

# **Technology and Social Change**

**Second Edition**

Edited by

**H. Russell Bernard**

*University of Florida*

**Pertti J. Peltó**

*University of Connecticut*



Prospect Heights, Illinois



As in the case of overpopulation on Mauritius discussed by Burton Benedict, the major technological impact was a fait accompli by the time Dr. Bernard arrived on Kalymnos. The synthetic sponge had already taken its toll of the natural-sponge markets, and Kalymnians were well into the process of adapting to the new situation. In this essay Bernard deals with the history of sponge fishing, the role of technology in the industry, and the social effects on a "monocrop" island when synthetics threatened its primary economic base. The case is interesting as an example of a widespread phenomenon. It is not a government program ; it is not a new city or dam or other major project ; it is not the sort of thing Robbins and Kilbride describe where people have access to microtechnology that they perceive as beneficial to their lives. Instead, 8,000 miles from Kalymnos a synthetic substitute was invented which threatened the livelihoods of people who worked with the natural counterpart. Here the product is sponge. It might have been nylon and its effect on the silkworm industry, or plastic buttons and their effect on the mother-of-pearl industry, or nuclear power and its effect on the Appalachian coal industry. On Kalymnos the fight to stay in the world's markets has led to a strategy which may prove effective in other areas : technology is being rolled back, and ancient, less expensive modes of production are being reinstated. The same thing may well happen to snowmobiles if it turns out that they cost more than their fun value is worth.



# SPONGE FISHING AND TECHNOLOGICAL CHANGE IN GREECE<sup>1</sup>

*H. Russell Bernard*

## INTRODUCTION

The most striking thing about Kalymnos has for a long time been its sponge-fishing industry. The most striking thing about this island today is the apparent strength of its economy and the survival of the sponge industry against massive competition from synthetics.

This chapter discusses what happened on Kalymnos. Briefly, historical, political, cultural, technological, and economic factors combined in the period from 1800 to 1960 to make Kalymnos the undisputed world center of sponge fishing. Beginning around 1960, the threats of synthetic sponge

<sup>1</sup> Field work was carried out on Kalymnos for one year, 1964–1965, two weeks of December, 1966, and on several field trips during the year 1969–1970. Field work at Tarpon Springs consisted of several months during the summers of 1963 and 1964. Research has been supported at various times by the National Defense Education Act, Social Science Research Council, University of Illinois, Wenner Gren Foundation, and Fulbright Foundation; these institutions' support is gratefully acknowledged. Thanks to Dr. Robert Littlewood and Dr. Henry Irwin of Washington State University for criticisms of earlier drafts.

