

# Bohdan Cwilong 1908-1958

*Unluckiest UBC Physics Professor, Non-discoverer of the triple-point of helium*

Bohdan Cwilong (approximate pronunciation "Bogdan Tsveelong") founded the Low Temperature Group in the Physics Department at UBC. He was recruited by Department Head Gordon Shrum and later fired after an unfortunate event that caused Shrum professional embarrassment. This incident, however, set Cwilong off on a scientific adventure that defies belief.

Much of the material in this poster comes from recollections of the late Johnny Lees, the departmental glass blower and friend of Cwilong's, related to and fact-checked (as far as is possible) by Emeritus Professor Peter Matthews.

## Early Life in Poland

Cwilong was born in Irkutsk, Siberia, but was raised in Piotrkow, then part of Imperial Russia, later in Poland. After graduation from the University of Warsaw, he worked at the Polish National Institute of Meteorology and the Centre for Aviation.

In 1928 Cwilong showed an aptitude for unusual aquatic adventure by sailing a converted bathtub 600 km down the River Vistula.

At the opening of WWII he was an officer in the Polish Army. After Poland was overrun by the Wehrmacht, he escaped first to France with the Free Polish Army, and then to England.



Bohdan Cwilong (centre), dressed to annoy his Department Head, outside the Hennings Building, 1953.



### Cwilong's low-temperature apparatus

A thick-walled glass pressure vessel (40 atm). Visual observation of a solid-liquid boundary is difficult when viewed through narrow slits between silvering of four layers of glass plus a thick glass wall, and layers of boiling liquid air and helium. The small compass needles were used to indicate liquid or solid when excited by an external magnet. (Peter Matthews photograph)

## Oxford

Because of Cwilong's background in academic meteorology, he joined the Clarendon Laboratory of the University of Oxford. He worked under the supervision of Professor G.M.B. Dobson (he of the Dobson units for atmospheric ozone) to establish the conditions needed to cause water vapour to condense into ice crystals in the atmosphere. Condensation trails were a problem for high-flying warplanes as they rendered the aircraft easily visible from the ground.

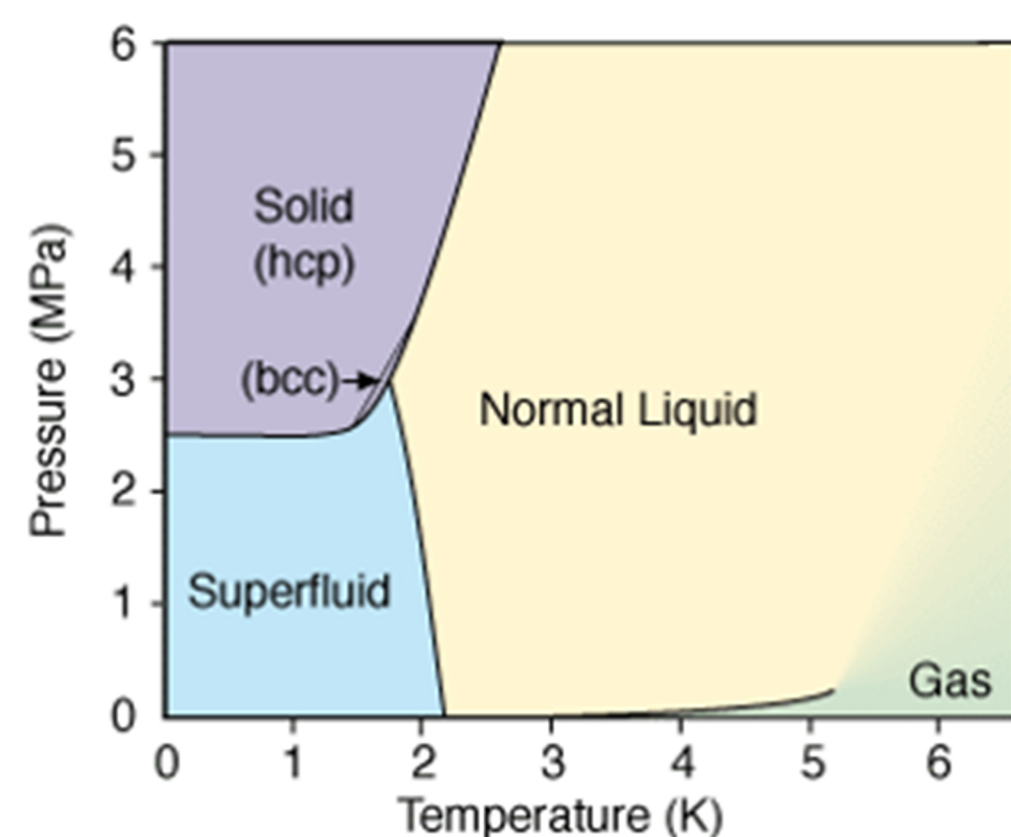
## UBC

After WWII, Cwilong spent a couple of years in New Zealand, and was then recruited by Gordon Shrum to come to Vancouver and head up a new Low Temperature Group. Cwilong was a odd choice as he had no relevant experience. Professor Simon at Oxford (himself a noted Low Temperature Physicist) wrote Cwilong a glowing reference, under the mistaken assumption that the UBC job was for a meteorologist. Luckily Cwilong was a quick learner, but his lack of a background in the field was to catch up with him later.

