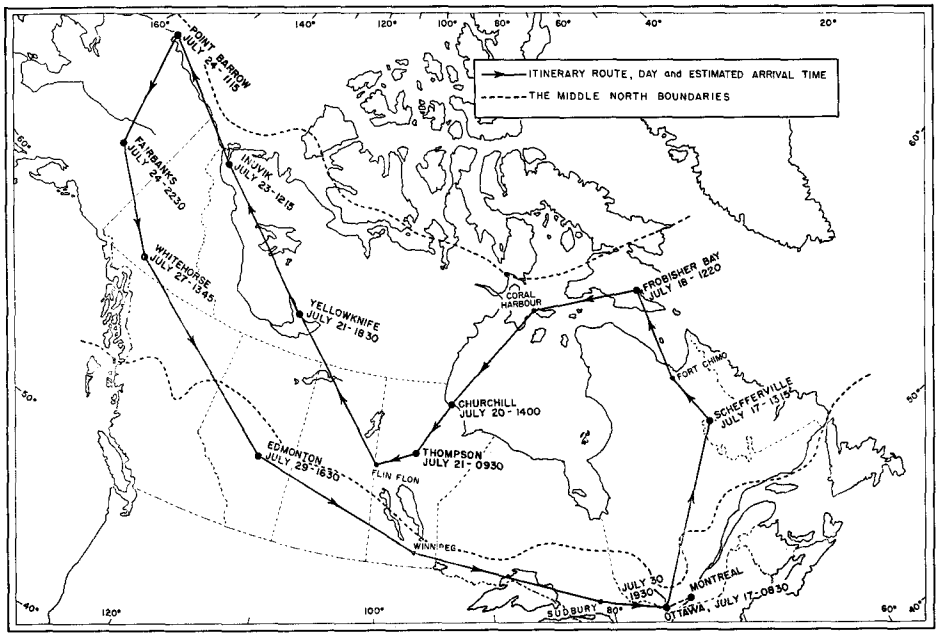

FIG. 1. Itinerary of the 1967 Middle North Tour.

from NORDAIR Ltd. in Montreal and arrangements were made to visit ten carefully selected Middle North communities. On 16 July, the evening before their departure, the group received a comprehensive briefing by senior officials of the Department of Indian Affairs and Northern Development in Ottawa, and at the end of their two-week tour, on the evening of 29 July, they were briefed by members of the Northern Alberta Development Council in Edmonton. Altogether, the tour covered about 9,500 miles, for which 44 hours of flying time were required. The complete itinerary, with the arrival dates at each of the centres visited, is shown in Fig. 1.

Seventeen people participated in the entire tour and the group was composed of 11 Americans, 5 Canadians, and 1 Scandinavian. The professional status of the participants was as follows: 7 university presidents, associate deans, chairmen of departments, and professors; 5 representatives of U.S. foundations; 3 heads of public and private research organizations; and 2 Arctic Institute staff. Two other prominent Canadians joined the group for varying periods of time during the trip.

It is expected that a brief resumé of the Wingspread symposium and a full report on the Middle North Tour will be published by the Institute before the end of 1967.

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The Soviet Drifting Ice Station, NORTH-67

In April 1967, one of the Arctic Research Laboratory's aircraft made two landings at the Soviet Drifting Ice Station NORTH-67. The station was on a floe about 2 metres thick which was somewhat cracked around the perimeter. The runway was in excellent shape, about 5,000 feet long and 125 wide, slick and hard. It was on a refrozen lead attached to the camp floe. Snow was scraped off, rather than dragged, with the use of tractors similar to small U.S. farm tractors.

The first landing was made on 15 April while the aircraft was en route from Point Barrow to Fletcher's Ice Island T-3. The Soviet Drifting Ice Station was then at 76° 40'N., 164°40'W., almost on a line between Point Barrow and T-3. The pilots decided to land at the Soviet station in part to encourage friendly relations between two groups engaged in comparable scientific research and combating the same austere environment and in part to satisfy a very human curiosity.