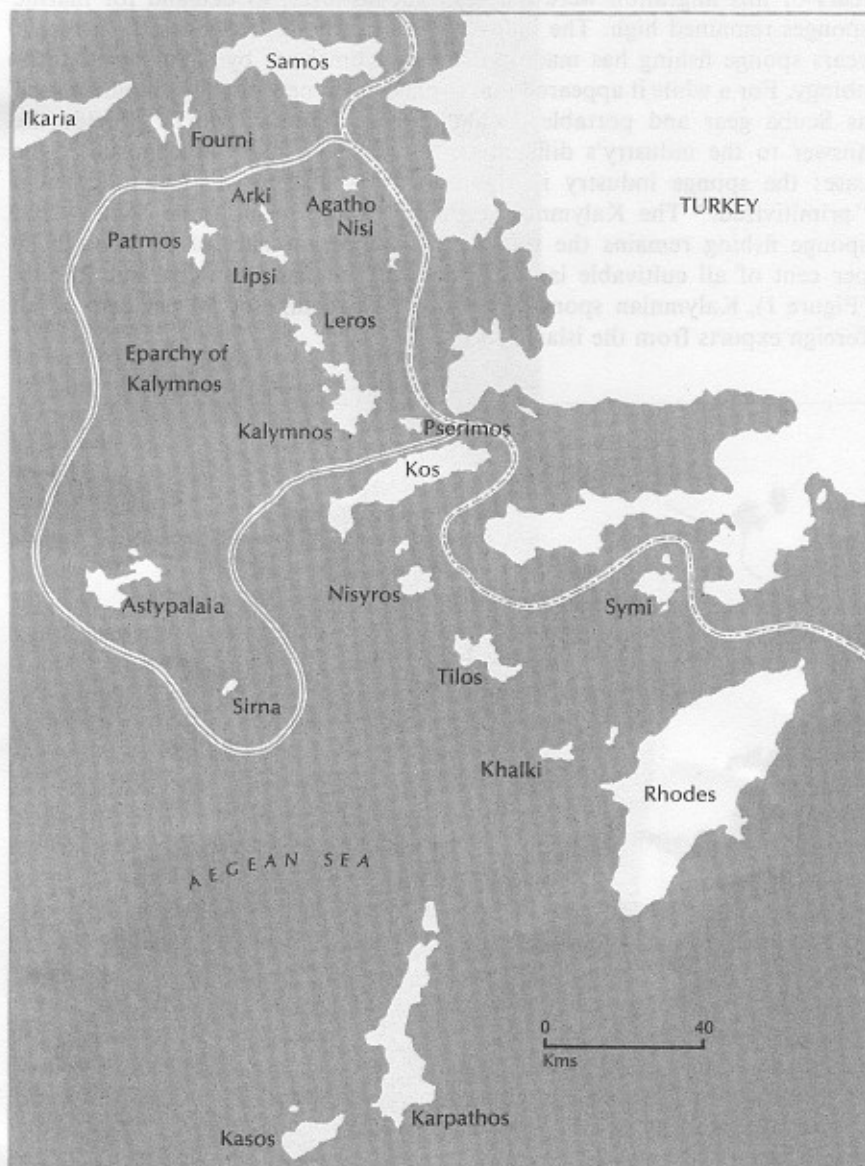


FIGURE 1. The Dodecanese.

competition caused a major labor migration. This led to a decline of importance of the sponge industry in the Kalymnian economy. The causative fears of this migration were not realized, however, as demand for marine sponges remained high. The industry thus nearly destroyed itself. In recent years sponge fishing has made a dramatic comeback by changing its technology. For a while it appeared that sophisticated new diving equipment such as Scuba gear and portable decompression chambers would provide the answer to the industry's difficulties. Surprisingly, just the opposite is the case: the sponge industry is vigorous again because its technology was "primitivized." The Kalymnian economy today seems quite healthy and sponge fishing remains the single most important part of it. Though 85 per cent of all cultivable land in the Dodecanese is on Kos and Rhodes (Figure 1), Kalymnian sponge continues to account for 90 per cent of all foreign exports from the island group.

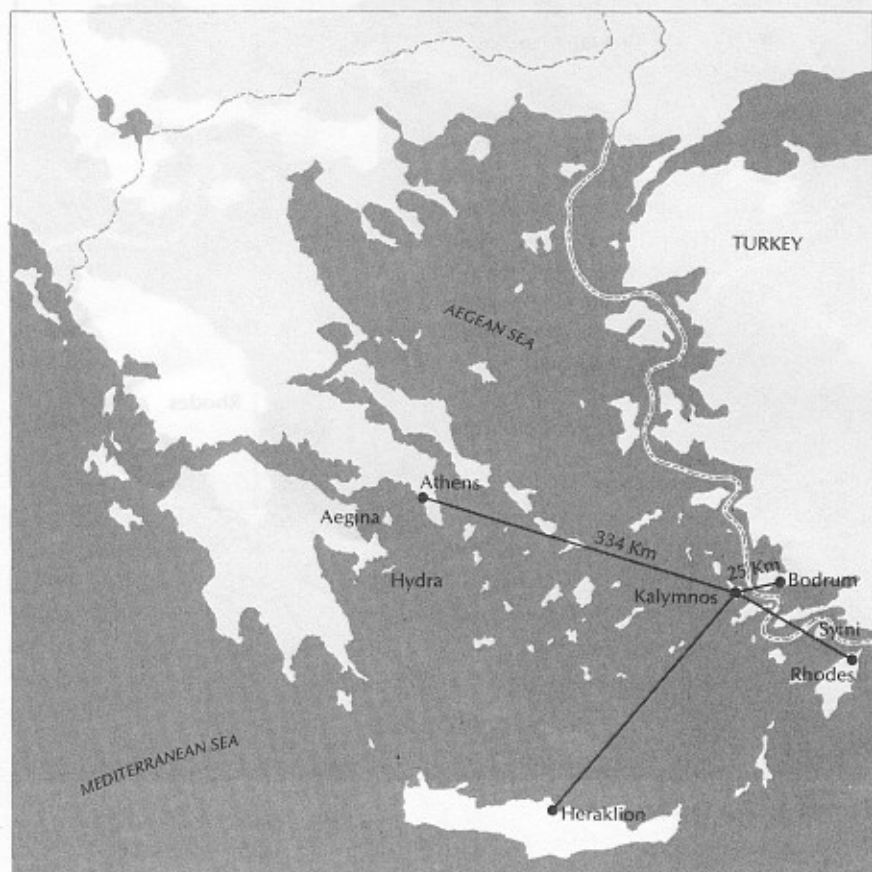


FIGURE 2. Greece.

## SETTING AND HISTORY

Kalymnos is 110 square kilometers of mostly rocky land, located 332 kilometers southeast of Athens, 145 kilometers northwest of Rhodes, and 25 kilometers west of Bodrum, Turkey (Figure 2). Only 18 per cent of the island is arable and most of the good land is too steep to be really productive. Still, slightly over 13,000 people inhabit Kalymnos, making it the most densely populated island in Greece.

