

CONTENTS AND SIGNIFICANCE OF THE MEDICINE CHEST ABOARD THE *LUCY A. NICKELS*

Felix Lakin, 13 August 2026

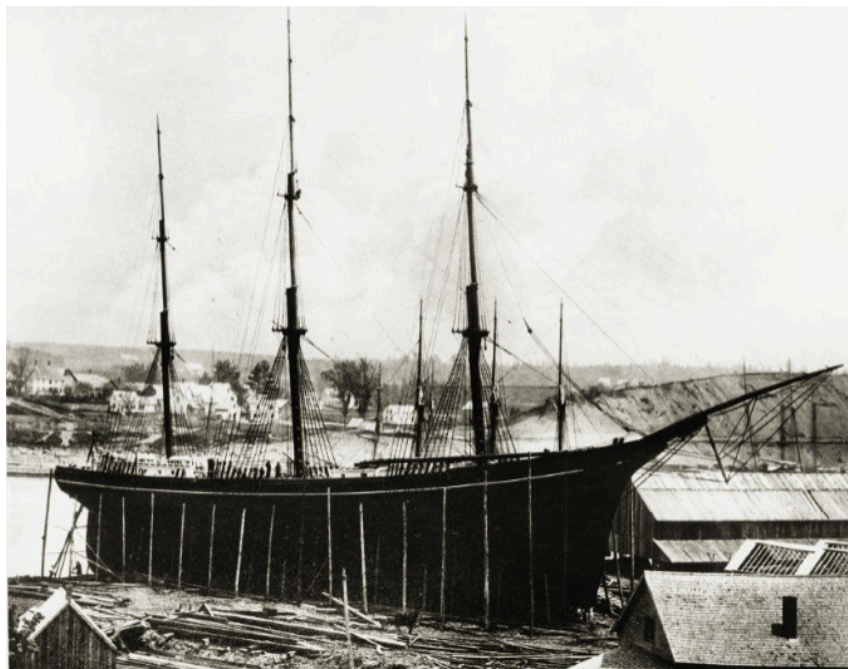
When one thinks of dangers at sea, they may imagine fearsome storms and shipwrecks. However, one of the most severe dangers faced by sailors was not the result of those dramatic events: illness was rampant aboard many western vessels, diseases from around the world spread quickly in the close living quarters of the sailors. Diseases spread through ports, where citizens and sailors from across the world and therefore with immune systems used to all different conditions mingled. Additionally, naval warfare was common during the age of sail, causing horrific wounds that had to be healed in extremely limited space and with few resources. The combination of these threats to the health of sailors resulted in the acceptance of the medicine chest into common use.



photo by: MAINE
Dept. Economic Development

Photo of the medicine chest aboard the *Lucy A. Nickels* (photo credit Maine Dept. of Economic Dev.)

Medicine chests came into use in antiquity, and were used widely on vessels, albeit in different forms, until after WWII according to 1947 publication *The Ship's Medicine Chest and First Aid at Sea*. As a result there were a wild variety of medical techniques used across time periods and different western cultures, all of which influenced to different degrees the contents of the medicine chest carried on the ship *Lucy A. Nickels* from Searsport Maine in the 1880s that are now in the Penobscot Marine Museum Collection.



Ship *Lucy A. Nickels* under construction in Brewer, ME in 1875 (Penobscot Marine Museum)

Medicine on European ships was insufficient until the 19th century due to a combination of limited medical knowledge, poor food quality, sick and injured men packed into far too small spaces without fresh air, and a complete lack of preventative medicine plans. In the mid 18th century, Tobias Smollett described the situation in grim detail, writing, "I was much less surprised after visiting our merchant ships to find that people should die on board than that any sick person should recover. Only fourteen inches of space were allotted to each sick man with his bed and bedding, and he was constantly deprived of the light of day and fresh air." These conditions were terrible, however, on a ship with limited space, ship's doctors (or the first mate or captain, in the absence of a doctor) had to work with what they had.

