inserts at either end. It is a more reliable procedure, however, to calibrate the sleeve by perfusing with blood an excised artery placed into the sleeve and submerged under blood.

Connections to the Amplifier and Oscillator

The electrodes and the magnet coils are connected to instruments which are described elsewhere (*6*, *7*). The connections are established by suitable plugs. The lead wires are guided from the site of implantation under the animal's skin and are permitted to issue from a small opening in the skin at the nape of the neck. It is very convenient to be able to attach the plugs to the animal's skin at the back of the neck. For this purpose, the outside of the plug is equipped with a thread (cast from TDM), and nylon nuts are used which can be screwed onto this thread. The polyvinyl tubing is bonded well to the Lucite body of the plug to make prolonged submersion in a conductive liquid possible. The entire flow meter, including leads and plugs, is sterilized by submersion in a solution of Zephiran.

Figure 11 shows the manner in which this plug is applied to an animal's skin. A round hole is cut into the skin with a sterile cork borer, and the plug and washers are applied as shown. Figure 12 shows outlets in the neck of a dog, associated with two flow-meter implants. The animals show no discomfort with this method of fixation of outlets. A 10-foot cord connected to the instruments gives the animal ample freedom of motion.

Although the work has been limited so far almost exclusively to animal experimentation, the methods described in this article are suitable for application to human subjects (*17*).

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15. I was greatly assisted in perfecting this type of flow meter by Harry S. Tillson of the Medical School Research and Development Shop. Many important improvements in the manufacturing procedure and design, including the method of molding these units, were suggested and worked out by him. In the latter process the advice and cooperation of Chester Chalberg were very helpful.

16. C. W. Barnes, in preparation.

17. I wish to express my gratitude for the generous support of this work by the Office of Naval Research. The coreless flow meters were tested in the course of cooperative research involving chest surgery with different groups. In this connection, I gratefully acknowledge my indebtedness to Drs. Paul H. Crandall, Peter Gall, James V. Maloney, and Lawrence W. Roth. Thanks are also due to Dr. Bennett J. Cohen for his helpful advice. The aid of the Research and Development Shop of the Medical School was of decisive importance, and I wish to thank Chester Chalberg for his never-failing cooperation and Harry Tillson for his valuable contributions. Last but not least, the tireless assistance of Clarence W. Barnes and Raymond T. Kado in the performance of the experiments and in the preparation of the illustrations is gratefully acknowledged.