The coastline is jagged and steep, and the island is cut lengthwise by three mountain ranges and two valleys. The port city of Pothea has nearly 10,000 inhabitants, making it an "urban area" according to the National Statistical Service of Greece. Xora, a short kilometer and a half from Pothea, has another 2,000 people. Perhaps 100 families (3 per cent of the total population) are engaged in agriculture; a like number make their primary income from shepherding. There are around 10,000 sheep and goats in the villages of Vathy, Dassos, Bothinous, Arginonda, Skalia, Emborios, Palionisi, Argos, and the islets of Telendos and Pserimos (Figure 3).

Most men in Pothea are engaged in commerce, trade, professions, or services (Table 1). But the principal adaptation of Kalymnos is to the sea which surrounds it. In ancient times Kalymnos sent her best youth for training in the Rhodian navy. The neighboring island of Kos, with its lush, flat lands, provided Kalymnos with most of its summer fruits and vegetables. It still does, and Kalymnians call the people of Kos *Kotes*, or chickens, to show their disdain for people who are tied to the land. One informant told me, "The ancients said that the three most terrible things in the world are fire, woman, and the sea. Man must do battle with all three to be strong. We have." The prowess of *Kotes* as firefighters was never established during my stay on Kalymnos. Needless to say, however, Kalymnians do not rate *Kotes* very high as mariners or lovers.

The impact of the sea on Kalymnos is profound. In 1965 I estimated at least 1,000 adult males were engaged locally in octopus fishing, commercial deep-sea fishing, and sponge fishing. Roughly 300 more were abroad in the Greek merchant marine. Another 50 to 100 men, depending on the season, worked in drydock and repair facilities. In all, about one third of the male work force, ages twenty to sixty-four, was active in sea trades. The most important of these was sponge fishing.

The exact date when Kalymnians began fishing for sponges is lost in antiquity, but there can be no doubt that it has been the mark of the island for centuries. When Suleiman II captured the Dodecanese in 1521, the Kalymnian surrender was marked by the sending of sponges and loaves of fine white bread. The symbolism of this gift, it is said, was not lost on the Sultan: Kalymnians neither grow grain, nor are they poor; they fish for sponges and buy only the best flour (Myres, 1944). The Sultan was obviously impressed; he granted Kalymnians unlimited use of the mainland for the

