

science are not so easily combined. In the short run, the passing of the science adviser's mantle to the NSF director, if this is what is to happen, will depend largely on Stever's relations with the inner White House circle. In the longer term, the prospect is that the NSF will once more quietly shrug off its policy-making functions, or else may risk a politicalization of its programs similar to that which now besets the National Institutes of Health.

The intentions of the White House planners for science policy are difficult to fathom. The dramatic hirings, firings, and reorganizations of the last few weeks bear signs of ad hoc thinking. The manner in which NIH director Robert Q. Marston was fired, left in limbo for a few weeks, and then appointed acting director of one of the NIH's component institutes is an indication of superficial planning as well as of careless personnel practices. The

impending disposal of the OST suggests a similarly ex tempore design. To a remarkable extent, top agency officials have been kept in ignorance of White House plans, even of the identity of those making the decisions that concern their agencies. The White House may be keeping tight-lipped because of its manifest distrust of the bureaucracy or maybe because it is hiding the fact that it has little to keep hidden.—NICHOLAS WADE

## Jason Division: Defense Consultants Who Are Also Professors Attacked

Recent books and commentaries on the Kennedy years have tended to illustrate the point that even the best and the brightest, in one best-selling author's phrase, of the young President's advisers were victims of fatal shortcomings—described as arrogance, amorality, or naiveté, depending on the critic. But in all the stories the tragic flaw bears the same name: Vietnam. If these advisers have an equivalent in the science community, it is probably the Jason Division, the 40-odd leading scientists—including some Nobel laureates—who in 1959 and 1960 banded together to work on national security matters in the summertime under the aegis of the Institute for Defense Analyses (IDA).

The Jasons, as they are known, who continue to meet every summer, are not yet the target of revisionist historians, but they have become the targets of the radical left, who attacked their role in the mid-1960's, in the eternal quagmire, Vietnam. Chapters of Scientists and Engineers for Social and Political Action (SESPA) at Berkeley and Columbia have confronted Jason members. The left in Europe, principally the Collectif Intersyndicale Universitaire d'Orsay Vietnam-Laos-Cambodge (CIU), confronted several Jason members last summer when they gave guest lectures at Paris, Rome, Corsica, Trieste, and even at CERN (Centre Européen de Recherches Nucléaires) in Switzerland.

\* \* \* \* \*

*The radicals question whether any military work is a legitimate subject of study. One French radical with CIU, Daniel Schiff, has cited Noam Chomsky to make his point to the Americans: "By entering into the area of argument and counterargument, of technical fea-*

*sibility and tactics, of footnotes and citations, by accepting the presumption of legitimacy on certain issues, one has already lost one's humanity."*

\* \* \* \* \*

What is Jason? IDA guards the membership list so closely that its full composition is not known. Most of its reports are classified and therefore members' positions on issues are also unknown. But despite these elusive aspects, some Jason members interviewed talked about the group's workings.

Unlike most consultants, Jason's contract continuation does not depend on the outcome of any given study. Advanced Research Projects Agency (ARPA) gives IDA an annual sum for Jason, which in 1965 was about \$520,000. Individual Jasons are paid different amounts, from \$100 to \$200 per day; fees are adjusted according to the pay scales of the universities from which members are drawn.

Members gather for 6 or 7 weeks each summer. Through Jason they have easy access to briefings from people at any level in the Department of Defense (DOD). They can read some (but not all) classified literature. Projects are determined at the outset of each summer by a type of military supermarket, in which officers brief Jasons on the apples and oranges in their arsenal—and the Jasons, individually or in groups, decide which items to study. Because of this volunteer, take-as-you-go process, Jasons say there are no "Jason positions" as such on issues.

"Jason's chief role is in shooting things down," says one member. Others confirmed this. "Most people in Jason are not enthusiasts for increased armaments, or escalation in strategic

weapons." If this is in fact so, Jason differs from most federal science advisory groups which are often asked to rubber-stamp predetermined policy.

