demic "slave markets" held during the recent Christmas-season professional meetings, but conversations with faculty members, including some who can display letters containing attractive offers from respectable institutions, suggest otherwise.

In the internal affairs of the institution, one of the most beneficial effects of the crisis was that it helped sweep away a good deal of the fantasy that frequently accompanies the quest for rapid excellence. In the upward climb, imagery has a part to play in attracting talent and money, but images conjured up for outside consumption can have a demoralizing internal effect if they don't match reality, and in the case of Pitt there were situations where harmony was lacking. On the basis of Pitt's own pronouncements, for example, the academic world had been led to believe that Pitt's faculty salaries were extremely high. But the crisis led to some careful introspection by faculty study groups, one of which concluded: "There are . . . impressions abroad that Pitt built its faculty by rather fantastic salary offers. Nothing could be further from the truth so far as the disciplines are concerned." The study went on to show that, in the natural sciences, the average salary at the professorial rank, with the exclusion of a handful of endowed chairs, was $11,853 for 9 months. And for associate professors it was $8270.

In a sense, the Pitt story is the story of private higher education all over the country. Endowment, which brings a return of only 4 or 5 percent a year, is becoming pitifully inadequate for meeting rapidly growing financial requirements. A million dollars of endowment is hard to come by, but once it is in hand, it provides only $40,000 or $50,000 a year. To meet the financial appetite of a university, there is nothing quite like a state treasury, and it is to this that Pitt is turning for the future. Pennsylvania is virtually unique in that its treasury may provide funds for private institutions of higher learning.

Last year, in addition to the regular appropriation for Pitt, the state provided an emergency grant of $5 million to help through the crisis. It is Pitt's hope that the legislature will bring it into something resembling the so-called Temple Plan, under which the state provides Temple University with a substantial annual appropriation. In return for this, the tuition has been greatly reduced, and the state appoints several members to the university board. In the case of Pitt, the details are still to be worked out, but those who command the university's affairs hope that the state will help meet a great portion of the costs of undergraduate education, while local wealth—which is said to be in a mood to resume giving, once the university's financial affairs are in order—will provide substantial funds for special programs and the graduate departments.

In the surrounding community the crisis appears to have provided some lessons as to what a university is all about. The medical faculty, long the most favored object of local philanthropy, has told its benefactors that it cannot thrive intellectually while the rest of the university is suffering for lack of funds. Leon Falk, Jr., whose family fortune was largely committed to the health professions at Pitt, frankly states, "I should have realized this a long time ago. I didn't, but now I do." The board, in direct response to faculty concern over the future of the university, has publicly committed itself to "sound fiscal policy" and a "determination to do everything in its power to maintain the standards which have been achieved and to foster growth toward the University's established goals. . . ." Skeptics may recall similar words in the past, but Pitt has been through a powerfully cathartic experience. The experience may have been one of those blessings in disguise—very well disguised. But valuable, though painful, lessons have been learned all around, and there is a reasonable chance now that Pitt will resume its progress toward excellence, a bit more slowly and quietly, but nevertheless in the right direction.—D. S. GREENBERG

(*Last of a series*)

Food and Drug Administration: Test for Leadership Vaccine

At a news conference held a few days after James L. Goddard was sworn in as new commissioner of the Food and Drug Administration, his boss, Department of Health, Education, and Welfare Secretary John W. Gardner, was quoted as saying that Goddard "has perhaps the most difficult job in Washington."

With the backing of the White House, Gardner had broken long precedent by reaching outside the FDA for a new commissioner. The 42-year-old Goddard, a medically trained Public Health Service career man, was at the time of his appointment serving as director of the PHS Communicable Disease Center in Atlanta.

Gardner broke a different sort of precedent by pointedly pledging "the strongest sort of support" his office can provide to Goddard. HEW secretaries in the past have usually concerned themselves with high-level budgetary and legislative matters and have taken care not to lash themselves to the mast of any constituent operating agency navigating stormy waters.

Gardner chose the occasion of Goddard's swearing-in ceremony in January to make public the report of an internal HEW committee which had been assigned the task of suggesting criteria for selecting a commissioner and identifying major problems facing the agency (see box, page 802).

The committee was headed by Rufus Miles, a former HEW assistant secretary for administration. Other members were Edward Dempsey and Boisfeuillet Jones, both former special assistants to the secretary; Bruce Cardwell, HEW budget officer and a former FDA offi-

cial; John Corson of Princeton; and Dwight Ink, assistant general manager of the Atomic Energy Commission.

The report carried the disclaimer, "It is not the intention of this report to criticize the performance of the men and women of the FDA who have performed well, but to identify important problems which have arisen and must be dealt with by the Secretary and the new commissioner." The report's general conclusion was that the key problems confronting FDA "stem largely from its explosive growth and the number of and complexity of the problems with which it must deal."