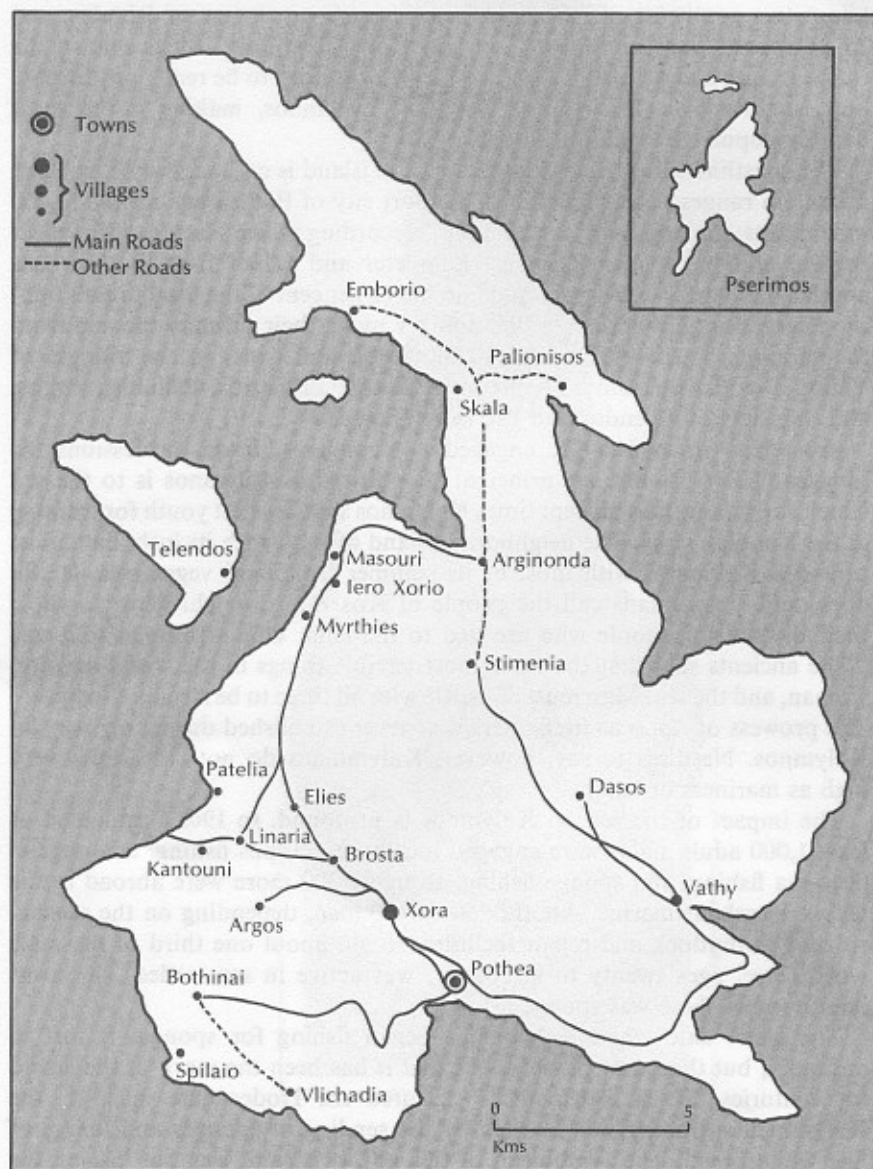


FIGURE 3. Kalymnos.



**Table 1**  
 Surveys of Artisans and Shops on Kalymnos\*

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Coffee grinders	2
Knitting shops	3
Furniture makers	8
Cobblers	25
Machine shops	8
Contractors	4
Mosaic works	1
Electrical repair	3
Sweet shops	9
Tailors	8
Woodworkers	13
Bakeries	11
Metal-working shops	7
Soap makers	1
Appliance sales	3
Lamp makers	2
Distillers	9 (including tavern owners)
Paint shops	3
Paint makers	1
Salt grinder	3
Tanners	5 (including one chamois factory)
Blanket makers	1
Meat shops	9 (including three frozen-meat stores)
Floor makers	4
Weavers	2
Ships ways	2
Jewelry shops	5
Goldsmiths	3
Ice makers	1
Wine shops	2
Auto repair	2
Auto rental	1
Motorcycle sales	2
Watchmakers	4
Barbers	15
Sugar refineries	1
Rug makers	1
Dry cleaners	2
Kerchief makers	1
Spice packaging	1
Restaurants	14
Movie theaters	4 (two summer and two winter)
Hotels	6 (accommodating 350 persons, excluding rooms for tourists and traveling salesmen)
Sponge merchants	50

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\* Source: Chamber of Commerce, Kalymnos (1964).





Dolphins and other hazards mean constant repair of fishing nets.

collection of firewood, gave them almost complete autonomy in the regulation of internal affairs, and collected very little tribute aside from sponges. At that time sponges were as valued as silks, perfumes, and spices, and many islands in the area (Kastellorizo, Symi, Khalki) were active in production. In 1830 the tribute collected from the Dodecanese was about \$10,000, barely enough to maintain the mosques on Kos and Rhodes. So long as the Ottomans did not interfere with their religion or customs, the Dodecanesians coexisted well with their rulers, as they had with the knights of St. John, the Genoese, the Venetians, the Byzantines, and the Romans before them.

The industrial revolution created great demands for sponges. By 1840 the major sponge islands of the Aegean (including Aegina and other non-Dodecanese islands) had fished out the Greek and Turkish waters. In that year Kalymnians and Symians simultaneously discovered vast resources off the coast of Derna, Libya. The discovery prompted further searches. In 1860 great new beds of sponges were found off the coast of Benghazi, and in the next twenty years they were found extending all the way west to Tunis. Between 1840 and 1890 the sponge-fishing islands really began to prosper. There were markets for sponges and people with a long tradition of sponge fishing to supply those markets. The populations of the sponge islands began to climb (Table 2).

**Table 2**  
Population of the Dodecanese, 1821-1947\*

Island	Area in Km <sup>2</sup>	1821- 1828	1850	1900	1910	1912	1917	1922	1931	1936	1941	1947	Inhabitants per Km <sup>2</sup>	
													1910	1947
Rhodes	1412.0	31,500	33,000	43,000	54,000	54,000	36,560	45,000	54,800	59,933	61,567	55,181	31.8	39.0
Karpathos	306.0	7,500	8,000	8,500	9,500	8,527	6,930	7,500	6,580	7,861	7,231	7,416	31.0	25.9
Kos	288.7	11,000	12,500	15,700	16,500	14,570	15,070	16,000	21,170	19,845	18,231	18,545	57.1	62.6
Kalymnos	128.2	5,000	7,600	19,400	20,000	23,200	14,950	15,500	16,500	15,439	14,872	12,227	162.2	95.3
Astypalia	113.6	3,000	3,000	2,500	2,000	1,780	1,380	1,370	11,610	1,754	1,771	1,800	17.6	15.8
Leros	71.5	4,500	4,600	6,400	6,000	6,000	4,880	4,000	5,500	7,159	10,979	6,161	96.5	86.1
Kasos	69.4	5,250	5,600	6,500	6,700	5,700	1,850	1,760	1,920	1,904	1,367	1,336	96.5	19.2
Tilos	64.3	2,000	1,950	1,900	1,850	1,300	2,100	1,160	1,230	1,226	1,131	1,085	28.7	16.8
Symi	63.6	6,250	8,000	18,000	19,500	2,450	7,300	7,000	9,460	8,182	4,147	4,090	306.6	64.3
Patmos	57.1	4,500	4,000	4,000	3,700	2,720	2,660	2,550	2,990	3,208	2,665	2,736	64.7	47.9
Nisyros	48.0	3,300	3,500	4,700	5,000	5,000	4,300	3,160	3,430	3,404	2,592	2,499	104.1	52.0
Khalki	30.3	1,200	1,500	2,900	3,000	3,215	2,200	1,300	1,790	1,470	754	731	99.0	24.1
Lipsi	17.4	—	—	—	—	—	—	560	960	981	817	873	—	50.1
Kastellorizo	11.5	2,500	3,500	8,500	9,000	4,020	2,000	2,700	2,230	2,269	1,111	663	782.6	57.6
Total	2,681.6	85,000	96,750	142,000	149,530	143,82	102,180	109,560	130,830	132,638	129,285	115,343	55.7	43.0