While western medicine had progressed greatly since the European Dark Ages, medics still operated under the concept of the four humors, the idea that the human body is composed of four components, or "humors." The humors were thought to be blood, phlegm, yellow bile (vomit), and black bile (feces). Medical texts such as the London Pharmacopoeia operated off of this concept, and as a result, medicines were focused on cathartics (laxatives), emetics, phlebotomy, chinchona bark, and opium blisters. Bloodletting was also present, but declined in popularity after the American Revolution (Gordon, MD). Additionally, marine medicine differed from standard medical practice at the time due to limited space and resources. Germ theory was accepted earlier in the maritime community due to the close quarters of the ship with less outside influence making the spread of disease through germs more obvious than on land. Despite this, illness had a significant death toll. Yellow fever, cholera, malaria, plague, scurvy, and more diseases took the lives of many.

Of all the diseases that plagued mariners of the past, the most infamous of all was scurvy. Scurvy occurs when the body does not get enough vitamin C. This causes symptoms including bleeding gums, losing

teeth, joint pain, old wounds re-opening, and is a generally debilitating condition. It was common on ships due to the difficulty of transporting fruits and vegetables over long distances. Additionally, it was somewhat common for captains to cut costs on food, described in *Manual on First Aid* as, "There was a day, fortunately, now almost passed, when it was considered economy to furnish for the use of the crew the poorest grade of food that could be bought" (Hart 21). After it was discovered that vitamin C deficiency is the cause of scurvy, many strategies were used to introduce it to the sailors. These strategies included vinegar on Magellan's voyages, lime juice, and pickled or fermented foods. Scurvy prevention is an example of preventative medicine, showing how life overall on the ship had to be controlled to prevent the development of disease in the first place. Preventative medicine is further demonstrated with rat guards, inverted cones attached to mooring lines to stop rats from climbing the lines from docks into the ship at port, and therefore preventing the rats and their diseases from boarding the ship in the first place. The development of rat guards and functioning preventative medicine plans only came to prominence in the late 19th century. Previously, diseases were spread by ships and outbreaks of things such as cholera and yellow fever frequently happened in port towns. However, as germ theory developed, preventative medicine techniques such as quarantining and early vaccines came into use .

Along with preventative medicine, the primary medical doctrine followed was homeopathy, or the belief that the same substances that cause illness in healthy people can cure a sick person. The result of this was the presence of things like poison ivy, belladonna, and iodum in a ship's medicine chest. Additionally, the contents of the medicine chest were closely related to herbalism, making medicines from plants available, as can be seen in the inventory of the chest:

