

man you want heading your country.

"We're listening to old tunes," says the leader of the Humphrey wing, and the Vice President agrees.

"We must proceed," Humphrey believes, "to negotiate a halt in the nuclear arms race in both offensive and defensive weapons. No addition of weapons, either by the Soviets or ourselves, can give either of us one iota more security. Each new weapon only brings us nearer the day when we will be unable to stop the plunge into nuclear war."

He is urging prompt ratification of the nuclear nonproliferation treaty, which Nixon forces have helped block in the Senate.

Humphrey is currently collecting papers from his science advisers on broad science policy. There is a strong possibility he will propose the establishment of a cabinet-level Department of Science to guard the interests of basic research against the inroads of the budget-cutters. Wiesner agrees with Presidential Science Adviser Donald F. Hornig (SN: 9/28, p. 309) that this may now be necessary. But he does not believe it will make the President's Office of Science and Technology any less necessary. ◇

APOLLO

Do it once, do it again

With most of its chips riding on last week's launch of the first manned shot of the Apollo lunar series, the Apollo program has moved into a fall and winter of intense activity. And if all goes according to plan, the space agency's planners find that they may have enough spacecraft and rockets left over to do the whole thing twice.

The equipment has all been paid for, but they may not be able to squeeze the operational money from an economy-minded Congress.

There are pieces of usable hardware scattered from Cape Kennedy to California, in various degrees of readiness, to redo Apollo 7 if necessary, or any of the shots planned to follow.

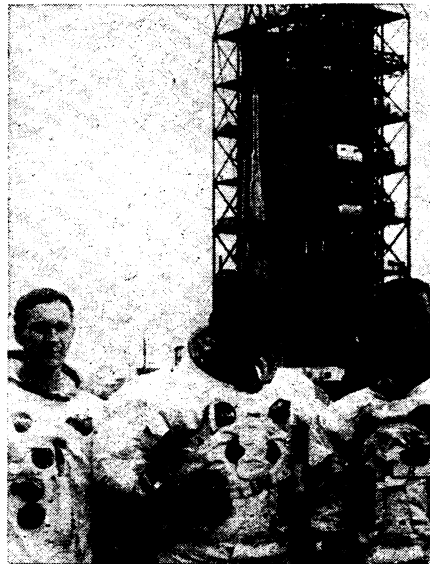
Even as the 224-foot Saturn 1B booster was fueled last week to carry Astronauts Walter Schirra, Donn Eisele and Walter Cunningham on the first U.S. manned space flight since November 1966, looming even taller on its mighty Saturn 5 rocket was the spacecraft destined to be Apollo 8, scheduled to fly perhaps 10 times around the moon in December. And on Oct. 6, only five days before Apollo 7 was due to take off, Apollo 9 arrived from its birthplace at North American Aviation in Downey, Calif. Apollo 9, planned for a flight in February or March, will give astronauts their first opportunity to fly the tricky lunar module that will later

carry two of them to the lunar surface.

As the Apollo 7 astronauts underwent their final physical examinations and practice countdowns last week, engineers in Houston, Texas, and Downey were working on no fewer than 16 other spacecraft, while others in other cities assembled and tested the powerful Saturn boosters designed to push the vehicles away from earth and to the moon.

Two spacecraft were in Houston, at the NASA Manned Spaceflight Center. Both are known as block II craft, replicas of the moonbound version as opposed to the more primitive block I model used in past unmanned flights. Neither of them will ever fly; they are being used in vibration, shock and instrumentation tests.

Apollo 10, the next spacecraft due at Cape Kennedy, is now in Downey where engineers recently finished installing its instruments. Now begin the weeks of painstaking checkouts that will



NASA

Apollo's Eisele, Schirra, Cunningham.

CERN'S ACCELERATOR

Back from the depths

When the British Government announced last June that it would not at present join in building the European 300-billion-electron-volt (GeV) accelerator (SN: 7/13, p. 30), Europe's subnuclear physicists were plunged into gloom. The giant proton synchrotron had been in the study stage for years, and a final go-ahead decision was to have been made by the previous December.

