ations will measure gravitational irregularities, or gravitational anomalies, on the earth and determine more precisely the distribution of matter within the earth. These results will derive from a great many precision observations of satellites for which atmospheric drag can be calculated with assurance—in other words, circular satellites, giving a uniform cross section for atmospheric resistance. Figure 7 shows the variations in the change of orbital period for 1957β1 as derived by L. G. Jacchia (*6*). The elongated object presented a varying frontal area with consequently great irregularities of motion. Predictions for such satellites can be made only a few days in advance, and variations in atmospheric density cannot readily be measured. The rocket stage of 1958β gives great promise of being extremely valuable for these geodetic purposes because of the great perigee distance. Even though the drag itself may not be predictable with precision, its amount is so small that good results are to be expected from precision observations of the rocket stage. The satellite itself, of course, can scarcely be the object of routine observations by any of the available photographic techniques. A more massive satellite, therefore, in an orbit with a very high perigee is the most desirable type for such geodetic investigations, and we expect such satellites to be launched in the near future.

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News of Science

Rockefeller Panel Urges Education Changes

On 22 June the Special Studies Project of the Rockefeller Brothers Fund released a report by its Panel V on "The Pursuit of Excellence: Education and the Future of America." The panel consisted of 15 educators and editors headed by John W. Gardner, president of the Carnegie Corporation of New York. Earlier reports in the Special Studies series have examined military security, economic and social matters, and foreign trade policy.

Following is the report as excerpted in the *New York Times*. The full report has been published as a Doubleday News Book.

I. The Dignity of the Individual

Ultimately the source of a nation's greatness is in the individuals who constitute the living substance of the nation. A concern for the realization of individual potentialities is deeply rooted in our moral heritage, our political philosophy, and the texture of our daily customs.

Our devotion to a free society can only be understood in terms of these values. It is the only form of society that puts at the very top of its agenda the opportunity of the individual to develop his potentialities. But in its deepest sense our concern for human excellence is a reflection of our ideal of the overriding importance of human dignity.

Our success or failure in this task is of crucial importance not for ourselves alone. All over the world peoples are striving for a new and fuller meaning of life. No challenge is more important than to give concrete meaning to the idea of human dignity.

II. The Nature of the Challenge

A. The setting of the problem: our population characteristics. Since 1950 on an average day there has been a net rise of about 7600 in the population; over the year, a rise of some 2,800,000. This may give us a population of not quite 225,000,000 by 1975.

The age composition of the population in 1975 will differ markedly from that of 1955. The recent baby boom will have resulted in an enormous increase in age groups 15 to 24; and as our present middle ages attain the later brackets, there will be a large increase in the age 65 and over.

This pattern of future population will present two vital problems. The first concerns the flood of young people who will place an immense pressure on educational institutions in the next 20 years, and on the labor market shortly thereafter. The second problem involves the social and individual problems posed by a rapidly expanding older group.

B. *The changing demands of society and the pressure on the supply of talent.* One of the striking features of contemporary life is the growing range and complexity of the tasks on which our social organization depends. This is dramatically apparent in science but is no less a reality in nearly every field of endeavor.

The demand for highly trained talent is not a sudden development. It has been coming for a long time. The increase in skill and training needed by our labor force can be expected to accelerate in the years ahead. Automation will reduce the number of routine jobs and will replace them by more demanding tasks of supervision, maintenance and regulation in addition to the production of the machines themselves.

There is a constant pressure by an ever more complex society against the total creative capacity of its people. Our most critical need a decade hence may be unknown today. Rather we must prepare ourselves for a constant and growing demand for talents of all varieties, and must attempt to meet the specific needs of the future by elevating the quality and quantity of talented individuals of all kinds.

One of our great strengths as a people has been our flexibility and adaptability under the successive waves of change that have marked our history. Never have we needed the trait more than today. It is for this reason that we should educate our young people to meet an unknown need rather than to prepare them for needs already identified.

C. The problem of change. One of the characteristics of a dynamic society is that its frontiers are constantly changing. The frontier of today becomes the familiar territory of tomorrow.

A dynamic society requires above all receptivity to change.

D. The social ceilings on individual

performance. A consequence of the complexity and specialization of modern society has been the increasing prominence of organization in our lives. But while complex organization is necessary, it is also costly. It is often a stifling atmosphere for the exercise of individual creativity, and it may induce a conformity that becomes a threat to the society's vitality.