\* \* \* \* \*

*Trying to explain why he was confronted last summer at Rome and Corsica by Italian and French students, Jason Sidney Drell of the Stanford Linear Accelerator Center says, "The Europeans don't have this. They think once you work for the government there you've sold your soul to the devil." At Corsica, the students had leafleted: "There can no artificial separation between a scientist's work in 'pure' science and his contribution to activities related to the military."*

\* \* \* \* \*

Jason originated during Project 137, a 1958 conference involving economist Oskar Morganstern, and physicists Eugene P. Wigner and John Wheeler, who invited younger physicists along to familiarize themselves with military technical problems. Their concern was that the only top-level scientific inputs were coming from an older generation of scientists, many of whom worked on the Manhattan Project—I. I. Rabi, Jerrold Zacharias, G. Kistiakowsky, E. O. Lawrence, E. Teller, and other "old boys." With the Missile Gap, let alone the Cold War, threatening, the country seemed to need the best young scientists.

At Los Alamos in 1959, some of the younger boys—many of them protégés of the older generation—gathered to discuss forming a group: Marvin L. Goldberger, now chairman of the physics department at Princeton; Kenneth Watson, of the University of California at Berkeley; Keith Bruechner, of U.C. at San Diego; Charles H. Townes, then with IDA; and Marvin Stern, "the real inventor of Jason."

It was agreed that a group would form under IDA auspices and the defense bureaucracy coughed up Sunrise as the title. Goldberger recalls that they

thought Sunrise sounded a little silly and accepted his wife's suggestion to call it Jason.

Jason originated as an enabling mechanism to keep younger physicists in touch with defense problems, but it rapidly evolved into a club. "We were all bright young men together; we were all precocious 30 years ago," recalls Freeman Dyson of the Institute for Advanced Study at Princeton, once J. R. Oppenheimer's demesne. He recalls having spent the war in England and says he learned "how" to talk to military officers then.

Many of the new Jason members were protégés of the "greats" of the era. Goldberger, with only a B.S. degree, worked on the Manhattan project, and, after this extraordinary education in physics, returned to the University of Chicago to get his Ph.D. under Enrico Fermi. At the time, he helped Chicago hire 1969 Nobel laureate Murray Gell-Mann, who was at M.I.T. finishing his Ph.D. Harold Lewis, a Jason cofounder and the current chairman, came to Chicago to be interviewed for a job; there he met Goldberger. Fermi allegedly termed Richard Garwin, whom he met as a graduate student, "the only true genius I have ever met." This high praise, coming from one of the most imposing figures in 20th-century physics, doubtless aided Garwin's entry to the group. And so on.

\* \* \* \* \*

*"Good geniuses" is how one left-wing critic describes the Jasons he has met.*

*"These guys take a lot of satisfaction in knowing they're going to be consulted over whether civilization will be destroyed or not. . . . It's a hubris, or arrogance, which says 'We are really bright guys and we can keep the country from doing ridiculous things.'*

*"So, they say to themselves, 'We will go along with the little things, like the Vietnam war, which we can't fight anyway, and save our guns for the big things, like ABM.' And they're totally unaware that they're just being used by some little, puddin'-headed guy in the Pentagon."*

\* \* \* \* \*

Drell recalls the headiness he felt when he first started flying to Washington to consult on national security ("Now there's nothing I loathe more than hopping on that plane"). Others are nostalgic about the early years. They point out that the now-giant army of in-house technical people in DOD, the directorate of the Defense Department's research and engineering, hardly existed then and that other consultants,

ARPA, and the President's Science Advisory Committee (PSAC), for example, were enjoying a heyday. Clearly also, the shuttling of Jason members from campus to capital, and breezy, shirt-sleeved summer sessions were a close mime of the style of the Kennedy Administration.

Technically, Jason's founding coincided with the introduction of the intercontinental ballistic missile (ICBM) as the central factor in the arms race. According to some Jasons interviewed, as soon as the ICBM came in, the antiballistic missile (ABM), was suggested as a U.S. defense against a massive nuclear attack from Russia. In 1960 the Army sought \$400 million, its first production funds, for ABM, in its early guise as Nike-Zeus. McNamara opposed ABM, while Jason as a group made technical studies of long-range radar detection and decoy discrimination possibilities, which made ABM seem unfeasible.

In addition to having its ABM views coincide with those of the Secretary of Defense, Jason had allies in the White House. Some fundamental questions about nuclear blast detection in the atmosphere and upper atmosphere had to be answered before Kennedy, with the urging of his science adviser, Jerome B. Wiesner, could go ahead with a nuclear test ban treaty. Also, important to it were the changing, increasingly convoluted versions of and rationales for the ABM.

