

How could this happen?

Case study of the July, 1956 collision of the ocean liners *Andrea Doria* and *Stockholm*

December 1, 2008

Russell Dale Flick

‘How could this happen?’

“Man is not the creature of circumstances. Circumstances are the creatures of men.”
Prime Minister Benjamin Disraeli.

Mrs. Odette Berry, a trim, elegant thirty-three year old World War II French war bride, fussed with son Michael, age six, as he played excitedly on the bed to her left while she placed their clothes in various drawers and cupboards. Through the open port the scent of salt air drifted in as the sound of bow waves broke like surf from the gently rolling hull of the liner *Ile de France*. It had been a long day traveling from Springfield, Ohio to New York. The welcome aboard dinner that night from first course to last had been what she fondly remembered from her native home in Chamonix, France. This crossing, one of many she had and would make since 1946, was a summer reunion with her relatives. The ship’s Chief Purser was an old childhood friend from Chamonix who had met her at the gangway upon boarding earlier in the day.

In his private quarters high above, fifty-three year old captain, Baron Raoul de Beaudean, of an old French aristocratic family, chain smoked sipping strong black coffee

over endless paper work before perusing the passenger lists sporting his famed monocle. He periodically checked with staff officers on watch for navigation and weather conditions that first night out in the busy sea lanes leading to and from New York. His 44,000 ton ship was gradually building up to 22 knots with her polished engine room telegraphs set on full speed ahead.

Some forty-four sea miles to the east another gleaming steamship of 30,000 tons, nine days and 4,000 miles out of Genoa, Italy, was headed west at 23 knots full ahead with the capacity to reach 26 knots when needed. It was the last night before disembarkation in New York the following morning. Being a three class liner, she represented society of all levels from the tourist class accommodations far below crowded with returning students, school teachers, priests and nuns from visits in Rome along with immigrating Italian families bound for America, to her plush, roomy suites with sitting rooms and large baths higher above.

The passenger list included Betsy Drake, wife of Cary Grant; actress Ruth Roman and young son; Mayor of Philadelphia, Mr. and Mrs. Richard Dilworth; Mr. George P. Kerr of Cincinnati's Procter & Gamble and family along with Mrs. Rufus B. Hall and daughter Margaret C. Hall of Hyde Park. The last night at sea for many was relatively quiet except for the party crowd who held forth in various bars and lounges dancing to the late hours. Others had turned in for the night or were cozy in their cabins reading. A few teenagers had congregated around one of the ship's swimming pools in the warm night air. On the bridge Captain Piero Calamai, fifty-eight, of an ancient and distinguished Genoese seafaring family, paced the bridge checking his bearings, questioning his staff officers and sniffing the air. He had an uncanny sixth sense and called to the engine room far below simply stating, "Fog." Immediately the high pressure steam feeding the dual Parson's turbines was reduced and she slowed from twenty-three to twenty-one knots, the equivalent of 23 land miles per hour. Ten red lights glowed indicating the watertight doors were closed, crow's nest watch set with the fog whistle roaring out every 100 seconds. His ship was equipped with the latest in radar, but neither the captain nor his officers had been formally schooled in its use other than reading the manufacturer's manual and on the job application. Her Speery ink course recorder had been forgotten and was some eleven hours off time. The two radar sets were not

equipped to plot actual location on the screen. Captain Calamai was a kind man who never disciplined in public and was often described as “mild.” He avoided liquor, small talk and ate in a private dining room with his senior officers. My close family friends, Mr. and Mrs. Albert Mayberry of Rochester, New York, had sailed east on the ship’s previous voyage to assume a diplomatic position in Rome and related years later the atmosphere with her crew. They had noticed in certain departments of the ship a somewhat laxness to duty and grumblings in the hotel staff with hints of labor problems facing the officers. Italy’s political situation ashore eleven years after the end of World War II was felt far away at sea.

