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Theseus, Ariadne, and the Otic Labyrinth

James H. Scatliff and Faustino C. Guinto

Authors' Note: *Theseus, Prince of Athens, offered to go to Crete in the periodic tribute of Athenian youths required by Crete. In the past there were no survivors, all having been devoured by the minotaur in the labyrinth. When Theseus entered the labyrinth, Ariadne, the daughter of the King of Crete and in love with Theseus, tied yarn to Theseus so that, as it uncoiled, he could find his way out of the labyrinth. He killed the minotaur and returned to Ariadne. The Athenian tribute ended and Theseus and Ariadne sailed away (1, 2).*

Theseus was having second thoughts as the Cretan ship got closer to its home shore. As the palace of Knossos and the upturned petrous ridge behind it loomed into view, Theseus wondered why he had been stupid enough to volunteer to kill the minotaur.

He certainly was the man to do it. The abhorrent loss of youths being sent to Crete as a tribute for some passed Athenian misbehavior must be stopped. He was strong and shapely from his constant workouts at the Hercules Fitness Center in the Agora. His endurance from running out and back to Marathon was superb. He was fast and agile from dodging Athenian chariot traffic.

But would their plan work? He put his arm around Ariadne and drew her close. He remembered the day they met as he came out of the fitness center with his well-oiled shoulders glistening in the sun. There was Ariadne beautiful and now radiant after acquiring her favorite yarn at the Golden Fleece knit shop. He knew that she was the daughter of King Minos of Crete and was in Athens as an exchange student. She knew that besides being the son of King Ageus he was the handsomest male alive in Attica. Theseus flexed his shoulder girdles modestly, said hello, and suggested baklava and coffee at the cafe Athenaeum.

Their romance flourished, as did a mutual hatred of the minotaur. Ariadne told Theseus she now had enough yarn to play out when tied around his waist to find his way back in the

labyrinth after doing in the minotaur. She also was fairly certain that the Aesculapian Hearing Center in Delphi had an oracle who could tell them the exact plan of the labyrinth.

Two weeks before embarking for Crete, Theseus and Ariadne had charioted to Delphi. Theseus loved his four horsepower, his balanced wheels, and having Ariadne holding on to him as they flew past Thebes. Some of the Theban ladies, who knew Theseus from past relationships, were jealous when they went by. The only limitation for complete exhilaration were the Spartan crash helmets they had to wear to conform to Attica road rules.

The oracle, after being sure Theseus's oracular insurance was paid up, told them an incredible tale. Zeus had asked the Cyclops, Giants, and Titans, who were notorious underworld characters, to help him in his takeover of Mt. Olympus from his father Chronos. One of the Giants got stuck in a Cretan earthquake as he emerged from Hades. The only thing left of him above ground was a temporal bone. After it had partly decomposed the Cretans found the bone ideal for a labyrinth. This was especially true after a monumental effort to turn the bone upward. This way the minotaur, who was half bull and half human, had better footing in the cochlea and semicircular canals.

The oracle had three-dimensional renditions of the labyrinth and its relationship to the petrous bone drawn on the temple wall. She pointed out that the minotaur liked to lurk at the end of the ductus reuniens. If Theseus could get him into the cochlea he could trap him in its apical turn. At all costs Theseus should try to keep the minotaur out of the semicircular canals, where Ariadne's yarn might be stretched to the breaking point. If the minotaur proved too much for Theseus, there were escape pathways through the vestibular or cochlear aqueducts that the Cretans had failed to plug as they filled in the internal auditory and eustachian canals.

