ates itself from the national community, advocates the creation of its own independent state, looks upon whites as a breed apart, not human in the same way that Negroes and the world's other nonwhite populations are human. Advocacy of nonviolent means to attain its goals does not follow from such an orientation.

As we look about us we find many other examples of the same opposition of orientations within discontented populations. Puerto Ricans, for example, are divided between those who identify with the United States and seek statehood and those who wish complete independence. French Canadians are divided between those who wish to be a part of the Canadian national community and those who desire to destroy it and have an independent Quebec instead.

The big question in all of these cases is why some people identify with the larger community while others do the opposite, and what the factors are that cause shifts from one orientation to the other. If we knew the answer we should know a lot more than we now do about what is required to achieve and maintain a world community in which arms control is possible.

I have been saying, then, that the problem of control and enforcement is a part of a more basic problem: What is it that makes communities? At the heart of this problem are the workings of social-psychological processes that have to do with identity, with people's self-images and self-ideals. As an anthropologist I am not qualified to assess the state of knowledge regarding these processes, but some of the work done by students of small groups and "reference groups" seems relevant (*9*). I can only say that if the practical problems that stand in the way of arms control are largely artifacts of the working of social-psychological processes of the kind I have suggested, then those committed to the promotion of arms control have reason to be concerned with the scientific study of these problems.

References and Notes

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News and Comment

Ranger: Oversight Subcommittee Asks Why NASA Doesn't Prevail on JPL To "Rigidize" Projectwise

On 4 May a subcommittee of the House space committee finished 4 days of hearings on Project Ranger with testimony from NASA administrator James E. Webb, in which he assured the legislators that NASA and the Jet Propulsion Laboratory (JPL)—contractor for the Ranger unmanned lunar spacecraft program—were reaching a meeting of the minds on issues which have ruffled their relationships.

Inferences of a showdown over renewal of a contract between NASA and JPL, which is managed by the California Institute of Technology, had been read into a Webb press conference in February by many observers (*Science*, 6 March, p. 1014). But the strong support given JPL by Webb during the hearings led some people on Capitol Hill to conclude that Webb, like the grand old Duke of York in the nursery rhyme, had marched his soldiers up the hill then marched them down again.

At the hearings Webb indicated that the press had overaccentuated the negative in his press conference and that the important difficulties between the space agency and JPL not only were soluble but were being solved.

While it will be necessary to await the subcommittee report on the hearings to learn if the NASA and JPL officials' comments satisfied the congressmen, the hearings themselves provided an unusually free public airing of the problems of management of a major federal research and development program.

The hearings were held by the House Science and Astronautics Committee's special subcommittee on NASA oversight, created this year by committee chairman George P. Miller to look into problem areas demarcated by the regular authorizing subcommittees in the course of their work.

To give weight to this oversight subcommittee, which is essentially an investigating group, Miller assigned all his subcommittee chairmen and senior members of both parties to it. With 14 members, it is the space committee's biggest subcommittee.

Chairman of the subcommittee is the Science and Astronautics Committee's ranking Democrat, Olin E. Teague of Texas, who is also chairman of the subcommittee on manned space flight.

In the Ranger hearings Teague stepped aside to turn over acting chairmanship to Congressman Joseph E. Karth (D–Minn.), who is chairman of the subcommittee on space science and applications and deals with Project Ranger in the line of ordinary duty. Teague's action, incidentally, is consonant with the general atmosphere established by Miller in the space committee, where seniority does not bind

with the straitjacket closeness that it does in most other committees. Junior members are not systematically squelched, as they are in some other committees, and in space committee business partisanship seems to be minimal. Miller, for example, scheduled the oversight subcommittee's first full hearings in March on the subject of nuclear propulsion and chemical propulsion, and one Republican member of the subcommittee, Congressman Alphonzo Bell of California, who has demonstrated a strong interest in the potentialities of the so-called gaseous core engine for nuclear space propulsion, was given scope for pursuing that interest that he, as a minority member, could not have hoped for in some other committees.

While a double meaning can be extracted from the formal name of the subcommittee on NASA oversight, the oversight function in Congress is a hallowed one which, as Karth pointed out, implies a "vigilant review of the performance of the Administration." Karth expressed the common congressional view that oversight or supervision of federal programs is appropriate at a time when most programs are proposed by the Executive rather than by Congress. The NASA program is particularly worthy of study since it has increased so rapidly in size and complexity.