Further to the west a smaller but none-the-less fast, sleek motor ship of 13,000 tons was picking up the sea lanes out of New York headed for Sweden at 19 knots. The night so far had been clear with passengers walking the decks enjoying the unusual summer weather. Miss Colleen E. Brunner of Des Moines, Iowa pointed out the Big Dipper and commented on the light of the moon. Below, Dr. Horace Pettit, an amateur yachtsman never without a compass in his pocket, was talking to his wife as she read in bed. High above captain Gunnar Nordenson, sixty-three, a no nonsense officer of the old school and a strict disciplinarian never given to small talk with his staff officers, gave the order to change course from 90 to 87 degrees to compensate for wind, current drift, tides and the tendency for any ship to ‘yaw’ port to starboard while under way.

At the helm stood twenty-six year old Peder Larsen, a promising sailor but known to his superiors to have problems with “wandering attention to conversation and other things around him.” He was new to the ship’s crew and was getting the feel of her helm. Above Larsen was twenty-six year old third officer Ernst Carstens, who periodically checked the bearings and radar while keeping tabs on Larsen with corrections of from 2 to 4 degrees port to starboard. He did not summon the captain at the first hint of fog, close the watertight doors or set the automatic fog whistle as a warning.

Captain Nordenson left the bridge with just Larsen at the helm and Carstens in command. The company felt no need for another officer to be present in times of clear sailing. Crow’s nest and naked eye deck observers were posted. All white mast and navigation lights were showing. At 10:30 PM the ship was estimated off course three miles and by 10:40 PM a slight haze was noted ahead but visibility still good. There was

no reduction of speed and the ship's watertight doors remained open. Carstens plotted the course from Nantucket and Pollock lightships at 10:48 PM but mistakenly noted the time as 11:00 PM. He saw on his radar a small, faint yellow 'pip' of another ship estimated at twelve miles to the left. The phone on the ship's bridge rang and for a few minutes he stood in conversation facing the opposite direction. As the fog thickened the two ships closed in on each other at a combined speed of just over 40 knots--two miles every three minutes. At 11:06 PM Carstens called out, "Lights to port. I see lights!" Unknown to all on the earth and sea, massive sunspot flares had been detected over an area of 100,000 square miles above the ships just before sunset.

Below captain Nordenson and Dr. Pettit heard a ship's whistle followed by the unmistakable shudder of a ship being thrown in full reverse. Dr. Pettit, taking his life in his hands, thrust his head out of the open porthole and yelled to his wife, "Brace yourself, we're going to crash!" At that moment the Swedish American liner *Stockholm* sliced into the starboard side of the Italian Line luxury liner *Andrea Doria* with a combined forward hull compression speed and weight of 4,000,000 tons. It was 11:11 PM, Wednesday, July 25, 1956. Nordenson rushed to the bridge and shouted, "Why didn't you summon me!" Officer Larsen, still clutching the engine room telegraphs on 'Full Astern,' sputtered a report and saw his life flash before him. "I'm done for now," he thought.

The reinforced steel hull of the *Stockholm*, built for Baltic Sea ice navigation, had penetrated some forty feet across the top and thirty feet within the *Doria's* hull from the upper deck to the nearly empty double-bottom fuel and water tanks below. Many aboard recalled the sound resembling a powerful explosion. The use of some 4,000 tons of heavy oil in addition to fresh water had already rendered her top-heavy at the end of the long Atlantic crossing. Death was instant for many from 1st Class to Tourist with the heaviest casualties among Italian families traveling to America. Those not killed instantly by blunt trauma were drowned by thousands of tons of sea water and bunker oil. Others were injured from being tossed down or hit by heavy interior materials broken loose. The group of partying teenagers by the pool watched the smashed white bow of a ghost ship scrape by over their heads and didn't wait around to see what would happen next.

Fore and aft electrical conduits showered white and red sparks into the sea as clouds of dust and smoke filled the interior of the ship with the added threat of fire. Lights went off and on again. The starboard steam turbine ruptured spilling oil and hydraulic fluid in her engine spaces. The *Doria's* 35,000 horsepower drove ahead dragging the *Stockholm* until she broke free bouncing along the hull crackling with friction sparks and a shrieking of metal on metal until her one anchor broke loose trailing some 700 feet of heavy chain; sweeping several crew members from their quarters to the bottom. Her bow had been smashed back some 80 feet and she began to settle forward at the bow.