E. Excellence in a democracy. The eighteenth-century philosophers who made equality a central term in our political vocabulary never meant to imply that men are equal in all respects. Nor do Americans today take such a view. It is possible to state in fairly simple terms the views concerning equality which would receive most widespread endorsement in our country today. The fundamental view is that in the final matters of human existence all men are equally worthy of our care and concern. Further, we believe that men should be equal in enjoyment of certain familiar legal, civil and political rights. They should, as the phrase goes, be equal before the law.

But men are unequal in their native capacities and their motivations, and therefore in their attainments. In elaborating our national views of equality, the most widely accepted means of dealing with this problem has been to emphasize equality of opportunity.

The great advantage of the conception of equality of opportunity is that it candidly recognizes differences in endowment and motivation and accepts the certainty of differences in achievement. By allowing free play to these differences it preserves the freedom to excel which counts for so much in terms of individual aspirations, and has produced so much of mankind's greatness.

Every democracy must encourage high individual performance. If it does not then it closes itself off from the mainsprings of its dynamism and talent and imagination, and the traditional democratic invitation to the individual to realize his full potentialities becomes meaningless.

With respect to the pursuit of excellence there are several considerations that we must keep firmly in mind. First, our conception of excellence must embrace many kinds of achievements at many levels. Second, we must not assume that native capacity is the sole ingredient in superior performance. Excellence is a product of ability and motivation and character. Finally, we must recognize that judgments of differences in talent are not judgments of differences in human worth.

III. The Educational System

A. The informal educational system. The formal educational system offers only part of the purposeful education that goes on in a society. Family, church, and school share the fundamental responsibility for education. But in a sense every institution in a society is constantly teaching its members, molding their behavior, contributing to their development: in childhood it may be the scout leader, the playground director, the policeman on the corner; in later years the employer, the union, the mass media.

The most effective educational system can be defeated by a social environment that blunts or destroys aspiration. There can be no striving for excellence without models to inspire emulation.

B. The formal educational system. Our schools are overcrowded, understaffed, and ill-equipped. In the fall of 1957, the shortage of public school classrooms stood at 142,000. There were 1,943,000 pupils in excess of "normal" classroom capacity. These pressures will become more severe in the years ahead. Elementary school enrollments will rise from some 22,000,000 today to about 34,000,000 by 1960–1961. By 1969 high schools will be deluged with 50 to 70 percent more students than they can now accommodate; by 1975, our colleges and universities will face at least a doubling and in some cases a tripling of present enrollments.

If we are to meet these pressures, our schools will need greatly increased public support and attention, and much more money. But they also need something besides money: an unsparing reexamination of current practices, patterns of organization, and objectives.

From time to time one still hears arguments over quantity versus quality education. Behind such arguments is the assumption that a society can choose to educate a few people exceedingly well or to educate a great number of people somewhat less well, but that it cannot do both. But a modern society such as ours cannot choose to do one or the other. It has no choice but to do both.

C. The teaching profession. The number of new school teachers needed in the next decade is between one-third and one-half of all the four-year college graduates of every kind in the same period. The danger of a decline in the quality of our corps of teachers is obvious.

The problem of recruitment is inseparable from the preparation required to enter the teaching profession. If the programs for the preparation of teachers are rigid, formalistic and shallow, they will drive away able minds as fast as they are recruited. Unhappily, preparation for pre-college teaching has come all too close to that condition. In some states the requirements for certification are so technical and trivial as to make it unlikely that individuals with a first-class liberal education would even apply—or be eligible if they did apply.

Fortunately, there appears to be a lively movement to correct these difficulties. As for the preparation of college teachers, the problem is one of reforming and expanding graduate education. There has been more emphasis on research and research training than on the preparation of teachers.

But even with aggressive recruitment there appears to be little or no likelihood that we can bring into teaching at any level anything approaching the number of qualified and gifted teachers we need. We can be certain that there will never be enough teachers with the extraordinary human gifts which make for inspired teaching. We must therefore utilize our superior teachers more effectively.

One way to make better use of the ablest teachers is to eliminate many of the petty tasks which occupy a teacher's time. Less highly trained classroom assistants may accomplish much in the lightening of this burden. Another measure is the employment of such devices as television to bring extraordinarily effective teachers into contact with larger numbers of students than they would otherwise face. Films may be similarly useful.

Such innovations as the teacher aide and television should not be thought of as stopgap measures to surmount the immediate teacher shortage, but of the beginnings of a long overdue revolution in teaching techniques.