From the Report on the Food and Drug Administration

Below in slightly condensed form are the conclusions reached by a committee appointed by HEW Secretary John W. Gardner to advise him on problems confronting the Food and Drug Administration and to make recommendations of qualifications for a new FDA commissioner.

1. **There is urgent need for a clear set of policies.** Confusion exists within the FDA concerning its basic policies and emphases. There is need to weigh complicated and often conflicting considerations and establish as clear guidelines as circumstances permit. Examples of the difficult issues which require clarification of policy include the following:

a. What should be the relative emphasis of enforcement as compared to education and voluntary compliance, and how can these two approaches be combined most effectively?

b. Where should the balance be struck between benefits and hazards in the approval of new drugs?

c. What principles should be used in deciding difficult cases where the issue is between quick action to protect the public against suspected but unproven health risks and more deliberate action to continue known health benefits? (This problem is made especially difficult when large economic losses hang on a close question.)

Developing such a policy framework is admittedly a difficult and never-ending task, since new policy questions constantly arise and present policies will not remain static but will evolve. The reduction to written form of the agency's guiding principles is nevertheless essential to understandable, consistent, and effective administration.

2. **There is need for a strengthening and re-orientation of management.** In growing from a small family-type organization in which decisions were made on a case-by-case basis by the top officials, to a large organization dealing with numerous and complex issues, the Food and Drug Administration has failed to make the necessary basic shifts in management philosophy and techniques which are required for effective and efficient administration. . . . Delays in some governmental services are merely annoying or inconvenient; delays in decision-making in the FDA may have extensive effect upon the health of significant segments of the American public. They may also have major economic impact upon the industries affected. In short, laxity in management cannot be tolerated.

3. **There is need to elevate the level of scientific competence of the FDA.** Much of the recent criticism of the Food and Drug Administration has centered upon the need for strengthening the scientific resources and competence of those who have made, or have avoided, decisions which subsequently have come under scrutiny and criticism by congressional committees, journalists, the scientific community, and others. . . .

Each of the three problems is made more acute by the intense pressures surrounding the operations of the Food and Drug Administration. Because of these pressures, the agency *must* achieve a high standard of excellence, *must* be skillfully managed, *must* be clear as to policies, *must* function with spotless integrity.

In recent years the agency has been a frequent target for strafing by critics in Congress and other quarters. While several members of the committee have been involved more or less closely in FDA affairs in past years, the faults noted in the report include most of the points on which FDA has been reproached. This report, coming as it does at the beginning of Goddard's tenure, may serve, incidentally, as a ready reference against which to measure future progress.

The committee dealt with broad issues and engaged in no detailed examination of FDA's conduct of its affairs. Some sort of no-holds-barred evaluation of performance by well-informed but objective observers would seem to be in order, however, if FDA ways are to be changed for the better.

In one sector, specific recommendations were made by the committee (formation of which was announced on the day former FDA commissioner George Larrick retired last November). These recommendations were on criteria for the appointment of a new commissioner.

The committee asked for a commissioner who offered scientific competence, a record as an effective administrator, and motivation to administer the food and drug laws forcefully. Goddard's reception as commissioner indicates an initial broad-spectrum acceptance by individuals and organizations ranging from some of FDA's sharper critics to the pharmaceutical industry, which, in its public demonstrations of sentiment, has been favorable if restrained.

In respect to agency management the committee urged that three top-agency administrators—the commissioner and deputy commissioner and the assistant commissioner for scientific resources—"should be viewed as a team to achieve maximum strength in both management and scientific competence."

All three top spots were vacated last year with the retirement of Larrick, his deputy commissioner, and his assistant commissioner for science. Winston B. Rankin, formerly assistant commissioner for planning, who was appointed by Larrick to serve as acting commissioner while the top job was vacant, is now serving as acting deputy commissioner. The post of assistant commissioner is open.

A number of other middle- and upper-echelon management positions in the agency are also open, in part because an unusually large group of senior

officials retired under an advantageous pension arrangement which prevailed for a limited period last year.

Goddard, therefore, has somewhat more room to wield the proverbial new broom than new chiefs of federal agencies usually have.

FDA, like other old-line federal agencies coping with new problems, contains an "old guard," largely in control of things, and a dissenting group. In general terms, the split in FDA is between, on the one hand, the group whose traditional role has been inspection and enforcement and, on the other, a smaller group with medical and scientific training, concentrated chiefly in the agency's Bureau of Medicine.

