

**From observant station of the Mangejm meteorological Society to the
Ural board of hydrometeorological service:
History of development of meteorological supervision on border of Europe and
Asia (Ural)**

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The history of almost continuous meteorological supervision on Ural originates from the moment of creation at the Pyshminsky factory (22 kms from Ekaterinburg) observant station of the Mangejm meteorological society. This station was organized in May, 1790 by the academician of St.-Petersburg academy of sciences Benedict Franz Iogann (Ivan Filippovich) fon Hermann and operated till December, 1791.

The initiators of creation of meteorological stations of the Mangejm meteorological Society in Russia (S.Peterburg, Moscow, Ekaterinburg) were Stephan Shtengel and Jacob Hemmeriks. This station became the first the unified advanced post of global research of an atmosphere on Ural where were observed temperature (by Reomjur thermometer), pressure (by barometer with scale in Parisian inches and lines), humidity (by Delucke Hygrometer), quantity of acting and evaporating liquid deposits, a direction of a wind (by windvane) and presumably atmospheric electricity. Results of activity of the station at Pyshminsky factory were published in the book of academician K.S.Veselovsky «About climates of Russia» (“O climatah Rossii”, 1857).

Unfortunately, J.Hemmerik's death (1790) and some other negative events resulted to disappearance of the Society. Meteorological researches on Ural also became incidental. They proceeded under I.F.Hermann's initiative. He was also the initiator of supervision in Ekaterinburg (1799-1802) within the framework of the program of the St.-Petersburg Academy of sciences. It became clear from the magazine under the title «Supervision at the mountain heads in Ekaterinburg (1802-1835)», which I have found out from the archive of the Ekaterinburg Magnetics and Meteorological Observatory (EMMO) in 2003: I.F.Hermann was the organizer of this supervision since August, 1802 till April, 1813. In this magazine records of temperature by Reomur thermometer, pressure by a barometer with scale in the English inches and lines, a direction and force of a wind (a condition of the sky) were found out. Supervision carried out Egor Anton (1802-1818) and Nikolay Labutin (1819-1825

(1835?).

In 1828-1829 years Ekaterinburg A.J.Kupffer's, A.Erman's, A.Humboldt's scientific expeditions and some Russian and German scientists visited.

With help of A.Humboldt A.J.Kupffer founded the Ekaterinburg meteorological and magnetic observatory, and also two stations of the Normal observatory in Zlatoust and Bogoslovsk (today it is city of Karpinsk of Sverdlovsk region) in 1836. From this year regional complex system of meteorological observations on Ural began to operate.

The main Ural observatory became the Ekaterinburg magnetic and meteorological observatory. Complex monitoring an atmosphere and lithosphere on Ural (stationary researches of meteorological and geomagnetic elements) originates in it. The Ural researches included stationary research century, seasonal etc. variations of climatic characteristics. They intended for climatic division of districts of the Ural territories in view of breadth and height of a place, and also research of global laws of geomagnetism and thermal geophysical characteristics. Scientific ideologists were F.Arago (under his program of investigation of century variations of magnetic elements and a thermal mode), A.Humboldt (he promoted the organization of system of complex monitoring of an environment on the basis of use of a method isolines and put the research problem of geography of plants, vertical ash value and systematization of climatic zones), A.J.Kupffer (he has organized and expanded system of complex meteorological and geomagnetic monitoring). Due to A.Kupffer's scientific contacts with K.Gauss _____ was equipped with K.Gauss's devices and techniques for geomagnetic measurements. K.Gauss also carried out theoretical processing of the Ural data within the framework of the mathematical theory of terrestrial magnetism. A.Kupffer tried to carry out supervision of a radiating mode with the help of Arago's actinometres in _____. In 1828 he started to collect data on temperature of terrestrial bowels of Ural (mines of Bogoslovsk).

First _____ observer was J.M.Rejnke (1836-1838). Then observers were: I.V.Avdeev (1838-1839), V.I.Rozhkov (1840-1846), I.V.Avdeev (1846-1848), K.G.Shugaev (1848-1859), M.A.Shulaev (1859-1871), A.V.Savin (1871-1872), N.V.Golubkov (1872-1876).

Initiative meteorological researches have begun from 1839 in Nizhny-Tagil'skaya meteorological observatory (1839-1866). Their initiator became Anatoly Nikolaevich Demidov and presumably the French scientist F.Le-Ple. French engineers - topographers E.Bergier and A.Allori were engaged in the organization of an observatory in Nizhny Tagil. Later the main inspector and the curator was French researcher L.Veer and observer was Irodion Matveevich Rjabov. In this observatory were observed temperature (by Reomur thermometer), atmospheric pressure (by barometers with the French inches and lines), humidity (by psychrometer of August), deposits and overcast. Since 1852 magnetic supervision began to be carried out.