Pilots Clifford Alderfer and Richard Dickerson, with their passengers from the Arctic Research Laboratory, Frank Spik, Al Magnuson, Simeon Akpik, and Loeb Wood, were cordially welcomed, and stayed from 1650 to 1830. After refreshments in the pilots' mess hall, they visited Chief Scientist Dr. Karasik, Director of Aviation Vasili A. Borisov, and

others. Karasik and Borisov both wore the Hero of the Soviet Union medal. Sergei S. Ivanov, whose mother is a prominent geophysicist in Moscow acted as interpreter. The Russians invited the ARL group to inspect any facility on the station, and Alderfer inspected one of the COLT aircraft used in their work on the station. Before leaving, the Americans made their hosts a gift of 5 cases of beer and 20 cartons of cigarettes; the Russians reciprocated with a 25-kilo keg of red caviar, a case of frozen fish, and miscellaneous small foodstuffs, including some of their instant coffee, which was delicious.

We invited Dr. Karasik and his group to visit T-3, but they said that the poor flying weather in the spring had put them so far behind schedule that they were now working 24 hours a day during good weather and hence could not take the time to stop at T-3, but that they would welcome our visits. They had, in fact, expected us to land on 12 April, when the American R4D had circled their camp. Both Russians and Americans took photographs, and a representative of Radio Moscow taped an interview with the ARL pilots.

A second stop was made by the R4D en route to Barrow on 29 April, at which time the Soviet Drifting Ice Station was at 77°N., 165°W. On that trip, the American party consisted of pilots Richard Dickerson and Guy Shepard, with the following passengers from the Arctic Research Laboratory, apart from myself: David M. Tyree RAdm. USN (Ret.), Dr. Ned A. Ostenso, and John Beck. Again we were cordially welcomed and given refreshments in the pilots' mess hall; we stayed for two hours. Among the many people with whom we talked (unfortunately we could catch only a few of the names) was Vladimir F. Kondratenko, Aircraft Controller. The fact that the station needed an Aircraft Controller may sound strange, until one realizes that there were 100 pilots attached to the operation, which involved a total of 300 or more people.

NORTH-67 was a busy place. A temporary, or portable station, it was a major flying operation in support of scientific geophysical observations, with emphasis on gravity, seismology, oceanography, and meteorology.

The station was serviced by 6 flights a day from the mainland. On 29 April, a poor day for flying, with a low overcast, wind, and snow, 9 COLT aircraft, one R4D type, and one IL-14 were parked, 1 helicopter was on the ice and 1 was flying. During our visit, 2 aircraft (one an IL-14) arrived and departed, and another was expected shortly. On 15 April, one of their large aircraft (C-130 type) had preceded the American group in landing. At that time, 3 COLT's and 2 helicopters were parked at the runway, 1 helicopter was landing, and 2 COLT's were approaching for landing.

The COLT, which carries 10 people and is manufactured in Poland, seems to be the workhorse of the operation. Although the Soviets do not think much of it because they consider it too small, our pilots were impressed with its short take-off and rate of climb. It takes off in 250 metres under no-wind conditions and in 150 metres with a 10 to 15 knot wind. The skis are laminated fiberglass, old Norseman style; they have no shock absorbers.

As to the camp itself, there were about 70 buildings in the main camp and some structures in outlying areas. Nearly all the structures were of the "Jamesway" type, except that they had rounded ends rather than vertical. The pilots' mess hall was about 10 feet high at the ridge and about 12 feet wide. Living quarters were not as high. The structures seemed to come in different lengths. Floors were made of light plywood, and the benches were of 1 inch by 8 inch lumber, probably birch. Interior covering of the structures was something like a heavy muslin. Snow was used for insulation on the outside, but by 29 April, the warm weather had melted it off. Windows were port-hole type. Sanitary facilities were designed solely for necessity, not for comfort; they consisted of a simple trench, unheated, with canvas protection from the wind. The buildings were heated by unvented propane heaters. Cook stoves were of the size used in our small efficiency apartments. They too were fueled by propane and unvented, and there was evidence of large stocks of propane bottles. Electricity was direct current, with light bulbs about the size of those in automobile headlights. Living quarters, which did not have electricity, were used in shifts by 2 men at a time. The scientific leader had a plywood hut of about 14 by 20 feet to himself; it was one of the very few structures of that type in the camp.

The camp was well laid out, clean, and very quiet. (There was no thumping of heavy generators.) It was distinctly divided into sections: pilots had their own quarters, mess hall, and facilities, and the same was true for radio operators, for maintenance personnel, and for the scientific group. Food supplies for this austere portable operation were definitely "camp type," with dried fish, canned sausages, bacon, much butter, instant coffee, and excellent bread. There was none of the "downtown" fare of the ARL, which is heavy in fresh meats. Cooking facilities were limited, but the Russians pointed out that these

quarters were characteristic only of temporary stations like NORTH-67, and that their more permanent ice stations were much better.

