



ROCKET RENDEZVOUS—An artist's concept shows the S-IVB stage approaching a space tanker previously placed into earth orbit. The propellants in the tanker will be transferred to S-IVB and the rocket will then launch the spacecraft into space. The Douglas Aircraft Company Missile and Space Systems Division is building the S-IV for the National Aeronautics and Space Administration.

GENERAL SCIENCE

Low Pay Slows Advances

➤ Seven out of ten top scientific conquests of the 1950's were advanced by government scientists or government-sponsored laboratories, Dr. James R. Killian, Jr., chairman of the Corporation of the Massachusetts Institute of Technology, in a public service report published by the National Civil Service League.

Dr. Killian, special assistant for science and technology to President Eisenhower, warns that lagging pay for scientists and engineers, career executives and professional people threaten national security as well as scientific advancement.

Dr. Killian reported that in identifying the ten top scientific or technological conquests of 1950's, the research and development heads of major U. S. corporations recently cited seven to which scientists in government or government-sponsored laboratories had made notable contributions.

These were: The penetration of space, hydrogen fusion, power from nuclear fission, solid state electronics, electronic computers, reducing the cost of conversion of salt water to fresh water, and commercial jet aviation. And in forecasting what this decade might bring, they identified five areas in which government researchers are deeply involved—manned space flight, fusion power, thermo-electricity, control of cancer, and the advancement of biology ever closer to the origin of life.

One of the nation's least recognized but most critical current problems is how to get and keep top scientific and engineering talent in the Federal career civil service.

Dr. Killian observed: "With all the assets and achievements to their credit, why should we be concerned about government scientists and engineers? What is going wrong? What must be tackled? Chiefly it is a matter of maintaining the pace that has been set—and I fear there are critical factors so seriously slowing that pace that they constitute a threat to the national welfare and security. The most important of these factors is pay. Government pay for scientists, along with that for career executives and other professional personnel, is lagging farther and farther behind pay for work of lesser scope and impact in private employment. "The Federal government plays the key role in our national security and it is the most complex organization in the country; yet it compensates its top people, in law, engineering, economics, and other fields, as well as science, at substandard salaries that would make any private corporation blush. As a consequence, although many good men, largely recruited during World War II, are still in government—held, in some cases by the challenge of their work, in others, by their substantial investment in the retirement system—the Federal service is facing critical, grow-

ing, daily losses of its best scientific people and is unable to recruit experienced, competent replacements for them."

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SPACE

Dual-Purpose Launch Vehicles Also Spacecraft

➤ DUAL-PURPOSE launch vehicles of the future may well also serve as spacecraft—even after the vehicle has been expended in space.

This was the prediction of Ted J. Gordon, chief Saturn systems engineer for the Douglas Missile and Space Systems Division. Mr. Gordon described the dual-purpose concept in a technical paper on the Saturn S-IV rocket presented in Cleveland at the Lunar Missions Meeting of the American Rocket Society.

Future booster rockets, he said, may become payloads in their own right, to be used as earth-orbit tankers, or, when expended, to serve as space laboratories or as way stations for lost space travelers.

"One of the major design challenges facing the aerospace industry today," Mr. Gordon said, "is the evolution of rocket stages into spacecraft to meet the requirements of new space missions."

The S-IV is the Douglas-built second stage of the Saturn C-1, slated as launch vehicle for early models of the Apollo spacecraft. First flight of the two-stage C-1, with a live S-IV, is scheduled for next year.

The S-IVB will be third stage of the more powerful Saturn C-5 booster rocket.

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MEDICINE

First Intercontinental Transmission of an ECG

THE ELECTROCARDIOGRAM of Edward G. Robinson was telephoned directly from his bedside in Nairobi, Kenya, to his personal physician in Los Angeles, Calif. This event marks the first transoceanic transmission of an electrocardiogram and the first time the new technique has been used to provide a medical consultation.

The Foundation for Diagnostic Research and Education, Inc., of New York City arranged for Mr. Robinson's actual current tracing to be transmitted by telephone to the office of his Los Angeles cardiologist.

The successful transmission, marking a milestone in medical communications, was achieved by a new electronic instrument, the Sonlink, developed by Mnemotron Corp., a subsidiary of Technical Measurement Corp. Sonlink instantly converts the recorded electrocardiogram (ECG) of a patient into an audible sound of variable pitch which can be transmitted over telephone, radio and microwave circuits.

The New York center at Grand Central Hospital is under the direction of Dr. Louis A. Scarrone, president of the Foundation. Supervision of the cardiac transmission from Africa to California is under the direction of Dr. Scarrone and Dr. Arthur Grishman, cardiologist at Mount Sinai Hospital.

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