

ENGINEERING

Largest Ship to Recoup Loss of France's Atlantique

WHEN the Normandie puts to sea, the French merchant marine will more than recapture its position lost by the tragic burning of the Atlantique, world's twelfth largest steamship.

The Normandie is the largest vessel in the world, clearly exceeding the Leviathan and the Majestic in both tonnage and length. She was launched during the past fall at St. Nazaire to be put in transatlantic service in 1934. (*SNL*, Dec. 24, '32, p. 407).

France now has only one vessel larger than the Atlantique, that is, the Ile de France of 43,153 registered tons, tenth largest steamship, according to Lloyds. It is exceeded in both tonnage and length by the following ships given in order of diminishing size: Leviathan, U. S.; Majestic and Berengaria, British; Bremen, German; Rex, Italian; Europa, German; Olympic, British; Conte di Savoia, Italian, and Acquitania, British.

The Atlantique was not as familiar to North Americans as are other ships of comparable size because she had never been to this country. She was built for South American trade and had been in service about a year. Names of practically all the other first dozen or so largest vessels are well known in this country because they designate vessels plying the North Atlantic.

The Normandie has an overall length of 1027 feet, 963 feet between perpendiculars, and will be rated at approximately 75,000 gross tons. The Leviathan's registered tonnage is approximately 60,000, more than the Majestic's 56,000, but her length between perpendiculars is only 907 feet 6 inches compared with 915 feet 5 inches for the Majestic.

The Normandie's breadth of 119 feet 6 inches accounts chiefly for her greater tonnage. The vessel is a little more than 19 feet wider than either the Leviathan or the Majestic.

In addition to excessive size, the Normandie will contain the largest electric motors ever built. Rated at 40,000 horsepower each, the new motors will give the vessel a total horsepower of 160,000; but even then she will not be the most powerful ship. The U. S. airplane carriers Saratoga and Lexington bear this title with 180,000 horsepower

plants in each. Each contains eight motors rated at 22,500 horsepower, connected in pairs to four propelling shafts.

The Normandie's claim to fame would probably not be so clear cut had work on the new British Cunard liner R-534 continued. But, because of economic conditions, construction was suspended almost a year ago on this vessel which, it was announced, would be rated at 73,000 tons and would have a length of 1,018 feet.

The Normandie's hull is divided into 12 water-tight compartments. There are eleven decks, five of which are continuous from stem to stern. Accommodation will be provided for 930 first class, 680 tourist and 560 third class passengers which, with 1,320 officers and men, will allow the ship to carry 3,490 persons.

The turbo-electric machinery has been designed for a service speed of 30 knots to enable the vessel to cross the Atlantic from Havre to New York by way of Plymouth under all conditions in less than five days.

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ETHNOLOGY

California Indians Had Tradition of Redeemer

INDIAN TRIBES of California long ago had a tradition of an Indian Redeemer, a savior and teacher who founded a faith that spread to all the tribes of the southern California coast. This is the finding of John P. Harrington, ethnologist of the Bureau of American Ethnology. Traditions of the Indian Redeemer have become so vague and so old that Mr. Harrington has been able to recover only broken glimpses into their significance.

The Indian Redeemer was the "God Chinigchinich." He was born of humble parents in an Indian village in what is now Los Angeles County. In his teens he astonished wise men of the village by his teachings. One day, in the presence of a vast assembly, he announced that he should be called Chinigchinich, and that he would teach ceremonies for curing the sick, obtaining food for the hungry, and overcoming evil. (*Turn Page*)

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Those who did not follow Chinichinich's teachings were avenged, he told. He said: "Him who obeyeth me not, I will send bears to bite him, rattlesnakes to sting him, sickness, calamities, and death."

Indian traditions say that this Indian god is still alive and existing. He is chief of the Happy Hunting Grounds and Captain of the Dead. Mr. Harrington hopes to recover more details of this mysterious Indian teacher and his influence.

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ARCHAEOLOGY

Skeleton Guards Relieved Of Duty at Monte Alban

SKELETONS that have guarded Tomb 14, Monte Alban, for centuries have at last been relieved of their duty.

Mexican archaeologists exploring the cemetery of the ancient Mexican city have entered Tombs 13 and 14. Above the latter they found two guardian skeletons buried. Inside the small flat-roofed stone chamber was the skeleton of the Indian whose attendants lay overhead.

In another part of Monte Alban, the excavators have been exploring the interior of the Southwestern Pyramid which stands on the North Platform. They have found a large debris-filled room inside the pyramid. Vestiges of stucco indicate that the room was once painted red. This red room, long hidden under the pyramid shell, is pronounced by the archaeologists to be the temple room of a smaller and older place of worship.

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Michigan scientists find that the grit cells in pears vary greatly with different varieties.

PHYSICS-ARCHAEOLOGY

Modern Laboratory Duplicates King Tut's Purple Gold

BEAUTIFUL purple surface films on golden sequins found in the tomb of Tut-Ankh-Amen have been proved to be due to the presence of iron in the gold, by Prof. R. W. Wood of the Johns Hopkins University. Prof. Wood reported on his examination of these ancient ornaments before the American Association for the Advancement of Science.

The sequins have been the subject of much discussion ever since they were first discovered. Some scientists have claimed that the Egyptians knew an art for coloring gold surface purple, while others have believed that the purple sheen was a kind of patina due to the great age of the ornaments. Prof. Wood, using the methods of a physicist, has shown the color to be due merely to the presence of iron in gold which has been first hammered and then heated. He even made duplicates of the sequins by hammering out a gold-iron alloy into the thin flakes and heating the latter over a flame. One of his modern purple-gold sequins has been sent to the Cairo Museum, to be displayed along with the originals.

A modern beauty aid helped in the solution of the riddle of the purple film. Prof. Wood found he could remove the film by coating the gold ornaments with celluloid varnish such as is used in fingernail polish, and then peeling off the varnish, leaving the underlying gold of a bright yellow color. There was no

sign of the film on the peeled-off varnish layer, but the film could be made to reappear by redepositing gold on the side to which the film was attached by vaporizing gold in a vacuum. Then the purple could again be seen by reflected light. The problem in physical optics presented by this phenomenon is still under examination, Prof. Wood stated.

Subjected to spectroscopic examination, the stripped-off film proved to be principally iron, probably an iron oxide. Prof. Wood then suspended one of the sequins from which the purple film had been removed between the poles of a strong electromagnet. It was attracted toward one of the poles, demonstrating the presence of iron in the gold.

Etching the surface of the gold with acid showed a very marked crystalline structure, such as is found only when rolled or hammered sheet gold is subsequently heated to nearly a red heat. Microscopic examination showed on the surface numerous small globules of gold standing out in high relief, conclusive evidence that the sequins had been heated to a high temperature after having been hammered into shape. It was after having learned these facts that Prof. Wood took gold and iron and duplicated the product of the "lost art" of the ancient Egyptian court jewelers.

The microscopic globules Prof. Wood believes to be due to melting of the gold out of a gold-orpiment mixture experimentally tried by the Egyptian artist. Orpiment is a bright yellow arsenic-sulfur compound known to the Egyptians and used by them in tomb wall decorations. Lumps of it were found in Tut-Ankh-Amen's tomb, some of which Prof. Wood received from the Cairo authorities.

Melting gold with this orpiment, and rolling the resulting bead out into a plate, Prof. Wood heated it over a flame and obtained gold globules exactly like those on the sequins. He also hammered out small nuggets of California gold, which had been in his family since '49, and on heating the resulting plates he again obtained the globules. No purple film appeared, however, for the California gold is free from iron.

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