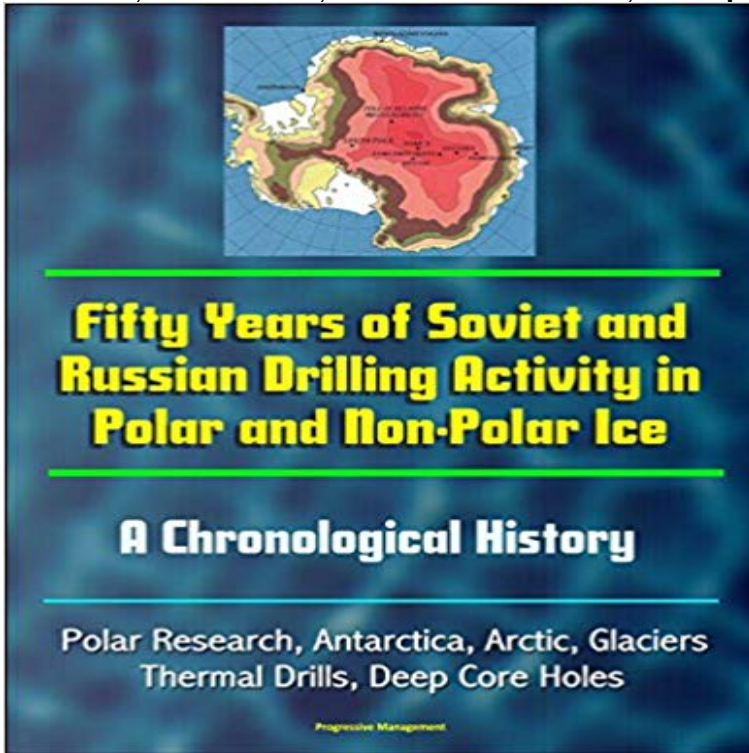


Fifty Years of Soviet and Russian Drilling Activity in Polar and Non-Polar Ice: A Chronological History - Polar Research, Antarctica, Arctic, Glaciers, Thermal Drills, Deep Core Holes



Soviet and Russian drilling activity in ice began in 1955 while conducting temperature surveys on a glacier in Franz-Josef Land in the Arctic and continued to 1960 on the glaciers of the polar Ural and the northern Tien Shen mountain ranges. In 1956 the first Complex Antarctic Expedition (CAE) was formed and the first Antarctic drilling was conducted in October of 1956 near Mirny Station. Later, the expeditions were referred to as Soviet Antarctic Expeditions (SAE) and Russian Antarctic Expeditions (RAE). Early efforts were conducted with hand drilling equipment followed by mechanical rotary and percussion drilling techniques. Thermal (flame and thermal electric) boring drills and later thermal coring drills eventually culminated in drills of the TELGA type for thermal drilling deep, dry holes. One such hole reached a depth of over 900 m at Vostok. Use of TBZS type thermal drills for drilling in fluid-filled holes were also developed, as was a technique using anti-freeze to dissolve the melt water formed, the dilute solution then remaining in the hole to provide the necessary hydrostatic balance. An electro-mechanical drill KEMS was first introduced on Vavilov Glacier, Severnaya Zemlya (Russian Arctic) in 1984 and then in 1989 at Vostok Station. Five major holes have been drilled at Vostok, the last one stopped in 2006 (RAE 51) at a depth of 3650 m, 100 m above Lake Vostok. This report chronologically summarizes the Soviet and Russian efforts over the last 50 years. Chapter 1 * Antarctica * Introduction * 1955-56, First CAE (Complex Antarctic Expedition): Mirny * 1956-57, Second CAE: Mirny * 1957-58, Third CAE * 1958-59, Fourth CAE (renamed SAE, Soviet Antarctic Expedition) * Vostok * Shackleton Ice Shelf (66 36 S, 101 20E) * Drigalskiy Island (appr. 66 S; 92 E) * Lazarev Station (6958S, 1255E) * 1959-60, Fifth SAE *

Lazarev Station * Arctic and Antarctic Research Institute * 1960-61, Sixth SAE: Mirny * 1961-62, Seventh SAE * 1962-63, Eighth SAE: Mirny * 1963-64, Ninth SAE * Traverse Vostok-Pole of Relative Inaccessibility (78 S, 20 E)-Molodyezhnaya * 1964-65, Tenth SAE * 1965-66, Eleventh SAE: Mirny * 1966-67, Twelfth SAE: Novolazarev Ice Shelf * 1967-68, Thirteenth SAE: Mirny * 1968-69, Fourteenth SAE: Mirny * 1969-70, Fifteenth SAE: Vostok * 1970-71, Sixteenth SAE: Vostok * 1971-72, Seventeenth SAE * Vostok * Mirny * 1972-73, Eighteenth SAE * Vostok * Mirny * 1973-74, Nineteenth SAE * Vostok * 1974-75, Twentieth SAE * Vostok * Vostok-1 (72 08S, 96 35E, 647 km mark on the Mirny-Vostok route) * Mirny * Lazarev Ice Shelf * 1975-76, Twenty-first SAE * Vostok * Vostok-1 * Lazarev Ice Shelf * 1976-77, Twenty-second SAE * Vostok * Vostok-1 * Novolazarevskaya Station * 1977-78, Twenty-third SAE * Vostok-1 * Base Salut (65 32 S, 96 30E) * 1978-79, Twenty-fourth SAE * Mirny * Pionerskaya (6944S, 9530E, 375-km mark on the Mirny-Vostok route) * Ross Ice Shelf (J-9 Camp) * 1979-80, Twenty-fifth SAE * Vostok * Mirny * Pionerskaya * 1980-81, Twenty-sixth SAE * Vostok * Komsomolskaya Station (74 06S; 94 30E, 870 km south of Mirny) * Mirny * Traverse Mirny-Pionerskaya-Dome C * 1981-82, Twenty-seventh SAE * Vostok * Komsomolskaya Station * 1982-83, Twenty-eighth SAE * Vostok * Komsomolskaya Station * Base Druzhnaya (77 34 S; 40 13W, Filchner Ice Shelf) * 1983-84, Twenty-ninth SAE * Vostok * Base Druzhnaya * 1984-85, Thirtieth SAE * Vostok * Base Druzhnaya * Dome B (77 04 S, 95 55 E, elevation 3850 m) * 1985-86, Thirty-first SAE * Vostok * Dome B * Base Druzhnaya * 1986-87, Thirty-second SAE * Vostok * Base Druzhnaya * 1987-88, Thirty-third SAE * Vostok * Mirny * Dome B * Base Druzhnaya-4 (69 44 S; 72 42E; Oasis near

Emery Ice Shelf) * 1988-89, Thirty-fourth SAE * Vostok * Mirny * 1989-90, Thirty-fifth SAE * Vostok * Mirny * 1990-91, Thirty-sixth SAE * Vostok * 1991-92, Thirty-seventh RAE * Vostok * Dome B * 1992-93, Thirty-eighth RAE * Vostok * 1993-94, Thirty-ninth RAE * Vostok * 1994-95, Fortieth RAE

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