FDA underwent a reorganization in 1963 which has been followed by a steady increase in manpower. The division most affected in proportion to its size has been the Bureau of Medicine, which is charged with primary responsibility for determining drug efficacy and safety, as directed in the Kefauver amendments to the Food and Drug Act. Something of a shift of influence toward the scientific side has occurred in recent years, noticeably since the thalidomide affair brought the agency dramatically to public attention.

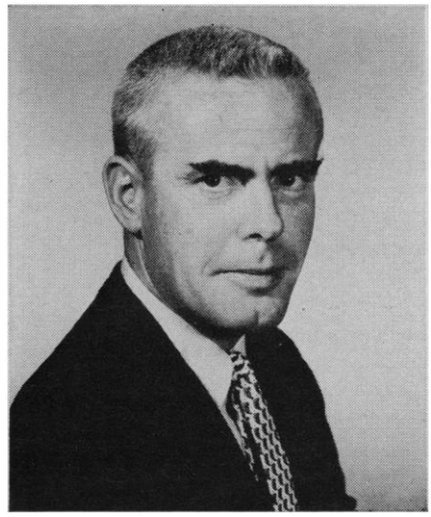
Goddard has let it be known he plans to make "structural changes" in the agency, but he has not yet given details. As commissioner he will be expected to strengthen the whole agency, and to do this he will have to find ways to bring into proper balance its scientific and enforcement elements.

Emphasis on Enforcement

In his public statements Goddard has taken care to emphasize the interrelation of the agency's functions. He was recently quoted by a drug industry trade paper, for example, as saying that he believes law enforcement is the agency's "No. 1 job," and that the agency's scientific capabilities need to be improved to permit sound legal judgments based on first-class scientific judgments.

Implications that the agency is taking a harder line on enforcement have been read into FDA's having instituted legal proceedings against a drug firm charged with making false advertising claims. The company pleaded no contest in a federal court in New Jersey and received the maximum fine of $2000. It was the first prosecution under the 1962 drug law amendments.

The FDA is also faced with fresh



James L. Goddard

enforcement problems in administering the new amendments on control of drug abuse (*Science*, 27 August 1965), which went into effect on 1 February. The amendments, dealing with amphetamines, barbiturates, and other "psychotoxic" drugs require augmented record-keeping, new regulations on filling of prescriptions, and increased penalties for illegal sales. The new law involves the FDA not only in the recruitment of more agents to enforce it but in the training of its agents in the exercise of police powers new to the agency.

Goddard appears to have been granted the breathing space usually allowed newly appointed head men by critics of federal agencies. L. H. Fountain (D–N.C.), whose House investigations subcommittee has been examining FDA activities in matters of drug safety, has taken friendly notice of Goddard's appointment. It is expected that the Fountain committee will soon finish its investigations and make its findings and recommendations available, no doubt in the expectation that Goddard will find them interesting.

Goddard's period of grace will probably not last overlong. He will be expected to fill the considerable number of important jobs open, and these appointments, as well as his reorganization moves, will be watched closely inside and outside the agency. In addition, action or lack of action on several issues before the agency will be interpreted as indicators of FDA policy under Goddard.

The agency has been under some criticism, for example, for not having ordered removal from the market of a group of drugs known as the long-acting sulfonamides, which are used particularly for treating certain diseases of the urinary tract. Critics, including some FDA physicians, have argued that the incidence of serious side effects is large enough to outweigh the special benefits of the drugs. Goddard has declared himself in agreement with the official FDA stand, which amounts to permitting sale of the drug with an amplified warning on the label of possible serious side effects.

The safety of oral contraceptives is another issue which some physicians inside as well as outside the FDA regard as in genuine doubt. The feeling seems to be that study of the effects of the oral contraceptives has not been sufficiently broadly based or systematic. Goddard has indicated that an effort is being made to collect all available data on clinical experience with the pills. An advisory committee will study this evidence in April, and, if a controlled study on any aspect is indicated, the FDA will take appropriate action, says Goddard.

Agency in Transition

In its transition from an agency primarily concerned with enforcement of relatively straightforward standards on contaminated or toxic food and drugs, the FDA's most challenging task is to determine the long-range effects of a great many new and sophisticated drugs. This task is a very demanding one indeed, especially since it is complicated by the play of very considerable medical and economic pressures. Gardner's remark about the difficulty of Goddard's job is, therefore, a reasonable one.

As an outsider, the new commissioner does not begin with an intimate familiarity with either the law or the agency he must administer, and in the inevitable breaking-in period his choice of close working associates will probably be particularly important.

It is likely, on the other hand, that his background in PHS will encourage a closer working relationship between FDA and PHS, with its strong research resources.

