perhaps the strongest argument for university participation in military research was made by Lt. Gen Austin W. Betts, the Army's Chief of Research and Development, who stated:

Only our enemies could justify a position that says we should not have adequate military strength. To have an adequate military posture, we must apply the most advanced technology to our weapons and equipment. To stay abreast of advances in technology, the military must be intimately involved in the support of research. *The citadels of research are the universities. It would be a national disaster if they could not make an appropriate contribution to our national strength.*<sup>54</sup> [Emphasis added.]

At this point, it is appropriate to emphasize that this university-Pentagon partnership was not created exclusively by and for the military; on the contrary, it is clear that many members of the university community actively sought out and cultivated such ties. In a revealing talk on Defense Department support of academic research, Dr. Foster indicated that "we receive far more proposals [for such research] than we can fund. In fact, every year—including this year [1969]—we receive requests for funds six to eight times greater than our budget for the R&D considered appropriate for academic effort."<sup>55</sup>

### 2. Why object to classified research?

In the past two years, several prominent universities, including Penn and Columbia, have adopted regulations barring the performance of classified research on their campuses. When some activists proposed a ban on *all* Pentagon contracts, most administrators and senior faculty members sought to distinguish between secret research, which was "bad," and unclassified research, which could not be banned without infringing upon an investigator's right to "pursue knowledge wherever it may lie." This argument holds that the major objection to secret research is its restriction on the

publication of any findings which result from a given research project; what's at stake here, then, is a concern with "academic freedom"—and not with the uses to which American military technology is ultimately put. Since classified research in fact, constitutes only four percent of all Pentagon-financed studies performed by universities<sup>56</sup> (excluding research performed by the Federally Funded Research and Development Centers), the question of the *uses* of knowledge, rather than of its publishability, is the paramount one facing the university community.

The function of the military establishment is to wage war; constitutional and Congressional restraints prohibit the Pentagon from engaging in any activities which do not contribute to the national defense. Since most unclassified research projects call for basic research with no apparent relationship to military problems, defenders of such projects usually imply that the Defense Department is performing a "public service" by financing research that would not otherwise receive support. But the Pentagon eschews such an interpretation of its role; thus General Betts wrote in 1968 that:

Generally, it has been our experience that those in universities who work under contract to the Army on basic research are sincerely and positively dedicated to one goal, that is, the pursuit of knowledge. They should understand, and most of them fully recognize the fact, *that the knowledge may and probably will be used to strengthen our military posture.*<sup>57</sup> [Emphasis added.]

The ultimate military utilization of any research effort may not be immediately apparent—but Pentagon sponsorship implies that someone in the Department of Defense believes that it will be useful to the military in some fashion. "The university laboratories," Dr. Foster explained, are "involved in basic research designed to deepen our scientific insights into fundamental problems that impede progress in key areas of defense technology."<sup>58</sup>

In 1967, a campaign against chemical and biological warfare research at the University of Pennsylvania led to the demand that Penn refuse classified research projects. When questioned about this episode at a Congressional hearing, Dr. Foster argued that no sanction be taken against the university if it adopted such a stand; to defend his position, Foster produced a list of 41 unclassified research projects being conducted by Penn that he maintained fulfilled the Pentagon's need for research "into fundamental problems that impede progress in key areas of defense technology."<sup>59</sup> The nation's highest military research official concluded:

Most of the value of university research work is in the unclassified area. I do not want to minimize in any way the classified work that is performed by these institutions. Nevertheless, *I believe the most important part is the basic unclassified work performed by the universities.*<sup>60</sup> [Emphasis added.]

If our opposition to military research stems from an abhorrence of U.S. foreign and military policies (with their implied goal of an expanding U.S. world empire), we cannot perpetuate the artificial distinction between classified and unclassified research.

### 3. Has the campus revolt had any effect on the War Machine?

It has been argued here that the most important military function of the university is the production, and concentration in useful form, of what has been called "technical intellectual resources." A Stanford Research Institute study summarized this function as follows: "The university is a major performer of defense R&D; a supplier of advisers and consultants to defense R&D agencies; a producer of the technical professional workforce that is the prime production factor in the many



government, non-profit, industrial, and academic laboratories that produce defense R&D; and a provider of continuing, updating education to the defense R&D workforce."<sup>61</sup>

Any evaluation of the movement against war research would have to conclude that the only measurable results achieved by the campus revolt have been confined to the first role identified by SRI, i.e., the production of defense R&D directly by the universities. Some universities have placed bans on secret research or otherwise objectionable projects (e.g., work on chemical and biological warfare), and some research institutes have been severed from their parent university. No limitations, however, have been placed on any of the other defense R&D roles performed by the university. It is questionable, moreover, whether any of the actions taken by the university have had any effect on the day-to-day functioning of the Fourth Armed Service: non-university research organizations have been found to assume responsibility for projects abandoned by the universities, and institutes that have lost their university sponsorship are fully capable of continuing work on their own. Thus even the institutional measures adopted by the universities to divest themselves of defense R&D work will not substantially alter the composition of the military research network; the cohesion of this network, after

sources. If America's outstanding scientists and engineers are persuaded to abandon military work, the Fourth Armed Service would be seriously impeded from carrying out its responsibilities. And if young scientists and graduate students eschew a career in those fields which are closely tied to "defense technologies," the impediment will be of a lasting nature.

In a guest article in *The New York Times*, Dr. Foster clearly revealed that the Pentagon is concerned by the growing alienation of young scientists from military research work. This phenomenon received national attention on March 4, 1969, when thousands of scientists participated in a one-day research strike to "protest the misuse of technology and the complicity of the scientific and technological community with the growing power and influence of the military-industrial complex." On the positive side, the strike was called to encourage scientists to seek "means for turning research applications away from the presnet overemphasis on military technology towards the solution of pressing environmental and social problems." Participants in the March 4th strike at MIT heard an impassioned plea from Harvard biologist George Wald for nothing more than "a reasonable chance to live, to work out our destiny in peace and decency." Wald, a Nobel laureate, told an appreciative audience that while "our government has become preoccupied with death, with the business of killing and being killed," the business of scientists "is with life, not death."<sup>62</sup> Recognizing that these arguments constitute a dangerous challenge to the morale and discipline of the troops under his command, Foster felt compelled to respond on a moral plane to the anti-military campaign:

Today the spirit and vigor [which created this country] often appear in the form of youth "revolution"—a tenacious and sometimes violent insistence on "relevance," . . . an unrelenting protest against affronts to the quality of life.

The theme of these young people is valid—our talents and our physical resources should be directed primarily toward enhancing the quality of life. . . . Unhappily, one compelling attribute of the current era, the end of which is not in sight, is the fact and prospect of war. Security from external threat to our nation is a prerequisite, therefore, to the improvement of the quality of life. . . .<sup>63</sup>

Lurking in the background, then, are the faded imperatives of the Cold War; from this perspective, "Research in areas of interest to defense is not in itself immoral. But to deny others the right to pursue defense research and to find alternatives for the common defense is, in my judgment, immoral."<sup>64</sup>

There is of course no way to determine who is being most persuasive in this struggle for the loyalties of young scientists. Nevertheless, there is some indication that the Pentagon will not, as in the past, be able to choose at random among the brightest minds in the nation when lining up staff for important research projects. Disenchantment with the military orientation of the "Science Establishment" was clearly visible at 1969 and 1970 meetings of the American Physical Society and the American Association for the Advancement of Science, where activists shattered the normally placid atmosphere of the proceedings to challenge those who unquestioningly accepted the present utilization of scientific resources. ("Our job as scientists," one protestor shouted, "is to see that science resources benefit the people.") At MIT, the Science Action Coordinating Committee, sponsor of the March 4th research strike, has succeeded in winning a pledge from the Institute's administration to seek non-military financing for MIT's defense-oriented Special Laboratories. More portentous, perhaps, are recent press accounts of young scientists who have quit defense research to work on environmental problems—or who quit science altogether to become full-time political activists.



all, depends not so much on formal arrangements as on its ability to funnel information to the Pentagon and money back to the research performers—a process which goes on unabated.

If any results have been achieved at all by the campus protest movement, they would have to be manifest in the most fundamental area of all: the attitudes and loyalties of the people who comprise the nation's technical intellectual re-



The Pentagon is well aware that it can shift university research projects to "less competent but more 'cooperative'" private research organizations. To do so, Dr. Foster argues, would be "a great disservice to the nation." In final confirmation of the analysis that has been presented here, Dr. Foster argued that:

It would be an even graver disservice to the nation to bar defense-related research from all campuses, as advocated by some. National security requires nothing less than the best research talent offered.

The Federal Government must be free to enlist those talents wherever they are found—and they flourish particularly in the university community.<sup>65</sup>

## FOOTNOTES

**NOTE ON METHODOLOGY:** For a comprehensive guide to information sources on military research organizations and activities, see the **NACLA Research Methodology Guide**, available for \$1.00 plus 25¢ postage from NACLA.

1. U.S. House of Representatives, Committee on Government Operations, *Conflicts Between the Federal Research Programs and the Nation's Goals for Higher Education*. Responses from the Academic and Other Interested Communities to an Inquiry by the Research and Technical Programs Subcommittee, 89th Congress, 1st Ses., (Washington, D.C.: U.S. Government Printing Office, 1965), p. 362. (Hereinafter cited as *Responses*.)
2. Albert Shapero, Kendall D. Moll, Robert A. Hemmes, and Richard P. Howell, *The Role of the University in Defense R&D* (Menlo Park, Calif.: Stanford Research Institute, 1966), p. 10. (Hereinafter cited as *Role of the University*.)
3. *Ibid.*, p. 14.
4. *Ibid.*
5. See U.S. Senate, Committee on Aeronautics and Space Science, *Scientists' Testimony on Space Goals, 88th Cong., 1st Ses., 1963*. Cited in *Role of the University*, p. 13.
6. *Congressional Record—Senate* (Dec. 13, 1967), p. S18485.
7. Princeton University, *Report of the Majority of the Special Committee to Examine Princeton's Relationship to the Institute for Defense Analysis*, p. 13.
8. National Science Foundation, *Federal Support to Universities and Colleges, Fiscal Year 1967* (Washington, D.C.: National Science Foundation, 1969), p. 45. (Hereinafter cited as *Federal Support FY67*.)
9. *Ibid.*, pp. 36-7.
10. Most campus research centers are identified in A.M. Palmer and A.T. Kruzas, Eds., *Research Centers Directory*, 2nd Ed. (Detroit: Gale Research Co. 1966). Foreign affairs research centers are identified in *University Centers of Foreign Affairs Research* (Washington, D.C.: U.S. Department of State, 1968).
11. *Responses*, p. 369.
12. For a thorough discussion of Columbia power structure, see *Who Rules Columbia?* (New York: North American Congress on Latin America, 1968).
13. As reported in the *Boston Herald-Traveler* (Feb. 21, 1966).
14. While the spin-off phenomenon is most conspicuous at MIT, it can be detected at many other large research-oriented universities. The Stanford Research Institute has identified 16 spin-offs from Stanford University in the Palo Alto Area; another 16 spin-offs have been traced to the University of Michigan, and six to the University of Minnesota. See *Role of the University*, pp. 96-102.
15. For carefully-documented discussions of the "Route 128 Phenomenon," see E.B. Roberts and H.A. Wainer, "New Enterprises on Route 128," *Science Journal* (Dec., 1968), 78-83; and "MIT and Military Capitalism," *Science Action Coordinating Committee Newsletter* (Sept. 17, 1969).
16. For a description of the "Columbia University Defense Establishment," see *Who Rules Columbia?*
17. Brooke Nihart, "Science Advisory Boards: Bargain or Boondoggle?," *Armed Forces Journal* (March 7, 1970), 18-24.
18. Office of the Director of Defense Research and Engineering, *Organization and Purpose of the Defense Science Board* (April 1, 1968).
19. *Ibid.*
20. *The New York Times* (Feb. 20, 1968).
21. *Role of the University*, Table A-1.
22. *Ibid.*
23. Institute for Defense Analyses, *Annual Report* (1964).
24. Institute for Defense Analyses, *Annual Report* (1966).
25. As disclosed in the *Student Mobilizer* (April 2, 1970), published by the Student Mobilization Committee to End the War in Vietnam.
26. As cited in Nihart, "Science Advisory Boards," p. 19.
27. *Washington Post* (Oct. 25, 1968).
28. *Army Research and Development Newsmagazine* (April, 1968).
29. Institute for Defense Analyses, *Annual Report* (1967).
30. *Armed Forces Journal* (Feb. 14, 1970).
31. U.S. House of Representatives, Committee on Government Operations, *Conflicts Between the Federal Research Programs and the Nation's Goals for Higher Education*. Report, 89th Cong., 1st Ses. (Washington, D.C.: U.S. Government Printing Office, 1965), p. 1. (Hereinafter cited as *Conflicts*.) This report should not be confused with the collection of *Responses*, which has the same title (see note 1).
32. *Ibid.*
33. *Ibid.*, pp. 1-2.
34. *Ibid.*, p. 15.
35. *Ibid.*, p. 17.
36. *Ibid.*, pp. 17-18.
37. *Ibid.*, p. 55.
38. National Science Foundation, *Federal Funds for Research, Development, and Other Scientific Activities, Fiscal Years 1967, 1968, and 1969* (Washington, D.C., 1968).
39. James K. Glassman, "A Report on the Future of the University," *Harvard Crimson* (May 7, 1969).
40. *Federal Support FY67*, pp. 24-5, 31-3, 36-7.
41. *Ibid.*, pp. 31-3.
42. *Conflicts*, pp. 43-4.
43. *Federal Support FY67*, pp. 31-3.
44. *Conflicts*, p. 31.
45. *Federal Support FY67*, pp. 17-18.
46. U.S. Senate, Committee on Government Operations, Subcommittee on Government Research, *Equitable Distribution of R&D Funds by Government Agencies*. Hearings, 90th Cong., 1st Ses., May 10, 11, 17 and 18, 1967 (Washington, D.C.: U.S. Government Printing Office, 1967).
47. Office of the Director of Defense Research and Engineering, *Project THEMIS* (Washington, D.C., Nov., 1967), p. iii.
48. *Ibid.*, pp. 1-7.
49. One should not conclude from this assessment that "have-not" schools do not make any contribution to the War Machine. In fact, many of these schools—particularly state and municipal colleges—are major suppliers of Army officers through the ROTC program. Other schools provide trained manpower for local defense industries. The division of American colleges into two camps is not the result only of disproportionate support for one side but rather represents a conscious need for a hierarchy of services which include the training function of have-not schools.
50. Glassman, "Report on the Future of the University."
51. *Congressional Record—Senate* (Dec. 13, 1967), p. S18485.
52. *Ibid.*
53. U.S. House of Representatives, Committee on Appropriations, Subcommittee, *Department of Defense Appropriations for 1968*. Hearings, 90th Cong., 1st Ses., Part 3, p. 90. (Hereinafter cited as *Appropriations 1968*.)
54. Lt. Gen. Austin W. Betts, address to the Armed Forces Communications-Electronics Association, as published in *Army Research and Development Newsmagazine* (Nov., 1968).
55. John S. Foster, Jr., address to the American Nuclear Society, as published in *Army Research and Development Newsmagazine* (Aug.-Sept., 1969).
56. *Ibid.*
57. Betts, in *Army Research and Development Newsmagazine* (Nov., 1968).
58. *Appropriations 1968*, p. 25.
59. *Ibid.*, pp. 90-91.
60. *Ibid.*, p. 93.
61. *The Role of the University*, pp. 3-4.
62. As reported in the *Boston Globe* (March 8, 1969).
63. John S. Foster, Jr., "Defense Role of U.S. Colleges," *The New York Times* (Jan. 12, 1970).
64. *Ibid.*
65. *Ibid.*



# Part I: A DIRECTORY OF MILITARY RESEARCH ORGANIZATIONS

## 1. The University Research Network

### UNIVERSITY OF ALASKA NAVAL ARCTIC RESEARCH LABORATORY

The Naval Arctic Research Laboratory (NARL) is an ongoing research program operated by the University of Alaska under contract to the Office of Naval Research. NARL maintains permanent research facilities at Point Barrow, Alaska, as well as temporary field camps in selected Arctic environments. In addition, the Lab operates two floating ice-island research stations. The Navy's contribution to this effort amounts to some \$1.25 million annually.

NARL's responsibility to the Navy includes research "on every parameter of the Arctic environment," including studies of Arctic botany and zoology, oceanography and geology, meteorology and ionospheric physics. The University also conducts experimental studies of auroral phenomena using rocket-borne instruments.

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### AMERICAN UNIVERSITY CENTER FOR RESEARCH IN SOCIAL SYSTEMS

The Center for Research in Social Systems (CRESS) is an integral unit of American University operated under contract with the Army Research Office. CRESS is the Federal Contract Research Center (FCRC) responsible for social science research relevant to military operations in the area of counterinsurgency, psychological warfare, and military civic action. The Center received \$1.9 million in defense contracts for its activities as an FCRC in 1967.\*

Founded in 1956 as the Special Operations Research Office (SORO), CRESS was reorganized in 1966 following disclosures of its participation in the notorious Project Camelot. CRESS presently incorporates two divisions: the Cultural Information Analysis Center (CINFAC), and the Social Science Research Institute (SSRI). CINFAC (known as the Counterinsurgency Information Analysis Center in pre-Camelot times) is the Department of Defense Information Analysis Center responsible for collecting, analyzing and disseminating social science data relevant to U.S. counterinsurgency operations in the underdeveloped nations. SSRI conducts long-range studies aimed at improving the effectiveness of U.S. military personnel attached as advisors to the armed forces of other countries. CRESS also prepares the Army Intercultural Communication Guides (otherwise known as Psychological Warfare Handbooks) for Third World areas.

CRESS activities related to the U.S. war effort in Vietnam have included the preparation of propaganda and psychological warfare materials for the successive rural pacification programs, an investigation of the potential utilization in counterinsurgency of the minority groups of South Vietnam, and an evaluation of the civic action program of the U.S. Special Forces ("green berets").

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\*After a number of student demonstrations, American University decided in May, 1969 to divest itself of CRESS. Subsequently, on Dec. 5, 1969, CRESS announced its separation from AU and its affiliation with the American Institutes for Research (AIR), a non-profit organization based in Pittsburgh.



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UNIVERSITY OF CALIFORNIA  
LOS ALAMOS SCIENTIFIC LABORATORY

The Los Alamos Scientific Laboratory (LASL), birthplace of the atomic bomb, is an integral unit of the Atomic Energy Commission (AEC) operated by the University of California. Established in 1943 as part of the Manhattan Project, Los Alamos currently has a staff of some 3,750 scientists, technicians and security personnel. The Lab's facilities in Los Alamos, N.M., represent an investment by the AEC of over \$228 million; the operating cost of the installation in fiscal year 1966 amounted to \$97 million. In addition to the New Mexico facility, LASL maintains a \$17 million laboratory at the Jackass Flats, Nev. Nuclear Rocket Development Station.\*

LASL describes its principal activities as "research and development programs relating to nuclear and thermonuclear weapons, use of nuclear energy for production of power and for rocket propulsion, and controlled release of thermonuclear energy and thermionic conversion." Los Alamos is in fact the nation's foremost center for nuclear weapons research; about 90 percent of all fission and fusion warheads stockpiled by the U.S. were developed at the Lab. Since the ban on the atmospheric testing of nuclear devices took effect, LASL has had to confine its weapons tests to underground detonations.

UNIVERSITY OF CALIFORNIA  
LAWRENCE RADIATION LABORATORY

The Lawrence Radiation Laboratory has remained an integral unit of the University of California since its founding in 1936; at present, however, the Lab is operated under a contract with the Atomic Energy Commission. During the Second World War the Lab was incorporated into the Manhattan Project, and was utilized for Ernest O. Lawrence's experiments on the electromagnetic process for U-235 separation. Situated on a hill overlooking Cal's Berkeley campus, the Lab currently occupies facilities worth over \$100 million and supports a staff of 3,150 scientists and technicians. Lawrence also maintains a \$9.5 million laboratory in Mercury, Nev., adjacent to the AEC's Nevada Test Site (where underground nuclear tests are conducted).

Under the direction of founder Ernest Lawrence, the Lab has pioneered in research on high energy physics using successively more powerful cyclotrons. In addition to its program of basic scientific studies, Lawrence conducts classified research as part of the AEC's weapons development program. The Lab also supervises the research program and operation of the Livermore Radiation Laboratory (see below). The combined operating expenditures of

\*in a report made public on April 22, 1970, a University-wide faculty committee recommended that Los Alamos and the Livermore Radiation Lab come under closer university supervision. The committee noted that "Aside from trivia...the presence of the University of California is in no way manifest either at Livermore or at Los Alamos." California's contracts with the AEC expire on Sept. 30, 1972, and new administrative arrangements may be enacted at that time.



Cal's Lawrence and Livermore facilities amounts to a staggering \$151 million annually--a figure greater than the total endowment of most colleges and universities.

The Livermore Radiation Laboratory, located in Livermore, Cal., is an integral unit of the Lawrence Radiation Lab supported by the AEC. In addition to its main laboratory, the Lab maintains research facilities at Coral Hollow in the San Joaquin Valley and at the AEC's Nevada Test Site. The combined value of Livermore's facilities represent an investment of \$175 million by the AEC. Livermore describes its major activities as research on "nuclear weapons, nuclear ramjet propulsion reactors, controlled thermonuclear reactions and biomedicine."

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UNIVERSITY OF CALIFORNIA  
NAVAL BIOLOGICAL LABORATORY

The U.S. Naval Biological Laboratory (NBL) is an integral unit of the University of California School of Public Health operated under contract with the Office of Naval Research. Located behind barbed wire at the Oakland, Cal., Naval Supply Depot, NBL supports a staff of some 100 university scientists and Naval security personnel. The Lab's principal fields of research are microbiology and aerobiology (the study of airborne infectious diseases).

There has been persistent speculation that NBL is engaged in research on chemical and biological warfare (CBW). When these suspicions were first raised by Ramparts in 1967, NBL officials evaded questions on the military application of their work. There is considerable evidence, however, that the Lab's research on aerobiology is directly related to the development of biological weapons. NBL holds an ongoing contract from the Army's CBW laboratories at Fort Detrick, Md., for research on the performance of biological agents disseminated in aerosol form.

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COLUMBIA UNIVERSITY  
LAMONT GEOLOGICAL OBSERVATORY

Established in 1949, the Lamont Geological Observatory was named for the man who contributed its founding grant, Thomas J. Lamont, the late Chairman of the Board of J. P. Morgan & Co. Operated by Columbia's Department of Geology, the Observatory has its own 150 acre campus at Palisades, N.Y. Lamont also maintains a field station in Bermuda, some seismic field stations in Africa, and a permanent seismographic installation at Punta Arenas, Cal. Lamont's principal fields of research include earthquake seismology, marine geophysics and oceanography.

Although most of Lamont's staff is engaged in basic scientific research, a major share of the Observatory's budget is derived from Defense Department contracts for classified studies of the detection of underground nuclear explosions. This effort, which earns Lamont about \$4.5 million annually, is part of the VELA-UNIFORM program of the Advanced Projects Research Agency.\*

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CORNELL UNIVERSITY  
CORNELL AERONAUTICAL LABORATORY

The Cornell Aeronautical Laboratory (CAL) was founded in 1946 when Cornell University inherited a war-surplus wind tunnel located

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\*Most of the classified research at Lamont is being phased out in response to a faculty committee's recommendation that Columbia terminate all secret projects.



near the Buffalo, N.Y., airport. Since then CAL has evolved into a diversified research organization with a staff of 800 and an annual operating budget of about \$20 million. In its promotional literature, CAL describes itself as a "financially independent, non profit wholly owned subsidiary of Cornell University." University representation on CAL's Board includes President James A. Perkins, Vice President Franklin A. Long, and several other top officials.

Late in 1967, faculty opposition to CAL's war-oriented research forced the University to seek a disengagement from the Laboratory. In September 1968, Cornell announced that it would sell CAL to E.D.P. Technology, Inc., for \$25 million. Employees of the Laboratory immediately took legal action to block the sale, and on Jan. 3, 1969, a New York State Supreme Court Justice issued a temporary injunction to halt action on the sale. Final determination of the case will undoubtedly be left to higher courts.\*

CAL's primary interest, as its name suggests, is aerodynamics and space technology. Many U.S. aircraft and missiles have received preliminary testing in CAL's wind tunnels and flight simulation laboratories. The Lab's transonic wind tunnel was recently used to evaluate the F-111 interceptor and the C-5A military transport. In 1967 CAL received defense contracts worth a total of \$17.1 million.

A major CAL activity has been research on chemical and biological warfare (CBW) and incendiary weapons. As subcontractor to the University of Pennsylvania, CAL participated in the notorious Spicerack and Summit projects. The Lab currently receives some \$1 million annually from the Army's CBW headquarters at the Edgewood, Md., Arsenal for research on CBW technology. The Edgewood Arsenal is also sponsor of a CAL project on the "Assessment of Flame and Incendiary Munitions Effects." Known by the code-name "Project Heatwave," this effort will include studies on the effectiveness of new "incendiary gels"--i.e., napalm.

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#### UNIVERSITY OF DAYTON RESEARCH FOUNDATION

The University of Dayton Research Foundation was founded in 1956 to administer research contracts held by members of the faculty and staff of the University. In fiscal year 1967, the Foundation processed defense contracts worth a total of \$3.8 million--most of which originated at nearby Wright-Patterson Air Force Base.

Dayton's activities for Wright-Patterson include maintenance of a Materials Documents Retrieval System at the base, and related research on the properties and structures of selected metals, alloys and ceramics. Specialized studies for the Air Force include research on "Antenna techniques for active and passive electromagnetic warfare," and a \$150,000 project entitled "Safe delivery and escape from the effects of nuclear weapons."

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#### GEORGE WASHINGTON UNIVERSITY HUMAN RESOURCES RESEARCH OFFICE

The Human Resources Research Office (HumRRO) is an integral unit of the George Washington University operated under contract with the U.S. Army. Established by George Washington in 1951, HumRRO is the Federal Contract Research Center (FCRC) responsible for the development of methods to improve the training of the U.S. soldier, and for behavioral science research on motivation, leader-

\*On March 4, 1970, the State Supreme Court of New York issued a permanent injunction barring Cornell from selling CAL to EDP. The decision is currently being appealed.



ship, and "man/weapon systems." As a function of the Army's human factors research program, HumRRO is funded almost exclusively by the Department of Defense; HumRRO currently operates on an annual budget of \$3.3 million.\*

HumRRO's administrative headquarters is located in Alexandria, Va.; most of its seven research divisions are located at regular Army bases, however. The divisions are: No. 1, Systems Operations (Alexandria, Va.); No. 2, Armor (Fort Knox, Ky.); No. 3, Recruit Training (The Presidio, Monterey, Cal.); No. 4, Infantry (Fort Benning, Ga.); No. 5, Air Defense (Fort Bliss, Tex.); No. 6, Aviation (Fort Rucker, Ala.); and No. 7, Language and Area Training (Alexandria, Va.).

A HumRRO activity of particular interest to many college students is project ROCOM: Development of Methods and Techniques for Improving the Output of ROTC. The "output," in this case, consists of the students enrolled in the Army Reserve Officers Training Corps. HumRRO furnishes the guidelines for ROTC training in a document entitled Training Requirements for the General Military Science Curriculum of the Army ROTC Program.

HumRRO's Division No. 7 (Language and Area Training) is the principal agency concerned with the development of training programs for U.S. military personnel attached to foreign military forces as advisors. HumRRO programs in this area include: "Development of Guidelines for Training Personnel for Military Advisory Duties," and "Guidelines for Civic Action Advisors."

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JOHNS HOPKINS UNIVERSITY  
APPLIED PHYSICS LABORATORY

The Applied Physics Laboratory (APL) is an integral unit of the Johns Hopkins University operated under contract to the Naval Ordnance Systems Command. Founded in 1942, APL is a Federal Contract Research Center (FCRC) with a staff of some 2,500 scientists, technicians and administrative personnel. In recent testimony to the Senate Armed Services Committee, APL's activities as an FCRC were described as research, development, test and evaluation work "in the areas of surface missile systems, space systems, ballistic missiles systems, advanced propulsion systems and their subsidiary technologies." In fiscal year 1968 APL received an estimated \$43.4 million for these services. The Lab maintains its own 350 acre campus in Howard County, Md.

APL's achievements in the area "complete missile design" include development of the Navy's "Three-T" missiles, Terrier, Tartar

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\*Following a series of student demonstrations, George Washington announced in May, 1969 that it would divest itself of HumRRO. Subsequently, in October, 1969, HumRRO (now known as the Human Resources Research Organization) became an independent non-profit corporation with its own Board of Trustees.



and Talos. APL is presently developing more sophisticated Navy missiles under Project Bumblebee (APL's contract for this project alone is worth over \$10 million annually).

Johns Hopkins boasts that there are already "30 APL satellites circling the earth," and that "more satellites will follow." The most recent addition to this family is the GEOS-A geodetic satellite. Of particular interest to the Navy pilots who fly regular bombing missions against North Vietnam is APL's "Oscar" satellite, otherwise known as the Navy Navigation Satellite. Oscar is used for precise determination of the location of aircraft carriers in the Tonkin Gulf.

Another APL activity is maintenance of the Chemical Propulsion Information Agency, the Department of Defense Information Analysis Center responsible for collecting, analyzing and distributing information on rocket propellants. The Agency provides technical assistance to the Pentagon's Interagency Chemical Rocket Propulsion Group.

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ILLINOIS INSTITUTE OF TECHNOLOGY  
IIT RESEARCH INSTITUTE

The Illinois Institute of Technology Research Institute (IITRI) was founded in 1936 as the Armour Research Foundation. IITRI is a separately incorporated research organization affiliated with and under the control of the Illinois Institute of Technology. IIT itself was organized in 1940 through the merger of the Armour Institute of Technology (founded in 1892 by Philip Danforth Armour) and the Lewis Institute.

IITRI's principal activity is the performance of contract research for industry in technical areas of physical sciences, product development and management. The Institute occupies six modern laboratory structures located on IIT's campus in Chicago's South Side, not far from the Union Stockyards where Philip Armour made his fortune in the meat-packing business. IITRI's annual volume of research now exceeds \$28 million; of this amount, some \$13.5 million represents Defense Department contracts.

IITRI's activities are highly diversified: current projects include studies in the areas of metallurgy, automated production, chemical engineering and life sciences. IITRI's services for the Defense Department include operation of the Electromagnetic Compatibility Analysis Center under a contract with the Electronics Systems Division of the Air Force Systems Command. Another IITRI unit, the Law Enforcement Science and Technology Center, is co-sponsor with the U.S. Justice Department of the annual Symposium on Science and Technology in Law Enforcement (at which police officials meet with university scientists to plan more efficient methods for suppressing urban rebellions).\*

IITRI's greatest contribution to the national defense is in the area of chemical and biological warfare (CBW). Assisted by lavish defense contracts, IITRI has become the nation's center for research on aerobiology (the study of airborne infectious diseases).

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\*In 1968, IITRI was commissioned by the Air Force Systems Command's Rome Air Development Center to establish a Reliability Analysis Center (RAC) as a clearinghouse for the collection and dissemination of information on electronic systems and micro-electronic and semi-conductor devices.



IITRI's Aerobiology Laboratory was constructed with funds provided by the Army's biological warfare center at Fort Detrick, Md., and is used primarily in Army-sponsored projects on CBW aerosols.

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#### MASSACHUSETTS INSTITUTE OF TECHNOLOGY LINCOLN LABORATORY

The Lincoln Laboratory was established by MIT in 1951 "at the request of the United States Army, Navy and Air Force." An integral unit of MIT with its own board of control, Lincoln Lab is the Federal Contract Research Center (FCRC) responsible for advanced research in the fields of electronics, information processing, radar and radio physics. The Lab occupies facilities provided by the Air Force at Hanscom Field in Lexington, Mass. Lincoln secured some \$66 million in defense funds during fiscal 1968, an amount which represents about two-thirds of MIT's income from defense contracts.

