

The later stages of the global commodity chain in sponges: 1850s-1950s

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Introduction

Little has been published on what happened to sponges after they had been gathered and subjected to primary processing, so this paper, reliant on secondary sources, is somewhat tentative and sketchy. The story is taken up from the point in the commodity chain at which sponges passed into international commercial networks, to be transported, distributed, industrially processed, retailed, and finally consumed.¹ A boom period stretched from the 1850s to the 1910s, followed by a plateau to the 1950s. The search for substitutes finally succeeded at the end of this period, leading to a drastic shrinkage of the business.

New production zones arose during the century covered in this paper, and the trade spanned the world for the first time. Modern transport and communication technologies and the provision of cheap credit impelled the globalisation of the business. Traders slowly became more corporate in their organisation, though sponges generally remained a niche trade, often added on to a long list of other commodities. Novel industrial methods were introduced to process sponges. Demand was driven not only by rising incomes and changing views of hygiene, but also by a multiplication of applications in daily life, and in artisanal and industrial activities. Entrepreneurial diasporas, largely Greek and Jewish, integrated the commodity chain, providing an element of continuity with the past.²

Globalising the extraction of sponges

Areas of output expanded across the world, as new producers joined the old heartland in the Aegean Sea. Demand for traditional personal and artisanal uses expanded from the mid nineteenth century, while modern industries became new consumers. This pushed up prices, encouraged prospecting for new sponge banks, and led to the first experiments in aquaculture.³ However, waters suited to commercial sponges were ecologically quite limited. The sea had to be shallow, warm, and quite saline. It also needed to have small intertidal variations, a firm bottom, and pronounced currents.⁴

Expansion of production took place in three main areas, although figures are rare and shaky, and serve only as rough orders of magnitude. Around 1908, the value of sponges produced in the 'Mediterranean and contiguous waters' was estimated at just over US\$2mn, or some 58% of world output. The Caribbean came to a little under US\$ 1.5mn, or 41%. The rest of the world made up a meagre 1%, though this may well be an underestimate.⁵ Figures by weight for 1927-1936 showed the Caribbean at 74%, and the Mediterranean at 26%, while the Pacific and Indian Oceans were ignored. In 1977-1986, again in terms of weight, the Mediterranean registered 56%, the Caribbean 30%, and the Pacific 14%.⁶ Mediterranean sponges generally fetched the highest prices on the world market, a fact which needs to be borne in mind when considering statistics by weight.⁷

Production in the Mediterranean mainly took place in shallow seas east of a line from northern Tunisia to the toe of Italy.⁸ The newly created Kingdom of Greece was a major player, gradually acquiring control of most of the Aegean from the Ottoman empire, and obtaining the Dodecanese from Italy after the Second World War.⁹ However, it was the maritime zone from Tunisia to Egypt that saw the greatest development.¹⁰ This North African zone produced 57% of the Mediterranean harvest by weight in 1938, whereas Greece and Turkey represented 25%, and Italy (presumably including the Dodecanese) 16%. This left only 2% for the rest, including Dalmatia (Croatia), Malta, Cyprus, Syria, and Lebanon.¹¹

The Caribbean, including the Gulf of Mexico, became the largest new source of sponges from the middle of the nineteenth century. In 1938, the Bahamas produced

38% of the zone's output by weight, Florida 35%, and Cuba 25%.¹² The remaining 2% came from British Honduras (Belize) and neighbouring Yucatán, Nicaragua and Honduras, Haïti, Jamaica, and Colombia.¹³ The Turks and Caicos Islands were effectively a prolongation of the Bahamas.¹⁴

The Bahamas were the first territory to spark international interest in the nineteenth century, when Mr Hayman, a French merchant who had been shipwrecked in the islands, sent a sample of local sponges to Paris in 1841.¹⁵ Some time before the First World War, the Bahamas became an exceptional case in the world, as a territory for which sponges were the main export. The sector employed about 12% of the total population of the archipelago by the mid 1930s.¹⁶

Cuba was another important new producer. Bahamian gatherers moved into the necklace of small islands that dot the northern coast, centred on Caibarién. Initially, they operated clandestinely, but later they obtained Spanish licences.¹⁷ A richer zone was discovered around 1878, and developed from 1884, in the shallow Gulf of Batabanó, between the southwest coast and the Isle of Pines (Isle of Youth).¹⁸ By the end of Spanish rule in 1898, the Batabanó banks yielded a harvest worth some US\$ 600,000 per year, while those of Caibarién were estimated at US\$ 300,000 to 400,000.¹⁹ The port of Surgidero de Batabanó was even at one point, with some hyperbole, called 'the sponge capital of the whole world'.²⁰ In 1935-1939, sponges accounted for 87% of all Cuban fishery products by value.²¹

