What will the next national administration be like? The articles that follow, on Gerald R. Ford and Jimmy Carter, examine in broad outline the political origins, public records, attitudes, and stated positions and commitments of the two candidates, especially as they bear on issues related to science and technology.

Gerald R. Ford

On 11 May 1976, President Gerald R. Ford signed legislation creating the Office of Science and Technology Policy (OSTP), thereby restoring science to the White House from whence it had been banished in the early 1970's as a nettling appendage to the Oval Office. Ford, obviously, does not look at science that way. From the time he took office in August 1974, he let it be known, through his own words and the initiatives of Vice President Nelson A. Rockefeller, that he would welcome the return of a science adviser to the President. In signing the OSTP bill*, which not only reestablishes a White House science office but also goes so far as to make the science adviser a full member of the policy-making Domestic Council, Ford made good on his word. Furthermore, by basing the existence of the science office in law (previous science offices were created, and abolished, by Executive order), Ford has ensured science a measure of permanence it has never before enjoyed at the upper reaches of government.

The President has set a new tone for relations between the White House and the scientific community, but one must not leap to the conclusion that because Ford supports the OSTP he has a comprehensive national science policy. Patently, that is not the case. Nor is there any evidence at the moment that the President is primarily concerned about it; he seems to be tackling science-related issues as they come, one by one. But there is reason to believe that, were he to be elected to a term of his own, Ford would be responsive to his science adviser, and it is at least possible to speculate that something resembling a coherent national science policy might be developed. The first part of the OSTP bill does outline "the principles of a national science and technology policy."

Ford became president at a time when it was hard to think of much that was going right in our national life. The economy was a mess. Unemployment and inflation were high. Confidence in the government's ability to do anything about it was (and still is) low. From the scientific community's perspective, times were bad indeed. There was a persistent feeling that the budget-cutters at the Office of Management and Budget (OMB) were intent on doing in basic research, unless, of course, it bore the clear promise of early and profitable applicability. (In fact, because of congressional rescue operations, things never turned out to be quite as bad for basic science and R & D as was feared, though it is true that the rate of growth of science budgets dropped and inflation also took its toll.) And scientists deeply resented being told by former President Richard Nixon that he really did not care to hear from them, even though a number of the country's most serious problems could not be dealt with without scientific advice.

*The National Science and Technology Policy, Organization, and Priorities Act of 1976 establishes the OSTP, a presidentially appointed committee to undertake a 2-year study of federal support of science and technology, and the Federal Coordinating Council for Science, Engineering, and Technology, an interagency body.

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Jimmy Carter

So much has been said and written about the presidential candidates this year, it can be hard to cut through all the clichés and boiler plate and perceive them clearly. In the case of Jimmy Carter the problem is compounded because, while Carter has held no public office outside of Georgia by which his qualities can be readily measured, his sudden rise to prominence in the Democratic primaries and his ultimate capture of the party nomination had made him an instant prodigy even before the fall campaign. He was the born-again Baptist, peanut farmer, and "populist" politician who successfully won out over all comers by promising to straighten out the mess in Washington through Christian love and zero-based budgeting.

If Carter is still fuzzily perceived by many voters, it is partly the candidate's own fault. His campaign exchanges with Gerald Ford have included no little self-serving and obfuscating political rhetoric. Nevertheless, by sorting through and trying to digest the immense amount of information that is available about Carter, one can get some idea, and maybe a pretty good one, of what a Carter presidency might be like. It would be different from all that have preceded it, and certainly very different from a continued Ford presidency.

Exercising the politician's license for self-puffery, Carter has stretched the credentials he gained as a naval officer under Admiral Rickover by often referring to himself as a "nuclear physicist" (*Science*, 6 August). But, if elected, he would in fact be the first professionally trained engineer to become president since Herbert Hoover. "It's nice to have a man running for President who has had 2 years of calculus," observes Lewis Branscomb, who heads Carter's science policy task force (*Science*, 3 September). Branscomb and other scientists and academicians who have been serving as advisers to Carter clearly regard him as exceptionally bright and able.

