Federal Pay Scales Cause Empty Labs

An experienced scientist in government employ makes about $18,000 a year. He'll never make more than $26,000 at the current rate for top echelon people, but in the outside world, he might make double the money.

Chances are he is already in the outside world.

Only 10 percent of U.S. scientists work for the Government, mainly in chemistry and agricultural sciences. And the 4.5 percent pay raise for Federal employees recently proposed by President Johnson and now before the Congress is not likely to precipitate an onslaught of scientists and engineers in search of Government jobs. At best, it may slow the siphoning off of talent by industry and universities.

Civil Service Commission officials report employment headaches are getting worse. Two years ago, recruiting science graduates was a challenge. Now it's formidable: it's not only hard to get them, it's hard to keep them.

The shortage has reached such proportions that last month Washington launched a new program to entice graduates of junior colleges and technical schools into jobs as engineering aides and science assistants. The theory is that some of the gaps in scientific brain power can be filled by scientists who are freed from routine chores.

The scope of manpower problems varies from agency to agency, from discipline to discipline. The most conspicuous lack is in engineering and physical science. Though the space agency still offers enough glamor and challenge to draw qualified people in reasonable numbers, the Department of Defense is short several hundred first-rank scientists and engineers, with no relief in sight. DOD's high-power "think" affiliates such as the Institute for Defense Analyses and the Rand Corp. (which are outside Government salary scales) can fill their jobs, but even they say they are having trouble attracting the caliber of scientist they want.

University research projects, which ironically are often Government supported, seem to hold as much attraction as jobs in industry. In either case, the Government goes without.

Apart from the Federal establishment, the bulk of scientific talent in this country is evenly divided between academia and industry. Universities have 35 percent of 243,000 scientists reporting to the National Register in 1966; industry has 34 percent; statistically, the highest median salary reported by scientists in industry and business was $15,300. What the median figure doesn't tell is that starting salaries of $12,000 are the rule for physicists, chemists and engineers in industry and that $50,000 for "senior" talent is not uncommon. Government scientists start at $9,000 to $10,000 and can go only to $25,890.

Competition for engineers and physical scientists is significantly affected by salary because the nature and challenge of the work in business and Government is likely to be similar, Federal officials say.

In biological sciences, where Government vacancies are not as extensive, money is not so prime a factor. Biochemists, geneticists, pharmacologists and medical doctors who are looking for jobs probably weigh the virtues of Government versus universities, not industry. In this scale Government has a better chance. The National Institutes of Health, for example, pay young Ph.D's about $1,300 less to start than industry's $12,800. But NIH offers enough prestige and research opportunity to make up for it. However, equal footing gives way in competition for senior research scientists, and NIH officials fear a real decline in quality if the $25,890 pay ceiling isn't raised soon. The difference between $12,000 and $11,000 can be tolerated by a young scientist who feels Government service gives him certain professional advantages. But when a 40-year-old man with three children has to choose between $25,000 at NIH and $45,000 at a medical school, he's going to go back to the university.

The President's 4.5 percent pay boost doesn't apply to anyone above the $17,550–$23,013 pay level. Despite its effort to approach equivalency with industry, so far it does nothing to alleviate the problem at the top.

However, the proposal does call for parity of pay with private industry, even at upper levels, by 1969.

A special committee, headed by Frederick R. Kappel, retired board chairman of American Telephone and Telegraph Company, has been named by the President to study and recommend changes in top Federal salaries.

Comparative Median Salaries

	Government	Universities	Industry
Chemistry	$12,000	$11,000	$12,800
Meteorology	$11,700	$12,000	$12,000
Physics	$12,900	$11,000	$14,600
Mathematics	$12,900	$11,000	$13,500
Agricultural Sciences	$10,000	$12,000	$10,000
Biological Sciences	$12,500	$13,100	$13,900

National Science Foundation

Ph.D. Reform in Social Sciences

The social sciences and humanities, long the poor relations of graduate education in the United States, are about to come into their own—thanks to a large infusion of non-Governmental money.

Ten major universities and the Ford Foundation are taking a lead in the fields that Congress has been urging on Federal planners in recent months. They have announced a joint seven-year program of some $200 million in grants to graduate students. The universities are contributing $160 million, and the Foundation $41,5 million.

The total equals some 10 percent of the funds the Federal Government is now spending yearly on the same disciplines. Washington, however, will pick up some of the universities' matching expenditures.

Though the program is starting with 10 outstanding universities, it will be expanded. The Foundation expects to provide funds totaling "several million dollars over the next five or six years" to additional graduate schools for specific Ph.D. program reforms.

The Ford Foundation, in announcing the effort, expressed concern with more than simply increasing the level of support for Ph.D.-oriented programs. It seeks to streamline the Ph.D. program, allowing candidates to slice three years off their current time.

Currently, graduate students in the social sciences and humanities, principally for lack of funds, spend 7.5

years in pursuit of their degrees. Candidates in the physical and biological sciences—where Washington directs almost all of the $2 billion a year it spends in support of university research—are through in five.

"The key to the reform," said the Foundation announcement, "will be the establishment of patterns of continuous full-time study and apprentice teaching, in most cases by a regular four-year program leading to the Ph.D. degree."

Some 10,500 doctoral candidates will be affected directly during the seven-year period.

How much and what kinds of reform the money buys, however, is up to the individual university. Harvard, for instance, plans to incorporate teaching into the doctoral program. Since most candidates eventually become professors, the teaching experience should be a valuable part of their education, "not a chore imposed by financial need," notes Dean J. Peter Elder of the Graduate School of Arts and Sciences.