As the hearings opened, the usually polite relations between the space agency and the space committee were frayed by a letter from Webb in which he said that the "timing of the hearings is unfortunate in that the factors of morale and program execution are both deeply involved. . . ."

Karth noted in his opening remarks at the hearings that the investigation had in fact been precipitated by an earlier letter Webb sent to the chairmen of both House and Senate space committees, and he went on to give a mild lecture to Webb in absentia on the prerogatives and responsibilities of Congress.

Specifically at issue was the subcommittee's right of access to a report of an internal review committee headed by Earl D. Hilburn, NASA's deputy associate administrator for industry affairs, and formed to investigate the Ranger 6 failure. NASA was reluctant to furnish the report, on the grounds that it was only one working paper and "not a definitive agency position."

Representative Joseph E. Karth (D–Minn.)

In a similar inquest on the troubles of Ranger 5—the so-called Kelly report (*Science*, 12 July 1963, p. 139)—NASA had also resisted making the whole report available to the committee, in part on the grounds that the report was classified because military systems were involved.

Karth bore down on the fact that the committee wished to compare the Kelly and Hilburn reports to learn to what extent recommendations had been carried out. The space agency provided enough information to satisfy the committee's curiosity, and no full-blown incident over executive privilege developed.

The aim of the Ranger hearings was described by Karth, who said, "I want to state at the outset it is not our purpose to second guess the scientists and engineers who have worked hard and long on this frustrating project. While we intend to review the technical difficulties that may have existed or continue to exist, I think it is fair to say that our primary interest has to do with the problem of management."

The focus of the hearings, predictably, became the relationship between NASA headquarters and JPL-Caltech. This relationship is a unique one for NASA, since Caltech manages JPL under contract, while all other major NASA laboratories, which perform research and administer contracts with industry, are government installations operating under the Civil Service system.

JPL has been NASA's main overseer of its program for unmanned lunar and interplanetary exploration. Disappointment in all six Ranger spacecraft flights to date has created adverse publicity for Ranger and for JPL, despite the technical difficulty of the project and the JPL's success with the Mariner II flyby of Venus and other achievements.

Attention to negotiation of a new contract with JPL was stirred by Webb in his February press conference, when he said it was necessary to insure "a strong, hard-headed, industrial type of management of programs at JPL."

Subcommittee questioning during the hearings was aimed mainly at learning how the new contract would be modified to insure this stronger management, or in even more direct terms, why NASA didn't exert the same sort of supervision over Project Ranger that it did over other NASA projects outside JPL.

In Webb's testimony, the edge of irritation with JPL which seemed detectable in the press conference had disappeared, and he and other NASA officials strove to explain the nuances of the liaison which makes JPL valuable to the space effort.

No single quote sums up the NASA view; the burden of agency testimony was that JPL offers special problems but provides special services. JPL not only administers specific projects—Ranger included—but it conducts research on the frontiers of space science which is necessary to the space agency's operations now and, especially, in the future.

In short, seeing that JPL's projects are managed as tightly as projects are in industry or in a NASA center, while at the same time preserving an atmosphere conducive to frontier research, requires a managerial tightrope act.

Discussing the human element, Webb noted that people with brilliant ideas about designing, testing, and flying equipment are often not interested in administration, housekeeping problems, and agency rules and regulations.

JPL has an advantage over industry in recruiting, said Webb, because at JPL people have an opportunity not only to work on a specific project—Ranger, Surveyor, or Mariner—but to participate in a "fluxing group that is advancing the state of the art" by doing research comparable to that done in university laboratories.

The matter of JPL organization came in for a good deal of discussion, with at least one congressman, succumbing to the spacemen's proclivity for making

verbs of nouns and adjectives, asking why NASA didn't see that JPL "rigidize" its system.

Until the troubles with Ranger 5 arose, JPL operated under a "matrix" organization composed of seven technical-discipline divisions with a project organization superimposed.

Under a matrix form, project personnel are drawn as required from various divisions. These people remain responsible to their own department heads.

In management jargon, "projectizing" an organization means that people working on a program like Ranger are brought under the line authority of a project manager and cannot, for example, be transferred elsewhere without the manager's concurrence.

After Ranger 5 fizzled, Project Ranger was partially projectized by JPL but, as was noted in the hearings, it took more than a year and a half to accomplish the job of centralizing power and responsibility.