But only three countries—Belgium, Austria and France—had counted themselves in. When Britain turned thumbs down because of her financial squeeze, it looked as though the whole project might die.

Already the Americans with their

precede its departure for the Cape. Apollo 11, a more likely candidate for the moon flight in the event that the preceding missions are anything less than letter perfect, is close on its heels, along with Apollo 12.

Two more Apollos are in North American's huge clean room, being checked to see that their life-support, communications and other systems work well together; another pair in the clean room is just being completed. Four more are in various stages of manufacture; the last three spacecraft in the present Apollo program are still collections of parts and blueprints.

But if Apollo 10 or 11 successfully completes the lunar mission, what happens to the rest? "That's a good question," is the standard reply from NASA and industry officials at Cape Kennedy. The space agencies' fiscal 1969 budget is the lowest since 1963, and the number of people working on Apollo has dropped almost a third to only 220,000.

With the Apollo Applications Program already cut to pieces in Congress, at least for the time being, and with the Vietnam War still taking the lion's share of the country's loose money, there could be enough hardware left over after the initial moon landing to run the space program all over again.

The current Apollo flight is the last in the schedule to use a Saturn 1B booster, yet there are nine 1B's left, some of them still incomplete, but all paid for. If Apollo 10 goes to the moon, there will also be nine spacecraft left over, as well as nine Saturn 5 boosters.

Due largely to the poor reception given the Apollo Applications Program for earth-orbital studies, NASA officials indicate that they plan to pursue the possibility of follow-up flights to the moon. There is theoretically enough equipment around for nine such missions without investing in a single additional spacecraft or rocket.

200-400 Gev project at Weston, were two years ahead of Europe (SN: 8/17, p. 161).

But in the last few months, the atmosphere has changed. Europe, it seems, will have its big accelerator after all, although at the beginning it will be less powerful and versatile than originally planned.

That, at least, is the spirit and the word that emanated from the latest meeting of the governing council of CERN—the European Organization for Nuclear Research—at its headquarters at Meyrin, outside of Geneva.

Two main reasons underlie the new optimism: The submission by Italy and

West Germany, in August and September, of letters of intent to join in the project (SN: 9/28, p. 320); and the conclusion last week of a CERN study which showed that the basic project could be built, even without Britain's contribution, for 75 percent of the original cost estimate. (Another cheering element is the widespread conviction that Britain, in two or three years, will finally join.)

Under the new program, total project cost would be chopped from 1,776 million Swiss francs to 1,330 million (about \$309 million, at the present rate of exchange).

No actual design changes are foreseen for the accelerator. Its 2.4 kilometer diameter stays the same, and so does its performance potential of 300 Gev and 10^{13} (ten thousand billion) protons per second. But it would not reach total performance right away. The idea is to run the machine with only part of the radio-frequency and magnet power equipment installed, and with a simplified injection system. This would temporarily cut intensity to 2×10^{12} (two thousand billion) protons per second for about two years. The energy level would also be temporarily reduced to 200 Gev, unless it was decided to take about 20 million francs from some other part of the project.

Significant cuts—totaling about \$50 million—would come in the preparations for high energy physics:

- Number of users would be held down to 60 to 75, or 80 percent of "what could be hoped for."
- A "small fraction" of the initial equipment would have to be brought in from the outside by visiting groups.
- Construction of the planned large track chamber is canceled or postponed.
- Preparations for experiments would start about one year later than originally planned.

As CERN Director General B. P. Gregory told the council, the feasibility study conclusions are "just a model, not a final design. There are lots of options the project leader can take. We are not freezing the character of the machine."

Despite the high feelings, the project is not off the launching pad. The five letters of intent correspond to almost 60 percent of the total contribution for the original project. "This," says Gregory, "puts the 75 percent project within range."