As Georgia's governor, Carter had a science adviser and a science and technology advisory council. Studies were prepared on questions such as how state agencies could profit from the technical expertise available at Georgia universities, and how NASA's earth resources satellites could be used in the state's geologic mapping, water pollution abatement, and agricultural disease control programs. Carter got the report on how to establish useful links between the agencies and academe too late in his administration to put it to a practical test. But the satellite study did lead to practical applications—multispectral photography was even used to survey the advance of a peach tree blight.

And, as an agriculturalist and senior partner in a family enterprise that grosses $2.5 million a year primarily from the growing, shelling, and storage of seed peanuts, Carter has—despite all the distractions of serving as governor and running for President—kept well up on the increasingly sophisticated methods that peanut growers and shellers now use. One day

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Health

During the past couple of years, Congress has struggled unsuccessfully to untangle a web of bills that would in one way or another provide the country with national health insurance, while day by day the cost of medical care has gone up and up. Ford's position on comprehensive national health insurance—the kind that would cover everyone for everything and be paid for by employer-employee payroll taxes—is simple. He is against it, not because he wants to deny medical care to people who need it, but because, in keeping with his policies of fiscal conservatism, especially when it comes to social programs, he believes the country just cannot afford it. Not now, anyway. He has said that, were the economy to recover, he might be able to support coverage of catastrophic illness for all citizens.

Ford's emphasis in health is not on national insurance but on a consolidation of the myriad existing health delivery programs for mothers, children, the mentally retarded, mentally ill, minorities, and so on, that are scattered throughout government. The President proposed consolidating Medicaid (aid to the medically indigent) and 15 other health care programs into a single "economic," "block grant" program, in which the federal government would turn over authority for delivering care to the states and give them $10 billion with which to do it. Ford, if elected, will introduce the block grant program again. Last time around, Congress did not pay much attention to it.

In addition, the President favors an immediate extension of coverage in Medicare benefits for persons over the age of 65. He definitely would like to see coverage of catastrophic illness for them and has also proposed provisions for unlimited stays in a hospital or "skilled care" nursing home for patients who need more than custodial supervision.

The biomedical research community, which felt particularly unappreciated under Nixon, has received reassuring treatment from Ford, who chose well-regarded insiders for his two top health jobs. The appointment of Theodore Cooper, former director of the National Heart Institute, and a Democrat, to the post of assistant secretary for health, was well received in the community, as was Ford's choice of Donald S. Fredrickson to head the National Institutes of Health (NIH). Furthermore, for the first time since 1971, when the war on cancer began to dominate the biomedical research scene, government is listening to scientists' advice about restoring some measure of balance in funding among the NIH institutes. Total funding for NIH is up in the fiscal year 1977 budget and, although cancer still leads the rest, money is being a bit more evenly distributed.

The President Ford Committee (Ford's campaign outfit) notes that his initiation of the swine flu vaccination program was one of his most outstanding actions in the health field since taking office. It is, at best, a dubious claim.

Science Policy and Basic Research

Despite his failure to formulate a comprehensive science policy for the nation, Ford has taken a real and personal interest in the development of the OSTP and, according to his first science adviser, H. Guyford Stever, who formerly was director of the National Science Foundation (NSF), Ford is accessible and is clearly sympathetic to basic research and development. He recognized that the federal investment in R & D was declining, particularly in the face of inflation, and his budget for FY77 called for $24.7 billion in R & D obligations, an 11 percent increase over FY76. Although it may not be as much as the scientific community would like, Ford's judgment about increasing research budgets at all reflects a sharp change in attitude from the previous Administration, which was only interested in things likely to pay off quickly and profitably. When the budget-cutters tried to take a whack at NSF's R & D budget for FY77, the President himself stepped in and restored some $15 million.

So far, in addition to Stever, the two scientists most closely allied with the Ford White House are Simon Ramo, vice-chairman of the board of TRW, Inc., and William O. Baker, president of Bell Laboratories (the latter was also a Nixon adviser). During the months that Congress and the White House were negotiating the details of the OSTP bill, Ford, taking a "We have to get on with the job right away" tone, named Ramo and Baker to head two panels of prominent scientists to study national science and technology policy issues. But even though Ramo and Baker are industry scientists who, generally speaking, fit one's preconceived notion of the Republican mode, the panels they headed were made up of men of a broad range of academic and research backgrounds and came from both political parties. Similarly, Ford showed that he does not think science advice should be a one-party affair when he recently named Democrats as well as Republicans to terms on the National Science Board.

