with fat is lowered down. The slices of fat are placed at the bottom of a can, and melting fat flows down keeping the fire burning.

Thus, in case of autonomous existence in the Arctic a person must make a rational use of everything that the nature and the surrounding environment provide him to his advantage. To survive in a rough climate a person must be physically fit and possess analytical skills as well as be ready to make decisions independently and be emotionally stable.

References

1. KEPL People under the conditions of autonomous existence [Электронный ресурс]. – Режим доступа: http://kell.ru/materialy_k_uroku/avtonomnoe_prebyvanie_cheloveka_v_prirodnoy_srede
2. The Arctic (2012) Population [Электронный ресурс]. – Режим доступа: http://ru.arctic.ru/population/
3. Volovich V.G. (2010) Person under extreme conditions of environment [Электронный ресурс]. – Режим доступа: http://kombat.com.ua/vol/vol7.html.

HISTORY OF DRIFTING STATIONS

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A drifting station is a scientific research station on a drifting ice floe in deep-water parts of the Arctic Ocean [1].

Stations conduct comprehensive, year-round research in oceanography, glaciology (ice physics and dynamics), meteorology, aerology, geophysics (ionospheric and magnetic field observations), hydrochemistry, hydrophysics and marine biology.

A drift station is a term used to describe a temporary or semi-permanent facility built on an ice floe. During the Cold War the Soviet Union and the United States maintained a number of stations in the Arctic Ocean for research and espionage, the latter of which were often little more than quickly constructed shacks [2].

Norwegian polar explorer Fridtjof Nansen was the first to come up with the idea of establishing research stations on drifting ice floes in the central Arctic after returning from his famous expedition (1893-1896) when the first drift was carried out on board the Fram ship frozen in heavy packed ice.

Canadian polar explorer Vilhjalmur Stefansson made the first attempt to set up a drifting station. In March 1918, an expedition led by Starker Storkerson camped on an ice floe with an area of over 400 sq km several hundred miles from Alaska. During the drift, the polar explorers conducted hydrological and meteorological observations. In November, the expedition safely returned to the mainland.

In the Soviet Union, the idea of setting up a station near the North Pole was advocated by Academy of Sciences Member Otto Schmidt and Professor Vladimir Wiese (Vize), who embraced and developed Nansen's ideas.

The first plan of establishing a polar research station, proposed by Vize, was considered back in 1929. However, no practical steps were taken in this area until 1935. On May 1, 1937, airplanes of a high-latitude air expedition landed on an ice floe near the geographical North Pole, delivering the station team and supplies.

A remarkable expedition was accomplished by the USSR just prior to the start of World War II, led by political officer Ivan Papanin. From a starting base on Rudolf Island in Frantz Josef Land, an aircraft expedition was deployed to the North Pole and a research camp established on the drifting ice in the vicinity of the pole. For communications, a radio beacon was installed, and for resupply, a landing strip was prepared.

On February 1, 1938, the first polar drifting station "North Pole – 1" of the Soviet Union, while adrift by the shores of Greenland, suffered a major storm. The wind accelerating to 150 kilometers per hour caused the entire ice block the station was based on to crack into small pieces. The people were left on a chunk barely 30 by 50 meters big, while their food and other belongings were swept away on another chunk of the block. Fortunately for the scientists, the radio transmitter stayed unbroken, which literally saved their lives, as they were able to call for help in time [4].

Though the general exploration of the north started as early as the late 18th Century, the serious step-by-step scientific reclamation of the Arctic only began in the 1920s. To learn more about the northern regions, polar stations, as well as sea and aviation ports, had been established on the shores of all northern seas. However, the most daring step was to set up a station which would actually be able to surf all the way to the North. This plan was put into operation by establishing, in 1937, the first drifting North Pole station, headed by the legendary Soviet scientist and explorer Ivan Papanin.

Before the expedition, from February 19 through 25 of 1937, Papanin organized a training course for his crew of three people, aiming to adjust them to the harsh conditions of the polar existence, as it required not only the exceptional health but a sufficient amount of stamina. The crew lived in a tent in one of the snow-clad fields in the Moscow region, drank water melted from the snow, and only fed on the polar ration. Later, the training base moved up north to the Franz Josef Land Archipelago, 900 kilometers from the North Pole.