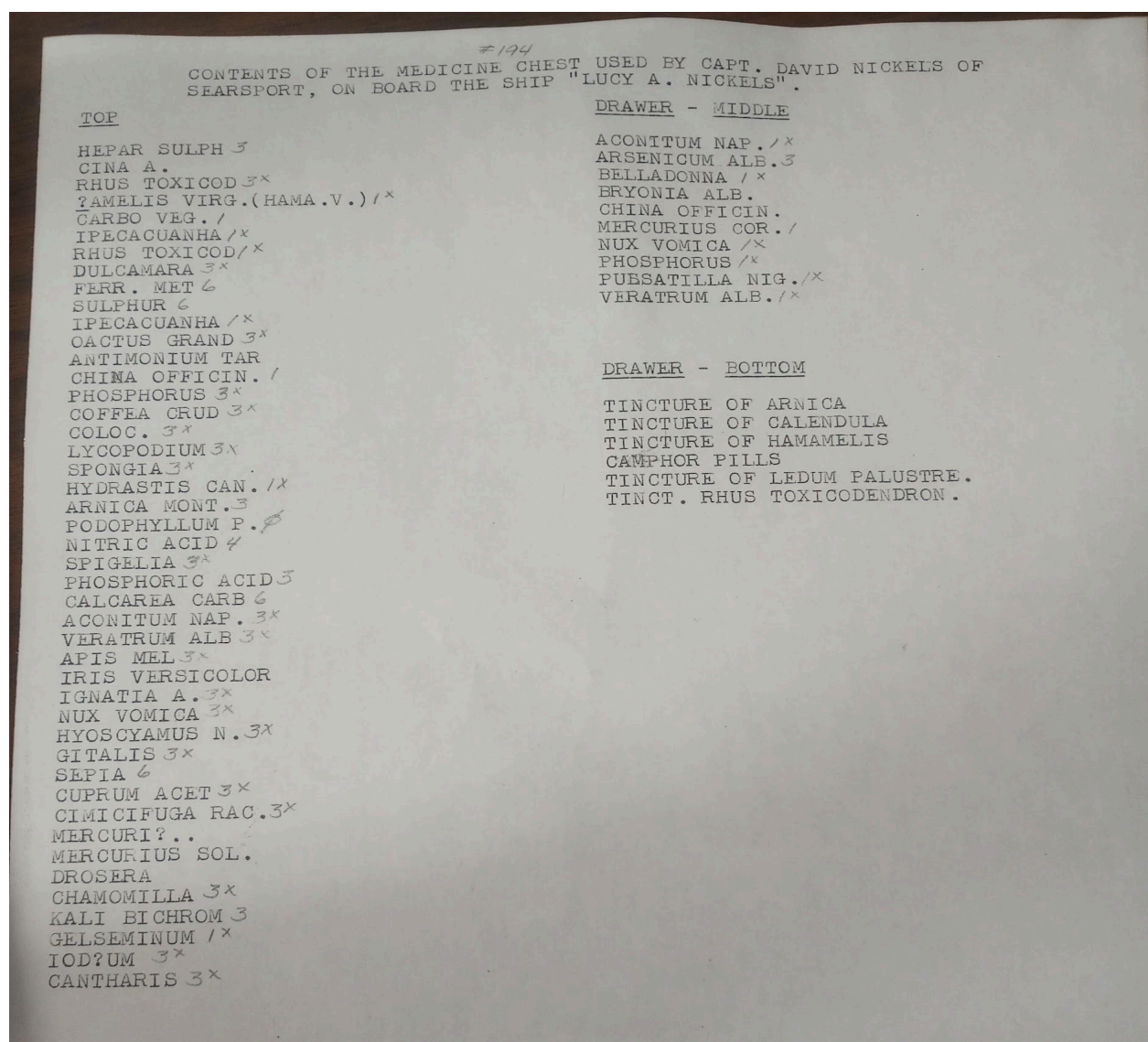


Photo of the inventory list of the medicine chest aboard the *Lucy A. Nickels* (photo credit Felix Lakin)

One example of herbalism in the *Lucy A. Nickels* medicine chest is *Pulsatilla nigricans*. *P. nigricans* is a flower in the buttercup family. It is traditionally used for treating mental disorders, cataracts, "uterine afflictions," conjunctivitis, acute meningitis, coughs, to remove tape worms, treat ear infections and clear any area full of mucus, etc. The active chemical compounds include flavonoids and triterpenoid saponins. *P. nigricans* is also the source of oil of anemone, which has two main active compounds: anemonin which can clear mucus and anenomic acid (anenomic acid is inert/does nothing) (Sadaf *et al*, 2018). It is still used in at-home medicine and is not poisonous. This was one of the treatments that was both effective and safe. Unfortunately, not all of the contents of the chest were so user-friendly.

While medicines are, by definition, designed to heal, many of them are also quite deadly when misused. One such treatment option from the ship's medicine chest was phosphorus. Phosphorus (P) was first isolated as a pure element in 1669, which was very exciting to the scientific community in Europe as it

was the first element to be isolated since antiquity. It is highly reactive due to its electronegativity, so reactive that it only occurs as phosphate in nature. Phosphorus burns and explodes on contact with air and water, reacting with oxygen so much that it is used as a military grade explosive. It is typically isolated as red or white phosphorus, with white phosphorus being both the more volatile variety and the one used in Victorian naval medicine. It was used to cauterize wounds. However, due to its volatility, the white phosphorus had to be removed from the museum in order to protect workers and patrons. The *Lucy A. Nichols'* chest was taken to Bangor by the Department of Environmental Protection where the chemicals were verified and detonated. Due to this phenomenon, it is surprising that the phosphorus never detonated on contact with the water that was highly prevalent on wet ships.

Not all dangerous compounds in medicine chests were explosive. In fact, they are the exception, as most of the danger in medicine chest came in the form of poisons. For example, belladonna (*Atropa belladonna*) is a plant in the Solenaceae family, the same family that has tomatoes and peppers. It is more commonly known as deadly nightshade, and is known to be highly toxic due to its high atropine concentration. According to the United States Forest Service, "In addition to atropine, which does indeed affect the pupils of the eye, several other highly toxic and potent psychoactive tropane alkaloids are found in belladonna, including hyoscyamine and scopolamine. All parts of the plant are toxic, but the sweet, purplish-black berries that are attractive to children pose the greatest danger. Symptoms of poisoning include rapid heart beat, dilated pupils, delirium, vomiting, hallucinations, and death due to respiratory failure." However, it was used in shipboard medicine as a tincture to treat "recurring spasm of the gastro-intestinal tract" (*The Ship's Medicine Chest*) until after WWII. It was dosed by a glass medicine dropper starting at 10 drops, with the dose increasing by 1 drop daily until either the patient was cured or they began displaying symptoms of nightshade poisoning, at which point the dose would be lowered back into that patient's "safe" range (*The Ship's Medicine Chest*).