Lincoln Lab was directly involved in the development of the three major early-warning air defense systems now in operation: the Semi-Automatic Ground Environment (SAGE) System, the Distant Early Warning (DEW) Line, and the Ballistic Missile Early Warning System (BMEWS). The technologies associated with these systems--radar detection and surveillance, re-entry physics and ballistic missile tracking--continue to be major fields of study at the Lab.

Lincoln's research on ballistic missile defense and anti-missile technology is sponsored by the Pentagon's Advanced Research Projects Agency (ARPA). Lincoln provides the scientific direction of ARPA's Project PRESS (Pacific Range Electromagnetic Signature Studies), aimed at improving detection systems for ballistic missile defense. Lincoln's PRESS activities include operation of radar-tracking facilities located on Kwajalein Atoll in the Pacific missile test range. These studies, offensive as well as defensive in nature, are intended to improve the penetration capabilities of U.S. inter-continental ballistic missiles (ICBMs).

#### MASSACHUSETTS INSTITUTE OF TECHNOLOGY INSTRUMENTATION LABORATORY

The Instrumentation Laboratory is an integral unit of the School of Engineering located on MIT's Cambridge, Mass., campus. The Lab has a staff of some 1,100 scientists and technicians, and operates on an annual budget in excess of \$20 million--most of it from Defense Department contracts.

The Instrumentation Lab's principal activity is the design and testing of the inertial guidance systems and automated control equipment for spacecraft, aircraft, submarines and ballistic missiles. Recent projects include the development of guidance systems for the Navy's submarine-borne Polaris and Poseidon missiles.\*

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#### UNIVERSITY OF MICHIGAN INSTITUTE OF SCIENCE AND TECHNOLOGY

Michigan's Institute of Science and Technology, organized in 1959, is a composite of several university scientific facilities, the most important of which is the Willow Run Laboratory (WRL) located in Ypsilanti, Mich. The Institute has a combined staff of some 650 scientists and technicians, and operates on an annual budget of about \$14 million. WRL, which works closely with the Advanced

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\*Following student demonstrations in April and May, 1969, MIT placed a ban on new defense contracts at the Instrumentation Lab (I-Lab), pending a study of possible funding sources for non-military research. Subsequently, on May 20, 1970, MIT announced that it would divest itself of the I-Lab (now called the Charles Stark Draper Laboratory), which is to



Research Projects Agency (ARPA) of the Department of Defense, receives some \$11 million annually from defense contracts.

In addition to WRL, the Institute comprises the Cooley Electronics Laboratory and three Department of Defense Information Analysis Centers--the Ballistic Missile Radiation Analysis Center (BAMIRAC), the VELA Seismic Information and Analysis Center (VESIAC), and the Infrared Information and Analysis Center. These units are responsible for collecting, analyzing and disseminating information on ballistic missile re-entry phenomena, seismic detection of underground nuclear explosions (Project VELA-UNIFORM), and infrared technology, respectively.

Michigan's expertise in these areas and related fields is applied to classified research on counter guerrilla surveillance systems, avionics (the design of aircraft fire-control and navigation systems), electronic countermeasures (for jamming enemy radar and listening devices) and ballistic missile defense. Recent projects include studies of the projected Strat-X missile--an advanced intercontinental ballistic missile (ICBM) under development by the Army--and operation of a \$4.3 million infrared observatory atop Mount Haleakala on Maui Island, Hawaii. The observatory, financed by ARPA, will be used to track ICBMs and military satellites.

Michigan has been active in America's Southeast Asian war effort since the early 1960s. In 1961, for instance, Michigan scientists were engaged in research to "analyze the coast and landing beach physiography affecting military operations in Southeast Asia." Later ARPA sent a team of WRL scientists to Thailand to study the effect of tropical conditions on guerrilla surveillance devices. In 1967 WRL received a \$1 million ARPA contract to develop a "Joint Thai-U.S. Aerial Reconnaissance Laboratory." The flying lab will use infrared detection equipment to pinpoint enemy guerrillas at night.

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OHIO STATE UNIVERSITY  
RESEARCH FOUNDATION

The OSU Research Foundation is a separately incorporated nonprofit research organization affiliated with Ohio State University. The Foundation contracts for and administers research contracts undertaken by the faculty and staff of OSU. In fiscal 1967 the Foundation administered defense contracts amounting to \$4.1 million out of a total budget of over \$12 million.

Projects administered by the Foundation encompass a great diversity of subjects, including all major scientific fields. A significant portion of the defense projects, however, involve research on "human factors engineering" and "man/machine systems." These studies, conducted by OSU's Engineering Experiment Station and Laboratory of Aviation Psychology, are designed to improve the efficiency of soldiers who operate complex weapons and machinery. Sample projects in this series include: "A Recommended Program for Advanced Individual Training in Anti-Aircraft Artillery," and "A Study of the Present Status of Training Aids and Devices for the Army Field Artillery Training Program."

OHIO STATE UNIVERSITY  
DEFENSE MANAGEMENT CENTER

The Defense Management Center is an integral unit of OSU's College of Administrative Science operated under contract with the U.S. Air Force. The Center consists of some 50 OSU faculty members on full-time assignment to the School of Systems and Logistics and the

20 become an independent corporation. The Lab now has contracts worth approximately \$54 million, and a workforce of 2,000 employees. Major projects include design of guidance and navigation systems for the Poseidon multiple-warhead missile (MIRV), the APOLLO spacecraft, the Navy's Deep Submergence Project, and the Air Force's SABRE system.



Defense Weapons Management Center--components of the Air Force Institute of Technology at Wright-Patterson Air Force Base. The OSU instructors conduct courses for military personnel in Logistics Management, Contract Administration, Maintenance Management, and related subjects. The Center also engages in research on logistics, cost effectiveness, data-processing systems and transportation management. OSU receives some \$1.2 million annually for these services.

Since its inception in 1955, some 20,000 officers have received instruction at the Center. Recently, OSU has expanded its services at the Center to include special training programs for foreign military personnel. In 1966, for instance, the Center offered a "Management Seminar for Turkish Air Force Officers" and a "Production Control Course for Philippine Air Force Officers."

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#### UNIVERSITY OF OKLAHOMA RESEARCH INSTITUTE

The University of Oklahoma Research Institute was established in 1941 to administer research contracts received by members of the faculty or staff of the University. The Institute does not support a research staff of its own, but provides clerical and professional services for University personnel. In fiscal 1967 the Institute administered defense contracts worth a total of \$1.1 million.

Although Oklahoma does not rank among the giants of defense contractors, the nature of its research effort deserves attention. The university maintains an ongoing research unit at Fort Sill, Okla. for "research and analysis in problems pertaining to heavy artillery." The project is supported by the Army's Artillery and Missile Center. A related Oklahoma project is entitled "The Susceptibility of Potential Target Components to Defeat by Thermal Action" (read: incendiary weapons). The University has also engaged in research on chemical and biological warfare (CBW) for Dugway Proving Ground, the Army's center for CBW munitions testing.

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#### PENNSYLVANIA STATE UNIVERSITY ORDNANCE RESEARCH LABORATORY

Penn State's Ordnance Research Laboratory (ORL) was established in 1945 as a unit of the University's Institute for Science and Engineering. The Lab is an outgrowth of the Harvard Underwater Sound Laboratory, which had been organized in 1941 by the National Defense Research Committee and relocated after the war at Penn State. Operated under contract with the Naval Ordnance Systems Command, ORL is the Federal Contract Research Center (FCRC) responsible for research and development of torpedoes and underwater missiles. The Lab received defense contracts worth \$9.6 million in fiscal 1968 for its activities as an FCRC.

ORL facilities include the Garfield Thomas Water Tunnel, the "largest water tunnel in the Free World for research on problems of hydromechanics," and an underwater test range near Key West, Fla. In 1961 ORL also assumed responsibility for the management of an anti-submarine warfare research center at La Spezia, Italy, in conjunction with NATO.

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#### UNIVERSITY OF ROCHESTER CENTER FOR NAVAL ANALYSES

The Center for Naval Analyses (CNA) of Arlington, Va., is administered by the University of Rochester under contract with the Office of Naval Research. The Center was originally organized by the Institute for Defense Analyses (IDA) in 1960 as the Institute for Naval Studies. In 1962 the Center's administration was transferred to the Franklin Institute, and subsequently, on August 1, 1967, to the University of Rochester.

CNA is the Federal Contract Research Center (FCRC) responsible for research and systems analyses in the area of naval and maritime warfare. The Center received \$8.9 million in fiscal 1968 for its activities as an FCRC.

Recent CNA projects include a highly classified study of "The Effectiveness of Surface Sea Surveillance During the Cuban Crisis," and a secret evaluation of Project Market Time, the Navy's effort to counter sea-borne infiltration in South Vietnam.

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#### STANFORD UNIVERSITY STANFORD RESEARCH INSTITUTE

The Stanford Research Institute (SRI) was founded in 1946 by Stanford University and a group of West Coast businessmen. The Institute is a separately incorporated nonprofit research organization governed by a Board of Directors elected by the Trustees of Stanford University. In the 22 years of its existence, SRI has evolved into one of the nation's largest research organizations, with a staff of 2,200 and an annual income of \$60 million (of which some \$30.6 million represents defense contracts). SRI's headquarters are located at Menlo Park, Cal., adjacent to the Stanford Industrial Park (occupied by "spin-off" industries which profit from SRI research activities). The Institute also maintains extensive laboratory facilities in South Pasadena, Cal., and a field office in Bangkok, Thailand.\*

SRI's major components include a Naval Warfare Research Center, Combat Development Experimentation Center, and Strategic Studies Center. Other divisions concern propulsion systems, data-processing equipment, materials sciences and life sciences.

Pentagon-financed research at SRI encompasses a wide array of subjects, ranging from an Army contract for "Research Studies on the Dissemination of Solid and Liquid Chemical and Biological Warfare Agents," to a Navy contract for research on "Engineer and Shore Party Support Requirements of a Marine Expeditionary Force."

SRI scientists have been particularly active in America's  
22 Southeast Asian war effort. SRI involvement in Vietnam includes a

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\*In May, 1969, following prolonged student disorders, a Stanford faculty committee recommended the separation of SRI from the University. This decision was implemented in Jan., 1970, when Stanford sold SRI to the Institute's own Board of Directors for \$25 million. SRI had previously agreed to discontinue work on chemical and biological warfare--but counterinsurgency studies for Project AGILE in Southeast Asia will continue.



secret survey of Naval mobility in the Mekong Delta area of South Vietnam, and research intended to improve the performance of Army field radios in jungle environments. SRI has been particularly conspicuous in Thailand, where some 55 Stanford researchers are attached to the Thai-U.S. Military Research and Development Center in Bangkok. The Center is financed by the Advanced Research Projects Agency as part of Project Agile, the Pentagon's counterinsurgency research program.

#### STANFORD UNIVERSITY STANFORD ELECTRONICS LABORATORY

The Stanford Electronics Laboratory (SEL) is the research arm of the University's Electrical Engineering Department, which held \$2.2 million in classified Pentagon contracts in 1969. Most of this work was concentrated in the Systems Techniques Lab (STL), located in the Applied Electronics Laboratory (AEL). In May, 1969, STL held six classified contracts worth over \$1 million for research in the area of electronic warfare.

Most of the work at STL concerns electronic countermeasures (ECM's) and counter-countermeasures (ECCM's)--i.e., techniques for jamming, deceiving, evading and destroying enemy radars (while protecting one's own radars). These techniques were extensively employed by U.S. planes over North Vietnam to locate and jam enemy radar systems used for anti-aircraft defense. Following a nine-day occupation of AEL by students protesting war research at Stanford, the administration agreed in May 1969 to terminate all classified contracts at the University.

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#### SYRACUSE UNIVERSITY SYRACUSE UNIVERSITY RESEARCH CORPORATION

The Syracuse University Research Corporation (SURC) was established in 1957 by the University's Board of Trustees as an autonomous non-profit research organization. SURC is administered by its own Board of Trustees, whose members are appointed by the Trustees of Syracuse University. The Corporation has some 350 employees, and maintains laboratories and offices on the University's Collendale Campus. Operating on an annual budget of about \$7 million, SURC "performs contract R&D work for industry and government in the physical and social sciences, in engineering, and in the application of engineering techniques to business and industry." SURC's defense contracts totalled over \$4 million in fiscal 1969.

The Defense Systems Division, SURC's largest component, conducts research on tactical electronic systems for the Navy and the Army Signal Corps. This division "specializes in such areas as radar, optical radar, communications, radio direction finding, battlefield assay systems...and underwater [signal] propagation and communications." Another division, the Special Projects Laboratory, "engages in studies on various aspects of missile defense and aerospace surveillance and signal processing"; this lab has also received several Air Force contracts for the development of airborne infrared surveillance systems and "terrain-avoidance radar systems."

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#### UNIVERSITY OF TEXAS DEFENSE RESEARCH LABORATORY

The Defense Research Laboratory (DRL) was founded in 1945 as an integral unit of the University of Texas, but with its own Board of control. The Lab, located in Austin, collaborates closely with the Applied Physics Laboratory of Johns Hopkins University. DRL's receipts from defense contracts amounts to about \$3 million annually.

DRL components and principal fields of research are: Acoustics Division and Underwater Missiles Division (undersea weapons systems), Aeromechanics Division (aeronautical and space engineering), Radar Division (application of radar, radio and electronic techniques to instrumentalities of warfare), and Military Physics Division (systems test and evaluation of air-to-air and air-to-ground missiles). Recent projects include the development of a "Helicopter-Borne Mine Reconnaissance System," and acoustical research aimed at improving the capacity of sonar equipment to detect enemy torpedoes.

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#### TUFTS UNIVERSITY HUMAN ENGINEERING INFORMATION AND ANALYSIS SERVICE

The Human Engineering Information and Analysis Service (HEIAS) of Tufts University is the Department of Defense Information and Analysis Center for research on human factors engineering. The Service is operated by Tufts under a contract with the U.S. Army Human Engineering Laboratories at the Aberdeen Proving Ground. The principal activity of HEIAS is the collection, acquisition, coding and storing of information on human factors engineering, and the dissemination of this information via published bibliographies.

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#### UNIVERSITY OF WASHINGTON APPLIED PHYSICS LABORATORY

The Applied Physics Laboratory (APL) is an integral unit of the University of Washington operated under contract with the Naval Ordnance Systems Command. Founded in 1943, the Lab has been designated the Federal Contract Research Center (FCRC) responsible for research and development in the field of underwater ordnance. In recent testimony to the Senate Armed Services Committee, APL's primary task as an FCRC was described as "the development of information, techniques and hardware for undersea warfare against fast deep-diving submarine targets and for use in the development of offensive weaponry of submarines and surface ships." The Lab received some \$3.1 million in defense funds for these services in fiscal 1968. The Lab maintains an underwater missile range in Puget Sound for test firings of missiles and torpedoes.

University Board for the Applied Physics Laboratory: J.P. Cartwright, Dean of the College of Arts and Sciences; E.M. Conrad, Vice President for Business and Finance; G.W. Farwell, Vice President for Research; J.E. Henderson, Director of APL; J.L. McCarthy, Dean of the Graduate School; C.H. Narris, Dean of the College of Engineering; Frederick P. Thieme, Vice President.



UNIVERSITY OF WISCONSIN  
MATHEMATICS RESEARCH CENTER

The Mathematics Research Center is an integral unit of the University of Wisconsin operated under contract with the Army Research Office. The Center, located on Wisconsin's Madison campus, is the Federal Contract Research Center responsible for mathematical research relevant to military problems. In recent testimony to the Senate Armed Services Committee, the Center's research activities as an FCRC were described as follows: "numerical analyses including [studies for] the extension of the scientific usefulness of high speed computers; statistics and probabilities; applied mathematics and analysis; and mathematical research applicable to operations research." Wisconsin received \$1.4 in defense contracts for these services in fiscal year 1968.\*

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## 2. Non-Profit Research Organizations

### THE AEROSPACE CORPORATION

The Aerospace Corporation is an independent non-profit research organization located in El Segundo, Calif. Founded in 1960 with the support of the U.S. Air Force, Aerospace's objectives are "to aid the Air Force in applying the full resources of science and technology to ballistic missile and military space systems." Most of this work consists of "general systems engineering and technical direction" of programs undertaken by the Air Force Space and Missile Organization (SAMSO). As the Federal Contract Research Center (FCRC) in this field, Aerospace received contracts worth \$73 million from the Department of Defense in fiscal 1968.

In addition to its facilities in El Segundo, Aerospace maintains laboratories in San Bernardino, Calif., and field offices at Patrick Air Force Base in Florida and Vandenburg Air Force Base in California--the headquarters, respectively, of the Air Force's Eastern and Western Test Ranges.

Major Aerospace projects include technical support for SAMSO's Standard Launch Vehicle (SLV) program and the inter-agency Advanced Ballistic Reentry System (ABRES) program. Aerospace's responsibilities under the SLV program involve reliability studies of the Atlas-D, Thor, and Titan-III missiles. Under the ABRES program, Aerospace is helping to design missile reentry vehicles with improved capability for the penetration of enemy anti-missile defense systems. As part of this work, Aerospace has contributed to the development of missile warheads carrying several independently-targeted reentry vehicles which will be carried by the next "generation" of intercontinental missiles.

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\*Projects conducted by the Mathematics Research Center in recent years include research on the protection of underground ICBM sites from enemy missiles, and on ICBM radar tracking.



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#### THE INSTITUTE FOR DEFENSE ANALYSES

The Institute for Defense Analyses (IDA) was founded in 1956 as a non-profit corporation by M.I.T., Stanford University, Tulane, Case Institute and the California Institute of Technology. These universities comprised the Members of the new corporation, and elected IDA's trustees. The original Members were subsequently joined by the Universities of Michigan, California, Illinois and Chicago, and Princeton, Columbia and Penn State. This consortium was finally dissolved in 1968, following the student disorders at Columbia (which were in part occasioned by opposition to Columbia's membership in IDA). Under the new arrangement, IDA is an independent corporation with a self-perpetuating Board of Trustees,

IDA's initial function was to provide scientific and technical support to the Weapons Systems Evaluation Group (WSEG) of the Department of Defense. Because of its ability to mobilize the scientific resources of its member universities, IDA has been able to greatly expand its activities, and the Institute now holds contracts with the Advanced Research Projects Agency (ARPA), National Security Agency, and--most recently--the Department of Justice. IDA's total receipts from Defense Department contracts in fiscal 1967 amounted to \$15.8 million.

IDA's research for WSEG and ARPA consists principally of studies on the effectiveness of proposed weapons systems, particularly ballistic missile systems. Since the onset of the Vietnam war, however, IDA has emphasized research on counterinsurgency and unconventional warfare. This work has included studies of the utilization of chemical and biological warfare and tactical nuclear weapons in counterinsurgency.

Within the past two years, IDA has been commissioned by the Federal government to employ its capabilities in the areas of systems analyses and operations research in the development of new systems for the suppression of urban disorders in the United States. Under a \$498,000 contract with the President's Commission on Law Enforcement and the Administration of Justice, IDA prepared a "task force report" on the application of science and technology to crime control. The IDA report recommended the application of military counterinsurgency systems to domestic police operations, and particularly to antiriot operations.

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## THE MITRE CORPORATION

The MITRE Corporation is a unique example of a "planned spin-off"--it was established in July, 1958 to take over work done by MIT's Lincoln Laboratory from 1951-58 on the SAGE (Semi-Automatic Ground Environment) air-defense warning system. MIT had agreed to start work on the top-secret SAGE program with the understanding that a permanent organization would ultimately be formed to complete the project. Lincoln supplied many of the people who had been involved in the SAGE project directly to MITRE: as of Jan. 1, 1959, 506 former Lincoln employees had been transferred to MITRE.

MITRE is an independent, non-profit organization recognized by the Pentagon as a Federal Contract Research Center. MITRE's total budget (\$36 million in fiscal 1968) is supplied by the Department of Defense. Located in Bedford, Mass., MITRE currently has about 1800 employees. Association with MIT at the administrative level is still quite close: James R. Killian, Jr. serves as Chairman of both MITRE and the MIT Corporation. Other MITRE trustees are associated with the Institute as administrative personnel or as members of the MIT Corporation.

MITRE is a research and engineering organization engaged principally in the design of strategic command systems, space surveillance systems, and military communications networks. Most of this work stems from technologies developed at Lincoln Lab under the SAGE and other early-warning air-defense systems. All major MITRE projects are highly classified.

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## THE RAND CORPORATION

The RAND Corporation--first and most famous of the military "think-tanks"--was organized in 1946 by Gen. Henry H. Arnold, head of the Army Air Force during World War II. Arnold's intention was to perpetuate the partnership of military men and university scientists that had been established during the war emergency on a temporary basis. In General Arnold's words, the new organization would "get the best brains and turn them loose on the problems of the future." By providing a campus-like environment and informal working conditions, RAND's founders were able to recruit academic scientists who spurned the discomforts of Pentagon employment.

RAND was initially administered by the Douglas Aircraft Corp., but in 1948 became an independent non-profit corporation with financial help from the Ford Foundation. The organization's headquarters are located on a beach-front site in Santa Monica, Calif., where security procedures are reported to be tighter than at the Pentagon itself. RAND's staff now numbers about 1100 persons, of whom 600 are research professionals.

Project RAND, the organization's basic Air Force contract, accounts for about two-thirds of RAND's \$22 million annual budget. Typical projects under the Air Force contract include studies of rocket propulsion systems, orbiting space stations, and inter-continental ballistic missiles. Much of this work incorporates the systems-analysis and cost-effectiveness methodologies developed by RAND scientists.

In recent years, RAND has received contracts from other branches of the military, particularly the Advanced Research Projects Agency (ARPA) and the Office of the Assistant Secretary of Defense for International Security Affairs (OASD/ISA). These contracts have resulted in interdisciplinary studies of problems in the areas of nation-building, the function of foreign aid, and counter-guerrilla warfare. Recent RAND reports for OASD/ISA include: "Viet Cong Motivation and Morale," "Support Systems for Guerrilla and Limited Warfare," and "Politics and Economic Growth in India."

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## THE RESEARCH ANALYSIS CORPORATION

The Research Analysis Corporation (RAC) is a non-profit research organization located in McLean, Va. As the Federal Contract Research Center (FCRC) responsible for systems analysis and operations research work for the U.S. Army, RAC is often described as the Army's equivalent of the RAND Corporation. RAC was founded in 1961 to continue the work of the Operations Research Office (ORO) of Johns Hopkins University, one of the oldest university-based military research organizations. When Johns Hopkins became uncomfortable with ORO's security requirements and military orientation, RAC was established as an independent corporation with its own Board of Trustees. RAC currently receives some \$13.3 million annually from the Department of Defense.

RAC's primary mission is to upgrade the combat effectiveness of U.S. troops by conducting operations research on the design, performance, and utilization of Army weapons systems. This work also includes long-range strategic analyses on future threats to U.S. security and possible countermeasures, as well as on-the-spot reviews of weapons effectiveness under battlefield conditions. In order to evaluate Army performance in Vietnam, RAC maintains field offices in Saigon and Bangkok.

Current RAC research emphasizes the application of systems analysis to counter guerrilla warfare in extreme terrain conditions. Recent projects have included studies of the utilization of chemical and biological warfare in counterinsurgency, and the mobilization of minority groups in counter guerrilla operations. RAC is particularly proud of its role in the creation of the Army's helicopter-borne 1st Cavalry Division (Airmobile).

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## RESEARCH TRIANGLE INSTITUTE

The Research Triangle Institute (RTI) was organized by a consortium of North Carolina businessmen and educators in order to encourage advanced-technology industries to establish plants in the state. The Institute is sponsored by three universities--the University of North Carolina at Chapel Hill, Duke University in Durham, and North Carolina State University in Raleigh--whose campuses form the points of the triangle from which RTI derives its name. The Institute itself is the core of an industrial park occupied by "spin-off" firms which market the results of RTI's research activities. Several State and Federal agencies have also built laboratories in the complex.

At present there are some 300 researchers on the staff of RTI, while another 4000 people are employed by the firms which comprise the Research Triangle Park. Current research at RTI includes work in the area of civil defense, electronics, bio-engineering, public health and agriculture. RTI received \$1.3 million from the Department of Defense in 1968, for work which included research on new chemical and biological warfare munitions.

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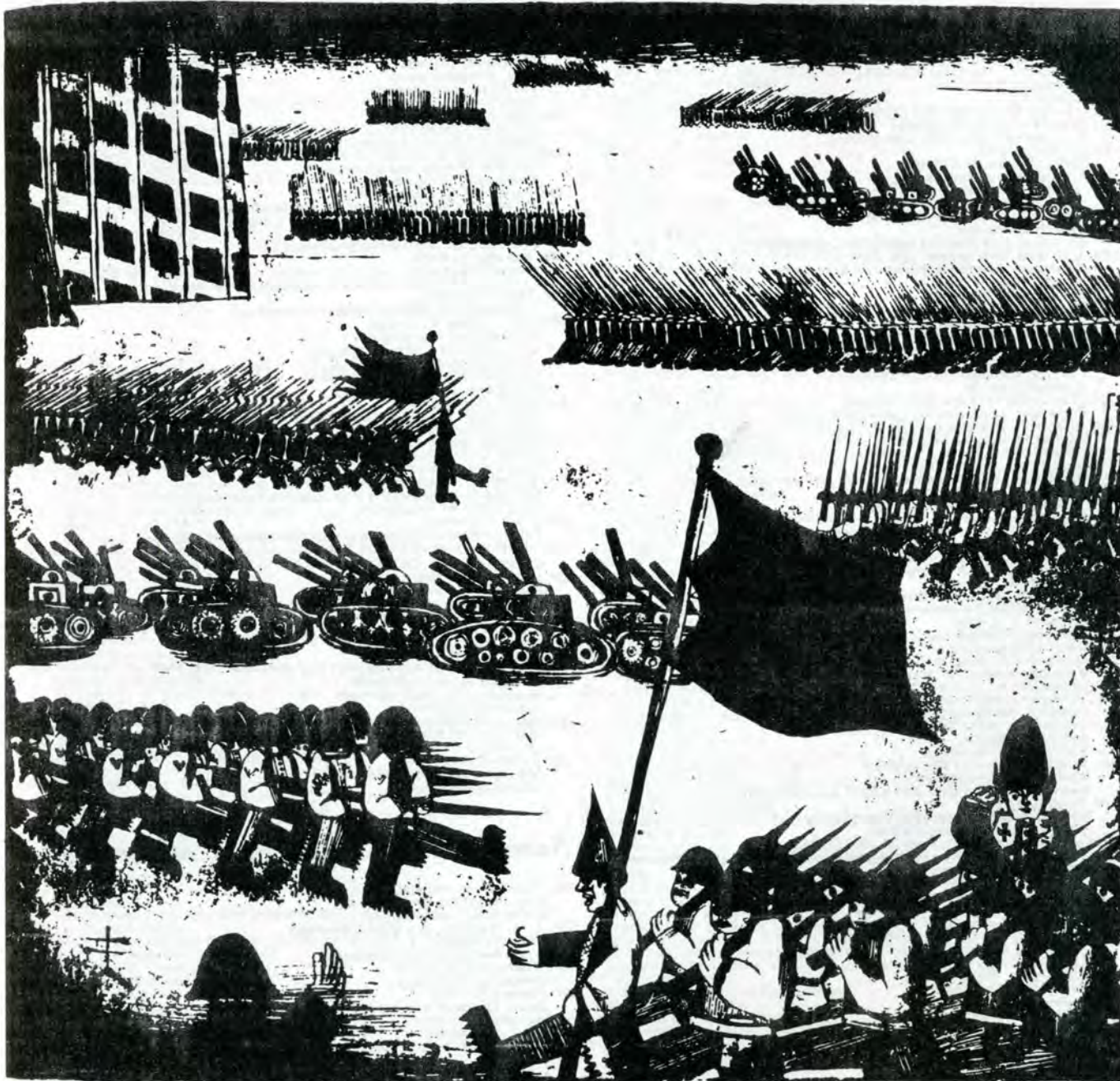
## RIVERSIDE RESEARCH INSTITUTE

The Riverside Research Institute (RRI) was established in November 1967 to assume responsibility for classified defense contracts that had previously been held by the Electronics Research Laboratory (ERL) of Columbia University. ERL had been organized in 1951 by the Department of Electrical Engineering to administer government-sponsored research contracts. In 1966, friction between ERL's project-oriented staff and the Electrical Engineering Department's teaching faculty--coupled with growing campus resistance to war-oriented research--forced Columbia to abandon ERL. RRI was subse-



quently incorporated as an independent nonprofit research organization with officers and staff drawn from the now defunct ERL. Although RRI has no formal ties with Columbia, it maintains close day-to-day relations with the University and occupies space in University building, Prentis Hall. Columbia reportedly will help finance expanded RRI facilities in the Piers Area of West Harlem.

Under the reorganization scheme, Riverside received custody of ERL's defense contracts, worth some \$5 million annually. Most of the contracts are for classified studies of advanced electronic and radar gear for ballistic missile detection systems. These studies represent part of Project Defender, the anti-ballistic missile research program of the Advanced Projects Research Agency. RRI personnel also man the AMRAD radar system at the Army's White Sands Missile Range.





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# PART II: CBW RESEARCH

## University Research On Chemical And Biological Warfare

*It's been almost three years since the public first learned of the extensive role of universities in the development of chemical and biological warfare (CBW) munitions. Following exposure of the notorious Spicrack and Summit projects at the University of Pennsylvania, movement researchers learned that approximately 50 other schools had engaged in CBW research. Subsequently, the editors of Viet-Report magazine conducted a six-month investigation of these projects and published the results a year ago in a special issue on "The University at War." What appears below is a condensed version of that survey, augmented by new information.*

### Abbreviations:

BW—biological warfare  
CBW—chemical and biological warfare  
CW—chemical warfare

ADRCR: Aerospace and Defense Research Contracts Roster, published annually by Bowker Associates, Washington, D.C.

ARTS: Army Research Task Summary, Fiscal Year 1961, published in nine vols. by the Department of the Army.

R&D: Research and Development Directory, published annually by Government Data Publications Inc., Washington, D.C.

TAB: Technical Abstract Bulletin, published semimonthly by the Defense Documentation Center, U.S. Dept. of Defense, Arlington, Va.

### BIBLIOGRAPHIC NOTE:

General information on CBW munitions and CBW research is available in the following publications: Carol Brightman, "The Weed Killers: Chemical and Biological Warfare in Vietnam," *Viet-Report* (June/July, 1966), pp. 9-14, ff.; Seymour M. Hersh, *Chemical and Biological Warfare* (Bobbs Merrill, 1968); Elinor Langer, "Chemical and Biological Warfare," *Science* (Jan. 13 and 20, 1967), pp. 174-79, 299-303; Steven Rose, Ed., *CBW: Chemical and Biological Warfare* (Beacon, 1969); J.H. Rothschild, *Tomorrow's Weapons* (McGraw Hill, 1964); U.S. Army Field Manual FM 3-10, *Chemical and Biological Weapons Employment*.

### University of Arizona, Tucson

The University of Arizona is investigating CBW detection systems for the Army Chemical Center at Edgewood Arsenal. Arizona holds contract no. DA-18-035-AMC-744(A), worth \$27,650, for research on "The Application of Metal Ions to Detection." (R&D, 1967.)

### Baylor University, New Orleans

Baylor holds an Army contract worth \$44,000 for a "Study of the Effects of Certain Analgesic Drugs on the Respiratory Center and Circulation in Humans." This work is being performed under contract no. DA-18-035-AMC-397(A) with the Army Chemical Center.

### University of California, Berkeley

The office of Naval Research supports a facility at the University of California known as the Naval Biological Laboratory (NBL). An integral unit of the School of Public Health, NBL maintains a staff of approximately 100 university scientists and naval security personnel. NBL's laboratories are located behind barbed wire at the Naval Supply Depot in Oakland.

NBL's principal research fields are microbiology and aerobiology (the study of airborne infectious diseases); in recent years, the lab has done epidemiological studies of bubonic plague, valley fever (coccidiomycosis) and meningitis. There has been persistent speculation that NBL is engaged in CBW research. When these suspicions were first raised by Ramparts magazine in 1967, NBL officials evaded questions on the military applications of their work. Since then, however, sufficient evidence has been uncovered to indicate that NBL works closely with the Army Biological Laboratories on BW research. In 1961, for instance, Ft. Detrick sponsored a project at NBL on "The Stability and Virulence of BW Aerosols." to "make basic aerosol investigations on the virulence, survival and behavior of pathogenic microorganisms and toxins in particles disseminated from the dry and wet state and to determine the relationships which exist between aerosol virulence... and such factors as particle size, host, sunlight, relative humidity, temperature, and other environmental factors." (ARTS, I, p. 43.) Dr. Stewart H. Madin, NBL's scientific director, was listed as the principal investigator for this project.