Sponges from Florida were first gathered in the Keys of the far south, close to the Bahamas and northern Cuba. This was again initially an outgrowth of Bahamian operations. Commercialisation took off the end of the 1840s, and the bulk of expanded production shifted to the west coast from the 1870s, with its centre in Tarpon Springs.²²

In late 1938, disaster struck this Caribbean zone. A blight, caused by a fungus, first appeared in the Bahamas around the autumn of 1937, and was spread by currents all around the zone. It was said to have been particularly severe in areas of experimental aquaculture. Recovery was slow.²³ Breaking out in a major way in December 1938 in the Bahamas, the 'deadly malady' destroyed an estimated 90% of the colony's sponges.²⁴ In Cuba, a violent hurricane, in October 1944, compounded problems. Cuba's landings in 1947 were a mere 3% of the yearly average for the late 1930s, although over 1,300 people were still employed by the industry in 1945.²⁵ Reaching the Florida Keys in March 1939, the fungus left sponge gatherers across the state 'destitute' by end of 1940. However, deeper waters off the west coast were slightly less severely affected.²⁶

Combined with the severe disruptions caused by the Second World War in the Mediterranean, the Caribbean blight caused the price of sponges to soar. In Florida, the cost of purchase rose from an average US\$1.65 per pound in 1936 to US\$18.7 in 1946. A similar rise was noted in Cuba.²⁷

The sponge economy of the Philippines was left far behind, and Asia was simply ignored in 1938 estimates of world output.²⁸ Sponges were not mentioned in the Reverend Tenison-Woods' survey of the marine resources of Southeast Asia, even though he had personally visited Sulu, in the southern Philippines, in 1885.²⁹ The Spanish authorities made timid efforts to discover the resources of the archipelago at around this time, although the Sulu Sea only became of some significance after the USA had taken over the colony in 1898, at a time when world supplies were tightening and prices were rising.³⁰

Outside the Philippines, attempts to develop 'sponge fisheries' had even fewer results. Repeated efforts in Australia came to nothing.³¹ Greek sponge divers headed for Australia after 1945, but they exploited their skills to dive for pearl oysters.³² In the South Pacific, various archipelagos were recognised as having potential.³³ However, the only known developments occurred when the Japanese acquired the Marshall and Caroline Islands from Germany as a result of the First World War, and experimented with sponge aquaculture.³⁴

The Indian Ocean was similarly marginal. Greek divers failed to establish a viable business in Madagascan waters in 1902, although some limited output probably continued thereafter.³⁵ Waters around Indonesia and Ceylon (Sri Lanka) remained virtually unexploited.³⁶ The Caribbean blight triggered ambitious plans in British Malaya in 1939, but the Second World War intervened.³⁷

The Red Sea, in some senses a geographical extension of the Mediterranean, had been famous for its sponges in ancient times.³⁸ In the modern period, however, despite the undoubted existence of large quantities of sponges, quality was judged to be poor, and output remained tiny.³⁹ As a result of the abnormally high world price in the closing stages of the Second World War, there was a brief boom in Eritrean exports, lasting into the 1950s.⁴⁰ Some Eritrean sponges were sold locally.⁴¹

The business of exporting

In terms of methods of purchase, there was much continuity, as well as some innovation. Some producers acted as exporters, thus bypassing commercial intermediaries. Many traders continued to buy directly from producers, who were often tied to them by loans, in ways that left little trace in historical records.⁴² In Cuba, 'convenient coffee-houses' served for transactions.⁴³ However, sponge auctions also developed, in both the Old World and the New.⁴⁴ In 1908, the not-for-profit Tarpon Springs sponge exchange was set up in Florida, though it is not clear how it functioned.⁴⁵ The not-for-profit Sponge Exchange Co. Ltd., in Nassau in the Bahamas, operated on a system of sealed bids, which were offered for specific lots.⁴⁶ The continued prominence of diasporic 'communities of trust' was notable.

