



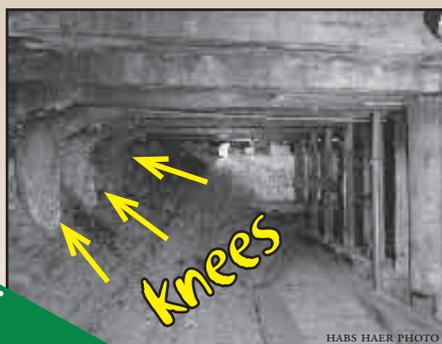
## Trees for Wooden Ships

Wood floats. Wood is a great material for building boats because wood floats (except for a few oddities, like *lignum vitae*, which you can read about on page 17). When English settlers first arrived in America, they were very excited to find the land covered with thick forests. You see, England in the 1600s was the greatest maritime power in the world, but they had a big problem. They had built so many ships that they had run out of trees. Suddenly, they had access to a whole new supply of timber for shipbuilding. Where some people saw forests of trees, others saw forests of ships' masts.

Shipbuilding became big business. The colonists cut down so many trees for ships' hulls that, in time, the entire New England landscape had changed.

If you needed to build yourself a boat or a ship, you would, of course, use whatever wood you could get. If you had a choice, however, you would be smart to pick different types of wood to build different parts of your ship. The *keel*, or backbone, of a ship, for instance, needs to be made of one long straight tree. Masts should come from straight timbers too, but masts, unlike some parts of the hull, need flexibility so that they can bend with the wind without breaking. Other parts of the ship, *knees* and *frames* (the ship's ribs), for example, are best

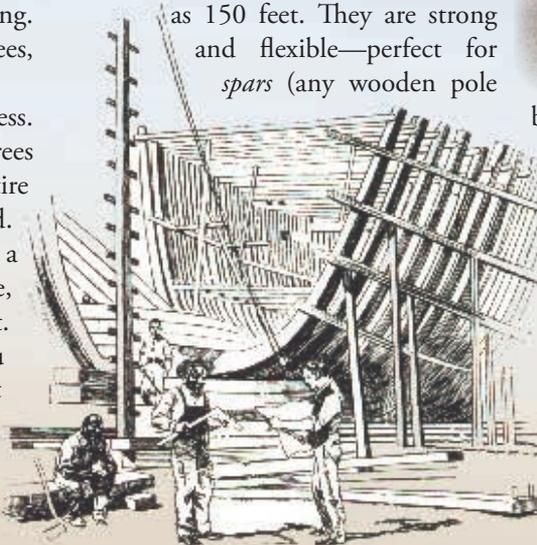
*Knees made from compass timber support the deck on the massive lumber schooner C. A. Thayer in San Francisco.*



HABS HAER PHOTO

made from curvy, twisted wood called *compass timber*. Compass timbers are wood pieces cut for ship construction to use their natural curves to fit parts of the hull that require that same curved shape. Shipbuilders can steam planks to make them bend somewhat, but the natural curve of the wood grain makes an even stronger piece.

One of the most common trees in colonial New England was the white pine. White pines grow very tall and straight—back then, many grew as tall as 150 feet. They are strong and flexible—perfect for *spars* (any wooden pole



used to support sails and rigging, such as masts, booms, gaffs, and the bowsprit). Pine is also not as heavy as some other choices, such as oak, and this was a good thing. Too much weight way up high on a sailing ship would make the vessel top-heavy and unstable.

Another great tree abundant in North America was the oak tree. White oak and southern live oak were ideal choices for the the keel and frames (the ship's skeleton), which had to be very strong to withstand the stresses of the wind and waves and to support the weight of everything that would go into the ship. Live oak is the heaviest of all oaks. It resists rot, something very important for a wooden ship that will spend its life in seawater. Live oak is



*Southern Live Oak*

best known for its great size and natural twists and bends, which shipbuilders used for compass timbers. Live oak was so important to shipbuilding that the young United States Navy reserved thousands of acres of southern woodlands to make sure it would have enough for its ships. USS *Constitution* was built with live oak frames. Her hull was so strong that she was nicknamed “Old Ironsides” because sailors had witnessed cannonballs bouncing(!) off her hull in battle. Oak is incredibly hard, not as flexible as pine, so it was good for the hull but not for the spars.

There are lots of other types of wood that were used in shipbuilding. The decision to choose one wood over another depended on a few factors: what part of the ship it would be used for, how many trees were available, how much it weighed, and, naturally, its strength.

Today, wooden ships are built with a much larger range of wood types because we can buy timber from all over the world to get exactly what we want. Many boatbuilders *laminates* (glue) pieces of wood together because it is harder to find the big-sized trees they need—or because if they do find a great big tree, they don't necessarily think it's a good idea to chop it down anymore. ⚓