News and Comment

San Diego: New General Campus for University of California Plots an Unconventional Course

The universities of the Western World, in the beginning, were established by roving bands of scholars and clerks and gained grandeur in the late Middle Ages through the benefactions of kings and nobles and churchmen. In the United States today, state legislatures are the principal founders of universities and the federal government is the chief bestower of magnificence through funds for research.

One new university which is typical in being founded on public funds but unusual in almost every other way is the new general campus of the University of California, San Diego (UCSD).

The university at San Diego is building from the top down. Graduate programs are well under way, but the first freshmen, an advance guard of 150 to 200, will not enroll until September.

This approach to university making, a topsy-turvy one by conventional standards, is feasible at San Diego because the Scripps Institution of Oceanography at La Jolla served as a nucleus for the new university and the Scripps campus served as a temporary base.

Scripps was founded in the 1890's as an independent biological research laboratory and became part of the University of California in 1912. After World War II oceanography attracted wider attention and generous federal support, and the scope of research and graduate education at Scripps broadened to emphasize physics, chemistry, geology, and geophysics as applied to the oceans, as well as marine biology.

Even if Scripps with its cadre of research scientists and graduate students had not existed, however, it was probably inevitable that the San Diego region would get a state university campus.

The sheer weight of population growth and the priorities laid out in the Master Plan for Education (*Science*, 3 and 10 April)—which called for balanced development of state educational facilities according to population—would no doubt have resulted in the location of a general campus in the area. (One estimate puts the number of college students in the Los Angeles area at 4 per 1000 population and in the San Diego-Imperial Valley area at 1 per 1000.)

For several years, industrial and civic leaders in the area have applied pressure for establishment of a state institution with major research capability, because of the contribution such an institution would be expected to make to the area's economy. The aerospace industry has colonized the San Diego region, and the Navy's electronic research laboratory is there. But the failure of a General Dynamics jet transport project a few years ago put a damper on prospects for employment in the industry, and the middle-aging of the Atlas missile, made by General Dynamics in San Diego, may foreshadow further readjustments. San Diego, while by no means a depressed area, has not shared fully in the boom that has buoyed the economies of the Los Angeles and San Francisco areas in the missile era.

University Spadework

A university for the area, therefore, appeared to be in the cards. But the kind of university San Diego is getting has been decisively influenced by a relatively small group of men, and notably, by almost all accounts, by Roger Revelle, director of Scripps and university dean of research for the state university, the University of California. Revelle is a former science adviser to the Secretary of Commerce and a ubiquitous member of government missions and interagency task forces such as the one, chaired by him, which recently made public a detailed report on "Land and Water Development in the Indus Plain."

For UCSD, Revelle seems to have acted as chief idea man, faculty recruiter, advocate to the Regents, and buffer for some of the criticism and controversy which the new campus has stirred. Among charter members of the faculty, Revelle is given credit for gaining acceptance of the idea that the university foundations should be laid at the graduate level, and for winning the "lead time" which, it is hoped, will allow the university to develop in accordance with a carefully plotted and novel grand design.

In the mid-fifties a university-level institution for the San Diego area was first envisioned as an institute of technology, featuring graduate teaching and research and centered around institutes rather than departments. In terms of quality, something on the order of the California Institute of Technology was to be the goal.

This idea won the approval of the UC Regents, but then one of California's periodic reappraisals of higher education resulted in a swell of opinion in favor of establishing new general campuses in preparation for the onslaught of students expected in this decade, and the San Diego area was ticketed as a logical location.

The search for a site produced some hard feelings. The Scripps campus and the hills behind it offered a spectacular setting, but a number of questions and objections were raised. La Jolla is a wealthy seaside suburb of San Diego. It has a faintly arty air about it, but many in the community had serious reservations about its becoming a Latin Quarter for 27,000 university students. There were also questions about free land for the university, transportation, and adequate and economic housing for faculty and students. Particularly telling were the objections of Edwin W. Pauley, an influential UC Regent who stressed that the situation of the proposed site in the flight path of a local naval air base would not enhance the academic atmosphere.

The partisans of the La Jolla site were persistent, however; such things as a grant of public land and a change in Navy flight patterns tipped the scale in favor of La Jolla, and in 1960 the first commitments were made.

The building of a university faculty at UCSD meant, in practical terms, that the first appointee in each department became chief recruiter in his subject. The first appointments, therefore, in an important sense fixed the character of the departments.

Perhaps because of the Scripps environment, the start was made in the sciences, and the physics department was the first to take shape. The physicists had to adapt to the rough-and-ready circumstances of makeshift quarters and did so by emphasizing study in such areas as plasma and solid-state physics, where huge machines are not required.

Lack of funds for research has proved no serious obstacle in the initial stages, however, say UCSD researchers. First-class men attract federal grants and contracts, and the scientists are satisfied that the new departments have attracted first-class people.