NBL's research on BW aerosols is continuing. Several papers based on the Army-sponsored project were presented at the Second International Conference on Aerobiology in March 1966 by NBL staff members. One paper, presented by M.T. Hatch and R.L. Dimmick,



concerned "Physiological Responses of Airborne Bacteria to Shifts in Relative Humidity." (Bacteriological Reviews, XXX, Sept. 1966.)

#### **UCLA Medical School, Los Angeles**

In 1961 the UCLA Medical School was engaged in an Army project on the pharmacology and physiological chemistry of chemical warfare. The project, sponsored by the Army Chemical Center, was "to develop through pharmacological research data for the support of a rational approach to the search for new CW lethal and incapacitating agents." UCLA's task was "to synthesize and study compounds pharmacologically related to types that have hallucinogenic properties." (ARTS, I, p. 138.) Apparently this research is continuing, since in 1966 the Medical School prepared a report for the Army on "Disabling Agents on the Central Nervous System." This project, performed under contract no. DA-04-495-AMC-791, was conducted by Dermot B. Taylor. (TAB, Jan. 1, 1967.)

#### **Cornell Aeronautical Laboratory, Buffalo, N.Y.**

The Cornell Aeronautical Laboratory (CAL), a wholly owned subsidiary of Cornell University, is investigating various dissemination systems for tactical CBW munitions. CAL's involvement in CBW research came to light in 1966 following disclosures of the notorious "Spicerack" and "Summit" projects at the University of Pennsylvania. Apparently, Penn had subcontracted certain aspects of these projects to CAL. According to Science magazine, CAL's role was to "conduct a detailed target analysis to determine anticipated neutralization requirements" for CBW weapons.

The CBW projects at Penn were ultimately cancelled as a result of faculty pressure, but CAL continued working on certain aspects of these projects. (Now Cornell is under pressure from its own faculty to get rid of the Aeronautical Laboratory.) CAL receives about \$1 million a year from the Army Chemical Center for "research services on chemical agents munitions systems for tactical employment" under contract no. DA-18-035-AMC-323(A). (ADRCR, 1965, p. 200.) Asked by Science magazine to describe the nature of these "research services," the CAL public relations manager replied in a letter dated Feb. 23, 1967, that "although few details can be provided, the objective of this program has been to determine effective means for delivering chemical agents as a tactical munition."

#### **University of Connecticut, Storrs**

Research into the synthetic production of LSD and other psychedelic drugs is underway in the Department

of Pharmacology for the Defense Department. Dr. Marvin Malone, an associate professor of pharmacology, told students that "UConn has been commissioned by the Defense Department to research LSD production techniques concurrent with the experiments currently being conducted on U.S. troops to determine the effects of psychedelic drugs in chemical warfare." (Connecticut Daily Campus Nov. 7 1966.)

#### **University of Florida, Gainesville**

The University of Florida holds an ongoing contract with the Air Force for "Ecological Records on Eglin Air Force Base, Fla." This project is related to tests of airborne CBW dissemination systems at the Air Proving Ground at Eglin. Florida received \$46,632 for this work in 1967 under contract AF-08(635)-5617. (R&D, 1967.)

#### **Illinois Institute of Technology Research Institute, Chicago**

This is one of the foremost university centers for research on CBW munitions. IITRI's work includes an ongoing Army project entitled "Munitions Filling Development for New and Standard Agents." As part of its work on this project, IITRI has issued reports on chemical bombs and other delivery systems for G agents (nerve gasses) and CS agents (riot-control agents). Researchers on this project, financed under contract no. DA-18-035-AMC-372(A), have included Warren J. McGonnagle, M.S. Nusbaum and R.S. Braman. (TAB, Jan. 1 and June 1, 1967.)

IITRI's major contribution to the CBW program is in aerobiology—the development of airborne infectious diseases as biological munitions. In the early 1960s IITRI built an aerosol laboratory with Army funds and has since cooperated with Ft. Detrick in studies of BW aerosols. (ARTS, I, p. 54.) A comprehensive series of reports on IITRI's aerobiology research program was prepared for the Army in 1966 by project director Richard Ehrlich. Although the report itself is classified, an abstract gives some impression of the areas covered. "One report describes IIT Research Institute's aerosol laboratories, including the pathological laboratory and animal holding facilities.... The final three reports summarize studies with Venezuelan equine encephalomyelitis (VEE) virus. One of these presents detailed studies on the characterization of airborne VEE virus." These reports covered research during the period October 1962 to June 1966 under contract no. DA-18-064-AMC-49(A). (TAB, April 1, 1967.)

Another IITRI project in the area of aerobiology was financed by the Air Force under contract no. AF-08(635)-5057. John D. Stockman prepared a report on "Dissemination Properties of Encapsulated Particles." According to the author's abstract, "this study provides information on the feasibility of disseminating microencapsulated biological agents." (TAB, April 15, 1967.)



### Johns Hopkins University, Baltimore

Between 1955 and 1963, Johns Hopkins received more than \$1 million for research on "diseases of potential biological warfare interest." (Science, Jan. 13, 1967.) According to university officials, this work is continuing at a reduced level. Johns Hopkins has also been studying chemical warfare. For the past few years Arthur Karmen has conducted "An Investigation of Rapid Methods of Analysis of Aerosol CW Agents." According to Karmen, "a new approach to collecting compounds in aerosols and analyzing them by gas liquid chromatography has been developed." This work was rendered under Army contract no. DA-18-035-AMC-144A. (TAB, July 1, 1966.)

### Kansas State University, Manhattan

Researchers in the chemistry department have been engaged in an Army-financed project involving chemical analyses of nerve gasses. The project, "Ion Phenomena," is rendered under Edgewood contract no. DA-18-035-AMC-718A. According to project director Robert W. Kiser, "Mass spectrometric study of GA and GF was undertaken to obtain more fundamental information of value in determining the processes that occur upon electron bombardment of these organophosphorus compounds." GA and GF are code-letters for two lethal nerve gasses. (TAB, May 15, 1967.)

### University of Maryland, College Park

The university has been studying "The Vulnerability of Man to Biological Warfare" since the early 1960s. According to a 1961 Army report, this project was designed to "study infectivity and pathogenicity of potential BW agents in experimental animals and subsequently in volunteers." (ARTS, I, p. 34.) At that time, the principal investigator on this project—financed under contract no. DA-49-007-MD-751—was Dr. T.E. Woodward. In 1966 two Maryland scientists described some of the results of this work at the Second International Conference on Aerobiology (Airborne Infection). Richard B. Hornick and Henry T. Eigelsbach of the school of medicine reported on experiments involving volunteers from the Jessup, Md., House of Correction who were exposed to aerosols containing *Tularemia* organisms. (Bacteriological Reviews, XXX, Sept. 1966.)

### University of Minnesota, Minneapolis

The agriculture department has been engaged in anticrop warfare research since the early 1960s. According to a 1961 Army report, this work is part of an effort to "conduct research on chemical and biological agents capable of destroying the food and industrial crops of potential enemy countries." Minnesota's task has been to study *Puccinia graminis tritici*, a species of wheat rust. (ARTS, I, p. 201.) Minnesota regularly issues progress reports on this work

to the Army; a recent report, by William M. Bugbee, concerned "The Pathogenicity and Aggressiveness of Entities of *Puccinia Graminis Tritici Race 15B* Obtained from Collection and Hybridization." This project is financed by the Army Biological Laboratory under contract no. DA-18-064-404-CML-433. (TAB, April 15, 1965.)

### The University of Oklahoma

The University of Oklahoma has studied the potential use of biological munitions in "remote area conflicts," i.e., in Vietnam-type wars. This work was performed under two contracts awarded in 1965 by the Army Dugway Proving Ground—no. DA-42-007-AMC-121, worth \$134,000, and no. DA-42-007-AMC-208, worth \$238,000. Oklahoma's task was to conduct "ecology and epidemiology research studies in remote areas." (ADRRD, 1965, p. 1032.)

### George Peabody College for Teachers, Nashville

The George Peabody College has been developing techniques for the instruction of military personnel in chemical, biological and radiological warfare, under Contract Nonr-1257(o1). The project, "CBR Training Aid Requirements, Army-Wide," has involved W.D. McClurkin, Harold Benjamin, Harold Drummond, Harry Harap and Lawrence Steward. A technical report prepared by this team concerned "Basic Individual CBR Training; Advanced Individual CBR Training; Chemical Corps, Unit CBR Training Courses in the Chemical Corps School; Preparation for Overseas Replacement Training; CBR Training Aid Problems; CBR Problems of General Interest." (TAB, Feb. 1, 1967.)

### Stanford Research Institute, Menlo Park, Calif.

The institute, a subsidiary of Stanford University, is principal CBW research centers. Projects undertaken by SRI in past years have involved every aspect of CBW research and development, including the investigation and testing of BW agents, the techniques of CBW dissemination, and the evaluation of airborne CBW delivery systems. A major share of this research is rendered under Army contract No. DA-18-035-AMC-122(A), an ongoing project of "Research Studies on the Dissemination of Solid and Liquid Agents." Researchers on this project have included William C. Thuman, I.G. Poppoff, Lionel A. Dickenson, Erwin L. Capner, John E. Baldwin, Theodore Mill, and R.C. Robbins. Recent project reports have considered the aerosol dissemination of CB agents, the performance of chemical bombs and aerosol generators, and mathematical models for CBW munitions employment. (TAB, Jan. 1, and April 15, 1967.)

Particular studies rendered under this contract have included a study of the "Dissemination of Aerosol Particles by Forming Clouds" prepared by William E. Ranz (TAB, April 15, 1967), and a proposal for the "Secondary Injection of CW Agents Into a Supersonic Rocket Exhaust" prepared by John E. Baldwin. The author of the latter indicates that "this study was directed to the use of a rocket motor for dissemination of chemical agents using the energy from a solid rocket motor exhaust for dispersion... Heat and turbulence of the exhaust serves to break up and distribute the agent over a very wide area." (TAB, Feb. 1, 1967.)

### St. Louis University, St. Louis

In 1961 St. Louis University undertook a research project for the Army Chemical Corps in "Medical Aspects of Chemical Warfare." Purpose of the project, funded under contract No. DA-18-108-CML-6601, was to "determine through clinical research, the effects of selected toxic compounds and of drugs antagonistic thereto, on the U.S. Army and USAF volunteers." The task of the St. Louis team, led by Dr. H. Donahoe, was to synthesize, examine by X-ray diffraction techniques, and conduct preliminary biological tests on compounds to test certain hypothesis of drug action." (ARTS, I, p. 220.) In 1967 St. Louis received another contract from Edgewood, No. DA-18-035-AMC-382(A) for research on "Neurotropic Effects in Relation to Chemical Structure." (R&D, 1967.)

### University of Texas, Austin

The university has since 1960 held a Ft. Detrick contract worth about \$15,000 a year for research on "Barrier Properties of a Group of Polymeric Materials to VX Agents." The research on this project is carried on by John Autian and others in the microbiology department. (TAB, June 1, 1967.) The university also holds an Edgewood contract, worth \$67,800 in 1967, for "An Investigation of Materials for Protection and Decontamination of Skin against Chemical and/or Toxic Agents." (R&D, 1967.)

### University of Utah, Salt Lake City

In recent years, the university has maintained close ties with the Army Chemical Corps' Dugway Proving Ground, the testing center for CBW weapons. In fiscal year 1965, the university has contracts for research at Dugway worth \$322,000. A summary of Army-financed research in 1961 indicates the kind of services that were being performed for Dugway: E. Dean Vest of Utah was the principle investigator in a project to "establish endemicity of disease of Dugway Proving Ground and surrounding areas, to evaluate the hazards arising from biological testing, and to demonstrate absence or spread of biological agents." (ARTS, I, p. 199.) This work has continued under contract no. DA-42-007-AMC-333(Y) with Dugway. (R&D, 1967.)



#### Utah State University, Logan

Utah State University has held a continuing contract with the U.S. Army Chemical Corps' Dugway Proving Ground since 1960. According to Wynne Thorne, Utah State's vice president for research, the contract is for "service activities performed by undergraduate students on the campus in counting fluorescent particles as part of a larger program in meteorological investigation." The project is supervised by Dr. Paul B. Carter of the bacteriology department. In 1967 the university received \$92,695 for this work under contract no. DA-42-007-AMC-37(R). (R&D, 1967.)

#### University of Washington, Seattle

The University of Washington has held several Army contracts for clinical research on the medical effects of CW munitions. This work on "The Medical Aspects of Chemical Warfare" is intended to "discover the toxicity of compounds, efficacy of drugs and mechanism of skin penetration of toxic

compounds." (ARTS, I, p. 186.) A recent project report described experiments on "Liver Esterase Activity in Soman-Poisoned Animals." This study, which involved an investigation of the medical effects of G agents (nerve gasses), was prepared by Ted A. Loomis of the pharmacology department. The work is funded under Army contract No. DA-18-035-AMC-384A. (TAB, June 1, 1967.)

#### Washington State University, Pullman

A research team is engaged in anticrop warfare research for the Army Biological Laboratories at Ft. Detrick. The purpose of the project, funded under contract No. DA-18-064-AMC-360, is to "conduct research on chemical and biological agents capable of destroying the food and industrial crops of potential enemy countries." The task of the group is to "conduct epidemiological studies on stripe rust of wheat." (ARTS, I, p. 202; TAB, May 15, 1967.)

#### Yale University, New Haven, Conn.

When The New Republic printed a story by Seymour M. Hersh in its May 6, 1967, issue which listed Yale among universities engaged in CBW research, Yale officials denied the charge. But the director of Yale's grant and contract administration, John H. Hoskins, acknowledged that "a review of contracts for research shows that there is one funded through Ft. Detrick. It is an unclassified basic research agreement supporting research of Dr. Jack R. Henderson, assistant professor of epidemiology in the department of epidemiology and public health. His research is an investigation in the epidemiological properties of viruses." According to the Technical Abstract Bulletin, Henderson holds Army contract No. DA-18-064-AMC-538(A) for "Research on Virus Diseases." Dr. Henderson's research in 1966 and 1967 was particularly concerned with the characteristics of various strains of equine encephalomyelitis virus. (TAB, May 1, 1967.)

## Addenda:

CBW contracts awarded to universities in fiscal years 1968 and 1969 are listed below. These contracts were awarded by the U.S. Army Edgewood, Md. Arsenal (headquarters for chemical warfare research), the Army Biological Laboratories at Ft. Detrick, Md. (center for biological warfare and defoliant research), and the Army Dugway Proving Ground (test center for CBW munitions). Each entry provides the following information: contract title, sponsoring agency, contract number, amount of award, source of data. Contract information was obtained from McGraw-Hill's **DMS Market Intelligence Reports (DMS)** and Government Data Publication's **Research and Development Directory 1968 (R&DD)**.

**University of Alabama:** "Services to Develop Fluorescent Particle Optical Physical Properties," Dugway, DA-A009-C-68-0081, \$136,203 (DMS). Concerns detection of BW aerosol particles.

**Brown University:** "Non-Aqueous Chemistry of Phosphorous Esters," Edgewood, DAAA15-C-0263, \$29,600 (R&DD).

**Cornell Aeronautical Laboratory:** "Aerosol Sampling for Particle Size Analysis," Edgewood, DAAA15-69-C-0337, \$79,000 (DMS); also: "Increased Level of Efforts to Develop a Liquid Droplet Detector and Size Analyzer," Detrick, DAADO9-69-C-0064, \$25,000 (DMS).

**Hannemann Medical College:** "Chemical Pharmacology of Prophylactic and/or Therapeutic Compounds in Volunteer Subjects," Edgewood, DAAA15-69-C-0295, \$49,775 (DMS).

**University of Hawaii:** "Application Evaluation of Soil-Applied Herbicides," Ft. Detrick, DAAA13-68-C-0179, \$62,000 (DMS).

**Illinois Institute of Technology Research Institute:** "Studies and Investigations in Aerosol Assessment Technol-

ogy," Ft. Detrick, DA18-064-AMC-494A, \$58,950 (DMS).

**Johns Hopkins University:** "Services Involving Medical and Pathological Aspects of Infectious Diseases," Ft. Detrick, DA18-064-AMC-104A and DAAA13-68-R-0057, \$75,000 (DMS).

**University of Oklahoma:** "Ecology and Epidemiology Research Survey in a Specified Area," Dugway, DAAD09-67-C-0007Y, \$514,215 (R&DD). Involves testing of BW agents in Alaska, perhaps elsewhere.

**Rutgers University:** "Research on Dissemination Processes," Edgewood, DAAA15-67-C-0552, \$69,538 (R&DD).

**St. Louis University:** "Neurotropic Effects in Relation to Chemical Structure," Edgewood, DAAA15-67-C-0007A (R&DD).

**Stanford Research Institute:** "Primary Toxicity Screening Tests and Methodology," Edgewood, DAAA15-67-C-0137, \$242,000 (R&DD).

**Union University, Albany Medical College:** "Experimental Studies of Toxic Effects and Pharmacology of a Toxic Protein," Edgewood, DAAA15-68-C-0575, \$70,000 (DMS).

**Utah State University:** "Services for Fluorescent Particle Counting," Dugway, DAAD09-68-C-0104, \$77,680 (DMS). Concerns detection of CBW aerosol particles.

**University of Utah:** "Services for Experimental Research and Support in Arbovirus Epidemiology and Technology," Dugway, DAAD09-67-C-0006, \$50,000 (DMS); also: "Services for Ecology and Epidemiology Research Studies," Dugway, DAAD09-69-C-0030, \$480,000 (DMS).

**University of Washington School of Medicine:** "Response of the Kidney to Chemical Stress," Edgewood, DAAA15-68-C-0229, \$83,000 (DMS).

**College of William and Mary:** "Study of Evaporator Kinetics in Assemblages of Liquid Particles in the Air," Edgewood, DAAA15-67-C-0151, \$25,000 (R&DD).

**University of Wisconsin:** "Investigation of New Types of Enterotoxins," Ft. Detrick, DA18-064-AMC-534A, \$80,000 (DMS).



# CBW Methodology Research

Company	Project title/description	Sponsoring agency/ Contract number/ Documentation
AEROJET-GENERAL CORP. Downey, Calif.	"CW Agent Prototype Munitions Dissemination Systems" --Experimental evaluation of "CW agent dissemination techniques & concepts as applied to prototype munitions systems to establish performance data...& to provide optimized systems-design criteria for utilizing agents."	Edgewood Arsenal, DA-18-035-AMC-117A (TAB, 7-1-66)
	"Tactical Incapacitating Munitions Study" & "Research on Army Air-Delivered Tactical CS Munition" --Research on battlefield use of incapacitating agents.	Edgewood Arsenal, DAAA15-67-R-0232, DAAA15-68-R-0011 (DMS '68)
	"Biological Line Source Dissemination System"-- Research on aircraft dissemination of BW agents.	Army Biological Lab, DA-18-064-AMC-300A (TAB, 11-1-66)
AIRCRAFT ARMAMENTS, INC. Cockeysville, Md.	"Dissemination System for Chemical Agents, Lethal & Incapacitating."	(Edgewood Arsenal, DA-18-108-AMC-62A (TAB, 9-15-66)
AMERICAN INSTITUTES FOR RESEARCH Silver Springs, Md.	"Effects of Drugs on Human Performance"--Develop- ment of "ability tests which will evaluate the effects of incapacitating compounds on human performance."	Edgewood Arsenal, DA-18-035-AMC-282A (TAB, 7-1-66)
ATLANTIC RESEARCH CORP. Alexandria, Va.	"Investigation of Supersonic Delivery of Biological Agents"--Studies to establish "design criteria for delivery of dry biological agents at supersonic delivery."	USAF Armament Lab, AF-08(635)-4396 (TAB, 11-1-66)
	"Rapid Gelling Systems for Chemical Munitions"-- Development of CW agent bomblets.	USAF Armament Lab, AF-08(635)-5156 (TAB, 4-1-67)
ANALYTIC SERVICES, INC. Falls Church, Va.	"The Technical Feasibility of Biological Warfare"-- Operations research on biological warfare, including computations of area coverage and casualties from simulated BW attacks.	USAF, AF-49(638)-1259 (TAB, 4-1-67)
AVCO CORP. Wilmington, Mass.	"Determination and Disposition of Submarginal Bio- logical Weapons"--Evaluation of "concepts for the determination and disposition of submarginal bio- logical weapons containing either anti-personnel or anti-crop agents."	USAF Armament Lab, AF-08(635)-4679 (TAB, 7-15-66)
BATTELLE MEMORIAL INSTITUTE Columbus, Ohio	"Biological Munitions for Small Targets"	Army Biological Lab DA-18-064-AMC-332A (TAB, 4-15-66)
BOOZ-ALLEN APPLIED RESEARCH, INC. Chicago, Ill.	"Mathematical, Statistical & Operations Research Relative to Effects of BW & CW Agents When Tested & Evaluated Under Operational Conditions"--Opera- tions research in support of CBW field test program at Dugway Proving Ground.	Dugway Proving Ground DAAD09-67-R-0272 (DMS '68)
	"Technical Development Plan for the Army's Air- Delivered Tactical CS Munition"--Reliability studies & field tests of air-delivered incapacitating agents.	Edgewood Arsenal DA-18-035-AMC-734A (TAB, 8-15-66)
C-E-I-R, Inc. Washington, D.C.	"Mathematical & Statistical Research & Data Analysis of CBW Testing Program"	Army Biological Lab DAAA13-68-C-0063 (DMS '68)



DOW CHEMICAL CORP. Midland, Mich.	"Evaluation of the Sensitivity of Some Common Food Crops to the Herbicide 4-amino-3,5,6-Trichloropicolinic Acid"--Research on the effectiveness of picloram in poisoning non-gramineous crops, including soybean, potato & manioc.	Army Biological Lab DA-18-064-AMC-119A (TAB, 7-1-65)
ETHYL CORP Ferndale, Mich.	"Synthesis & Screening of Defoliants"--Research on the effectiveness of various metalorganic compounds used as defoliants.	Army Biological Lab DA-18-064-CML-2850 (TAB, 3-1-67)
GARRETT CORP. AI Research Mfg. Co. El Segundo, Cal.	"Services to Design & Develop the XM26 Riot Control Dispenser."	Edgewood Arsenal DAAA15-69-C-0061 (CBD, 9-4-68)
GCA CORP. Bedford, Mass.	"New Techniques for the Dissemination of Chemical Agents"--Investigation of "new techniques & concepts for the dissemination of solid & liquid chemical agents."	Edgewood Arsenal DA-18-108-AMC-249A (TAB, 11-1-66, 3-15-67)
	"Aerosol Dissemination Assessment" & "Research on the Dissemination of Inhalable Aerosols"--Research on the dissemination of CBW aerosols.	Edgewood Arsenal DA-18-035-AMC-376A DAAA15-67-C-0509 (TAB, 6-15-67, R&DD '68)
	"Services to provide meteorological data system integration, operation & maintenance at Dugway Proving Ground" & "Services for the development of dosage prediction models & concepts"--Operations research & computer services in support of CBW field test program of Dugway Proving Ground.	Dugway Proving Ground DAAD09-68-C-0094 DAAD09-67-R-0009 (DMS '68, R&DD '68)
GEOMET INC. Rockville, Md.	"Services to collect, evaluate, statistically summarize & tabulate all pertinent data & information as appropriate on offensive-defensive systems, their subsystems & components, for CBW agents."	Dugway Proving Ground DAAD09-69-R-0082 (CBD, 4-23-69)
GOODYEAR AEROSPACE CORP. Akron, Ohio	"Study of Materials & Methods for Subpackaging Biological Munitions" & "Exploratory Development for a Chemical & Biological Bomblet"--Research on the fabrication of CBW bomb components.	USAF Armament Lab, AF-08(635)-5404 AF-08(635)-5392 (TAB, 10-1-66, 10-15-66)
W. R. GRACE & CO. Clarksville, Md.	"Development of Chemical Agent Suspensions"--Research on aerosol dissemination of CW agents.	Edgewood Arsenal DAAA15-67-C-0059 (TAB, 7-1-67)
	"Research on New Concepts for the Dissemination of Agents for Tunnel Denial"--Research on the use of CW agents to drive people from tunnels (as in Vietnam).	Edgewood Arsenal DA-18-035-AMC-747A (TAB, 1-15-67)
HARVEY ENGINEERING LABS Torrence, Cal.	"Implosion Dissemination of Solid Chemical Agents (BZ)"--Research on the aerosol dissemination of incapacitating agent BZ.	USAF Armament Lab, AF-08(635)--4416 (TAB, 10-1-66)
HONEYWELL, INC. Ordnance Div. Hopkins, Minn.	"BZ Bomblet (BLU-20/B23)"--Fabrication of a bomblet containing incapacitating agent BZ compatible with the SUU-13/A bomb dispenser for "high-speed, low-altitude aircraft delivery."	USAF Armaments Lab, AF-08(635)-3691 (TAB, 6-1-67)
ARTHUR D. LITTLE, INC. Cambridge, Mass.	"Research on Incapacitating Agents"--Research on the military use of "psychochemicals" (hallucinogens), including THC, a synthetic form of marijuana.	Edgewood Arsenal DAAA15-68-C-0023 (DMS '68)
MELPAR, INC. (Subsidiary of Westington Air Brake Co.) Falls Church, Va.	"Fluctuating Meteorological Parameters"--Study of "the environmental fluctuations experienced by a freely-travelling BW aerosol particle."	Dugway Proving Ground DA-42-007-AMC-224R (TAB, 10-1-66)
	"Provide Meteorological Support & Participate in Tests & Surveys in Various Environments, Areas & Terrains," "Development of Instrumentation for Real Time Measurements of Field Disseminated CBW Agents" & "Development of Tracer Materials & Detection Methodology to be Used in Tracing Biological Aerosols in Field Testing"--Provide scientific services in support of CBW field testing program of Dugway Proving Ground.	Dugway Proving Ground DA-42-007-AMC-339Y DA-42-007-AMC-305R DA-42-007-AMC-312R (R&DD '68)



MONSANTO RESEARCH CORP. Dayton, Ohio	"Physical & Colloid Research on Chemical Agents," "Properties of Bromophenylacetoneitrile (Agent CA)" & "Studies of Surface Chemistry of Solids in Dissemination"--Studies of Chemical agents "in order to support the search for new agents, evaluate candidate agents & improve the stability & effectiveness of operational agents."	Edgewood Arsenal DA-18-035-AMC-136A DAAA15-68-C-0006 (TAB, 12-15-66, 7-15-67, DMS '68)
	"Study of Simulants (Test Expedients) for Toxic Chemical Agents"--Selection of "nontoxic simulants for chemical simulants for chemical agents BZ, GB & VX" for use in test exercises.	USAF Armament Lab DA-18-035-AMC-387A (TAB, 1-1-67, 7-1-67)
NORTHROP CORP. Anaheim, Cal.	"Non-linear Dispensing System"--Research on the aircraft dissemination of CBW agents.	USAF Armament Lab AF-08(635)-5034 (R&DD, '67)
OPERATIONS RESEARCH, INC. Silver Springs, Md.	"Project PHAROS: Sensitivity Analysis of the Operational Effectiveness of CBW Weapons Systems"--Development of a "methodology for analyzing & evaluating the CBW weapons system in a militarily useful manner."	Edgewood Arsenal DA-18-108-CML-6554 (TAB, 4-15-66)
	"Project PHAROS II: A Revised CBW Weapons Systems Simulator"--Computerized simulations of CBW attacks, including projections of casualties.	Dugway Proving Ground DA-42-007-AMC-163Y (TAB, 7-1-67)
PENNSALT CHEMICALS CORP. King of Prussia, Pa.	"Defoliants & Foliar Desiccants Synthesis & Screening"--Evaluation of the effectiveness of various compounds for use as anti-crop agents.	Army Biological Lab DA-18-064-CML-2847A (TAB, 6-1-66)
RESEARCH ANALYSIS CORP. McLean, Va.	"Economic-Crop Destruction as a Cold War/Counterinsurgency Weapon"--Strategic analysis of the military usefulness of crop-destroying campaigns.	Army Research Office DA-44-180-ARO-1 (TAB, 6-15-67)
SHOCK HYDRODYNAMICS, INC. Sherman Oaks, Cal.	"Study of Supersonic Delivery of Liquid CB Agents"--Research on aircraft dissemination of CBW agents.	USAF Armament Lab AF-08(635)--4435 (TAB, 10-15-66)
TRAVELERS RESEARCH CENTER, INC. Hartford, Conn.	"CBW Effectiveness Methodology: An Analysis of Needs & Current Status" & "Methodology & Applied Studies Relevant to CBW Operations Research"--"The range of likely uses of antipersonnel toxic CBW munitions is considered & the requirements for computing their effectiveness are identified."	Edgewood Arsenal DA-18-035-AMC-727A (TAB, 8-1-67, R&DD '68)
	"Techniques for Dosage Prediction"--Development of mathematical models for the computation of dosage levels resulting from CBW attack.	Dugway Proving Ground DA-42-007-AMC-247R (TAB, 7-1-67, 8-15-67)
	"Study of Aerosol Diffusion over a Woodlot Complex"	Dugway Proving Ground DAAD09-68-C-0042 (DMS '68)
UNIDYNAMICS Phoenix, Ariz.	"New Methods of Chemical Agent Dissemination by Thermal Means"--Development of a CW dissemination system "in which the hot gases from a burning pyrotechnic melt, ablate & vaporize the agent."	Edgewood Arsenal DA-18-035-AMC-371A (TAB, 3-1-67)
VITRO CORP. OF AMERICA Eglin AFB, Fla.	"An Ecological Study of the Effects of Certain Concentrations of Cacodylic Acid on Selected Fauna & Flora"--Tests to determine toxicity of cacodylic acid, an anti-crop agent used in Vietnam.	Air Proving Ground AF-08(635)-5150 (TAB, 8-1-67)

\*Abbreviations: CBD, Commerce Business Daily (published by U.S. Department of Commerce); DMS, Defense Marketing Service (published annually by McGraw-Hill); R&DD, Research & Development Directory (published annually by Government Data Publications, Inc.); & TAB, Technical Abstract Bulletin (published bi-weekly by the Defense Documentation Center of the U.S. Department of Defense).

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# PART 3: FOREIGN AFFAIRS RESEARCH

## The Foreign Affairs Research Establishment

*The text reproduced below constitutes the introduction to a Directory of University Centers of Foreign Affairs Research released in 1968 by the State Department's Office of External Research. In this introduction, the government quite candidly describes how the social science departments of leading American universities have been coopted and channeled into producing "policy oriented research" and into training administrators for the U.S. empire. The Directory's selected chronology on the development of foreign affairs research centers (also reproduced below) encapsulates the complimentary trends of the emergence of these centers and the global expansion of U.S. economic, political and military hegemony.*

*The data on 191 university-linked foreign affairs research centers and inter-university consortia contained in the directory includes brief descriptions of research orientation, funding, publications and the names of the principal researchers associated with the centers. The Directory is thus a valuable tool both as a source of information on particular campuses as well as an aid in putting local research activities into a national perspective. The Directory is available for \$1.00 from the U.S. Government Printing Office, Washington, D C. 20402 (request State Dept. Publication No. 8378).*

### Some Historical Notes

The historical notes which follow are intended to supplement the data in the directory by reviewing the development of the university-affiliated center, beginning with the introduction during the 1920's of the interdisciplinary approach to research. This led to the "center concept" and its application to social science research in international affairs. World War II and its aftermath called for solutions to national security problems and emphasized the need for intensified foreign area studies. By the 1950's, the center concept, undergirded by technological advances and increasingly directed toward policy-oriented research, had become a way of intellectual life in the United States. The present decade opened with a call for the "further strengthening of university programs in world affairs" and for increasing use by the Government of scholarly research; on its part, the Government thus far in the 1960's has taken several significant steps to increase its support for, and improve its utilization of, such research.

