

The Shipwreck of the SS *Republic* (1865). Experimental Deep-Sea Archaeology. Part 2: Cargo.

Neil Cunningham Dobson & Ellen Gerth

Odyssey Marine Exploration, Tampa, USA

Between October 2003 and February 2005 Odyssey Marine Exploration surveyed and conducted an extensive excavation on the shipwreck of the 19th-century sidewheel steamer the SS *Republic* at a depth of approximately 500m in the Atlantic Ocean, over 150km off the southeastern coast of the United States. The *Republic* was en route from New York to New Orleans with passengers and a composite commercial and monetary cargo when she foundered during a hurricane on 25 October 1865.

Some 262 ROV dives took place on the *Republic*, accumulating approximately 3,500 hours of bottom time on the seabed. 16,000 digital still photographs were taken and over 3,000 hours of video footage recorded. During the archaeological excavation 14,414 artifacts and 51,404 coins were recovered, recorded and conserved. These assemblages have produced a unique image of daily life in post-Civil War America, unparalleled in scale and diversity on any wreck of a steamship.

© Odyssey Marine Exploration, 2009

1. Economic Background

The shipwreck of the steamship *Republic* was laden with an extensive and diverse collection of cultural assemblages, which, beyond the coin cargo (Bowers, 2009), were not documented in historical records of the vessel's final voyage. The gold and silver coins, minted in Philadelphia, New Orleans and San Francisco, and dating from the late 1830s to 1865, are believed to represent the largest collection of Civil War-era coins discovered on a shipwreck, including pristine and uncirculated examples (Figs. 4-5). Of greater archaeological importance is the plethora of trade goods, essential to daily life and commerce in mid-Victorian America (Fig. 1). The arrival in New Orleans of an assortment of bottled goods (patent medicines, inks, pickled foods, hair tonics and tooth powders), accompanied by leather footwear, hardware, and ironstone china, would have been vital to help kick-start the city's depressed economy.

Without a cargo manifest or related documentary evidence, the intended recipients of the *Republic*'s cargo will never be known. Yet the historical context in which these goods circulated can be partly reconstructed by an examination of New Orleans' *post-bellum* economic climate in tandem with other socio-cultural, health and demographic factors.

In the decades preceding the American Civil War the growing world demand for cotton led to the development of vast slave plantations in the lower Mississippi Valley.

New Orleans served as the central hub from where cotton was largely shipped either directly to Liverpool and other British ports or was trans-shipped through New York. During the 1850s the annual shipment of cotton to England rose from 582,723 bales to 1,426,966 bales, representing well over one-half of New Orleans' total exports. In the same period, French consumption also more than doubled from 125,067 to 303,157 bales. In addition to Liverpool and Le Havre, there was also a significant increase in cotton shipments to Bremen, Genoa and Trieste to serve the growing textile industries of the German states and northern Italy (Reinders, 1998: 37).

The cogs in this trade spine explain the preponderance of British products amongst the *Republic*'s ceramic and stoneware and glass bottle cargo: no outgoing merchant vessel would return from Britain via other ports without a profitable consignment. By 1860-61, cotton exports from New Orleans had peaked at a total of over 2.2 million bales per annum, valued at \$110 million. Sugar and tobacco shipments followed as distant secondary commodities, while foodstuffs comprised the remaining bulk exports (McNabb and Madère, 2003; Reinders, 1998: 40-1). New Orleans was now the second largest commercial center in the United States behind New York and the most important cotton market in the world (Reinders, 1998: 37; Vandal, 2000: 18).

Because of its specialization in marketing agricultural

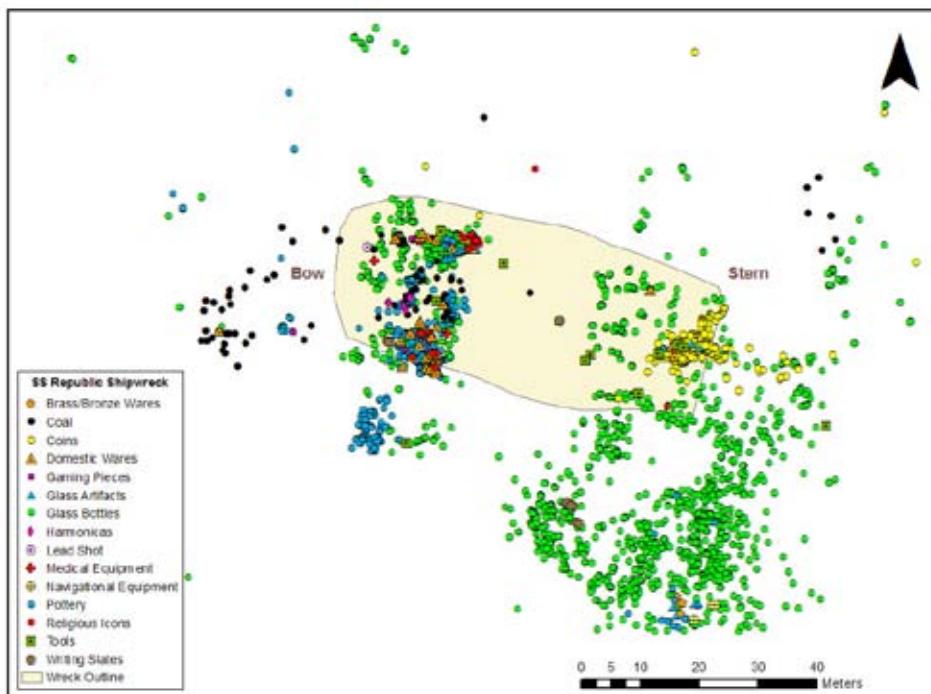


Fig. 1. Distribution of recovered cargo wares from the wreck of the Republic.

commodities, New Orleans in effect never developed into a major manufacturing center. In 1860, the city was ranked sixth in the nation in terms of population size, yet only seventeenth in value of its manufacturing productivity. While some light manufacturing had emerged by the 1850s, it was largely small-scale private enterprise, assorted industry and crafts of minor importance. The average New Orleans industry operated with limited capital and only employed a few workers (Reinders, 1998: 45-46). Most of these businesses did not survive the Civil War. Imported goods were abundant, inexpensive and readily available to large-scale retail merchants in New Orleans (McNabb and Madère, 2003; Stout, 2007: 4). Wholesale and import merchants also supplied smaller urban retailers, country shopkeepers, planters and individual peddlers. Many vendors were African American women who conducted trade in the streets, a traditional practice introduced from the African homeland.¹

New Orleans' reliance on highly specialized cotton exports and imported goods, propelled by a competitive and prosperous mercantile class, was its Achilles heel. The importance of the city's port, and Louisiana's strategic position on the Mississippi, made it an early Union target during the Civil War and blockades seriously disrupted the city's trade, the welfare of her merchants and her blue-collar workers. Without the constant flow of goods, New Orleans could not function (McNabb and Madère, 2003; Stout, 2007: 4). The city's resources were further diminished with the imminent approach of the Union fleet in April 1862. With the enemy in sight, the Confederate army



Fig. 2. Reconstruction of the sidewheel steamer Republic based on a painting of the SS Tennessee in the Peabody Essex Museum, Salem, Massachusetts. Painting: by John Batchelor.

seized control of New Orleans and systematically destroyed the city's material wealth. Stores of cotton and tobacco were burnt. Railroads and steamships spirited away Confederate troops, documents and military supplies. The city's banks dispatched \$6 million in gold specie out of town for safety (Capers, 1965: 155; Stout, 2007: 8).

In the aftermath of the Civil War, New Orleans was demoralized and impoverished. Unemployment, endemic even during times of relative prosperity, reached new heights after the war as the city was struck by a crippling economic depression. The recovery problems common to the entire South were greatly exacerbated by the city's unusually large population of urban dwellers. The challenges of

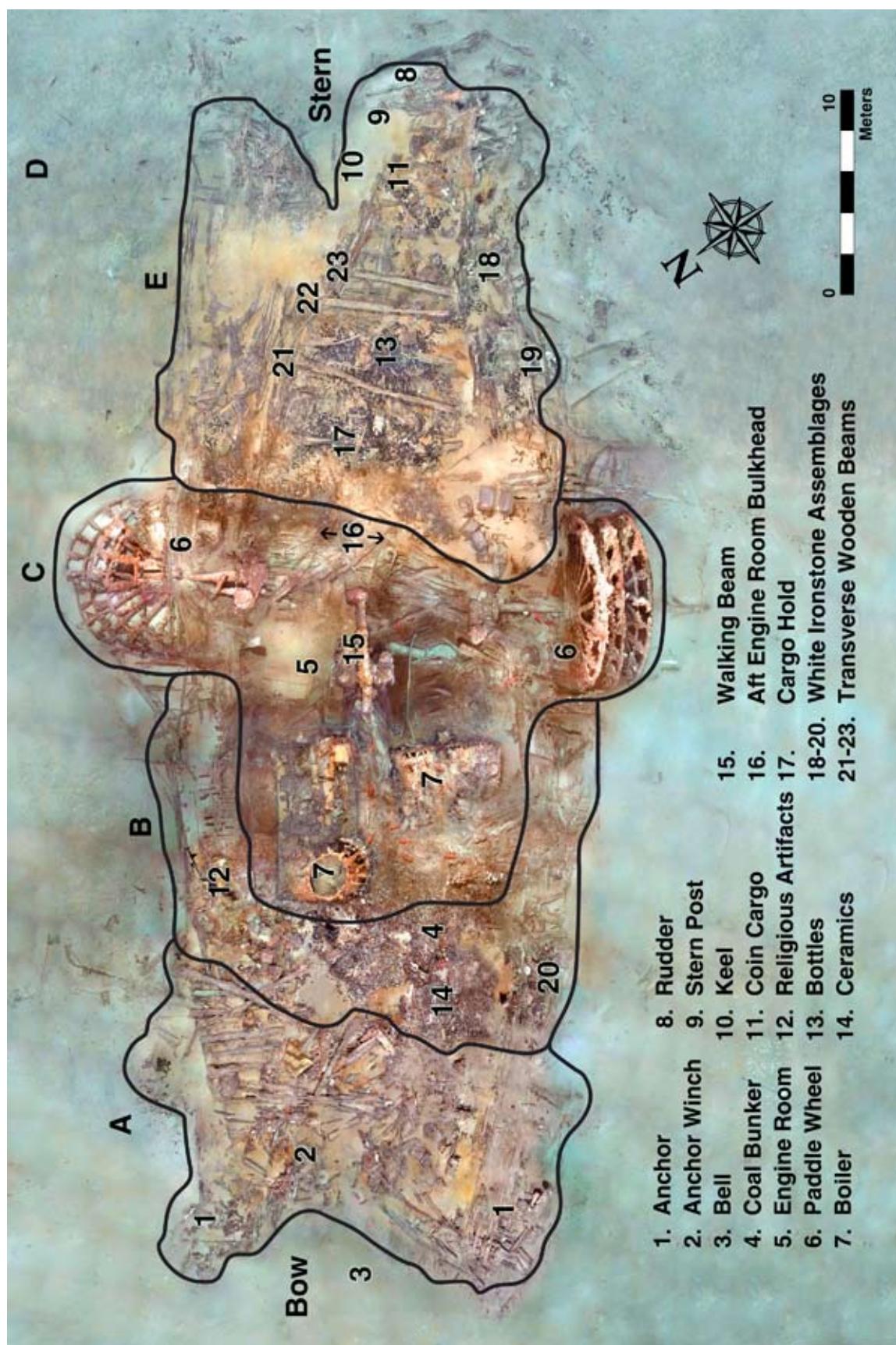


Fig. 3. Photomosaic displaying survey/excavation areas and the locations of prominent archaeological contexts.



Fig. 4. Gold coins in situ in the stern area of the wreck of the Republic.



Fig. 5. Silver coins in situ inside a decomposed wooden shipping keg in the stern area of the wreck.



Fig. 6. Bolts of cloth in situ in the bows of the wreck (Area A) alongside scattered coal and glass bottles in the background.

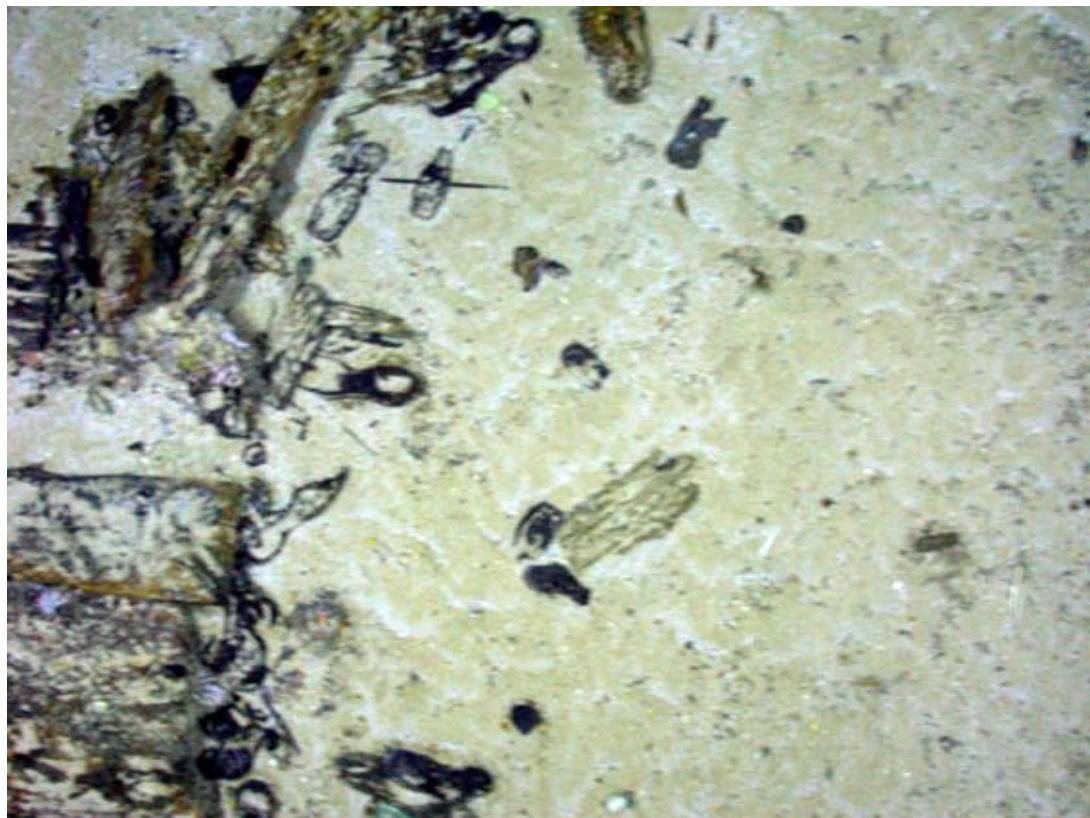


Fig. 7. Leather shoes in situ in the debris field (Area D).



