CHEMISTRY

Improve Helium Liquefying

➤ THE HELIUM GAS that gives lift to American balloons is more easily converted into liquid form by improved equipment developed at the National Bureau of Standards. Liquid helium is becoming increasingly important in scientific investigations, particularly in studying the behavior of metals at temperatures in the region of absolute zero.

Helium long resisted attempts to liquefy it, but later was reduced to a liquid by a combination process that involved high pressure and low temperatures obtained with the help of more easily liquefied gases. Helium liquefies at a lower temperature than any other gas, approximately at a point eight degrees above absolute zero, which itself is approximately 460 degrees below the zero of the Fahrenheit scale.

At the temperature of liquid helium, metals such as lead and tin, ordinarily poor conductors of electricity, become what scientists call superconductors, with a complete loss of resistance to the electric current. The National Bureau of Standards, with the support of the Office of Naval Research, is now making studies seeking a more complete explanation of this and other low-temperature phenomena.

The improved helium liquefier was designed by R. D. Scott of the Bureau staff. It operates on what is known as the Simon principle, employed in equipment devised by F. Simon about 16 years ago. It differs from the usual type of Simon apparatus in that the liquid helium is delivered into an external receiver by means of a transfer siphon.

In devising the Simon process, which was a simpler method than those used earlier, F. Simon filled a strong, thermally insulated container with helium at 150 atmospheres pressure. After cooling with solid hydrogen to about 18 Fahrenheit degrees above absolute zero, the compressed helium was allowed to escape through a throttling valve. When the pressure had reached atmospheric, the container was found to be more than half filled with liquid helium.

The heart of the new Scott apparatus is a thick-walled monel chamber, designed to withstand a pressure of 4100 pounds per square inch, within which the helium is liquefied. This chamber has an outer jacket through which liquid hydrogen is pumped. Both are contained in an evacuated container, which is also surrounded by liquid hydrogen. A combination of high pressure and escaping helium forms the liquid.

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GENERAL SCIENCE

Soviet Claim to Antarctic

➤ THE RUSSIANS who have added discovery of the Antarctic to the airplane and countless other achievements which the Soviets say Russia did first apparently don't believe their own man. Or maybe Capt. Fadei Bellingshausen of Emperor Alexander's Antarctic expedition strayed from the party line about a century before the party was born.

The great Bellingshausen, one of the real heroes of early Antarctic exploration, is now listed by the U.S.S.R. as co-discoverer of the Antarctic. What the now generally accepted records show is that Bellingshausen did name the first bit of the Antarctic continent to be discovered.

But he named it after an American, a "Connecticut Yankee" whom he met there.

Discovery of the mainland is credited to Capt. Nathaniel Brown Palmer of Stonington, Conn. Palmer, a young man of barely 21, was master of the sloop, "Hero," searching for fur seals. In mid-November, 1820, he first sighted the Antarctic peninsula jutting north toward South America.

Nearly three months after his discovery, Palmer heard fog bells in the Antarctic night. The next morning, he was invited to board the Russian frigate, commanded by Bellingshausen who had been sent to explore the Antarctic waters by Emperor Alexander I. The young Yankee navigator told the Russian officer what he had seen.

So impressed was Bellingshausen, and so unmindful of future repercussions, that he exclaimed:

"What do I see and what do I hear from a boy in his teens; that he is commander of a tiny boat the size of a launch of my frigate and has pushed his way towards the Pole through storm and ice!"

Then, with even less respect for the claims of the future rulers of Russia, he added:

"I name the land you have discovered in honor of yourself, noble boy, Palmer's Land."

That the land was a part of a continent was not suspected with any certainty until another American, Charles Wilkes, led the U. S. Exploring Expedition down the Antarctic coast south of Australia in 1840. And it wasn't until the twentieth century that any relatively complete exploration of the continent was made.

Although the American sealer, Palmer, gets credit, except from the Soviets, for the first discovery of land in the Antarctic, it may have been sighted earlier by whalers. One Dirk Gerritsz, a Dutch sailor, is known to have been close to the continent as early as 1599, and he may have seen land.

The U. S. has never pressed any official claims in the Antarctic. Last fall, it was announced that the State Department had approached seven other nations about some form of internationalized settlement of the Antarctic claims.

Russia was not among the nations approached, although historically Bellingshausen was an important early explorer. But until the latest pronouncement from the Russian All-Union Geographical Society, the Russians had shown little interest in the area since the time of Bellingshausen.

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ZOOLOGY

California Youth Studies New England Island Life

➤ THE width of a continent is no barrier to the pursuit of a serious scientific hobby, in the case of Dwight W. Taylor, 17-year-old student at the Webb School of California, in Claremont. A resident of Altadena, he has spent three summers making a thorough study of the mollusks of Nantucket island, off the Massachusetts coast.

Mollusks constitute the animal group comprising clams, snails, squid and their relatives. Before Mr. Taylor's studies began, 46 molluscan species were known from Nantucket; he has increased the count to 120. His searchings have taken him all the way from the high, dry pinewoods and old cemeteries of the island down to the shoreline and out to numerous offshore islets and rocks. He has also dragged the sea bottom to depth down to 90 feet in a search for the more elusive species. He has digested his data to show the animals' ecological relationships, that is, their reactions and adaptations to the small worlds they live in. Mollusks, he finds, are limited in the range of life-conditions under which they can exist. For instance, one burrowing species found normally in hard clay becomes both stunted and deformed if it is forced to burrow in sand.

In addition to his Nantucket researches, Mr. Taylor is also studying the mollusks that live within a two-mile radius of his school, and also the species (mostly snails) that have become adapted to the extremely dry-land conditions prevailing in the Mohave desert. He is interested in fossil shells as well, especially those representing the Pleistocene ice age. He has found deposits of such shells both in California and on Nantucket.

Mr. Taylor has become so much interested in his subject that he is considering making it his life work. His early scientific work has already begun to pay dividends, for he is one of 40 high-school seniors from all over the country who are winners in