After a thorough training course on May 21, 1937, the plane lifted Papanin's four, also carrying tons of scientific equipment and food supplies. They even took Papanin's private stamp he used to label his letters to Moscow and the crew's favorite dog Cheerful.

The ice block Papanin's crew landed on was, according to Papanin himself, "three-meters thick, drifting above five kilometers of water." The ice block was three by five kilometers large and housed a tent, storage space, workshops, radio antennas, and a weather booth. The group's major task was to observe the weather conditions. They worked 16 hours a day, simultaneously studying and keeping diaries. Papanin himself jazzed up his academic work by cooking meals for the rest of the crew.

Before the disaster cut into the group's schedule, that is, from June 1937 till February, Papanin's squad spent 274 days adrift, having traveled a total of 2500 kilometers. After the disaster occurred, and though the tiny ice block they were on could be squashed between the other bigger blocks at any moment, Papanin's squad, left without any supplies, still tried to carry on working as they waited for the help to come.

The scientists were rescued on the fourteenth day of the drift by the "Taimyr" and "Murman" patrol vessels, with an icebreaker and a zeppelin also rushing to the site. On February 21, 1938, Papanin's squad set their feet on board the Yermak icebreaker.

The scientists were greeted in Moscow as heroes, making the headlines of every paper, while playing "The Papanin Squad" became one of the favorite amusements among young boys.

The North Pole -1 station opened a new chapter in Arctic exploration, giving way to setting up more elaborate stations, which even to this day contribute to the exploration of the Arctic.

On average, 600-650 ocean depth measurements are taken, 3,500-3,900 meteorological observations are made, 600-650 pilot balloons carrying radio sensors are launched, and 1,200-1,300 seawater temperature measurements and samples are taken for chemical analysis at the station each year. Magnetic, ionospheric, glacial and other observations are also conducted. Regular determination of the ice floe's astronomical coordinates provides data on the direction and speed of its drift.

Important physical and geographical discoveries were made during the expedition as valuable conclusions were made regarding the patterns and interconnection of processes in the polar region of the earth's water area and atmosphere.

Unknown to the west at the time, a second Soviet drifting station "North Pole-2" was organized and deployed in 1950. Observations carried out during its drift showed that continuation of the study was needed. After 1954, Soviet field work on the drifting ice became regular - every year one, two, or sometimes even four ice camps operated in the Arctic Ocean [3].

Arctic studies over several decades were aimed at understanding of regularities of natural processes and how to forecast them. The drifting ice stations collected fundamental observational data. These operations continued until 1991 when the station "North Pole-31" terminated. During the period 1937-1991, 88 polar crews occupied the ice floes for a total of 29,726 drift days, while drifting a distance of 169,654 km. The research program of the "North Pole" drifting stations is unequalled in the 20th century by duration, variety of observational material, importance of scientific discoveries, and number of resolved problems.

In March 2003, the government decided to resume research programs on Polar drifting stations. On April 25, 2003, the first Russian drifting station, North Pole-32, opened. Drifting stations have been operating regularly ever since.

In the post-Soviet era, Russian exploration of the Arctic by drifting ice stations was suspended for twelve years. The year 2003 was notable for Russia's return into the Arctic. As of 2006, three "NP" stations had carried out scientific measurements and research since then: "NP-32" through "NP-34" The latter was closed on May 25, 2006.

"NP-35" started operations on September 21, 2007 at the point 81°26′N 103°30′E, when flags of Russia and Saint Petersburg were raised there. 22 scientists, led by A.A.Visnevsky are working on the ice floe. Establishment of the station was the third stage of the Arktika 2007 expedition. An appropriate ice floe was searched for from Akademik Fedorov research vessel, accompanied by nuclear icebreaker Russia, using MI-8 helicopters, for a week, until an ice floe with an area of 16 square kilometers was found. The ice has since shrunk significantly, however, and the station is now being abandoned ahead of schedule.

References

1. Drifting station [Electronic resource] http://encyclopedia2.thefreedictionary.com/drift+station/, free, reference date 17.05.2016.
2. History of drifting station [Electronic resource] https://en.wikipedia.org/wiki/Drifting_ice_station, free, reference date 17.05.2016.
3. History of drifting station [Electronic resource] http://arctic.ru/news/20151218/261584.html, free, reference date 17.05.2016.
4. On this day: Russia in a click [Electronic resource] http://russiapedia.rt.com/on-this-day/february-1, free, reference date 17.05.2016.