The outlook for science seems to have improved during the two and a half years of the Ford Administration. In part, that is because it could not have gotten much worse. But in part also because Ford seems to have an honest regard for science.—BARBARA J. CULLITON

Jimmy Carter

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last August Carter, followed by a troop of reporters, visited Clyde Young, a Georgia agricultural experiment station scientist who has developed a practical method of chemical analysis for predicting when a farmer's peanut crop will mature and be ready for digging. Young was astonished at how much Carter knew about what was going on in peanut research. "He knew more than half the scientists who work at it full time," Young told *Science*. "That statement seems incredible, but I'll stick to it."

As a political campaigner, Carter has gained a well-deserved reputation for trying to present himself in such a way as to win over conservatives and liberals alike. Policy positions which may arouse strong antagonism in one group or another have often been downplayed or soft-peddled. The fact is, however, Carter must be regarded a liberal and a reformer on the basis of his commitments to labor, blacks, women's rights groups, environmentalists, and consumer organizations.

The very fact that, in Georgia, Carter built a constituency composed in substantial part of both blacks and rural whites is evidence that, on his home turf, he has been coming across as a champion of the common man. Blacks generally supported his opponent, Carl Sanders, in the 1970 gubernatorial race, but they warmed to him later. After the inaugural address in which he proclaimed racial discrimination to be a thing of the past, Carter was pictured on the cover of *Time* as one of the new breed of southern governors.

Given the limitations of his office and the "mess" he inherited from his predecessor, Lester Maddox, Governor Carter performed more than creditably. His principal achievement seems to have been to reorganize the state bureaucracy—which was a stupefying maze of agencies, boards, and commissions (many of them nonfunctioning or obsolete)—and to institute zero-based budget-

ing.* One big advantage of these reforms was to establish accountability and give the governor real control over state government. Another was to allow major improvements in the delivery of services. In his book *Why Not the Best?*, Carter cites an example of the latter:

> In the multitude of departments that existed prior to the formation of the Human Resources Department, we sometimes had five or six different caseworkers going into one home and maintaining, of course, five or six different files on the same family. This was causing enormous waste of manpower, and an ineffective administration of human services because there was no personal involvement between the caseworkers and the family. When we merged mental and physical health, retardation, vocational rehabilitation, welfare, alcoholism, drugs, problems of the aged, and juvenile offenders into one department, we could have one or, at the most, two caseworkers serving a particular family with different kinds of afflictions.

Inasmuch as the fostering of economic development and new job opportunities has to be a major concern of any Georgia governor, Carter and his administration showed surprising dedication to environmental protection and the preservation of important coastal and inland natural areas. The pulp and paper mills came under strong pressure to stop polluting Georgia's rivers and estuaries, and pollution discharges were substantially reduced.

Also, Carter brought the stream channelization activities of the U.S. Soil Conservation Service to a virtual halt, and he killed a major Corps of Engineers dam project that previous governors and many prominent legislators had supported. Also he showed a keen interest in land-use planning and requisition—for instance, he pressed successfully for control on development of Georgia's beaches and sea islands, and he urged Congress to enact national land-use legislation.

If Carter Wins. . .

Carter has said that, if he wins the election, he will bring in a "new generation of leaders," with a good many of the new faces to come from state and local government. Inasmuch as the Carter campaign has been run by Southerners, many top jobs in a Carter administration would almost certainly go to them and others from the South. Certainly, Southerners are well represented on the small Carter-Mondale policy planning staff that has been recruited from the literally hundreds of exceptionally well-credentialed young men and women who have applied.

While Carter would have to look for talent in all the usual places, such as the corporations, the universities, and the big law firms, he is likely to be looking in some new places as well. For instance, the "public interest" movement—as represented by groups such as Ralph Nader's Public Citizen, Inc., and the environmental law firms—has flowered since the last Democratic Administration, and many of its leaders (now mostly in their 30's) no doubt would like to exercise a little power from the inside, for a change.