Fig. 8. Glass champagne-style, whiskey and glass bitters bottles in situ in Area E.



Fig. 9. Glass whiskey and bitters bottles in situ in Area E.



Fig. 10. Glass champagne-style, mustard barrel, bitters and cathedral-patterned pickle bottles between frames and cargo hold bulkheads in Area E, some still stacked in their original rows after their packing crates had completely deteriorated.

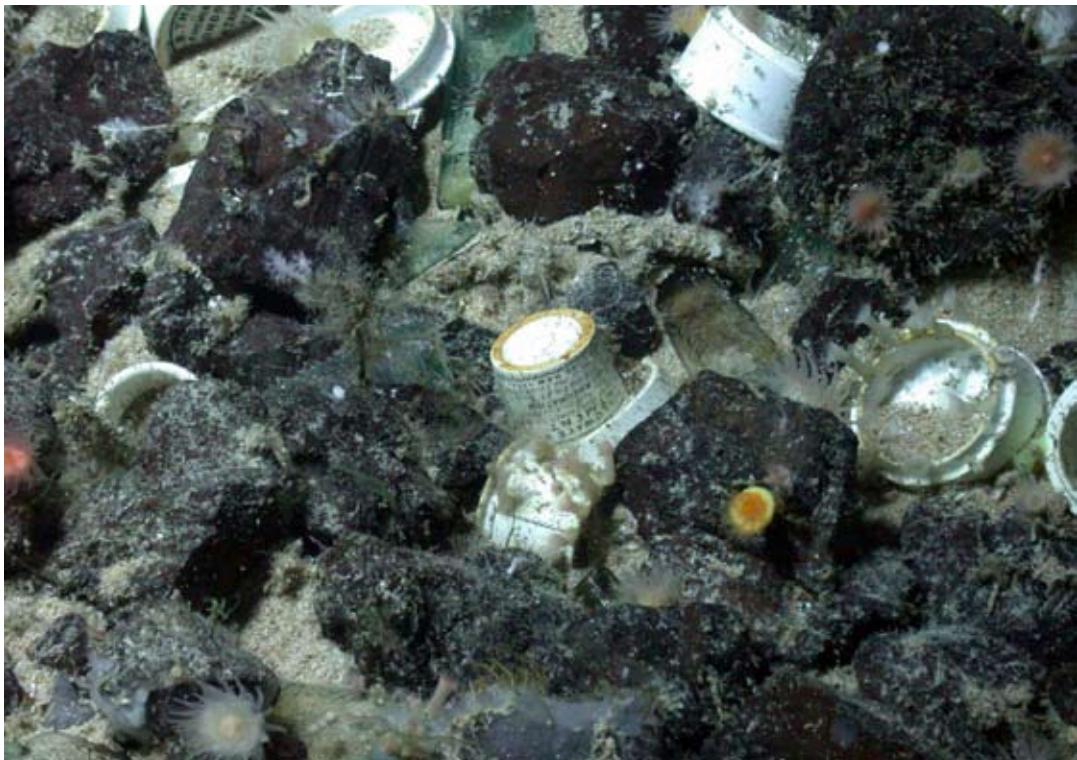


Fig. 11. The coal pile in Area A intermixed with J.B. Thorn/John Tarrant ceramic medicine pots and lids, Holloway's Ointment pots, and glass patent medicine bottles.



Fig. 12. Assorted ironstone china in situ in Area D.



Fig. 13. Ironstone china footbaths, slop jars, tooth brush containers, and cups and saucers in situ in Area D.



Fig. 14. Ironstone china cargo in situ in Area D, consisting of footbaths, slop jars, stacked wash basins and demitasse cups and saucers.



Fig. 15. Detail of the ironstone china cargo in Area D, including footbaths, slop jars and demitasse cups and saucers in situ.

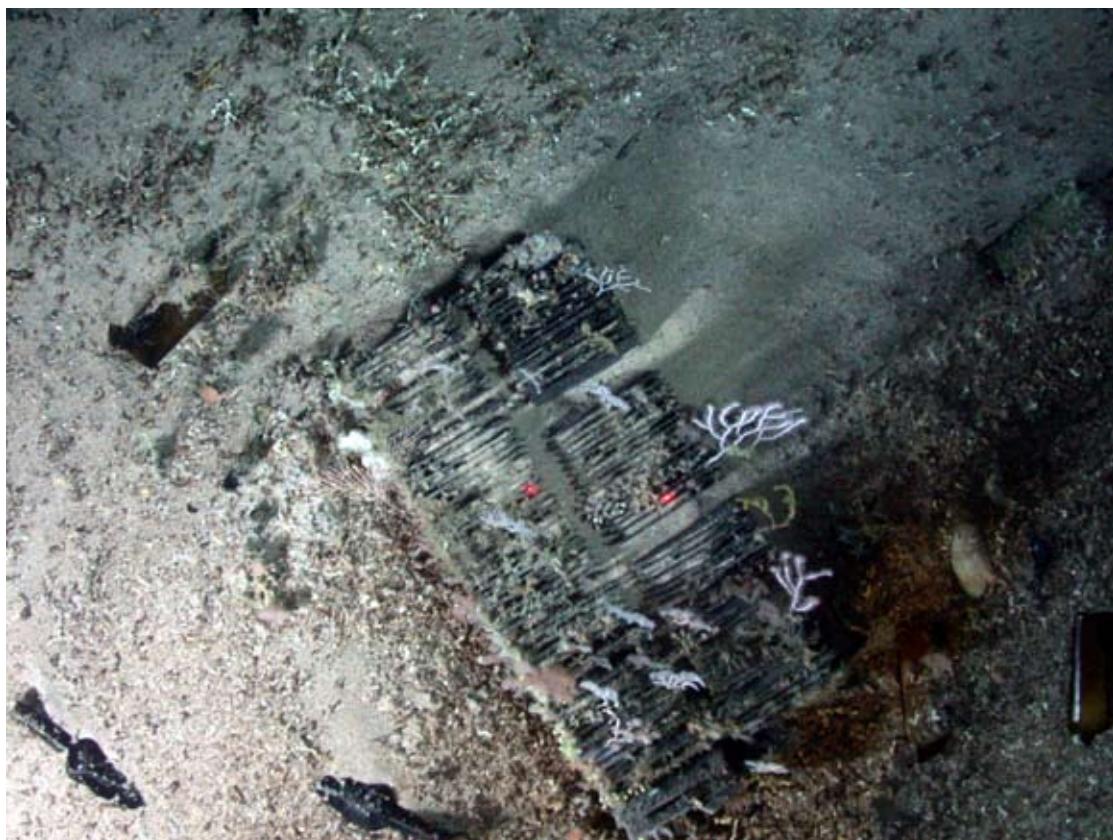


Fig. 16. Welsh writing slates still stacked in the Area D debris field, even though their original wooden shipping crates are entirely deteriorated.

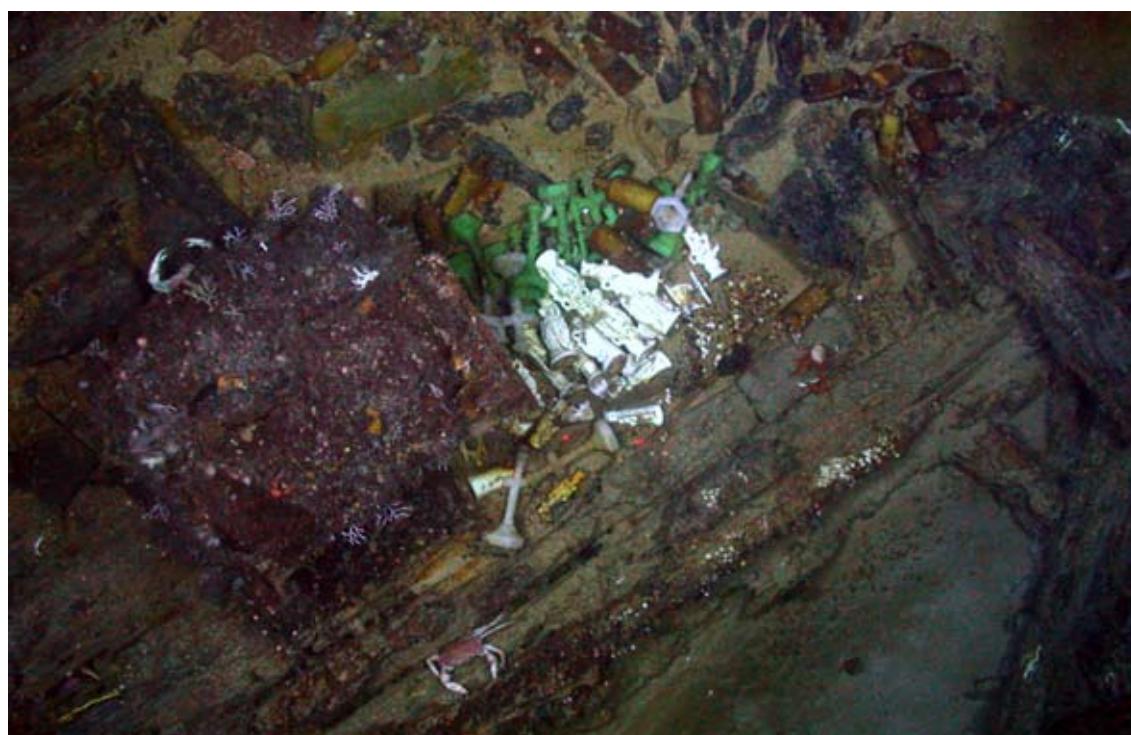


Fig. 17. A cargo of porcelain and glass religious figural candlesticks in situ in Area B; its packing crate is not preserved.



Fig. 18. A copper-alloy telescope in situ in the debris field (Area D). Found near glass lenses and a brass barometer, it seems to have been part of a consignment of nautical instruments.



Fig. 19. Rectangular metal lining ingots in situ in the engine room (Area C). The ingots were intended to be melted down and poured into a bearing mold or tray to produce sheet metal for placement over the surface of the engine's moving parts to prevent wear and damage. Each is stamped S. Whites and J. W. Quincy of New York.

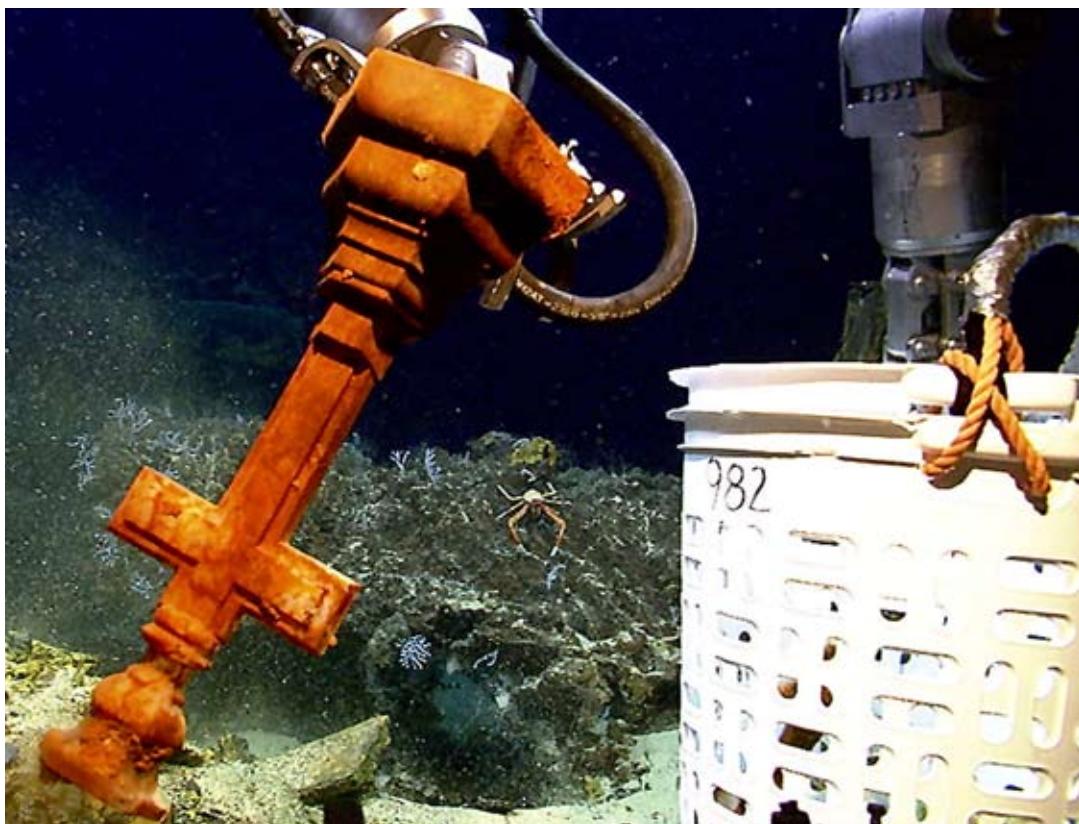


Fig. 20. A glass crucifix candlestick in Area B being transferred into a recovery basket by the ROV Zeus' limpet suction system.



Fig. 21. A glass bottle containing preserved gooseberries being recovered by the ROV Zeus' limpet suction system.



Fig. 22. A milk glass base of a ruby-colored glass oil lamp font being recovered by the ROV Zeus' limpet suction system.