Shrum once noticed that Cwilong was not wearing a tie while lecturing. He sent a terse note defining clearly the dress code then expected of lecturers. Outraged, Cwilong went home and made a large gaudy tie with spare curtain material, which he then wore regularly for his lectures. Johnny Lees remarked that this was the only time he could recall of someone having the nerve to defy Shrum.

## The Triple-Point Affair

In 1952 Cwilong thought he had found evidence for the hitherto unknown triple-point (solid/liquid/gas) of helium. He wrote a note for Physical Review and planned to make a grand announcement at the Royal Society of Canada meeting in Ottawa in 1952, but Shrum went instead. At the talk, NRC physicists pointed out that helium has no triple-point: simple thermodynamics forbids it! In fact, Cwilong had already figured this out, but his telegram to Shrum did not arrive in time. Shrum, publicly embarrassed, fired him.



Phase diagram for  $^4\text{He}$

In 1950 there were reliable measurements down to 1.2K. The Clausius-Clapeyron relation ( $dP/dT = \Delta S/\Delta V$ ) and the third law of thermodynamics ( $S \rightarrow 0$  as  $T \rightarrow 0$ ) dictate that the solid-liquid boundary should flatten out as absolute zero is approached. It would take pathological behaviour to make it intersect the gas line below 1.2K. Image by Erkki Thuneberg, retrieved on December 12, 2018 via <http://lil.tkk.fi/research/theory/helium.html>

## Free to Sail the World

Relieved of responsibility to UBC, Cwilong apparently obtained some money from the UK Met Office for a multi-year round-the-world "cruise" to make meteorological and magnetic measurements. His vessel, the "Non-Magnetic III", built entirely of wood in his back yard, was deployed from the schooner "Princess Waimai", which had a crew of six seamen-scientists, plus Cwilong and his wife.



On his second time around the world, the Princess Waimai got stuck when Cwilong could not pay the dues for the Panama Canal. The authorities impounded his battery. He tried to escape without it, taking his wife but leaving the crew stranded. He ran into a hurricane and the ship was dismasted. He was towed ignominiously back to Panama by a passing freighter, to face legal action not only from the Canal Authority but also from his crew, whom he had left stranded penniless with only the clothes on their backs.

Here the story takes an interesting turn: in order to avoid the penalties he made a deal with the Panamanian Government, and became the founder of the meteorological program at the University of Panama.

Unfortunately Bohdan Cwilong did not live to enjoy the tropics for long; he died three years later.

### Harbor-Bound Princess Waimai Encounters More Legal Shoals

The yacht Princess Waimai, already in custody of the US Marshal and harbor-bound in Balboa, was attached in a fresh admiralty action at the US District Court, Ancon this morning. Libelant in the new action was Reginald Milburn, consul for Her Britannic Majesty's government, who was acting on behalf of his government. Milburn's libel against the British-flag yacht, and her master and owner, B. M. Cwilong, who is a British citizen, was filed by Dr. L. S. Carrington as proctor for the libellants. The suit is described as a "cause of wages, clothing, maintenance and transportation" in which Milburn seeks to recover the sum of \$1,449.65 expended on behalf of his government to feed, clothe, pay and repatriate six seamen of the Princess Waimai. Claimant alleges that on July 30, while in the Bay of Panama, owner-master Cwilong sent the men ashore, allegedly on some business for the ship, and then lifted anchor and proceeded to sea accompanied only by his wife. All six men, he charged, were left on shore "without clothing, wages, or means of transportation" to points of origin. Noting that under the Merchant Ship-pling Act of 1906, the British government became responsible for these obligations, Milburn states that he expended the following sums for the crewmen named:

Ethelbert Pierre	189.80
N. Baetz	162.15
J. Gloski	225.30
S. Bakiewicz	300.20
A. Mendosa	159.90
J. B. Rios	412.30

Besides the above amounts totaling \$1,449.65, Milburn seeks to recover costs of the action. As crewmen had been picked up at various ports, it is understood, cost of repatriation varied widely. Several weeks ago the Princess Waimai was attached in a \$2,500 libel suit filed on behalf of the owners and crew of the Panama coastal vessel Darien. This was the sailing yacht to Balboa after it was found dismantled in the Pacific southwest of Panama. The first action is still pending.

The Panama American, April 23, 1955

- References:  
B. M. Cwilong, The Solidification Curve of Helium II, Phys. Rev. 88, p.135 (1952)  
B. M. Cwilong, The Solidification Curve of Helium II - Erratum, Phys. Rev. 88, p.1435 (1952)  
G. Seligman, Obituary: B. M. Cwilong, Journal of the International Glaciological Society, 3, p.322 (1958)

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