### An American Phenomenon

The university research center is largely an American phenomenon, whose historical roots are to be found in several characteristics peculiar to American scholarship. Among them is the traditionally pragmatic bent of social science in this country; another is the emergence, after World War I, of research as a significant function of the university; a third factor is the trend toward research of an interdisciplinary nature. These influences of themselves





might have led ultimately to the development of today's research center concept. As it happened, they were reinforced in the 1920's by another American phenomenon, the private foundation, which provided centers with the funds needed for rapid growth.

The notion that social science research should have more or less immediate "practical" utility has during the last half century paralleled the opposite attitude that research should follow its own inherent insights and purposes, leaving practical applications to other practitioners. The pragmatic attitude was expressed by Columbia's President Nicholas Murray Butler, who as early as 1923 called for "a single compact group" at the university "to plan and execute researches in current economic, legislative, municipal, political and social problems, and to put their services at the disposal of private and public groups, as well as agencies of government."

Only five years later, Frederick A. Ogg echoed the sentiment in a work prepared for the American Council of Learned Societies: "If . . . we depend on physical and biological science to augment the goods of existence in an increasingly crowded world," Ogg wrote, "we depend no less on the social sciences to enable us to avail ourselves of these goods with a minimum of friction and waste. . . . For this practical reason, if no other, it is imperative that social studies march with the natural sciences." In 1939 Robert S. Lynd argued in a famous series of lectures -- "Knowledge for What?" -- for the application of all available knowledge to cope with social problems of the time. And after World War II, Harold Lasswell and colleagues in several areas of social research elaborated and popularized the pragmatic orientation in their idea of "the policy sciences."

As these passages suggest, the "social problem" orientation of American scholarship was closely associated with, and indeed facilitated, a rapid rise in the importance attributed to research among the several functions of the university; the commitment to empirical investigation was thus another factor in the emergence of the research center as a characteristic academic division. Hitherto the university had typically left the responsibility for conduct of research to the individual members of its faculty; it might contribute little more than the requirement of a Ph.D. and the pressure for continuing publication, or alternatively it might focus primarily on teaching. As a faculty committee at one university noted in 1925, statutes defining the duties of faculty members dealt explicitly with matters of instruction, leaving research to individual initiative; university funds "pay for majors delivered," while research "has little or no official standing." This situation changed rapidly, however, as universities both enhanced the status of research and assumed responsibilities for fostering it, devising new organizational forms that, as one University of Chicago proposal said, "would cut across departmental lines, marshalling a number of departments or parts of departments for frontal attacks on large projects of investigation requiring the concerted effort of scholars of widely differing interests and aptitudes."

This interdisciplinary tendency in the social studies was a third influence on the growth of research centers. As Charles E. Merriam wrote in 1926, "The problem of social behavior is essentially one problem, and while the angles of approach may, and should, be different, the scientific result will be imperfect unless these points of view are at times brought together in some effective way so that the full benefit of the multiple analysis may be realized." This view, which is commonplace today, was partly the result of general intellectual currents revealed, for example, by the diffusion of Freudian ideas to literary and social scientific fields.

But, as Lasswell and others have noted, more specific forces also were at work. Among them was the nature of social problems themselves, many of which could hardly be dealt with adequately within the confines of any single discipline. In addition, at least in political science, the émigré European scholars who came to occupy leading positions in American universities in the 1930's insisted "on the relevance of sociological and even psychological theories for an understanding of politics," as Robert Dahl put it. Finally, there was the cross-fertilization resulting from the efforts of workers in some fields to emulate the methods of the more quantitative branches of the psychological and social sciences that had apparently demonstrated their superior scientific cachet and practical value.

Such trends reflected the flexible, lively, and creative features of American higher education. But their rapid institutionalization was due in considerable part to a fourth factor -- encouragement and financial support from private foundations and eventually from the Federal Government. Armed with this support, the advocates of cross-disciplinary social research were able, among other things, to break through traditional professional boundaries and to create institutes and centers that have become an increasingly prominent force in American scholarship.

### The Early Years

Probably the most striking development in American universities between the two World Wars was the vast increase in research. A survey of "humanistic and social" research in American universities conducted in 1926-7 by the American Council of Learned Societies with a grant



from Carnegie Corporation of New York demonstrated that social science research was suffering from acute poverty; those universities -- by no means all -- that supported humanistic and social research did so with annual allotments ranging from \$250 to \$40,000. But the situation changed rapidly as social scientists formed coordinating organizations at the national level and, with foundation help, established numerous university-affiliated research centers.

The Laura Spelman Rockefeller Memorial played a decisive role in the establishment and development of several of the early centers, including the Institute of Psychology, Yale (1924); the Institute of Human Relations, Yale (1929); the Institute for Research in Social Science, University of North Carolina (1926); and the Institute for Research in the Social Sciences, University of Virginia (1926). In its 1926 annual report, the Memorial referred to the extent of its "aid for institutional centers for social research" and announced that "future activities . . . will be directed increasingly toward the support of such research centers." This announcement cannot have escaped the attention of university administrators faced with the problem of financing research with the meager funds available from their own budgets.

The rationale underlying the Memorial's program, as stated by Raymond B. Fosdick in The Story of the Rockefeller Foundation, was "the idea of bringing together the various disciplines of the social sciences . . . in a systematic investigation of concrete social problems." Between 1923, when the Memorial began its program of support for the social sciences, and 1929, when it was consolidated with the Rockefeller Foundation, the Memorial spent approximately \$41 million on all phases of the program. Of this amount, about \$20 million went to university centers of research (including several in Europe). In an address at the dedication of the University of Chicago's Social Science Research Building in 1929, President Robert B. Hutchins commented: "The Laura Spelman Rockefeller Memorial in its brief but brilliant career did more than any other agency to promote the social sciences in the United States."

Recognizing the need for some coordination of research on a national basis, the American Political Science Association as early as 1908 proposed -- unsuccessfully -- the creation of a national center for political studies. But in 1923, at the APSA's initiative, the Social Science Research Council was formed as a national association to promote research in all fields of social studies. Within two years the Council included scholars representing political science, economics, sociology, statistics, history, anthropology, and psychology. Working mainly through committees, the SSRC -- occasionally joining forces with the American Council of Learned Societies, formed in 1919 -- has had a tremendous influence on the growth and direction of American social research.

In a prophetic report to the SSRC in 1927, James T. Shotwell, chairman of its Advisory Committee on International Relations, observed that "scientific discovery, invention, industrial and financial organization have transformed the problems of statecraft as much as they have remade the immediate conditions of living. . . . Out of the ferment of the post-war era we already can see new forces arising, which, if they mature will modify the entire relationship of civilized nations. These elements of a historic process cannot be studied adequately by the means and through the instruments at our disposal at present. They cannot be referred to the casual or incidental interest of those who make this field an academic avocation. . ." The appeal had little immediate impact on university research, which was concentrated on methodological concerns and domestic problems rather than on international affairs.

In the early thirties the importance of international studies at the graduate level received recognition at three universities. Johns Hopkins established the Walter Hines Page School of International Relations in 1930; the University of Chicago in 1931 set up a Committee on International Relations to coordinate an interdisciplinary graduate program; and Tufts University in 1933 created the Fletcher School of Law and Diplomacy. In 1935, Yale University, with a grant from the Rockefeller Foundation, established its Institute of International Studies, the first center devoted to advanced research. But it remained virtually unique until after the Second World War.

#### World War II and Its Aftermath

The war shook the provincialism of American social science. Leaders belatedly recognized how ignorant most Americans were about cultures of other critical areas of the world. Fortunately for the war effort, some groundwork had been laid in earlier years, partly as the result of grants from the Rockefeller Foundation to Columbia, Harvard, and Cornell for the teaching of Russian and to Columbia and Yale for instruction in Chinese. Of even greater significance was the first of nine grants made by the Foundation in 1941 to the American Council of Learned Societies for the development of instruction programs in a number of "neglected" modern languages that might be needed by military personnel in the impending conflict. The Emergency Intensive Language Program developed by the ACLS provided many of the techniques adopted when the Army Specialized Training Program launched its area and language training in 1943.



New approaches were not confined to language teaching. In political science, as Dahl has pointed out, a whole generation was influenced by first-hand experience with the political and administrative realities of the war effort.

The confrontation of theory and reality provoked, in most of the men who performed their stint in Washington or elsewhere, a strong sense of the inadequacies of the conventional approaches of political science for describing reality, much less for predicting in any given situation what was likely to happen.

One wartime project which transcended conventional approaches was carried out by the Army Research Branch. It involved some 300 studies of various phases of the soldier's life, based on more than 600,000 interviews. At the end of the war the Army turned over its data to the Social Science Research Council, which, with a grant from Carnegie Corporation, conducted a secondary analysis of the material and published the results in four volumes. Commenting on the American Soldier Project, Paul Lazarsfeld wrote:

Never before have so many aspects of human life been studied so systematically and comprehensively. The findings have major implications for the understanding of civilian as well as military life.  
... Why was a war necessary to give us the first systematic analysis of life as it really is experienced by a large sector of the population?

The survey techniques employed by the Army Research Branch had a considerable influence on the methodology of future sociological research and the project itself pioneered research in the behavioral sciences subsequently sponsored by the Department of Defense.

Another fertile source of new realizations and approaches was the Research and Analysis Branch of the Office of Strategic Services. Many hundreds of researchers in politics, economics, psychology, and sociology, driven by the heat of war demands, discovered in various degrees the value of interdisciplinary teamwork, the unbelievable expansion of U.S. interests into novel geographic and functional areas, and the potential for applying what used to be called academic techniques to meeting the most practical of demands. The dispersal of much of this group and others like it after the war carried these intellectual habits and observations to all corners of the American academic world.

The university community, as it focused on applied science in the forties, developed many of the trends which have characterized the involvement of American social science with world affairs in the past two decades. To take but one year, 1945, the Social Science Research Council established a Committee on Political Behavior, the Air Force launched Project RAND, and Columbia University received \$250,000 from the Rockefeller Foundation to organize the Russian Institute. In these events can be seen strands of the developing web of new approaches -- foundation support, Government interest, and interdisciplinary organization of research centers -- which were to exert so much influence on postwar studies in foreign affairs.

One catalyst was the Rockefeller Foundation, which had been instrumental in developing non-Western studies as an integral part of American social science. Its 1945 grant to Columbia for the Russian Institute, the first of its kind and a model for others, was the precursor of a host of foundation grants to what were to become known as university foreign language and area centers. Two years later Carnegie Corporation began to support university centers for non-Western studies, and early in the next decade the Ford Foundation came in on a massive scale.

The new language and area centers reflected the same pressures for greater knowledge of foreign societies which confronted the Government at the end of the war. When the imposing array of academic talent drawn to Washington for wartime service divided between those who chose to remain in Government service and those who returned to universities, there was danger of an intellectual gap. Different agencies reacted in different ways, but there were few policy-makers who did not see the relevance of social science research in its broadest sense to the new position of the United States in the world. The Department of State, for example, retained in-house a fair fraction of the OSS research force to continue developing in its service an interdisciplinary research program; it also in 1948 established as a complement to its in-house staff the Office of External Research. The purpose of this office was, and is, to amplify the research resources available to the Department by ensuring a steady flow of information and ideas between Government policy-makers and private scholars engaged in research on foreign affairs.

The Air Force had embarked on a different course at the end of the war, creating a new \$10 million organization to conduct "a program of study and research on the broad subject of intercontinental warfare other than surface." RAND's work was at first exclusively in the physical sciences, with emphasis on space technology. As a result of a 1947 conference, whose participants included leading behavioral scientists, a program of social science research took form in 1948. In the same year, Project RAND became the RAND Corporation,



a nonprofit organization "to further and promote scientific, educational, and charitable purposes, all for the public welfare and security of the United States of America."

#### Trends in the 1950's

The Air Force in 1945 had considered, and rejected, the idea of establishing Project RAND on a university campus; one factor in its decision was "the near absence of a well-developed body of thought and community of scholars dedicated to the study of national security as an analytic field."

A development six years later suggested that the problem was less paucity of academic resources for studies relating to national security than lack of effective organization. The U.S. Government requested the Massachusetts Institute of Technology to help in solving electronic problems related to overseas broadcasting. The concept of the study pioneered in requiring the insights of social science research as well as expertise in the physical sciences. "A survey of the academic resources of the Boston-Cambridge area revealed a wealth of individual talent in the relevant social sciences but no research organization able to mobilize it. The Center for International Studies was formed to fill this need for research on important problems in the social sciences that did not seem to be receiving sufficient attention." (Research Report: 1964-1965, Center for International Studies, Massachusetts Institute of Technology, 1965.)

The M.I.T. Center's work demonstrated that university research could contribute significantly to Government needs and paved the way for similar centers elsewhere. Paul Nitze, then Secretary of the Navy, commented on this development in a speech at the University of Edinburgh in 1966:

How did these centers respond to the Government's needs? In a variety of ways. First of all, they attracted men of scholarly qualities who were interested in learning about, and working with, national security problems. These men were free from direct government responsibility, lived in an atmosphere of academic freedom, and had sufficient time to study and reflect on the very serious challenge at hand. Soon various branches of the Government gave studies under contract to these centers . . . and before long the outlines of an identifiable academic discipline having to do with national security affairs in the nuclear age began to emerge.

The M.I.T. Center and later the Harvard Center for International Affairs, established in 1958, were among many which benefited from the emergence of the Ford Foundation on the national -- and international -- scene. Between 1951 and its termination in 1966, Ford's International Training and Research Program, the rubric under which came most of the Foundation's grants for international purposes, expended a total of more than \$270 million. Of this sum, \$155 million was for the purpose of strengthening foreign area and other international studies at American universities.

The Foundation's strongly international orientation derived from recommendations of the study committee appointed in 1949 to develop plans for the best use of income from \$500 million. In the words of President H. Rowan Gaither, Jr., its trustees "decided in September 1950, that initially the Foundation would devote its resources to efforts to advance world peace, democracy, economic well-being, education, and knowledge of the behavior of man."

Ford was not alone in furthering these objectives during the 1950's. The Fulbright program, launched in 1948 in five countries, grew to include 35. The National Science Foundation in 1956 created its social science research program. As William W. Marvel observed in The University Looks Abroad (Education and World Affairs, 1966), this was also the decade of the Comparative Politics Committee of the Social Science Research Council, the decade for American education of the foreign student and the first scholarly exchanges with the Soviet Union, and, most importantly for the development of centers for research on foreign affairs, the decade of the National Defense Education Act, the behavioral revolution in American social science, and the growth by geometric progression of interdisciplinary research centers on the American university campus. The realization had come that, in James Shotwell's words a quarter of a century earlier, international affairs research "cannot be referred to the casual or incidental interest of those who make this field an academic avocation."

#### Concern in Washington

The international role of American universities was the subject of a report published in 1960 by the Committee on the University and World Affairs, of which some 100,000 copies were distributed. The Committee, created the previous year by the Ford Foundation at the request of Secretary of State Christian Herter, was chaired by J. L. Morrill; other members



included Dean Rusk, then president of the Rockefeller Foundation; John W. Gardner, then president of Carnegie Corporation of New York; and Senator J. William Fulbright. Its report noted:

Our basic knowledge of a vast array of foreign societies, of international relations, and of economic growth and social change is gravely deficient. If our understanding and our capacity to act in such areas as Asia, Africa and Latin America are to be illuminated by critical appraisal, greatly expanded opportunities are needed for scholarly studies of those countries and of United States relations with them.

Calling attention to the disparity between Government agencies' use of university research in foreign relations compared to that in other fields, the report commented: "With further strengthening of university programs in world affairs, the competence for policy-oriented research will grow and should be used increasingly by government."

An outgrowth of the Committee's report was the establishment, with funds from the Ford Foundation and Carnegie Corporation, of Education and World Affairs, a private organization whose purposes are "to study, analyze and assist in strengthening the international teaching, research and service dimensions of U.S. colleges and universities."

Specific recommendations relating to use of university research by the Agency for International Development emerged from the study conducted for AID by a task force headed by John W. Gardner. Its report, A.I.D. and the Universities, published in 1964, urged a greatly increased program of contracts and grants to universities for development-related research:

The most important single fact about development research today is that there isn't enough of it. . . . A.I.D. should increase very substantially its own commitment in research. And the universities interested in development should make concerted efforts to bring other sources of funds, governmental and nongovernmental, into the productive support of development research.

The first of several indications of growing Congressional interest in support of scholarly activities was the passage in 1960 of legislation establishing the East-West Center in Honolulu "to promote better relations and understanding between the United States and the nations of Asia and the Pacific through cooperative study, training and research." The Mutual Educational and Cultural Exchange Act of 1961, in addition to consolidating the various authorities for the State Department's exchange programs, specifically provided for "promoting modern foreign language training and area studies" in American institutions by "supporting visits and study in foreign countries by teachers and prospective teachers . . . for the purpose of improving their skill in languages and their knowledge of the culture of the people of those countries."

Congress in 1965 passed a bill establishing the National Endowment for the Humanities and specifying that among the fields in which it was to award fellowships and grants were "those aspects of the social sciences which have humanistic content and employ humanistic methods." Both training and research in international studies at U.S. universities were authorized in the International Education Act of 1966, under which grants would be available to institutions of higher learning and to professional and scholarly associations for the development of "centers for advanced international studies." The Act also provided for the establishment of a National Advisory Committee on International Studies, of whose members "a majority shall constitute a broad representation of higher education in the United States." Legislation still pending would center federally supported social science research in a new National Foundation for the Social Sciences.

In response to concern over coordination of Government-sponsored social science research the Department of State in 1964 took the initiative in establishing the Foreign Area Research Coordination Group (FAR). The Group now includes representatives of 21 Government departments and agencies which sponsor research, both in-house and through grants and contracts.

#### A Time for Appraisal

The tremendous impetus of the 1950's carried the funding and development of foreign affairs research centers well into the present decade. But by the mid-sixties the signs of slowing growth were unmistakable. The last half of the decade may well emerge as one of evaluation and consolidation. This review goes on under various auspices. In 1964 the Committee on Research Evaluation, sponsored by the Carnegie Endowment for International Peace, set to work (see International Relations Research: Problems of Evaluation and Advancement, Santa Barbara, Clio Press, 1967). Numerous stocktaking papers were solicited by the U.S. Office of Education in preparation for implementation of the International Education Act. The Division of Behavioral Sciences of the National Academy of Sciences-National Research Council has three committees at work on aspects of the social sciences, all of which have implications for foreign affairs research: the Advisory Committee on



Government Programs in the Behavioral Sciences, the Behavioral and Social Sciences Survey Committee, and the Committee on International Relations in the Behavioral Sciences. Even more recently, Education and World Affairs announced plans for a new Committee on International Studies.

The reasons for this self-examination are numerous. Prominent among them are no doubt: (1) the very fact of rapid growth itself, which has been accompanied by both intellectual and organizational variety and diversity; (2) the explosion of latent social problems on the American domestic scene; (3) concern over the modelities of Government support for research in foreign affairs; and, perhaps, (4) the numerous effects which the mere passage of time has wrought in the view of the world held by American scholars and by the public at large.

What all of this activity portends for university-related centers of research on foreign affairs remains to be seen. Policy-makers and scholars both in and out of Government share an interest in seeing to it that the United States does not face the critical decade of the 1970's in what Professor Karl Deutsch has aptly called a state of intellectual disarmament.

### Summary Analysis of the Data

#### Financial Support

The source of funds most frequently cited by the 191 centers included in the directory was the Ford Foundation; 107 centers, or 56 percent of the total, reported that they received at least partial support from Ford, either directly or through sharing in grants made to the host university. The next most frequently mentioned source of funds was the host university itself, reported by 71 centers, 37 percent of the total. In addition to outright financial support, it may be assumed that most centers also receive indirect assistance from the university, in the form of library facilities, time of faculty members, housing, etc.

Among other principal categories of financial support, ranked according to the number of centers assisted, are: Federal Government (67), Rockefeller Foundation (18), Carnegie Corporation of New York (17), gifts from individuals (16), and State governments (14). (Because most centers report multiple sources of support, these figures add to more than the total number of centers represented.)

#### Geographic Distribution

Centers seem to attract additional centers; the prime example is Columbia University, with 17. Of the 191 centers, 112 cluster around 12 institutions. Geographic distribution consequently is spotty; 27 States, plus the District of Columbia and Puerto Rico, are represented, but New York accounts for 41 centers and California for 28, whereas nine of the States and Puerto Rico have one center apiece.

A recent development among these centers that has tended to equalize geographic distribution of foreign affairs research programs is the consortium, which enables the member institutions to pool their research resources and thus augments the facilities and personnel within reach of all. The membership of some of these cooperative arrangements, such as the Inter-university Consortium for Political Research based at the University of Michigan and the Human Relations Area Files at Yale, includes organizations other than universities and extends to institutions outside the United States.

#### Subject Matter Range

As for the range of subjects on which the centers focus, the index to the directory lists a total of 60 involved in specific geographic areas and 131 in functional fields. (Some of these operate in more than one area or field.) Of the geographically oriented centers, the largest group -- 20 -- is engaged in research on the Far East. Latin American research ranks next, with 11 centers, followed by Africa, with nine, and Europe and the Middle East, with five each.

In the case of functionally oriented centers, 17 are principally engaged in research on socio-cultural change. Other fields of significant concentration are: Political change and development (14), economic development (13), communism (13), international relations in general (11), international economics (10), national security (10), and population and demography (10). Fairly evenly distributed are centers focusing on agriculture, communication, education, human resource development, and international organizations.

The criteria for selecting centers for this directory exclude many significant activities carried out by university centers whose principal emphasis is on teaching and training rather than on research. Thus the publication is not a complete guide to either university research or university education in foreign affairs. Nonetheless, even within the restricted framework adopted for the survey, it is apparent that university-based centers are responding to the research needs of an increasingly complex world.

1. California (Berkeley), California (Los Angeles), Chicago, Columbia, Cornell, Harvard, Indiana, Michigan, Michigan State, Stanford, Washington (Seattle), and Wisconsin.



# AN INVENTORY OF GOVERNMENT-SPONSORED\* FOREIGN AFFAIRS RESEARCH

\*DEPARTMENT OF STATE AND DEPARTMENT OF DEFENSE

Compiled by Michael Klare

Organization:	Project Title/Sponsoring Agency/Contract Number/Amount of Contract/ When Active/Classification (if known):	Principal Researcher(s):
Abt Associates, Cambridge, Mass.	Symposium: Great World Problems of the Next Decade/DoS/\$12,700/1966/	
	POLITICA--A Manual Countersubversion and Counterconspiracy Game (Project Agile)/ARPA/65-66/	Clark Abt
	URB-COIN--A Manual Counterinsurgency Game (Project Agile)/ARPA/65-66/	Clark Abt
American Institutes for Research, Pittsburgh, Pa.	Research on Relationships Between U.S. Troops and Indigenous Populations in Developing Countries/Army/\$200,000/FY 67/	
	Research on Army Command Information Orientation of Troops for Community Relations (emphasis: Korea, Thailand)/Army/FY 68/	

American University, Center for Research on Social Systems (CRESS), Washington, D.C.

Note: CRESS is the Federal Contract Research Center (FCRC) responsible for social science research relevant to U.S. Army operations in the fields of counterinsurgency, psychological warfare, and military civic action. CRESS, originally known as the Special Operations Research Office (SORO), is composed of the Social Science Research Institute (SSRI) and the Cultural Information Analysis Center (CINFAC). SSRI is the research arm of CRESS, while CINFAC is the Department of Defense Information Analysis Center responsible for collecting, storing and disseminating information on counterinsurgency operations in underdeveloped areas. CRESS received \$1,900,000 from the DoD in fiscal 1968 for these activities.

## Major Programs:

Strategic and Tactical Factors Underlying Military Counterinsurgency Operations/ARO/\$69,000 in FY 67/Reports: Challenge and Response in Internal Conflict (3 Vols.), Vol. I, The Experience in Asia; Vol. II, The Experience in Europe and the Middle East; Vol. III, The Experience in Africa and Latin America.	D. M. Condit
Study of Military Resistance to Communist Underground Movements/ARO/\$58,000 in FY 66/Reports: Human Factors Considerations of Undergrounds in Insurgencies, by Andrew Molnar, Jerry Tinker, and John LeNoir (1966); The Communist Movement in South Vietnam--A Case Study in Organization and Strategy (67).	Andrew Molnar Frederick Munson
Internal Security (formerly titled: Analysis of Military Operations in Support of Internal Security in Developing Nations)/ARO/\$84,000 in FY 67/Reports: Combatting Subversively Manipulated Civil Disturbances, by Andrew Molnar and Adrian Jones (1966); Characteristics of Civil Disturbances (1967).	Adrian Jones Norman LaCharite
Changing Roles of the Military in the Contemporary World/ARO/\$142,300 in FY 67/Reports: A Survey of Elite Studies, by Carl Beck, James Malloy and William Campbell (1965).	John L. Houk
Analysis of the Motivational Factors Which Support Counterinsurgency Military Operations/ARO/65-67/Reports: Working With Peoples in Developing Areas--One Task of the American Soldier Overseas, by John L. Houk (1966).	John L. Houk
Ethnographic Study Series: Minority Groups in South Vietnam/ARO/65-66/Reports: Brief Notes on the Tahoi, Pacoh and Phuon of the Republic of Vietnam, by Narilou Fromme (1966).	
Characteristics of Societies Relevant to U.S. Military Interests (continuation of project titled: Sociological and Psychological Vulnerabilities of Hostile and Potential Hostile States)/ARO/\$115,000 in FY 67/CONFIDENTIAL/Reports: Psychological Vulnerabilities of the Soviet Union, by James Pacy (1964); North Vietnam (1968); Thailand (1968).	Charles Spinks
Intercultural Communications (formerly known as Psychological Operations)/ARO/\$143,000 in FY 67/continuing project/CONFIDENTIAL/Reports: U.S. Army Psychological Operations Handbooks for Afghanistan, Burma, Cambodia, China, Colombia, Congo, Egypt, Ghana, Indonesia, Iran, Iraq, Jordan, Laos, Lebanon, Pakistan, Saudi Arabia, South Vietnam, Syria, Thailand, Turkey; also, U.S. Army Intercultural Communications Guides for Brazil, Venezuela, and the Himalayan Area.	

Arthur D. Little, Inc. Long Range Environmental Studies: USSR and Eastern Europe/Army/FY 68/  
Cambridge, Mass.



Associates for International Research, Inc., Cambridge, Mass.	Great World Issues of 1980/USAF, Dir. of Plans/contract AF-49(638)-1586/ \$49,782/FY 66/ Research on Urban Disequilibrium (Project Agile)/ARPA/65-66/CONFIDENTIAL	Lawrence Barass
Atlantic Research Corp., Georgetown Research Project, Alexandria, Va.	Africa and U.S. National Security/DoD/\$2,493/FY 67 Soviet Military Aid as a Reflection of Soviet Objectives, 1956-67/USAF/ \$19,995/FY 68/ Nation-Building Contributions of 12 Latin American Air Forces/USAF/FY 68/ Remote Area Conflict (Project Agile)/ARPA/64-66/Reports: A Depth Study of Castro-Communist Operations and Insurgency Potentials in Guatemala (1965); A Depth Study of Contemporary Insurgency and Counterinsurgency Operations in Peru, Ecuador and Bolivia (1964); Internal Security Forces in Venezuela (1965); Follow-up Report on Insurgency and Counterinsurgency Developments in Venezuela (1965); A Depth Study of Communist Insurgency and Government Counteraction in Colombia (1965).	Hans Weigert
Battelle Memorial Institute, Columbus, Ohio	Long-Range Environmental Studies: The World Environment/Army/FY 68/ Water Problems of the Middle East (Project Agile)/ARPA/1966	J. R. Irwin J. A. Eibling
Bendix Corp., Systems Division, Ann Arbor, Mich.	Project Search: Nature of Sublimated (Very Limited) Warfare/ONR/contract N000-14-66-C262/\$86,000/FY 66/ Project Forward: Naval Conflict Characteristics (Past and Future Role of the Navy in Limited Warfare)/ONR, Advanced Warfare Systems Div./contract Nonr-4601(00)/\$45,000/65-66/SECRET/ Project Protect: Problems of U.S. Defense Policy in a World of Nuclear Pro- liferation/USAF/contract AF-49(630)-65-5/\$90,000/FY 65/ Project Bisect: U.S.-Communist Chinese Politico-Military Interactions/USAF/ contract AF-49(638)-1776/\$92,124/67-68/	Joseph Coffey
Booz-Allen Applied Research, Inc., Chicago, Ill.	Long Range Environmental Studies/Army/FY 67/	
Brandeis University, Waltham, Mass.	Study of Political Attitudes of Youth as a Factor Affecting Economic Develop- ment/AID/contract AID-csd-824/\$250,000/65-68/	Roy Macridis John Wahlke
Brookings Institute, Washington, D.C.	Transportation and Economic Development/AID/contract AID-repas-5/\$1,469,720/ 62-67/	
Browne and Shaw Research Corp., Waltham, Mass.	Project Diffusion Follow-on: International Defense Planning--A Study of Methods for Sharing Skills and Concepts in Defense Policy Planning/OASD,ISA/ \$37,036/67-68/ Role of Communist Chinese Trade as an Instrument for Acquiring Foreign Tech- nology/OASD,ISA/\$52,417/67-68/ Strengthening International Peacekeeping/OASD,ISA/\$85,569/67-68/	
Bucknell University, Lewisburg, Pa.	Achievement Motivation in Military Leadership/USN/FY 68/	
Bureau of Social Science Research, Washington, DC	Aerospace Power and Behavioral Knowledge/USAF/\$99,000/67-68/	
University of California Berkeley, Cal.	The Politics of Modernization--Implications for Military Planning/AFOSR, Behavioral Sciences Div./contract AFOSR-758-65/\$98,191/FY 66/ Implication of Comparative National Development for Military Planning/AFOSR, Behavioral Sciences Div./contract AFOSR-227-66/\$95,000/FY 66/ Himalayan Border Studies/ARPA/\$285,000/67-68/	David Apter Seymour Lipset
University of California Los Angeles, Cal.	The Political Behavior of Foreign Military Elites/AFOSR, Behavioral Sciences Div./contract AFOSR-769-65/\$10,000/64-66/ The Future of Deterrence in U.S. Strategy/USAF/\$74,665/67-68/	Oscar Grusky



Checchi and Company, Washington, D.C.	Application of Communications Satellites to Underdeveloped Nations/NASA and AID/NASA: \$104,000; AID: \$50,000/65--/CONFIDENTIAL/	
University of Chicago, Chicago, Ill.	Political Development and Modernization in Islamic Countries--Implications for Military Planning/AFOSR/64-68/\$64,100/  Studies in Military Sociology/ARO (subcontract from the American University Center for Research in Social Systems)/65--/Reports: Public Order and the Military in Africa, by Henry Eisen (1967); Political Development and the Role of the Military in Modern Egypt, by Lou Cantori (1967).  Political Development and Modernization in Latin America/AFOSR, Behavioral Sciences Div./\$64,000/64-67/	Morris Janowitz  Leonard Binder
Columbia University, School of International Affairs, New York, N.Y.	Research Project on National Income in East Central Europe/CIA/\$125,000 annually/61-68/  Research on the Financial Systems of Poland, Czechoslovakia and Hungary/ACDA/\$119,200/64-68/	Thad Alton  Thad Alton
Cornell University, Ithaca, N.Y.	Comparative Study of Social and Cultural Change/AID/contract AID-csd-296/\$621,772/53-66/(emphasis: India, Peru, Thailand, Puerto Rico).  Agricultural Prices in Economic Development--Their Role, Function and Operation/AID/contract AID-csd-1438/\$266,000/66-69/(emphasis: India, Thailand).	A. R. Holmberg
Cornell Aeronautical Laboratory, Buffalo, N.Y.	Investigation of Categories and Types of Naval Forces/ONR/contract Nonr-4117(00)/\$74,174/64-66/SECRET/	R. Stevens Ben Levitt
Dartmouth College, Hanover, N.H.	Transnational Research on Conflict/USN/FY 68/	
Educational Testing Ser- vice, Princeton, N.J.	Risk-taking and Negotiation/ARPA/\$36,000/67-68	
Foundation for Research on Human Behavior, Ann Arbor, Mich.	Symposium on Comparative Social Change in Developing Countries/AID/contract AID-csd-756/\$35,000/64-66/	H. W. Peter
General Electric (TEMPO) Santa Barbara, Cal.	Projected International Patterns/USAF/\$172,425/66-68/	
General Research Corp., Santa Barbara, Cal. (formerly Defense Research Corp.)	Counterinsurgency Studies in Latin America: Venezuela, Colombia (Project Agile)/ARPA/1965/CONFIDENTIAL/  Urban Insurgency Studies (Project Agile)/ARPA/1965/CONFIDENTIAL/	R. Holbrook  John Sorenson

George Washington University, Human Resources Research Office (HumRRO), Arlington, Va.

