

state & society

Harwell's industrial-contract research thrives

Since 1946 the Harwell Laboratory of the United Kingdom Atomic Energy Authority has been the place where Britain's research into reactors and reactor materials has been concentrated. During the last few years it has added a new role to this traditional one; the laboratory is engaging in contract-supported applied research for private industry. The fields of research are not limited to nuclear technology—many of them are "spin-off" technologies in areas where Harwell has special experience. They include radioisotope applications, electronics, mechanical engineering, chemical analysis, materials science, computing and cryogenics. Recently *PHYSICS TODAY* visited Harwell to talk to its director, Walter Marshall, and to find out more about this program.

During the past decade Harwell has seen its original role in British nuclear-energy research dwindling; the reactor research it grew up on is not finished, but staffing and funding for this work have both been steadily reduced since the middle 1960's, with the decision to go ahead with the construction of fast-breeder reactors. The development of the next generation of reactors proceeded, but the scale of effort required at Harwell became smaller. So, despite the continuing importance of this original role, the laboratory needed new objectives to stay healthy—but what were they to be? Could they be related to the earlier programs?

When we last talked to Marshall four years ago (*PHYSICS TODAY*, August 1968, page 66) he was new to his job and spoke more about plans for the future than about the then current situation. The major problem facing the UK, as Marshall saw it, was industrial growth and innovation; he therefore added to Harwell's atomic-energy program its new role as an innovator of ideas and as a contract-research organization—a novelty for a laboratory traditionally performing open-ended research supported by government financing. We started our recent conversation by asking him how it had worked out in the intervening four years. "Far better than I would have hoped," he an-

swered, "Far better than I would have expected."

Problems. Of the several problems that had to be overcome, one was to get the principle accepted as a sound and viable idea. To many people it seemed somehow unnatural that a traditionally single-functioned laboratory should go multifunctional—they argued that it would "lose its way." Marshall admits that a single well defined mission for a laboratory is an attractive concept, but he says you must always face the fact that eventually that mission will be accomplished—and then what do you do? The argument that Harwell should be multifunctional was helped by the publication last year of the Rothschild Report, titled "A Framework for Government Research and Development," which discusses government policy in funding all areas of research. Although concerned largely with medical, agricultural and environmental research, the report's arguments in favor of multifunctional laboratories were very helpful

continued on page 63



MARSHALL

Survey finds physicists on the left

The political leanings of academic scientists are a function of their discipline, and physicists are the most liberal in the natural sciences. The most eminent and successful scientists generally hold more liberal views than their less well known colleagues. These are some of the findings of a survey conducted by political scientist Everett C. Ladd of the University of Connecticut and sociologist Seymour M. Lipset of Harvard (*Science* 176, 1091, 1972).

In 1969 the Survey Research Center at Berkeley surveyed just over 60 000 full-time faculty members including 1707 physicists, 1884 chemists, 2916 mathematicians, 812 geologists, 4567 biological scientists, 2395 faculty in colleges of medicine and 4382 engineers as well as faculty members from the social sciences, humanities, law, fine

arts, education, business and agriculture. Ladd and Lipset then analyzed the Center's data.

They find that "the faculties of the various academic fields are sharply differentiated in their politics." Physicists are the most liberal group within the natural sciences and engineering and are slightly to the left of the professoriat as a whole. Working with a variety of items measuring liberalism, Ladd and Lipset constructed a five-item scale including questions on rioting by blacks, legalization of marijuana, racial integration in public elementary schools and the US policy in Vietnam; in addition each respondent was asked to evaluate his own political position. Other political questions were also asked.

On particular political issues, physicists had the greatest opposition to the

Vietnam war policy among natural scientists, 67% calling either for an immediate unilateral withdrawal or for the reduction of US involvement. Of the physicists, 70% felt that the police did not "act reasonably in curbing the demonstrations at the (1968) Democratic Convention," as compared with 59% in mathematics and 41% in civil engineering. The legalization of marijuana was endorsed by 40% of the physics faculty, more than in any other natural science.

As to the reasons behind the liberal tendency of physicists, Ladd and Lipset hypothesize that the most liberal fields are the ones that emphasize the importance of creativity, originality and innovation. They say that "intellectuals are more likely than others to be partisans of the ideal and thus to criticize reality from this standpoint."