In 1876-1885 years the initiative system of regional meteorological monitoring and complex regional meteorological supervision on Ural was organized under guidement

of _____ and the Ural society of amateurs of natural sciences (Ural'skoe Obchshestvo L'ubitelei Estestvoznaniija - UOLE). Their initiator became Onisim Egorovich Kler. He has arrived to Ekaterinburg from Switzerland and has remained in Russia. A problem of these researches was to establish connection between the atmospheric and biospheric phenomena on the basis of stationary research century, seasonal etc. variations of climatic characteristics on longitudinal and latitude directions, stationary and field studying of geobotanical laws according to A.Humboldt and A.Decandole. In this period the wide researches of quantity of firm liquid deposits (from 1872, by UOLE) for climatic division of districts of the Ural territories were widely spread, and also phenological supervision have begun.

During 1885 for 1925 the Ural researches of an atmosphere become more fundamental. They began to be carried out in a complex with geophysical researches of _____ and UOLE. Studying the phenomena in various layers of an atmosphere and lithospheres began this time. Their initiators became Russian Germans G.F.Abels and P.K.Muller. Due to them on Ural research of processes of an active surface (a thermal mode of ground began in view of a moisture and a snow cover), high-altitude researches of an atmosphere, a radiating mode, seismic researches, development of meteorological and geomagnetic map-making of the Ural region developed actively. They were helped by UOLE (O.E.Clerc etc.).

During the revolutions of 1917 and the Civil war on Ural (1918-1920) _____ did not stop supervision. It was rescued from destruction by G.F.Abels and O.E.Clerc.

In June, 1921 the Soviet authority has issued «the Decree about the organization of meteorological service in Russia». In 1924 the Main physical observatory in Leningrad (St. Petersburg) was renamed into the Main geophysical observatory. In 1933 there was one more reorganization: the Central board of Uniform Hydrometeorological service of the USSR was organized. In 1936 it was renamed into Hydrometeorological service at Council of National Comissars of the USSR. So, in 1933-1936 years the Ekaterinburg magnetic and meteorological observatory has turned to the Ural Board of hydrometeorological service (Ural'skoe upravlenie gidrometeorologicheskoi sluzhby - UUGMS).

In 1925-1945 years in framework of _____, and then UUGMS, in Sverdlovsk (Ekaterinburg) monitoring of anthropogenous indignations of the city environment began, and also amplified actinometrical researches.

Initiators of the system of actinometrical researches on Average Ural were D.F.Nezdjurov (1925), R.G.Abels (1926-1941), N.N.Kalitin and V.A.Berezkin (1942-1944). In 1929-1931 years because of technogenous reasons (opening of a streetcar service in Sverdlovsk) geomagnetic researches were transferred to Vysokaja Dubrava (R.G.Abels). This station is in 30 kms from Ekaterinburg. In 1934 there it was organized actinometrical branch of UUGMS. Arrival and the charge of radiant energy and radiating properties of an atmosphere (V.G.Pozdeev) were investigated there.

In 1941-1944 years on Average Ural the system of monitoring of a radiating mode was created, also there was a deepening of studying of geosphere processes.

This period is connected with activity of evacuated in Ekaterinburg and Vysokaja Dubrava on base of ____ - UUGMS the Main geophysical observatory and the Leningrad institute of experimental meteorology (1941-1944). In 1942 in Vysokaja Dubrava research of atmospheric ozone (N.N.Kalitin, V.A.Berezkin) was initiated.

After 1945 creation of system of complex studying of a geographical environment on Ural began: atmosphere-physical and geophysical monitoring of the Ural ridge on breadth of ____ (Vysokaya Dubrava, Sverdlovsk, Arti, 1969-1971). Supervision over an atmospheric electricity (R.A.Paramonov) were developed. Initiators of creation of the observatory "_rti" were scientists of the Ural Institute of geophysics of the Academy of sciences of the USSR J.P.Bulashevich and N.A.Ivanov. Their activity in the organization of supervision were advised and helped by R.G.Abels and the head of Sverdlovsk seismic station I.K.Silina. The first director of the observatory "Arti" became A.E.Rytsk, the first scientific researches have begun V.A.Shapiro, Z.I.Borisova, T.N.Panov, G.G.Orlov etc. Now supervision in the Vysokaya Dybrava, Ekaterinburg and the observatory "_rti" are directed on an establishment of connection of the meteorological phenomena with geophysical and space processes. Now the head of observatory "Arti" is O.A.Kusonsky.

As a whole in history of ____ one can allocate three stages:

1. the history of the Mangejm station of meteorological society at Pyshminsky factory (1790-1791);
2. the history of meteorological supervision at Ekaterinburg Ober-berggamt (1791-1835);
3. the history of geophysical researches in ____ (1836-1929).

In the given work for the first time on the basis of contemporary records the data for the period from 1791 to 1835 are submitted and appreciated. Merits in the organization of supervision of academician I.F.Hermann, observers E.Antonov (the period 1799-1813), N.Labutin (1819-1835), G.Helm (1831-1834) are marked. The contribution to the organization and becoming ____ of German scientists and scientists of German origin _Humboldt, A.Kupffer, K.Gauss, J.Rejnke, G.Abels, P.Muller is generalized.

Priority researches ____ of distribution of a snow cover on slopes of the Ural mountains are opened and their urgency in connection with detection now effects of izostasy in atmospheric processes is marked.

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