Finally, if FDA is to be reformed, Secretary Gardner's backing could play an important part. The laws which FDA administers place, in many cases, the ultimate responsibility with the Secretary. In the past this has usually been regarded as a matter of form. But, partly by accident, partly by design, the reform of FDA has been made a sort of test case for the new management at HEW.—JOHN WALSH

President Presents Medal of Science Awards

President Johnson's remarks at the White House ceremony of 10 February 1966 for Medal of Science winners, together with the list of medalists and their citations, follow.

I have heard it said that "Everyone wishes to have the truth on his side, but it is not everyone that sincerely wants to be on the side of the truth."

We are pleased today to welcome men who have chosen to be on the side of truth—and to pursue truth as a way of life. They honor us by their presence—and by their accomplishments they honor the nation.

We recognize those accomplishments today by conferring on these men the National Medal of Science, the highest tribute their government can pay them.

One of these medals is being awarded posthumously—to Dr. Hugh Dryden, who died last December after nearly 50 years of exceptional government service. His work lives on. His contributions will enrich the lives of generations of Americans.

The National Medal of Science honors individual achievement. It reminds us that in a nation of millions, and a world of billions, the individual is still the first and basic agent of change. Without the unfettered curiosity of individual men probing and reaching for new truth, our planet would be a dry and dreary place.

It is a truism, almost, to say that the individual matters most. The very simplicity of the statement lends itself to misunderstanding. Certainly the welfare and happiness of all our people must be the continuing quest of science and government. As neglected needs mount, a nation indifferent to the interests of the larger community of citizens only invites disorder and ruin.

But that pursuit must never tolerate apathy to the right of one man to be different. We are a nation of differences, and the values and principles that protect those differences are the source of a unity far more lasting and strong than any contrived harmony could ever provide.

One man alone with his conscience—whether in the laboratory, or the study, or the classroom, or on the street corner—is to be jealously guarded from the thousand who, believing him wrong, would deny his right to search and speak the truth. On that fact we have built a free and great and diverse society.

The National Medal of Science symbolizes that from one individual's freedom to be different comes achievement to bless all of us.

The work of these men has been for all mankind. They have extended the frontier of our minds, as well as enriched the comfort of our bodies. And we are all the better for their efforts.

This is the 20th year of the atomic age. The power of the sun is now in our hands. From this day forward, there will be no excuses. There can be food and shelter and clothing and health and education and meaningful leisure for every human being on earth.

Our children and grandchildren will judge us by a standard more demanding than ever before. For they will know that if we fail at the moment of man's greatest opportunity, the fault will lie not in the stars but in ourselves.

The Medalists

John Bardeen, professor of physics and electrical engineering, University of Illinois, for his brilliant contributions to the theory of electrical conductivity in solid materials, and especially those which led to the development of a successful theory of superconductivity.

Peter J. W. Debye, professor emeritus and former chairman of the department of chemistry, Cornell, for sustained contributions of major concepts of modern chemistry and especially for the application of physical methods to the understanding of large molecules and their interaction in solution.

Hugh L. Dryden, deputy administrator of NASA and home secretary for the National Academy of Sciences, who died 2 December, for contributions as an engineer, administrator, and civil servant for one-half century to aeronautics and astronautics which have immeasurably supported the Nation's pre-eminence in space.

Clarence Leonard Johnson, vice-president for advanced development projects, Lockheed Aircraft Corporation, for bold innovations in the use of materials and in the design of aircraft of unusual configurations that pioneered new vistas for the possibility of flight.

Leon M. Lederman, physics professor, Columbia, for systematic studies of mesons, for his participation in the discovery of two kinds of neutrinos and of parity violation in the decay of mumesons.

Warren Kendall Lewis, professor emeritus of chemical engineering, M.I.T., for contributions as a scientist, teacher, and inventor who as the leader of modern chemical engineering has made the American chemical industry pre-eminent in the world.

Francis Peyton Rous, medical researcher, Rockefeller University, for the original discovery and continued elaboration of the relationship between virus and tumors, which has come to form the biologic base for so much of our present research effort on cancer.

William W. Rubey, professor of geology and geophysics, University of California, Los Angeles, for showing by profoundly original observations and clear physical reasoning how sand grains and mountains move and from whence the oceans come.

George Gaylord Simpson, Agassiz Professor of Vertebrate Paleontology, Harvard, for penetrating studies of vertebrate evolution through geologic time, and for scholarly synthesis of a new understanding of organic evolution based upon genetics and paleontology.

Donald Dexter Van Slyke, research chemist, Brookhaven National Laboratory, for classic studies of the chemistry of blood and of amino acid metabolism, and for the quantitative biochemical methodology underlying much of clinical medicine.

Oscar Zariski, professor of mathematics, Harvard, for his creation of a rigorous abstract theory of algebraic geometry, and for his profound influence—especially through many brilliant students—on the algebraic structure of contemporary pure mathematics.