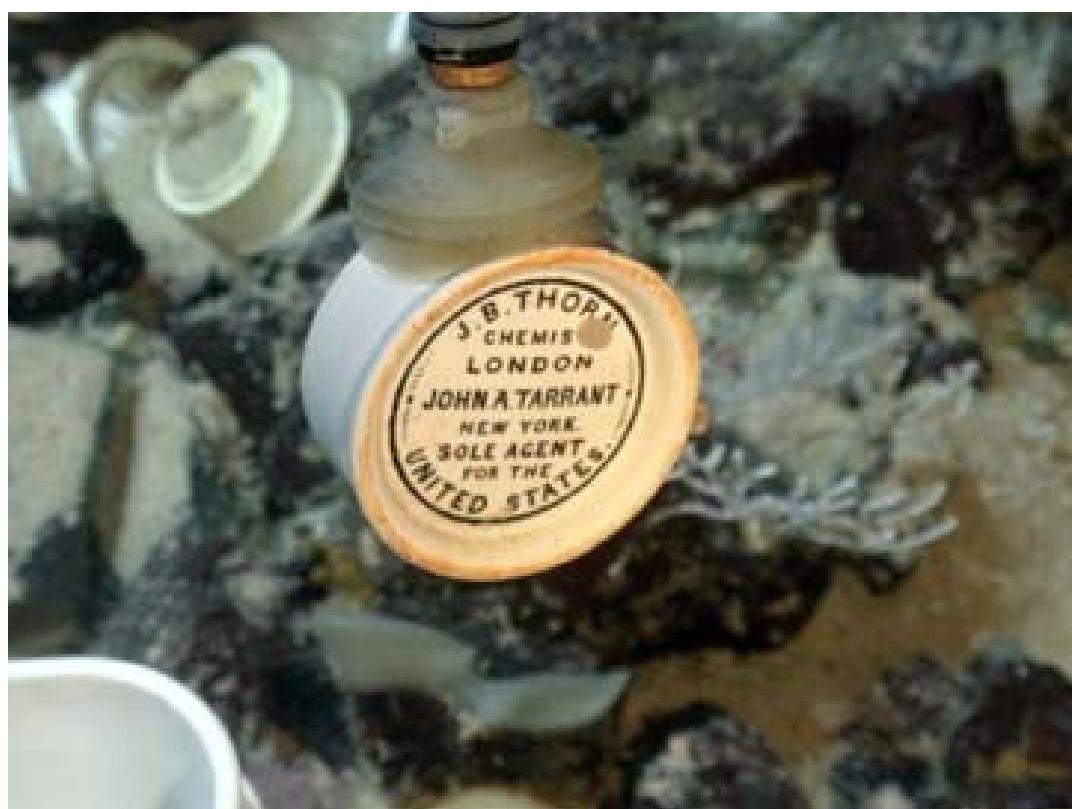


Fig. 23. A J.B. Thorn of London's ceramic medicine pot being recovered by the ROV Zeus' limpet suction system.

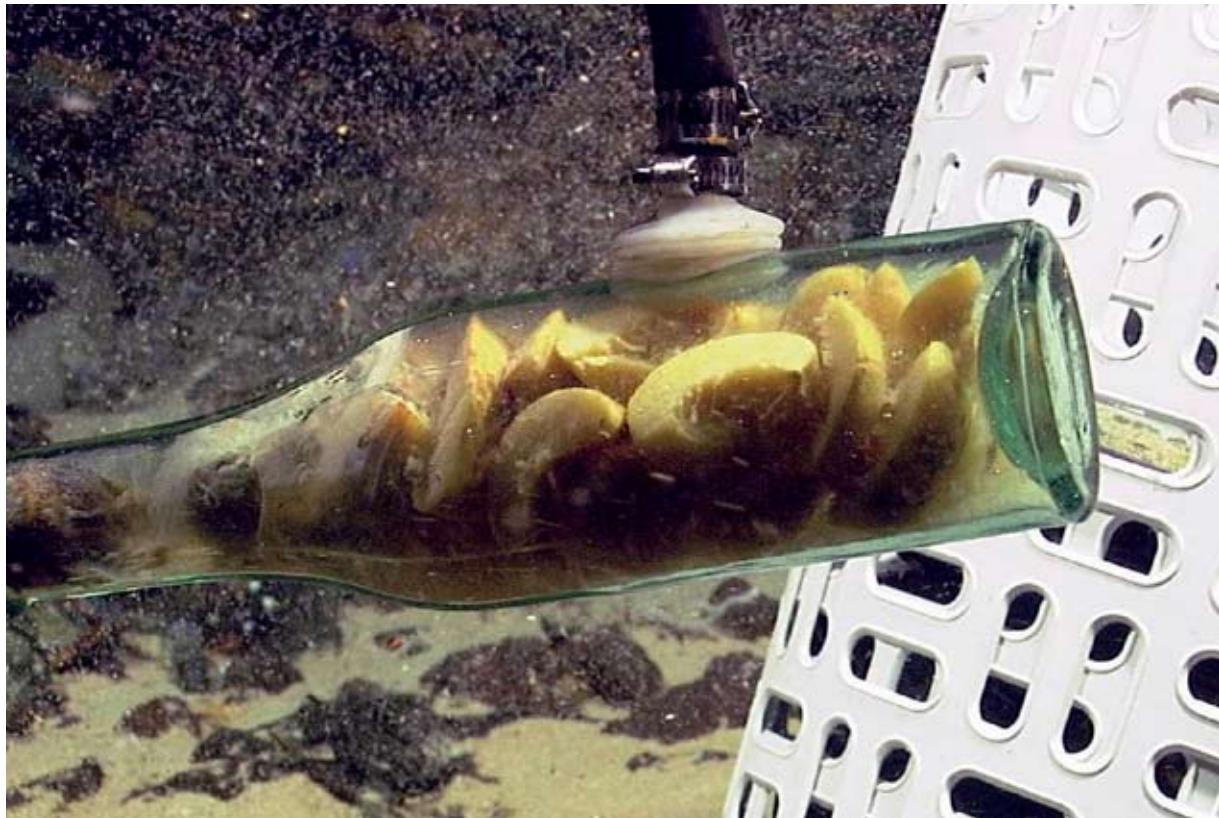


Fig. 24. A glass bottle containing preserved peaches being transferred to a recovery basket using the ROV Zeus' limpet suction system.



Fig. 25. An umbrella inkstand being recovered by the ROV Zeus' limpet suction system.

overpopulation were further intensified by the migration of thousands of former slaves who had abandoned the plantations and flocked to the city during the war and after emancipation in 1863. New Orleans' black population more than doubled from 24,500 in 1860 to 50,450 in 1870 (Stout, 2007: 2; Vandal, 2000: 18-19).

Nonetheless, New Orleans was virtually the only major city of the Confederacy to emerge from war without near-total destruction. It remained a gateway for economic traffic into the deprived South, as well as an established entrepôt for trade south of America's borders. It is within this socio-economic context of deprivation and yearning demand that the abundance of essentially utilitarian commodities onboard the *Republic* was shipped to market with great expectations.

2. Coins

When she foundered, the SS *Republic* was transporting an extensive consignment of coins (*Charleston Daily Courier*, 30 and 31 October, 11 November 1865). The excavation of her shipwreck yielded 51,404 coins in total: 4,135 gold and 47,263 silver issues, as well as four British florins and two silver 25 cents (Figs. 4-5). The specie consisted of 2,675 gold \$20 double eagles and 1,460 \$10 gold eagles, but mostly 47,263 silver half dollars. The latter included some coins of the Capped Bust design, but Liberty Seated coins predominated: an artistic innovation of engraver Christian Gobrecht that portrayed Lady Liberty seated on a rock, one hand holding a shield and the other a pole surmounted by a liberty cap, a symbol of freedom. The scene is surrounded by 13 stars, with the date below. The reverse displays a perched eagle, wings downward, holding an olive branch and three arrows (Bowers, 2005: 262).

A detailed presentation of the *Republic*'s coin mints and a functional interpretation is presented elsewhere (Bowers, 2009).

3. Glass & Stoneware Bottles

Some 58% of the artifacts recovered from the *Republic* comprised 8,429 glass and stoneware bottles, once stored in the ship's aft and forward cargo holds (Figs. 2-3, 8-11). These include an intriguing collection of medicinal 'cures' (2,672; 31.7% of the total), ink bottles and stands (2,447; 29.0%), food products (1,522; 18.0%), beauty products (958; 11.4%) and alcoholic beverages (830; 9.8%).

The combined volume and variety of bottled goods seems to represent the largest and possibly most diverse collection ever recovered from any shipwreck site. Their

subsequent study and analysis has provided a rare insight into prevailing social and economic conditions in New Orleans following the American Civil War. The assemblage simultaneously permits a broader interpretation of the country's socio-economic climate in an era when the North served as the major manufacturer and supplier of goods being shipped southwards and when the United States, as a whole, relied on an influx of British imports and, to some extent, products from Continental Europe. Significantly, the study of the *Republic* bottle assemblage has also divulged new information relating to the business histories of the companies that both used the containers and supplied their contents.

The collection reflects a transitional period in the development of glassmaking, the start of which had been underway for several decades (McKearin and Wilson, 1978: 13-14; Switzer, 1974: 5). The eclectic mix of technologies (such as the use of the pontil rod versus snap case) and other production features evidenced in the bottle collection represent a unique record documenting the variable pace at which improvements and innovations were taking hold in American glass factories. This new body of information contributes significantly to an important chapter in the commercial glass- and bottle-making industry in America.

A. Patent Medicines

A sample of 2,672 patent medicines and other medicinal bottles was recovered from the wreck of the *Republic* (31.7% of the total bottle assemblage). The dubious contents of the patent medicines and other medicinal bottles derived from recipes that often contained harmful narcotics laced with alcohol and other undisclosed ingredients (Gerth, 2006: 23-40). Proclaiming outrageous medical results, these dangerous compounds promised to treat everything from coughs and fevers to digestive ailments, constipation and nervous excitement. Even cancer and diabetes were within their advertised curative powers (Fike, 1987: 3; Gerth, 2006: 23).

Embossed names of remedies on bottles include Dr. McMunn's Elixir of Opium (Fig. 26), Mrs. Winslow's Soothing Syrup (Fig. 27) and H.T. Helmbold's Genuine Fluid Extracts. Most of these patent medicine proprietors lacked a valid medical license, yet could sell their proprietary products without prescription and without disclosing their contents (Fike, 1987: 3-4). While the medical profession and consumers had complained about the 'quack' medicine trade well before the turn of the century, it was not until the enactment of the Pure Food and Drug Act of 1906 that more stringent steps were taken to curtail the manufacture, false claims and sale of these often fatal nostrums (Davoli,

1998: 5; Fike, 1987: 3-4; Young, 1961: 239-40, 244; pers. comm. Byron Dille', June 2009).

Many of the ingredients used in patent medicines were grown in the South, yet there were very few southern patent medicine manufacturers. In fact, the year 1865 was not yet over before a Charleston druggist was shipping north the roots of Southern plants for use in J.C. Ayer's medicinal products (Young, 1961: 98). James Cook Ayer was a qualified doctor – a rarity among patent medicine manufacturers – who began to create his own line of patent medicines in the 1840s (Davoli, 1998: 3; Fadely, 1992). His Lowell Massachusetts patent medicine business produced 'remedies' such as Ayer's Cherry Pectoral and Ayer's Cathartic Pills, both of which were recovered from the shipwreck (Figs. 28-29). A few samples of the latter, packaged in small rectangular glass bottles, still contain their original pea-sized pills. By the time Ayer retired in the early 1870s, he had acquired a vast fortune from his patent medicine business. At his death in 1878, he was considered the wealthiest manufacturer of patent medicines in the country (Gerth, 2006: 30; *New York Times*, 4 July 1878).

While the preponderance of 19th-century patent medicines largely comprised bottled products, many of the 'remedies' were also sold in ceramic containers, including two types recovered from the *Republic*. The excavation yielded 71 small 'Holloway's Ointment' pots without lids (Figs. 11, 30), advertised at the time as being "for the Cure of Inveterate Ulcers, Bad Legs, Sore Breasts and Sore heads" as well as "Gout and Rheumatism". Thomas Holloway of England amassed a fortune selling his ointment and other medicinal products, later investing some of his wealth in establishing Royal Holloway College for Women, an architectural marvel that is today a part of the University of London. The 71 lidless Holloway specimens recovered may have been sealed with wax or wax paper, the remains of which have not survived.

Also recovered from the site in even larger quantities were ceramic medicine pots with accompanying lids, the bottom of each pot bearing the name of J.B. Thorn, London Chemist, and John A. Tarrant, New York, Sole Agent for the United States (Figs. 11, 23, 31). A number of such patent medicines used in the United States were thus British imports sold by US wholesale druggists such as Tarrant & Co., operative from 1859 to 1906 (Fike, 1987: 49-49). As noted in contemporary mid-19th century advertisements, Thorn's Compound Extract of Copiaiba and Sarsaparilla was taken for the "cure of the afflicted... sanctioned by the faculty of medicine and recommended by the most eminent in the profession" (*Boston Directory*, 1 July 1856: 31). Later declared false and fraudulent under the 1906 Food and Drugs Act, the product was sold as a

remedy for venereal disease (gonorrhoea) and kidney infections (Cramps, 1921: 624).

Most American patent medicine manufacturers were located in Northern cities, including New York, Boston and Philadelphia. Before the Civil War, patent medicines had a total annual sale of \$3.5 million. By the turn of the century, the total patent medicine business had escalated dramatically to \$75 million (Fox, 1997: 16). As late as 1896, 10,000 people were engaged in the patent medicine manufactures of the United States, receiving collectively over \$4 million a year in salaries and wages. New York City stood at the head of this industry with over 85 factories, employing a thousand people (Shrady, 1896: 939-40).