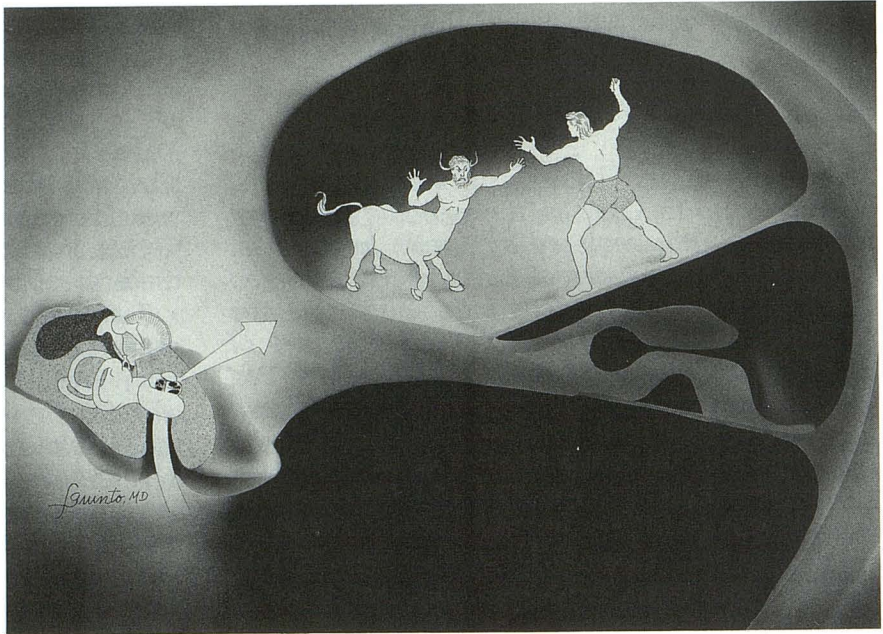
The oracle pointed out middle ear anatomy but

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Fig. 1. Theseus and the Minotaur meet in the scala vestibuli in the middle turn of the cochlea.



didn't think the minotaur would be there. She told Theseus to watch his step in the external canal and not to slip on remaining cerumen. He also had to be careful not to trip over the middle ear ossicles that had become unhinged in the earthquake and were scattered in pieces around the basal turn of the cochlea. The ear drum was also torn in the quake but still intact at the scutum. Theseus, once in the middle ear, could get into the labyrinth through either the round or oval window.

As the ship docked, Theseus went over the anatomical details that Ariadne had embroidered on the inside of his toga shirt. He was sure that he had memorized them completely and could use them well. He was not sure that a strong blow to the minotaur's neck would be enough to kill him. He wished he could use an assault sword with many blades but the Cretans would not allow it.

The next day, after the bull dancing and a low-fat-high-protein feast, Theseus was ushered to the brink of the external auditory canal. Ariadne's tears had persuaded her father to let her accompany Theseus to the opening but no farther. She did not tell her father how close-knit they would be.

Theseus tied the yarn securely around his waist. In the external canal he avoided the collections of wax but tripped on the broken malleus. Uninjured, he went through the round window and immediately heard the bellowing of the minotaur. It was a deafening, frightening sound of many decibels.

He shined his ever-ready torch around the

vestibule and saw nothing. He checked the diagram inside his shirt and knew then he could corner the beast. The sound came from the cochlea and there was no escape for the minotaur. He ran through the basal turn. It seemed smaller than the oracle told him it would be.

They met in the middle turn (Fig 1). The minotaur's eyes shed spark showers and steam erupted from his nostrils. His horns were sharp and deadly. Theseus flexed both his shoulder and pelvic girdles and circled the minotaur. The minotaur was not fast enough to turn with Theseus. As he went around him, Theseus suddenly used what he had learned at the Kung Fu parlor in Athens. He kick-boxed the minotaur in the hind-quarters, driving the beast toward the apical turn of the cochlea. Theseus waited for his chance to strike the tiring beast at the level of the carotid sinus. As he was about to do it, the minotaur lunged for the cupula of the cochlea and slithered out along the scala tympani. The oracle had not told Theseus that the cochlea was divided by the two scala.

In hot pursuit Theseus got to the ductus reunions, checked it, and went into the sacculus. There was no sign of the minotaur. He detached his yarn which was now well knotted. Holding his torch high, he ran through the semicircular canals. The light produced threatening shadows from the crista in each canal but the minotaur was not there. As he was checking the utriculus, he heard Ariadne's screams coming through the round window. When Theseus's yarn went slack Ariadne feared the worst had happened, and she went into the middle ear.