On the *Doria's* bridge, Captain Calamai and his officers rushed to the starboard wing bridge and peered over as tons of hull plates, furniture, luggage, and human bodies avalanched into the sea. Below, engineers shut down boiler furnaces before cold sea water caused an explosion. An error in initial design had neglected installation of a water-tight door leading to the five independent diesel generators. Only one sealed generator continued to work as the water rose steadily. Built to 1948 International Standards, the ship was not to list more than 7 degrees—15 degrees at maximum; yet she heeled 18, 19, 20 and 22 degrees to the point where none of her eight port lifeboats could be freely swung from their davits. History repeated itself as her main deck bulkheads flooded and spilled over into adjacent compartments just as the *Titanic* had in 1912. Captain Calamai, remembering a maneuver from his World War II days, put the port engine on dead slow in an attempt to drive the ship to the shallows just off the coast allowing her to settle. The ship responded but wobbled precariously threatening to capsize and he signaled 'Stop Engines.' He knew she was doomed. In retrospect he realized that no rescue ship of deep draft could have reached her if she had been settled off Nantucket.

Officers and crew were ordered to swing out the remaining eight lifeboats and load passengers. But how? The low starboard side was out of the question as mountains of passenger luggage had been stacked against companion doors for the arrival in New York the next morning. Life lines and ladders were thrown over the stern now some three stories above the water. Passengers either on their own or in rope slings, ladders or

cargo nets would be sent down. There were boats for 1,004 but there were 1,706 passengers and crew aboard.

Forty-four miles away aboard the French Line's *Ile de France*, Odette Berry noticed a sudden increase in speed and a change of course. An announcement in French called all crew and officers to quarters. With young Michael asleep, she ventured into the corridor and up to the main lounge only to be met by her purser friend rushing to his duty station. In French, "We're going to a stricken ship...the *Andrea Doria*...take Michael and go to my office where you can see from the portholes." Captain Beaudean had received the SOS at 11:30 PM and promptly swung his thirty year old fuel hungry liner and crew into action. With the increasing fog he feared another disaster with so many rescue ships converging to the same location.

All public rooms and decks were to be cleared of passengers and ready as crew prepared for the rescue with boats, hot food, blankets, medical attention and empty cabins and lounges to house survivors. Reports of the listing *Doria* caused Beaudean to wonder if they would make it in time. 'Pips' on his radar screens were growing fainter and there were fears she'd already started to sink. The problem lay with the *Doria's* radar not being installed to swing level with the list and the signals being beamed up into the sky and down to the surface of the sea. The *Robt. E. Hopkins*, *Pvt. Wm. H. Thomas* and *Cape Ann* had responded rushing to the collision site. Distress radio signals were heard as far away as Argentina.

Since ancient times the design, building, propulsion and navigation of ever larger ships evolved to exercises of applied mathematics. In the modern era officers, engineers and crew members are trained in stability, steam and diesel mechanics, hydraulics, carpentry, electricity, ventilation, weather forecasting, food preparation, health and sanitation, liquid fuels, chemistry, environmental factors. Like a great organism ship systems are intricately interwoven to keep all in running order. The failure of one main system or department could spell disaster to all. The *Doria's* chief engineer, without consulting Captain Calamai, struggled with his assistants to pump heavy oil from the lower wing tanks to the high side of the ship attempting to correct the list to port. It was later realized that such a maneuver decreased stability increasing the risk of capsizing by raising the ship's center of gravity.

By 12:30 AM the list had increased to 28 and then 30 degrees. Never had a ship survived with such a list. Had the wind been higher, the sea rougher, she would have rolled over and gone down with but a fraction aboard surviving. Though fully air-conditioned, a number of passengers had opened the ports to their cabins for fresh sea air, others had been shattered by the collision. Many could not be secured in time as additional sea water poured in. Years earlier, following the *Lusitania* disaster, Massachusetts Institute of Technology had calculated that one 18 inch open or shattered porthole submerged three feet would inject 3.75 tons of water per minute.