The leisureliness of the process was traceable in large part to a mutuality clause in the present contract which required agreement by both parties not only on what jobs JPL should take—"tasking," in the aerospace vernacular—but also on how the work should be done.

The new contract, though it has not been signed and the terms have not been made public, will give NASA much greater leverage on these decisions.

Other changes have been made as well. A separate quality-assurance and quality-control section has been set up within the Ranger group, and the number of persons engaged in this pursuit has been increased sharply; for example, accounting and record-keeping procedures have been tightened up. And a NASA "resident office" has been set up at JPL with a staff large enough and competent enough to give NASA headquarters a supervisory conduit to the laboratory.

All these things bring management at JPL closer to the "industrial type" which Webb talked about in his press conference and which seems to be admired by the subcommittee.

In delaying the signing of the new contract, perhaps until near the end of the year, NASA seems to be allowing time to see how these changes and others are implemented and also to permit further negotiation of differences with JPL and Caltech officials.

In the past year or so JPL also has ceased to be NASA's sole agent and prime contractor in unmanned lunar exploration, in part because JPL-Caltech officials were unwilling to see the lab undertake the heavy design and production tasks which proposed new projects would have required. The Surveyor spacecraft, which is scheduled to make soft landings on the moon beginning in 1965, will be built by Hughes Aircraft as prime contractor, with JPL as technical manager. Last week NASA named the Boeing Corporation of Seattle as prime contractor for Lunar Orbiter spacecraft which are expected to fly photo missions around the moon, starting in 1966. Technical management of the orbiter program has been moved to NASA's Langley research center in Virginia. JPL will continue as prime contractor for Ranger and Mariner programs and, presumably, for the Mars probes. The new programs, incidentally, will permit NASA to compare performances on the basis of differing contractual arrangements.

The space committees are certain to keep close watch on Ranger and JPL. But, while the congressional committees are becoming increasingly well informed and inquisitive, the consequences of their investigations and recommendations are unclear.

Well before creation of the oversight committee, Karth's subcommittee on space sciences and applications held investigatory hearings on the Project Anna geodetic satellite system, the Project Advent military communications satellite program, and the Centaur launch vehicle development programs, all of which were experiencing difficulties.

In the case of Centaur, more money and better management moved the project out of the doldrums, but the action appears to have been initiated by NASA. Congressional criticism on these three projects seems to have produced no direct results, although public discussion of faults and expressions of congressional displeasure generally have a stimulating effect on agencies.

Congress has, until now at least, exercised influence on the space program primarily by setting limits on total funds available to NASA. The fact that authority on space-agency matters is divided between House and Senate and between authorization and appropriations committees in each house contributes to Congress's difficulty in influencing specific NASA programs. And the space agency itself, by and large, has made the decisions on which programs to cut and which to fatten.

The latest round of hearings should make clear to NASA that in the future the House committee will be interested not only in the management of the program for the unmanned exploration of space but in results. For the present, the encounter with the censorious Congressmen may actually strengthen NASA's hand in the attempt to reach a *modus vivendi* with JPL which will, in Webb's words, "preserve the values and get the job done."—JOHN WALSH

David M. Bonner Dies

David M. Bonner, chairman of the department of biology and a key member of the original faculty group at the new University of California, San Diego, died 6 May at the age of 47.

At San Diego Bonner had organized a department with special competence and interest in cell biology. He was author of the book *Heredity* and winner, in 1952, of the Eli Lilly medal for achievement in biology. He was a member of the National Academy of Sciences and served on the editorial board of *Science*.

Bonner did his undergraduate work at the University of Utah and earned his doctorate at California Institute of Technology in 1940. He taught and did research at Stanford and served in the Office of Scientific Research and Development during World War II, before going to Yale in 1946.

Announcements

A program leading to the master's degree in **mathematics** has been established at the University of Puerto Rico's Rio Piedras campus. Participants must have had undergraduate work in advanced calculus, modern algebra, and 2 years of German, French, or Russian. Information on the program is available from Francisco Carriga, chairman of the mathematics department, University of Puerto Rico, Rio Piedras, P.R.

The Endocrinology Study Section of the U.S. Public Health Service is seeking expressions of interest in a conference on the "usefulness of currently available **gas chromatographic techniques** for the analysis of steroids in