Note: HumRRO is the Federal Contract Research Center (FCRC) responsible for the development of methods to improve the training of the U.S. soldier, and for behavioral science research on motivation, leadership and man/weapon systems. HumRRO Division No. 7 (Language and Area Training) is the principal agency concerned with training programs for U.S. military personnel attached to foreign armed forces as advisors; this unit receives \$500,000 annually for this work. All HumRRO programs are subsumed under contract DA-44-188-ARO-2 with the Department of the Army.

#### Major Programs:

Development of Guidelines for Training Personnel for Military Assistance Advisory Duties (Work Unit MAP)/ARO/Reports: Advisor and Counterpart Activities in the Military Assistance Program in the Republic of China, by Dean Froehlich (1965); The Design of Cross-Cultural Training for Military Advisors, by Arthur Hoehn (1966).	Arthur Hoehn
Guidelines for Civic Action Advisors (Work Unit CIVIC)/ARO/continuing project/Reports: The Process of Cross-Cultural Innovation, by Arthur Niehoff and Charnel Anderson (1967); Peasant Fatalism and Socio-economic Innovation, by Arthur Niehoff (1967).	Alfred Kraemer
Development of Concepts and Techniques for Area Training (Work Unit AREA)/ARO/continuing project/Reports: Cross-Cultural Problems of U.S. Army Personnel in Laos and Their Implication for Area Training, by Alfred Kraemer and Edward Stewart (1964); Examples of Cross-Cultural Problems Encountered by Americans Working Overseas, by Robert Foster (1965); An Analysis of Human Relations Training and Its Implications for Overseas Performance, by Robert Foster and Jack Danielian (1966).	Alfred Kraemer



Harvard University, Cambridge, Mass.	Strategic Analysis of Extra-Legal Internal Political Conflict/DoD/\$97,947/ FY 67/	
	Measuring Social Change in Developing Countries/USAF/\$33,000/67-68/	Alex Inkeles
	Military Implications of Change in Communist China/USAF/\$106,000/67-68/	John Lindbeck
	Emergent Leaders in Developing Nations/USAF/1968/	
University of Hawaii, East-West Center, Honolulu, Hawaii	East-West Values Change/ONR, Group Psychology Branch/contract Nonr- 4806(00)/\$10,000/FY 65/	A. Arkoff
	Far Eastern Values and Attitudes/USN/FY 68/	
Historical Evaluation and Research Organiza- tion, Washington, D.C.	National Strategic Concepts and the Changing Nature of Modern War/USAF, Dir. of Plans/contract AF-49-(638)-1585/\$78,426/65-67/	
Howard University, Washington, D.C.	Military Implications of the Transmission of New Technology to Developing Nations/AFOSR, Behavioral Sciences Div./contract AFOSR-533-66/\$50,000/ 63-68/	D. L. Spencer
HRB-Singer, Inc. State College, Pa.	Socio-Political Precursors to Insurgency/ONR, Group Psychology Branch/ contract Nonr-4749(00)/\$9,900 in FY 65, \$29,000 in FY 66/	George Guthrie James McKendry
	Research on Social Science Aspects of American Military Commanders' Con- trol of Goods Brought Into a Developing Country/Army/\$70,000/67-68/ (emphasis: Korea).	
Hudson Institute, Harmon-on-Hudson, N.Y.	Implications of Future Weapons Technology on Arms Control/ACDA/contract ACDA-ST-51/\$207,368/64-66/	
	Strategic Factors Affecting the Threat or Use of Force/DoD/\$222,000/66-67/	
	Alternative Political and Strategic Environments for Air Force Systems in the Period 1975-85/USAF/\$99,526/FY 68/	
	An Analytic Study of U.S. National Security Issues for Educational and Research Purposes/OASD,ISA/\$130,000/FY 68/	
	Greater Stability and Tranquility Among the Older Nations/OASD,ISA/ \$10,000/FY 68/	
	Problems for U.S. Politico-Military Policy in the Next Decade in (1) European Defense and (2) Nuclear Proliferation/DoD/\$247,427/FY 65/	
	War Termination Conditions and Techniques/USAF/\$83,521/67-68/	
	Study of Political, Strategic and Tactical Considerations Involved in Low- Level Deployment of Ballistic Missile Defense/Army, Deputy Chief of Staff for Military Operations/\$118,156/1966/	
Hughes Aircraft Corp., Washington, D.C. Office	Sea-Based Strategic Systems in an Arms Control Environment/ONR, Advanced Warfare Systems Div./contract Nonr-4907(00)/\$178,831/65-66/SECRET/	R. Kay
Human Sciences Research, McLean, Va.	Delineations of the Naval Role in Psychological Operations/ONR, Group Psy- chology Branch/contract Nonr-4346(00)/\$128,000 in FY 66/Reports: A Pre- liminary Analysis of Naval Unconventional Warfare, by Terry Rambo (1966); An Analysis and Delineation of the Concept of Naval Psychological Opera- tions, by Gerald Bailey (1966); Interpersonal Influence Processes in Navy Port Calls, by Albert Jenney II (1966).	Dean Havron
	Rural Value Systems, Republic of Vietnam/ARPA/\$164,000/FY 67/	
	Population Movements as a Factor in Insurgency (Project Agile)/ARPA/ \$260,000/FY 67/	
Institute for Defense Analyses (IDA), Arlington, Va.	Interaction of Politico-Military Objectives, Budgets, Technology, and Force Structure/OASD,ISA and OASD,SA/\$800,000/continuing project/Sub-projects: Communist China's Evolution and Impact on U.S. Security Interests Through 1975 (Study Mandarin); Exploratory Research on Eastern Europe (Study Carpathia)/Reports: United Kingdom Military Policy and U.S. Security, by John Cary (1966); New Military Cooperative Arrangements in the Indian Ocean Area--An Assessment of U.S. Benefits, by John Cary and John Moriarty (1966).	



Inter-University Seminar on Armed Forces & Society, Inc.	Political Functions of Military Elites: North Africa and the Near East/ AFOSR, Behavioral Sciences Div./\$40,000/66-68/ Social Research and Military Management/USAF/\$40,000/FY 67	Amos Perlmutter
Johns Hopkins University, Center for Foreign Policy Research, Washington, D.C.	Future Role of Military Alliances/USAF, Director of Plans/contract AF-49 (638)-1580/\$71,207/65-66/ 1980 and the Balance of Power in the Pacific/USAF/\$71,785/66-68/ Comprehensive Epidemiological Studies in Developing Nations/Army/FY 68/	
University of Kansas, Kansas City, Kansas	Modernization: Social, Political and Economic Development (Project Themis)/ ARPA/FY 68	
Univ. of Maryland, College Park, Md.	Cross-Cultural Investigation of Some Factors in Persuasion and Attitude Change/ONR, Group Psychology Branch/contract Nonr-595(21)/\$21,480/65-66/ Reports: Involvement and Source Credibility as Variables in Persuasion With Japanese Students, by Elliot McGinnies (1966). Comparative Study of Normative Behavior -- Japanese and American Youth/ USAF/\$34,000/67-68	Elliot McGinnies Elliot McGinnies
MIT, Center for International Studies, Cambridge, Mass.	Arms Control and Limited War/ACDA/contract ACDA-WEC-98/\$222,500/65-67/ Strategic Thinking of European Elites (Project Michelson)/U.S. Naval Ordnance Test Station/64--/ Political-Military Gaming of Deterrent Strategies (Project Michelson)/ U.S. Naval Ordnance Test Station/64--/ Human Factors in Modernization--Comparative Research on Behavioral Change/ ARPA/\$80,000/67-68/ Improved Analytical Methods for Development Planning/AID/contract AID-csd-467/\$72,160/64-66/	Lincoln Bloomfield Daniel Lerner Morton Gordon Lincoln Bloomfield Frederick Frey Richard Eckaus Louis Lefebvre
Matrix Corp., Nashua, N.H.	Marine Pacification Training/USN/\$30,000/67-68	
McDonnell-Douglas Aircraft Corp., Santa Monica, Cal.	Role of the USAF in the Post-Armistice Activities of Insurgency and Limited War/USAF/FY 68/ Strategic and Military Objectives, 1975-1985/Army, Deputy Chief of Staff for Military Operations/contract DA-49-092-ARO-117/\$89,000/65--/CONFIDENTIAL Long-Range Environmental Studies: Latin America (1985-90) and Oceanic Islands (1985-90)/Army/FY 68/	
Melpar, Inc., Falls Church, Va.	Feasibility of Verifying a Prohibition on Field Testing of Chemical and Biological Weapons/ACDA/contract ACDA-ST-91/\$173,442/65-67/	
Mental Research Institute, Palo Alto, Cal.	Content Analysis of Communist Chinese Mass Communications (Project Michelson)/U.S. Naval Ordnance Test Station/\$21,000 in FY 67/66-68/ Reports: Chinese Political and Cultural Themes -- A Study of Chinese Communist Films, by John Weakland (1966).	John Weakland
University of Michigan, Ann Arbor, Mich.	Decision-Theoretic Principles in the Design of Verification Systems/ ACDA/contract ACDA-ST-49/\$30,409/64-66/	
Michigan State Univ., East Lansing, Mich.	Diffusion of Agricultural Innovations in Rural Societies/AID/contract AID-csd-735/\$1,236,000/64-68 Evaluation of the Process of Economic Development in Less Developed Friendly Countries/AID/contract AID-csd-732/\$37,880/64-66/	E. M. Rogers
Midwest Research Institute, Kansas City, Mo.	Inspectability of Chemical and Biological Weapons Production, Transportation and Storage/ACDA/contract ACDA-ST-108/\$251,839/66-67/	
University of Missouri Columbia, Mo.	Organizational and National Background Differences in Work Performance/ USN/FY 68	



North Dakota State College, Fargo, N.D.	Cross-Cultural Studies in Persuasion -- Source Credibility/AFOSR, Behavioral Sciences Branch/contract AFOSR-762-65/\$42,272/64-66/	J. C. Whittaker
Northern Illinois Univ., Dekalb, Ill.	Thai-Malay Village Study (Project Agile)/ARPA/1966/	M. L. Thomas
Ohio State University Research Foundation, Columbus, Ohio	The U. S. and the Western Europe of the 1970's/OASD,ISA/contract DA-49-083-OSA-3185/\$17,250/66-67/ Analysis of Programs for the Development of Agricultural Credit Institutions/AID/contract AID-csd-463/\$636,821/64-67	Edwin Fedder James Robinson Mervin Smith
University of Pennsylvania, Phila., Pa.	Interaction of Social Values and Political Responsibility in Developing Countries/AID/contract AID-csd-719/\$250,000/64-69/ Model Study of Escalation/ACDA/contract ACDA-ST-64/\$73,899/64-66/	Philip Jacob Russell Ackoff
Univ. of Pennsylvania, Foreign Policy Research Center (FPRI), Phila, Pa.	Alternative U.S. Strategies and America's Future/USAF, Director of Plans/\$95,000/64-65 Evolution in Eastern Europe and Its Implications for U. S. Security/USAF, Dir. of Plans/\$163,634/65-68/	William Kintner
Penna. State Univ., State College, Pa.	Impact of Modernization in the Philippines/ARPA/FY 68	
Univ. of Pittsburgh Pittsburgh, Pa.	Research on the Process of Institution Building/AID/contract AID-csd-763/\$158,380/64-66 Elite Structures and Elite Transformation in Totalitarian Political Systems/ AFOSR, Behavioral Sciences Div./contract AFOSR-622-64/\$71,000/64-68/ Methodology for Analysis of Internal Social Movements/USAF/FY 68/	Milton Esmond Carl Beck
Porter-International Co., Washington, D.C.	Measures to Promote Self-Help in the Military Aid Program/OASD,ISA/contract DA-49-083-OSA-3284/\$279,000/66-67/CONFIDENTIAL	
Princeton Univ., Center for International Studies, Princeton, N.J.	Genesis of Civil Violence/ARPA/\$39,000/FY 67/ The Social Bases of Stable Political Systems/ONR, Group Psychology Branch/contract Nonr-1858 (54)/\$232,000/66-68/	Ted Gurr Harry Eckstein
Purdue University Research Foundation, Lafayette, Ind.	An Analytical Study of AID University Programs in Agricultural Education in Less Developed Countries/AID/contract AID-csd-840/\$1,200,000/65-68/ Social and Psychological Aspects of Verification, Inspection and International Assurance in Arms Control/ACDA/contract ACDA-E-104/\$63,500/66-67/	

RAND Corporation, Santa Monica, Calif.

Note: The RAND Corporation is the Federal Contract Research Center (FCRC) responsible for study, research and analysis relevant to U.S. military operations, particularly in the aerospace field. RAND's Social Science Department conducts an extensive research program on economic, political and social conditions in underdeveloped areas, and on the techniques of counterinsurgency. RAND issues hundreds of studies each year, many of them relevant to U.S. foreign policy, all of which obviously cannot be listed here.

#### Major Programs:

Conflicts Studies/OASD, ISA/\$1,200,000 in FY 66/continuing project/Sub-projects: Economic and Military Assistance Problems and Programs; Force Posture Implications of Alternative Pacific Problems; U.S. Military Assistance to India and Pakistan; Support Systems for Guerilla and Limited Warfare; Communism in Italy and France; French Policy Toward the Algerian Revolution; Security Policy Studies of Latin America; Security Problems of Asia and the Pacific; Insurgent Forces Study; NATO's Southeast Flank; Security Policy Studies of NATO and Europe; Military Problems in Thailand and Laos; Studies of Cuba; NATO's Northern Flank/ Reports: Viet Cong Motivation and Morale, by L. Goure, A. J. Russo and D. Scott (1966); Security and Assistance in Thailand and Laos, by C. A. Cooper and Hans Heyman, Jr. (1966); Observations on the Chieu Hoi Program, by Lucien Pye (1966); Political Motivation of the Viet Cong -- the Vietminh Regroupees, by J. J. Zasloff (1966).

Project RAND Studies/USAF/\$956,000 in FY 67/Subprojects: Sino-Soviet Economic Potential; Soviet Foreign and Military Policy; Soviet Foreign Policy Toward Latin America; Strategy and Tactics of Chinese Foreign and Military Policy; Political Context of Japanese Rearmament; Role of the Military in Indonesia; British Military Policy; The Future of NATO; Use of Force in Underdeveloped Areas.







Syracuse University, Center for Overseas Operations & Research, Syracuse, N. Y.	Appraisal of the Administration of Technical Assistance Programs, With Special Reference to Agriculture/AID/contract AID-csd-289/\$355,475/63-66/	Irving Swerdlow
University of Texas Austin, Texas	Mobility of Foreign Military Leadership/USN/FY 68	
Wayne State Univ., Detroit, Mich.	Research Project on World Politics Simulation/DoS/\$25,000/1966	
Western Washington State College	Effects of Leadership on Far Eastern Morale and Leadership/USN/FY 68/	
Western Behavioral Science Institute	Simulated Politico-Military Decision-making/USN/\$32,000/FY 67	
Westinghouse Electric Corp., Baltimore, Md.	U. S. Strategic Alternatives and Access Problems: Impact of U. S. Armed Forces Abroad/USAF/\$189,519/67-68/	
Westwood Research, Inc., Los Angeles, Calif.	Seapower in Special Warfare/ONR, Advanced Warfare Systems Div./contract Nonr-4962(00)65--/SECRET	L. I. Dew, Jr.
Williams College, Center for Development Economics, Williamstown, Massachusetts	Import Substitution and Economic Policy in Economic Development/AID/ contract AID-csd-736/\$173,299/64-67	J. H. Power
Univ. of Wisconsin, Madison, Wisconsin	Persuasive Communications in the International Field/ONR, Group Psychology Branch/contract Nonr-1202(24)/\$30,000/65-66/	S. Watson Dunn
Yale University, New Haven, Conn.	War and International Alliances/USN/FY 68	
Yale University, Economic Growth Center	Quantitative Study of Economic Structure and Growth/AID/contract AID-repas-12/ \$1,514,000/62-68/	

#### Abbreviations:

ACDA	Arms Control and Disarmament Agency (DoS)	NASA	National Aeronautics and Space Administration
AFOSR	Air Force Office of Scientific Research	OASD,ISA	Office of the Assistant Secretary of Defense, International Security Affairs
AID	Agency for International Development	OASD,SA	Office of the Assistant Secretary of Defense, Systems Analysis
ARO	Army Research Office	ONR	Office of Naval Research
ARPA	Advanced Research Projects Agency (DoD)	USAF	U.S. Air Force
CIA	Central Intelligence Agency	USMC	U.S. Marine Corps
DoD	Department of Defense	USN	U.S. Navy
DoS	Department of State		
FY	Fiscal Year		

## Addenda:

Since the publication of the above inventory in the Sept. 1968 issue of the NACLA Newsletter, a number of corrections and additions have been brought to our attention by readers and through further research. Users of this pamphlet are encouraged to send us any additional information they may have on this subject for publication in future issues of the Newsletter.

Institution:	Project Title / Principle Researcher / Sponsoring Agency / Contract Number / Value of contract / When Active:
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Cornell University  
Ithaca, N.Y.

Comparative Study of Social and Cultural Change / Allan R. Holmberg, Morris E. Opler, Lauriston Sharp, Henry F. Dobyns / AID / contract no. AID-csd-296 / \$621,772 / 63-66 / Reports by Holmberg, Opler and Sharp: Methods for Analyzing Cultural Change; Some Principles of Cultural Change; Strategic Intervention in the Cultural Change Process (1967-68). Other reports: Thirty Years of Change in Puerto Rico, by Dorothy Dulles Bourne and James R. Bourne (1966).



Harvard University Cambridge, Mass.	Proliferation Study—Middle East / Thomas C. Schelling and Marvin I. Kalkstein / DoD / DA-49-083-OSA-3099 / \$32,408 / 66-67 /
	Strategic Analyses of Extra-Legal Internal Political Conflict / Thomas C. Schelling / DoD / \$97,947 / 67-68 / Reports: The Politics of Non-Violent Action, by Gene Sharp (1969).
	Emergent Leaders in Developing Nations / Seymour M. Lipset / USAF / AFOSR-1205-67 / \$97,947 / 66-68 /
	Socio-Cultural Aspects of Development / Alex Inkeles / USAF / AFOSR-1094-66 / \$49,912 / 66-68 /
Historical Evaluation and Research Organization Washington, D.C.	Isolating the Guerrilla / T.N. Duquy / ARPA / DA-49-092-ARO-102 / 1966 /
Hughes Aircraft Co. Washington, D.C.	Geographic Nuclear Restrictions and the United States Navy and Marine Corps / R. Kay / ONR / Nonr-4515(00) / \$89,447 / 64-66 /
Institute for Defense Analyses (IDA) Arlington, Va.	IDA's Annual Report for 1968 lists the following reports of its International and Social Studies Division: Force-Improvement Plans for the People's Liberation Army, by A. Fraser; Hong Kong/Macao—"People's War" in Microcosm, by A. Fraser; Soviet Response to Sino-American Crises—Chinese Expectations, by H. Hinton; The Fuel Situation in Eastern Europe, by S. Wasowski.
Pennsylvania State University State College, Pa.	Impact of Modernization in the Philippines / George M. Guthrie / ARPA / ONR-656(47) / \$332,000 / 66-69 / Reports: Six Perspectives on the Philippines, by George M. Guthrie (1968); Modernization in the Philippines, by Frank Lynch, Paul Hare, Richard Stone, David Szanton, et. al.
University of Pittsburgh Pittsburgh, Pa.	Research on the Process of Institution Building / Milton J. Esman (incorrectly spelled Esmond above), Hans C. Blaise, Guthrie S. Birkhead, John Hanson and William Siffin / AID / contract no. AID-csd-763 / \$158,380 / 65-68 / Reports: The Institution Building Concepts—An Interim Proposal, by M.J. Esman (1967); Public Administration Institute for Turkey and the Middle East, by G.S. Birkhead (1967); The Thai Institute of Public Administration, by W.J. Siffin (1967); The College of Education, NSUKKA—A Study of Institution Building Among the Modern Ibo, by J.W. Hanson (1968); Introducing Innovation in Ecuadorean Higher Education, by H.C. Blaise (1968)
Radio Corp. of America, Morrestown, N.J.	Limited War Prospects, 1970-1980 / F.P. Henderson and D.S. Bond / DoD / 1966 /
Rice University Houston, Texas	Interdisciplinary Study of Social Change / ARPA / \$440,000 / 67-68
Rowland & Co., Inc. Haddonfield, N.J.	Preparation of a Case Book on the Republic of Korea's Reserve Divisions Civic Action Program / Army / \$70,000 / FY 67 /
Rutgers University New Brunswick, N.J.	Arms and Democracy: The Reciprocal Influence of Weapons and Political Systems / ACDA / contract no. ACDA-IR-20 / \$40,000 / 63-68 /
	Environmental Factors Influencing the Effectiveness of Military Groups / USN / FY 68 /
Stanford Research Institute Menlo Park, Cal.	Alternative Communist China Threat Postures and Annual Costs, 1967-1985 / M.B. Summers / DoD / DA-49-092-ARO-10 / 1966 /
	Services Acquired in Behalf of the Federal Republic of Germany to Formulate Certain Management Policies and Practices Within the Ministry of Defense / DoD / \$323,364 / 1968 /



# Pentagon Sponsored Foreign Policy Research

According to information provided by the Department of Defense, the Pentagon spent a total of \$45.4 million on social and behavioral science research in fiscal year 1969. \$48.6 million was budgeted for these purposes in FY 1970; of this amount, \$5.2 million is for studies with foreign policy implications and \$7.5 million is for foreign area research. Reprinted below is a listing of current Pentagon-sponsored social research projects with foreign policy implications, many of which are continuations or modifications of projects listed above. Source: Congressional Record, May 1, 1969, pp. S4418-23.

## Abbreviations:

ARPA: Advanced Research Projects Agency  
 CRESS: Center for Research in Social Systems  
 DoD: Department of Defense  
 IDA: Institute for Defense Analyses  
 OASD/ISA: Office of the Asst. Secy. of Defense for International Security Affairs  
 RAC: Research Analysis Corp.  
 SDC: System Development Corp.  
 SRI: Stanford Research Institute

### POLICY PLANNING STUDIES WITH FOREIGN POLICY IMPLICATIONS

SPONSOR: DEPARTMENT OF THE ARMY, OCRD

[Note: Information concerning 21 projects is classified and, therefore, not included in this listing]

Project title	Project description	Contractor/investigator	Previously initiated, underway in fiscal year 1969	Initial funding in fiscal year 1969	Planned for fiscal year 1970
Beliefs and habits of certain foreign populations of significance for psychological operations (U).	Classified	CRESS	\$49,000		
U.S. Army psychological operations requirements worldwide.	Overview, ordering, integration of PSYOPS knowledge and thinking to provide guidance for planning, operations, training, research.	CRESS	7,000		\$25,000
Development of critical target analysis information for the U.S. strategic psychological operations in Southeast Asia.	Identification of questions to be used as essential elements of information to collect information required in conduct of PSYOPS.	CRESS	7,000		
Development of methodology for tactical use by psychological operations units.	Develop practical methodological guidelines enabling PSYOPS officers to evaluate attitudes in overseas areas with reasonable degree of accuracy.	CRESS	68,000		
A systematic framework for psychological operations.	Estimation of worldwide requirements for U.S. Army PSYOPS in time frame 1970-77.	CRESS	49,000		50,000
Internal security.	Research on civil, paramilitary and military police operations related to overseas internal defense and development.	CRESS	77,000		80,000
Combating insurgent infrastructure in Southeast Asia.	Research on techniques to eliminate Communist insurgent movement in South Vietnam. Application of findings to dissimilar environment of second country in SEA.	CRESS	81,000		85,000
Strategic and tactical factors underlying internal defense and development.	Analyses of processes involved in internal conflict.	CRESS	77,000		75,000
Utilization of military assistance program equipment by developing nations.	Assess capability of military personnel and institutions in developing nations to operate, maintain, support equipment furnished under Military Assistance Program.	CRESS	34,000		
Social processes relevant to military planning for stability studies of African groups.	Study of African socio-political structures, dynamics, and leadership resources and attitudes.	CRESS	34,000		
Changing roles of the military in developing nations.	Subcontracted studies of changing roles of military establishments.	CRESS	2,000		
Assessment of cultural meanings through associative group analysis technique.	Development, testing of technique for collecting culture and audience—Specific information on foreign societies.	CRESS	93,000		100,000
Cultural Information and Analysis Center (CINFAC).	An information storage, retrieval, analysis facility providing information services concerning foreign areas and cultures to qualified requestors.	CRESS	750,000		750,000
Evaluation of the impact of visual PSYOP in the Republic of Korea.	Determination of effectiveness of on-going PSYOP activities conducted in ROK to maintain positive disposition toward UNC/USFK.	CRESS			70,000
Research on civic action and community assistance programs in Panama.	Identification of techniques and procedures that contribute to operational effectiveness of military civic action programs.	CRESS			85,000
Feasibility study of a system for debriefing MAAG advisors (Debrief).	Development, evaluation of techniques and instruments for debriefing US military personnel who have served overseas in military assistance program.	Human Resources Research Office	45,000		69,000
Development of concepts and techniques for area training (Area).	Development for behavioral criteria to improve effectiveness of area training.	do	45,000		



## POLICY PLANNING STUDIES WITH FOREIGN POLICY IMPLICATIONS—Continued

SPONSOR: DEPARTMENT OF THE ARMY, OCRD—Continued

[Note: Information concerning 21 projects is classified and, therefore, not included in this listing]

Project title	Project description	Contractor/investigator	Previously initiated, underway in fiscal year 1969	Initial funding in fiscal year 1969	Planned for fiscal year 1970
Program of instruction for the development of cultural self-awareness (Cope).	Design, production and evaluation of program of audiovisual instruction for development of cultural self-awareness.	Human Resources Research Office	\$113,600		\$115,000
Factors influencing effectiveness of advisor-counterpart interactions (Refract).	Develop operational techniques to assess effectiveness of advisor-counterpart relations and identify factors that influence them.	do	45,000		23,000
United States-Thai security guard (ES-73)	Assess effect of cultural factors on performance of personnel involved in Thai security guard program.	do	122,700		
Development of generalized method for repairing self-instructional foreign language courses (Auto-span).	Effort organized around the development and evaluation of prototype course in Spanish.	do	113,600		138,000
Implementation and modification of the USMACTHAI adviser debriefing program (Refocus).	Develop and evaluate techniques for systematic continuation and modification of adviser debriefing program within U.S. Military Assistance Command, Thailand.	do	122,700		
Overseas Military Posts and Communities (Sojourn)	Develop techniques to gather information pertinent to management, organization and planning for U.S. military communities overseas.	do	68,000		
Development and evaluation of a southeast Asian cultural assimilator.	Compile assimilator and evaluate advantages and disadvantages of using this as a principal teaching vehicle.	do			23,000
Guidelines for effective management of foreign national employees of the U.S. Army.	Survey of experiences of U.S. supervisory personnel and development of data bank of critical incidents and cultural differences relevant to civilian personnel operations.	do			69,000
Research on troop-community relations, Korea	Evaluate and further develop orientation program designed to improve relations between U.S. soldiers and Koreans.	American Institutes for Research	185,000		185,000
Research on troop-community relations, Thailand	Develop and test orientation program designed to improve relations between U.S. soldiers and Thai population.	do	90,000		112,000
Research on troop-community relations, Panama	Develop and test orientation program designed to improve relations between U.S. soldiers and Panamanians.	do		\$70,000	70,000
Impact of body size on Korean utilization of U.S. equipment and analysis of ROKA Reserve training.	Assess implications of anthropometric data for utilization of U.S. military equipment; and preparation of casebook analysis of training program for ROKA Reserve divisions, assessment of implications for use in other countries.	Rowland & Co.	65,000		70,000
Socioeconomic aspects of American military commanders' control of goods brought into a developing country.	Analysis of problem of military control of materiel introduced into developing countries.	HRB Singer, Inc.	10		80,000
Sources and indicators of trends in the Pacific region.	Develop information on major economic, demographic sociological trends in Oceania.	National Academy of Sciences	10		
Subtotal			2,534,600	105,000	2,804,000

## SPONSOR: U.S. ARMY MEDICAL RESEARCH AND DEVELOPMENT COMMAND

Comprehensive epidemiologic studies in developing countries.	Study of disease conditions and vectors in selected rural populations.	The Johns Hopkins University, Alfred Buck, MD.	\$168,533		\$115,000
A sociomedical study of the Lisu of northern Thailand.	Anthropological fieldwork among the Lisu tribe.	University of Illinois, E. Paul Durrenberger.		\$43,687	0
The culture of health and illness in a Southeast Asian village.	Beliefs and behavior relating to health and illness in a village in Thailand.	University of Pennsylvania, Gertrude Marlowe.	0		
Interpersonal perception and the psychological adjustment of group members.	Study of group effectiveness in divergent cultural groups.	University of Illinois, Fred E. Fiedler.	0		0
Social structure and ecology of Red Karen-Shan interethnic relations in Province Mai Hongson (Thailand) emphasizing environmental health aspects.	Study of social customs and attitudes in relations to disease.	University of Illinois, Frederick K. Lehms	8,440		0
Subtotal			176,973	43,687	115,000

## SPONSOR: NAVY, OFFICE OF NAVAL RESEARCH

Anthropological research to assist Navy strategic planning.	Investigator will combine anthropological variables with econometric techniques in order to conceptualize and predict mobility in foreign military hierarchies. Will be completed in May (1969).	University of Texas, I. Buchler	0		
A technique for deriving Navy planning information from analysis of mass media.	Make content analysis of Chinese Communist values, attitudes, problems, and decisionmaking by analyzing mass media output.	Mental Research Institute, J. Weakland.	\$22,000		\$25,000
The development of a method for forecasting decisions and actions for military groups.	Make cross-national data base analysis of the effects of different military postures and strategies on the decisionmaking of foreign military groups; research will also be conducted on the predicted responses of these groups to perceived politico-military threats.	Western Behavioral Science Institute, J. Raser.	28,000		
Improved Marine Corps training for civic action, civil affairs, and related programs.	To research information necessary to develop a valid strategy for Marine programs designed for training personnel to interact with indigenous populations in counterinsurgency environments. Contract terminates in March (1969).	Matrix Corp., R. Campbell	18,000		70,000
Development of USMC combined action capabilities for Vietnam and future contingencies.	To provide information useful to USMC in developing pacification or "other war" capabilities to utilize in limited or small war situations.	Human Sciences Research Inc., M. D. Havron.		\$94,000	95,000
Environmental forecasting for Navy long-range planning.	Conduct research to obtain a more precise description of future international environments and to examine the implications which these descriptions have for naval mid- and long-range planning.	McDonnell Douglas Aircraft Co., D. N. Ivanoff.	25,000		
Identification of factors influencing the effectiveness of management and leadership.	Field data collection on the training, leadership characteristics, preferences, and effectiveness of foreign managerial personnel and trainees.	University of Rochester, B. M. Bass.	45,000		50,000
Factors involved in modifying hostile attitudes.	Research on factors which determine whether attitude change of Far East groups is based upon persuasive communications on strategic issues.	University of Maryland, E. McGinnies.			20,000



## POLICY PLANNING STUDIES WITH FOREIGN POLICY IMPLICATIONS—Continued

SPONSOR: AIR FORCE OFFICE OF SCIENTIFIC RESEARCH (OAR)—Continued

[Note: Information concerning 21 projects is classified and, therefore, not included in this listing]