To live up to campaign vows, a Carter administration would have to give top priority to making sweeping changes in the federal bureaucracy and the budget-making process and to reducing unemployment and inflation. Carter has not disclosed an overall reorganization plan and does not yet have one. But he has promised, in keeping with what Congress has recently provided, to have an "Office of Science Adviser" as a permanent and high-level link between White House decision-making and the scientific community. He also has promised to establish a separate department of education and thereby consolidate numerous programs (such as those for literacy training) which are now scattered throughout the government.

Carter has noted that a Carnegie Corporation–supported survey has indicated that two-thirds of the institutions of higher education in the United States are either already in financial trouble or headed for it. The new department of education would presumably help shape the "imaginative reforms" he believes to be needed to overcome these problems. One reform which he has suggested would be to have other state governments do as Georgia did while he was governor and give tuition grants to students enrolled in private institutions of higher education.

Carter also has made public at least the broad outlines of a plan to combine in one department nearly all of the offices and agencies responsible for developing and carrying out energy policy. The Federal Energy Administration, the Energy Research and Development Administration (ERDA), and the Energy Resources Council—all created within the last 2 years—would be abolished, together with one venerable New Deal agency, the Federal Power Commission. The Nuclear Regulatory Commission, which makes critical licensing decisions, would lose its economic regulatory function to the new department but would otherwise remain intact.

Although acknowledging that ERDA itself was created to bring most energy R & D functions together within one agency, Carter says, with some exaggeration, that ERDA's "entire slant is toward the nuclear industry." He then adds: "Sixty-five percent of [ERDA's] research resources are oriented toward nuclear fission and fusion, while only 5 percent will go to energy conservation and 6 percent for solar power. This distribution is folly. We are now wasting 50 percent of the energy we are presently using. . . ."

Although not against further development of nuclear power, he wants to minimize it and to emphasize energy conservation and the development of coal and renewable energy resources. Such ambitious aims for reorganizing the bureaucracy and changing program goals would almost certainly run into fierce opposition in Congress and in the Executive Branch itself, and could well end in frustration.

Increasing economic growth, from the 1969 to 1975 rate of less than 2 percent of GNP each year to 4 to 6 percent, would be a central aim of the new administration. Such growth would be necessary for a major reduction in both unemployment and inflation and for generating the revenues to pay for the important new social programs—in health, education, housing, and other areas—to which Carter is committed.

As part of his strategy for economic expansion, Carter would seek to strengthen the supply side of the economy through such measures as lowering interest rates on investment capital, stricter enforcement of antitrust laws, and—pushing research and development. "We have now fallen far behind countries like West Germany and Japan on the amount of research and development that goes into increasing productivity for efficient means of generating goods and services," Carter has said.

With a bow to fiscal conservatives, Carter has promised that, in the event growth of the economy and of revenues fell short of expectations, the promised social programs would be phased in more slowly so as to permit a balanced budget by his fourth year in office. Therefore, should it turn out that the economy responded no better to Democratic than to Republican nostrums, Carter could be a very long time indeed in delivering such expensive programs as national health insurance for all.

*Every existing or proposed governmental function—of which some 10,000 were identified in Georgia—had to be justified anew each year, on its own merits and in the light of alternatives. Further, all state officials and employees responsible for these functions were drawn into the process of budgetary analysis and justification. As the system has since been modified by Carter's successor, Governor George Busbee, the rejustification of established programs will take place only every third or fourth year.

Taken separately, Carter's promises for economic growth, energy development, and environmental protection are ambitious enough; taken together, they are ambitious to a point that some political and administrative miracles might be necessary to carry them out. For example, stepping up the rate of economic growth will increase the possibilities for environmental pollution—the fact that "the environment" suddenly became a big issue several years ago was due in part to the high growth rate of the 1960's.

Also, stepping up coal production rapidly as an alternative to increased reliance on nuclear power and foreign oil could, besides being difficult in itself, put the environment under still greater stress. According to statements he has made to the press, Carter would push development of Appalachian coal in preference to coal in the West, where he believes problems related to water resources, transportation costs, community impact, and environmental degradation might be severe.