Nitric acid, or HNO_3 , is a highly corrosive inorganic acid. It is used industrially in metal etching and industrial manufacturing. Due to its corrosiveness, it causes the human skin to burn and melt (it is used in acid attacks). However, that is only an issue if the nitric acid is spilt on someone. Unfortunately, it is also highly dangerous when airborne. Inhaling excessive fumes of nitric acid (which evaporate off of any liquid nitric acid) can cause a pulmonary edema (lungs filling with fluid, which causes drowning). This edema may not develop for several hours after exposure, and can be deadly without treatment, "The volatile fumes of nitric acid can cause serious and extensive damage to the body's mucous membranes. The clinical manifestations can range from mild irritation of the upper respiratory tracts to third-degree burns of the respiratory tracts. When high-concentration nitric acid fumes reach the patient's lower respiratory tract, it can cause inhalation lung injuries such as pulmonary edema and obliterative bronchitis" (Zhao *et al* 2025). In some cases, this can be an "occupational hazard" for people working in chemical treatment plants today (Zhao *et al* 2025). Onboard a ship, the med bay had limited space and little ventilation. As a result, a ship's doctor or whoever was using the medicine chest would have to be extremely careful when handling nitric acid so as not to kill both the patient and themselves. The medical use of nitric acid is uncertain. It may have been used to make wounds for vaccination as a more sterile alternative to knives, but the true purpose has been lost to history.

Carapichea ipecacuanha, or just Ipecac, is a member of the Rubiaceae family. It grows in the northern part of South America, specifically Brasil, Colombia, Venezuela, and the part of Peru east of the Andes mountains. It has been used for thousands of years by native peoples in the region as well as onboard European ships since contact (Ferreira *et al* 2012). Ipecac is an emetic, a substance that causes vomiting. It was used to treat recurring fevers by “cleansing the system.” This would often be followed by a dose of calomel if the acting physician decided the bowels were not yet “cleansed.” After the bowels were empty, theoretically removing the cause of the fever from the body, the symptoms of the disease would be treated with quinine, or, in its absence, charcoal. Ipecac was also used to treat typhus, again by attempting to remove the cause of the disease before restorative treatments began (Parsons M.D. 16). It is strange that ipecac was the only member of Rubiaceae in the chest as the whole family of plants were quite popular in Victorian naval medicine, particularly quinine and cinchona or “Peruvian Bark” to treat almost any infectious disease. It is possible that the company producing the chest had no access to these compounds, or that they were not recorded in the inventory, or that they were intentionally left out.

Additionally, the medicine chest on the *Lucy A. Nickels* had no opiates. This was strange at the time, as opium and specifically laudanum were the primary painkillers in maritime medicine and were used to treat anything from a broken arm to typhus. In its place, a North American plant called *Arnica montana* or just arnica was used. *A. montana* flowers can be used for painkillers, usually applied for joint pain. However, in the case of *this specific medicine chest*, it may have been used as a general painkiller in the absence of any opiates.

The transition to modern medicine was gradual. At any given time, the captain or first mate administering medical help on a ship considered what they were doing to be “modern medicine.” The medicine chest aboard the *Lucy A. Nickels* is a snapshot of the medicine chest in the 1880s, and was, at its time, considered to contain excellent modern treatments. For our purposes, however, we can consider the transition to modern medicine to coincide with the end of the age of sail, roughly 1900. Medicine chests continued to be produced and sold to both commercial and military vessels in the early 20th century. At the time, germ theory was becoming more widely accepted as scientific fact and the names of illnesses were transitioning from their traditional names to modern ones. Books such as *Manual on Ship Sanitation and First-Aid for Merchant Seamen* (1923) and *The Ship’s Medicine Chest and First Aid at Sea* (1947) are direct descendants of medicine chest manuals in the Victorian era. Medical treatment and practice is built off of past trials and experiments, and the ship’s medicine chest over time is an example of how that evolution takes place.

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