An added element of the early days was that the rest of the year the Jason physicists were competing with each other for recognition through publications and for key academic posts. The national security blanket Jason offered during the summers, however, enabled them to be friends too. "They weren't really competing with each other in Jason the way they would outside. Outside they would compete ferociously."

Finally, Jason became a club in the purely social sense. While the physicists rolled up their shirt sleeves with generals at such scenic spots as La Jolla, California; Woods Hole or Falmouth on Cape Cod; or the Bowdoin College campus in Maine, their wives and children would be establishing themselves on the local beach for the summer. "It has to be near a beach," explained one member a little sheepishly. On one occasion in the early 1960's, some of the wives collaborated in producing a supper-club series of skits titled, "Review from the Bridge," featuring a mock strip-tease number to the tune of a song, "My Heart Belongs to IDA."

*Enter, the Vietnam war. Many Jasons describe it as a bomb: badly conceived, clumsily carried out, and too long. "Ninety percent of us are doves," said one liberal member, but some Jasons believe that the war is a just one in a just cause.*

*Many Jasons to this day, however, regard the threat of nuclear war and the strategic arms race as the most important issues facing the country—not Vietnam. "The possibility of nuclear warfare is very great at any time," said Foley. MacDonald, who was connected with Jason and vice president of IDA during the mid-1960's, was asked what he would do if he felt his government was doing something evil. "I would quit." Does he think the Vietnam war is evil? "I think it was not in the best interests of the United States. The war is not proper . . . ."*

\* \* \* \* \*

Vietnam is not only the focus of the current radical attacks on Jason, but also the turning point in Jason's collective history. Several of those interviewed suggested that Jason's recent decline of influence with the generals could be due to its "track record" on Vietnam: support of McNamara and the Office of the Secretary of Defense against the Joint Chiefs of Staff and other military departments on the electronic barrier and the bombing. But one liberal member went even farther: "Obviously we blew it," he admitted. "When McNamara came to us in 1966 we should have told him to shove it and made a public statement."

IDA's annual report for 1964 indicates that the government's interest in "counterinsurgency, insurrection, and infiltration" led Jason to look at problems "not entirely in the realm of physical science." Apparently this is a reference to a small study group including Gell-Mann which looked into Vietnam-related problems. Jason members say that there was no Vietnam work when they met at Woods Hole in 1965.

But, in 1966, some Jasons and other intellectuals, principally in Cambridge, decided to do something on Vietnam. Roger Fisher of the Harvard Law School (and later inventor of the television program "The Advocates") wrote John McNaughton of the Office of the Secretary of Defense in January suggesting an electronic barrier. Meanwhile a group of Harvard and M.I.T. scientists suggested to McNamara that they establish a general technical working group on Vietnam and received his blessing.

The result was an intensive 10 days of briefings with McNaughton, Maxwell Taylor, former chairman of the Joint Chiefs of Staff, John Foster, and others, and, for the intellectuals, according to one, "everybody and his grandfather." They were held at the Dana Hall School for Girls in Wellesley, Massachusetts. According to the *Pentagon Papers*, IDA supplemented the project with 20 extra staff members and the group split into several study sections for the summer.

The main Jason group met at the University of California at Santa Barbara in July. About seven or eight members studied the barrier proposal in very great detail. Principals were Henry W. Kendall of M.I.T., Frederick Zachariasen of the California Institute of Technology, William A. Nierenberg of Scripps Institution of Oceanography, Gell-Mann, and Lewis. Others, including MacDonald and Garwin and some whose names, of course, are not known, say they "floated" in and out of the study sessions and participated, but not in a systematic manner. A principal from IDA was Seymour Deitchman.

The idea was to create a cordon of technological weapons to be placed along a 20- by 100-kilometer strip of the southern demilitarized zone and the Laos-North Vietnamese border, to absolutely close those borders to infiltration. Anyone—presumably soldiers and trucks—trying to get through would be stopped—i.e.—killed, maimed, or blown up, by a combination, according to the *Pentagon Papers* quotes from the report, of gravel mines, Sadeye/Blu-26 bomb clusters, and strike aircraft patrolling the area receiving sensor signals. Attempts to cross would be detected by a combination of acoustic sensors, seismometers, and button bombs the size of aspirin tablets, which make a noise loud enough to trigger other, cruder sensors. The barrier could be extended geographically by a manned version of the fence, and IDA's publications bibliography shows Matthew Sands as author of a paper titled "The manned barrier systems: A preliminary study." Richard Blankenbecler the same year authored a paper apparently related to the barrier titled, "Explosively produced flechettes."