Science in the News

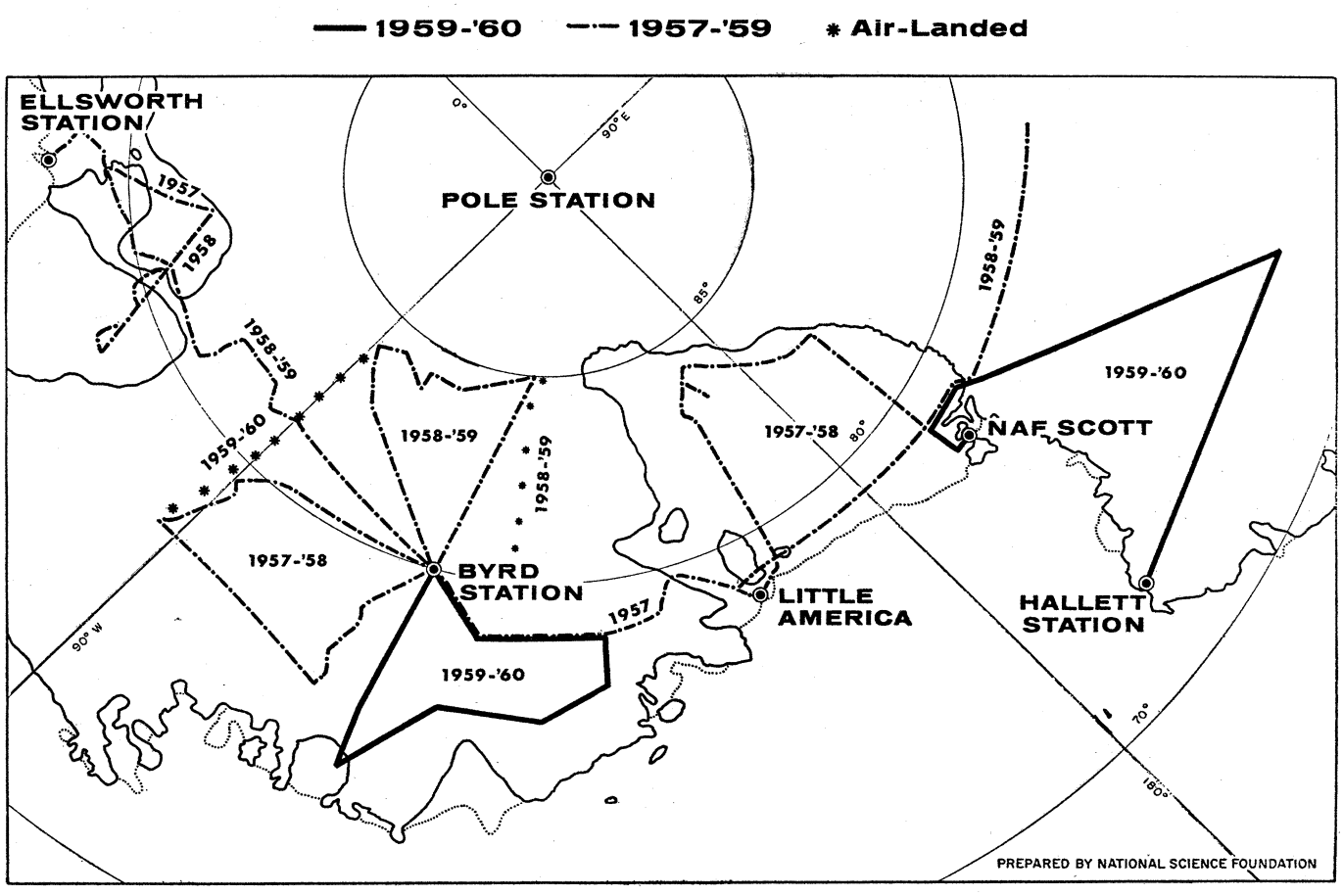
Diplomats Ponder Antarctica's Future as Scientific Studies Are Resumed

Representatives of the 12 countries that participated in the antarctic program of the IGY are now in conference in Washington to negotiate a treaty to assure the continued peaceful use of the continent. The call for the conference was made in May 1958 by President Eisenhower when, citing the "splendid example of international cooperation" afforded by the IGY, he sent invitations to the foreign ministers of the 11 nations that had a role in the IGY antarctic program. Among the delegates attending the meeting, which opened 15 October, are First Deputy Minister Vasily Kuznetsov of the Soviet Union and Prime Minister Walter Nash of New Zealand. At the first meeting of the conference Herman Phleger, head of the U.S. delegation, was elected permanent chairman. The conference may last several weeks.

As the diplomats begin their work, scientists from the United States and other countries, with the onset of the summer season, are resuming the intensive continental studies which began on a large scale with the International Geophysical Year in 1957–58. Approximately 70 scientists are now converging at the half dozen U.S. bases in Antarctica to conduct 29 new projects recently announced by the National Science Foundation and to continue others that were begun under earlier NSF grants. Studies of cosmic rays, geomagnetism, aurora and airglow, and glaciology are among the projects, as well as three mapping programs to be conducted by the American Geographical Society and the U.S. Geological Survey.