Greeks spread around the world in the pursuit of sponges, especially from the 1870s.⁴⁷ They were numerous in the booming banks off the coast of North Africa.⁴⁸ Sfax, in southern Tunisia, was one of the largest export centres in the Mediterranean, and Greek traders dominated the sponge business there by around 1900.⁴⁹ Tarpon Springs in Florida famously came to host a flourishing community of Greek divers and traders.⁵⁰ Greek agents of houses in New York, London and Paris dominated purchases in Nassau, Bahamas, in the interwar years.⁵¹ In Cuba's Gulf of Batabanó from the early 1880s, Greek immigrants began by diving in suits. However, after a few years, they left production to the locals, and concentrated on exporting sponges.⁵² Cuban historians recognise the crucial role played by Greeks in placing their country's sponges on the international map, with Giannis Esfakis Yanakakis remembered as a pioneer.⁵³ A Greek, P. I. Pipinos, was both producer and exporter in southern Philippines from the 1910s to the 1920s, although production appears to have ceased in the troubled decade of the 1930s.⁵⁴

Jewish traders, globally ensconced as commercial intermediaries, also dealt in sponges. However, unlike Greek entrepreneurs, they do not seem to have engaged in gathering them. The case of Mr Hayman in the Bahamas has already been noted.⁵⁵ Another example was Silvio Nasi, 'the king of sponges' in Eritrea, who was also involved in a wider set of marine activities.⁵⁶

The business of importing

Sponges gravitated mainly towards a relatively small number of towns. Some were conveniently close to major areas of consumption. Others acted as entrepôts for re-exports. Yet others had established specialist knowledge of marine products. None of these roles was necessarily exclusive. There were no known futures markets for sponges, probably reflecting low turnover and the lack of a standard product on which to base futures contracts.

In Europe, Britain and Germany were the largest importers around 1930, followed by the Netherlands, France and Italy.⁵⁷ Trieste (in Austria-Hungary till 1918), Marseille, and London stood out as gateways for imports.⁵⁸ Paris, up the Seine from the port of Le Havre, was sometimes considered to be the sponge capital of Europe.⁵⁹

New York was the crucial entrepôt in North America.⁶⁰ The eight main wholesale firms established there in 1887 employed agents in Florida and elsewhere. Many sponges also

entered the ports of Boston, Philadelphia, Baltimore, and New Orleans.⁶¹ As for San Francisco, it acted as the American entrepôt for the Pacific.⁶² Chicago and Saint Louis were major inland centres of distribution, situated on waterways.⁶³

In the Pacific zone, Singapore acted as an entrepôt for sponges from the Philippines.⁶⁴ Osaka, in western Japan, had well-established links with Singapore for imports of marine produce, organized by Chinese traders and syndicates.⁶⁵ Sponges were entering Japan through Osaka from at least 1920.⁶⁶ Japanese imports from the Philippines were later on a considerable scale.⁶⁷

Greeks developed a leading position as importers in the second half of the nineteenth century. The greatest sponge trader in the world was said to be Nikolaos Vouvalis (1859-1918), a Greek merchant from Kalymnos, whose father had already done business in London before him. The younger Vouvalis founded N. Vouvalis & Co. in 1882, and became so wealthy that he was invited to the palace by Queen Victoria. By the dawn of the twentieth century, he had branches and agencies in the Greek islands, Libya, Tunisia, both the production zones of Cuba, Nassau in the Bahamas, and Tarpon Springs in Florida. His widow, Katerina, kept the business going till her death in 1959.⁶⁸ Other Greeks were prominent in Stockholm and Trieste, though people with Italian and French names were also active in major European cities.⁶⁹ As for the Greek American Sponge Company, centred in Chicago, its origins and composition are unknown.⁷⁰

Jews were seemingly more prominent as importers than as exporters. Mr. A. Isaacs was the first to bring Florida sponges to New York from 1849, and also obtained them from the Bahamas and the Mediterranean. He was the brother-in-law of Mr. Hayman of Paris, who had pioneered French sponge imports from the Bahamas in 1841.⁷¹ A. Isaacs & Co. remained a major New York importer in the 1900s.⁷² David Rosenfeld's firm was active in Trieste from 1896.⁷³ In London I. & M. Cohen and Henry Marks & Son were two prominent houses, established in Houndsditch.⁷⁴ Emmanuel (Edgar) Israel Cohen, son and grandson of sponge traders, whose grandfather had come from the Netherlands, took over the first of these firms from 1894 to 1933. He had a colourful and diverse business career, including co-founding the Harrod's Department Store, and becoming 'taxi-cab king' of London with motorised cabs.⁷⁵