\* Source: Agapitedes, 1946, p. 417.

During the seven months of good weather from April through October, the sponge fleet sailed south to North Africa and fished what they could, using the primitive methods of breath-hold diving. To operate at great depths a man would plummet to the bottom, holding a flat, elliptical 15-kilogram marble slab before him. The slab had a hole in one rounded end where a line was attached from the boat. The man had time to pick up one or two sponges before he had to tug on the line, signaling that he had to be pulled back up rapidly for air. The system was crude, but it worked. In spite of the fact that all divers suffered broken ear and nasal membranes, as well as impaired vision, they continued to work at depths of 30 to 70 meters in search of what was referred to as the "golden fleece of the sea." Aprocryphal stories of breath-holding dives to 90 meters are still part of coffeehouse folklore. The market price for sponges was very high. Profits were limited only by the size of the harvest and this was limited only by technology.

In 1885, the *skafandra*, or deep-sea diving suit, was introduced from France. The men were afraid of the contraption (the story has it that it took a woman to try it first in order to shame the men into using it), but they tested it and the results were, as might be expected, phenomenal. Sponge production rose dramatically and new elements of danger were introduced into diving: the bends and embolisms.<sup>2</sup> But this did not deter the Dodecanesians. In what must have been one of the most striking cases of all time of the effects of new technology, Symi and Kalymnos swelled with migrants from other islands and the nearby Turkish mainland, where large Greek colonies existed until 1922. Between 1850 and 1912, the populations of Kalymnos rose from 7,600 to over 23,000; Symi's rose from 8,000 to over 22,000.

The Pothea-Xora area grew into an urban center. Until 1804 the small Kalymnian population had lived in Kastro, a small mountain fortress which protected the citizens from recurrent pirate attacks during the Middle Ages. Then Xora became the capital and a few people cautiously built homes around the perfect harbor of Pothea. By 1900 land prices in Pothea were equal to those of major European cities (Myres, 1944). Sponge markets flourished. Processing plants proliferated as people took advantage of the boom by investing their capital in sponge stocks for resale in England, Germany, and France. Boats were built as rapidly as artisans could turn them out. Sponge fishing became a way of life, and money flowed into Kalymnos as sponges flowed out.

The continuous input of foreign capital encouraged the growth of merchan-

<sup>2</sup> For a full discussion of Kalymnian casualties from diving, see Bernard, 1967. Briefly, bends are caused by supersaturation of the blood with nitrogen inhaled in normal air under pressure. When the pressure is released rapidly, as when a diver ascends rapidly, the nitrogen "boils" and escapes in bubbles. The bubbles may damage nerve tissue, causing death or paralysis. The phenomenon is akin to what happens when a bottle of warm beer is opened quickly. Air embolisms are caused by the diver's failure to exhale when ascending. Under reduced pressure the volume of air in the lungs expands, causing rupture damage.

dising and the opening of shops. Kalymnos became the second largest trading center in the Dodecanese, the first being Rhodes. It was already the administrative center of all the islands north of Kos (Figure 1), as well as the center of a diocese and the seat of the Metropolitan (Bishop) of the northern Dodecanese. In addition, sponge fishermen placed a high value on education. Kasperson has shown that Kalymnos and Symi both produced an inordinate number of poets, artists, sculptors, statesmen, teachers, doctors, dentists, and lawyers. It was the Golden Age of sponge fishing (Kasperson, 1966).

The first crisis of the twentieth century for Dodecanesian sponge fishing occurred in 1912, when the Italians captured the Dodecanese from the Ottomans. They were greeted as liberators and brothers in Christianity (Shear, 1943), and they proclaimed the islands would shortly be given free choice of political association. Three years later, in 1915, Italy suspended all sponge fishing off the coast of Libya (which they had also taken from the Turks), ostensibly for military reasons. Italian boats were encouraged to take up sponge production. In the secret Treaty of London (April, 1915), Italy was promised full sovereignty over the Dodecanese in return for her support of the Allies in the war (Wambaugh, 1943).