Another factor that Ladd and Lipset cite to explain the liberalism of physicists "involves the uses to which knowledge in a given discipline is put and the resultant contacts with groups" and outside interests. Since physics is largely apart from the business world, its practitioners are likely to be more liberal in their politics, they assert. The survey showed that 2% of physics faculty members had received support from private industry during the year previous to the survey, while 10% of the chemistry faculty had received such support.

Asked whether he thought that their liberalism might fade with the recent funding cuts and perhaps a greater dependence among physicists on industry for funding, Lipset told PHYSICS TODAY, "I don't think they would be affected by the so-called practicalities—it has more to do with the kind of people that are involved. I think that there are general attitudes that you find among scientists and intellectuals that would not really change over money."

One subgroup the authors investigated consisted of the more successful and eminent faculty members. They defined two groups, *achievers*—those who had published ten or more professional works in the two years preceding the survey and who held positions at elite universities (defined by SAT scores and funding levels) and *consultants*—who had been paid consultants to any agency of the federal government in the year preceding the survey.

Ladd and Lipset found that "in all disciplines, achievers are much more liberal in their views than the rank and file and consultants somewhat more liberal." In physics, 81% of the achievers opposed Administration policies in Vietnam, compared to 67% of the rank and file. Over two-thirds of the physics achievers (68%) approved the emergence of "radical student activism," while only 48% of the total physics fac-



LADD

ulty held that position. Only 20% of physicist achievers approved of classified weapons research on campus as compared to 31% of all of the physics faculty.

The differences between the achievers and the rank and file are even more surprising when the ages of the groups are taken into account, because it is usually assumed that the young are most liberal. Only 2% of the physics achievers are under 30 compared to 15% for the physics faculty at large. By any measure of success and eminence chosen, Ladd and Lipset found that "the most successful, highly achieving or influential faculty are more critical and left-of-center politically than is the general professoriat."

Among the social makeup of the physics faculty, the survey showed that 26% came from families with the father



LIPSET

in a high status job, a percentage topped only by medicine and geology in the natural sciences and engineering. A question on religion showed that 14% of physicists are from Jewish background, 60% Protestant, 14% Catholic, 5% "other" and 7% none.

Lipset told PHYSICS TODAY that unfortunately the questionnaire used in the Carnegie survey did not permit distinguishing theoretical physicists from experimental physicists. He said that he hoped that in the future someone would be able to survey some of the differences between them since it appears clear that there are variations in their political leanings. "In general," he told us, "those who do theoretical work in different fields appear more likely to support more 'idealistic' or even 'extreme' variants of political thought."

—SMH

Protesters harass Jason physicists

Members of the Jason group in the Institute for Defense Analyses have recently been the targets of considerable protest. In Paris this June, protesters forced the cancellation of a physics lecture by Murray Gell-Mann (who has been on sabbatical from Cal Tech). The following month in Rome and in Corsica the same thing happened to Sidney Drell (who was on sabbatical from SLAC). Meanwhile in the US, five members of Jason at Columbia University have been the subject of many protest leaflets (which Jason members say contain lies and distortions), including some that were distributed at the homes of Henry Foley and Malvin Ruderman.

Jason is a brain trust of about 35 people, almost all of whom are physicists. As individuals under Jason auspices, they work on problems of national interest, which they themselves select. Most of their activity is in defense problems, but they also handle prob-

lems from the Department of Transportation, the Office of Science and Technology, and so on. In the Pentagon papers, a study group under Jason auspices is reported to have condemned the bombing of North Vietnam and to have recommended as an alternative an electronic anti-infiltration barrier. Some Jason members have been active in giving Congressional testimony on defense or civil technology—some agreeing and some disagreeing with the official government position. Drell and others have contributed to studies in support of the SALT agreement. Another Jason member, Richard Garwin, has been outspoken in his opposition to the American supersonic transport.

As reported in *Science*, when Gell-Mann appeared to give the third of a series of four lectures at the College de France in Paris, he was questioned by a group calling themselves the "Collectif Intersyndical Universitaire d'Orsay