The several hundred people in the camp were rather clearly separated into groups, each with its own chief, who seemed to exercise considerable authority. There were no women on the station. The pilots work for Aeroflot, and many are veterans of World War II. Borisov, age 52, had received the Hero of the Soviet Union medal for being the first Russian to bomb Berlin. Some had ferried B-26's from Nome to Siberia. All of them seemed to be professional arctic pilots. Many had served in the Antarctic, and one pilot had 30 years' service. Dickerson recognized a man whom he had once met at the Soviets' Mirny Station in Antarctica. The average age of pilots and maintenance people seemed to be in the 40's and that of the scientists nearer 30 years. The cooks looked like the "construction type," but wore cap insignia.

There seemed to be a great deal of scope for personal preference in clothing. Aircraft people wore leather-like jackets; some had leather pants and rubber boots. Scientists wore huge leather or felt boots that came up almost to the knees. All of them were amused by our white felt "bunny boots," and they thought that the ARL pilots were out of their minds to wear leather shoes.

The station had 3 physicians, and they volunteered to send one to T-3 if need arose. The pilots, similarly, had offered to send over aviation gas if needed.

The Russians seemed eager for an exchange of views and knowledge, and asked innumerable questions: What were the scientific fields in which one should look for more exchange of information? Was it possible to have a greater exchange of ideas for working with aircraft in the Arctic? How thick and what kind of ice was T-3? (They seemed to be greatly surprised to learn that it was 100 feet thick, although most scientists have surely had access to the many published accounts of T-3.) What type of studies were being pursued on T-3? Why did we not keep aircraft stationed on T-3? (They regarded this as a lamentable deficiency in the T-3 program.) How many pilots did ARL have? How many aircraft did we have? (They were incredulous when we answered that the normal contingent was 4 pilots and 3 aircraft!) What type of housing was on ARLIS II? (They were familiar with ARLIS II and much interested in that type of operation.) How long had ARL personnel been in arctic work? Dr. Karasik was familiar with the U.S. arctic program, and the U.S. people about whom the Russian scientists expressed the most interest were Lachenbruch, Ostenso, and Cartwright.

We were sorry to have to take our leave, and hoped that they might visit us on T-3, but the weather continued poor throughout the first half of May. Our pilots have not heard the NORTH-67 beacon since 1 May, nor have any of their aircraft passed over T-3, but we will remember with pleasure the hospitality we enjoyed on NORTH-67.

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Comments on the Report on the Soviet Drifting Ice Station, NORTH-67

Dr. Max Brewer's report on visits to the Soviet Drifting Ice Station, NORTH-67, reminds us again that our nearest neighbours across the Arctic Ocean have had a special interest in the Arctic and northern lands for a long time. This is not strange when one remembers that more than one third of Soviet territory lies north of the Arctic Circle, that a number of their great rivers — the Ob, Yenisei, Lena, Kolyma, and Northern Dvina — flow northward into the Arctic Ocean, and that by the middle of the seventeenth century Russian explorers had sailed, in parts, the whole of the Northern Sea Route between the Atlantic and Pacific Ocean in efforts to link up their river waterways with ocean commerce. Early attempts to exploit that route took a heavy toll of those explorers even before Vitus Bering and Alexis Chirikov were discovering and outlining the coast of Alaska.

And then the age of aviation brought a new impetus to polar exploration and research, in which aviators and explorers from a number of countries participated and set world records. In this year of the centennial of the purchase of Alaska from Russia by the United States, it is appropriate for us in North America to talk especially about the achievements of our Russian neighbours and their pioneers in the Arctic.

The high title, Hero of the Soviet Union, was created and first given to 7 airmen who rescued the crew of the ship *Cheliuskin* which had perished in the ice of the Chukchi Sea on 13 February 1934, while en route from Murmansk to Vladivostok.