These events had dramatic effects. The population of Symi fell by 67 per cent in five years (Table 2). The largest sponge production flotilla in the world (over 200 vessels) vanished from Symi. There are no sponge boats there today, and the population is about 2,500 persons.

The sponge islands of Greece fared better than the Italian Dodecanese. In time, though, with the coming of synthetics, they too dropped from the picture. In 1930 Aegina (Figure 2) had an estimated fifty boats in operation, most of which fished the North African sponge grounds after 1920, when wartime restrictions were lifted. In 1965 only three boats registered at Aegina; in 1970 there were none. Hydra (Figure 2) had its own sponge fleet. In 1950 fourteen vessels registered for sponge fishing out of that island. In 1954 there were only four. By 1960 not a single boat remained.

In the Dodecanese several islands came through World War I with relatively less population decline than Symi. In 1925 there were an estimated thirty-five boats in operation on Khalki. World War II initiated an exodus. By 1947 there were only 731 people on the island. In 1950 only two sponge boats remained.

Kalymnos fared best. The flexible and diversified trading economy developed during the second half of the nineteenth century helped prevent a mass exodus between 1912 and 1917. In addition to trade and professionalism, Kalymnians developed a small, first-class citrus industry and several good-sized olive groves. Some men, of course, went into the merchant marine, a perennial source of employment throughout the Aegean. From about 1900 to 1940 there was a cigarette-rolling industry employing 800 women. Thirty-five per cent of the population left when the Italians closed the North African sponge grounds, but around 15,000 stayed right up to the present day. Sponge fishing continued in Aegean waters until after World War I, when North

Africa was reopened. In 1922 a new diving system was introduced, called *fernez*, after the man who invented it. It employed a face mask and an attached air hose, but no dry suit. The diver went down nude with the marble slab,

Table 3

Output, Number of Vessels and Persons Employed in Greek Sponge Fishing, 1948-1964\*

Year	Sponge Output (kg)	Vessels	Divers and Crew	Yield/Man(kg)
1948	117,760	216	1,951	60
1949	161,280	229	2,706	60
1950	168,960	224	2,607	65
1951	143,360	194	1,970	73
1952	128,266	186	1,780	72
1953	63,836	120	1,108	58
1954	126,592	143	1,710	74
1955	135,484	159	1,614	84
1956	120,696	149	1,484	81
1957	120,184	169	1,634	74
1958	108,250	158	1,488	73
1959	100,000	105	1,186	84
1960	85,913	83	844	102
1961	70,645	87	739	96
1962	89,948	110	1,047	86
1963	97,011	113	1,125	86
1964	97,970	117	900	109

\* National Statistical Service of Greece.

but could stay down for long periods. The system has remained unchanged except for the adaptation of modern wetsuits against the cold. In 1928 the marine engine came to Kalymnos. Hundreds of oarsmen were put out of work, but production was increased with the new mobility.

Between 1910 and 1940 Kalymnians produced more than 80 metric tons of sponge a year. A 5.5 per cent municipal tax on sponge sales produced revenues of more than \$45,000 a year for payment of teachers and sanitation workers, for dock maintenance, and for local government (Zirounis, n.d.). The sponge merchants grew very wealthy. The richest of them all, a Mr. Boubalis, became a legend in his own time, building an old-age sanitarium, a hospital, two high schools, a grade school, and an orphanage.

The affluence of Kalymnos was unchallenged—until the cellulose sponge appeared in the United States soon after World War II. Housewives turned immediately to the synthetics, which were cheaper than marine sponges and which came in convenient sizes, shapes, and colors. Sponge fishing went into

world-wide decline. Production in Greece fell from 168,960 kilograms in 1950 to 97,970 kilograms in 1964 (Table 3). But Kalymnos alone produced 56,102 kilograms, or 57 per cent of the national output in 1964, and during the general world slump in sponge fishing of the 1960's, the island maintained both production and export of sponges, and actually increased the dollar value of its exports (Table 4). Disparate events combined to make this possible.

**Table 4**  
Kalymnian Exports, 1958-1969

Year	Kilograms Exported	Value in Dollars	Average Price/Kg
1958	53,499	1,081,698	20.22
1961	67,845	1,335,307	19.38
1962	65,768	1,267,923	19.27
1963	68,653	1,498,904	21.83
1964	62,288	1,337,763	20.51
1968	61,167	1,846,012	30.18
1969	53,143	1,510,503	28.42

In 1906, six years before the Italian occupation of the Dodecanese, two sponge-diving brothers from Aegina discovered 9,000 square miles of unexploited sponge beds in accessible waters out to 25 fathoms off the west coast of Florida. They founded the Greek colony of Tarpon Springs, 26 miles from Tampa. As the repression of the Italian occupation grew in the Dodecanese, many of the sponge fishermen from Kalymnos, Symi, and Khalki migrated to Tarpon Springs. By the beginning of World War I more than 2,000 Greeks (almost all men) had established themselves in the colony. In the twenty years prior to the end of World War II Tarpon Springs became the world's largest producer (Bernard, 1965).