But the root problem of the teaching profession remains financial. Salaries must be raised immediately and substantially. Almost as important is the fact that promotional policy for most school systems is routine and depends much more on seniority than on merit.

D. The curriculum. At the pre-college level, the gravest problem today is to reach some agreement on priorities in subject-matter. This problem is particularly critical for those academically talented students who will go on to college. Without presuming to lay down an inflexible set of recommendations, we may suggest what these high-priority items in a solid high school curriculum might be for those of considerable academic ability:

In addition to the general education prescribed for all—four years of English, three to four years of social studies, one year of mathematics and one year of science—the academically talented student should have two to three additional years of science, three additional years of mathematics, and at least three years of a foreign language. For certain students the study of a second foreign language, for at least three years, might replace the fourth year of mathematics and the third year of science.

Particularly with respect to the highest-priority subjects, we must modernize

and improve the quality of the courses themselves.

E. Science education. The crisis in our science education is not an invention of the newspapers, or scientists, or the Pentagon. It is a real crisis.

The U.S.S.R. is not the "cause" of the crisis. The cause of the crisis is our breath-taking movement into a new technological era. The U.S.S.R. has served as a rude stimulus to awaken us to that reality.

The heart of the matter is that we are moving with headlong speed into a new phase in man's long struggle to control his environment, a phase beside which the industrial revolution may appear a modest alteration of human affairs. Nuclear energy, exploration of outer space, revolutionary studies of brain functioning, important new work on the living cell—all point to changes in our lives so startling as to test to the utmost our adaptive capacities. We need quality and we need it in considerable quantity! We must develop guidance efforts designed to reach all able youngsters, and we must engage in a major expansion of the facilities for science teaching.

There is a danger of training scientists so narrowly in their specialties that they are unprepared to shoulder the moral and civic responsibilities which the modern world thrusts upon them. But just as we must insist that every scientist be broadly educated, so we must see to it that every educated person is literate in science.

F. The identification of talent and the uses of diversity. One of the most important goals of any education system is to identify and guide able students and to challenge each student to develop his capacities to the utmost. Tests are most effective in measuring academic aptitude and achievement.

Used with a sound understanding of their strengths and limitations, present testing procedures can contribute significantly to a program of talent identification.

But testing procedures unwisely used can do harm. A few basic considerations must be understood: First, tests are effective on a limited front. Second, no single test should become a basis for important decisions. Third, test scores are one kind of data to be placed alongside other kinds of data.

The identification of talent is no more than the first step. It should be only part of a strong guidance program. As many teachers as possible should be trained to take part in it. As many high schools as possible should have special guidance officers.

The objective of all educational guidance should be to stimulate the individual to make the most of his potentialities. The fact that a substantial fraction of the top quarter of high school graduates fail to go on to college is a startling indictment of our guidance system.

The general academic capacity of students should be at least tentatively identified by the eighth grade as the result of repeated testings and classroom performance in the elementary grades. An adequate guidance system would insure that each student would then be exposed to the sort of program that will develop to the full the gifts which he possesses.

Our schools have made far more progress in identifying different levels of talent than in the development of programs for these different levels. Adequate attention to individual differences means rejecting a rigid policy of promotion by age; and it means sensible experimentation with various kinds of flexibility in the curriculum to meet the varying needs of young people.

A more special problem is presented by the top 2 percent of the high school population. For this group particularly the Advanced Placement Program is important. Under this, an expanding number of secondary schools, both public and private, are offering college-level courses to their best juniors and seniors. Many colleges are prepared to permit such students to "leapfrog" freshman college courses and get credit for them. Another approach is represented by the experimental Program for Early Admission to College, under which about 1000 able students have entered twelve different colleges over the last five years before completing the last year or two of high school.

G. Financing. All of the problems of the schools lead us back sooner or later to one basic problem—financing. It is a problem with which we cannot afford to cope half-heartedly. An educational system grudgingly and tardily patched to meet the needs of the moment will be perpetually out of date.

It is likely that ten years hence our schools and colleges will require at least double their present level of financial support.

It is the weakness in the state and local taxing systems more than anything else that gives rise to current proposals for increased federal support of education. For those who wish to resist or postpone the resort to federal funds and at the same time not constrict educational services there seems to be only one alternative: a thorough, painful, politically courageous overhaul of state and local tax systems.

Federal programs in education now exist on a large scale. It is certain that they will increase both in scale and in variety. There are educational problems gravely affecting the national interest which may be soluble only through federal action.