Throughout the Civil War, Northern patent medicine manufacturers remained enormously successful, supplying a sundry of remedies to the Union troops, preying on their fears of southern tropical afflictions and, in particular, water-borne dysenteric ailments. Official medical records of the time confirm that bowel complaints were most prevalent among the Union troops and caused the most deaths (Young, 1861: 95). To alleviate these digestive disorders troops took a variety of 'medicinal' bitters: herbal brews steeped in alcohol. One popular brand shipped on board the *Republic* was Dr. J. Hostetter's Stomach Bitters (93 green and amber bottles), first introduced to the market in 1853 (Fig. 32). Fortified by up to 47% alcohol, advertisements directed towards army consumption claimed that the bitters provided "a positive protection against the fatal maladies of the Southern swamps, and the poisonous tendency of the impure rivers and bayous". The Hostetter marketing campaign proved so successful that the War Department authorized the distribution of Hostetter's Stomach Bitters to the Union Army (Baxter, 1997: 1-2; Davoli, 1998: 4; Fike, 1987: 36; Young, 1961: 95, 129).

A major concern for the military was cholera, a lethal bacterial disease borne largely through contaminated water supplies and designated America's greatest scourge after its widespread ravages in 1849 in New York and New Orleans, spreading ultimately across the entire country into Canada. Cholera once again reached New Orleans in 1865 and broke out into an epidemic the following year. While contemporary eruptions in other cities were often mild and short-lived, New Orleans suffered greatly and repeatedly until 1868 (Dhiman *et al.*, 1997: 13).

Union soldiers especially feared yellow fever (Roberts, 2003: 139). While the fever's mosquito-bred, nautical origins and method of transmission remained a mystery at the time, the virus was known to flourish in southern sub-tropical and swampy environments. Throughout the 1860s, Western medicine had contended with its outbreaks. New Orleans, in particular, was no stranger to the

disease. Between 1817 and 1905, the year of the city's last epidemic, more than 41,000 people died from yellow fever (Stout, 2007: 39–40; Young, 1961: 98).²

No doubt, Hostetter's and similar 'antidotes' provided bottled courage to frightened men in times of need (Baxter, 1997: 2). Veterans returned home addicted to bitters and other 'medicinals' that they believed had prevented these illnesses during the war, spurious remedies which they then passionately advocated to their families and friends (Davoli, 1998: 4; Young, 1961: 97). In fact, Hostetter's Bitters, known as the 'Soldier's Safeguard', was so successful that after the war shots of it were sold in local bars and saloons (Davoli, 1998: 4; Young, 1961: 95, 130).

Not surprisingly, a wave of medicinal bitters flooded the mid-19th century market, each competing for a share of this multi-million dollar business. Especially appealing was their tax-exempt status. Sold as a medicinal product with 'healing' roots and herbs, these high alcohol 'remedies' were not subject to the taxes levied on the sale of all liquors to help finance the Union War effort (Gerth, 2006: 44; pers. comm. Byron Dille', June 2009). Drake's Plantation Bitters was among the more successful brands (Fig. 33). Over 150 bottles were recovered from the *Republic* in varying shades of light and dark amber and a distinctive olive-yellow hue. The famous recipe, touting a potent 38% alcohol, was made from Caribbean St. Croix rum and sold in a unique log cabin-style bottle accompanied by claims that it cured virtually every disease known to mankind (Fike, 1987: 33; *Harpers*, 1 August, 1863; *P.H. Drake & Co's Gratuitous Medical Annual*, 1871–1872).

Unsanitary conditions in Army field hospitals, and the many deaths that resulted from dysentery and other diseases, contributed to a prevailing lack of confidence in doctors. Thousands of soldiers returned to civilian life inflicted with ruined digestions, malaria, wounds, emotional trauma and other psychological and physical ailments that troubled them for the rest of their lives. While wartime deprivations and crippling illnesses had undermined health on the home front, conditions at home were often equally harsh. Pervasive poverty and an inadequate diet contributed to the host of diseases that attacked weakened immune systems (Davoli, 1998: 4; Stout, 2007: 39–40; Young, 1961: 98). The post-war South thus offered a perfect market for patent medicines.

B. Ink Products

Close in quantity to the glass medicine bottles are inkstands and master ink bottles recovered from the wreck of the *Republic* (2,447 containers; 29.0% of the total), both of stoneware (96 bottles and 1,376 ink pots) and glass (171 bottles and 804 inkstands), some with their corks still intact

and retaining their original writing fluid. The majority of the differently shaped and shaded glass examples (Fig. 36) were produced in glassworks operating in New England, the Midwest and Middle Atlantic, the three glass-blowing regions of the United States (McKearin, 1978: 68, 269).

The glass inkstands from the *Republic* (Figs. 34–35) take the form of an assortment of conical and square 'schoolhouse' or 'cottage-style' bottles, but the majority are umbrella inkstands in varying shades of green and aquamarine (493 examples). While none of the glass specimens retain their paper labels, a handful still contain remains of their original writing fluid. A few of the square versions are embossed with company names, including a number bearing the name Guyot, an ink-making enterprise with its roots in 17th-century France (Fig. 34). Its founder, a French chemist, is often referred to as the 'father' of the modern ink industry (Carvalho, 2008: 86).

Some of the umbrella inkstands are embossed on the base with the letters NY. Research suggests that a New York ink maker may have custom-ordered these inkstands from a glassmaking firm and sold his own company product inside them (pers. comm. Bill Lindsey, March 2009). The *Republic*'s cargo of umbrella inkstands, also known as pyramid ink bottles (Figs. 25, 35), were common throughout New Jersey glasshouses and were also produced by the Stoddard glasshouses of New Hampshire, as well as by most other glass manufacturers of the era (McKearin, 1978: 269; pers. comm. Byron Dille', June 2009).

The preponderance of ink containers on board the *Republic*, totalling 1,376, are plain and sturdy British-made stoneware pots (H. 22.0cm) mass-produced for the American market (Fig. 37). Added to the stoneware assortment are 96 brownish-orange salt-glazed master ink bottles in three distinct sizes (height variations: 17–18cm, 21–22cm and 25–26cm; Figs. 38–39), products of Britain's J. Bourne & Son's Denby and Codnor Park Potteries and identified by the company stamp near the base (Cambell, 2006: 137).³ A further 16 unmarked large stoneware bottles are likely products of a separate British pottery and also probably contained ink, medicine or chemicals often stored in bulk quantity (Fig. 40).

The stoneware master ink bottles, designed for storing bulk ink to refill smaller inkstands and inkwells used in offices and schools, also carry the name of the London company P. & J. Arnold (Fig. 39). In its heyday, Pichard and John Arnold's early 19th-century firm manufactured over 30 varieties of ink (Carvalho, 2008: 180). By the middle of the century, their chemical writing fluid was widely imported into the United States in Bourne's stoneware bottles and had become a competitive threat to the domestic market (Odell, 2003).

The abundance of ink containers shipped aboard the *Republic* evokes both curiosity and speculation as to their purpose and use. Developments in New Orleans point to some plausible explanations. It has been suggested that the ink shipped to New Orleans, in tandem with the arrival of Yankee investors seeking economic opportunities, would have been essential for drawing up legal contracts conveying the purchase and transfer of cheap land and other commodities (pers. comm. Bill Lindsey, May, 2009).

More broadly, ink was the lifeblood of government, business, education and daily life. A very large military establishment that consumed paper and ink like a furnace was based in New Orleans. Conceivably, the writing containers were intended for use in New Orleans' schools: public, private and parochial alike. In 1863, General Nathaniel Banks also authorized the establishment of black schools, which were partly supported by organizations such as the National Freedman's Relief Association that invested thousands of dollars on books, clothing and supplies from 1865-66 (Blassingame, 1973: 109-110). Finally, New Orleans was of course also a port from which commodities were trans-shipped to further destinations.

C. Food Products

Numbering 1,522 examples, bottles containing food products are the third largest category recovered from the shipwreck of the *Republic* (18.0% of the total), including a variety of pickled goods, sauces and preserved fruit. Most were retrieved empty, but a few examples still contained their original 19th-century contents: well-preserved chunks of pineapple and rhubarb, sliced peaches, blueberries and gooseberries (Figs. 21, 24, 41-43). Some 288 of the food bottles are of the ornately embossed Cathedral pickle and pepper sauce type (Figs. 44-45). Three of the latter still contain perfectly preserved red and yellow peppers. Cathedral-patterned bottles designed to emulate ornate church windows and arches were an American invention produced in hundreds of similar designs. Used by companies such as W.D. Smith, William Underwood and W.K. Lewis, the food products stored in these ornate bottles were intended to compete effectively with similar imported English products sold in plainer bottles.⁴

Of the many British food products competing with American goods, Lea & Perrins Worcestershire Sauce is best known (Fig. 46). Launched commercially in 1838, within a few years it was imported extensively into the United States by John Duncan's Sons, New York. By 1849 it was consumed west of the Mississippi as thousands of gold seekers made their way to the California gold fields. This popular condiment soon found a receptive market in

restaurants, hotel dining rooms and in the dining salons of passenger ships (Zumwalt, 1980: 269).

The large volume of Lea & Perrins Worcestershire Sauce bottles recovered from the wreck of the *Republic*, however, indicates that they were not all intended for passenger consumption, but were probably being shipped as cargo. Of the 285 bottles retrieved, 207 still retained their original glass-and-cork stoppers. All of the bottles are of British manufacture. Lea & Perrins Worcestershire Sauce was not actually bottled in the United States until 1877, when John Duncan had his company initials 'JDS' embossed on bases by Salem Glass Works. At this time, there was a marked changeover in the United States from British to American-produced Lea and Perrins bottles (pers. comm. Bill Lindsey, June 2009; Lunn, 1985: 1-2; Zumwalt, 1980: 269).

D. Beauty Products

The glass bottle assemblage also incorporates beauty products (958; 11.4%), many of which were associated with fashionable fragrances manufactured by American and European perfumers. Included in this category are approximately seven bottles that once contained Murray & Lanman's Florida Water (Fig. 47), the most popular product sold by Lanman & Kemp, a leading New York City wholesale druggist firm founded by Robert J. Murray in 1808. Touted as a multi-purpose toilet water with both cosmetic and restorative qualities, company advertising proclaimed the product was associated with the Spanish explorer Ponce de León and his legendary search for Florida's Fountain of Youth in 1513.

Of particular interest is the pervasive role of Lanman & Kemp in the 19th-century wholesale drug trade throughout the United States and worldwide, with major operations in Central and South America and in the Caribbean Islands, supported by travelling agents. Product orders were also sent through the maritime mail. Lanman & Kemp records document business correspondence addressed to the company dating to 1859 and 1861 that was shipped aboard the SS *Tennessee* from Vera Cruz in Mexico to New Orleans, when the steamship later renowned as the *Republic* was under the ownership of Charles Morgan.⁵

In addition to selling their own patent medicines, Lanman & Kemp's New York-based enterprise also sold other products. Records testify that these included those of James C. Ayer, Edward Phalon, J.A. Tarrant, Charles Osgood, Thomas Holloway, William B. Moffat and B.L. Fahnestock, company names whose products are well represented in the *Republic*'s patent medicine cargo. The firm also dealt in opiates, medicinal and culinary herbs, spices, liquors, flavorings, perfume extracts and a sundry of other medical

and non-medical items (cf. Lanman and Kemp Collection, Domestic Correspondence, and Company History, Hagley Museum Library). With its extensive business connections throughout the United States and abroad, it is plausible that Lanman & Kemp's drug firm was responsible for the shipment of at least some of the *Republic*'s bottled goods other than just their own cosmetic line.

Also present among the beauty products are a host of hair potions bearing names such as Burnett's Cocaine (Fig. 48). The invention of Massachusetts' Joseph Burnett may have been intended to exploit the public's fixation with the many cocaine-laced patent medicines flooding the market. Unlike his competitors, as a graduate of the Worcester College of Pharmacy Burnett stands out as one of the few fully qualified pharmacists in this field. Meanwhile, Phalon and Son's Chemical Hair Invigorator (Fig. 51), manufactured by a New York hairdresser and wigmaker, promised to preserve the hair and prevent it turning gray (Fadely, 1992). A handful of milk glass bottles contained Laird's Bloom of Youth Liquid Pearl, whose New York maker claimed it beautified and preserved the complexion and skin (Fig. 49). While seemingly benign, many of the beauty products of the era, particularly those for the hair, contained harmful ingredients such as lead acetate, which research today suggests is a carcinogen and likely contributed to the untimely death of many 19th-century consumers (pers. comm. Byron Dille', June 2009).

The beauty and cosmetic goods on the *Republic* were predominantly sold in glass containers and, with a few exceptions, were largely American products. Yet, approximately 50 stoneware cosmetic pots were recovered from the site in two distinct sizes (58cm and 79cm high), the product of the famous French Perfumer L.T. Piver, whose company name is transfer-printed on all of the pots (Fig. 50). By the 19th century, Piver's international business incorporated over one hundred branches around the world, including shops in Paris that catered to the wealthy, including the Bonaparte family. Over the years the Piver company launched an exhaustive range of health and beauty products, including a variety of perfumes, fragrant soaps and body creams.⁶ The sturdy, unlidded stoneware pots retrieved from the *Republic* perhaps contained one of L.T. Piver's cosmetic creams or face powders.

E. Alcoholic Beverages

Closely paralleling the volume of the beauty products recovered from the *Republic* was a large consignment of beer (Fig. 53), whiskey, champagne and wine bottles (830; 9.8% of all bottles). Their thick dark glass reduced breakage and inhibited exposure to heat and light, preventing spoilage during transport and storage (Figs. 8-10). After the war,

as the population of the United States increased rapidly, more than 100,000 saloons were in operation throughout the country: by 1870, approximately one drinking institution for every 400 men, women and children (Gerth, 2006: 54). The large quantity of bottled wine, beer and other liquors shipped on the *Republic* just months following the war was intended to help restock the shelves of New Orleans' reinvigorated saloons.

4. Writing Slates

Some 61 rectangular writing slates were recovered in the Area D debris field from a larger consignment discovered on the shipwreck, including a deposit of uniform rows of slates standing upright on their sides as originally packed in their wooden shipping crates, which are otherwise completely decomposed (Fig. 16). An 1869 handbook for transoceanic shipments from the United Kingdom describes in detail the method for stowing both roofing and writing slates, which were typically shipped as ballast cargo. A packing arrangement comparable to the *Republic* is described, whereby "Slate is as brittle as earthenware and requires equal care; slate ought to be stowed on its edges and kept in that position; when flat it will be very liable to break" (Gerth and Tolson, 2008: 44; Stevens, 1869: 548).

