the scantier archeological record—so did the proportion of dogs, which exceeded that at any other Starčevo-Körös site excavated to date.

Of the other domestic species, it is obvious that the pig was domesticated at the site, since the bones of individuals range from the wild to the domestic form. Sheep and goats were introduced as fully domesticated animals from the eastern basin of the Mediterranean. Most of the cattle were animals that had been domesticated several generations before. Because the domestication of cattle first started in the Balkans, in Thessaly (*7*) and Greek Macedonia (*8*) in the second half of the 7th millennium B.C., domesticated cattle could easily have reached Yugoslavia in the 6th millennium B.C. Nevertheless, there are also evidences of a local domestication of cattle. [There are transitional individuals between the wild and domestic form. As judged on a morphological basis, some of them —the disproportioned ones—could be crosses between wild and domestic cattle, but the overwhelming majority—the small-scale "editions" of the large aurochs (*9*)—were animals newly domesticated at the Lepenski vir site.]

The wild animals of Lepenski vir show the normal range of size variation exhibited by the corresponding prehistoric forms, except for some exceptionally large catfishes that may have weighed 300 to 400 pounds (about 140 to 180 kilograms).

Finally, we come to the relationship of the animal remains to the structures in which they were found. Recent studies of the archeological material of Lepenski vir have aroused speculation that the buildings of both the first and second phases were not true houses but shrines. The bone material found in some of them seems to strengthen this theory. Animal bones were found in 30 of the buildings, and fish bones were identified in nearly all of them. A surprisingly large number (13) of the structures contained a red deer skull with antlers, and seven contained a red deer shoulder blade. Often the complex of red deer skull and shoulder blade occurred along with bones of dogs and wild swine which were in anatomical order. All of these bone assemblages may well be sacrificial remains (that is, defined bones of defined species) and many confirm the view that the buildings were shrines.

There is no doubt that Lepenski vir was one of the earliest centers of animal domestication in Europe. With the special composition of its domestic fauna it represents a form of animal husbandry that has not previously been known to have occurred in either the temperate zone of Europe or in the Middle East, but its origin and its relationship to other archeological sites can be discovered only through further investigation.

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NEWS AND COMMENT

Science in Italy: Reform Effort Takes a Sharp Turn Leftward

Rome. A *Science* correspondent reported in 1964 that "Italian scientists seeking an improved climate for research find themselves more pessimistic than usual. . . ." Today, few changes having since taken place in Italy's antique and poorly financed system of research administration, they are even more pessimistic. But what must be added is that a half-dozen years of frustration have pushed the mass of Italian research workers sharply to the left. And as a result, thousands of them, from senior investigators to bottle-washers, are now also concerning themselves with issues that go beyond the traditional and long-ignored rallying points of pay, working conditions, and research support. Endlessly discussed at mass assemblies that have recently immobilized major research centers throughout the country for months at a time, these issues are closely linked to the peculiarly downtrodden state of Italian science—which is worse off, by far, than science in any other industrialized nation. But they also transcend the usual bread-and-butter concerns and critically bring in such fundamental matters as the system of developing social priorities in research, the scientist's responsibility to the public in an economy dominated by profit-making criteria, and the linkage of financial reward to individual position and productivity. The debates and conclusions concerning these matters are not always notable for clarity or coherence, for, in general, they reflect a desire not only to reconcile good Marx with good science but also to mold the product in a fashion that will assure some chance of its surviving in Italy's enduring condition of political chaos. Thus, to arouse support within the lower echelons of the scientific community, and also to establish links of sympathy with industrial workers, major emphasis has been placed on both raising pay and narrowing the salary differentials between technicians and scientists. But the ultimate goal, as recently explained during a long evening with some dozen young physicists, chemists, and other scientists from a major research center, has little to do with money. Rather, as one young scientist put it, the pay issue is being spotlighted because it quickly shows how research workers are "manipulated" for the pursuit of goals about which they have no say. From that point, goes the explanation, one can proceed to a recognition of the manner in which capitalist systems exploit science against the interests of the masses. (After this thesis was expounded

to a visiting scientist from a nation that is well cemented into the Soviet bloc, he remarked to his Italian colleague, "Yes, but you have *fine* equipment in your laboratory.")

In other instances, the agitation takes a less ethereal form, and can be considered radical only in the context of Italy's incredible backwardness in public welfare measures. Thus, staff members of a psychology institute are looking for some means of making their views known in connection with a government bill to set up a system of preschool education. No one in authority has sought their views, nor is there any established channel for presenting them. But, in the generally aroused atmosphere that now envelops the Italian scientific community, they are eager—though not optimistic about their prospects—to inject some contemporary thinking into the situation. Several years ago, it is generally agreed, the thought would not have occurred to them, and, if it had, they would not have bothered. Similarly, staff members at the Istituto Superiore di Sanità in Rome, which approximately combines the functions of the U.S. National Institutes of Health and the Food and Drug Administration, are agitating for the Istituto to have a more decisive role in the regulation of pharmaceutical drugs. What they would like to do is to replace the present perfunctory system—which is largely based on following FDA's lead and then looking into ensuing calamities—with screening methods based on clinical and pharmacological studies. Their chances of success, in a land noted as a pill-peddler's paradise, are widely acknowledged to be limited, but, again, the case is typical of interests proceeding beyond the traditional issues of money and working conditions.