It would be well to bear in mind four principles in appraising proposals for federal support of education: (i) The Federal Government should address itself to those needs which educational leaders have identified as having a high priority. (ii) Federal funds should constitute one source of support among many. State, local and private sources of funds should continue to be the major factor in the support of education. (iii) It should preserve local leadership and local control over education. (iv) It should be based on a recognition that the Government inevitably exercises a certain leadership function in whatever it does.

Perhaps the most popular form of federal support for education is the scholarship program. Scholarships involve a minimum hazard of federal interference. As long as very few institutions charge tuition covering the full cost of education, a scholarship program which enables the student to pay his tuition should provide the college with a supplementary grant to make up the full cost of his education.

To the extent that the Federal Government can assist in building construction, either through loans or outright grants, it will be engaging in one of the most helpful and least hazardous forms of support to education.

The share of privately financed colleges and universities of total enrollments has already declined to well below 50 percent; and within fifteen years their share of students could easily be closer to 25 percent.

Unquestionably the solution for the privately financed institutions lies not in any one device but in the simultaneous exploration of numerous paths—both for cutting costs and for raising money: for example, eliminating unnecessary frills in the curriculum; sharing facilities with neighboring institutions; dropping the extravagant notion that every institution must offer a carbon copy of the curriculum offered by every other institution; making radically better use of physical facilities; raising tuition; cultivating increased corporate and alumni giving; and obtaining certain kinds of federal support.

Unless changes such as these are carried out there is real danger that the influence of private higher education will progressively decline.

IV. The Use and Misuse of Human Abilities

A. The inadequate use of talent. 1) *The fuller use of underprivileged minorities.* Primary among these groups, is, of course, the Negro, who has been disadvantaged economically as well as politically and socially in the United States. The end of segregation, with all the difficult adjustments it imposes, is of course a step in the right direction. Legislation such as fair employment practices acts will add a necessary stimulus to private

reorientation of attitudes. Until the Negro has been offered equal opportunity with the non-Negro to develop and use his individual talents to the utmost, and until he can be encouraged to make the most of his opportunity, we shall have failed to achieve our moral goal.

2) *Better use of the talents of women.* One out of every three workers in our regular labor force of nearly 70,000,000 is a woman. To this already large contribution, we can expect a substantial increase over the next decades due to the age composition of our population. There are still relatively few professional fields beyond nursing and teaching in which women participate extensively. Many firms still hesitate to use women in executive capacities or to include in executive training programs even those women who expect to remain in employment.

3) *The rehabilitation of economically depressed areas and segments of the population.* The nation is paying a high price for its depressed areas in terms of the wastage of human abilities.

4.) *Better use of older workers.* Only for a portion of older people has retirement with economic security become a treasured period of leisure when one can do "what one always wanted to." For others it is a dreaded break in the texture and tempo of life, leading to personal dissatisfaction on the one hand, and to wasted ability on the other. Remedial action might take the form of a later retirement age. Or it might involve the development of special job opportunities for people over 65. Such opportunities have already been provided in college teaching: the professor retiring from one campus may be hired on special status by some other college.

B. The use of talent in large organizations. Every corporation, union, government agency, military service and professional group should—in its own best interest as well as that of its personnel—conduct a never-ending search for talent within its own staff.

Sometimes a change of jobs is extremely useful in lifting the individual out of his rut and exposing him to new challenges. In this connection it must be noted that nontransferable pension and benefit plans weaken the incentives of men and women to move to positions where better use could be made of their capacities and experience. There seems to be a need for more vesting of pension rights, so that the employee who moves to another job need not leave behind years of accumulated benefits.

Improved opportunities for further education within employing organizations and under community auspices can help mature people to test their own unexplored interests and abilities and to develop their potentialities more fully.

One consequence of the scarcity of professional skills is the hoarding of talent—a practice visible in a good many areas of government, business and academic life.

V. Motivation and Values

Some of our more discerning critics are uneasy about the current aspirations and values of Americans. They sense a lack of purpose in Americans; they see evidence that security, conformity, and comfort are the idols of the day; and they fear that our young people have lost youth's immemorial fondness for adventure, far horizons and the challenge of the unpredictable.

Fortunately we do not need to decide whether the situation is seriously deplorable or only mildly so. The truth is that never in our history have we been in a better position to commit ourselves wholeheartedly to the pursuit of excellence in every phase of our national life. Intellectual and moral excellence has come to play a uniquely important role. It is essential that we enable young people to see themselves as participants in one of the most exciting eras in history and to have a sense of purpose in relation to it.

