scientists, who work under conditions of extreme secrecy as far as the rest of the world is concerned, manage to distinguish themselves. . . ."

In his letter of reply, Franke explained that the data to be released would be of no value for "precise work required by a potential enemy." All sounding information obtained by precise, electronic methods will continue to remain classified, as will all data obtained from ships which are on classified maneuvers.

Franke also emphasized that the new instruction regarding oceanic soundings is not a reversal of Navy policy and certainly does not represent a concession to American scientists at the expense of national security. Franke said:

"The present policy represents rather a reappraisal of former directives so that all military information remains safeguarded while at the same time data which are not of material use to a potential enemy are made available to our own scientific community. In no case is this a carte blanche release of information. . . ."

It is only precise knowledge of the kind that is still classified that might, for example, help an enemy submarine to move more stealthily or to fire a missile accurately at an American city.

The Navy Order

The section of the Navy directive that is of the greatest significance to scientists, particularly geologists and oceanographers, reads as follows:

"All . . . sounding information, charts, collection sheets, and other means of portraying ocean depths [except for special information that must remain classified for military reasons] shall be unclassified. This includes but is not limited to sounding records, echograms, collection sheets, small scale chartlets prepared for inclusion in scientific or technical papers, and similar sounding information where the method of positioning is by conventional navigational means such as piloting, navigation radar, celestial navigation, loran A, or dead reckoning."

The newly declassified information, which is available both to individuals and to organizations, may be obtained by writing to the Hydrographer, U.S. Navy Hydrographic Office, Washington 25, D.C. An applicant must bear the expense involved in reproducing the data that he requests.

Cosmic-Ray Balloon Flights Successfully Completed before French Nuclear Explosion

Two of the largest high-altitude balloons ever launched were sent up recently from an aircraft carrier as part of an over-all study of cosmic rays known as Project ICEF (International Cooperative Emulsion Flights). The experiment, which took more than a year to prepare, might have failed if the French Government had set off its nuclear explosion before the launching.

About 25 universities and other research institutions, representing every continent except Antarctica, are participating in the ICEF program, which is centered at the University of Chicago, under the sponsorship of the National Science Foundation and the Office of Naval Research. The program's scientific work was under the direction of the late Marcel Schein, professor of physics at Chicago, prior to his death on 20 February.

The 10-million-cubic-foot balloons, which were more than 400 feet high, carried 800-pound blocks of special photographic emulsion sheets to record primary cosmic-ray particles. The launchings, called Skyhook 60 by the Navy, were made from the deck of the U.S.S. *Valley Forge* as she cruised in the Caribbean late in January.

Schein Writes France's Perrin

The timing of the launchings was of especial significance, for France had announced plans to conduct a nuclear test in the Sahara Desert. Radiation from such an event would have fogged the emulsion sheets to be sent aloft.

It has just been revealed that in mid-December Schein wrote to his friend Francis Perrin, high commissioner of the Atomic Energy Commission of France, to ask for reassurance about "possible interference" in his experiments between 23 January and 5 February. When the *Valley Forge* sailed from Norfolk, Va., for the Caribbean on 18 January, the letter was still unanswered and Schein had a telegram sent that indicated his concern.

A reply came from Perrin on 20 January which said: "I have passed on information sent by Professor Schein in order to avoid failure of the forthcoming experiments." In a letter dated the same day, which arrived later, Perrin wrote: "I believe you can go on without any risks of interference with the experiments you are planning before 5 February." These communications, are clear evidence of France's unusual interest and good will, although they do not indicate whether or not changes were made in France's test schedule in response to Schein's appeal. The Sahara nuclear explosion occurred on 13 February.

The Flights

The first balloon, Skyhook Bravo, rose without mishap to 116,000 feet (about 21 miles) on 26 January. However, unexpectedly strong winds in the upper stratosphere drove the balloon southwestward too fast. To avoid the risk of losing the gondola in the Venezuelan jungle, it was cut down over the sea about 400 miles off the South American coast, where it was retrieved by a destroyer the next day.