Fate Uncertain

The sentiments aroused by these and related issues are now powerfully present, and, whether the specifics involved are supported, opposed, or ridiculed, figure large in the Italian scientific community, from the lab bench to the executive suites of government research agencies. One measure of success is that, in diluted fashion, the concept of reducing the spread in pay scales was incorporated into government-supported reform legislation, though, characteristically, the bill failed to make its way through Parliament; now that the government has been dissolved—for the 30th time since World War II—the fate of the measure is uncertain.

What is very certain, though, is that the evolution on policy matters within the Italian scientific community has been accompanied by a growing militancy among researchers, many of whom have come to believe that disruption is the only certain means of arousing the notice of their come-and-go governments. For example, in mid-December, following months of assemblies that brought research to a halt, scientists and technicians occupied the buildings of the Istituto Superiore di Sanità to protest what they considered to be maltreatment of the lower salaried levels in a parliamentary reform bill. Police forcibly removed over 100 persons from the premises, and charges of trespass on government property were brought against 77 of them. Among these were many who occupied full-fledged research positions in the multifariously tiered civil service job structure; this was somewhat unusual, since elsewhere occupations and demonstrations by professionals had rarely provoked police action.

The assemblies and demonstrations drew wide support, and even on the right side of the political spectrum it is often conceded that research is so poorly treated in Italy that there may be no alternative to mass action for reform. But the accompanying turbulence also had some painful personal results, among them the sudden walkout of the chairman of the physics department at the Istituto, Mario Ageno. As head of the department for the past 11 years, he had acquired a reputation for being nonautocratic, equitable in disposing of whatever rewards he was allowed to control, and keenly interested in high-quality research. Kind words are said about him in all camps, which is far from common. On 25 July, Ageno's laboratory was invaded by a group demonstrating on the issue of greater equality in salaries. Ageno himself, it is agreed by all, was as holy as any of them on this issue. But he decided at that point that he had had enough. He walked out of the Istituto and has never returned. "I resigned because it became impossible to work," he said in an interview. "Today we have a lot of people who call themselves scientists but who don't know anything about science. Professors no longer teach, students get degrees without having done any research. We have enough money for research. What we lack is organization and people who are interested in research, rather than social and political struggles. I was going to quit anyway,"

NEWS IN BRIEF

● **THERMAL POLLUTION**: The Justice Department has filed its first suit to halt thermal pollution. It charged the Florida Power and Light Company with overheating waters in Biscayne Bay, including an area encompassed by the Biscayne National Monument. The suit alleges that water used for cooling leaves the power plant about 10 to 20 degrees hotter, thus damaging marine life in the bay. The damage will be greater, the suit says. when two nuclear power plants now under construction are finished. The power company earlier denied the alleged damage at an Interior Department conference and refused to halt excavation of a drainage canal. The suit asks a submission to the court within 45 days of a plan to eliminate thermal pollution by the power plant and a halt to construction of the canal.

● **NEW PSAC MEMBERS**: President Nixon last week named five scientists to the President's Science Advisory Committee: Dr. Solomon J. Buchsbaum, vice president of research, Sandia Laboratories; Dr. Theodore L. Cairns, assistant director, Central Research Department, E. I. du Pont de Nemours & Co.; Dr. James S. Coleman, professor, Department of Social Relations, Johns Hopkins University; Dr. Val L. Fitch, professor of physics, Princeton University; Dr. Lloyd H. Smith, Jr., professor of medicine and chairman of the Department of Medicine, University of California, San Francisco Medical Center. The new members will serve until 1973. They will replace Dr. Ivan L. Bennett, Jr., New York University; Dr. Sidney D. Drell, Stanford Linear Accelerator Center; Dr. Charles P. Slichter, University of Illinois at Urbana; Dr. Charles H. Townes, University of California at Berkeley; and William R. Hewlett, Hewlett-Packard Company. Hewlett had resigned, and the terms of the others had expired.

● **AIRPORT ENVIRONMENT STUDY**: The Port of New York Authority has requested a study assessing the environmental and economic impact of extending the runways at John F. Kennedy International Airport. The study will be done by the Environmental Studies Board of the National Academy of Sciences and the National Academy of Engineering.

he explained, "because there was so much ridiculous regulation that I couldn't subscribe to a journal without getting someone's permission. But when they invaded my laboratory after all I've done, I decided it was time to leave at that moment. Now I'm looking for a job."