Still another challenge is that of providing "models" for young people. The life goals of young people are in considerable measure determined by the fact that they identify themselves with admired figures in the adult world.

If we ask what our society invites in the way of high performance we are led to the conclusion that we may have, to a startling degree, lost the gift for demanding high performance of ourselves. It is a point worth exploring.

What most people, young or old, want is not merely security or comfort or luxury—although they are glad enough to have these. They want meaning in their lives. If their era and their culture and their leaders do not or cannot offer them great meanings, great objectives, great convictions, then they will settle for shallow and trivial meanings. People who live aimlessly, who allow the search for meaning in their lives to be satisfied by shoddy and meretricious experiences have simply not been stirred by any alternative meanings—religious meanings, ethical values, ideals of social and civic responsibility, high standards of self-realization.

This is a deficiency for which we all bear a responsibility. It is a failure of home, church, school, government—a failure of all of us.

No inspired and inspiring education can go forward without powerful undergirding by the deepest values of our society. The students are there in the first place because generations of Americans have been profoundly committed to a republican form of government and to equality of opportunity. They benefit by a tradition of intellectual freedom because generations of ardent and stubborn men and women nourished that tradition in Western civilization. Their education is based upon the notion of the dignity and worth of the individual because those values are rooted in our religious and philosophical heritage.

We would not wish to impose upon students a rigidly defined set of values. Each student is free to vary the nature of his commitment. But their freedom must be understood in its true light. We believe that the individual should be free and morally responsible: the two are inseparable. The fact that we tolerate differing values must not be confused with moral neutrality. Such tolerance must be built upon a base of moral commitment; otherwise it degenerates into a flaccid indifference, purged of all belief and devotion.

In short, we wish to allow wide latitude in the choice of values but we must assume that education is a process that should be infused with meaning and purpose; that everyone will have deeply held beliefs; that every young American will wish to serve the values which have nurtured him and made possible his education and his freedom as an individual.

Members of the Panel

John W. Gardner (chairman), president, Carnegie Corporation of New York; president, Carnegie Foundation for the Advancement of Teaching.

J. Douglas Brown, dean of faculty, Princeton University; former member, Mobilization Program Advisory Committee, Office of Defense Mobilization.

Lowell T. Coggeshall, dean of the Division of Biological Sciences, University of Chicago; former special assistant for health and medical affairs, Department of Health, Education, and Welfare; president, Association of American Medical Colleges; president, American Cancer Society.

Philip H. Coombs, secretary and director of research, the Fund for the Advancement of Education, Ford Foundation; former executive director, President's Materials Policy Commission; faculty member, Amherst and Williams colleges.

Dana L. Farnsworth, director, university health services, Harvard University and Radcliffe College; president, Group for the Advancement of Psychiatry; physician, Massachusetts General Hospital.

Eli Ginzberg, professor of economics, Columbia University; director, Conservation of Human Resources, and director of staff studies, National Manpower Council.

Caryl P. Haskins, president, Carnegie Institution of Washington.

Theodore M. Hesburgh, president, University of Notre Dame; commis-

sioner, Civil Rights Commission; member, National Science Board.

Margaret Hickey, public affairs editor, *The Ladies' Home Journal.*

David Reisman, professor, sociology department, University of Chicago.

J. E. Wallace Sterling, president, Stanford University.

Howard E. Wilson, dean, School of Education, University of California, Los Angeles.

Dael Wolfle, executive officer, American Association for the Advancement of Science; former director of the Commission on Human Resources and Advanced Training.

Fred M. Hechinger, associate publisher, The *Bridgeport Herald;* education editor, *Parents Magazine.*

James R. Killian, Jr., president, Massachusetts Institute of Technology; Special Assistant to the President.

New RCA Electronic "Eye"

An extremely sensitive electronic "eye" which may disclose previously unseen details of the planets and distant nebulae, permit visual reconnaissance in almost complete darkness, and provide a powerful new tool for scientific research, has been developed by scientists of the Radio Corporation of America.

The new device is a developmental, advanced type of camera tube, based on television principles and known as the Intensifier Orthicon. In contrast to the conventional Image Orthicon, which is used in present television pick-up functions, the new tube employs either one or two "intensifier" stages between the light-sensitive pickup surface at the front of the tube and the signal output assembly at the rear. The tube was developed by George A. Morton and John E. Ruedy at RCA's David Sarnoff Research Center, Princeton, N.J., in a research program sponsored by the Aeronautical Research Laboratory at the Wright Air Development Center.