Captain Calamai did not sound the general alarm in order to avoid a mass panic and rush to the boats. Loud speakers gave the order to abandon ship in Italian and English. Passengers later formally complained the PA system was garbled with announcements being spoken only in Italian. Crew members began leading passengers aft. The high stern was the only means of escape and people began jumping from the deck or tossing infants and young children down with injuries and death as they struck the waiting boats below or materials drifting in the ship's wreckage field. Another family friend, Mrs. Cathy Bauer, five months pregnant, remembered how her husband advanced down a manila line with her straddling his shoulders to a boat suffering painful rope burns to her hands and arms.

At 2:00 AM the gleaming *Ile de France* sounded her steam whistles and slid in to the lee side of the *Doria*. Her huge electric name signs blazed across the night. "I am here...I am here" Captain Beaudean radioed in encouragement as boats were lowered into the sea. Odette Berry, fluent in Italian, entrusted her son Michael to a lady passenger and rallied a number of women to begin collecting extra items of clothing, shoes, undergarments, blankets and toiletries for the arriving passengers and crew. Those aboard the rescue ships were dismayed to see the first boats filled with predominately male crew members from the *Doria*. It must be understood that many of these men were from the ship's hotel department and not true mariners in the sense. Ship lines then still signed on boys as young as fifteen and sixteen, with most having never been on a ship and seeing the sea for the first time. It was an old story. These men occupied the lowest cramped sections of the ship and had seen the horror of the collision and immediate flooding first hand.

By 4:00 AM the *Doria* had been cleared of all passengers with Captain Calamai and eleven trusted officers remaining aboard. By 5:00 AM the ship was listing 40 degrees. “You go,” he said gently, “I will stay.” By tradition a ship captain is the embodiment of his vessel—its heart and soul—carrying implications of nobility, duty, chivalry and dedication. His officers implored him to leave and at 5:30 AM they boarded the salvage tug *Hornbeam*. There were ominous pops, cracking and rumbling of interior fixtures and equipment now breaking free and sliding to starboard. As they neared the rescue vessel sailors noticed two immense white sharks following with deadly intent and yelled down for the men to keep well to the center of the lifeboat.

Captain Calamai, as do other officers at sea, realized that abandoning a ship leaves it prey for rogue salvagers to board and lay claim to the spoils. Had the *Doria* remained miraculously afloat she would have been the property of such actions and out of the hands of the Italian Line and her officers. U.S. Coast Guard and Navy vessels were present not only to save human life but to protect vested property rights. The Italian government was the largest stock holder in the company with the ship regarded as a possession of the nation.

Calamai had questioned a trusted sailor on the bridge, “Do you have the books?” meaning the valuable ships logs and manifests. The young sailor had been handed one book and replied, “Yes, sir.” It was later realized the logs and papers needed had slid to the floor in the bridge office and were forgotten in the confusion. The book in question contained nothing more than ship expense accounts and recordings of her refrigeration department. This would prove a disaster in the hearings that would follow. Officers at Lloyds of London, responding to the news and clicking ticker tapes, were behind closed doors awaiting reports on the sinking while pouring over insurance policies and architectural plans of the ship. Lloyd assessors were already hitting the keys on their calculators tabulating the bad news.

The *Ile de France*, with 753 ‘souls’ on her passenger manifest, circled the *Doria* three times, dipped her flags, blew her whistles and headed for New York. The *Stockholm* took aboard 544, with other army and navy vessels loading the remainder. The *Stockholm* steamed slowly for New York with her shattered bow precariously supporting the force of the sea. At 10:09 AM July 26th, the *Dori* rolled on her starboard

side and settled by the bow as massive bubble fields and geysers of water from her open ports and compartments shot skyward. The stern plunged as the name of a proud ship in gleaming gold letters sank to the floor of the continental shelf 225 ft. below. Unusable lifeboats and debris bobbed in her swirling wake in a wreckage field covering acres. Rescue vessels combed the area for the possibility of any survivors still swimming or even floating bodies. None were found and an orange floating buoy was dropped to mark the location.