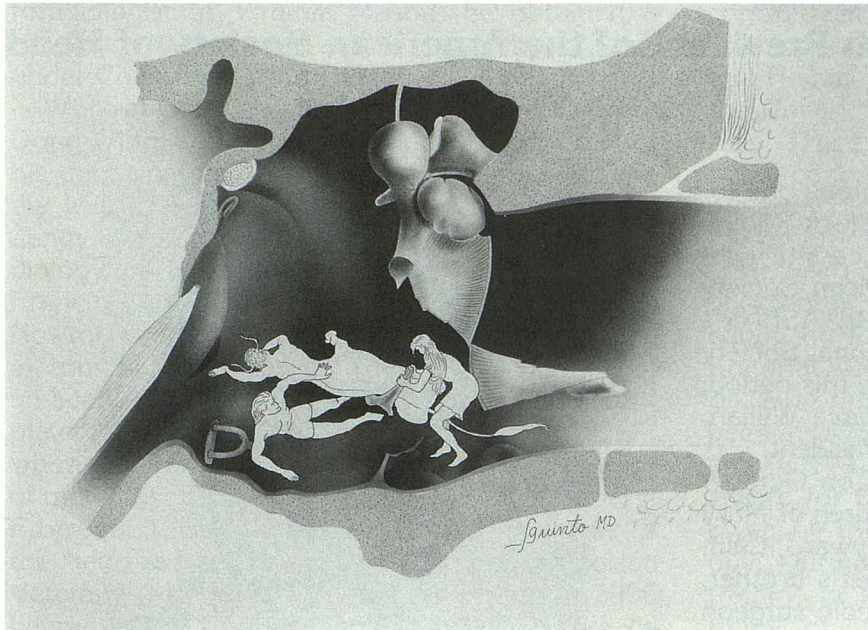


Fig. 2. Ariadne uses the long arm of the incus to leverage Theseus from the fallen body of the minotaur. The giant's torn eardrum in the earthquake is above and behind Ariadne. A cholesteatoma in Prussak's space erodes the scutum. The incus and stapes are dislocated. The minotaur's left front hoof points toward the round window with the oval window, facial nerve and semicircular canals directly above.

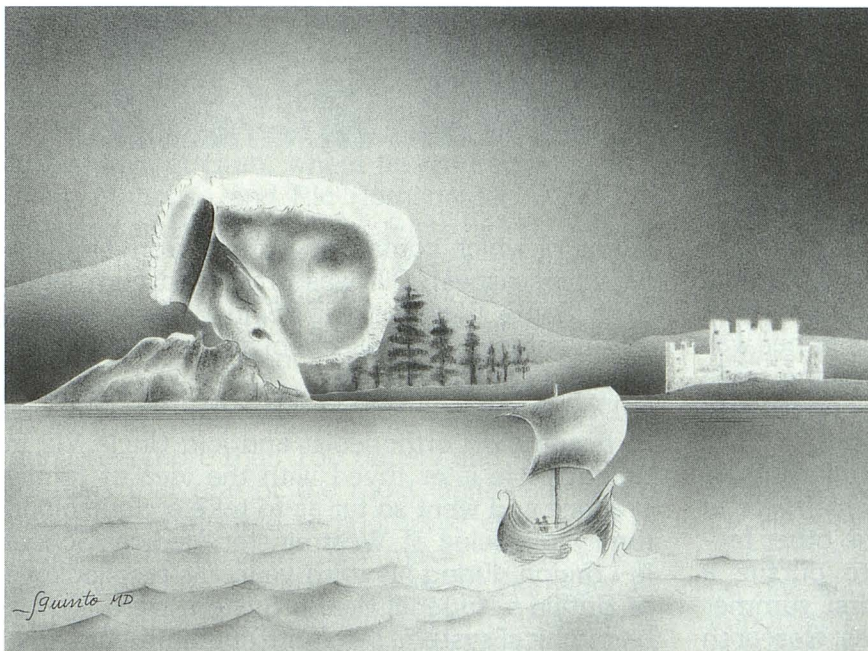


Fig. 3. Ariadne and Theseus sail away from Crete. The giant's upturned temporal bone with its petrous ridge and porous acousticus are on the left. The palace of Knossos is on the right.

As Theseus came out through the oval window he saw that the minotaur had Ariadne trapped between remaining large fragments of the malleus and incus. Theseus came up behind the minotaur and drove him toward Prussak's space, which was partly covered by a reddish, yellowish, waxy material. The minotaur was pinned in and slipping on a cholesteatoma which had been starting in the giant's ear before the earthquake. When the minotaur went down Theseus jumped on his back, raining blow after blow to each carotid sinus. With one last great bellow, he rolled over and died. In doing so, the beast trapped Theseus's leg under its body. Ariadne seeing this and being

ever resourceful picked up the long arm of the incus and leveraged Theseus free (Fig 2).

The King of Crete kept his word. With the minotaur dead Athens was free of its human tribute. The marriage of Theseus and Ariadne was magnificent and they left Crete before the next earthquake (Fig 3). To this date, Athenian ear nose and throat specialists pay tribute to the anatomical knowledge and great bravery of Theseus and Ariadne.

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