**Manila Hemp**

Now, listen to part of a lecture of Botany subject studying plants class.

Professor: Hi, everyone, good to see you all today. Actually, I expected the population to be a lot lower today. It typically runs between 50 and 60 percent on the day the research paper is due. Um, I was hoping to have your exams back today, but, uh, the situation was that I went away for the weekend, and I was supposed to get in yesterday at five, and I expected to fully complete all the exams by midnight or so, which is the time that I usually go to bed, but my flight was delayed, and I ended up not getting in until one o’clock in the morning. Anyway, I’ll do my best to have them finished by the next time we meet.

OK, in the last class, we started talking about useful plant fibers. In particular, we talked about cotton fibers, which we said were very useful, not only in the textile regarding knitting clothes industry, but also in the chemical industry, and in the production of many products, such as plastics, paper, explosives bomb , and so on. Today we’ll continue talking about useful fibers, and we’ll begin with a fiber that’s commonly known as “Manila hemp.”

Now, for some strange reason, many people believe that Manila hemp is a hemp plant. But Manila hemp one class of plant is not really hemp. It’s actually a member of the banana family—it even bears little banana-shaped fruits. The “Manila” part of the name makes sense, because Manila hemp is produced chiefly in the Philippine Islands and, of course, the capital city of the Philippines is Manila.

Now, as fibers go, Manila hemp fibers are very long. They can easily be several feet in length and they’re also very strong, very flexible. They have one more characteristic that’s very important, and that is that they are exceptionally out of normality resistant to salt water. And this combination of characteristics—long, strong, flexible, resistant to salt water—makes Manila hemp a great material for ropes, especially for ropes that are gonna be used on ocean-going ships.

In fact, by the early 1940’s, even though steel cables were available, most ships in the United States Navy were not moored equivalent to car parking with steel cables 钢缆; they were moored with Manila hemp ropes. Now, why was that? Well, the main reason was that steel cables degrade very, very quickly in contact with salt water. If you’ve ever been to San Francisco, you know that the Golden Gate Bridge is red. And it’s red because of the zinc paint that goes on those stainless steel cables.

That, if they start at one end of the bridge and they work to the other end, by the time they finish, it’s already time to go back and start painting the beginning of the bridge again, because the bridge was built with steel cables, and steel cables can’t take the salt air unless they’re treated repeatedly with a zinc-based paint.

On the other hand, plant products like Manila hemp, you can drag through the ocean for weeks on end. If you wanna tie your anchor to it and drop it right into the ocean, that’s no problem, because plant fibers can stand up for months, even years, in direct contact with salt water.

OK, so how do you take plant fibers that individually you could break with your hands and turn them into a rope that’s strong enough to moor a ship that weighs thousands of tons? Well, what you do is you extract these long fibers from the Manila hemp plant, and then you take several of these fibers, and you group them into a bundle, because by grouping the fibers you greatly increase their breaking strength—that bundle of fibers is much stronger than any of the individual fibers that compose it.

And then you take that bundle of fibers and you twist it a little bit, because by twisting it, you increase its breaking strength even more. And then you take several of these little bundles, and you group and twist them into bigger bundles, which you then group and twist into even bigger bundles, and so on, until eventually, you end up with a very, very strong rope.