Project title	Project description	Contractor/investigator	Previously initiated, underway in fiscal year 1969	Initial funding in fiscal year 1969	Planned for fiscal year 1970
Innovation and social change in developing countries.	Guidance for training of personnel to be assigned to foreign duty....	Hebrew University, Israel, Dr. S. Eisenstadt.	0		
Information system for analysis of a closed society....	Method for coding and analyzing data on a strategic area (Chicom)...	University of California, Berkeley, Dr. C. Y. Glock.	0		
Comparative analysis of military career patterns.....	Cooperation with friendly foreign military forces.....	University of California, Los Angeles, Dr. O. Grusky.	0		
Methodology for analysis of internal social movements.	Providing predictive base for forecasting social movements in selected countries.	University of Pittsburgh, Holzner and Yang.	0	0	
Behavior norms: Japanese and American youth.....	Comparison of attitudes and behavior of the youth of 2 countries for military assistance and manpower resource purposes.	University of Maryland, Dr. E. McGinnies.	0		
Research to improve language training—Western European countries.	Update training materials and courses in Western European languages.	Center for Applied Linguistics, Washington, D.C., Dr. T. Sebeok.	0	0	
Transfer of technology under military auspices.....	Cooperation with foreign military assistance and training programs.	Howard University, Dr. D. Spencer.	0	0	
Political functions of the military in the Middle East and North Africa.	Improved understanding of the role of foreign military forces in stabilization of Middle East.	Operations and Policy Research, Inc., Washington, D.C., A. Parlmutter.		\$47,000	0
Simulation studies of communication behavior under stress.	Use of foreign national students in communication studies of stress in laboratory simulations.	Ohio State University, H. Quarantelli.	0	43,000	\$45,000
Research on special personnel utilization problems of USAF.	Develop methods for analyzing behavior and performance of AF personnel in stressful duties (including special forces, and survival and resistance in captivity situations).	Preston and Associates, J. Monroe.	0	70,000	70,000
Cultural differences in training task approach.....	Cross-cultural study of differences in training techniques, using United States and Puerto Rican students.	New York University, Dr. J. Weitz.	0	0	25,000
Perception of threat, evaluation of stress and decisionmaking.	Study of the way individuals and groups including civilian populations, their leaders and military organizations are likely to respond to the threats inherent in aerospace warfare and other impending dangers.	Catholic University, Washington, D.C., A. Frances.		67,000	68,000
Studies in the processes of political development and revolutionary behavior.	Strategic analysis of selected developing countries from documentary and other available data.	University of Pennsylvania Foreign Policy Research Institute, Kintner and Schwartz.		63,000	62,000
Training system for effective interaction with foreign military personnel.	Development of realistic training programs using people of different cultures in problem-solving situations.	Tufts University, Dr. B. Wedge.		55,000	55,000
Information system for updating, retrieval and analysis of data on Eastern European political leaders.	Provide USAF access to data archive on Eastern European leadership trends.	University of Pittsburgh, Prof. Carl Beck.		25,000	0
Data analysis center for comparative study of leaders (mainly Far East and SEA).	Development of system to provide DOD and academic access to available data on leaders.	University of California, Berkeley, Dr. D. Nasatir.		70,000	80,000
Total funding (estimates).....				440,000	405,000

## SPONSOR: ARPA/BEHAVIORAL SCIENCES—DEFENSE RESEARCH DONE IN FOREIGN AREAS

Himalayan border countries project.....	Describe political-social-economic development in the Himalayan border states. No field work now taking place in India. Research being conducted at the India Office Library and at the Institute of Commonwealth at the University of London. Termination being negotiated by agent.	University of California, Berkeley, Dr. Leo Rose.	0		
Cross-national studies of conflict dynamics and resolution.	Present understanding of bargaining and negotiating behavior comes from research done solely with American subjects. This project cross-checks such knowledge by using similar data from European subjects to provide American military personnel with ability to deal effectively with European counterparts. Overseas work done entirely by foreign nationals in a cooperative program Expires August 1970.	UCLA, Dr. Harold Kelley.....	\$80K		0
Human interaction and communication.....	Improve ability to communicate where obstacles such as language and cultural differences exist. Overseas work entails validation of previously developed techniques for rapid acculturation of American military personnel to foreign environments. Expires August 1971.	University of Illinois, Dr. Fred Fiedler.	100K		0
Social change as a result of modernization.....	To determine most effective uses of DOD aid to developing nations so that conflict between traditional cultural values and pressures toward modernization are minimized. Transfer to non-DOD agency under discussion.	Kalamazoo College, Dr. Stillman Bradfield. Penn State University, Dr. George Guthrie. Princeton University, Dr. Harry Eckstein. Rice University, Dr. William McCord.	0 0 0 0		
Subtotal.....			242K	0	0
Cultural change in developing societies (THEMIS)....	DOD is frequently required, through aid and establishment of bases, to make massive infusions of men and material into traditional societies. This project studies the effects of such situations, with reference to ways of ameliorating the disruption which sometimes results from large-scale American military presence overseas. Work has taken place in American Micronesia, and contract will transfer to Air Force—which has large bases in this area.	University of Kansas, Dr. Felix Moos.	0		
Nonverbal communication cross-cultural studies.....	Some nonverbal communicative acts i.e., gestures and facial expressions, appear to be common to all cultures while others are highly culture-specific in their meanings. Understanding these meanings will enable American military personnel to communicate more effectively in foreign societies. No further work overseas to take place under this contract. Money to be used for conclusion in United States of work begun overseas. Expires August 1970.	Langley Porter Institute, Dr. Paul Ekman.	62K		0



**POLICY PLANNING STUDIES WITH FOREIGN POLICY IMPLICATIONS—Continued**  
**SPONSOR: ARPA/BEHAVIORAL SCIENCES—DEFENSE RESEARCH DONE IN UNITED STATES BUT RELATED TO FOREIGN AREAS**

[Note: Information concerning 21 projects is classified and, therefore, not included in this listing]

Project title	Project description	Contractor/investigator	Previously initiated, underway in fiscal year 1969	Initial funding in fiscal year 1969	Planned for fiscal year 1970
Foreign communication and defense.....	Describe communication mechanisms of China and Soviet Union and develop computer simulation of message flow so as to predict spread of information and news in future. Expires September 1969.	MIT, Dr. Ithiel Pool.....	0		0
Military implications of international bargaining and negotiations.....	Build predictive theories of bargaining and negotiating processes to avoid, limit and resolve military conflict. Increase understanding of the relation of such processes to international politico-military systems through development and use of computer simulations. Intermediate results in use by Joint War Games Agency and Industrial College of the Armed Forces.	SDC, Dr. Gerald Shure..... Northwestern University, Dr. Harold Guetzkow.	\$250K 125K		\$1,136K 94K
Human factors in modernization.....	Originally planned as foreign study of peasant societies undergoing development and modernization. No field work undertaken and project is phasing out. Expires September 1969.	MIT, Dr. Fred Frey.....	0		0
Strategic analysis of social conflict.....	Continuation of Dr. Schelling's work to improve understanding of revolutionary processes.	Harvard University, Dr. Thomas Schelling.	75 K		78 K
Prediction of international military capabilities and events.....	To develop quantitative methodology and theory for use of publicly available data (U.N., news media, etc.) to improve predictions and understanding of actions by foreign nations.	University of Hawaii, Dr. R. Rummel. University of Southern California, Dr. Charles McClelland. Yale University, Dr. Bruce Russett.	130 K 80 K 80 K		130 K 80 K 80 K
Subtotal.....			740 K	0	1,598 K
Total.....			982 K	0	1,598 K

<sup>1</sup> ARPA funded.

<sup>2</sup> Funded in fiscal year 1968.

<sup>3</sup> Funded in fiscal year 1967.

<sup>4</sup> Partial support.

<sup>5</sup> Planned.

Note: Dashes (.....) indicate not applicable or that project is completed; 0 indicates project is continuing, although funding is completed.

**DEPARTMENT OF DEFENSE SOCIAL/BEHAVIORAL SCIENCE RESEARCH PROJECTS USING INFORMATION ABOUT FOREIGN AREAS**

**SPONSOR: ARMY, OFFICE, DEPUTY CHIEF OF STAFF, MILITARY OPERATIONS (ODCSOPS)**

[Note: Information concerning 20 Projects, including all Projects sponsored by ARPA/AGILE, are classified and not included in this listing]

Project title	Project description	Contractor/investigator	Previously initiated, underway in fiscal year 1969	Initial funding in fiscal year 1969	Planned for fiscal year 1970
Strategic analysis of subsaharan Africa, 1969 (SASSA) (8 substudies).	Includes studies of U.S. strategic interests, environmental trends, and U.S. policies and programs.	RAC.....	\$70,500		\$74,000
Strategic analysis of Europe, 1969 (SAEUR) (6 substudies).	Includes studies of French foreign policy, European trade prospects, development of Siberia and Soviet-Japanese trade.	RAC.....	122,300		128,000
Strategic analysis of north Africa, the Middle East, and South Asia, 1969 (SANESA) (8 substudies).	Includes studies of Algeria, Yemen, Indian political leadership, Cyprus, and inter-Arab relations.	RAC.....	95,300		100,000
Strategic Analysis of Southeast Asia, 1969 (SASEA) (8 substudies).	Includes analyses of Malaysian foreign policy, regional military cooperation, and Australian foreign and military policy.	RAC.....	124,000		130,000
Strategic analyses of Latin America, 1969 (SALA) (5 substudies).	Includes studies of strategic, economic, military, and other aspects of Latin American positions and treaties.	RAC.....	93,000		100,000
Strategic analysis of northeast Asia, 1969 (SACNEA) (4 substudies).	Includes studies of aspects of China's policies and changes and analysis of Japanese and North Korean policies.	RAC.....	122,400		130,000
Theater fire support concepts.....	Omitted because of classification.....	RAC.....		\$15,000	
Conflict contingencies in the 1970's.....	To identify those minor contingencies which would occur worldwide in 1972-79 period and would require U.S. participation.	RAC.....		26,200	
United States and regional collective security arrangements (COLSEC) (2 substudies).	Analyze U.S. policies concerning selected existing collective security arrangements. A concept of selective noninvolvement will be explored.	RAC.....		40,000	
The Pacific-Indian Ocean region as a strategic zone.....	Analysis of the impact of the British withdrawal, technological advancements, and increased Soviet and CHICOM interest in the Indian Ocean region.	RAC.....		35,300	
Latin American nuclear free zone (LANFZ).....	Will address questions concerning U.S. bases, installations, and activities in the zone of application of LANSF Army plans for the defense of the Panama Canal.	RAC.....		29,300	
Vulnerabilities of Communist China to U.S. Psychological Operations.	Determination and assessment of vulnerabilities of China and methods of exploitation by U.S. and/or allied PSYOPS.	RAC.....	60,000		
Strategic Postures Study (SPOST).....	Work supporting a continuing Army Staff study effort to analyze and evaluate alternative postures for the U.S. the U.S.S.R., and CPR in the 1968-80 period.	SRI.....	820,000		860,000
Total.....			1,507,500	145,800	1,522,000

**SPONSOR: AIR FORCE, OFFICE, DEPUTY CHIEF OF STAFF, RESEARCH AND DEVELOPMENT**

Japanese rearmament, nuclear, and space programs.....	A study of factors and developments affecting the Japanese military contribution to the U.S. effort in Asia, including the security pact.	Rand, P. F. Langer and M. E. Davies.	\$61,000		\$60,000
Chinese military and foreign policy.....	A continuing analysis of the background and fundamental characteristics of Chinese foreign and military policies to elucidate their implications for U.S. policy. Research provides background for consultations with Air Staff officials and for inputs to inter-departmental studies, such as work on strategic posture toward China.	Rand, A. Hsieh.....	99,000		100,000
European security issues.....	A continuing examination of trends in the political and military relations of European States, including possible changes in European security arrangements, and national developments affecting the overall European military posture.	Rand, F. C. Ikle.....	122,000		120,000
Soviet military and foreign policy.....	A continuing study of Soviet military doctrine, use of military strength for political purposes, foreign policy, and political institutions in the Soviet Union and East European States.	Rand, A. Horelick.....	252,000		250,000
Military representation in U.S. missions.....	Examines better methods of military representation in handling military aid in foreign countries, specifically India, Indonesia, Brazil, and Iran.	Rand, P. Y. Hammond.....	43,000		40,000



**DEPARTMENT OF DEFENSE SOCIAL/BEHAVIORAL SCIENCE RESEARCH PROJECTS USING INFORMATION ABOUT FOREIGN AREAS—Continued**  
 [Note: Information concerning 20 Projects, including all Projects sponsored by ARPA/AGILE, are classified and not included in this listing]—Continued

**SPONSOR: AIR FORCE, OFFICE, DEPUTY CHIEF OF STAFF, RESEARCH AND DEVELOPMENT—Continued**

Project title	Project description	Contractor/Investigator	Previously initiated, underway in fiscal year 1969	Initial funding in fiscal year 1969	Planned for fiscal year 1970
Sino-Soviet economic potential.....	A continuing study of the economic background of Soviet and Communist Chinese military power. Presently it includes studies of outlays, employment, and organizational problems in Soviet R. & D., Soviet foreign economic relations, and Chinese civil aviation.	Rand, O. Hoefding.....	\$112,000		\$110,000
The role of the military in Indonesia.....	An analysis in support of Air Force plans and intelligence of the role of the military in the developing political, economic, and defense structure of Indonesia, and the probable role of Indonesia in the larger context of U.S. security interests in SEA.	Rand, G. J. Pauker.....	35,000		35,000
Asian security issues.....	To help the Air Force by delineation: (a) Future alternative regional and global environments which would affect the Air Force operations, (b) alternative postures and policies which emphasize these components which are of particular Air Force interest but which also consider other theater forces, local, paramilitary and police forces and barriers; foreign aid programs, bilateral and multilateral security arrangements, (c) comparisons of these alternative postures and policies in various potential military and political contingencies in different regional and global environments.	Rand, C. Wolf, Jr.....		\$131,000	130,000
Policy relevant technology in the 1970's and 1980's.....	To project the future of a number of technologies that have particular relevance to interactions among countries and what implications such technological developments have for U.S. military and political policy. Of interest are (a) power generation and transmission; (b) information processing and communication; (c) manufacturing and transportation.	Rand V. Gilinsky.....			2,000
<b>Total.....</b>			<b>724,000</b>	<b>131,000</b>	<b>847,000</b>

**SPONSOR: OASD/ISA**

Development of a planning, programming and budgeting system (PPBS) for U.S. foreign economic decision.	Development of an analytical framework or model which can be used to identify how resources are organized and focused in achieving U.S. foreign policy objectives.	Planning Research Corp.....	0		
The role of Chinese Communist external trade as an instrument for acquiring foreign technology.	Investigation of benefits that may accrue to the Chinese ballistic missile program in the next 10 years from existing trade relations with Japan, West Germany, United Kingdom, France, and Italy.	Browne & Shaw.....	0		
Strengthening international peacekeeping.....	Examination of potential opportunities and limitations of international peacekeeping forces in local conflicts and related U.S. interests.	do.....	0		
Do.....	Preliminary analysis of potential U.S. interests in concepts of international peacekeeping.	Hudson Institute.....	0		
Implications for U.S. policy of a developing trend for greater stability and tranquility among the older nations.	Analysis of an apparent developing trend toward stability, reasons for this stability, issues likely to arise in areas outside the "zone of tranquility," and effects on U.S. security prospects.	do.....	0		
Communist organization and operations study.....	An attempt to isolate factors affecting cohesion or disintegration within the Vietcong movement.	Rand.....	0		
The Soviet military organizational behavior.....	Exploratory research in the decision-making behavior of the Soviet military establishment.	do.....	0		
Alternative strategies for insurgent conflicts.....	Studies problem of developing U.S. policy alternatives which might reduce budgetary and human costs.	do.....	\$75,000		
Independent nuclear capabilities.....	Research on international ramifications of nuclear proliferation and political and technical measures that might assist in controlling proliferation.	do.....	25,000		
NATO's southeast flank.....	An examination of the relationship between U.S. military aid programs and bilateral negotiations on U.S. base rights.	do.....	10,000		
Country planning, programming, and budgeting system.	Research in possibilities of developing and improving capabilities within the U.S. Government for "program packaging" of U.S. military and economic assistance.	do.....	0		
Asian security issues.....	An attempt to formulate and assess a number of different U.S. policies in various international environments and in various military contingencies.	do.....	435,000		\$350,000
Insurgent forces.....	Development and analysis of certain U.S. experiences in Vietnam, aiming at generalization applicable to future U.S. policymaking.	do.....	100,000		110,000
European security issues.....	An examination of a range of alternative security arrangements and the role of the U.S. presence in Europe.	do.....	200,000		200,000
Latin America.....	Analysis of Latin America military institutions and the various environments conditioning their domestic roles and foreign relationships.	do.....	40,000		50,000
Command and control problems for the national command authority.	A study of information and control facilities, systems and procedures required for management of crises and control of conflicts.	do.....	50,000		50,000
Capabilities and interests study.....	An examination of U.S. interests, commitments, and capabilities required to meet future contingencies that threaten those interests.	do.....	100,000		150,000
Cost methods and factors.....	A project aimed at establishing a comprehensive data base and appropriate costing methods to support studies involving the military forces of foreign countries.	do.....	50,000		75,000
Special country and area studies.....	Examination of political, economic, and military policies in various regions and the implications for U.S. security policy.	do.....			50,000
Project management, project formulation, and special requests.	Rand management of ISA-sponsored research, formulation, and exploration of research relevant to ISA interests, and special studies that may be requested on short notice.	do.....	100,000	\$15,000	165,000
Eastern Europe.....	A series of studies on political, economic, and military trends in Europe, including security arrangements.	IDA.....	205,000		225,000
Communist China.....	A broad effort to correlate and evaluate data on Communist China's political, economic, and military objectives and to determine the foreign policy implications for the United States.	IDA.....	205,000		225,000
Exploratory research.....	Funds set aside for the formulation of new studies which may be relevant to ISA requirements.	IDA.....	40,000		50,000
An analytical summary of U.S. security for educational and research purposes.	An examination of various U.S. national security issues and their relationships.	Hudson Institute.....	10,000		10,000
Resource allocations and models for RVN Navy/AF and comparable forces.	To estimate historical total allocations and to determine implications of alternative RVN force structures and comparable forces.	Research Analysis Corp.....		60,000	0
Arms control studies.....	Studies are formulated in response to estimates of potential problems, including nuclear proliferation, regional arms control considerations, international peacekeeping, defense options under alternative "freezes" on strategic weapons, and arms control on seabeds.	Undetermined.....		100,000	300,000
Projects being planned.....	Studies will be developed to support ISA's ad hoc planning requirements.	Undetermined.....		\$130,000	\$140,000
<b>Total.....</b>			<b>\$1,645,000</b>	<b>305,000</b>	<b>2,150,000</b>

Note: Dashes (....) indicate not applicable or that project is completed; 0 indicates project is continuing, although funding is completed.



# PART 4: THE UNIVERSITY-POLICE COMPLEX

## Training For Repression

By Lee Webb

American universities have traditionally acknowledged their "obligation to society" by training military officers in time of war; now, as the home-front war begins to monopolize the attention of the government authorities, universities are being encouraged to provide training for police officers. Over 750 colleges currently offer courses in "police science"--a fivefold increase since 1960.

According to the International Association of Chiefs of Police, 257 colleges now offer associate degrees in law enforcement, and 44 offer bachelor's degrees; the comparable figures for 1960 were 40 and 15, respectively. This massive increase is a consequence of the Omnibus Crime Control and Safe Streets Act of 1968, which authorized the Law Enforcement Assistance Administration (LEAA) to finance the education of policemen, corrections officers, court personnel, and others working in the "criminal justice system."

These police training programs are mirror images of the Pentagon's ROTC programs. Both police and military officials believe that the sophisticated systems and weapons being introduced require manpower with more than a high school education. Supported with grants from LEAA, police departments are attempting to utilize the new military systems developed for use in Vietnam. New "command and control" systems, communications equipment, "night vision devices," and computerized intelligence systems can only be operated by skilled and trained personnel.

A college education is now being viewed by top police officials as yet another weapon for controlling insurgent groups within the population. Quinn Tamm, Executive Director of the International Association of Chiefs of Police, once said that "a man who goes into our streets in hopes of regulating, directing

or controlling human behavior must be armed with more than a gun and the ability to perform mechanical movements in response to a situation. Such men as these engage in the difficult, complex and important business of human behavior. Their intellectual armament--so long restricted--must be no less than their physical prowess." (Quoted in the report of the President's Commission on Law Enforcement and the Administration of Justice.)

Over 65,000 police are being trained at 720 colleges and universities thanks to the largesse of the U.S. Department of Justice. Through LEAA's Office of Academic Assistance, the Department provides loans to students preparing for careers with the police, courts or prison system, and makes grants to "in-service" personnel taking specialized courses or attending night school. Pre-service students can receive up to \$1,800 a year in loans, and in-service students up to \$300 per semester in grant aid.

Police officials and university administrators counter student and faculty hostility to police training programs by explaining that such programs will "professionalize" and "humanize" the police. Professionalization of the police means exactly what it does in the Army: a fascination with technique and modern equipment, a de-politization of the department, and a readiness to carry out any orders from above. Professionalization will not liberalize the police--but rather will make it a more powerful and versatile instrument in the hands of the Nixon-Agnew Administration.

(For a guide to researching the police, send a stamped, self-addressed envelope to NACLA, P.O. Box 57, Cathedral Station, N.Y. N.Y. 10025. This guide is also included in NACLA's Research Methodology Guide--see back inside cover for details.)





# Law Enforcement Degree Programs

Source: Law Enforcement Education Directory, 1970, published by the International Association of Chiefs of Police

Institution	Degree	For Information Contact Department of
<b>ALABAMA</b>		
Jefferson State Junior College	A.S. (Transfer) A.A.S.	Police Science and Criminology
The Marion Institute	A.A., A.S. (Law Enf.)	Law Enforcement
<b>ALASKA</b>		
Anchorage Community College	A.A. (Police Admin.)	Police Administration
University of Alaska	A.A. (Police Admin.)	Political Science
<b>ARIZONA</b>		
Cochise College	A.A. (Law Enf.)	Law Enforcement
Glendale Community College	A.A. (Law Enf.)	Cont. Education
Northern Arizona University	B.S. (Police Sc., Criminalistics)	Police Science and Administration
Phoenix College	A.A. (Police Sc.)	Law Enforcement
University of Arizona	B.S.P.A., M.P.A. (Law Enf., Correcs.)	Public Administration
<b>CALIFORNIA</b>		
Allan Hancock College	A.S. (Law Enf., Correcs.)	Law Enforcement
Antelope Valley College	A.A. (Police Sc.)	Guidance and Counseling
Bakersfield College	A.A. (Police Sc.)	Vocational-Technical Education
Barstow College	A.A. (Law Enf.)	Law Enforcement
Cabrillo College	A.A. (Police Sc.)	Police Science
California State College at Long Beach	B.S. (Police Sc.) M.S. (Police Admin., Criminalistics)	Criminology

California State College at Los Angeles	B.S., M.S. (Police Sc., Criminalistics)	Police Science and Administration
California, University of	A.B., B.S., M., D. (Criminology)	Criminology
Cerritos College	A.A. (Police Sc.)	Social Science
Chabot College	A.A. (Police Sc.)	Police Science
Chaffey College	A.A. (Police Sc.)	Police Science and Corrections
Citrus College	A.A. (Police Sc.)	Police Science
College of the Desert	A.A. (Police Sc.)	Vocational-Technical Education
College of the Redwoods	A.A. (Police Sc.)	Public Safety
Compton College	A.A., A.S. (Police Sc.)	Police Science
Contra Costa College	A.A. (Law Enf., Correcs.)	Police Science
De Anza College	A.A. (Law Enf.)	Law Enforcement
Diablo Valley College	A.A. (Police Sc.)	Police Science
East Los Angeles College	A.A. (Police Sc.)	Police Science
El Camino College	A.A. (Police Sc.)	Police Science
Fresno City College	A.A., A.S. (Police Sc.)	Police Science
Fresno State College	B.S., M.S. (Law Enf., Correcs.)	Criminology
Fullerton Junior College	A.A. (Police Sc.)	Police Science
Gavilan College	A.A. (Police Sc.)	Police Science
Glendale College	A.A. (Police Sc.)	Police Science



Institution	Degree	For Information Contact Department of
Golden West College	A.A. (Law Enf.)	Law Enforcement
Grossmont College	A.A., A.S. (Criminology)	Criminology
Hartnell College	A.A. (Police Sc., Correcs.)	Police Science
Imperial Valley College	A.A. (Police Sc.)	Police Science
Long Beach City College	A.A. (Police Sc.)	Police Science
Los Angeles City College	A.A. (Police Sc.)	Police Science
Los Angeles Harbor College	A.A. (Police Sc.)	Police Science
Los Angeles Valley College	A.A. (Police Sc.)	Police Science
Marin, College of	A.A., A.S. (Police Sc.)	Vocational and Technical Education
Merrit College	A.A.	Police Science
Mira Costa College	A.S., A.A. (Police Sc.)	Vocational and Technical Education
Modesto Junior College	A.A. (Police Sc.)	Police Science
Monterey Peninsula College	A.A., A.S. (Police Sc.)	Police Science
Mount San Antonio College	A.A. (Police Sc.)	Public Safety and Service
Napa College	A.A. (Police Sc.)	Police Science
Palo Verde College	A.A. (Police Sc.)	Vocational Education
Pasadena City College	A.A. (Police Sc.)	Engineering and Technology
Peralta Colleges	A.A. (Police Sc.)	Police Science
Rio Hondo Junior College	A.A. (Police Sc.)	Police Science
Riverside City College	A.A. (Police Sc.)	Police Science
Sacramento City College	A.A. (Police Sc.)	Service Occupations

Institution	Degree	For Information Contact Department of
Sacramento State College	B.A., M.A. (Police Sc.)	Police Science and Administration
San Bernardino Valley College	A.A. (Police Sc., Correcs.)	Public Protection
San Diego Junior Colleges	A.S. (Police Sc.)	Police Science
San Francisco, City College of	A.A. (Police Sc.)	Criminology
San Joaquin Delta College	A.A. (Police Sc.)	Police Science
San Jose City College	A.A. (Law Enf.)	Law Enforcement
San Jose State College	A.B. (Law Enf., Penology), M.S. (Law Enf.)	Law Enforcement and Administration
San Mateo, College of	A.A. (Police Sc.)	Social Science
Santa Ana College	A.A. (Police Sc.)	Police Science
Santa Barbara City College	A.A., A.S. (Police Sc.)	Vocational-Technical Education
Santa Monica City College	A.A. (Police Sc.)	Police Science
Santa Rosa Junior College	A.A. (Police Sc.)	Police Science
Sequoias, College of the	A.A. (Police Sc.)	Police Science
Shasta College	A.A. (Police Sc.)	Law Enforcement
Sierra College	A.A. (Police Sc.)	Police Science
Solano College	A.A. (Police Sc.)	Police Science
Southern California, University of	B.S., M.S., D.P.A. (Police; Correcs., Admin.)	Public Administration
Southwestern College	A.A. (Police Sc.)	Police Science and Administration
Ventura College	A.A. (Police Sc.)	Police Science and Public Administration
West Valley College	A.A. (Law Enf.)	Law Enforcement
Yuba College	A.A., A.S. (Police Sc.)	Police Science



Institution	Degree	For Information Contact Department of
<b>COLORADO</b>		
Arapahoe Junior College	A.A.S.	Police Science
El Paso Community College	A.S.	Occupational Studies
Metropolitan State College	A.A.S., B.S. (Law Enf., Police Sc.)	Law Enforcement and Criminology
Trinidad State Junior College	A.A.S. (Law Enf.)	Law Enforcement
<b>CONNECTICUT</b>		
Eastern Connecticut State College	A.S. (Law Enf.) 4 Year - Part Time	Law Enforcement
Manchester Community College	A.S. (Police Sc., Correcs.)	Law Enforcement
New Haven College	A.S., B.S. (Law Enf.)	Law Enforcement
Norwalk Community College	A.A.	Law Enforcement
University of Hartford	A.S., B.S. (Police Admin.) M.P.A.	Public Administration
<b>DELAWARE</b>		
Brandywine College	A.S. (Police Sc.)	Police Science and Administration
<b>DISTRICT OF COLUMBIA</b>		
American University	A.A., A.B. (Police Admin.)	Continuing Education
Washington Technical Institute	A.A. (Police Sc.)	Police Science
<b>FLORIDA</b>		
Brevard Junior College	A.S.	Police Administration
Broward Junior College	A.S., A.S. (Police Sc.)	Police Science
Central Florida Junior College	A.A. (Law Enf.)	Law Enforcement
Daytona Beach Junior College	A.A., A.S. (Police Admin.)	Law Enforcement
Florida Junior College at Jacksonville	A.A., A.S. (Police Sc.)	Police Science and Administration

Florida Keys Junior College	A.S. (Police Sc.)	Police Administration
Florida State University	A.S., A.B., B.S., M.A., M.S., Ph.D. (Law Enf., Criminalistics)	Criminology and Corrections
Lake-Sumter Junior College	A.A. (Correcs.)	Law Enforcement
Miami-Dade Junior College	A.A., A.S. (Police Sc.)	Police Science and Criminology
Palm Beach Junior College	A.S. (Law Enf.)	Social Science
Pensacola Junior College	A.S.	Law Enforcement
St. Petersburg Junior College	A.A. (Police Admin.)	Police Administration
Tallahassee Junior College	A.A., A.S.	Law Enforcement
Valencia Junior College	A.S. (Law Enf.)	Law Enforcement
<b>GEORGIA</b>		
Albany Junior College	A.A. (Police Admin.)	Social Science
Armstrong State College	A.A. (Police Admin.)	Police Science
DeKalb College	A.A. (Police Sc.)	Police Science
Georgia State College	A.A., B.S., M.S.	Criminal Justice
Kennesaw Junior College	A.A. (Police Admin.)	Admissions
<b>HAWAII</b>		
Honolulu Community College	A.S. (Police Sc.)	Public Administration
<b>IDAHO</b>		
Boise College	A.A., B.A., B.S. (Criminology)	Governmental Services
College of Southern Idaho	A.S. (Law Enf.)	Vocational-Technical Education
<b>ILLINOIS</b>		
Black Hawk College	A.A.	Governmental Services
Carl Sandburg College	A.A.S. (Law Enf.)	Police Science Technology



Institution	Degree	For Information Contact Department of
College of Dupage	A.A., A.A.S. (Police Sc.)	Police Science Technology
Danville Junior College	A.A.S.	Police Science
Illinois Central College	A.A.S. (Police Tech.)	Police Science Technology
Joliet Junior College	A.S.	Vocational-Technical Education
Loop College	A.A. (Law Enf.)	Law Enforcement
Prairie State College	A.A.S., B.S. (Law Enf.)	Occupational Services
Rock Valley College	A.S.	Technology
Southern Illinois University	A.A. (Law Enf.)	Center for Study of Crime
Triton College	A.S.	Police Science Administration
University of Illinois at Chicago Circle	B.A. (Criminal Justice)	Criminal Justice
Waubensee Community College	A.A.S.	Vocational-Technical Education
Western Illinois University	B.S. (Law Enf.)	Law Enforcement
William Rainey Harper College	A.S. (Law Enf.)	Police Science
<b>INDIANA</b>		
Indiana State University	B.S., M.S.	Criminology
Indiana University	A.B., M.P.A. (Law Enf.)	Police Administration
University of Evansville	A.A. (Law Enf.)	Law Enforcement
<b>IOWA</b>		
Iowa Central Community College	A.A.	Arts & Science
Iowa Western Community College	A.A.S.	Social Science
Kirkwood Community College	A.A.	Law Enforcement
North Iowa Area Community College	A.A. (Law Enf.)	Law Enforcement
Southeastern Iowa Area Community College	A.A. (Law Enf.)	Law Enforcement