Those familiar with the project insist that it was viewed as a means of undercutting the military's justification that the bombing campaign would halt infiltration. They say, but cannot prove, that they sought to have the cordon placed in uninhabited areas where there were no civilians.

The group also wrote that the North Vietnamese would find ways to penetrate the barrier, and new technologies would have to be installed to thwart them. Thus, they envisioned a "dynamic battle of the barrier." The cost, they say, in military terms was "not great, perhaps \$800 million to \$1 billion per year."

In any event, McNamara enthusiastically adopted the barrier notion after a series of lunches with some of the scientists and a 6 September trip to Zacharias's summer home on Cape Cod. One familiar with that occasion says that John Foster, director of Defense Research and Engineering, was there, as well as McNaughton, Richard Goodwin, and Yarmolinsky. For the scientists, there was Kistiakowsky, George Rathjens, Carl Kaysen, MacDonald, Wiesner, and Zacharias. McNamara arrived in his own Air Force plane and was offered a drink; they spread out large maps of Southeast Asia on the coffee table and floor, while the scientists did the briefing.

"Imagine them, marking out on these top-secret maps exactly where this thing would go, while dogs and children were running through the house from the beach. It must have been incredible."

McNamara managed to get approval for his project, according to the *Pentagon Papers*, but as a result of infighting among the military and the Office of the Secretary of Defense on implementation, it was only installed on a piecemeal basis.

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*It is hard to describe the new left's anathema for the Jason barrier proposal and its sequel, the electronic battlefield. In the opinion of Fred Bramfman, director of Project Air War, a Washington, D.C., research group that collects data on the effects of the bombing and new technology from Asian refugees, the barrier is the logical extension of the air war, where soldiers kill by merely pressing buttons in a remote location never viewing these actions.*

*Bramfman charges that the devices Jason suggested have been "indiscriminately sewn in Southern Laos, southern portions of North Vietnam, and portions of Cambodia. . . . There are 250,000 civilians living, for example, in the Pathet Lao controlled southern Laos."*

*"I consider the electronic battlefield a clear example of war crimes in Indochina. A personnel bomb cannot distinguish between soldiers or civilians.*

*. . . The basis of international law relating to war is that participants distinguish between military and civilian targets."*

*Asked if he thinks the Jason group is responsible for the battlefield's uses, Bramfman said: "I don't doubt that the Jason people have had a more beneficial effect than some others. . . . But that means they are lesser, rather than greater, war criminals. They are dramatic examples of how it is possible to be a moderate, well meaning, decent war criminal."*

\* \* \* \* \*

Meanwhile, in Wellesley and Cambridge, various people worked on an analysis of the bombing, which, as quoted in the *Pentagon Papers*, pretty thoroughly condemned it and reinforced McNamara's growing doubts about its efficacy. The *Pentagon Papers* say that the bombing report was a Jason product, but some of those involved say it was IDA's, not Jason's. Among the participants were E. Bright Wilson, professor of chemistry at Harvard; Zacharias; Carl Kaysen, director of the Institute of Advanced Study at Princeton; George Rathjens, professor of political science at M.I.T.; Wiesner; and others. I. I. Rabi and Kistiakowsky apparently also had roles as overseers. According to IDA annual reports, Kistiakowsky and Wiesner both have been connected with Jason as senior advisers, not as members.

Jason was entwined in other Vietnam work in 1966. There was a study of manpower and logistics referred to in the *Pentagon Papers*. IDA reports list the 1967 publication of a classified paper by Wallace Bode, Rathjens, and others, titled, "A study of data related to Vietcong/North Vietnamese Army logistics and manpower."

"Tactical weapons in Southeast Asia" was the title of another paper compiled, according to IDA's bibliography, by Dyson, Stephen Weinberg of M.I.T., Robert Gomer and S. C. Wright, both at Chicago. Dyson declined to discuss the classified content of the paper, as did other Jasons. But in response to inquiries they would laugh, make remarks about Dyson's dovish views, and otherwise hint at what the paper says. Finally one blurted out, breaking security regulations, as well as the suspense: "That paper gives all the reasons why you wouldn't use nuclear weapons in Vietnam."