Scientific Studies Pushed

In announcing the NSF Antarctic Research Program, which the foundation supports with more than $3 million in grants, Alan T. Waterman, director, said: "Greater emphasis will be placed by the United States on geology, cartography, and biology during the next year." The three cartographic projects call for topographic mapping in the area, revision of maps, and the development of an atlas which will include data on snow accumulation, magnetic variation, and the thickness of the ice sheet. Among the geological studies are projects to determine how long low temperatures have existed on the continent by measurement of the thermolumines-



Completed and projected land traverses of United States scientists in Antarctica.

cence of rock samples, others to devise means of extracting minerals under antarctic conditions, and another, on bedrock geomorphology, to shed light on certain "classic" antarctic problems such as the location of the "Antarctandes" —the extension of Andes Mountains into the continent.

About a dozen biological projects are planned for the current research season. They range from the banding of sea birds to the observation of the men who will take part in one of the land traverses planned for the summer season. This work is part of a continuing collection of data on the performance of participants in the Antarctic program. Past observation has revealed the occurrence of certain behavior patterns among members of traverse teams. For example, prior to crossing a dangerous crevasse area, the traverse party members reveal tendencies toward depression; this is followed by exhilaration when they leave the danger area. During one of the traverses this year, an investigator will try to measure physiological responses to such situations. Other biological projects involve studies of the metabolism of Adelie penguins during the nesting and breeding seasons, studies of airborne organisms, and collection of data on the parasites of antarctic fish.

Logistic support for the scientific programs will be supplied by the U.S. Navy as in past years. The Navy, which identifies its program as Deep Freeze 60, will employ eight ships, 36 aircraft, and about 3000 men in its support activities. Rear Admiral David M. Tyree, who relieved Rear Admiral George Dufek last April, will command the operation. In addition to its support activities the Navy will also conduct a number of hydrographic and meterological surveys and will participate in the mapping programs.

International Control for Antarctica?

At the opening session of the conference in Washington, support was given to a plan for the establishment of an "international regime" to coordinate future activities on the continent. New Zealand, which has vast claims on the 5.5 million square miles of Antarctica, said that it would renounce its claims if such a regime were established.

Territorial claims threaten to be a major stumbling block in the way of a treaty. The delegates from Chile and Argentina objected to internationalization on the grounds of encroachment of sovereignty. Both countries have sizable conflicting claims. The United States and the U.S.S.R. have made no claims to territory and refuse to recognize the claims of others. Britain, Australia, New Zealand, Norway, and France have mutually recognized claims.

In his letter calling for the conference, President Eisenhower stressed the need for an agreement to assure the continuation of "fruitful scientific cooperation" in Antarctica. He suggested that a treaty might be concluded that would have the following purposes: (i) freedom of scientific investigation throughout Antarctica by citizens, organizations, and governments of all countries, and a continuation of the international scientific cooperation which was carried out so successfully during the International Geophysical Year; (ii) international agreement to ensure that Antarctica be used only for peaceful purposes; (iii) any other peaceful purposes not inconsistent with the Charter of the United Nations.

The United States' view is that such a treaty can be concluded without requiring any participating nation to re-

nounce any basic historic rights or claims to sovereignty. The treaty would provide that such rights and claims would remain unaffected while the treaty was in force, and that no new claims would be made. "In other words," the President's letter stated, "the legal *status quo* in Antarctica would be frozen for the duration of the treaty, permitting cooperation in scientific and administrative matters to be carried out in a constructive manner without being hampered or affected in any way by political considerations."

Whether the President's plan or the internationalization proposal will be followed is impossible to say at this juncture. Early indications are, however, that Chile and Argentina, for whom the issue is a major one, will insist that suggestions in the President's letter set the framework for the talks. At the opening session, Adolfo Scilingo, head of the Argentine delegation, stressed the point that the conference was not called "to institute regimes or to create structures. It is not its mission to change or alter anything."

Whatever the decision that may result from the conference, there seems little question that all participants are party to the general agreement that scientific work in Antarctica, such as that which is now being resumed, should be continued and expanded.

British Science Attains Cabinet Status

In accordance with his campaign promise, Prime Minister Harold Macmillan has appointed a science minister, Viscount Hailsham, who will serve under the title of Lord Privy Seal. Hailsham leaves the posts of party chairman and Lord President of the Council. Titles such as Lord Privy Seal and Lord President of the Council originated centuries ago. These posts do not carry departmental responsibilities, the titles being retained to allow for appointments of ministers to oversee specific sectors of the national effort. Hailsham will assume responsibility for the Atomic Energy Authority, the Department of Scientific and Industrial Research, and research in medicine, agriculture, and outer space.