State University of Iowa	M.A. (Law Enf., Correcs.)	Sociology
University of Iowa	A.A. (Law Enf.), M.A. (Law Enf., Correcs.)	Sociology
<b>KANSAS</b>		
Allen County Community Junior College	A.A. (Police Sc.)	Police Science
Cowley County Community College	A.A.S. (Police Sc.)	Occupational Education
Hutchinson Community Junior College	A.A.S. (Police Sc.)	Vocational-Technical Education
Wichita State University	A.A.S. (Police Sc.)	Police Science
<b>KENTUCKY</b>		
Eastern Kentucky University	A.A., B.S. (Law Enf.)	Law Enforcement
University of Louisville	B.S. (Police Admin.)	Police Administration
<b>LOUISIANA</b>		
Loyola University	A.A., B.A. (Criminology)	Evening Division
<b>MARYLAND</b>		
Anne Arundel Community College	A.A.	Law Enforcement
Catonsville Community College	A.A. (Police Admin., Correcs.)	Police Administration and Corrections
Cecil Community College	A.A.	Law Enforcement
Community College of Baltimore	A.A. (Police Sc.)	Urban Affairs
Essex Community College	A.A. (Police Sc.)	Social Science
Hagerstown Junior College	A.A.	Law Enforcement
Montgomery College	A.A. (Police Sc.)	Police Science
University of Baltimore	B.S. (Law Enf.)	Law Enforcement
<b>MASSACHUSETTS</b>		
Cape Cod Community College	A.A.	Social Science
Mount Wachusett Community College	A.S. (Law Enf.)	Evening Studies



Institution	Degree	For Information Contact Department of
Northeastern University	A.A., B.S. (Law Enf. & Security)	Criminal Justice
Worcester Junior College	A.A. (Police Sc.)	Police Administration
<b>MICHIGAN</b>		
Delta College	A.A. (Law Enf.)	Social Science
Flint Community Junior College	A.A. (Police Sc.)	Law Enforcement
Glen Oaks Community College	A.A.	Dean of Instruction
Grand Rapids Junior College	A.A. (Public Safety)	Public Safety
Kellogg Community College	A.A.	Admissions
Lansing Community College	A.A. (Law Enf.)	Law Enforcement
Macomb County Community College	A.A. (Law Enf.)	Public Services
Michigan State University	B.S., M.S., Ph.D. (Criminal Justice, Criminology)	Police Administration and Public Safety
Oakland Community College	A.A. (Police Sc.)	Business
St. Clair County Community College	A.A. (Law Enf.)	Law Enforcement Education
Schoolcraft College	A.A. (Technology)	
Wayne State University	B.S. (Police Admin.)	Police Administration
<b>MISSISSIPPI</b>		
University of Mississippi School of Business & Government	B.A. (Police Admin.)	Political Science
<b>MISSOURI</b>		
Central Missouri State College	A.B., B.S. (Law Enf.)	Law Enforcement
Florissant Valley Community College	A.A.	Law Enforcement
Forest Park Community College	A.A.S.	Law Enforcement

Meramec Community College	A.A.S.	Law Enforcement
Missouri Southern College	A.S. (Law Enf.)	Law Enforcement
Penn Valley Community College	A.A. (Police Sc.)	Police Science
University of Missouri	B.S. (Admin. of Justice)	Administration of Justice
<b>MONTANA</b>		
Dawson College	A.A. (Police Sc.)	Police Science
<b>NEBRASKA</b>		
University of Nebraska at Omaha	A.A., B.S. (Law Enf., Correcs.)	Law Enforcement and Corrections
<b>NEVADA</b>		
Nevada Technical Institute	A.S. (Law Enf.)	Law Enforcement
University of Nevada	A.S. (Law Enf.) B.A.	General and Technical Studies
<b>NEW HAMPSHIRE</b>		
St. Anselms College	A.A.	Police Science
<b>NEW JERSEY</b>		
Atlantic Community College	A.A., A.S.	Dean of Instruction
Ocean County College	A.A. (Law Enf.)	Law Enforcement Option
Rider College	A.A. (Law Enf.)	Special Programs
Rutgers, The State University	A.S. (Police Sc.)	Law Enforcement
<b>NEW MEXICO</b>		
New Mexico State University	B.S. (Police Sc.), A.A. (Police Sc.)	Police Science
<b>NEW YORK</b>		
Auburn Community College	A.A.S. (Police Sc.)	Continuing Education



Institution	Degree	For Information Contact Department of
Dutchess Community College	A.A. (Police Sc., Correcs.)	Social and Service Technologies
Elmira College	A.A.S.	Evening and Summer Sessions
Erie Community College	A.A.S.	Police Science
Hudson Valley Community College	A.A.S. (Police Sc.)	Police Science
Jamestown Community College	A.A., A.A.S., A.S.	Continuing Education
John Jay College of Criminal Justice	A.S., B.S. (Police Sc.), A.A., B.A.	Police Science
Mohawk Valley Community College	A.A.S. (Police Sc.)	Continuing Education
Monroe Community College	A.A.S. (Police Sc.)	Police Science
Nassau Community College	A.A. (Police Sc.)	Police Science
New York State University	A.A. (Police Sc.)	Police Science
New York University	M.P.A., Ph.D. (Public Admin.)	Law Enforcement
Onondaga Community College	A.S., A.A.S.	Police Science
Orange County Community College	A.A. (Police Sc.)	Police Science
Rockland Community College	A.A.S.	Law Enforcement
State University of New York	M.A., Ph.D. (Crim. Justice)	Criminal Justice
State University of New York	A.A.S.	Police Science
Suffolk County Community College	A.A.S.	Police Science
Ulster County Community College	A.A.S. (Police Sc., Correcs.)	Public Service
Westchester Community College	A.A.S.	Police Science
<b>NORTH CAROLINA</b>		
Central Piedmont Community College	A.A.S.	Police Science and Criminology
Davidson Community College	A.A.S.	Police Science and Criminology

Durham Technical Institute	A.A.S.	Vocational-Technical Education
Forsyth Technical Institute	A.A.S.	Vocational-Technical Education
Gaston College	A.A. (Police Sc.)	Police Science
Pitt Technical Institute	A.A.S.	Police Science
Southwestern Technical Institute	A.A.S.	Social Science
Wilson County Technical Institute	A.A. (Police Sc.)	Police Science
<b>OHIO</b>		
Clark County Technical Institute	A.A.S.	Police Science
Cuyahoga Community College	A.A., A.S. (Police Sc.)	Law Enforcement
Kent State University	B.A. (Law Enf. Admin.)	Political Science
Lakeland Community College	A.A.S.	Technical Education
Lorain County Community College	A.A.S. (Police Sc.)	Police Science
University of Akron	A.S.	Law Enforcement
University of Cincinnati	A.S. (Police Sc.)	Police Science
University of Dayton	B.S.S.	Law Enforcement
University of Toledo, The	A.A.	Law Enforcement Technology
Youngstown State University	A.A., B.A. (Law Enf., Correcs.)	Criminal Justice
<b>OKLAHOMA</b>		
Northern Oklahoma College	A.A. (Law Enf.)	Social Sciences
University of Oklahoma	A.B. (Political Sc.)	Political Science
University of Tulsa, The	B.S. (Police Sc.)	Sociology
<b>OREGON</b>		
Blue Mountain Community College	A.S. (Law Enf.)	Vocational-Technical Division
Clatsop Community College	A.A. (Police Sc.)	Police Science



Institution	Degree	For Information Contact Department of
Lane Community College	A.S. (Law Enf.)	Social Science
Portland Community College	A.A. (Police Sc., Correcs.)	Public Safety
Portland State University	B.S. (Behavioral Sc.)	Law Enforcement
Southern Oregon College	B.A., B.S. (Law Enf.)	Law Enforcement
Treasure Valley Community College	A.A. (Police Sc.)	Law Enforcement
Umpqua Community College	A.A. (Police Sc.)	Vocational-Technical & Adult Education
<b>PENNSYLVANIA</b>		
Bucks County Community College	A.S. (Police Admin., Police Sc., Correcs.)	Law Enforcement
Community College of Allegheny County	A.A., A.S. (Police Sc., Admin.)	Police Science & Administration
Community College of Beaver County	A.S.	Law Enforcement
Harrisburg Area Community College	A.S. (Police Sc., Public Admin.)	Police & Public Administration
Indiana University of Pennsylvania	A.A., B.A. (Crim., Law Enf.)	Criminology
Lehigh County Community College	A.A., A.A.S.	Police Science - Administration
Montgomery County Community College	A.A.S.	Science & Technology
Pennsylvania State University	B.S. (Law Enf. and Correcs.)	Law Enforcement and Corrections
Temple University	A.A. (Law Enf.)	Law Enforcement
York College	A.S.	Law Enforcement
<b>RHODE ISLAND</b>		
Bryant College	A.S., B.S. (Law Enf.)	Law Enforcement
<b>SOUTH CAROLINA</b>		
Palmer College	A.A.	Education
Spartanburg Junior College	A.A. (Police Sc.)	Police Science

<b>TENNESSEE</b>		
Memphis State University	A.A., B.S., M.A. (Law Enf.)	Sociology, Division of Law Enforcement
<b>TEXAS</b>		
Amarillo College	A.A.S. (Police Sc.)	School of Technology
Central Texas College	A.A.S. (Law Enf.)	Law Enforcement
El Centro College -of the Dallas City Jr. College District	A.A.S.	Police Science
Grayson County Junior College	A.A.	Law Enforcement
Lee College	A.A.	Social Science
McLennan Community College	A.A.S.	
Odessa College	A.A. (Police Sc.)	Police Science
Sam Houston State University	A.B., B.S., M.A. (Police Sc., Law Enf.), Ph.D. (Criminal Justice)	Law Enforcement
San Antonio College	A.A.S. (Law Enf.)	Law Enforcement
San Jacinto College	A.A., A.S.	Technical Education
South Texas Junior College	A.A.	Police Administration
Tarrant County Junior College	A.A.	Police Administration
Texarkana College	A.A. (Police Tech.)	Police Technology)
<b>UTAH</b>		
Brigham Young University	A.A., B.S. (Law Enf.)	Law Enforcement Education
University of Utah	B.A., B.S. (Sociology)	Sociology
Weber State College	A.A., A.S. (Police Sc.)	Police Science
<b>VIRGINIA</b>		
Central Virginia Community College	A.A.S. (Police Sc.)	Police Science
Northern Virginia Community College	A.A.S.	Police Science



Institution	Degree	For Information Contact Department of
Old Dominion University	A.A. (Law Enf.)	Law Enforcement
Richmond Professional Institute	A.A., B.S. (Law Enf.)	
Virginia Commonwealth University	A.A., B.S. (Law Enf.)	Sociology
Virginia Western Community College	A.A.S.	Police Science
<b>WASHINGTON</b>		
Bellevue Community College	Assoc. in Technology	Law Enforcement
Clark College	A.A. (Police Sc.)	Police Science
Everett Community College	A.A. (Law Enf.)	Law Enforcement
Fort Steilacoom Community College	A.A. (Law Enf.)	Occupational Education
Green River Community College	A.A. (Law Enf.)	Law Enforcement
Highline Community College	A.A.S. (Police Sc.)	Law Enforcement
Madison Area Technical College	A.A. (Police Sc.)	Police Science
Olympic College	A.T.A. (Police Sc.)	Police Science
Pacific Western College of Liberal Arts	B.S. (Police Sc.)	Police Science
Seattle Community College	A.S.	Curriculum & Instruction Laboratory
Shoreline Community College	A.A.A. (Police Sc.)	Vocational-Technical Education
Tacoma Community College	A.A.	Community Services
Washington State University	B.S., M.A. (Police Sc.)	Police Science
Yakima Valley College	A.A. (Police Sc.)	Occupational Education
<b>WEST VIRGINIA</b>		
West Virginia State College	A.A., B.S. (Law Enf.)	Law Enforcement

Institution	Degree	For Information Contact Department of
<b>WISCONSIN</b>		
Kenosha Technical Institute	A.A.S. (Police Sc.)	Police Science
Madison Area Technical College	A.A.S.	Law Enforcement
Marquette University	A.A. (Law Enf.)	Continuing Education
Milwaukee Area Technical College	A.S. (Police Sc.)	Police Science
Wisconsin State University	B.S. (Police Sc.)	Police Science and Administration
<b>WYOMING</b>		
Casper College	A.A. (Law Enf.)	Law Enforcement





# 'R&D' For the Homefront War

## —THE SCIENCE OF REPRESSION

By 1965, the United States could boast a sophisticated counterinsurgency apparatus in Southeast Asia -- and then the Watts ghetto of Los Angeles exploded, revealing the total inadequacy of our homefront counterinsurgency forces, the local police, in coping with major urban disorders. A researcher for the Defense Research Corporation (DRC), John L. Sorenson, wrote in 1965,

"Investigations by DRC of the state of the field in 1964 indicate that the United States is inadequately prepared to counter urban insurgency [UI]. The preventative or responsive measures available to national and local policy-makers are few. . . . While basic tactics are available to handle routine riots and occasional terrorism, the broader concept of a whole program of counterinsurgency is hardly even discussed among police here or abroad. The military often is called in to control a situation which has exceeded the capacity of the regular police, but they too lack a doctrine, training, or materials to do more than simply quell mass action. An alarming operational and doctrinal vacuum pervades our own and other democratic countries in the face of the UI threat."<sup>1</sup>

In order to fill this "operational and doctrinal vacuum," the government hurriedly began a program of research designed to upgrade our ability to control urban violence. Not surprisingly, Washington called in its battle-tested experts on Third World counterinsurgency to plan the new attack on domestic instability. To launch this campaign, the Institute for Defense Analyses (IDA), a university-sponsored military think-tank, was asked to prepare a "Task Force Report" on Science and Technology for the President's Commission of Law Enforcement and the Administration of Justice.

In its report to the Commission, IDA noted that, "The Defense Department spends about \$7 billion a year on research and development, about 13 percent of its regular budget. In contrast, as recently as 1965, the Justice Department was the only Cabinet department with no share of the roughly \$15 billion Federal Research and Development budget. The research and development budget in other criminal justice organizations is negligible."<sup>2</sup> This situation should be changed, IDA argues, since "The experience of science in the military . . . suggests that a fruitful collaboration can be established between criminal justice officials on one hand and engineers, physicists, economists, and social and behavioral scientists on the other. In military research organizations these different professions, working with military officers in interdisciplinary teams, have attacked defense problems in new ways and have provided insights that were new even to those with

long military experience. Similar developments appear possible in criminal justice."<sup>3</sup>

Using military research organizations as a model, IDA proposed that the Federal government establish a research institute devoted to law enforcement research: "Probably the most important single mechanism for bringing the resources of science and technology to bear on the problems of crime would be the establishment of a major prestigious science and technology research program within a research institute."<sup>4</sup> This proposal was adopted by the President's Commission and subsequently incorporated into legislation.

The Omnibus Crime Control and Safe Streets Act of 1968 (Public Law 90-351) creates a National Institute of Law Enforcement and Criminal Justice as the research arm of the Law Enforcement Assistance Administration (LEAA). The Act authorizes the Institute to conduct research studies with its own staff, and "to make grants to, or enter into contracts with, public agencies, institutions of higher education, or private organizations to conduct research, demonstrations, or special projects pertaining to . . . the development of new or improved approaches, techniques, systems, equipment, and devices to improve and strengthen law enforcement." In order to establish guidelines for such projects, LEAA commissioned IDA to prepare "A National Program of Research, Development, Test, and Evaluation on Law Enforcement and Criminal Justice."

Using the IDA proposal as a model, the Institute subsequently awarded several million dollars' worth of contracts to universities and other non-profit institutions. Many of these projects call for the application of social science research in determining how the anger and frustration of youth and minority peoples can be channeled into "constructive," non-violent activities. Other projects are designed to modernize police communications, intelligence, and "command-and-control" systems. A list of these projects, reproduced from the First Annual Report of the Law Enforcement Assistance Administration, appears below.

-- M.K.

### FOOTNOTES:

1. John L. Sorenson, Urban Insurgency Cases (Santa Barbara, Calif.: Defense Research Corp., 1965), pp. 6-7.
2. Institute for Defense Analyses, Task Force Report: Science and Technology (Washington, D.C.: Government Printing Office, 1967), pp. 2-3.
3. *Ibid.*, p.2.
4. *Ibid.*, p. 82.





## National Institute of Law Enforcement and Criminal Justice

# 1969 Research Contracts

Source: FIRST ANNUAL REPORT 1969 LAW ENFORCEMENT ASSISTANCE ADMINISTRATION

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- NI-094 \$6,070 From 7/1/69 to 6/15/70  
Grantee: Arizona State University, Tempe  
Title: Police and the Urban Minorities of Phoenix (PUMP)  
Abstract: The Police and the Urban Minorities of Phoenix, "Project PUMP," is an interdisciplinary approach designed to pump the resources of the university and those of metropolitan Phoenix into the solution of problems arising from abrasive relations between disadvantaged minorities and law enforcement agencies. PUMP is proposed as the beginning of a long term research, programing, and planning structure to assist in solving complex social, legal, political, and economic questions to which law enforcement agencies must address themselves. PUMP will be directed toward the improvement of law enforcement services as well as toward identification of factors which operate to prevent crime.
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- NI-003 \$144,505 From 1/1/69 to 9/30/69  
Grantee: Associated Public Safety Communications Officers (APCO)  
Title: Illinois Police Communication Study, Phase II  
Abstract: Design of optimum police communications systems for the 3-State area of Milwaukee, Wisconsin to Gary, Indiana (Metropolitan Chicago). Emphasis will be on Spectrum Management (Phase II).
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- NI-070 \$5,000 From 7/14/69 to 8/31/69  
Grantee: Association on American Indian Affairs, Inc., New York, New York  
Title: Law and Order on the Mississippi Choctaw Reservation  
Abstract: The project will address itself to the area of Indian reservation law enforcement by studying a single tribe's problems in this field. The proposed project will provide assistance to the Mississippi Choctaws in dealing with law enforcement problems and in establishing a tribal system of law and order.
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- NI-060 \$6,000 From 7/26/69 to 6/13/70  
Grantee: Bowling Green State University, Bowling Green, Ohio  
Title: The Impact of Community Corrections Centers upon a Correctional System  
Abstract: This project is concerned with the impact of four recently established community correctional centers upon the correctional system of Vermont and its applicability in other parts of the Nation. It will investigate not only the effects of these centers upon the community itself but also on the whole process of administering criminal justice. A wide variety of information on this model program will be collected, analyzed, and evaluated in the course of this research effort.
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- NI-032 \$25,000 From 6/15/69 to 12/15/69  
Grantee: University of California at Berkeley  
Title: Physical Evidence Utilization  
Abstract: Examine and evaluate impact on crime control of various criminalistics operations.
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- NI-041 \$21,955 From 7/1/69 to 12/31/69  
Grantee: University of California at Santa Barbara  
Title: Econometric Study of Economy-Related Crimes  
Abstract: This is a study to determine the interrelationships among economic, age, education, and law enforcement factors for a selected age group of offenders committing economic crimes on the arrest rates for these crimes. This is an attempt to view this kind of criminal activity in a broad enough context to determine not only where and at what levels crime may be expected, but also to identify the critical factors leading to economic crimes.
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- NI-026 \$50,141 From 6/30/69 to 9/30/70  
Grantee: Carnegie-Mellon University, Pittsburgh, Pennsylvania  
Title: Analysis of a Statewide Criminal Justice System  
Abstract: A study of the entire criminal justice system at the State level (Pennsylvania) is being done so that a clear understanding of the interrelationships among the elements of a State criminal justice system can be developed from a broad vantage point, and thereby detect and hopefully avoid bottlenecks and conflicts which occur within the elements of any system which must function together smoothly. The results of this study will be applicable with appropriate modifications to many other States and will furnish an important planning tool for allocating resources to obtain an effective state criminal justice system.
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- NI-028 \$64,955 From 6/13/69 to 6/13/70  
 Grantee: City University of New York  
 Title: Training Police as Specialists in Family Crisis Intervention  
 Abstract: This project is an extension of research done by the City University of New York with the New York Police Department. The research will train selected members of the Public Housing Police Force as specialists in family crisis intervention. An evaluation of the training will be made in terms of such variables as the reduction in the number of injuries sustained during family crisis intervention.
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- NI-024 \$37,746 From 6/30/69 to 12/30/69  
 Grantee: City University of New York  
 Title: Physical Environment and Urban Street Behavior  
 Abstract: This pilot project will explore the impact of physical environment upon urban street behavior in a selected area of New York City. It is based upon the assumption that aspects of the physical environment can be structured in a manner which will channel the creative energies of young people and adults to constructive rather than criminal street behavior. Only a limited amount of research has been done in this area.
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- NI-045 \$50,000 From 6/30/69 to 12/13/69  
 Grantee: Franklin Institute Research Laboratories, Philadelphia, Pennsylvania  
 Title: User Requirements Conferences  
 Abstract: This grant will support the conducting of two conferences on selected critical topics in law enforcement. The purpose of the conferences is to define unmet user requirements in specific areas as a basis for identifying and designing research in these areas. The two conferences will be: (1) Computer Applications in Law Enforcement, and (2) Police Response Time.
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- NI-023 \$49,663 From 6/30/69 to 1/31/70  
 Grantee: George Washington University, Washington, D.C.  
 Title: Development and Implementation of a Behavioral/Systems Approach to Prevention and Control of Delinquency and Crime.  
 Abstract: This study will analyze the effectiveness of our social institutions, education, welfare courts and corrections in the control and treatment of delinquents. It is expected to provide an explanatory framework for social behavior and a program for the management of the general system.
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- NI-039 \$101,083 From 6/30/69 to 5/31/70  
 Grantee: Georgetown University Law School, Washington, D.C.  
 Title: Study and Evaluation of Projects and Programs Funded under the Law Enforcement Assistance Act of 1965  
 Abstract: An evaluation of the completed projects funded under the LEA Act is the objective of this study. It should provide an analysis of what has been learned, what mistakes have been made, what areas of inquiry deserve no further support and what significant gaps require new efforts.
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- NI-056 \$6,423 From 7/15/69 to 2/16/70  
 Grantee: Human Interaction Research Institute, Los Angeles, California  
 Title: Training Policemen to Deal with Family Disturbances  
 Abstract: The purpose of the proposal is to train police to deal with "family disturbances" in addition to law enforcement duties, the apprehension of criminals and crime prevention training. Specifically they will be trained to deal with: (1) offenses against family and children, (2) incorrigible juveniles, (3) family disturbances, and (4) "disturbing the peace" calls.
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- NI-200 \$6,542 From 6/30/69 to 9/30/70  
 Grantee: Indiana University Foundation, Bloomington, Indiana  
 Title: Organizational Response to Civil Disorder  
 Abstract: The goal of the project is to explore and illuminate patterns of response of various public organizations in Indiana to the threat or realization of civil disorder with respect to organizational planning, training, operational decisionmaking, and interorganizational behavior. The researchers will employ semistructured interview schedules, structured questionnaires and official documents as sources of data.
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- NI-047 \$118,800 From 7/1/69 to 6/30/70  
 Grantee: Institute for Behavioral Research, Silver Spring, Maryland  
 Title: Develop a Study of Alternatives to Punishment in Maintaining Law and Order  
 Abstract: This research project has two objectives: The first objective is to study alternatives to punitive law enforcement measures, such as fines and incarcerations, by investigating the feasibility of preventive systems based on constructive re-enforcement. The second objective is to evaluate a study completed by the Institute for Behavioral Research at the National Training School for Boys. This study used the technique of operant conditioning to change the behavior of 41 selected inmates.
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- NI-031 \$101,914 From 9/1/68 to 7/31/69  
 Grantee: Institute for the Study of Crime & Delinquency, Sacramento, California  
 Title: Model Community Corrections Program—Phase II  
 Abstract: This continuation grant will provide second stage funds to construct a model community correctional program designed to interface with a typical county criminal justice system in providing disposition alternatives for client control and treatment through community based programs evolved from planning activities conducted under a previous LEA Act grant.



- NI-025 \$60,676 From 6/30/69 to 12/31/70  
 Grantee: University of Iowa, Iowa City  
 Title: The Role of Industries in a Comprehensive Correctional Program  
 Abstract: The objectives of this study are: (1) To tabulate and analyze the current status of the correctional industries programs in seven midwest States; (2) to determine the attitudes of State correctional administrators and members of the community power structure toward the role of industries and toward such new programs as halfway houses and work release; (3) to discuss, analyze and publish the results.
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- NI-037 \$54,867 From 7/1/69 to 6/30/70  
 Grantee: The Justice Foundation, Fayetteville, Arkansas  
 Title: Regional Law Enforcement Assistance Program  
 Abstract: This feasibility study relates to the problems of working among state, county, and local jurisdictions. This will help to clarify the political feasibility and the communication and data problems involved in making a statewide criminal justice system meaningful.
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- NI-079 \$5,000 From 7/1/69 to 6/30/70  
 Grantee: University of Kansas, Lawrence  
 Title: Juvenile Justice After Gault: A Study of Three State Systems  
 Abstract: The research objective is to explore the effect of the Supreme Court Gault decision on the State juvenile courts. Specifically, the effect the decision has on the organization, operation and philosophy of juvenile justice.
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- NI-093 \$5,000 From 6/23/69 to 6/22/70  
 Grantee: Kent State University, Kent, Ohio  
 Title: Attitudinal Changes in Law Enforcement and College Student Populations  
 Abstract: This proposal is directed to the analysis of the Component parts of a college course which are designed not only to produce understanding of law enforcement philosophies, concepts, and procedural operations, but also to produce a favorable change in attitudes towards the criminal justice system.
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- NI-016 \$5,397 From 5/1/69 to 8/31/69  
 Grantee: University of Kentucky, Lexington  
 Title: Publication of Electronics Countermeasures Conference  
 Abstract: Dissemination of the proceedings of the third annual conference on electronic crime-control countermeasures.
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- NI-085 \$5,000 From 6/15/69 to 12/15/69  
 Grantee: Lawyers' Committee for Civil Rights Under Law, Washington, D.C.  
 Title: An Experiment in Using Legal Skills to Reduce Police-Community Hostility  
 Abstract: The primary goal of the project is to involve members of the private bar in the solution of a major problem facing law enforcement agencies: Community hostility to the practices and methods used in law enforcement.
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- NI-043 \$125,000 From 6/30/69 to 10/13/70  
 Grantee: City of Louisville, Kentucky  
 Title: Fast Response Criminal Warning System  
 Abstract: This project will attack two major alarm problems; high operational costs of leased telephone lines, and the efficient handling of the annunciator or read out when a large number of alarms are involved. The first problem is alleviated by using normal existing telephone circuit and the latter problem is alleviated by computer decoding of the alarm signal.
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- NI-083 \$5,845 From 7/1/69 to 3/31/70  
 Grantee: Mary Holmes Junior College, West Point, Mississippi  
 Title: Proposed Study Concerning Juvenile Delinquency and Youth Court Reform  
 Abstract: The proposed research plan involves the following: (1) A general review and analysis of the youth court system of Mississippi; (2) the dissemination of information for the benefit of officials involved in the administration of justice to juveniles before the youth courts; and (3) the assistance to legislators in the formulation and drafting of legislative reforms of youth court statutes.
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- NI-033 \$14,600 From 6/9/69 to 12/9/69  
 Grantee: Governor's Public Safety Committee, Boston, Massachusetts  
 Title: Law Enforcement & Criminal Justice Education Survey  
 Abstract: This project undertakes to survey the needs, resources, and other facilities of professional and preprofessional education for law enforcement and corrections personnel; and to develop a coordinated plan to serve as a blueprint for such education in the Commonwealth of Massachusetts and as a model for similar programs throughout the United States.
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- NI-080 \$4,551 From 7/1/69 to 2/1/70  
 Grantee: Miami University, Oxford, Ohio  
 Title: An Economic Analysis of Distribution of Police Patrol  
 Abstract: The first part of the study would research the existing distribution of police manpower in relation to important social and economic variables such as level of income and education, population density and social composition. The second part of the study would concern the optional allocation of patrol forces to minimize the cost of crime to society.



- NI-027 \$50,714 From 6/30/69 to 6/30/70  
 Grantee: University of Michigan, Ann Arbor  
 Title: Methodological Studies of Crime Classification  
 Abstract: The accurate assessment of the volume of crime and of particular kinds of crime is the objective of this study. It is expected to evaluate the factors that affect the classification of major index crimes and to develop ways of estimating base populations for victim statistics.
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- NI-034 \$13,280 From 6/30/69 to 3/15/70  
 Grantee: University of Michigan, Ann Arbor  
 Title: Interdisciplinary Seminar in Criminal Justice Administration and Corrections  
 Abstract: An interdisciplinary seminar will be established by the University of Michigan Law School to discuss research needs in the area of crime and delinquency. Its objective is the germination of better research ideas.
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- NI-040 \$59,130 From 7/1/69 to 6/30/70  
 Grantee: Institute for Social Research, The Regents of the University of Michigan, Ann Arbor  
 Title: Alternative Responses to School Crisis  
 Abstract: It is a goal of this project to work with three schools to try out several models of alternative and more creative response to crisis and disruption. It is also a goal of this project to develop and demonstrate programs to create new links between protesting student groups, educational leaders and police officials. Representatives of law enforcement systems need to understand better the particular issues and potentials in student-school crises, and the ways they may be most helpful to students and educators. The latter groups need a better understanding of the potential role of law enforcement systems, and the implications of school unrest for local police and judiciary agencies.
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- NI-068 \$4,985 From 9/1/69 to 8/31/70  
 Grantee: Department of State Police, East Lansing, Michigan  
 Title: Evaluation of Michigan State Police-Public School Liaison Program  
 Abstract: The intent of this proposal is to secure funds for the completion of an independent, objective, scientific evaluation of an existing police-school liaison program by trained social researchers. The Michigan State Police with Western Michigan University have collected data from two school systems with the intent of measuring the attitudes of the school populations toward police officers and law enforcement. It is proposed that federal funds be made available so that after 1 year's exposure the same researchers may again test for any measurable amounts of attitudinal change and also attempt to determine which of the police school liaison activities are most effective and which might have a negative influence.
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- NI-076 \$2,569 From 9/1/69 to 5/31/70  
 Grantee: Middle Tennessee State University, Murfreesboro  
 Title: Attitudes and Attitude Changes in Law Enforcement Officers  
 Abstract: This research is intended to accomplish the following general purposes: (1) To generate information concerning certain specific attitudes of law enforcement officers of differing levels of experience and training, drawn from differing population areas and organizational structures. (2) To determine whether or not these attitudes undergo change during periods of instruction of varying kinds designed to improve law enforcement skills of the personnel, and to estimate the direction and degree of these attitude changes within and between the different groups.
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- NI-044 \$100,000 From 6/30/69 to 6/30/70  
 Grantee: Midwest Research Institute, Kansas City, Missouri  
 Title: A Systems Analysis of Criminalistics Operations  
 Abstract: This study will be a comprehensive systems analysis of the crime laboratory in law enforcement and criminal justice. Emphasis will be placed on quantifying the knowledge of present experts in criminalistics so as to allow a structured approach to both enhance and multiply this expertise to the benefit of all areas of the country. The primary goal of the study is to recommend systems of criminalistics operations that would meet cost/benefit criteria while serving the needs of local communities, regional areas and the nation.
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- NI-063 \$4,945 From 6/15/69 to 6/15/70  
 Grantee: University of Minnesota, Minneapolis  
 Title: Socialization of Police Recruits  
 Abstract: The purpose of the research is to explore the nature and effects of socialization processes on police recruits. The factors which contribute to the socialization of the recruits are: (1) first on-the-street experiences; (2) prevailing attitudes of veteran officers in his precinct and (3) type of clientele.
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- NI-202 \$65,000 From 6/30/69 to 12/30/69  
 Grantee: National Conference on Citizenship, Rockville, Maryland  
 Title: Responsible Participation of Youth in Public Life  
 Abstract: The primary objectives of the research will be to study alienated youth with focus upon an evaluation of in-depth case studies in three areas: (1) The university campus; (2) the black community; and (3) the social, economic, and political institutions of American society.