According to Morton, the new Intensifier Orthicon is probably 100 times more sensitive than the fastest known photographic film for the same exposure time at extremely low levels of light. It can "see" in surroundings which appear completely dark to the human eye, achieving a sensitivity that approaches the fundamental limit set by photon statistics, Morton claims.

Discussing the various possible applications of the new instrument, Morton emphasized its value in astronomy as a viewing system coupled with a telescope to overcome the effects of the earth's atmospheric turbulence in viewing planets and nebulae. He also mentioned its value in the amplification of dim images such as the light traces left by the passage of high-speed subatomic particles in nuclear research.

Radio Telescope in California

The University of California at Berkeley is planning to enter the field of radio astronomy. Plans call for the erection of an 85-foot radio telescope to be built at a site to be selected as soon as possible. Total cost of the project is estimated at about $500,000. The Office of Naval Research will provide $368,000 for the telescope, and the university will provide $150,000 for land and buildings.

Medical Communication

The Institute for Advancement of Medical Communication, a nonprofit organization, was recently formed to develop ways to increase the efficiency of information exchange among medical scientists, medical educators, and practising physicians. The institute plans to devise and test new methods of disseminating medical information and to serve as an information center for medical organizations that request help with communication problems. The work of the institute will be financed by general and research grants both from private foundations and from the Government.

The charter members of the board of directors are Chauncey D. Leake, professor of pharmacology and assistant dean, College of Medicine, Ohio State University; Homer W. Smith, professor of physiology, College of Medicine, New York University; and Irving S. Wright, professor of clinical medicine, Cornell University. Richard H. Orr, assistant editor of the journal *Metabolism* and former medical director of Grune and Stratton, Inc., will serve as executive director. An advisory board is in the process of being selected. The temporary headquarters of the institute are at 37 E. 67 St., New York 21, N.Y.

Training Reactor in Puerto Rico

On 30 June the Atomic Energy Commission signed a letter contract with AMF Atomics for a pool-type nuclear training and research reactor to be built at the commission's Puerto Rico Nuclear Center in Mayaguez. AMF Atomics is a division of American Machine and Foundry Company and is located in Greenwich, Connecticut. The Puerto Rico Nuclear Center was established by the AEC on 2 October 1957 as a part of the Atoms-for-Peace program.

Under the terms of the agreement, AMF Atomics will design, fabricate, install, and test a 1000-kilowatt (heat), forced circulation, pool-type reactor at the center, which is located adjacent to Mayaguez campus of the University of Puerto Rico.

The reactor, scheduled for completion in mid-1960, will contain features permitting future operation at power levels up to 5000 kilowatts with minimum modifications. The reactor, to be designed for use both as a training and a research facility, will include a thermal column with both horizontal and vertical access, six experimental beam holes, and a dry gamma irradiation facility.

The first phase of the construction program will be completed in 1960. Facilities included in the first phase are the reactor, a laboratory and training building, and a greenhouse for agricultural training and research. All of these facilities will be at Mayaguez.

The center has as its goal the development of a comprehensive program for training and research in nuclear science and engineering, and the peaceful application of nuclear energy to medicine, agriculture, and industry. The program will be available to students in all of the American republics. Four sessions of the radioisotopes training course have already been completed, and courses in nuclear science and technology are being offered at the university's campuses at Mayaguez and Rio Piedras. Instruction generally is provided in Spanish. Charles Bonilla is director of the center.

Scientists in the News

GEORGE R. THURMAN has been named director of the Monterey, Calif., engineering laboratory of the guided missile division of the Firestone Tire and Rubber Company. Thurman, who has been manager of the Firestone defense research division in Akron, Ohio, succeeds Captain FRANK W. MacDONALD (U.S. Navy, retired). V. E. LUCAS, who has been assistant manager of the defense research division, succeeds Thurman as manager of that division.

EMERSON W. CONLON, general manager of the Turbomotor Division of the Curtiss-Wright Corporation, has been named director of engineering and scientific research and professor of mechanical engineering at Drexel Institute of Technology.

BETTY M. WATTS, professor of foods and nutrition at the Florida State University, Tallahassee, has been selected by the American Meat Institute Foundation as the recipient of the F. C. Vibrans' Senior Scientist Award for 1958.