The distinctive blue-gray coloring of the *Republic* slate shipment is a variety known as 'Old Vein', mined in the Blaenau Ffestiniog district of northwest Wales (pers. comm. Dafydd Roberts, National Slate Museum, August, 2008). While paper had become commonplace by the late 1800s, slates were used widely as writing tablets in schools when paper was scarce and expensive. This was very probably the case after the Civil War, particularly in the formerly Union-blockaded South.

The *Republic*'s slates were probably intended for purchase and use in one of the many public, private or religious schools in New Orleans and perhaps even in the surrounding parishes (Gerth and Tolson, 2008: 45). A revealing letter written by the American Missionary Association teacher Edmonia Highgate in December 1866 described how her "French Creole" students from plantations in Lafayette Parish purchased their own slates and traveled between 3 and 8 miles to attend school. "So anxious are they to learn", she wrote, "that they walk these distances so early in the morning as never to be tardy. Every scholar buys his own book and slate."⁷

5. Pottery

The excavation of the *Republic* also yielded an abundance of sturdy white ironstone china pottery, largely utilitarian



Fig. 26. A Dr. McMunn's Elixir of Opium glass bottle with cork stopper inside (H. 10.6cm).



Fig. 27. A Mrs. Winslow's Soothing Syrup glass bottle, a morphine-based formula sold as a remedy for teething infants (H. 12.1cm).



Fig. 28. A J.C. Ayer's Cherry Pectoral glass bottle (H. 18.5cm).



Fig. 29. A J.C. Ayer's Cathartic Pills glass bottle, which originally stored pea-sized tablets to treat countless ailments including skin disease (H. 5.3cm).



Fig. 30. A Holloway's Ointment pot for the cure of various ailments, including sore breasts, gout and rheumatism (H. 3.8cm).



Fig. 31. A J.B. Thorn of London's ceramic medicine pot distributed by wholesale druggist John A. Tarrant of New York (H. 4.6cm; Diam. 6.1cm).



Fig. 32. Dr. J. Hostetter's Stomach Bitters glass bottles once contained a potent herbal brew laced with alcohol (H. 22.0cm).



Fig. 33. Drake's Plantation Bitters glass bottles feature a distinctive log cabin design patented in 1862 (H. 25.0cm).



Fig. 34. A Guyot glass inkstand containing its original cork stopper (H. 6.6cm).



Fig. 35. Eight-paneled glass umbrella inkstands in assorted shades of green and aquamarine, and a rare amethyst example (H. 6.3cm).



Fig. 36. Master ink bottles with pouring spouts designed for refilling smaller ink containers (the form has H. variables of 19.5-30.3cm).



Fig. 37. A British-made stoneware ink pot (H. 5.6cm).



Fig. 38. J. Bourne & Son stoneware ink bottles once contained P. & J. Arnold's writing fluid; both company names are stamped on the bottles' bases' (H 14.4cm and 18.0cm).



Fig. 39. Detail of the company stamp on a J. Bourne & Son British stoneware bottle. Also featured is the stamp of the P. & J. Arnold London ink-making firm.



Fig. 40. A large unmarked British stoneware bottle for storing bulk ink, chemicals and other fluids (H. 25.5cm).



Fig. 41. An A. Kemp glass preserve bottle containing remains of pineapple (with modern plastic protective cap) (H. 24.5cm).



Fig. 42. Sliced peaches, possibly intended to be used as pie filling, preserved in a glass bottle (H. 30.0cm).



Fig. 43. Gooseberries preserved in a glass bottle (H. 30.0cm).



Fig. 44. Cathedral-patterned glass pepper sauce bottles featuring both the square and six-sided version (H. 22.5cm and 25.5cm).



Fig. 45. Cathedral-patterned glass pickle bottles were recovered from the wreck in four different sizes and once stored a variety of fruits and vegetables (H. 28.0cm and 22.5cm).



Fig. 46. A Lea & Perrins Worcestershire Sauce glass bottle with an intact glass-and-cork stopper (H. 17.8cm).



Fig. 47. A Murray & Lanman's Florida Water glass bottle (H. 22.8cm), advertised for both health and beauty purposes.



Fig. 48. A Burnett's Cocaine hair potion glass bottle (H. 18.0cm).



Fig. 49. J. & G.W. Laird 'Bloom of Youth' milk glass bottles, its contents touted for "Beautifying & Preserving the Complexion and Skin" (H. 11.7cm).



Fig. 50. An L.T. Piver cosmetic cream or face powder stoneware pot (H. 7.9cm).



Fig. 51. A Phalon and Son's Chemical Hair Invigorator glass bottle (H. 17.5cm).



Fig. 52. A Van Buskirk's Fragrant Sozodont glass bottle (H. 14.1cm), its contents intended for cleaning and preserving teeth and gums.



Fig. 53. Black glass beer bottles. The dark color produced by iron oxide strengthened the glass and inhibited exposure to light, reducing spoilage (H. 24.5cm and 20.3cm).

ware mass-produced for the American market by England's Staffordshire potters (Figs. 12-15, 54-72). A number of pieces bear the maker's marks of prominent potteries, including T. & R. Boote, Joseph Goodwin, Jacob Furnival, and John Maddock & Son. Also known as English porcelain and stone china, ironstone china was first introduced by Staffordshire potters in the early 19th century as a substitute for porcelain. It was a modest ware that appealed to a less expensive market. In marketing terms, the name 'Ironstone China' was fitting because it was immediately identifiable, implied high quality and had hard durability. By the early 1840s, America received its first ironstone imports; English potters soon discovered that the inhabitants of the 'colonies' greatly preferred this unfussy, plain and durable china to more exotic wares. It was an immediate success and public demand soared.⁸

A sample of 2,775 pieces of white ironstone china was recovered from the wreck of the *Republic*. Some 1,186 saucers bear the maker's mark of John Maddock & Son; 266 of the saucers are 12cm-diameter demitasses; 17 are of 15cm diameter and 883 of 16cm diameter (plus 20 undefined). The saucers are accompanied by ironstone cups (1,067) of at least three different shapes and sizes (483 of 7.6cm height and 274 of 8cm height), including 365 of the smaller, more delicate demitasse (Figs. 54-58).

A sample of the eclectic ironstone table and toilet wares was also recovered in substantially smaller quantities. Table wares include 157 dishes with lids, 18 plates, eight drinking mugs, three soup bowls, a casserole serving dish and one coffee/tea pot. Utilitarian toilet wares essential to health and hygiene in an era lacking indoor plumbing include 27 water pitchers (Figs. 63-66), nine wash basins (Fig. 69), 19 assorted soap dishes/strainers/lids, 10 toothbrush holders and lids (or brush boxes with lids; Figs. 67-68), 10 chamber pots and 10 lids (Figs. 70-72), eight slop jars (Figs. 60-62), an additional seven lids, and eight footbaths (Fig. 59).

A few of the plain ironstone toilet wares were embellished with gold ornamental trim, the remains of which can be seen on a few individual vessels, including washbasins, chamber pots, pitchers, and toothbrush containers, the latter referred to as 'brush boxes' in 19th-century documents (pers comm. Robert Hunter, May 2009). Many of the ironstone examples feature decorative fruits, nuts, and grains, popular themes suggestive of the American prairies and presented as design elements formed on pot handles and as finials on lids.

Although clay was plentiful in areas of the United States, most dinner and toilet wares were imported until the late 19th century. American clay was reserved for making bricks, tiles and other practical utensils such as crocks and jugs.⁹

6. Religious Objects

In stark contrast to the mass of utilitarian cargo recovered from the wreck site was a distinctive concentration of about 96 religious objects shipped in a single wooden crate, still partly preserved on the seabed (Fig. 17). These included 34 pressed-glass candlesticks in the form of the crucified Christ (Fig. 20), produced in both white and green glass, as well additional porcelain candlestick pairs featuring the figurative form of St. Joseph and the Virgin Mary holding Jesus. The crate was also filled with porcelain figurines of the Virgin Mary, assorted angels, Virgin Mary holy water fonts, and angel and crucifix holy water fonts.

Crucifix-themed glass candlesticks were popular at the time of the *Republic*'s final voyage and were used in private homes, convents and churches. Between 1840 and the latter part of the century, several American glassworks produced such objects in a variety of colors, often opaque, to appear more like ceramic than glass. Typically sold in pairs, research suggests that the examples from the *Republic*, in both white and green glass, were manufactured by the Boston and Sandwich Glass Company of Massachusetts, founded in 1825 and credited with having produced the country's first pressed glass (pers. comm. Jane Spillman, April 2005; pers. comm. Dorothy Hogan-Schofield, July 2009; Barlow and Kaiser, 1983: 61).

The majority of religious artifacts recovered from the site are Continental hard paste porcelains, most of which are glazed, with a few unglazed pieces, the latter commonly referred to as bisque porcelain or biscuit ware. These include porcelain statuettes portraying 'Our Lady of Grace', presented as the 'Queen of Heaven and Earth', standing on a base, which appears to symbolize the globe with a depiction of the sun in the center. One version of the statue wears a veil; the other is adorned with a crown decorated with 12-stylized stars thought to represent the 12 Apostles (pers. comm. Father William Kurchinsky, April 2009).

Additional examples include small angel figurines, both standing and kneeling, one version kneeling on a square base with traces of its original black and red pigment; porcelain Holy Family candlestick pairs in three different sizes, one representing the Virgin Mary holding the infant Jesus, the other, St. Joseph with his characteristic lily; and three different forms of holy water fonts, one depicting the Virgin Mary standing inside a decorative shrine (representing 'Our Lady of Grace' or possibly, the 'Shrine of Our Lady of Lourdes'), and another portraying Christ on the cross, designed for hanging on a wall; and lastly, a tiny angel with a small basin at its feet, whose diminutive size is suggestive of little tokens or gifts given to young children (pers. comm. Barbara Perry, April



Fig. 54. A British ironstone china demitasse cup and saucer bearing the maker's mark of John Maddock & Son (Diam. 16.0cm).



Fig. 55. A British ironstone china demitasse cup recovered from amongst a large cargo of utilitarian wares intended for everyday domestic use (H. 6.4cm).



Fig. 56. A British ironstone china mug (H. 9.7cm).



Fig. 57. A British ironstone china cup (H. 7.6cm).



Fig. 58. A British ironstone china beveled cup (H. 7.7cm).



Fig. 59. A British ironstone china footbath with ornamental handles; decorative toilet wares were commonly sold as matching sets (H. 22.0cm).



Figs. 60-61. A British ironstone china slop jar with decorative handles featuring fruit and harvest-related themes inspired by the American prairies (H. 31.5cm).

Fig. 62. A British ironstone china slop jar lid with ornamental finial (H. 10.5cm).



Fig. 63. An ironstone china water pitcher that would have accompanied a wash basin (H. 30.0cm).



Fig. 64. A British ironstone china water pitcher (H. 30.0 cm).



Fig. 65. A British ironstone china water pitcher (H. 24.0cm).



Fig. 66. A British ironstone china water pitcher (H. 19.5cm).



Fig. 67. An ironstone china toothbrush holder with lid, known as a 'brush box' in 19th-century documents (L. 21.9cm).



Fig. 68. An ironstone china toothbrush holder with lid featuring a decorative finial similar to other pottery wares recovered from the wreck (L. 21.9cm).



Fig. 69. A British Ironstone china wash basin (H. 11.2cm).



Fig. 70. A British ironstone china chamber pot (H. 14.3cm).



Fig. 71. A British ironstone china chamber pot (H. 14.3cm).



Fig. 72. A British ironstone china chamber pot or slop jar lid with remains of decorative gold trim (H. 10.5cm).



Fig. 73. A child's tea set adorned with black figures in classical garb reminiscent of ancient Greek vases (H. tea cups 4.6cm, L. saucers 8.5cm).

2005; pers. comm. Father William J. Kuchinsky, April and August 2009). Lacking maker's marks and factory records, the origins of these porcelain objects remain uncertain, but some appear to be similar to those bought and sold wholesale by the Swiss Benziger Brothers, whose New York City branch, founded in 1853, was in operation when the *Republic* sank.

The *Republic* figurines, however, most closely resemble hard paste porcelain wares produced in France, very probably Limoges, where dozens of 19th-century factories supplied New York City's import trade. Having launched the French porcelain import trade in the 1840s, the Haviland family, in particular, not only imported French wares to New York on a grand scale but also sold their imports wholesale to other American porcelain traders (pers. comm. Robert Doares, July 2009; Wood and Doares, 2005: 24). This unique crate is published in detail elsewhere (Tolson and Gerth, 2009).

7. Miscellaneous

The other 3,080 artifacts recovered from the wreck of the *Republic* consist of an extraordinary diversity of goods, from four-holed white and brown porcelain buttons, bolts of cloth (Fig. 6), dominoes, harmonicas, horse spurs, clock parts, cane handles made of pewter, brass, wood and ivory, and 951 pieces of widely assorted hardware (ceramic door-knobs with metal shanks, spigots likely intended for use with barrels or kegs, door hinges, file rasps, keys, door locks and 278 spoons plus 13 further concretions containing multiple spoons; Figs. 79-82, 87-88). These goods were presumably intended for New Orleans hardware merchants hoping to rebuild a former trade or launch a new business.

Without the convenience of modern plumbing, Victorians washed their hair far less often than today, but combing and styling were essential to everyday hygiene and grooming. The excavation yielded a handful of combs, both straight and folding varieties, as well as individual stacks of concreted ladies' headbands (Figs. 83-85). Visibly similar to their modern-day plastic counterparts, the *Republic* shipment was made of vulcanite (vulcanized rubber), a typically black rubber-like substance first produced in 1843 by the American inventor Charles Goodyear (Wilson, 1917: 185).