Yet, given the high sulfur content of most Appalachian coal and the fact that much of the production would come from contour strip mining, this policy could lead to worsening air quality in urban regions and more environmental havoc in coal states such as West Virginia and Kentucky. The adoption and enforcement of a tough law regulating coal stripping, together with an all-out effort to reduce sulfur emissions by requiring utilities to use the best available pollution control technologies, might reduce these problems to manageable and acceptable limits—but, if one looks to past experience, the prospects are not particularly encouraging.

On questions having to do with foreign policy and national security, some of Carter's statements—such as those criticizing the Helsinki agreement and implicitly challenging Soviet hegemony over Eastern Europe—have a sharp, hawkish edge. But, in general, his attitude seems supportive of detente, and he has gone further than Nixon or Ford ever have in some of his proposals for arms control. For instance, he has advocated a 5-year moratorium on nuclear testing and the early negotiation of a comprehensive test ban treaty, to be verified by "national technical means" and without on-site inspection. The Threshold Test Ban Treaty, which has been signed but not ratified, he regards as "wholly inadequate."

Carter has criticized the strategic arms ceilings arrived at at Vladivostok as too high but has left open the possibility that he might accept those ceilings as a step toward further arms negotiations. In his view, the Republican Administration has "gutted" the Arms Control and Disarmament Agency and flouted the new law requiring arms control impact statements for all major new weapons programs. And he has said that, although there might eventually be a place for the B-1 bomber in the U.S. weapons inventory, this weapon should not now be produced and deployed.

Carter has perhaps been more outspoken and specific on the problem of nuclear proliferation than on any other national security issue. For example, he has called for all nations to adopt a voluntary moratorium on the sale or purchase of nuclear enrichment or reprocessing plants—and for this moratorium to apply retroactively to the recent purchase agreements between Germany and Brazil and between France and Pakistan; further, he says that the U.S. government should not allow any domestic commercial reprocessing "until the need for, the economics, and the safety of this technology is clearly demonstrated." Should such reprocessing ever go forward, Carter believes it should be on a multinational basis.

Although many of Carter's positions on domestic and foreign policy issues can be regarded as extraordinarily ambitious, his partisans will respond that they are no more ambitious than the times call for. And, if it is fair to say that the accomplishment of his aims may require political miracles, it is perhaps equally pertinent to observe that Carter's sudden and wholly unexpected emergence as a contender for the presidency was itself something of a miracle—one brought about by extraordinary political determination and skill. In the final analysis, many voters who decide to go with Jimmy Carter for president may be making a judgment that Carter would be as serious and resourceful in office as he has been in seeking office.—LUTHER J. CARTER

Conflict of Interest: DOD's Currie Charged with Favoritism to Rockwell

Senator William Proxmire (D–Wis.) has called for the "suspension" of Malcolm Currie, chief of Pentagon research, and his deputy from "all further R & D or procurement activities" in the light of the findings of a 5-month Senate investigation into the question of whether Currie showed favoritism toward the Rockwell International Corporation. The "evidence is strong enough to warrant" their dismissal, Proxmire said, but that question should be left up to Secretary of Defense Donald Rumsfeld.

As the results of the investigation were released, Rumsfeld issued a statement of support for Currie, but said that he had not had time to actually read the Proxmire report. In March, Rumsfeld "severely reprimanded" Currie for having accepted Rockwell's hospitality by spending Labor Day weekend in 1975 at a company-owned Bimini resort with its president. Senator Thomas F. Eagleton (D–Mo.) called for Currie's resignation and asked the Proxmire Subcommittee on Investigations, of the Joint Committee on Defense Production, to examine Currie's actions regarding a controversial missile Rockwell was developing, the Condor.

The report, an unusually detailed legalistic document couched in very restrained language, charges Currie with a particular kind of conflict of interest. Aside from the free Bimini weekend, it found no evidence that promises of jobs or "gratuities" had been offered to Currie by Rockwell. Instead, however, there was a pattern whereby Currie acted "on its behalf to such a degree that questions could be raised about whether he may have given preferential treatment" to Rockwell. The appearance of giving preferential treatment to any person is specifically prohibited by Pentagon standards of conduct.

The General Counsel of the Department of Defense, Richard A. Wiley, who must enforce such regulations, has not