

blamed, because the foot-and-mouth disease virus can survive in the refrigerated carcass for up to 4 months. The virus concentrates not in the muscle, for example, where increasing acidity creates inhospitable conditions, but in the lymph nodes, blood, and bone marrow. The common theory is that scraps of infected, uncooked meat find their way into pig swill, which negligent pigkeepers fail to boil, as the law requires. A dog going into the fields with a bone containing infected bone marrow could also spread the virus.

The strain of virus identified in the present outbreak has not, however, been traced to Argentine meat. The virus seems to be one originally identified in 1943 in Germany. It first appeared in Britain in an outbreak in England in 1966, and again appeared in two separate outbreaks, in January and August of this year. The origins of the present epidemic are unknown.

Unfortunately the foot-and-mouth virus is a hardy one. Tests have shown that it can survive on boots for nearly 3 months, and on hay for 15 weeks. With its nucleic acid core and protein coating, the virus can be inactivated by heat and sunlight, but Britain's cool wet autumn provides conditions in which it flourishes. The virus strain involved in the present epidemic is said not to be among the most severe in its effects, but it has one particularly insidious characteristic: its incubation period is said to be an unusually long 8 days, as compared with the 3- to 6-day period typical for many strains. Animals are infected with the disease for longer periods before they show symptoms, and the chances of transmitting it are therefore increased.

British research on foot-and-mouth disease is concentrated at the Animal Virus Research Institute in Pirbright, Surrey, located near the fringe of the commuter belt south of London. Government research on foot-and-mouth was started in 1924 at Pirbright, and in 1951 the laboratory was reconstituted under its own governing body. The institute is financed through the Agricultural Research Council, under the Department of Education and Science. The council oversees the institute's scientific program.

Development and production of anti-foot-and-mouth vaccine has been a main effort at Pirbright. To free staff for research, an agreement was reached in 1961 with the Wellcome Founda-

tion, under which the foundation undertakes the production of vaccines on a commercial scale for sale abroad. There is some irony in the situation, since, when the government decided to acquire a standby stock of vaccine, Pirbright could not increase production fast enough to fill the demand and supplies had to be ordered from laboratories established by the British abroad.

The institute, which is the counterpart of the United States research facility on animal virus diseases on Plum Island, off Long Island, has a staff of about 250 persons, 30 of them professionals. Research at Pirbright includes studies in the pathology of the disease, biochemical and biophysical investigations of the virus, and studies in viral genetics. About 75 percent of the research effort pertains to foot-and-mouth disease, and about 25 percent to other viral diseases, such as African swine fever and African horse sickness, which are regarded as potential dangers to animals in Britain.

The seriousness of the present outbreak has brought criticism both of control methods and of the slaughter policy itself. Heavy financial damage to farmers who lose their animals and, in some cases, literally their livelihood has hit British agriculture hard. As this was written, however, sentiment among farmers, scientists, and government officials appeared to be still decidedly for maintenance of a slaughter policy. Although foot-and-mouth has radiated outward and, particularly, southward from the West Midlands area where it began, the disease remains concentrated in that region. Unless major flare-ups occur in new areas, it is unlikely that officials will shift to vaccination.

There is growing recognition, however, that changing circumstances are making Britain more vulnerable to foot-and-mouth. Population growth and increasing mobility have made rural areas less isolated and the difficulty of preventing the spread of the disease greater.

The first outbreak of the current epidemic occurred in an area where some of the best and most efficiently run dairy herds are found. Farmers successfully operate with a high number of animals per acre, and this increases the chances of infection. Artificial insemination has bred big milk-producers for British dairy herds, but some observers suggest that inbreeding

has made the animals more susceptible to foot-and-mouth disease.

Other countries which follow strict slaughter policies are, for the most part, self-sufficient meat producers, but Britain's imports of Argentine meat are economically important.