A cargo of toiletries recovered from the *Republic* includes a dozen bone toothbrushes, their swine-hair bristles no longer intact (Fig. 86). 'Very Fine London' printed on the handle of a few examples reveal a British origin. Toothbrushes were first produced in England around 1780, but were not mass-produced in America

until after 1885. Accompanying this oral hygiene package were bottles of Van Buskirk's Fragrant Sozodont, created in 1859 by the New Jersey druggist Roswell Van Buskirk (Fig. 52). Advertisements claimed that this product would clean and preserve the teeth and harden the gums as well as "impart a delightfully refreshing taste and feeling to the mouth" (Fike, 1987: 187).¹⁰ Retangular-shaped ironstone toothbrush holders with lids were also recovered from the *Republic* (Figs. 67-68).

The few one-off objects found on the wreck of the *Republic* site are suggestive of personal possessions stowed among the passengers' belongings or perhaps shipped in reduced quantities as limited consignments. Among these individual items is a seemingly rare and virtually intact child's tea set consisting of a teapot accompanied by four cups and saucers, a waste bowl, a sugar bowl and creamer (Fig. 73). Such sets of the era were intended not only as toys, but also to teach young girls how to serve tea properly. The assemblage features a neoclassical decorative theme bearing several complementary motifs. The use of black figures dressed in classical garb against a red background is reminiscent of Classical Greek vases. The decorations were applied to the plates and vessels with transfer prints and then the pieces were fired to make the decoration permanent (pers. comm. Barbara Perry, April 2005).

The excavation yielded four individual porcelain figurines, probably of French origin, the product of one or more of the many factories mass producing porcelain wares for the American market (pers. comm. Robert Doares, July 2009). Each figurine represents a different character and theme. A man and his female counterpart, both without pigment or paint, were clearly intended to be a matching pair (Figs. 76-77). Their seemingly playful gestures and courtly attire are reminiscent of the 18th-century Rococo style, which placed an emphasis on portraying the carefree life of the aristocracy. Love and romance were common themes, marked by free and graceful movement. This elegant porcelain couple would have been admired by ladies of the era and presented in their homes on fireplace mantels or tea tables (pers. comm. Barbara Perry, April 2005). A third ceramic figurine depicts a country maiden with remains of red pigment, while a fourth 'neo-roccoco' porcelain figurine represents a costumed female figure, a motif popular in the 19th century with its renewed interest in historical art styles.

A well-known class of artifact amongst the one-off finds on the site was an individual 'Rebekah-at-the-Well' teapot featuring the typical brown Rockingham glaze. In 1851 Edwin Bennet of Baltimore produced an earthenware teapot illustrating a scene from this biblical story, one of

the most popular Bible stories of the time. From a practical utilitarian standpoint, the dark glaze was effective in hiding tea stains. However, the decoration itself was the more influential selling point and quite possibly offered the single greatest contribution to the huge popularity of Rockingham ware teapots (Perkins, 2004: 81). The best-known Rockingham products were made at Bennington, Vermont, yet almost every pottery in the eastern United States and Ohio also produced them (pers. comm. Barbara Perry, April 2005).

A unique porcelain figural inkstand cover portrays a woman sewing and accompanied by children reading at her side (Fig. 78). Hidden beneath this decorative piece is a tray with two small holders containing a removable ink and spill pot. Further detail depicts a small round face repeated on both of the pot holders. The inkstand is indicative of production in the Staffordshire Minton Pottery and Porcelain Factory founded in the 1790s to rapidly become the uncontested leader in the European ceramic market (Csenkey, 2002: 24; pers. comm. Barbara Perry, April 2005).

Additional one-of-a-kind artifacts recovered from the wreck of the *Republic* include an oversized porcelain cup and saucer with hand-painted leaves and flowers; a small transfer-printed tray probably manufactured in a British pottery (pers. comm. Barbara Perry, April 2005); a pressed glass bar bottle in the 'Ashburton' pattern with a ground and polished base, likely a product of the New England Glass Company; a pressed glass inkstand featuring the 'Argus' (thumbprint) pattern produced by Bakewell, Pears and Company or M'Kee and Brothers, both 19th-century Pittsburgh glass houses.

Of special interest are three distinctive glass oil lamp fonts, one of which was hand blown and features elaborate hand-decorated red glass threads, which were probably intended to conceal the yellowish oil (or more likely kerosene) that had recently been introduced as the lamp fuel of choice, both cheaper and less odorous than whale oil. The threaded decoration on the lamp was especially labor-intensive, thus making the object more expensive. The stem and foot of the *Republic*'s font are broken off, but the stem would originally have been about as long as the glass font and probably terminated in a colorless glass pressed foot or base (pers. comm. Jane Spillman, April 2005; Spillman, 2006: 15).

The second lamp is a clear glass font with a repeating cable and star patterned decoration, its stem and foot also broken away. The third lamp font, hand-blown with

a ruby-colored overlay cut to clear glass, and an engraved, heavily faded vine decoration running along its shoulder, is accompanied by a pressed milk glass base (Figs. 22, 74-75). Produced by the Boston and Sandwich Glass Company of Massachusetts, this particular lamp would have been described as 'plated, cut and engraved' by the hardware and lighting companies that sold them (Barlow and Kaiser, 1989: 205-206). The overlay technique for producing the font involved encasing or plating the glass on the outside with a different color glass, and then cutting it back by hand to reveal the glass beneath. Such production began in the 1840s, when the Boston and Sandwich Glass Company set up a small furnace intended for the manufacture of colored glass for plated wares. The labor involved in the glassmaking and cutting made this piece considerably more expensive than most table lamps. Its use, like similar pieces of the era, was intended for city homes and large estates, where a staff of servants could maintain them in pristine condition (Barlow and Kaiser, 1989: 195).

The individual artifacts also include a lemonade or whiskey tumbler pressed in the 'Ribbed Ivy' pattern, possibly the product of M'Kee Brothers (pers. comm. Jane Spillman, April 2005; Spillman, 2006: 16); an ironstone relish dish with a popular shell pattern, probably from a British Staffordshire pottery (pers. comm. Barbara Perry, April 2005); a small porcelain vase with a budding flower motif and an underglaze cobalt blue decoration, typifying French production; two larger matching porcelain vases, also of probable French manufacture, referred to as 'wedding vases' or 'mantel vases' in light of a French custom whereby matched pairs were presented to young brides and grooms for display on their mantels (pers. comm. Robert Doares, July 2009) and a syringe-like device made of vulcanite (a hard rubber) believed to be for hygienic purposes (woman's douche), with the remains of a patent stamp suggestive of Nelson Goodyear's May 6th 1851 patent for processing hard vulcanite (Wilson, 1917: 185; Fig. 90).

After four years of relative economic isolation during the Civil War, the everyday goods from the wreck of the *Republic* – some sacred but most utilitarian – would have been both essential and welcome to alleviate years of hardship in everyday life in New Orleans. The ship's enormous shipment of largely everyday items, plus a small array of luxuries, would have helped rejuvenate the city's diminished stores. Unexpected and undocumented on most other 19th-century steamships of the era, the cargo of the *Republic* offers a unique window into the aspirations of Victorian New Orleans.



Fig. 74. A ruby-colored glass oil lamp font and milk glass base made by the Boston and Sandwich Glass Company of Massachusetts.

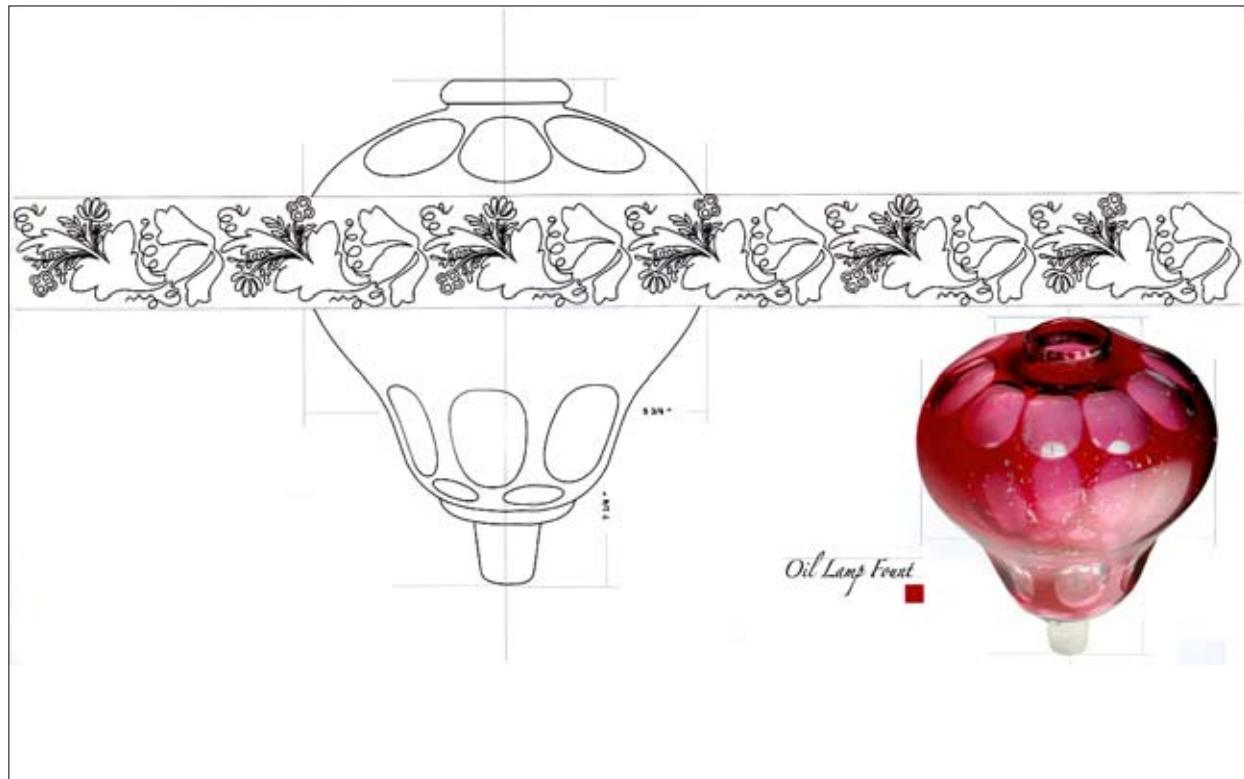


Fig. 75. Drawing of the fading vine decoration engraved on the shoulder of the ruby-colored glass oil lamp font.



Figs. 76-77. Porcelain figurines depicting a man and his female counterpart, both without pigment or paint and of probable French production (H. 13.4cm and 12.5cm).



Fig. 78. A British Staffordshire figural porcelain inkstand cover portraying a woman sewing accompanied by children reading at her side. The decorative tray at right, holding two removable ink and spill pots, would have been hidden beneath the figures (H. inkstand cover 13.0cm; W. of base 15.4cm).



Fig. 79. The ironmongery cargo includes doorknobs, locks, keys, rivets, spigots and files.



Fig. 80. The Republic's varied cargo included consignments of dominos, harmonicas, glass buttons and clock parts.



Fig. 81. A concretion of pewter spoons before conservation.



Fig. 82. A pewter spoon from the wreck of the Republic (L. 20.8cm).



Fig. 83. A straight-edged vulcanite comb (L. 17.8cm).



Fig. 84. A vulcanite folding comb (L. 8.9cm).



Fig. 85. Vulcanite ladies' headbands still in their original stacked shipping positions (Widths 12.3-14.9cm).



Fig. 86. A bone toothbrush (L. 17.0cm).



Fig. 87. A clothes iron (L. 13.4cm) with molded handle for extra grip.



Fig. 88. Iron scissors (L. 15.6cm).



Fig. 89. The remains of a leather shoe from the Area D debris field (L. 26.1cm).



Fig. 90. A vulcanite woman's douche used for personal hygiene (L. 18.0cm).



Fig. 91. A rectangular metal engine lining ingot stamped with the names S. Whites and J. W. Quincy of New York, the company that probably mixed the metals and cast the ingots (L. 21.4cm).

8. Conclusion: Comparative Analysis

New Orleans earned its economic status as the ‘Queen of the South’ by riding on a cloud of steam. Only after the introduction of the steamboat in Louisiana waters in 1811 could vessels comfortably counter the currents of the Mississippi to reach the city’s wharves, over 150km from the river’s mouth (Irion and Ball, 2001: 48). The SS *Republic* was a vital cog in revitalizing New Orleans after years of economic decline had stripped the city’s shops of basic commodities and luxuries alike. Her cargo displays links with the US, France and notably Britain in the form of products transported in glass and stoneware bottles, Welsh writing slates, French porcelain wares and Staffordshire ironstone china. Valued at \$340 million in 1860, US trade with the United Kingdom was triple the volume of the next country, France (Selcer, 2006: 90).

Due to rich historical sources, combined with key excavated sites, an abundance of data exists to examine the function and flaws of steam-powered vessels. The mid-19th century was a transitional time for steam-powered river, coastal and trans-oceanic ships. Much is known about the construction and capabilities of steamers through the comparative study of other 19th-century steam-powered vessels.

The shipwrecks of this type of craft are embedded in the field of marine archaeology today. Steamships were the largest and most complex machines of their era, unrivalled until the advent of the automobile and the construction of roads (VandenHazel, 1987: 331). They were largely classless and their passengers varied in economic and social status from wealthy vacationers to poor immigrants and everything in between (Lockhart, 2006: 4). The finds on such shipwrecks can reflect this diversity. Lockhart (2006: 89) has compellingly argued that using age as a measure of a wreck’s importance should only be one of many criteria. Significance, more appropriately, should be based on the importance of the vessel’s history, its influence on an area, country or culture, its relevance to the development of a country, its ability to provide information, its public interest and as an example of a specific technology.

The major archaeological significance of the SS *Republic* is its enormous collection of artifacts, which bridge the class divide. High-value gold and silver coins are intermixed with coal, humble glass bottles, modest everyday china, harmonicas and dominoes, a microcosm of the re-emerging vitality of contemporary New Orleans. Because of her great depth, much of the cargo that the *Republic*’s crew and passengers failed to jettison in a desperate attempt to save her survive on the sea bottom. By contrast, steamers lost in shallow

waters were readily salvaged. As a consequence, the majority of such excavated steamship sites are largely defined by well-preserved hull remains and engines, many of which have been examined in detail. Numerous shipwrecks spanning the period 1838-93 – before and after the date of the *Republic*’s loss – provide comprehensive contexts for the evolution of steamers on lakes, rivers and seaways from northern Europe to the Americas.