It seems to me that 1937 marks the beginning of the Soviet effort to explore the Arctic Basin in a systematic way with aircraft, a plan which according to Admiral Burkhanov

had been worked out in previous years by their Arctic Institute. As Burkhanov says: "All stages of Arctic research during the years of Soviet rule have been linked with the problem of charting and mastering the Northern Sea Route. A network of polar stations guaranteeing exhaustive observation throughout the year of basic natural processes taking place in the Arctic, wide air reconnaissance over the vast Arctic expanses"[1] was and still is the Soviet Union's basic policy. The implementation of the plan has been known, in rough translation, as "the flying laboratory method with leaping detachments." In May 1937, using four 25-ton, 4-engine aircraft (ANT-6's), a Russian team established Station NORTH POLE, later known as NORTH POLE-1, and occupied it for 9 months. The scientists on that expedition were Papanin, Krenkel', Fedorov, and Shirshov.

The method of using a central base from which small aircraft operate has been followed consistently ever since. Through these "flying laboratories", the Russians have covered the arctic basin with geophysical observations and made major contributions to the reconnaissance of the whole polar area. The May 1937 expedition was followed by record-breaking flights from Moscow over the North Pole to an airport near Vancouver, B.C., in June, and to San Jacinto, California, in July. Both flights were made with ANT-25 aircraft.

At the time, these transpolar flights created a stir throughout the world second only to the launching of Sputnik 20 years later. And the June 1967 issue of the magazine *Grazhdanskaia Aviatsiia* (Civil Aviation) carries a glowing account of the first transpolar nonstop flight entitled "USSR-USA, Over the North Pole" by M. V. Vodop'ianov, famous Soviet pilot and himself a Hero of the Soviet Union. According to Vodop'ianov: "The purpose of these flights was to investigate the shortest air route between the Soviet Union and the United States." The issue of the magazine which commemorates the fiftieth anniversary of the Russian revolution, includes a full-page photograph of Chkalov, Baidukov, and Beliakov, the pilots who made the first flight. The crew of the second flight — from Moscow to San Jacinto, California — were Gromov, Iumashev, and Danilin. As the flyers passed over the Pole, the weather prevented them from seeing the four scientists who were "keeping their heroic watch" on NORTH POLE-1.

Now, 30 years after those historic flights, the details of an American-Soviet air transport agreement are being concluded, and one of the principals who signed the Meteorological Annex for the Soviet Union was Academician and Hero of the Soviet Union, Evgenii Konstantinovich Fedorov, who pioneered as a young geophysicist on NORTH POLE-1. Also, as Brewer reports, some of the pilots on NORTH-67 are veterans of polar aviation, having ferried war planes from Nome to Siberia during World War II.

Many air travellers have experienced, or are at least aware of, the airlines which fly routes through Anchorage, Alaska. At present, nonstop flights are scheduled between Anchorage and Amsterdam (4,475 miles), Copenhagen (4,313 miles), Hamburg (4,430 miles), Paris (4,689 miles), Tokyo (3,460 miles), Chicago (2,830 miles), and other cities in the United States. The air distance between Anchorage and Moscow is about 4,300 miles.

While we two neighbours keep nuclear-tipped missiles aimed at each other across the arctic seas, it is of some comfort to learn, through Brewer's report, that a few of our scientists are having warm and friendly visits with their counterparts on the drifting floes in the icy winds of the Arctic.

Paul A. Smith
THE RAND CORPORATION

Editor's Note: Readers who are not familiar with these Soviet operations in the Arctic Ocean may be interested in the following excerpts from a note by Moira Dunbar, Defence Research Board, Ottawa.

"The Soviet Union has two complementary but quite distinct programs of data collection in the Arctic Ocean, the NORTH series and the NORTH POLE series. The first takes place every spring and consists of a temporary ice station from which a large number of small aircraft operate, landing and making spot observations over a wide area. Known as High Latitude Airborne Expeditions, each in the series is designated "NORTH" with the last two digits of the year. Thus NORTH-67, visited by ARL personnel, was the twentieth of the series, which started in 1948.

"The more permanent Soviet Drifting Ice Stations (NORTH POLE series) grew out of the original concept of the Papanin station. These stations carry a much smaller number of men for a longer period, each one being maintained for around two years, by which time they are usually near the outlet from the Arctic Ocean. There are normally two in operation at any given time. NORTH POLE-2 was started in 1948 and the latest is NORTH POLE-15."

[1]Burkhanov, Vasily, 1956. *New Soviet Discoveries in the Arctic* (Moscow: Foreign Languages Publishing House) p. 17.