As in the case of the Twin Towers on 9/11, it wasn't so much the question of why she sank, but what took her so long? Sink she did but the sinking, to the shock of her owners, officers, marine architects and Lloyds of London underwriters, was by capsizing, and that would make all the difference in the world. Later, on the French Line pier in New York, a distraught lady passenger from the *Doria* summed it up best when she screamed in the lenses of hungry news cameras, "This is an international disgrace!" Cruel comments soon circulated with the Italian Merchant Marine being called, "The pasta fleet...the Chianti navy." The Swedish Line took it on the chin with, "Bull headed Vikings drunk on Aquavit and Vodka." Here in the states the Italian-American press stridently chastised other leading papers for focusing too much on the rich and famous while appearing to ignore the plight of Italian crew members and citizens who suffered most in the lowest decks of the ship. It was a disaster unheard of in the era of modern navigation equipment and ship technology.

The morning of their salvation crew members of the *Doria* stood at the rails of their rescue ships, man for man, praying softly to patron saints tossing keys, name tags, tool belts, flash lights into the sea—anything linking them to an unlucky ship. It was an ancient tradition. On the *Stockholm* crew members crept out on the crushed bow to retrieve a number of souvenirs from the *Doria*. One was rewarded with a perfect crystal cocktail shaker from a first class suite resting on the lip of a crushed bow plate.

On September 19, 1956 'discovery proceedings' were convened in New York with representatives for the Italian and Swedish lines along with sixty other lawyers filing for death, injury, loss of valuable cargo and first class mail in a group of 1,200 third party claimants. The government owned Italian Line had approached the Swedish company to settle out of court to avoid "washing of dirty linen in public." The loss of the four year

old *Doria* was quickly written off the books for \$30,000,000 at the moment of sinking. Her assessed value today would be \$225,000,000. Total damages were estimated at \$116,000,000 in 1956 dollars--\$870,000,000 today.

Captains Nordenson, Calamai and staff officers were summoned to give evidence in an attempt to piece together the facts of the disaster based on scant documentation and memory. Translators in Italian and Swedish were required for more technical and legal points of discussion and argument. Loss of the *Doria*'s vital logs and troublesome notations from *Stockholm*'s third officer Carstens based on memory, poor log keeping and the tradition of 'dead reckoning,' were embarrassing. 'Dead reckoning' took on a whole new meaning. The ancient "act of God" claim would be dismissed if a ship could be found un-seaworthy or due to acts of negligence by officers, crew or owners.

The testimony on what ship was where, their steering, response to lights, whistles and actions just prior to the collision filled page after page numbing even the most expert of the seated board and admiralty lawyers. Board of Inquiry members were heard to mumble in a caucus, "Now, do we *really* understand what went on here?" The unusual atmospheric conditions and fog that night revealed the *Stockholm*, in the hands of Peder Larsen, the sailor who was known for "not focused...wandering attention," had his ship nearly twenty miles off course. Fog and rain were known to smother radar readings with a possibility that radar had been "bounced off" fog layers like mirrors similar to a mirage on land. The 'calculated risk' of running ships at high speed through fog conditions had been winked at by companies and officers for years in order to meet schedules of passengers, cargo, food supplies and oil deliveries the next day in port. Neither ship had sufficiently 'reduced their speed in order to be able to stop in one half of their visibility field.'

Captain Nordenson had sworn it was his practice to reduce speed in fog. When the Court of Inquiry summoned the *Stockholm*'s log books as evidence it revealed that in some sixty previous watches, when fog was encountered, the speed of the ship had never been reduced. This news came as a bomb shell in the proceedings. Nordenson, under incredible stress, suffered a mild stroke and the hearings were delayed some three weeks until he recovered and could return to the stand.

Atlantic sea lanes at the time were not universally accepted with ships on opposing courses too close together. Present lanes for ships have been set at twelve miles with a five to seven mile safety margin at minimum.