Loaded with provisions for the US Army garrison at Fort Towson, Oklahoma, in March 1838 the sidewheel steamer *Heroine* snagged on the bed of the Red River. Her cargo was ruined, but the engine salvaged. Excavations have revealed that the hull and main deck are complete, stretching for 43m under the sand and with hatches still in place. Barrels of pickled pork and the intact rudder have been recovered. The *Heroine* is the only known historical shipwreck in the state of Oklahoma (Crisman, 2005: 220-21).

The hulls of two Morgan Line steamers have been recorded in detail. The *New York* left Galveston on 5 September 1846 with 30 passengers and a crew of 23 and hit a hurricane in the Gulf of Mexico. Located off the coast of Biloxi, Mississippi, the *Josephine* was an iron-hulled steamer built in 1867 and lost in 11.5m of water in the Chandeleur chain off Mississippi in February 1881 en route to New Orleans (Irion and Ball, 2001: 50-51, 54-55). Off the coast of Nova Scotia, the structure of the transatlantic steamer *Humboldt*, lost in December 1853 and at 2,181 tons one of the largest ships of her time, has been documented (Kenchington and Whitelock, 1996).

The 25.05m-long oak and pine *Eric Nordewall* was one of five paddle steamers built in the 1830s by the Ship Company for Steam Boat Trade to cater for the newly opened Gota Kanal, which crossed Sweden from the Baltic Sea to the west coast. She foundered on 4 June 1856 following 20 years of service after grounding on a shoal outside the town of Vadstena in Lake Vattern and plummeting to a depth of 45m. Her hull is in an outstanding level of preservation. Whereas the superstructure and interior fittings of the *Republic* have been completely stripped away by currents, the intact hull of the wreck of the *Eric Nordewall* is still “furnished with a pleasing decoration in the Empire style, very unlike the steel and glass fibre surroundings of the travel compartment of today. The wide benches along the walls of the saloons where the saloon passengers may have slept side by side with no partitions between them tell the same story” (Cederlund, 1987: 113).

The coastal paddle steamer blockade-runner *Denbigh*, one of the most successful and famous of the American Civil War, has been recorded near Galveston, where she was wrecked in May 1865 after being shelled whilst running the Union blockade (Arnold, 2005: 222-25; Arnold *et al.*,

2001). Very few artifacts survive but, lost in the same year as the *Republic*, her hull represents an important structural counterpoint to the *Republic*'s cargo diversity. Further afield, the engine of the SS *Xantho*, a 32.3m-long iron-hulled paddle steamer built by Denny's of Dumbarton in 1848, and lengthened and refitted as a screw steamer in 1871 before being wrecked off Port Gregory, Western Australia, in shallow water in 1872, has been excavated, recovered and studied in detail (McCarthy, 1988: 342; McCarthy, 1995).

Unlike the *Republic*, many steamships foundered in waters that were sufficiently shallow to permit contemporary salvage. Thus, the cargo of the 2,000-ton capacity wreck of the stern-paddle-wheel steamer *Montana*, beached at St. Charles, Missouri, in 1884, was recovered immediately after her loss. Nevertheless, the site is of major importance because very few historical records chronicle the great service that river boats performed in America's western migration. 70% of her hull survives and displays frame-first technology, although a keel-plank and some of its bottom outer hull-planks were probably laid down before the floors. *Montana*'s design does not easily fit into prevailing theories of bottom-, skeleton- or shell-first construction because only part of her structural strength derived from her hull. The rest came from her hogging-chain system, an external support (Corbin and Rodgers, 2007: 62, 64, 65, 67).

Finally, the side paddlewheel steamer *John Fraser*, lost in 1893 in 14m of water in Lake Nipissing, Ontario, was used to tow logs from assembly points such as the mouth of the Sturgeon River to sawmills, transported shantymen to the winter logging camps and towed flat-bottomed barges with supplies of hay, oats, barley, beans, salted meat, horses, saw-mill parts, tools, cooking stoves, kitchen utensils, china and the personal belongings of settlers and forestry workers. She has been termed "a highly organized assemblage of people, machines and materials functioning together" (VandenHazel, 1987: 331). Detailed examination of the above hulls and their internal machinery – description of which is beyond the scope of this report – furnish a comprehensive reconstruction of the design and efficacy of steam power in the age of the *Republic*.

A similar deep-water site to the SS *Republic* is the side-wheel steamer SS *Central America*. Launched in October 1852 for the United States Mail Steamship Company, this three-mast, 82m-long vessel ran regular trips between New York and Panama. On the second day of battling a hurricane in September 1857 she sprang a leak and sank the next day, 256km off Cape Hatteras, North Carolina, in 3,000m of water and with the loss of 426 passengers and crew.

Using early remote technology, a high-value specie and gold ingot cargo was recovered along with many artifacts, including a diversity of glass and stoneware bottles, many

with distinctive shapes similar to those recovered from the *Republic*, yet found in substantially lower volumes. Examples include medicinal, wine and sauce bottles and a stoneware example with the J. Bourne & Son Denby and Codnor Park Potteries stamp (Thompson, 1998: 157), yet lacking the P. & J. Arnold London ink company mark that is distinctive to the stoneware master ink bottles shipped aboard the *Republic*. The SS *Central America* also carried white ironstone china, including a pitcher and blue-trimmed mugs, whose small size most suited a child (Thompson, 1998: 159). A breakdown of the specific quantities of glass bottles and ironstones wares on the *Central America* is currently unpublished.

Particularly unique to this wreck, however, were numerous intact passenger trunks, which unlike the multiple cargo items recovered from the *Republic*, provide a unique insight into the specific individuals who were travelling on board the *Central America*. The first trunk retrieved from the debris field belonged to two newlyweds and contained both men's and women's clothing, including custom-made linen dress shirts, a single-breasted waistcoat with patterned silk, a linen morning robe and a lace-trimmed dressing gown. Also stored in the trunk was a pair of Derringer pistols, a dog's head watch fob with garnet eyes and various toiletries, such as a hairbrush with hair still clinging to its bristles (Thompson, 1998: 140, 142-4, 148-9). No intact passenger cargo trunks were discovered on the *Republic*, which suggests that they were the first to be thrown overboard by the crew in a failed attempt to save the ship.

In terms of cargo content, a close parallel to the *Republic* is the *Arabia*, a wooden river steamboat built by John Snyder Pringle in Brownsville, Pennsylvania, in 1853. At 51.3m long, she was an average sized river steamboat. On 5 September 1856 the *Arabia* struck a submerged walnut tree in the Missouri River, which pierced her hull while she was heavily loaded with 222 tons of cargo destined for frontier merchants. Over the decades the river changed its course, so that when the wreck of the *Arabia* was discovered in 1988 by a team using a proton magnetometer she was located 13.5m under a Kansas farmer's cornfield.

Excavation of the ship uncovered a diverse cargo of trade goods still preserved in wooden barrels and crates, including Goodyear rubber shoes, boots, European ceramic dishes packed in straw, gold-rimmed eyeglasses, buttons, beads, doorknobs, shirts, glass-bottled food, medicine and spirit bottles, inkwells, clay smoking pipes, candles, textiles, spoons, bells, wrenches, guns and pocket knives. Many of these mid 19th-century wares are virtually identical to those recovered from the *Republic*, including brown marbled and white ceramic doorknobs, keys, spoons, files and bottles with preserved fruit probably intended as pie filling,

as well as the popular Dr. J. Hostetter's Stomach Bitters (Hawley, 1995: 42, 58-9; Hawley, 1998: 77, 146, 208). Based on a concept of financial security in diversity rather than bulk, no two cases on the *Arabia* were alike. Aspects of this philosophy are shared in the *Republic*.

The loss of the *Arabia* was not a rare event. In the 44 years preceding 1897, 273 boats sank along the Missouri, 193 of them wrecked on snags similar to that which crippled the *Arabia* (Switzer, 1974: 2). So hazardous was river travel that the expected life of a Missouri river steamboat was less than five years (Hawley, 1995: 8).

Another of the Missouri's young victims was the steamer *Bertrand*, built in Wheeling, West Virginia, in 1864. The 48m-long, low draft vessel sank less than a year later on 1 April 1865 when the steamer struck a hidden snag at Portage La Force near De Soto Landing in Nebraska Territory. The *Bertrand* had departed from St. Louis bound for Fort Benton in Montana Territory two weeks earlier carrying at least 10 passengers and over 250 tons of agricultural and mining supplies, household paraphernalia, munitions, and clothing, as well as canned and bottled foodstuffs, wines and bitters. Also on board was an estimated 35,000 pounds of mercury, probably intended to help extract gold through the amalgamation process. Two contemporary attempts to salvage the cargo were largely unsuccessful, yet appear to have recovered most of the mercury (Switzer, 1974: 1).

As in the case of the *Arabia*, the *Bertrand* was discovered with its intact cargo well preserved in deep mud and silt. In 1968 and 1969 a recovery project supervised by archaeologists of the National Park Service and personnel of the Bureau of Sports Fisheries and Wildlife excavated the *Bertrand*'s voluminous shipment of frontier-bound trade goods, yielding over two million artifacts. The hull was subsequently reburied (Corbin, 2002a: 14; 2002b: 201; Switzer, 1974: 1). Lost just six months prior to the *Republic*, the *Bertrand*'s cargo of more than 6,000 glass and stoneware bottles bears striking similarities to the *Republic* (Switzer, 1974: vii), although the latter collection of over 8,000 bottles is larger in quantity and presents a broader diversity of bottle types.

Many of the finds had precise parallels to the *Republic*: keys, spoons, clock parts, buttons, doorknobs, door locks, axe heads and leather shoes, as well as combs made of hard rubber and ironstone china packed in wooden barrels (Petsche, 1974: 49, 60-61, 64-65, 69). The *Bertrand*'s 6,000 glass and stoneware bottles include forms represented in the *Republic*'s larger assemblage. In the bitters' category, 191 bottles of Dr. J. Hostetter's Stomach Bitters were found in 12-bottle cases on the *Bertrand* (Petsche, 1974: 50-51; Switzer, 1974: 33-4). Also represented in both assemblages are Drake's Plantation Bitters bottles (109 on the *Bertrand*), whiskey bottles produced in the Ellenville Glass Works,

beer, ale, wine and champagne bottles, and an assortment of foodstuff, including preserved fruit, condiments and sauces. Among the latter are the distinctive cathedral pickle and pepper sauces, Burnett's flavoring extract, and barrel-shaped mustard bottles with raised staves and bands distinctive to this bottle type (45 on the *Bertrand*) (Switzer, 1974: 16-20, 23-6, 29, 33-4, 36-7, 44-6, 48-50, 51-8, 78).

Additional bottled foodstuffs represented in the *Bertrand* collection include a probable competitor to the original Lea & Perrins Worcestershire Sauce bottles (33 on *Bertrand*). While the *Bertrand* examples feature glass stoppers embossed with the Lea & Perrins company name, the embossment on the shoulder of the bottles cunningly reads 'Worcester Sauce', not the traditional 'Worcestershire Sauce.' Unlike the *Republic*'s authentic Lea & Perrins Worcestershire Sauce bottles, the *Bertrand* examples are vertically embossed with the E.F. Dixie company name, which research suggests was probably a Worcester, Massachusetts, firm competing in the 1860s with the more popular British brand and reusing original Lea & Perrins glass stoppers to promote its bottled sauce (Switzer, 1974: 59, 79; pers. comm. Bill Lindsey, June 2009). In the ink category, one case of the *Bertrand*'s cargo contained 24 J. Bourne & Son's stoneware master ink bottles, also from the Denby and Codnor Park Potteries and similarly stamped with the mark of the P. & J. Arnold London ink company (Switzer, 1974: 67).

Buried for over a century in an anaerobic muddy environment, the *Bertrand*'s bottles were largely well preserved with their contents intact, as were their corks, paper labels, wax and foil seals and stencilled wooden packing crates. A more detailed study of the *Bertrand* collection in tandem with that of the *Republic* will no doubt shed further light on how the *Republic* bottles may have been sealed, packed, stored and shipped.

In conclusion, starved of everyday commodities and luxuries, yet spared by early conquest and the subsequent importance to the Union war effort, New Orleans was once again a major port on the rise with great demands in 1865, when the *Republic* slipped beneath the waters of the Atlantic Ocean. Before the Civil War, arrivals at the Levee quay in New Orleans had averaged 300 steamboats a month, and about half that amount of oceangoing sailing ships (Van Zante, 2008: 65). Joseph Holt Ingraham reflected the prosperity of the time in *The Sunny South; Or, the Southerner at Home* (Philadelphia, 1860), where the Levee port was described as a "ceaseless maelstrom of motion... Imagine one broad field of such commercial life, four miles in unbroken extent, and you will have some idea of the 'Levee' at New Orleans."

However, virtually all trade ceased with the outbreak of war, with W.C. Corsan observing in *Two Months in*

the Confederate States: an Englishman's Travels Through the South (London, 1863: 10-11) that in "time of peace, this immense area would have been piled up from end to end... [but] how different was the sight that met our eyes. Half a dozen paltry coasters, seeking a freight which was not to be found... while neither a bale of cotton, a hogshead of sugar, a bushel of corn, a packet of merchandise, or a man at work, could be seen from one end of that levee".

New Orleans resident Marion Southwood found oatgrass growing over the town's wharves during the war years and sadly reminisced that "where formerly all was life, bustle and animation, nothing is doing... The place looks as if it had been swept by a plague". The decay of the wharves made them so unstable that at the end of the war ships were compelled to land three and four deep on the few secure landing stages. In 1867, around \$300,000 of the \$3.1 million New Orleans city budget – the largest single item – was invested in the repair of the wharves and landings (Van Zante, 2008: 66).