Recruiting of faculty—some at UCSD call the process proselytizing—seems to have gone well but not easily. One scientist in a highly competitive field of research described the process this way. "We've dealt with a large number of people. A lot said no, but you never drop your standards."

The recruiters have taken the trouble to look beyond university ranks for prospects, and a number of the UCSD faculty are drawn from government and nonprofit research institutions and from industry. By the ordinary indexes, the new university has done well in the sciences. At last count it could claim two Nobel prize winners, chemist Harold Urey and physicist Maria Goeppert Mayer, and 13 members of the National Academy among its 80 faculty members.

The Attractions

UCSD's arcadian setting and salubrious climate are obviously no deterrent, but recruits seem to be drawn mainly by a chance to do research they feel important and, as one said, "to help try to create an ideal university." Certainly the opportunity to work in an institution "unbound by tradition," as one senior faculty member put it, has exercised a strong attraction.

The major science departments were established and planning for the undergraduate program was under way when the humanities faculty began to arrive on the scene and, as one observer says, "turned things upside down."

The scientists, who were the original settlers, had agreed that the humanities and social sciences departments, even at first, must not be mere "service" departments as they are in some technically oriented institutions, since top-quality faculty would not come to UCSD except on terms of parity.

The scientists took some convincing, but the result is a plan for a common program for all students in the first 2 years which will concentrate on "breadth" requirements and leave the final 2 years open for intensive specialization. More study of humanities and social sciences will be required of science majors, and more science and mathematics of majors in fields outside the sciences, than is the case almost anywhere else. The hope is to offer an education suited to the demands of the 20th century.

The man who has presided over the initial building phase of plant, faculty, and program at UCSD is Herbert F. York, who went to La Jolla in 1961 as the university's first chancellor.

York, now only 42, has been a University of California man for 21 years, with some time out for government service. In the 1940's and '50's he served in a succession of increasingly responsible faculty and administrative posts. A professor of physics and director of the Lawrence Radiation Laboratory, Livermore, York in 1958 went to Washington as chief scientist for the Defense Department's Advanced Research Projects Agency (ARPA) and then became director of defense research and engineering, the top R&D post in the Pentagon. In 1961 he left government and took the UCSD chancellorship.

York's task at San Diego can be likened to that of project manager responsible for seeing that deadlines are met successfully on construction, academic planning, and faculty recruiting. He has been an effective advocate of the San Diego operation, and his status as an old university hand has helped, since, in some quarters, the UCSD faculty is looked upon somewhat as the Sinn Feiners were in the early days of the Irish Free State.

By his own choice, York is to be replaced in the chancellorship by this summer. For reasons of health—he had some trouble with his heart while he was in Washington—and because his inclination is to move closer to science, he is ready to relinquish his general administrative duties at San Diego.

So another man will be in the chancellor's office when the first freshmen arrive next September and a new increment of 100 graduate students raises the total to 385.

San Diego ultimately will be one of the large universities in the California system, with 27,500 students. Berkeley enrollment is at that level, set by the Regents as a maximum, and UCLA will be there soon.

While San Diego expects growing pains, it believes its unique academic master plan will enable it to exploit the advantages for research of university organization while preserving the small college's virtues in teaching.

Collegiate System

Key to this plan would be the establishment on the university campus of semiautonomous colleges, scheduled to number 12 by the time maximum enrollment is reached. Each college would have about 2300 students, including lower and upper division undergraduates and graduate students. Each college would be staffed and equipped to give the average undergraduate about two-thirds of his work for a bachelor's degree. Each college would be expected to develop special strength in certain subject fields, and there would be some interchange of students among colleges for course work.

Enrollment is scheduled to reach 5450 by the academic year 1970–71, and full enrollment of 27,500 is anticipated in 1995.

The colleges would have dormitory and dining facilities for their students and some classroom and lab space. Major libraries, auditoriums and theaters, lecture halls for large classes, and big laboratories would be operated by the university.

Students would be admitted to colleges rather than to the university, but admissions would be the function of a central university office. Married students and commuters would be attached to colleges in the same way that resident students would be.

Most faculty members would be attached to some college, although it appears that there also would be some university appointments.

A dual departmental system would be created in the cause of fostering optimum conditions for both teaching and research. Each college would have departments and could group its departments into divisions on the familiar pattern. The colleges would also be encouraged to exercise a high degree of autonomy in setting their own rules on grades, probation, dismissal, and so forth—that is, to develop distinct institutional personalities.

A college, however, would have no jurisdiction over the programs of its graduate and professional students. For

in addition to the college departments there would also be university departments made up of all faculty members in a particular subject in all the colleges. The chairmen of the university departments would be appointed by the chancellor after consultation with the dean of graduate studies, and these university departments would oversee graduate education.