All court proceedings were halted and closed to observers in January, 1957, when technical findings were filed revealing that the *Doria* had barely met the ship stability requirements from her Italian builders within the 1948 Life At Sea Convention due to her empty fuel and water compartments pierced and flooded at the end of a long voyage. Another design error in the *Dori* had proven fatal. Her turbines and generators were dependent on cooling by sea water pumped in from the hull below the waterline. As the ship drastically listed to starboard, her only intake openings on the port side sucked in air, causing the vital pumps and generators to overheat and shut down one by one. It boiled down to a tragedy of errors and unanticipated factors linked to a sense of over confidence by officers and helmsmen. No definitive summary of the case was ever made as to the actual cause of the collision.

The two companies agreed to drop their suits ending all legal action against each other. The terms were to remain secret with no assessment of blame upon either the *Stockholm* or the *Doria*.

Could the *Doria* have been saved? Though a horrendous collision, the flooded hull compartments could have held if the all-important watertight doors in the lower access tunnels of the ship had been in place at the time of her construction preventing further flooding and disabling of the ships engines and pumps. Some stabilization of the ship may have resulted until chartered salvage tugs and crews could have boarded. We will never know.

Epilogue

The *Doria* remains in her watery grave off Nantucket with decks and superstructure slowly rusting and collapsing like a house of cards. Within days divers descended to examine and retrieve various objects and take photographs. Her vaults and safety deposit boxes in the Purser's office were found to have been emptied before she sank. After fifty-two years sailors report oil bubbling to the surface of the sea while

unsuspecting fishing trawlers snag deep nets on her superstructure. Captain Calamai never sailed again and was retained by the Italian Line until he reached the mandatory retirement age of sixty.

Captain Nordenson was handed command of the new liner *Gripsholm* until his retirement in 1958. Others were promoted by the Swedish Line. Third officer Carstens joined the *Grispholm* but left the line in 1958 with a black cloud of controversy surrounding him. Helmsman Peder Larsen disappeared from any further publicity and his ensuing life and fate are unknown at this writing.

The aging but still magnificent *Ile de France* sailed on until 1958 when retired. In France, as some other nations, a ship by gender is a 'He' and not a 'She.' The *Ile* was featured in a 'B grade' Hollywood movie with Robert Stack and Dorothy Malone titled 'Last Voyage.' Film directors had taken option under charter and planned to deliberately sink the ship while cameras rolled until the French nation rose in protest. She was ordered only partially sunk. The *Ile* was steamed to Japanese ship breakers, stripped and cut up in 1959.

Mrs. Odette Berry, a widow at eighty-five, still resides in her Springfield, Ohio, home shrouded in the veil of advancing Alzheimer. She examines old photos attempting to recall the events with any clarity. Mrs. Albert Mayberry, a widow of ninety-two living in a North Carolina retirement center, recalls various crossings on the Italian line with vivid insights of the beautiful *Doria*, her officers and crew prior to the return fatal voyage.

Loss of life aboard the *Doria* and *Stockholm* totaled 52 from the initial collision and trauma injuries in the months to follow. Collisions, supper club fires, air craft, railway and terrorism tragedies in ensuing years have long surpassed the death toll of July, 1956. Today the new class of mega cruise liners is topping 120,000 tons carrying in excess of 3,000 passengers. There is no end in sight as companies enter the market with vessels now in the \$800,000,000 range. These massive superstructures towering up nineteen decks, with shallower rounded hulls, give me pause to reflect as an amateur arm-chair naval architect. On numerous cruises I've stood on deck in a stiff wind sensing the slow roll recovery and the noticeable wind compression rate against the ship—and wonder.

Within the past two years ballast and stability incidents have occurred at sea involving large cruise liners. One on the Atlantic was linked to a freak wave of unusual height. Another in the Gulf of Mexico involving PRINCESS CRUISE LINES immense *Grand Princess* was caused by bringing the ship's helm around too hard in order to answer a distress call. The ship destabilized, held a long, frightening list with passengers and crew injured by sliding furniture and fixtures. By the time I boarded the following week all had been squashed by the company and officers—except for more vocal cabin stewards, waiters and bar tenders who had to clean up the mess.