Some American 'wholesale druggists' acted as importers, perhaps reflecting links to pharmacies that retailed the sponges. Thus, Smith, Kline & French (later part of Glaxo Smith Kline) imported sponges in Philadelphia, as did Coffin Redington & Co. and Langley and Michaels & Co. in San Francisco, and Meyer Brothers, 'Druggists', in St Louis.⁷⁶

The Cresswell family had a long history in the business; an advertisement for Cresswell Brothers proudly declared in 1951 that they had been for '150 years in sponges'.⁷⁷ By 1886, the firm's headquarters were at 13A Red Lion Sq, WC1, in London, and it was importing sponges from Greece, Turkey, Egypt, the Bahamas, Florida, and Cuba.⁷⁸ The family had a representative, a relative, on the Greek island of Aegina from the 1890s, who was said to live like the Greeks by the early 1920s.⁷⁹

This firm also exemplified the temptation to form cartels to corner the market. In 1886, it boasted of holding the exclusive right to sell sponges in Britain obtained from the Cuban Sponge Fishing Co., which in turn held 'special concessions from the Cuban government'.⁸⁰ In 1903, Cresswell Brothers teamed up with I. & M. Cohen and Henry Marks & Son to form International Sponge Importers Ltd., although each company retained its separate identity.⁸¹

Industrial processing

The processing of sponges could be broken down into three overlapping stages. On boats, or on land close to gathering zones, workers removed organic tissue through fermentation, beat the sponges to remove stones and sand and soften them, washed them in sea-water, dried them, and did some cutting to improve shapes. In a second stage, in a number of workshops in zones of production, sponges were further beaten, washed, and cut, as well as being chemically treated, and pressed and baled, although

British importers preferred their sponges not to be pressed. It seems that these establishments relied exclusively on human energy, and that mechanisation was largely restricted to hand-driven screw-presses.⁸² Photographic evidence from the Bratsera Hotel in Hydra, the former sponge factory of Nikolaos Verneniotis, would support this.⁸³

In a third stage, sponge factories in zones of consumption carried out processes that were quite similar to those in the second stage. In some cases, sand and other extraneous materials had to be removed, as unscrupulous traders had introduced these materials to increase the weight of the sponges. Those that had been pressed for baling had to be soaked to regain their shape.⁸⁴ In Europe, such factories existed in London, Liège, Paris, Stockholm, Trieste, Mantua, Milan, and Rome, and the overlap between factory-owners and importers was considerable.⁸⁵

These factories were not necessarily very mechanised. In 1898, the Royal Lombard Institute of Sciences and Letters decided not to award its triennial gold medal for industry to Alfredo Zaffaroni di Andrea, who had set up a sponge establishment in Milan. He maintained fleets of boats on the Italian coasts to gather sponges, and he imported others from Cyrenaica (Libya) and the Caribbean. His finished products were exported all over Europe on quite a scale. However the committee noted that the processes in his factory consisted of extremely simple hand operations, notably washing in an alkaline solution to lighten the colour, and clipping to improve the shape. These were not considered to be truly industrial.⁸⁶

This contrasted with Cresswell Brothers of London, already noted as importers, who claimed to run the largest sponge factory in Europe by the early 1920s, situated in 18-19 Red Lion Square. Steam-power was applied, even though the machines were small, one of 5 horsepower, and one of 10. They were employed to clean, bleach, soften, squeeze out water with rubber rollers, and dry with hot air. Chemical bleaching to attain a yellow hue was also practiced. Sorting, stringing, and carding were presumably done by hand.⁸⁷ Whilst this processing was industrial in nature, its value might be queried, as both softening and bleaching could lead to a loss of durability and resilience in sponges.⁸⁸

Diasporic communities were again notable in the industrial field. For example, David Rosenfeld set up a sponge factory in Austro-Hungarian Trieste. Deported as a Jew from Italy in the Second World War, he never returned from the death camps. Today, Rosenfeld claim to be oldest European sponge factory still in existence. Archival photographs give some idea of the firm's past industrial processes.⁸⁹

Retailing and consumption

Methods of selling of sponges to consumers remain rather nebulous in the historical record. Pictorial evidence shows street vendors and peddlers hawking bath sponges.⁹⁰ Pharmacies (chemist's shops) and health shops sold higher end personal hygiene products.⁹¹ Industrial sponges may have been bought directly from manufacturers. Sponges were broadly valued according to their colour, size, shape, softness, fineness, durability, resilience and capacity for absorption. However, different kinds were preferred for different purposes.⁹²