Over the years, a slaughter policy has probably been less expensive for Britain than vaccination would have been. The present epidemic and the outbreaks that preceded it have raised the question of whether the slaughter policy may grow more expensive and less effective. Minister of Agriculture Peart has announced that there will be a major examination of present policies and methods of control. The last time this was done was in the wake of a serious outbreak of foot-and-mouth disease in 1951. The result of that inquiry was a reaffirmation of the slaughter policy. Despite rapid improvement in the effectiveness, and a significant downward trend in the costs of vaccine, there is a deep-seated reluctance in Britain to accept the disadvantages which would accompany a vaccination policy. But it is possible that, as with devaluation, the undesirable may in the long run become inevitable.—JOHN WALSH

APPOINTMENTS

Mortimer H. Appley, dean of the faculty of graduate studies and director of the Institute for Behavioral Research, York University, Toronto, to head of the department of psychology, University of Massachusetts. . . .

David H. Kurtzman, chancellor emeritus of University of Pittsburgh, to superintendent of public instruction for Pennsylvania. He succeeds **J. Ralph Rackley**, who has returned to Pennsylvania State University as provost. . . .

Robert F. Packard, director, Office of Outer Space Affairs, Department of State, to director of the newly established Office of Space and Environmental Science Affairs, International Scientific and Technological Affairs, State Department. . . . The following have been appointed to the Advisory Committee on Research in the Biological and Physical Sciences, FDA: **William D. Cooke**, dean of the graduate school, Cornell University; **Julius M. Coon**, head of the pharmacology

department, Jefferson Medical College; **Ruben W. Engel**, office of associate dean for research, College of Agriculture, Virginia Polytechnic Institute; **Lloyd N. Ferguson**, department of chemistry, California State College, Los Angeles; **Francis A. Gunther**, professor of entomology, Citrus Experiment Station, University of California, Riverside; **George P. Hager**, dean, College of Pharmacy, University of North Carolina; **David B. Hand**, head, department of food science and technology, Cornell University, New York State Agricultural Experiment Station; and **Gerald N. Wogan**, associate professor of food toxicology, department of nutrition and food science, Massachusetts Institute of Technology. . . . **Thomas P. Almy**, professor of medicine, Cornell University College of Medicine, to chairman of the department of medicine, Dartmouth Medical School; and **James C. Strickler**, assistant professor of medicine, Cornell University College of Medicine, to associate dean and associate professor of medicine, Dartmouth Medical School. . . . **Edwin L. Goldwasser**, professor of physics, University of Illinois, to deputy director of the National Accelerator Laboratory, Weston, Ill. . . . **Thomas P. Evans**, vice president of research and development, W. A. Schaeffer Pen Company, to director of research, Michigan Technological University. . . . **Henry C. Gatos**, professor of electronic metallurgy and professor of molecular engineering, M.I.T., to associate director of the Center for Materials Science and Engineering, M.I.T. . . . **Robert J. Beyers**, assistant professor of zoology, University of Georgia, to director of the Savannah River Ecology Laboratory. It is operated by the University of Georgia under a contract with the AEC. . . . **Felix Milgrom**, professor of bacteriology and immunology, School of Medicine and Dentistry, State University of New York at Buffalo, to chairman of the department of bacteriology and immunology, at Buffalo. He succeeds **Ernest Witebsky**, who will retire. . . . **John A. Starkweather**, professor of medical psychology and acting director of the Computer Center, University of California, San Francisco Medical Center Campus, to director of the computer center. . . . **J. A. Jacobs**, head, department of geophysics and director, Institute of Earth Sciences, University of British Columbia, to Killam Memorial Professor of Science, University of Alberta. . . .