But to reach the 75 percent commitment, about five more countries would have to come in.

The big bargaining will be over the site choice. The field has been narrowed to eight possibilities: in Sweden, Greece, Spain, Austria, France, Belgium, Germany and Italy.

Pointedly, Gregory told the council delegates that "in a sense we already have a short list. It is clear that the sites in the five countries which have already sent in their letters of intent will be in the forefront of everybody's mind. . . ."

According to one informed staffer, the field is already narrower than it looks. Each of the possible sites have disadvantages, but the most promising seem to be the sites at Drensteinfurt, Germany, and Doberdò, Italy.

"No one will pull their knives out," says one CERN official, "but they will certainly be wielding their can openers."

The aim is to have the site and the name of a director general ready for a first vote by the December council meeting. The hope is that final decisions would then be able to be taken in March, which would allow construction to start in the second half of 1970.

Officials at CERN admit that in fact a March target may be too early. "But," says one, "for the first time we are really moving toward the project. I don't think anyone doubts that we will go ahead."

VIOLENCE COMMISSION

Social scientists respond

In the wake of the assassination of Senator Robert F. Kennedy, in naming a commission to probe the nature and causes of violence in the United States (SN: 6/22, p. 589), President Johnson asked: "What in the nature of our people and the environment of our society makes possible such murder and violence?"

It was a challenge thrown to the professions that make up the social and behavioral sciences—those disciplines whose laboratory is the human environment. And they have taken up the challenge.

The violence commission, born of the shock that followed the Kennedy assassination, promises, unlike its predecessors, to be an effort of major scientific importance.

Judging by the number of psychiatrists, sociologists, biologists and other scientists who have readily accepted the commission's call for information, and by the scope of the investigation now getting underway, this should be the first thorough analysis of individual and group violence in the United States.

"I don't believe I have ever seen such enormous enthusiasm and receptivity by the scientific community wishing to help in a Federal effort," says Dr. Marvin E. Wolfgang, a University of Pennsylvania criminologist and one of the two research directors appointed by the commission. Enthusiasm has been evident since last July, he says, when 50

scholars, given eight days notice, left their vacations to meet in Washington and lay down guidelines.

Such response contrasts markedly with the scientific suspicion which greeted the Kerner Commission on civil disorders last year (SN: 4/20, p. 386). At that time, social scientists expected a political whitewash of the nation's racial problem, and many would not participate in the investigation. No whitewash occurred and the final document, although an honest statement on black-white relations, suffered from lack of scientific depth.

The new study has been planned by scientists, and according to Dr. James F. Short, sociologist at Washington State University in Pullman, Wash., and co-director with Dr. Wolfgang, the integrity of their input is guaranteed.

Scientific quality, however, does nothing to guarantee political results on any of the issues raised. Federal commissions are effective tools for studying a problem; their output is typically shelved by a political establishment unwilling to make major social changes. That has been the fate of both the Kerner Commission's work and the recent commission on crime. Each called for sweeping political action, one to open the society to greater Negro participation, the other to reform the criminal justice system.

If their recommendations had been implemented, both Dr. Wolfgang and Dr. Short agree, the need for a new study would have been greatly muted.

But they were not implemented, and the new commission will explore, among other things, the idea that protest is part of the Democratic process.

"Protest can be called the lubricant of social change," says Dr. Wolfgang. "The question is, can we do this without violence?"

For one of its studies, the commission will look into the theories and attitudes motivating student protest, antiwar protest and black protest.

Last week, it surveyed the general public on degrees of hostility felt against political figures and institutions and the question of firearms.

Possible psychological effects of television entertainment, and the news media will be analyzed during subsequent hearings, as well as violence stemming from police action.

At the individual level, the commission will pull together recent neurological and genetic work indicating biological roots for some criminal violence.

The xyy syndrome, a defect in sexual chromosomes, has, for instance, been linked to criminal behavior in some men. And brain surgeons suspect there may be a neurological cause for certain types of homicidal rage.