As a further superstructure to harbor research, institutes would be created. These are envisioned as interdisciplinary efforts in particular fields of research. These institutes generally would be located within colleges having strength in pertinent fields, but some might also be separately administered by the university.

On paper, the San Diego formula looks like a crossing of the familiar American plan and the system evolved in Britain's senior universities. Whether aspects of the Oxbridge system, with its federation of independent, separately endowed colleges and its time-tried unwritten constitution can be transplanted successfully remains to be seen.

Reconciling the demands of the college, the university, and the statewide university system in one institution will not be easy. And the biggest strain on UCSD's a priori plan will come as enrollment and faculty size grow and pressure is applied from outside for the university to accept more students faster.

Critics of San Diego claim that the university has had advantages not enjoyed by other new general campuses of its generation—Santa Cruz on the San Francisco peninsula and Irvine near Los Angeles, for example. San Diego has been living through a grace period when investments are heavy in relation to educational output. But the time is coming when the university will have to justify itself to the bookkeepers, since equity and the rules demand that the cost per student be comparable on all U.C. campuses.

The multicollege approach, in other words, must prove competitive with the monolithic university. UCSD partisans argue that it can, since good planning will avoid a duplication of facilities.

In case of serious trouble there is an escape route for UCSD, since the colleges will be added successively and there would be opportunity in the early stages of expansion to modify or change the shape of the university.

The San Diego faculty, however, seem convinced that they are not living a Utopian dream. The San Diego plan, they argue, provides a practical way to achieve the principle of tying research and teaching closely together.

One faculty member summed up the high expectations for both students and faculty at UCSD when he said, "we plan to treat the undergraduates like graduate students and the graduate students like colleagues." Beginning next September the question of whether students and faculty are up to such standards of performance will be put to the test.

Things may in fact not work out exactly according to the grand design. But the idealism, self-confidence, and academic daring in evidence at San Diego should make the university in the coming years one of the most interesting experiments in American higher education.—JOHN WALSH

Nuclear Stockpile: Data Suggest That in Absence of Clear Policy Reserves Just Growed and Growed

The cutback in production of fissionable materials announced simultaneously 2 weeks ago by Premier Khrushchev and President Johnson is not, as both were at such pains to emphasize, "disarmament." In terms of capacity to wage war, the cutback is essentially an agreement to continue arming at a somewhat slower rate than formerly. In other terms, however, the event is more significant, for it marks the first time the U.S. and the U.S.S.R. have shown the requisite common sense and courage to free themselves from a nuclear equivalent of the doctrine of conspicuous consumption. The two countries apparently reached this stage independently: the Administration had planned to cut back production of nuclear materials anyway (an earlier cut was announced in January), and merely enhanced its reputation for peace-making, as well as for economy, by persuading Khrushchev, who has rather similar needs, that this was a good time for him to do the same.

The result is an excellent example of an emerging pattern of Soviet-American understanding, the more secure for being rooted in self-interest. There is no written agreement and no plan for verification of compliance. But at the same time there is no threat to national security, and no self-sacrifice. We would maintain the production cut even if the Russians did not, for as Johnson has made abundantly clear, the production capacity in question represents surplus capacity. Khrushchev has said a trifle vaguely that he is discontinuing the construction of two big plutonium-producing reactors, and substantially reducing the production of uranium-235. Johnson, totaling the cutbacks announced in January with those presented last week, has committed the U.S. to a 40-percent reduction in production of enriched uranium and a 20-percent cutback in production of plutonium. Using almost identical phrasing, the two leaders said that more fissionable material would be allocated to peaceful uses. (Great Britain, which ceased nearly all production of fissionable material about a year ago, supported Johnson's move; France, seeking an independent nuclear deterrent, appeared uninfluenced by it.)

More interesting than the question of what is being cut back, however, is the question of what it is being cut back from. The full story of how our nuclear stockpile began and how it grew is difficult to unravel, because most of the relevant facts are classified. But some information is available, some inferences can be drawn, and a rough picture of the development of the system can be assembled.

In 1947 when the Manhattan Project was handed over to the newly established civilian Atomic Energy Commission, the United States had two gaseous diffusion installations for producing enriched uranium at the Oak Ridge, Tennessee, site, and three reactors for producing plutonium at Hanford, Washington. From the late 1940's to the middle 1950's, congressional interest in things atomic intensified, and more facilities for producing nuclear materials were added at Oak Ridge and Hanford. In addition, gaseous diffusion plants were established at two new sites—Paducah, Kentucky, and Portsmouth, Ohio—and additional plutonium reactors were established at a site at Savannah River, South Carolina. The grand total, at the end of 19 years of cold war, is three gaseous diffusion plants (Oak Ridge, Paducah, and Portsmouth), with 12 processing buildings, and two plutonium reactor sites (Hanford and Savannah River), with 13 reactors currently in operation. During the same period, seven chemical separation plants were built, of which four (two at Hanford, two