The third period was characterized by the development of complex oceanological research, special expeditions and coastal waters stations. There appeared oceanological scientific institutions and international associations.

Round-the-world expedition on board the vessel "Vityaz" (1886-1889) headed by the academic oceanologist Stepan Osipovich Makarov (1848/49 – 1904) made a detailed study of the Northern part of the Pacific Ocean. The ship had special facilities for studying the water and the ocean bottom. Suffice it to point out, the northern parts of the Pacific were not sighted before, and not sailed by oceanographic vessels. S.O. Makarov was the first to make a conclusion about the circular rotation and anticlockwise movement of the surface water in the Pacific. He is also known for the idea to construct the ice-breaker «Yermak», and to head its building. On board the ship «Yermak» he made two arctic expeditions in 1899 and 1901. Besides, he worked out tactics of armored fleet, handled the problem of ship floodability and durability. At the beginning of Russian-Japanese war, he was the Commander-in-Chief of the Pacific Ocean squadron in Port Arthur (Lüshun). The vice-admiral was blown up on a mine on board the battleship «Petropavlovsk» [1, p. 678]. Vladivostok citizens are proud to have a monument of this outstanding sea explorer.

The XX century (1949-1979) observed the exploration survey of a new «Vityaz», the Soviet scientific-research vessel that covered the «white spots» on the maps of underwater relief of the Pacific Ocean, the Shatsky submarine elevation; the knoll of Academy of Sciences; the Deryugin submarine depression; the depression of Tinro; the Kuril-Kamchatka kennel, etc.[7].

It is important to mention Russian-American cooperation within the International geophysical year (1957-1958); it resulted in the creation of bathymetrical charts (bottom contour charts) and new navigation maps of the Pacific Ocean.

A real heroic deed took place in 1960 when Swiss explorer Jacques Piccard and American Lieutenant Don Walsh submerged in the bathyscaph "Trieste" into the deepest trench of the Pacific Ocean named Mariana Trench [2, p. 89]. As a result a bathymetrical atlas of oceans was published by the American National center of geophysical data in 1994.

In the year 1973 Pacific Oceanological Institute named after Viktor Ivanovich Il'ichev (1932□1994) was opened in Vladivostok Far Eastern branch of the Russian Academy of Sciences. It started extensive research of the Far Eastern seas and the open space of the Pacific Ocean. In the last decades numerous measurements of the Ocean floor have been made from space satellites.

The figure of Il'ichev is really great. He headed the Oceanological Institute for 20 years (1974–1994). He is renowned for his rich contribution in the world and Russian science with the works of primary importance. His wide scope of intellect allowed him to work in different spheres of modern science, such as geophysics, marine geology, hydrochemistry, nuclear physics, etc. During the 20 years of his leadership V.I. Il'ichev turned the Institute into a multifunctional scientific institution with modern laboratories, in which scientists can solve the most complex problems of studying and exploring the resources of the ocean [4].

The Russian Government highly appreciated his personal achievements. In 2011, Prime-Minister V.V. Putin basing on the Federal service of state registration gave his name to a guyot in the Pacific Ocean (the Magellan mounds in the western part of the Pacific) [3]. Thus our fellow countryman was immortalized for his significant work [6].

The Il'ichev Institute centers on acoustics and physics of the ocean and atmosphere, geochemistry and ocean ecology, geology and geophysics, as well as satellite oceanology. The Institute has two naval experimental stations. The first is located on Popov Island in Peter-the-First Bay, the other is situated on Schultz peninsula near Vityaz' Bay on the Japanese sea shore. Far Eastern seafarers board special ships provided by the local branch of the Russian Academy of Sciences to conduct scientific research in the Pacific Ocean [7].

Our further study is connected with the work performed by the Institute named after V.I.

Il'ichev in Vladivostok. Today, Far eastern scientists have shed light on Arctic anomalies. The Pacific oceanological institute is planning to organize three expeditions to the Arctic Ocean. The scientists' concern is with the intensive degradation of sub-sea permafrost of East-Siberian shelf that gives out gigantic quantities of ancient organic substances; the latter can influence the climatic plan of the Earth [8].

In conclusion it should be pointed out that Far-eastern discovery of the Pacific Ocean and the Arctic anomaly is very important for the present and the future. Scientific research vessel «Academician Lavrentiev» with 27 people on board from Vladivostok, Moscow and Tomsk studies the processes influencing climatic changes. Cooperation of scientists from the Oceanological Institute named after V.I. Il'ichev of the Far-Eastern branch of the Russian Academy of Sciences with a number of analogous institutions of Russia proceed working at the problem of global warming.

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2. Gorskaya M.V. English-Russian and Russian English Geographical Dictionary. 2-nd Stereotype Edition. – M.: Russky Jazyk Publishers, 1994. – 272 p.

3. Guyot Il'icheva (Magellan mounts, Western part of the Pacific Ocean) [electronic resource] – Access mode: guyot.ocean.ru/o-proekte/kharakteristiki-regiona.html

4. Il'ichev V.I. // Bol'šoi Rossisky entsiklopedičesky slovar'. – M., 2003. – P.569.