But what happened to the *Stockholm*? In 1959 she was sold to an East German company as a communist trade-union cruise ship calling at Baltic, Caribbean, Mediterranean and African ports. In the late 1990s she was purchased by Italian interests and towed to Genoa for total gutting and refitting. Italian news media screamed “E ARRIVATA LA NAVE DELLA MORTE”—‘the ship of death has arrived.’ Her Italian owners created an almost new liner of the 1948 built ship. As the *Italian Prima*, she was luxuriously appointed with top of the art internal computer and conference centers appealing to what was whispered as “high rollers with a lot of shady money” to run in the Cuban cruise market to broker off shore deals. The scheme quickly faltered with the ship again sold and now operating on the Mediterranean as the *Athena*.

On a warm July evening in 1968, I walked from my hotel in Genoa, Italy, to the Italian Line pier to attend a bon voyage party for friends aboard the *Cristoforo Colombo*, less celebrated and not so glamorous sister ship to the *Andrea Doria*, as she cast off for a cruise through the Mediterranean and Adriatic. Paper streamers snapped in our hands as she backed out, rounded, paused, sounding long blasts of her steam whistle. Voices on the pier softened as we admired her lights gleaming like a thousand diamonds. In poet Homer's words, “She moves a goddess and looks a queen.” Nearby a group of veteran Italian sailors practiced the rite of quickly turning their backs crossing themselves to ward off bad luck for a departing ship. I glanced to sea and on the evening horizon detected the early signs of mist and gathering fog. And I remembered that July night twelve years before.

“Life brings its own education, and life of the sea permits no truancy. It says to a man, learn to be a seaman or die. It takes no slurring answer, it gives no immunity...The ocean cannot be cheated...It may not be crossed except by those who know the stars.”

Lincoln Colcord in ‘Ship of Ghosts.’

END

Research sources

1. Newspapers: CINCINNATI POST, CINCINNATI TIMES STAR, CINCINNATI ENQUIRER, NEW YORK TIMES, July, 1956.
2. LIFE Magazine: July, 1956 and selected follow issues.
3. ‘STEAMBOAT BILL’, Journal, The Steamship Historical Society of America No. 258.
4. Maxtone-Graham, John. THE ONLY WAY TO CROSS, Macmillan, New York, 1973.
5. Armstrong, Warren. ATLANTIC HIGHWAY, John Day Co., New York, 1962.
6. Moscow, Alvin. COLLISION COURSE, Van Rees Press, New York, 1959.
7. U.S. Coast Guard. Investigation and technical findings, Court of Inquiry.
8. Emmons, Frederick. THE ATLANTIC LINERS, Bonanza Books, New York, 1972. Drawings & biographical sketches of ocean liners.
9. Newell, Gordon. OCEAN LINERS of the 20th Century, Bonanza Books, New York, 1963.
10. Preston, Diana. LUSITANIA: An Epic Tragedy, Berkley Books, New York, 2002. [Portholes, stability factors, listing of ships, technical factors of ships].
11. ‘RMS TITANIC: Ownership and salvage award report.’ Pertinent to salvage.
12. Drawings, plans, technical data, calculations for *Andrea Doria*, Genoa, Italy.

Interviews

1. Berry, Odette Mrs. Aboard liner *Ile de France*. Access to family photos from the ship and personal memories. Son Michael Berry, Springfield, Ohio.
2. Bauer, John. Rescue from the *Andrea Doria*, July 26, 1956. ‘Rope burns.’
3. Judd, William Capt. Insights on radar operation and weather factors.

4. Mayberry, Albert Mrs. Memories of the Italian Line and the *Andrea Doria* from previous voyage before sinking. Insights on officers, crew and 'labor atmosphere aboard.'
5. Pirelli, Carlo Mr. Italian Line, New York, retired. Insights on operation of the New York office, Italian government investment etc.