Jacques L. Sherman, Jr., chief of medical services, Coney Island Hospital, to medical director, primary deputy to the executive vice president and director of medical education, Maimonides Medical Center; and **Benjamin Wainfield**, chief of outpatient services, Coney Island Hospital, to director of ambulatory health services at Maimonides. . . . **Dave C. Jones**, research physiologist, physiology-psychology branch, Biological and Medical Sciences Division, U.S. Naval Radiological Defense Laboratory, San Francisco, to head of the physiology-psychology branch at the Laboratory. . . . **Roy E. Ritts, Jr.**, director of medical research, American Medical Association, and director of the AMA-Education and Research Foundation Institute for Biomedical Research, to head of the section of microbiology, Mayo Clinic. He succeeds **Lyle A. Weed**, who will become senior consultant, Mayo Clinic. . . . **David Korn**, pathologist and senior investigator, NIH, to executive head of the department of pathology, Stanford University School of Medicine. . . . **David B. Brooks**, on leave from Resources for the Future, Washington, D.C., as assistant professor of economics, Berea College, Kentucky, to chief, division of economic analysis, Bureau of Mines. . . . **Boyd E. Olson**, director, marine sciences department, U.S. Naval Hydrographic Office, to deputy scientific and technical director, U.S. Naval Oceanographic Office. . . . **Donald M. Rockwell**, acting dean of Juniata College and chairman of the division of natural sciences and mathematics, to dean of academic affairs at the college. . . . **J. H. U. Brown**, assistant director of operations, National Institute of General Medical Sciences, to associate director for scientific programs, NIGMS. . . . **Jack Matthews**, chairman of the department of speech and theater arts, professor of speech, and director of graduate study in audiology and speech pathology, University of Pittsburgh, to acting dean of the Division of Humanities, at the university. . . . **Stanley N. Davis**, professor, department of geology, Stanford University, to professor, department of geology, University of Missouri at Columbia. . . . **Robert W. Detenbeck**, associate professor of physics, University of Maryland, to associate professor of physics, University of Vermont, and **David A. Depatie**, staff scientist, Los Alamos Scientific Laboratory, to assist-

ant professor of physics, University of Vermont. . . . **Clavin M. Kunin**, associate professor, University of Virginia, to chairman, department of preventive medicine, at the university. He succeeds **William S. Jordan, Jr.**, who has become dean of medicine, University of Kentucky. . . . **Carlton J. Leith**, professor of geology, North Carolina State University, to acting head of the newly established department of geosciences at the university. . . . **George J. Langmyhr**, associate medical director, Planned Parenthood-World Population, to medical director of PPWP. . . . **Douglas M. Surgenor**, dean of the School of Medicine, State University of New York, Buffalo, to provost of the health sciences faculty at the university. He will continue as dean until a successor is named. He succeeds **Peter F. Regan**, who became executive vice president of the university. . . . **Michael T. Romano**, professor of restorative dentistry and administrative assistant to the dean, University of Kentucky College of Dentistry, to associate dean of the new School of Dentistry, Louisiana State University. . . . The following appointments have been made at the Institute for Defense Analyses: **Gordon J. F. MacDonald**, vice president for research, to executive vice president; **Ali B. Cambel**, director, research and engineering support division, to vice president for research; **Robert H. Fox**, acting director, research and engineering support division, to director of the new science and technology division; and **Alexander J. Tachmindji**, member of the research and engineering support division, to deputy director of the science and technology division. . . . **Ray Koppleman**, on leave from the position of associate dean, Biology Collegiate Division, University of Chicago, to head of the National Science Foundation Indian office, New Delhi. . . . **Raymond R. Mindlin**, professor of civil engineering, Columbia University, to the position of first James Kip Finch professor of applied science at the university. . . . **Bruce E. Walker**, associate professor of anatomy, University of Texas Medical Branch, to chairman of the department of anatomy, Michigan State University. . . . **Eldon E. Ferguson**, chief, Atmospheric Collision Processes section, Boulder Laboratories, to director of the Aeronomy Laboratory, ESSA's research laboratories, Boulder. He succeeds **E. K. Smith**, who will devote his time to research. . . .