In 1939 a blight, known as the red tide, made its appearance in the Caribbean. The disease, whose cause is as yet unknown, was recorded several times during the nineteenth and early twentieth centuries. There is no effective control of the tide, which kills all marine life in its path. In 1939 it destroyed dozens of small shrimping, clamming, crab-fishing, and sponge-harvesting operations in the Bahamas. The outbreak lasted a year. It swept up past Cuba and dissipated just south of the United States, leaving Florida's shores untouched.

It was precisely at this time that a method was found of converting the pulp of wood wastes into the synthetic cellulose sponge. Great industrial resources were mobilized for the development of this new product and for the improvement of its then poor absorption and lasting qualities.

Soon thereafter, World War II began in Europe, and Mediterranean sponge production (along with all international shipping) was again restricted. The demand for sponge for industrial uses was at an all-time high in the United States. American involvement in the world conflict turned the research and production efforts of the major chemical companies to war materials. Thus the Caribbean industry had been wiped out by the red tide, the Mediterranean was cut off, and the development of the synthetic sponge was stalled by war: Tarpon Springs was left with a virtual monopoly on the American sponge markets.

In 1946, 200 vessels were in operation, and nearly \$3 million changed hands on the Tarpon Springs Exchange. Greek coffeehouses and nightclubs featuring bouzouki music and dancing girls flourished in the free-spending maritime atmosphere. Greek culture in general enjoyed a renaissance in its American setting. Because immigration from Greece was cut off during those years, the boom went on with no substantial increase in population, and per capita income skyrocketed.

The prosperity was short-lived. In 1947 the red tide struck again, this time off the west coast of Florida. Tons of dead marine life were washed ashore on the beaches of St. Petersburg, according to local newspapers. The largest and most lucrative sponge grounds in the world were decimated. The disease came from the tip of Florida and worked its way north. Sponge boats tried



Washing and bleaching of sponges provides work for older men on the island.



to work ahead of the tide, but without success. Sponges crumbled to dust in the divers' hands as they pulled them off the host rock. In 1948 only \$1 million changed hands on the Tarpon Springs Sponge Exchange, by 1953 less than \$250,000.

Almost overnight the course of world sponge fishing was altered. Demands for natural sponges for industry remained high in the United States. Greek sponge merchants in Tarpon Springs, New York, Chicago, St. Louis, and other cities turned once again to the Mediterranean. Many of the American merchants had relatives on Kalymnos, and direct family ties became rapid channels of communication for market demands. Postwar political events in Greece helped Kalymnos meet these new market demands from the United States.

In 1948 the Dodecanese islands, after 700 years of foreign rule, were awarded to Greece by the United Nations. The Agricultural Bank of Greece immediately subsidized farming and fishing there with the infusion of capital development funds and loans, and Kalymnians were repatriated from Gaza where they had been wartime refugees. Thus capital, labor resources, waiting export markets and tradition set the stage for a resurgence of the sponge industry which had been curtailed by war. While the cellulose sponge priced most islands out of the market (see page 289), Kalymnian sponge fishing survived again.

In 1950, 23 per cent of the estimated male labor force was engaged in sponge production; another 15 per cent worked in processing and distribution. Jobs such as bleaching and trimming were a source of employment for older seamen who could no longer stand the rigors of six months a year at sea.

In 1958 it appeared that the demand for natural sponges had stabilized. The housewife markets had been lost, but synthetics still had not been perfected for use in many industries. The washing trades (automobiles, windows, factories), the ceramic and leather-tanning industries, and hospitals continued to use natural sponges for their absorptive, textural, and natural hygienic properties. Kalymnos had a partial monopoly on sponge production and prospects looked good for the future.

It was false hope. Everything depended on the absence of mass synthetic production in Europe. In 1950 cellulose sponges were manufactured in limited quantities in Sweden. By 1958 Germany, France, and Belgium had developed fresh patents of their own. The industrial producers of synthetics possessed almost unlimited capital for advertising and merchandising, as well as for research and development. Markets for marine sponge began to shrink again, boats lay in dry dock, and on Kalymnos divers, captains, and buyers alike were faced with decisions for the future.