At the research centers of the atomic energy agency, the Comitato Nationale Energia Nucleare (CNEN), research was brought to a halt for about 5 months last year while assemblies were held on questions ranging from the ideological significance of merit salary increases to the political purity of basic research. On the former question it was decided that financial reward for what is deemed good work is simply another capitalist device for controlling the workers, and eventually the assemblies took positions against merit increases and for a narrowing of the salary spread between scientists and technicians. On the issue of basic research, it was decided, as a young physicist described it to me, that "pure research is not pure. It is linked to the system of private profit. Therefore, scientists cannot regard themselves as poets and contend that their work is remote from worldly concerns." The assemblies, by all accounts, drew overwhelming participation, and on most issues ended by taking positions to the left of the labor unions, which, though Communist or Socialist in orientation, have a reputation for seeking harmonious relations with management. The effect of it all, it is generally agreed, has been to push all positions to the left, with even government-backed proposals and legislation reflecting the crucial concept of greater equality in pay.

Solidarity and Fatigue

Though the assemblies and the leftward movement merit notice both for their scale and intensity and because they are an unusual phenomenon within the life of a relatively large and well-developed scientific community, their concrete effects so far are difficult to establish. There is no doubt that thousands of scientists and technicians now more or less share a particular political vision and feel bound together by the experience of months on end of searching discussion. But even the most enthusiastic concede that their collective energies are yet to be fully replenished after the sustained efforts of last year. And, while the assemblies produced a mass of revolutionary rhetoric and prescriptions, the day-to-day state of science and education in Italy is so chaotic that simply to keep things going is an exhausting enterprise. Though booming industrially, Italy ranks extremely low in the proportion of national output allotted to research and higher education. Spending for research and development last year was less than 1 percent of the gross national product, as compared with well over 2 percent in France, West Germany, and Great Britain. Funding for basic science is running behind the national multi-year plan, so much so in fact that the medical and biological sciences committee of the National Research Council suspended its granting activities in January on the grounds that the available funds were absurdly short of the need. In effect, the committee was going out on strike in an effort to arouse its constituents to protest to the government. Unfortunately, the government was tottering at the time, later fell, and, at this writing, had not yet been reconstituted.

University reform to date mainly extends to a lowering of admission requirements. As a result, the University of Rome, built to accommodate 10,000 students, now has an enrollment of over 90,000. Other universities are similarly overwhelmed. Laboratory facilities are so swamped that degrees in the sciences are awarded without the students' having had any laboratory experience; these are known as "theoretical degrees." Political favoritism, with a wide array of parties and factions to favor, still influences research appointments, often down to the level of laboratory chief within an institute. (A story is told of a research director who hired several people under the category of electrician. A civil service inspector eventually arrived to inquire about their party affiliations. "Social Democrat, Christian Democrat, Unitarian Socialist," he was told as they went down the list. "What about this last one?" he inquired. "Oh, he's an electrician," the director explained. "You see, we really needed an electrician.")

Salaries remain extremely low: $350 a month for a highly trained, widely published scientist in his mid-thirties is typical in the government pay scale. Direct taxation is negligible in Italy, but so are the social services; indirect taxation, however, is quite high. Hours and working conditions often remain governed by laws that date back to the emergency conditions of World War II. Thus, at the Istituto Superiore di Sanità, the regular working day officially runs from 8 a.m. to 2 p.m. One category of worker is assured 45 hours of overtime per month, another gets 30. Innumerable reform bills have been offered to provide for greater flexibility, but, since 1964, some half dozen of them have foundered in parliament.

A prevalent complaint is that inadequate funds, along with the rigidities of the civil service employment structure, make it extremely difficult for a newly graduated scientist to begin his career in any way other than attaching himself to a powerful scientist "patron." Sometimes the arrangement provides enough flexibility for him to pursue his own research interests. More often, though, he has to accommodate himself to the patron's scientific interests. Several Italian scientists who have worked in the United States made the point that one impressive strength of the American system was the opportunity it afforded beginning researchers to pursue their own investigations. Now that funding for research has tightened up in the United States, they speculated, it is not unlikely that the patron system will figure larger and larger in the economics of research—a development they do not commend to their American colleagues.

Diminished Influence

There is a Minister of Science, but no Ministry of Science, since he is minister without portfolio, a condition unparalleled in any other major European country. The National Research Council is the principal agency for financing research outside the fields of nuclear energy and medicine, but the term of its president, Vincenzo Caglioti, expired over a year ago. He continues to serve, pending reappointment or replacement, but his influence in government, when there is a government to be influenced, is diminished by his uncertain status.

Under these circumstances, how does research progress? The answer appears to be either that it doesn't—which was certainly the case during the long run of assemblies last year—or that a great deal of energy and administrative cunning must be expended to acquire periods of peace at the lab bench. As one scientist put it, "If you know all the rules and ins and outs, and you have good connections, and you know how to exploit various opportunities for getting money and support and people—then, you can manage to work out four or five hours a day for nothing but research."—D. S. GREENBERG