Because the emulsion had been exposed only 5 hours, it was decided that the same gondola should be sent up a second time in a flight designated Skyhook Bravo Re-Fly. However, this was delayed until after Schein had flown to Puerto Rico to talk with the all-important weather advisers for the project, Herbert Riehl, professor of meteorology at the University of Chicago and former head of the university's Institute of Tropical Meteorology at San Juan, and Ralph Higgs, supervisory meteorologist at the U.S. Weather Bureau airport station in San Juan.

On 30 January Bravo Re-Fly ascended to 113,500 feet but then steadily lost altitude, apparently because of ballast difficulties. The balloon finally held level at 61,000 feet. Meanwhile, a third flight, Skyhook Charlie, was attempted the following day, 31 January. When Charlie tore free of its load and collapsed into the sea, Bravo Re-Fly assumed new importance. The latter's gondola was cut free and parachuted down after 27 hours, and thus its film now holds the record of 32 hours of cosmic-ray bombardment—the total for the two flights.

The stack of emulsion sheets that were to have been carried by Charlie will last only a short time, even when kept refrigerated. Therefore, another flight is scheduled to take place within the next few weeks.

The emulsion sheets will be divided among a number of research groups at universities throughout the world. The international aspects of the program

make possible a world-wide team study of high-energy phenomena not obtainable with present-day accelerators. Individual scientists with particular competence in this pioneering field of physics, working independently but on common phenomena, will, it is hoped, provide a considerable increase in knowledge of interactions among nuclear and electromagnetic particles and of their galactic origins. It is estimated that research workers will require about 2 years to analyze the data.

Skyhook Results Assessed

Shortly before his death Schein said: "We are sure that we have obtained excellent data from the two 'Bravo' flights." He predicted that many "monsters" would show on the block of film. "Monsters" are cosmic-ray events so powerful that their effects can be seen with the naked eye. Schein also was confident that the emulsion would reveal hypernuclei produced by collisions, strange-particle production, and some rarely observed break-up processes of heavy nuclei in a primary cosmic-ray event.

For meteorology the immediate results of Skyhook 60 are more specific, according to Riehl. He says that the day and night data studies for the recent flights suggest the possibility that an ideal meteorological laboratory has been found. He commented:

"There are characteristics at 100,000–120,000 feet that are remarkably similar to weather patterns at lower altitudes. This we never knew before. We can now see that the upper stratosphere is a transporter of weather momentum. Why this transfer of momentum occurs is not at all obvious. What its effects are on lower level weather we do not yet know. Isolated weather systems at such heights—free of friction from the earth's surface and of distortion from the earth's heat—offer us an ideal laboratory. Up to now, we have felt that it would be a waste of time to explore the meteorology of the upper stratosphere. With our 'Skyhook' discoveries, perhaps we can go on to find more general laws of weather than we now possess."

Skyhook Bravo Re-Fly just before launching. With inflation tubes tied off and dangling, the balloon stands nearly 500 feet above the deck of the U.S.S. *Valley Forge*.

New York Science Teachers Campaign for Improved Teaching

Business leaders and a group of distinguished scientists will lead the discussions at a science teachers' luncheon conference scheduled for 19 March at the Hotel Statler-Hilton, New York. The conference, "Science for Survival," is being conducted by the Federation of Science Teacher Associations of New York City in connection with its annual luncheon.

The affair, which has been largely a social event in past years, is being used this year as part of a continuing campaign by the science teachers to point up the deficiencies, needs, and possibilities of better science teaching in the city's schools. The conference will include a series of panels dealing with the training of future scientists, development of scientific literacy, the status of science teachers, and community cooperation in science education.

Scientists who will participate include Peter Debye, Nobel laureate and professor of chemistry at Cornell University; Edwin C. Kemble, professor of physics at Harvard University; Victor P. Bond of Brookhaven National Laboratory; and Jerrold R. Zacharias, professor of physics at Massachusetts Institute of Technology. Ticket sales are being handled by Martin Roth, George Washington High School, Audubon Ave. and 192 St., New York, N.Y.

The Meteorite of 30 June 1908

The Committee on Meteorites of the Academy of Sciences of the U.S.S.R. is at present very anxious to obtain information about the circumstances of the fall of the so-called Tungus meteorite, which occurred during the early morning of 30 June 1908, in the middle of Siberia.