\* \* \* \* \*

*The New York SESPA chapter has demonstrated every Wednesday noon against Jason members' collaboration*

with "the enemy"—the DOD, that is—on Vietnam. But the Jasons there at Columbia have had other tactics—alleged threatening phone calls and hate mail—used against them. One leaflet circulated by SESPA recalled a Hastings-on-Hudson dinner party before the 1963 test ban treaty at which Garwin allegedly talking about nuclear testing and strontium-90 in milk, said, "Well, what's a few dead babies or mothers." . . . One of the guests . . . stood up and said to Garwin, "If I were a mother I'd stand you up against a wall and shoot your b—— off." Garwin issued a rebuttal denying most of the story, saying he had publicly campaigned for the test ban treaty. In reply, SESPA issued another version of the story, this time quoting Garwin at the dinner party as having compared the babies and mothers to the Jews in Germany.

"It's impossible to resign under this kind of tactic," says Malvin Ruderman of Columbia's physics department. And Foley says, "Nothing could be better designed to draw us together."

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There is some contradiction about Jason's 1967 consulting on the war. Some of the above-mentioned IDA research papers appear to have been published in 1967 and it is not clear when the research terminated. The *Pentagon Papers* also discuss at length a 1967 study of the bombing, saying "IDA's Jason division called together many of the people who had participated in the 1966 summer study." It calls the 1967 bombing analysis, submitted to McNamara in December and key to McNamara's subsequent advocacy of a bombing halt, "probably the most categorical rejection of bombing as a tool of our policy in Southeast Asia to be made before or since by an official or semi-official group."

But many Jasons interviewed said this study, like the 1966 one, was not done under Jason auspices, but by IDA. Jasons sat on a steering committee, however, consisting of Goldberger, Gell-Mann, Lewis, Yarmolinsky, and Kistia-kowsky (the latter two not Jason members).

The actual work was headed by MacDonald, then vice president of IDA, and two IDA staffers, Louis Blair and Paul Schweitzer. According to one account, these three individuals, in effect, locked themselves up in IDA's Arlington, Virginia, headquarters from September to December and generated a three-volume report which a current Jason adviser calls "far and away the best work ever compiled on the sub-

ject." The *Pentagon Papers* credits this particular work, along with a CIA study named SEACABIN, as having clinched McNamara's antibombing stance.

There are indications, too, that when Harry MacPherson, President Johnson's speech writer and confidant, was told days before Johnson's historic March 1968 broadcast, to prepare a speech for him condemning the bombing, this IDA report was used as one of his key reference materials.

Jason members differ on whether any Vietnam work has been done since 1966-1967. The *Student Mobilizer* at one time published excerpts of a Jason meeting held by Gell-Mann in 1967 to consider forming a social science section of Jason, principally to work in Thailand. Another Jason member denies that these plans ever were implemented. As to other studies, some Jason members say there has been "no" more war work; others say there "may" have been some.

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SESPA regards Jason's Vietnam work as immoral complicity in genocide and calls for Jason's collective resignation. Somewhat feebly many Jasons respond by stressing their opposition to the war in the mid-1960's. But one member, recalling a briefing on it Jason requested from Maxwell Taylor, was asked if any of the Jasons in the audience had expressed these feelings to Taylor. "No," he replied. "You don't confront generals." Another member recalls that in all their summer meetings, Jason as a group had never even taken a vote on the war. Another, who hasn't attended meetings since 1967, says, "We blew it."

\* \* \* \* \*

On Vietnam, some Jasons say they tried to deescalate the war and failed. Likewise on the ABM, some claim that they were a force for restraint; yet both the Nixon and Johnson administrations have pressed for ABM development. One Jason, trying to explain these failures, said, "You see, we really have very little influence."

Some say a changing DOD is responsible for Jason's apparent diminished influence. Garwin says, "Jason is now less influential because the DOD is less easy to influence. Now, honest technical judgments have less to do with the biggest decisions that are made." Dyson, reflecting on his 30-year acquaintance with military officers, says, "The military has changed a great deal. They've become disenchanted with technology as a result of Vietnam. . . .

The important decisions the government is faced with are not as technical as they used to be."

Certainly the technical problems Jason has dealt with have changed. Drell says that today "the big technical problems are system problems," as opposed to the pure physics questions which were raised about ABM.