- NI-073 \$6,557 From 9/1/69 to 6/1/70  
 Grantee: University of Nebraska, Lincoln  
 Title: Evaluative Research of a Community-based Crime Prevention Program  
 Abstract: There are two general goals of the proposed research project: (1) Evaluation of the effectiveness of the volunteer counselor program; and (2) development of predictive techniques to improve the efficiency of the total program. The program model is divided into five subareas: (1) Selection, (2) matching, (3) training, (4) followup services, and (5) evaluation. The model attempts to specify decision within each subarea and to identify important variables which influence the decision making process.
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- NI-059 \$5,000 From 7/1/69 to 1/1/70  
 Grantee: University of Nevada, Reno  
 Title: Expediting the Criminal Processes  
 Abstract: It is proposed that procedures presently employed in metropolitan courts to process criminal cases from arrests through final disposition be critically examined. It is expected that a critique of current methods will reveal new legal alternatives which will expedite trial of criminal cases.
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- NI-029 \$87,695 From 6/30/69 to 3/31/70  
 Grantee: New Transcendy Foundation, Inc., Washington, D.C.  
 Title: Youth Involvement Programs—Inventory and Prospectus  
 Abstract: The objective of the study is to establish criteria for the success or failure of youth involvement programs. It aims to provide a basis for planning crime prevention programs by giving us a baseline evaluation of what has gone before.
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- NI-087 \$8,650 From 7/1/69 to 7/1/70  
 Grantee: Odyssey House, Inc., New York City  
 Title: Odyssey House Community Involvement Center: A Drug Rehabilitation Pilot Project  
 Abstract: The aim of the Community Involvement Center (CIC) and the thrust of the grant application is to demonstrate that a voluntary drug rehabilitation agency which uses both professionals and exaddicts as part of its therapeutic community can affect change in a heavy crime-drug area . . . that a planned, intensive program of education based on drug abuse prevention can hold back the tide on the increased use of drugs and involvement in crime . . . that a direct approach via local community associations and through individuals within a neighborhood coupled with a positive working relationship between a drug rehabilitation community, law enforcement agencies, public defenders, and other social agencies can lessen tensions and bring about a higher degree of law and order to a community.
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- NI-071 \$6,330 From 9/1/69 to 8/1/70  
 Grantee: Ohio University, Athens, Ohio  
 Title: The Policeman—His Credibility As A Message Source  
 Abstract: The study proposes to test the following hypotheses concerning the credibility of police officers: (1) police officers as information sources have a credibility profile that is no different from any other professional group; (2) credibility profiles of police officers are not affected by the race of the officer or the race of the respondent; (3) credibility of police officers is greater when the officers are represented as communicating in an area which lies in their professional competence.
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- NI-066 \$6,300 From 7/1/69 to 7/1/70  
 Grantee: Orange Coast Junior College District, Costa Mesa, California, and Los Angeles Police Department, California  
 Title: Project Calcop  
 Abstract: The general objectives of the project are to: (1) Develop training materials and techniques which can be used in police training using a computer assisted approach; and (2) to conduct and evaluate a developmental and experimental project in criminal law as a basis for creating a model which can be used in police training.
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- NI-030 \$35,714.20 From 6/30/69 to 6/30/71  
 Grantee: University of Pennsylvania, Philadelphia  
 Title: Patrolmen in Urban Environments  
 Abstract: This project is designed to study the technical and cultural processes by which a citizen is enrolled, trained, and acculturated into an urban police force. Observation will be carried out in a program of systematic field work extending over a full year and will cover the range of ecological types in American cities. Police contacts in interactional situations will be given particular attention.
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- NI-077 \$6,655 From 9/1/69 to 12/30/69  
 Grantee: Pennsylvania State University, University Park  
 Title: Manpower, the Administration of Criminal Justice, and New Recruitment Target Groups  
 Abstract: The purpose of the study is to develop a central information source on the number, types, and caliber of personnel involved in the administration of criminal justice in Pennsylvania. The project will use the computed information and convert it into an action program to provide employment opportunities and training strategies in the various elements of the criminal justice system.
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- NI-075 \$5,000 From 6/15/69 to 12/31/69  
 Grantee: Portland State University, Oregon  
 Title: Police-Community Relations Evaluation Project  
 Abstract: The primary goal of the project is to develop criteria for the evaluation of police-community relations programs. The project will: (1) Make a preliminary study of current police-community relations programs being utilized throughout the Nation; (2) observe the effectiveness of methods used; and (3) prepare guidelines for the establishment of police-community relations programs.



- NI-092 \$7,960 From 7/1/69 to 10/31/69  
 Grantee: Research Analysis Corporation, McLean, Virginia  
 Title: A Feasibility Study of Offender Participation in the Dispositional Decision of a Juvenile Court  
 Abstract: A study is proposed to determine the feasibility of a demonstration project to test whether offender participation in the dispositional decisionmaking process of the juvenile court is possible and practical, and to discover the probable effects upon the individual offender and the recidivist rates. The study would seek to answer the questions of whether such participation is possible from the standpoint of the court officials, desirable from the standpoint of juvenile offenders, and advantageous, in a measurable way, to the process of rehabilitation.
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- NI-088 \$5,000 From 7/1/69 to 9/30/70  
 Grantee: College of St. Thomas, St. Paul, Minnesota  
 Title: The Efficiency of Law Enforcement Resources  
 Abstract: It is the objective of this study to statistically estimate the efficiency of law enforcement in reducing the number of major crimes against property. Using cross sectional data for the United States, statistical estimates of the parameters of an economical model of criminal behavior will be ascertained. An attempt will be made to answer such questions as: Are sufficient funds allocated to crime prevention? Should police forces be consolidated? What factors are important in determining the amount of crime?
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- NI-050 \$6,188 From 7/1/69 to 6/30/70  
 Grantee: University of Southern California, Los Angeles  
 Title: Decisionmaking, Correctional Alternatives and Recidivism  
 Abstract: The proposal is concerned with doing research on the operation and results of legal and correctional systems. Specifically it will seek: (1) to construct indexes of correctional program effectiveness; (2) to evaluate programs in terms of their ability to reduce delinquency rate; and (3) to achieve a better matching of types of offenders with type of correctional programs.
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- NI-035 \$33,815 From 7/1/69 to 1/1/71  
 Grantee: The Technological Institute, Evanston, Illinois  
 Title: Prediction and Optimization for Police Beats  
 Abstract: This study will make use of previous empirical work done in several cities on the police beat problem, and provide a more basic rationale for the prediction of criminal activity in real situations as the first step in improving the operational effectiveness of law enforcement activity.
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- NI-065 \$6,000 From 6/15/69 to 9/1/69  
 Grantee: Travis County Juvenile Court, Austin, Texas  
 Title: Augmentation of Moral Judgment in the Adolescent Juvenile Delinquent  
 Abstract: The research consists of investigating the effects of modeling behavior on the moral judgment of delinquents. The implications of this research reside in its possible application to the treatment of juvenile delinquency. Findings will contribute further to the parameters of influence of social reinforcement theory in moral socialization of the child. The results will also provide further classification of the relationships between moral judgment and moral behavior.
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- NI-084 \$5,987.34 From 7/1/69 to 3/31/70  
 Grantee: Tucson Police Department, Arizona  
 Title: Police Labor Organizations  
 Abstract: The purpose of the project is to study police labor organizations, the problems created by them, and the potential solutions to these problems. The study will provide police administrators, labor leaders, and city officials with: (1) A suitable framework within which the groups can achieve their competing interests with minimum disruption to the police purpose and public safety; (2) the effect that police labor organizations have on the judicial and police department disciplinary process; (3) information on police organizations to be used as a research reference; and (4) statistics and converting them to conclusions and trends.
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- NI-036 \$61,825 From 6/30/69 to 6/30/70  
 Grantee: Vera Institute of Justice, New York, New York  
 Title: Bronx Sentencing Project  
 Abstract: The overall goal of this project is to develop a sentencing model for adult misdemeanants which can be adapted for use in any high volume misdemeanor court in an urban setting. The major components of the program are (1) a short form presentence report containing objective background information about the defendant, (2) sentencing guidelines and (3) referrals of selected defendants to community agencies for supervision and assistance. Recommendations will be made to the Institute with regard to sentencing in misdemeanors.
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- NI-038 \$105,000 From 6/30/69 to 6/30/70  
 Grantee: Vera Institute of Justice, New York, New York  
 Title: Evaluation of the Effects of Methadone Treatment on Crime and Criminal Narcotics Addicts  
 Abstract: Funds are requested for the criminal evaluation segment of a proposed narcotics program including methadone treatment in the City of New York to be located in the model cities areas of Bedford, Stuyvesant, Harlem, and South Bronx. Recommendations will be made with regard to the potential of methadone treatment as a method for dealing with addicts and addict-created crime.



- NI-089 \$6,300 From 7/1/69 to 4/30/70  
Grantee: University of Virginia, Charlottesville  
Title: Research for the Enhancement of Correctional Endeavors  
Abstract: The purpose of the research is to conduct a pilot study for the enhancement of correctional endeavors in Virginia. The program will also be used to stimulate graduate research programs in this area. In addition the program will develop methodology for collecting data on inmates and processing it efficiently.
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- NI-090 \$5,000 From 6/5/69 to 6/5/70  
Grantee: University of Washington, Seattle  
Title: Seattle Police Disciplinary Procedures Project  
Abstract: This study has as its objective the improvement of disciplinary procedures within police departments through the cooperative efforts of a law school and a police department. It is hoped that formalizing disciplinary procedures will strengthen police morale, minimize the possibility of unfairness or arbitrariness, provide the police department with legal assistance in a sensitive area and improve police-community relations.
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- NI-054 \$8,069.10 From 6/20/69 to 9/20/69  
Grantee: Wayne State University, Detroit, Michigan  
Title: Production of a college level text to be entitled "Cases and Materials on Michigan Criminal Law for the Police."  
Abstract: A project to develop an experimental text consisting of cases and materials on Michigan Criminal law for the police administration courses in substantive criminal law at the college and university level. The material would cover the traditional offenses both against the person and property that are ordinarily covered in a beginning course in criminal law.
- 
- NI-009 \$102,148 From 6/30/69 to 6/30/70  
Grantee: Wayne State University, Detroit, Michigan  
Title: Study of the Police Vehicle  
Abstract: The overall goal of this project is to understand the role of the vehicle in relation to police departments and from this understanding will come a better vehicle for police use, a better set of policies for its use, and a better program for procurement, replacement and operation. The objective in the broad sense is to aid in achieving better police operations within the best cost framework.
- 
- NI-091 \$4,957 From 7/1/69 to 6/30/70  
Grantee: Wilberforce University, Wilberforce, Ohio  
Title: Professional Social Work Consultation to Police  
Abstract: The goals of this proposal are to: (1) Provide training, education and consultation services for prevention of social disorganization; (2) impart social welfare techniques, knowledge and skill to law enforcement personnel; (3) bridge the gap between the law enforcement and the social service systems; and (4) promote social stability in the community.
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# APPENDIX:

## Defense Department Contract Awards To Non-Profit Institutions, Fiscal 1969

The chart reproduced below lists universities and non-profit organizations among the leading 500 military contractors according to net value of awards of \$10,000 or more for research, development, test and evaluation work during fiscal year 1969. The table is taken from the Defense Department's compilation of "500 Contractors Listed According to Net Value of Military Prime Contract Awards for Research, Development, Test and Evaluation Work, Fiscal Year 1969," issued Oct. 20, 1969.

RANK	NAME OF CONTRACTOR AND LOCATION	THOUSANDS OF DOLLARS	RANK	NAME OF CONTRACTOR AND LOCATION	THOUSANDS OF DOLLARS
17	MASSACHUSETTS INSTITUTE OF TECHNOLOGY CAMBRIDGE MASS LEXINGTON MASS	97,786 38,946 66,882	60	I I T RESEARCH INSTITUTE CHICAGO ILLINOIS ANNAPOLIS MARYLAND	11,986 7,387 4,519
22	AEROSPACE CORP EL SEGUNDO CALIFORNIA SAN BERNARDINO CALIFORNIA	76,232 76,191 41	63	ILLINOIS UNIVERSITY OF CHICAGO ILLINOIS NORMAL ILLINOIS URBANA ILLINOIS	11,599 186 23 11,398
25	JOHNS HOPKINS UNIVERSITY BALTIMORE MARYLAND SILVER SPRING MARYLAND	47,981 2,777 45,204	64	MICHIGAN UNIVERSITY OF HONOLULU CITY HAWAII ANN ARBOR MICHIGAN WILLOW RUN MICHIGAN YPSILANTI MICHIGAN	11,359 1,720 9,882 487 78
31	MITRE CORP WASHINGTON DC BEDFORD MASS BAILEYS CROSSR VIRGINIA	32,115 292 568 29,855 2,288	68	STANFORD UNIVERSITY MENLO PARK CALIFORNIA PALO ALTO CALIFORNIA STANFORD CALIFORNIA	18,133 63 123 9,947
36	STANFORD RESEARCH INSTITUTE ETHIOPIA THAILAND FORT HUACHUCA ARIZONA FORT ORD CALIFORNIA MENLO PARK CALIFORNIA SOUTH PASADENA CALIFORNIA STANFORD CALIFORNIA CASCADE MONTANA CHEYENNE WYOMING	24,821 63 2,327 18 16 21,639 22 128 462 154	69	PENNSYLVANIA STATE UNIVERSITY UNIVERSITY PARK PA	9,971 9,971
42	RAND CORP SANTA MONICA CALIFORNIA	19,138 19,138	70	RESEARCH ANALYSIS CORP MCLEAN VIRGINIA	9,915 599 9,316
43	SYSTEM DEVELOPMENT CORP THAILAND VIETNAM HUNTSVILLE ALABAMA LOMPOC CALIFORNIA LOS ANGELES CALIFORNIA SANTA MONICA CALIFORNIA COLORADO SPRINGS COLORADO BELLEVILLE ILLINOIS WRIGHT PATTERNS OHIO JOHNSVILLE PA FALLS CHURCH VIRGINIA HAMPTON VIRGINIA LANGLEY AF BAS VIRGINIA	19,095 788 378 151 615 1,271 13,859 13 491 47 428 799 19 1,068	71	ROCHESTER UNIVERSITY OF ROCHESTER NEW YORK ARLINGTON VIRGINIA	9,892 9,878 22
47	CORNELL AERONAUTICAL LABOR INC THAILAND EDWARDS CALIFORNIA BUFFALO NEW YORK FALLS CHURCH VIRGINIA	17,137 968 42 16,862 65	73	BATTELLE MEMORIAL INSTITUTE DUXBURY MASS COLUMBUS OHIO WRIGHT PATTERNS OHIO RICHMOND WASHINGTON	8,477 28 7,968 178 319
49	CALIFORNIA UNIVERSITY OF BERKELEY CALIFORNIA DAVIS CALIFORNIA IRVINE CALIFORNIA LA JOLLA CALIFORNIA LOS ANGELES CALIFORNIA RIVERSIDE CALIFORNIA SAN DIEGO CALIFORNIA SAN FRANCISCO CALIFORNIA SANTA BARBARA CALIFORNIA SANTA CRUZ CALIFORNIA SEPULVEDA CALIFORNIA	15,048 3,288 57 76 5,635 1,896 582 2,676 156 668 68 26	74	COLUMBIA UNIVERSITY NEW YORK PALISADES NEW YORK	8,162 8,894 68
57	INSTITUTE FOR DEFENSE ANALYSIS WASHINGTON DC ARLINGTON VIRGINIA	12,327 2,887 18,328	80	WOODS HOLE OCEANOGRAPHIC INST WOODS HOLE MASS	6,838 6,838
			91	WASHINGTON UNIVERSITY OF SEATTLE WASHINGTON	5,614 5,614
			95	RIVERSIDE RESEARCH INSTITUTE WHITE SANDS MS NEW MEXICO NEW YORK NEW YORK	5,241 1,599 3,642
			96	TEXAS UNIVERSITY OF ALAMOGORDO GERMANY AUSTIN NEW MEXICO DALLAS TEXAS EL PASO TEXAS GALVESTON TEXAS HOUSTON TEXAS	5,283 38 37 4,578 18 395 89 72
			97	SOUTHWEST RESEARCH INSTITUTE OSCEOLA NEW YORK WRIGHT PATTERNS OHIO RIVER OAKS TEXAS SAN ANTONIO TEXAS	4,851 17 453 14 4,367
			98	CORNELL UNIVERSITY ARLINGTON VIRGINIA BUFFALO NEW YORK ITHACA NEW YORK NEW YORK NEW YORK	4,798 2,812 15 2,789 62



RANK	NAME OF CONTRACTOR AND LOCATION	THOUSANDS OF DOLLARS	RANK	NAME OF CONTRACTOR AND LOCATION	THOUSANDS OF DOLLARS
99	GEORGE WASHINGTON UNIVERSITY WASHINGTON DC	4,757 4,757	171	TEXAS A + M RESEARCH FOUNDATION COLLEGE STATION TEXAS	1,998 1,998
102	OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS OHIO DAYTON OHIO WRIGHT PATTERSON OHIO	4,543 3,164 40 1,339	184	FLORIDA STATE UNIVERSITY TALLAHASSEE FLORIDA	1,856 1,856
106	NEW MEXICO STATE UNIVERSITY LAS CRUCES NEW MEXICO UNIVERSITY PARK NEW MEXICO WHITE SANDS MS NEW MEXICO	4,334 867 1,927 1,540	186	IOWA UNIVERSITY OF IOWA CITY IOWA	1,844 1,844
110	SYRACUSE UNIVERSITY RESEARCH CORP BURLINGTON MASS GLIDERLAND CE NEW YORK SYRACUSE NEW YORK	4,084 79 70 3,935	190	LEHIGH UNIVERSITY BETHLEHEM PA	1,761 1,761
113	UTAH UNIVERSITY OF DALLAS TEXAS DUGWAY UTAH SALT LAKE CITY UTAH	3,894 85 540 3,269	194	NEW MEXICO UNIVERSITY OF ALBUQUERQUE NEW MEXICO SANDIA NEW MEXICO	1,722 443 1,279
119	AMERICAN UNIVERSITY WASHINGTON DC	3,524 3,524	198	DENVER UNIVERSITY OF DENVER COLORADO	1,661 1,661
120	DUKE UNIVERSITY DURHAM NCAR	3,398 3,398	199	RENSSELAER POLYTECHNIC INSTITUTE TROY NEW YORK	1,655 1,655
126	ALASKA UNIVERSITY OF COLLEGE VILLAGE ALASKA	3,195 3,195	203	PURDUE UNIVERSITY INDIANAPOLIS INDIANA LAFAYETTE INDIANA	1,601 10 1,591
128	HARVARD UNIVERSITY BOSTON MASS CAMBRIDGE MASS FORT DAVIS TEXAS	3,130 420 2,550 160	206	CINCINNATI UNIVERSITY OF CINCINNATI OHIO	1,584 1,584
130	DAYTON UNIVERSITY OF DAYTON OHIO WRIGHT PATTERSON OHIO	3,055 2,610 445	207	ILLINOIS INSTITUTE OF TECHNOLOGY CHICAGO ILLINOIS	1,579 1,579
133	PENNSYLVANIA UNIVERSITY OF PHILADELPHIA PA	3,007 3,007	208	RICE UNIVERSITY HOUSTON TEXAS	1,571 1,571
134	WASHINGTON UNIVERSITY ST LOUIS MISSOURI	3,004 3,004	211	SYRACUSE UNIVERSITY SYRACUSE NEW YORK UTICA NEW YORK	1,550 1,519 31
136	PRINCETON UNIVERSITY PRINCETON NEW JERSEY	2,845 2,845	212	BROWN UNIVERSITY PROVIDENCE RI	1,546 1,546
143	CALIFORNIA INSTITUTE OF TECHNOLOGY PASADENA CALIFORNIA	2,623 2,623	213	RESEARCH TRIANGLE INSTITUTE ATLANTA IRAN DURHAM GEORGIA TRIANGLE PARK NCAR	1,531 496 198 737 100
147	ARIZONA UNIVERSITY OF TUCSON ARIZONA CAMP DRUM NEW YORK	2,508 2,484 24	214	TENNESSEE UNIVERSITY OF KNOXVILLE TENNESSEE MEMPHIS TENNESSEE TULSAHOMA TENNESSEE	1,520 1,294 100 126
152	MIAMI UNIVERSITY OF CORAL GABLES FLORIDA GAINESVILLE FLORIDA MIAMI FLORIDA	2,381 638 27 1,716	216	RHODE ISLAND UNIVERSITY OF KINGSTON RI	1,505 1,505
156	MINNESOTA UNIVERSITY OF AUSTIN MINNESOTA DULUTH MINNESOTA MINNEAPOLIS MINNESOTA	2,319 21 45 2,253	220	MISSOURI UNIVERSITY OF COLUMBIA MISSOURI KANSAS CITY MISSOURI ROLLA MISSOURI	1,411 303 41 1,067
157	MARYLAND UNIVERSITY OF BALTIMORE MARYLAND COLLEGE PARK MARYLAND	2,275 860 1,415	225	KENTUCKY UNIVERSITY OF LEXINGTON KENTUCKY	1,332 1,332
159	HAWAII UNIVERSITY OF HONOLULU CITY HAWAII	2,201 2,201	226	CHICAGO UNIVERSITY CHICAGO ILLINOIS	1,329 1,329
160	PURDUE RESEARCH FOUNDATION LAFAYETTE INDIANA WEST LAFAYETTE INDIANA	2,171 2,152 19	229	OREGON STATE UNIVERSITY CORVALLIS OREGON	1,321 1,321
163	MIDWEST RESEARCH INSTITUTE SUNNYVALE CALIFORNIA KANSAS CITY MISSOURI WRIGHT PATTERSON OHIO	2,162 113 1,719 330	233	VIRGINIA UNIVERSITY OF CHARLOTTESVILLE VIRGINIA RICHMOND VIRGINIA	1,257 1,237 20
165	BROOKLYN POLYTECHNIC INSTITUTE OF BROOKLYN NEW YORK FARMINGDALE NEW YORK	2,111 2,006 105	235	NORTHWESTERN UNIVERSITY CHICAGO ILLINOIS EVANSTON ILLINOIS	1,255 26 1,229
166	NEW YORK UNIVERSITY ANTWERP NEW YORK BRONX NEW YORK NEW YORK NEW YORK UNIVERSITY HIGH NEW YORK	2,000 30 334 1,656 60	241	SOUTHERN METHODIST UNIVERSITY OF DALLAS TEXAS	1,209 1,209
168	WISCONSIN UNIVERSITY OF MADISON WISCONSIN	2,061 2,061	242	CATHOLIC UNIVERSITY OF AMERICA WASHINGTON DC	1,189 1,189
			244	FRANKLIN INSTITUTE OF PENNSYLVANIA PHILADELPHIA PA SWARTHMORE PA	1,187 1,169 18
			247	ANALYTIC SERVICES INC FALLS CHURCH VIRGINIA	1,180 1,180
			253	STEVENS INSTITUTE OF TECHNOLOGY HOBOKEN NEW JERSEY	1,152 1,152



RANK	NAME OF CONTRACTOR AND LOCATION	THOUSANDS OF DOLLARS
254	CASE WESTERN RESERVE UNIVERSITY CLEVELAND OHIO	1,149 1,149
258	DREXEL INSTITUTE TECHNOLOGY PHILADELPHIA PA	1,118 1,118
262	NORTHEASTERN UNIVERSITY BOSTON MASS	1,086 1,086
266	YALE UNIVERSITY NEW HAVEN CT ALAMOGORDO NEW MEXICO	1,077 980 97
267	HUDSON INSTITUTE CROTON ON HLDG NEW YORK	1,074 162 912
269	AMERICAN INSTITUTE FOR RESEARCH THAILAND PALO ALTO CALIFORNIA WASHINGTON DC SILVER SPRING MARYLAND PITTSBURGH PA	1,058 331 13 69 325 328
278	ALABAMA UNIVERSITY OF BIRMINGHAM ALABAMA HUNTSVILLE ALABAMA UNIVERSITY ALABAMA	1,055 288 717 138
271	GEORGIA INSTITUTE TECH ATLANTA GEORGIA	1,050 1,050
278	BOSTON COLLEGE CHESTNUT HILL MASS WESTON MASS	1,006 876 139
282	COLORADO UNIVERSITY BOULDER COLORADO DENVER COLORADO	1,001 781 228
283	GEORGIA TECH RESEARCH INSTITUTE ATLANTA GEORGIA	989 989
285	FLORIDA UNIVERSITY GAINESVILLE FLORIDA	955 955
286	SOUTHERN CALIFORNIA UNIVERSITY OF LOS ANGELES CALIFORNIA	955 955
295	PITTSBURGH UNIVERSITY OF PITTSBURGH PA	905 905
298	NORTH CAROLINA UNIVERSITY OF CHAPEL HILL NCAR	891 891
301	NORTH CAROLINA STATE UNIVERSITY RALEIGH NCAR	882 882
303	NEW MEXICO INSTITUTE MINING + TECH CHINA LAKE CALIFORNIA SOCORRO NEW MEXICO	877 12 865
306	DELAWARE UNIVERSITY OF NEWARK DELAWARE	868 868
309	SOUTHERN RESEARCH INSTITUTE BIRMINGHAM ALABAMA	853 853
313	NEW YORK STATE UNIVERSITY OF ALBANY NEW YORK BUFFALO NEW YORK LONG ISLAND CI NEW YORK NEW YORK NEW YORK STONY BROOK NEW YORK SYRACUSE NEW YORK	832 137 469 38 128 24 52
318	COLORADO STATE UNIVERSITY FORT COLLINS COLORADO	802 832
320	NORTH DAKOTA UNIVERSITY OF GRAND FORKS NDAK	794 794
324	OREGON UNIVERSITY OF EUGENE OREGON PORTLAND OREGON	774 568 206
330	MICHIGAN STATE UNIVERSITY EAST LANSING MICHIGAN LANSING MICHIGAN	751 738 13
339	IOWA STATE UNIV OF SCIENCE + TECH AMES IOWA	721 721

RANK	NAME OF CONTRACTOR AND LOCATION	THOUSANDS OF DOLLARS
340	WENTWORTH INSTITUTE BEDFORD MASS BOSTON MASS	713 110 603
345	WEST VIRGINIA UNIVERSITY MORGANTOWN WVA	697 697
349	JEFFERSON MEDICAL COLLEGE PHILADELPHIA PA	688 688
350	LOUISIANA STATE UNIVERSITY OF BATON ROUGE LOUISIANA	684 684
352	VANDERBILT UNIVERSITY NASHVILLE TENNESSEE	671 671
355	LOWELL TECH INSTITUTE BILLERICA MASS LOWELL MASS	652 47 605
369	FAHNEYMAN MEDICAL COLLEGE + HOSPITAL PHILADELPHIA PA	608 608
384	LOUISVILLE UNIVERSITY OF LOUISVILLE KENTUCKY	572 572
385	CONNECTICUT UNIVERSITY OF STORRS CT	570 570
392	MASSACHUSETTS UNIVERSITY OF AMHERST MASS WALTHAM MASS	545 527 18
393	NOTRE DAME UNIVERSITY OF NOTRE DAME INDIANA	543 543
396	INDIANA UNIVERSITY BLOOMINGTON INDIANA INDIANAPOLIS INDIANA	536 499 37
398	LOVELACE FOUNDATION ALBUQUERQUE NEW MEXICO	532 532
405	OKLAHOMA UNIVERSITY OF FORT SILL OKLAHOMA NORMAN OKLAHOMA OKLAHOMA CITY OKLAHOMA	511 38 237 236
406	YESHIVA UNIVERSITY NEW YORK NEW YORK PHILADELPHIA PA	507 477 38
412	CARNEGIE MELLON UNIVERSITY PITTSBURGH PA	494 494
413	TEXAS TECHNOLOGICAL COLLEGE LUBBOCK TEXAS	488 488
415	ARIZONA STATE UNIVERSITY TEMPE ARIZONA TUCSON ARIZONA	483 469 14
418	TUFTS UNIVERSITY BOSTON MASS MEDFORD MASS	475 115 368
420	KENT STATE UNIVERSITY KENT OHIO	474 474
423	MEDICAL COLLEGE OF SOUTH CAROLINA CHARLESTON SCAR	472 472
428	UTAH STATE UNIV OF AGRIC + APPL SC BEDFORD MASS LOGAN UTAH	468 11 457
433	KANSAS UNIVERSITY OF KANSAS CITY KANSAS LAWRENCE KANSAS	459 98 361
434	MISSISSIPPI UNIVERSITY OF EDEN MISS UNIVERSITY MISS	459 409 50
437	VERMONT UNIV OF + STATE AGRIC COLL BURLINGTON VERMONT	456 456
448	UNIVERSITY CORP ATMOSPHERIC RESCH BOULDER COLORADO SUNSPOT NEW MEXICO	426 42 384
453	TEMPLE UNIVERSITY PHILADELPHIA PA	414 414



RANK	NAME OF CONTRACTOR AND LOCATION	THOUSANDS OF DOLLARS
456	GEOPHYSICAL INSTITUTE OF ALASKA COLLEGE VILLAGE ALASKA	481 481
457	OKLAHOMA STATE UNIVERSITY OF STILLWATER OKLAHOMA	398 398
460	VIRGINIA POLYTECHNIC INSTITUTE BLACKSBURG VIRGINIA	395 395
462	NORTH DAKOTA STATE UNIVERSITY FARGO NDAK	391 391
478	AMERICAN FOUNDATION BIOLOGICAL ROCKVILLE MARYLAND MADISON WISCONSIN	365 338 35
479	NATIONAL SOCIETY PROFESSIONAL ENGR WASHINGTON DC	364 364

RANK	NAME OF CONTRACTOR AND LOCATION	THOUSANDS OF DOLLARS
480	RUTGERS UNIVERSITY NEW BRUNSWICK NEW JERSEY	364 364
482	BOSTON UNIVERSITY BOSTON MASS	363 363
491	KANSAS STATE UNIVERSITY OF AGR MANHATTAN KANSAS	352 352
494	DARTMOUTH COLLEGE HANOVER NH	349 349
498	WASHINGTON STATE UNIVERSITY ALAMOGORDO NEW MEXICO PULLMAN WASHINGTON	345 148 285
		639,798

# Project Themis Grants For 1969:

ARMY RESEARCH AND DEVELOPMENT NEWSMAGAZINE JULY-AUGUST 1968

**ARMY**—University of Cincinnati, internal aerodynamics and air-breathing engines; Drexel Institute of Technology, powder metallurgy; Florida State University, prediction of tropical weather phenomena; University of Iowa, vibration and stability of military vehicles; Lehigh University, nonlinear wave propagation; North Dakota State University, control of vectors of diseases of military importance; and

Rensselaer Polytechnic Institute, electrochemical power sources; Medical College of South Carolina, resuscitation and treatment of wounded; Stevens Institute of Technology, evaluation of terrain-vehicle systems; Texas A&M University, aircraft dynamics for subsonic flight; Texas Technological College, human performance under stress; Vanderbilt University, coating science and technology; University of Louisville, studies of performance assessment and enhancement; and University of North Dakota, control of arthropods of medical importance.

**AIR FORCE**—University of Arizona, precision optical systems; State University of Arizona, detection devices, techniques and theory; University of Connecticut, structural fatigue; Drexel Institute of Technology, forecasting by satellite observations; University of Hawaii, on-line computer systems; Illinois Institute of Technology, V-STOL aerodynamics; Kent State University, liquid crystal detectors; and

University of Kentucky, metal deformation processing; University of Mississippi, biocontrol systems; North Carolina State University, digital encoding systems; University of Tennessee, MHD power generation and (separate program) remote sensors for environmental systems; University of Vermont, isolation and sensory communication; University of Virginia, atomic interactions in gases.

**NAVY**—Catholic University, vitreous state structure and dynamics and (separate program) dynamics of cable systems; Colorado State University, tropical weather disturbances and surface effects and (separate program) predictability of low-altitude winds; Florida State University, computer-assisted instruction and training; University of Iowa, application and theory of automata; Jefferson Medical College, pathogenesis of acute diarrheal disease; and

Kansas State University, electronic components in nuclear radiation environment; Lehigh University, low-cycle fatigue in joined structures; University of Missouri (Rolla), effect of aqueous aerosols on atmospheric processes; University of North Dakota, high-pressure physiology; Rensselaer Polytechnic Institute, radiation effects on electronic materials; Rice University, coherent and incoherent EM radiation; Southern Methodist University, statistics in calibration methods; West Virginia University, V-STOL aerodynamics.



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