Medium-sized, fine, soft, bleached sponges were the traditional aid to bathing. The demand for such sponges expanded as population and incomes rose after the Industrial Revolution, and as cleanliness came to stand close to godliness. Cleaning the bed-ridden and the dead were also significant, as was the removal of facial make-up.⁹³

Animals also needed to be cleaned, for which there was a preference for larger, tougher and coarser unbleached sponges, as they were more durable. In particular, as cities grew, the numbers of equids living in them to provide urban transportation expanded enormously.⁹⁴ The ostler sponging down a horse was an traditional scene, which became even more common in the nineteenth century.⁹⁵

Another established use of sponges was for contraception and the control of menstrual bleeding. The contraceptive sponge, tied to a string and removed after intercourse, was

not a particularly effective method of preventing conception, but it served before the advent of new systems. Sponges were also employed as early forms of reusable tampons.⁹⁶

Medical applications grew fast in the nineteenth century, with small, soft, flat sponges preferred by surgeons to clean skin, apply antiseptics, absorb fluids, control bleeding, and dress wounds. After surgery, the sponges would be rinsed in baking soda, chemically bleached, and reused.⁹⁷

Larger, coarser unbleached sponges cleansed inanimate objects, such as land vehicles of every kind, boats, windows, and surfaces in buildings and stables.⁹⁸ The inside of the barrels of artillery pieces also had to be wiped and cooled after every shot in the early nineteenth century, with sponges fixed on long sticks, to prevent the next charge from igniting prematurely. On HMS Victory, a six-man crew was assigned to each big 32lb naval gun, and Number 4's job was sponging out the barrels.⁹⁹ Sponges were still used by artillery units in the 1900s, despite advances in military technology.¹⁰⁰

The absorptive capacity of sponges was a fundamental quality, which served in many everyday situations.¹⁰¹ Stamps and other adhesive surfaces required wetting, while splodges of ink and other liquids could be mopped up.¹⁰² Humidifiers, sometimes containing sponges, were hooked onto radiators, as central heating spread.¹⁰³

The construction industry was another major customer for rough, tough unbleached sponges. Builders, notably brick-layers and tile-layers, employed them to smooth cement, clean roof-coverings, and polish stone surfaces, such as marble. Moreover, they were aids to painting and decorating the inside and outside of buildings.¹⁰⁴

Artisans had long employed sponges, and the new factories of the Industrial Revolution adopted them in their turn.¹⁰⁵ Indeed, in the 1930s, it was estimated that artisans and factories consumed fully 70% of the world's output of sponges.¹⁰⁶ Sponges were essential items in an artist's paint-box, and they further served for tanning, other work with leather, polishing stone, lithograph printing, photography, sprucing up hats and canes, and working with precious metals and jewels.¹⁰⁷ Specialisation emerged. For example, jewellers liked small soft reef sponges, which otherwise were not in much demand.¹⁰⁸ Potters were especially dependent on sponges, and continued to employ the natural variety until well into the 1960s.¹⁰⁹ In 'dark Satanic mills', sponges found new uses, applying lubricants, sealants, and colours, cooling machinery, and filtering liquids. Grass sponges were found to be particularly effective for oily tasks.¹¹⁰

Cheap off-cuts, a by-product of trimming and shaping sponges, came into their own at this time. The padding and stuffing of upholstery, cushions, saddles, helmets, and similar objects consumed much of this material, although the propensity of sponges for water absorption could cause problems. Padding also served for packaging, insulation, sound-proofing, and cushioning shocks and vibrations caused by machinery.¹¹¹ The growth of a market for off-cuts, which had been known as 'sponge waste', improved the overall profitability of the business.

Substitutes for sponges

The accelerating demand for sponges, combined with occasional interruptions in supplies, caused prices to rise, which in turn led to a search for cheaper alternatives. These became available on an increasing scale in the interwar years, at a time when prices were stabilizing.¹¹² Changes in production and other processes also meant that sponges sometimes became less suitable, further stimulating a search for new options. Substitutes were vegetable or animal in origin initially, but were increasingly produced by chemists. In many cases, these ersatz commodities retained the name of 'sponge', despite being made of other materials.