As the ABM proposals shifted in the middle 1960's from a "thick" system against a massive Russian attack to a "thin" system protecting our cities from a smaller scale, Chinese attack, the technical questions changed; meanwhile ABM-related technologies were advancing rapidly. Some Jasons indicate that the newer versions of ABM appeared no more feasible than the early ones, but that Jason and others who said so lost their in-house DOD fight when McNamara, in an 18 September 1967 speech, turned around and announced a decision to proceed anyway. Certainly after that, several scientists who had argued about ABM behind closed doors in Jason, PSAC, and in other federal councils, started coming out of the military woodwork to try, virtually for the first time, to lobby in public against these systems.

Today, many of the Jasons are also proud of having studied conversion of bomber to missile defenses in connection with the arms limitations (SALT) talks, and antisubmarine warfare, which they say are the next key step in arms limitation.

\* \* \* \* \*

Vietnam is not the only albatross the radical left seeks to hang around Jason's neck. The new Berkeley SESPA book "Science Against the People" says: "Most of the Jasons we spoke with would rather talk, and boast of their contributions toward peace on arms control. . . . Some have pointed with pride to the nuclear test ban treaty and the recent SALT agreement. . . . It should just be noted that the arms race has yet to be stopped and the Nixon policy—peace through strength—calls for new escalations in the technology of strategic armaments; and we may expect scientists of the Jason caliber have been and will be instrumental in helping the Pentagon get the 'best' new weaponry that this country can produce."

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Like IDA and other defense-dependent groups, Jason is trying to weave nondefense work into its routine. Last year Foley and Ruderman worked on a study of the stratospheric effects of

(Continued on page 505)

(Continued from page 462)

the supersonic transport plane. There have been briefings, supermarket style, from officials in the Department of Housing and Urban Development, the Postal Service, the Office of Civil Defense, and elsewhere.

But after talking enthusiastically about this work, some Jasons admit they really aren't communicating with these new clients. "In civilian areas, no one has ever had control of a large project. In DOD, you can sit back and tell someone how to spend \$200 million to find the answer to his problem. But in these agencies, the guy you're talking to has never seen anything close to \$200 million." Indeed, it is hard to ascertain what contribution theoretical physics can make to the problems of the Post Office.

Small wonder then, that a number of Jasons suggest that the group may cut its link to IDA, which has its own problems, and realign with Stanford Research Institute. Some do not rule out the possibility that Jason will simply disband. Others will only say Jason's role is "changing."

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*Should they resign from DOD? The official who earlier labeled the Jason "hubris," or arrogance, thinks they're in a vise. "At this point you're asking them to admit to error—that several years of their lives were spent being manipulated by Johnson and Nixon." An entirely different view came in the reaction of one long-term Democratic congressional speech writer who exclaimed: "God. If Nixon loses the scientists what are we going to do when there's another Sputnik?"*

*The radicals have two prescriptions for Jason. One is that they collectively resign in a gesture of protest. The other, which is Bramfman's formula, is that they remain in DOD and "resist" it from within by leaking documents.*

\* \* \* \* \*

So the question is whether this group (which Hans Bethe allegedly termed a Who's Who of Theoretical Physics) ever did or can presently achieve what it set out to do—exert an influence on the country's military and military-political history. In the wave of reprisal from the radical left, at least, it is clear that Jason, like the Jason of mythology, has sewn a field with dragon's teeth which have sprung up into a host of hostile soldiers.

—DEBORAH SHAPLEY

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#### THE UNIVERSITY OF ILLINOIS AT CHICAGO CIRCLE

Invites applications for faculty positions in **Ecology, Genetics, Microbiology, Vascular Plant Morphology, Vertebrate Morphology, and Vertebrate or Neural Physiology**. The appointees will be expected to participate in undergraduate and graduate teaching and research. These positions are available commencing September 1973.

The department also invites applications from individuals with research interests in **Development, Protozoology, Vertebrate Biology or Computer Assisted Instruction** for faculty positions in the **Introductory Biology** program. The appointees will be expected to participate in graduate teaching and research. These positions are available commencing September 1973. Submit curriculum vitae and three letters of recommendation to: **Dr. Elmer B. Hadley, Department of Biological Sciences, University of Illinois at Chicago Circle, Post Office Box 4348, Chicago, Illinois 60680.**