At the same time, undergraduates deserve the best tutors and assistants, says Dean Elder.

Assistant teaching is often described as "slave labor" by unwilling, penny-poor graduate students.

The new grants will cover 25 percent of the humanities and social science candidates at Harvard. But Dean Elder expects the program to have "rub-off value" for other students, and especially for faculty. A classicist himself, Dean Elder views as outdated the "genteel, 19th century tradition" that a student should spend years in study.

Whether or not the grants cover behavioral sciences depends on the university. The Foundation expects they will; Harvard however, plans to include only social psychology, along with sociology, anthropology, economics, political science and history. The University of Chicago is aiming its grants at economics, political science and history among the social sciences.

The eight other universities are the University of California, Berkeley; Cornell, University of Michigan, University of Pennsylvania, Princeton, Stanford, University of Wisconsin and Yale.

Pre-life on Jupiter?

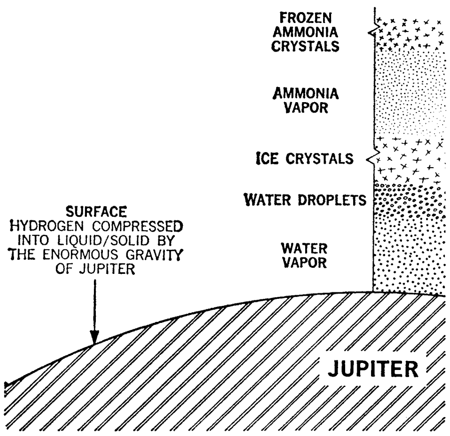
The planet Jupiter has an atmosphere of ammonia, methane and water, believed similar to that of earth some four and one-half billion years ago.

The largest planet of the solar system, with a diameter of 87,000 miles, was long thought to be completely hostile to any form of life.

No one knows exactly what hides underneath its impenetrable deep cloud cover. However, scientists simulating Jupiter's atmosphere in a laboratory have produced many of the building blocks of life, lending support to the possibility that life may exist on the planet.

The experiments were reported to the American Chemical Society meeting in Miami by Dr. Cyril Ponnamperuma and Fritz Woeller of the National Aeronautics and Space Administration's Ames Research Center.

They found that energy transfer and chemical processes in the turbulent



atmosphere of the huge planet may produce organic compounds found in amino acids and living cells. These processes are similar to those believed to have produced life on earth.

The scientists used electrical discharges, simulating lightning, as the energy source to produce the pre-life molecules from an atmosphere of ammonia and methane. Only water was needed to turn these particles into even more complex organic molecules.

The extremely low temperature of the top of Jupiter's atmosphere, estimated at 356 degrees below zero F, did not interfere with the production of organic compounds.

The laboratory simulations of Jupiter's atmosphere drew on the work of Drs. P. E. J. Peebles of Princeton University, Roger M. Gallet of the National Bureau of Standards, and E. J. Opik of the Armagh Observatory in Northern Ireland, among others.

They proposed models of Jupiter's atmosphere based on gravitation studies and behavior of the planet's moons, and on spectroscopic analyses of sunlight reflected from the planet.

Jupiter is believed to have a stratified atmosphere. All its layers are believed to contain substantial amounts of methane, hydrogen, helium, ammonia and neon.

Despite its huge size, Jupiter rotates once every 10 hours. This produces a rapid alternation of warm and cold and is believed to produce added atmospheric mixing and electric discharge.

Scientists have previously found that certain common bacteria and fungi can multiply on earth in an artificial atmosphere having high concentrations of both ammonia and methane.

The simulation experiments add further evidence to the possibility that life might exist on the most massive planet in the sun's family.

Fingerprinting the Moon

When astronauts bring back pieces of the moon, the samples will be identified in much the same way as the FBI identifies a burglar. A "fingerprint" file will be built in Houston, Texas, containing the radioactive prints of earthly and extraterrestrial material. Scientists will check the emissions of the lunar samples against the file.

The technique, in addition to identifying the minerals in a sample will also tell much about the origin and history of the moon.

These plans were outlined to some 9,000 chemists and chemical engineers from around the world last week in Miami Beach during the spring meeting of the American Chemical Society.

Dr. G. Davis O'Kelley of Oak Ridge National Laboratory described the lunar "fingerprint" technique, already working in prototype in his lab. The amount and energy of radioactive decay particles leaving the lunar samples will be measured by their impact on crystals of sodium iodide doped with 0.1 percent thalium. The patterns will be compared with those of earthly material as well as with meteorites.

Radioactivity from the fission of heavy atoms, and that induced by high energy cosmic rays, will be compared to learn the approximate age of the moon, and whether it was torn from the primordial earth or captured in its travels by earth's gravity.

The analyses will be done in NASA's Manned Space Flight Center in Houston where the samples will be quarantined for a month after arrival from the moon.

During the week-long session, the chemists also heard about more earth-bound matters, including unwanted human fat.

Dr. Eli Seifter, of the Albert Einstein College of Medicine at Yeshiva University, New York, reported on a bodily substance that breaks down stored fats. Called a lipid mobilizer, it might be used, he said, to slim obese people. Currently, he is testing the hormone-like substance, reclaimed from cow and pig pituitary glands, on rabbits, to see if it adversely affects their livers. If no damage is done, human experimentation is possible.