Actually, the appointment does not substantially alter Hailsham's previous responsibility, but only extends it. As Lord President, he devoted part of his time to all of the areas listed except atomic energy, which has been under the direction of the Prime Minister. Now Hailsham will give his full attention to scientific matters. He has already indicated that he intends to concentrate especially on the production of more scientists and on getting the results of research into practical use.

A related appointment is that of Duncan Sandys, former Minister of Defense, as head of a new Ministry of Aviation. He will have charge of the development of guided missiles, radar, and electronics, as well as of the aircraft industry and commercial aviation. Sandys will take over responsibilities borne in the past by the Minister of Transport for Civil Aviation and by the Minister of Supply for research, development, and production of civil and military aircraft, guided and atomic weapons, and radar and electronics.

Press Reaction

The press in this country has paid particular attention to the new emphasis on science in Britain's ruling body, using such terms as "space-age cabinet." However, the British *Economist,* for example, does not give much weight to the trend, saying of Lord Hailsham:

"He now departs bell, book and candle into space: to take ministerial charge of science, a job which was puffed up during the election campaign but which nobody is quite sure really exists." The *Economist* then observes that it would be a great pity if the appointment were the "first step into oblivion" for one of the ablest Conservative ministers, and adds that if Lord Hailsham had been in the Commons he would have been given far greater departmental responsibilities.

The *Economist* article also comments that Sandys has "stepped down" to the new Ministry of Aviation and suggests that the latter is another office which probably should not exist. The article points out that there is an immediate political decision to be taken—whether to give more scope to the private airlines—but that after that the new ministry could "too easily become a collecting place for the pleas of special interests. . . ."

United States observers will study closely the effectiveness of the new cabinet posts. Special interest in the appointments has been generated by the Department of Science bill that is pending before the Congress. The proposed legislation includes a suggestion that there be a secretary for science in the President's cabinet.

Ochoa and Kornberg Win Nobel Prize

The Nobel Prize in physiology and medicine will be shared this year by Severo Ochoa, chairman of the department of biochemistry at New York University, and Arthur Kornberg, executive head of the department of biochemistry at Stanford University. The two men are being honored with the $42,409 award for discoveries related to the synthesis of ribonucleic acid (RNA) and deoxyribonucleic acid (DNA).

These two complex organic chemicals have been under study for years. DNA is the chemical that functions in most living things as the carrier of hereditary qualities. It has been described as providing the master pattern in each cell, allowing that cell to reproduce itself in its own image. It is thought that it plays some role in the production of RNA, which is believed to be essential in the production of protein, the basic material for all living tissue. Further, it is thought that in some viruses, such as the poliomyelitis virus and the tobacco mosaic virus, RNA also passes on hereditary "instructions." Because of the complexity of living cells, it has been difficult to find ways of studying the two chemicals in isolation.

Kornberg's contribution was the discovery of an enzyme that promotes production of DNA from much smaller organic molecules, which are available commercially. Ochoa found an enzyme that fulfills a like function for RNA. Beginning in 1955, Ochoa obtained his enzyme from *Acetobacter vinelandii,* the bacteria that turn alcohol into acetic acid. In 1956 Kornberg found his enzyme in the common intestinal variety of the bacterium *Escherichia coli.* He put this to work to produce DNA but found that magnesium salts must be present with the primer to start the reaction.

The research, which was conducted independently by Kornberg and Ochoa, has made it possible to use these enzymes for synthesis of compounds that appear to be virtually identical with DNA and RNA physically and chemically, although they have not yet been shown to be biologically active. The work has clarified many of the questions about cellular reproduction and protein formation.

The Two Careers

Ochoa, who is 54 years old, was born in Spain, where he received his medical degree with honors from the University