The cargo of the SS *Republic*, in particular, is a unique archaeological witness to the origins and forms of imports circulating in New Orleans and the South in the immediate aftermath of the American Civil War. Although this shipwreck may be considered to be relatively recent chronologically, its rich archaeology helps considerably resurrect one of America's most important and intensively studied periods of history.

Acknowledgements

The authors of this report are enormously grateful to the entire Odyssey team whose steadfast commitment and breadth of expertise ensured that the *Republic* project succeeded. The authors extend huge thanks to the following:

Odyssey co-founders, Greg Stemm and John Morris, for their vision, endurance and unyielding determination to find the *Republic*; Marine Operations Manager Roy Truman whose soaring expectations guaranteed success; Project Manager Ernie Tapanes and his team of side-scan technicians, whose meticulous search operations and extraordinary patience ultimately led to the amazing discovery; Project Managers Tom Detweiller, Andrew Craig and Mark Martin for their rare gift in directing and managing shipboard operations and for their undying support of the entire operational team; ROV Supervisors Gary Peterson, Eric Peterson and Jim Starr and all the ROV technicians whose competence and adroit skills ensured that the artifacts were recovered from the site with the utmost care and in tandem with the highest archaeological standards; Data Manager Gerhard Steiffert and his team of dataloggers, who painstakingly recorded every minute of every dive and managed the enormous mountain of

data, photographs and underwater footage that was recorded; and the Master's officers and the crew of the *Odyssey Explorer*, without whom the time spent on the ship months away from home in sometimes terrible seas would have been unbearable.

To our good friend, colleague and archaeologist, Hawk Tolson, whose professionalism, encouragement and support have never wavered and whose adept research skills during those rare off-hours have provided a wealth of information. A mighty thank you is offered to John Oppermann and his entire research team who have supported this project with great energy and enthusiasm, in particular Kathy Evans and John Griffith. We are indebted to Adam and Eric Tate whose patience and Excel wizardry accessed the artifact data so relevant to the report. Gerri Graca, Odyssey's archivist extraordinaire, demonstrated exceptional resourcefulness locating essential and often obscure sources and other critical references. Fred Van De Walle, Chief Conservator and his dedicated team, Alan Bosel and Chad Morris, responded to our numerous queries and have set high standards of conservation, recording, documentation and photography. To Laura Barton and her team for all the media support and wonderful graphics generated. A special thank you is extended to the designer Melissa Kronewitter and to George Salmon and Chad Morris for producing exquisite photography.

We are especially grateful to an elite group of professionals, who have so generously offered their invaluable time and vast knowledge to the SS *Republic* project: Jane Spillman, Curator of Glass, Corning Museum of Glass; Barbara Perry, Former Curator of Decorative Arts, the Mint Museum; Bill Lindsey, formerly Bureau of Land Management and author of the Society for Historical Archaeology/BLM Historic Glass Bottle Identification and Information Website; Robert Hunter, British and American ceramic scholar and editor of *Ceramics in America*; Dafydd Roberts, Keeper, National Slate Museum, Llanberis, North Wales; Reverend Father William Joseph Kuchinsky, Priest of the Catholic Diocese of Wheeling-Charleston, WV; Byron Dille', bottle collector and historian; Robert Doares, Porcelain Historian, Williamsburg, Virginia; and Dorothy G. Hogan-Schofield, Curator Of Collections, Sandwich Glass Museum.

To Dr. Sean Kingsley, Director of Wreck Watch International, we are profoundly grateful for providing his firm guidance, keen insight and editorial wisdom. A final acknowledgement is in special memory of the former Conservator Herbert Bump, who established precedents in the early stages of the *Republic* project that Odyssey has continued to foster and emulate.

Notes

1. See Louisiana State Museum, *Ante-bellum Louisiana: Urban Life*: <http://lsm.crt.state.la.us/cabildo/cab9a.htm>.
2. *Yellow Fever Deaths in New Orleans, 1817-1905* (Louisiana Division New Orleans Public Library): <http://nutrias.org/facts/feverdeaths.htm>.
3. *A Brief History of the Denby Pottery*: www.clariceware.com/The%20Denby%20Pottery%20story.htm; *A History of Denby*: www.denby.com.au/denby_history.html.
4. *Glenn Poch's Bottle Collecting Newsletter* 19 (1997): www.antiquebottles.com/poch/19.html.
5. See: <http://dalessandris.net/lkpostalhistory.aspx>.
6. For L.T. Piver's perfumes, see: <http://www.piver.com/EN/historique.htm>.
7. *Reconstruction: the Second Civil War. American Experience Mini Documentary*: www.pbs.org/wgbh/amex/reconstruction/schools/ps_highgate.html.
8. See: <http://www.thepotteries.org/types/ironstone.htm>.
9. See: http://www.thepotteries.org/a_z.htm.
10. *An American Time Capsule: Three Centuries of Broad-sides and Other Printed Ephemera, Testimonials in Relation to the Merits of Van Buskirk's Fragrant Sozodont; for Cleansing and Preserving the Teeth, Hardening the Gums...* (Printed Ephemera Collection, Portfolio 122, Folder 35, New York, 1859).

Bibliography

- Arnold, J.B., 'The *Denbigh*, a Civil War Blockade Runner'. In G.F. Bass (ed.), *Beneath the Seven Seas* (London, 2005), 222-25.
- Arnold, J.B., Oertling, T.J. and Hall, A.W., 'The *Denbigh* Project: Excavation of a Civil War Blockade-Runner', *IJNA* 30.2 (2001), 231-49.
- Barlow, R. and Kaiser, J., *The Glass Industry in Sandwich. Vol. 2* (Atglen, 1989).
- Barlow, R. and Kaiser, J., *The Glass Industry in Sandwich. Vol. 4* (Windham, 1983).
- Barua, D. and Greenough III, W.B. (eds.), *Cholera: Current Topics in Infectious Disease* (Springer-Verlag New York, 1992).
- Baxter, F., 'A Century of Hostetter's Bitters or... It Pays to Advertise', *Bottles & Extras* 8.90 (1997), 1-5.
- Blassingame, J.W., *Black New Orleans: 1860-1880* (University of Chicago Press, 1973).
- Bowers, Q.D., 'Appendix B. Coins of the SS *Republic*'. In P.J. Vesilind, *Lost Gold of the Republic* (Shipwreck Heritage Press, 2005), 251-67.
- Bowers, Q.D., *The SS Republic Shipwreck Excavation Project: the Coin Cargo* (OME Papers 7, forthcoming 2009).
- Brantz, M., *Baltimore: Past and Present with Biographical Sketches of its Representative Men* (Baltimore, 1871).
- Campbell, G. (ed.), *The Grove Encyclopedia of Decorative Arts* (Oxford University Press, 2006).
- Capers, G.M., *Occupied City. New Orleans Under the Federals 1862-1865* (University of Kentucky Press, 1965).
- Carvalho, D.N., *Forty Centuries of Ink* (New York, 2008).
- Cederlund, C.O., 'The Eric Nordewall – An Early Swedish Paddle Steamer', *IJNA* 16.2 (1987), 109-33.
- Corbin, A., *The Material Culture of Steamboat Passengers. Archaeological Evidence from the Missouri River* (New York, 2002a).
- Corbin, A., 'Steamboat Archaeology on the Missouri River'. In C. Ruppé and J. Barstad (eds.), *International Handbook of Underwater Archaeology* (New York, 2002b), 193-206.
- Corbin, A., *The Life and Times of the Steamboat Red Cloud* (Texas A & M University Press, 2006).
- Corbin, A. and Rodgers, B.A., 'Steamboat *Montana* (1879–1884) – Leviathan of the American Plains', *IJNA* 36.1 (2007), 59-74.
- Cramp, A.D., *Nostrums and Quackery, Volume II* (Chicago, 1921).
- Crisman, K., 'The Sidewheel Steamer Heroine: Red River, Oklahoma'. In G.F. Bass (ed.), *Beneath the Seven Seas* (London, 2005), 220-21.
- Csenkey, E., *Hungarian Ceramics from the Zsolnay Manufactory* (Yale University Press, 2002).
- Cunningham Dobson, N., Tolson, H., Martin, A., Lavery, B., Bates, R., Tempera, F. and Pearce, J., *The HMS Sussex Shipwreck Project (Site E-82): Preliminary Report* (OME Papers 1, 2009).
- Davoli, E.L., *Patent Medicines: Ethnic or Socioeconomic Indicators? Louisiana Department of Transportation and Development* (Presented at the First Annual South Central Historical Archaeology Conference, Jackson, Mississippi, 1998).
- Fadely, D., *Hair Raising Stories* (Privately Published, 1992).
- Fike, R.E., *The Bottle Book: A Comprehensive Guide to Historic, Embossed Medicine Bottles* (Salt Lake City, 1987).
- Fox, S., *The Mirror Makers A History of American Advertising and its Creators* (University of Illinois Press, 1997).
- Gerth, E., *Patent Medicines, Bitters, & Other Bottles from the Wreck of the Steamship Republic* (Shipwreck Heritage Press, 2006).
- Gerth, E. and Tolson, H., 'Lost Cargo Writes History: Writing Slates from the Wreck of the Steamship *Republic*', *North South Trader's Civil War* 33.5 (2008), 38-50.

- Gilman, J., *The SS Xantho Hull Reconstruction Project* (Western Australia, 2002).
- Hawley, D., *Treasures of the Arabia* (Kansas, 1995).
- Hawley, G., *Treasure in a Cornfield: The Discovery and Excavation of the Steamboat Arabia* (Paddlewheel Publishing, Kansas, 1998).
- Heyl, E., *Early American Steamers, Volume I* (New York, 1953).
- Irion, J.B. and Ball, D.A., 'The New York and the Josephine: Two Steamships of the Charles Morgan Line', *IJNA* 30.1 (2001), 48-56.
- Kane, A.I., *The Western River Steamboat* (Texas A & M University Press, 2004).
- Kelly, W.J., *Shipbuilding at Federal Hill Baltimore (c. 1662-1961)* (unpublished manuscript, 1961).
- Kenchington, T. and Whitelock, C., 'The United States Mail Steamer Humboldt, 1851-53: Initial Report', *IJNA* 25.3 (1996), 207-223.
- Lockhart, B., *Steamship Wrecks from the Late Nineteenth to Early Twentieth Centuries as Archaeological Sites* (MA Thesis, Flinders University, South Australia, 2006).
- Lunn, K., 'Identification and Dating of Lea and Perrins' Worcestershire Sauce Bottles on Canadian Historic Sites: Interpretations Past and Present', *Canadian Journal of Archaeology* 5 (1981), 1-17.
- McCarthy, M., 'SS Xantho: The Pre-disturbance, Assessment, Excavation and Management of an Iron Steam Shipwreck off the Coast of Western Australia', *IJNA* 17.4 (1988), 339-47.
- McCarthy, M., *The SS Xantho Excavation 1983-1995* (Western Australia, 1995).
- McKearin, H. and Wilson, K.M., *American Bottles and Flasks and their Ancestry* (New York, 1978).
- McNabb, D. and Madère, L.E.L., *A History of New Orleans* (2003): www.madere.com/history.html.
- New York Marine Register. A Standard of Classification of American Vessels, and of other such Vessels as Visit American Ports* (New York, 1857).
- Odell, J., *The Story of Butler's Inks. Oak Galls Beetles and J.J. Butler: The Early Years* (Digger Odell Publications, 2003).
- Perkins, C.J., *Rockingham Ware in American Culture, 1830-1930* (University Press of New England, 2004).
- Petsche, J.E., *The Steamboat Betrand. History, Excavation and Architecture* (National Park Service, US Department of the Interior, Washington, 1974).
- Reinders, R.C., *The End of An Era. New Orleans 1850-1860* (Gretna, 1998).
- Ridgely-Nevitt, C., *American Steamships on the Atlantic* (University of Delaware Press, Newark, 1981).
- Roberts, G., *The Confederate Bell* (University of Missouri Press, 2003).
- Scharf, J.T., *History of Baltimore City and County* (Philadelphia, 1881).
- Shrady, G.F. (ed.), *Medical Record. A Weekly Journal of Medicine Vol. 50 July 4, 1896 – December 26, 1896* (New York, 1896).
- Spillman, J.S., 'Sunken Treasure: The SS Republic.' In J.S. Spillman (ed.), *The Glass Club Bulletin of the National American Glass Club* 204 (2006), 13-17.
- Stevens, R.W., *On the Stowage of Ships and their Cargoes with Information Regarding Freights, Charter-Parties, &c. &c.* (London, 1869).
- Stout, W.A., *A Return to Civilian Leadership, New Orleans 1865-1866* (M.A Thesis, Louisiana State University and Agricultural and Mechanical College, 2007).
- Switzer, R., *The Betrand Bottles: A Study of 19th Century Glass and Ceramic Containers* (National Park Service Department of the Interior, 1974).
- Thompson, T., *America's Lost Treasure* (New York, 1998).
- Tolson, H. and Gerth, E., *Faith of Our Fathers: Religious Artifacts from the SS Republic (1865)* (OME Papers 9, forthcoming).
- Van Zante, G.A., *New Orleans 1867. Photographs by Theodore Lilienthal* (New York, 2008).
- Vandal, G., *Rethinking Southern Violence: Homicides in Post-Civil War Louisiana, 1866-1884* (Ohio State University Press, 2000).
- VandenHazel, B.J., 'The Wreck of the Side Paddlewheel Steamer John Fraser, Lake Nipissing, Ontario, Canada', *IJNA* 16.4 (1987), 331-41.
- Vesilind, P.J., *Lost Gold of the Republic* (Shipwreck Heritage Press, 2005).
- Wilson, G.H., *A Manual of Dental Prosthetics* (New York and Philadelphia, 1917).
- Wood, B. and Doares, R., *Old Limoges: Haviland Porcelain Design and Décor, 1845-1865* (Artgen, 2005).
- Young, J.H., *The Toadstool Millionaires: A Social History of Patent Medicines in America before Federal Regulation* (Princeton University Press, 1961).
- Zumwalt, B., *Ketchup, Pickles, Sauces - 19th Century Food in Glass* (Fulton, 1980).