Loofah (*al-Lūf*; *Luffa aegyptica*) was perhaps the oldest and most widely employed vegetable alternative to bath sponges. It was a kind of cucumber-shaped marrow, growing on a vine, which originated in Egypt. The seeds and soft matter were removed, and what remained was a springy dried 'skeleton', not unlike a natural sponge. Although rather rough on the skin, it was a good exfoliator. Cultivation spread to areas

such as India and Japan. The latter was the largest producer in the world by the early 1920s, and exported the product to other lands.¹¹³ The dried root of the konjac plant (*Amorphophallus konjac*, or *konnyaku* in Japanese) was similarly employed in Japan, and more widely in eastern Asia, though it was slow to spread globally.¹¹⁴

Other early substitutes of vegetable origins were applied for specific purposes. Blotting paper absorbed fluids, especially ink. It emerged from a chance discovery in England, around 1795, that not sizing paper had the effect of producing this kind of product, and it spread in the first half of the nineteenth century.¹¹⁵ Cotton gauze pads replaced sponges for surgical purposes from around 1900, while retaining the name of 'sponges'.¹¹⁶ Foam rubber, which had the advantage of not absorbing water, was employed for stuffing cushions and upholstery.¹¹⁷ Imitation bath sponges might also be made of rubber.¹¹⁸

The most successful early substitute of animal origin was 'chamois' leather, which served to clean objects, especially automobiles, rather than people. Despite its name and historical origins, this soft and absorbent leather was usually made from sheepskin, split and soaked in oil, rather than being tanned.¹¹⁹ Some traders in natural sponges also dealt in chamois, which was not the case for other substitutes.¹²⁰ Henry Marks & Sons, sponge-traders of London, themselves manufactured both chamois leather and imitations of it in 1910.¹²¹ Various forms of softened leather also served as replacement bath sponges.¹²² Animal hair, notably horse-hair, was an old alternative for stuffing mattresses and other objects.¹²³

None of these early ersatz products made much of a dent in the demand for natural sponges, but the end of the 1930s marked a crucial turning point. Prices for natural sponges rocketed in the United States, as the Caribbean blight and war in the Mediterranean restricted supplies drastically. And yet, sponges had become essential for wide swathes of industrial production, which expanded mightily in conditions of war. The nadir came in 1944, when America's local output of sponges, plus imports for consumption, fell to only 24% of the corresponding figure for 1935.¹²⁴ In 1944, the Americans cited the necessities of their war effort to impose a price cut of 20 to 50% on Cuban sponges.¹²⁵

To cope with this dire situation, the DuPont chemical company in the United States discovered how to make synthetic sponges from cellulose. They sold the technology to General Mills in 1952, and these cheap substitutes soon flooded the market for domestic sponges. Cellulose sheets, usually dried wood pulp, were softened with water and chemicals. Sodium sulphate crystals were added, with hemp fibres, and dyes. The size of the crystals, which melted and drained away as the mixture was heated, determined how large the pores would be in the sponge block. Once hardened, the block was soaked again with bleach, to remove impurities, and washed and cut. A textured plastic scouring pad was often attached to one side, as a standby for domestic cleaning purposes.¹²⁶ However, cellulose sponges were not equal to the natural variety for many purposes.¹²⁷

Competition for natural sponges also came from polyurethane foam, a polymer that was developed a little later. This type of artificial sponge was employed in the domestic sphere, but was apparently more significant for industrial applications.¹²⁸ Cellulose sponges are considered to be more effective than polyurethane ones for purposes of humidification.¹²⁹

The synthetic revolution hit producers of natural sponges hard. There was a brief final boom immediately after the Second World War, as a response to pent-up demand and the regeneration of beds, but it was a swan-song.¹³⁰ Nevertheless, the sector survived, by reinventing itself once again. Gritty industrial uses were relegated to the past, and sponges were once again marketed as natural, organic, and non-polluting aids to personal hygiene.¹³¹

Conclusion

Further research is needed to fill in the story of the later stages in the commodity chain. It is impossible properly to grasp the history of sponges without understanding what happened to them after they had been given an initial degree of processing in zones of gathering. Commercialisation, transport, importing, warehousing, distribution, retailing, and consumption are all required links in the chain, to gain a good understanding of the evolution in the demand for sponges, and their pricing.

One question that remains to be resolved is how capital intensive these processes became from the mid nineteenth to the mid twentieth century. Companies often stressed progress and modernity in their advertising, and yet the sponge business remained quite traditional in many respects. Modern technologies helped to globalise production, commercialisation, and consumption, but old-fashioned entrepreneurial diasporas remained prominent. Moreover, industrial processing never developed very far. Indeed, it is a moot point whether it was worth the expenditure in modern machinery, fuel, and technical personnel.

NOTES

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