The sponge buyers were able to liquidate some of their holdings in order to obtain capital for reinvestment. The favorite form of investment became, and continues to be, the building of hotels on beachfront property. An organization of merchants and professional men, including doctors and lawyers, joined with the wealthiest of the sponge buyers to form an organization



During the winter the sponge boats are hauled out of the water and fixed for the following summer's trip. However, many boats have recently remained in drydock year round as the industry has declined.

for the promotion of tourism. They published maps and brochures. Some of the buyers had warehouses and distribution facilities in France, Spain, Germany, or England. They were able to supply these warehouses with sponges bought in Bodrum, Turkey, only a few hours away by small craft. As the industry languished in Kalymnos, the obscure sponge business in Bodrum began to flourish. In 1965, 9 metric tons of sponge worth over \$77,000 was bought by Kalymnian buyers. Other buyers decided to liquidate their business and retire. One man, who is today among the most successful of the Kalymnian sponge merchants, converted his island warehouse into a factory for the manufacture of synthetic sponge, cut from foam blocks he imported from Belgium and resold in France. The irony of his success is lost on no one in Kalymnos.

The buyers were able to implement their decisions easily, but the captains were not so fortunate. Their capital was tied up in hardware such as boats,

diving equipment, and the like, and no one wanted to buy a used sponge boat. Their cash reserves were no match for those of the buyers, so some of the captains retired. Others managed to convert their boats into small cargo vessels for interisland transport of fruits and vegetables. Like the buyers, those that could stand the pressure remained in the business.

They complained they could no longer make decent profits from sponges. In fact, most captains and buyers could do better with their capital in bonds or banks. But, like many farmers in the United States who earn less than 4 per cent on their yearly investment, they consider their work a way of life not to be abandoned lightly.

This was not the case with divers. They had no liquid capital to manipulate, nor were they tied down by ownership of land, warehouses, or boats. They are usually quite young and have shallower roots and fewer ties to break than entrepreneurs like captains and buyers; they deserted Kalymnos in droves. The traditional maternal pressures against leaving the natal home were lacking. Kalymnian mothers of absent sons expressed open relief that their boys were not in the dangerous business of diving. The industrial opportunities in Australia and West Germany in the 1960's were practically inexhaustible, and the Greek merchant marine was becoming the largest in the world (Tables 5 and 6). For the young men there was absolutely nothing to lose. Many of the older divers remained, but even they were attracted overseas when, in the early 1960's, Tarpon Springs began a comeback by importing Kalymnian divers. On Kalymnos a shortage of diving labor replaced the

**Table 5**  
Permanent Migrants from Greece,  
1958-1964\*†

Year	Number of Migrants (Approximate)
1958	25,000
1959	22,000
1960	47,000
1961	58,000
1962	84,000
1963	100,000
1964	107,000

\* Source: National Statistical Service of Greece.

† Does not include "temporary" migrants, most of whom are on merchant ships. In 1964 there were 47,616 such migrants, of whom only 1,179 were women and 40,470 were males, 15-45 years of age.

**Table 6**  
**Greek Merchant Ships by Category, 1932-1964\***

Year	(000 GRT) Total Tonnage	Total Number	Tanker and Cargo†	Passenger	Misc.‡
1932	1,430	558	429	115	14
1939	1,837	557	500	56	21
1946	502	138	122	14	2
1952	1,270	489	421	38	30
1957	1,563	549	463	46	40
1958	1,905	616	519	49	48
1959	3,344	827	695	65	67
1960	5,384	1,043	907	65	71
1961	6,393	1,165	1,006	68	91
1962	6,774	1,232	1,047	74	111
1963	6,938	1,314	1,110	79	125
1964	7,249	1,422	1,196	97	149

\* Source: National Statistical Service of Greece.

† The National Statistical Service of Greece lists only Greek flag vessels. Greek ships flying convenience flags (Panama, Liberia) account for more than twice the tonnage shown here.

‡ Including tugs, cable ships, international water fishing boats, and so on.

synthetics as the primary enemy of sponge fishing and, ironically, Kalymnians and Kalymnian-Americans were set against one another in a battle for economic survival. On Kalymnos the traditional relationship between divers and captains was almost reversed and the switch nearly destroyed sponge fishing entirely.

## PLATIKA

Until 1937 the sponge operations were run on shares. Each diver got a unit share of the profits; the deck crew a half share each; the captain two shares, one for himself and one for his boat. After a sponge sale the captain took the costs of the trip off the gross profits before shares were divided. He alone determined the operation costs. The net profits to be divided were what the captain said they were. Apparently, the system was badly abused.

A contract system was instituted (Dodecanese law 560/1937, Koundouris, 21) to protect the interests of the divers. Deck crew members received a fixed sum under the new law as their total salary for the sponge-fishing season. They got part of their wages in advance to pay for separate maintenance of families while they were at sea. Divers got a percentage of their production

rather than a fixed sum, based on experience, capability, and bargaining skill. They, too, would be given a part of their earnings in advance. At the end of the trip, when the sponges were sold by the captains, each diver would then receive his share, depending on the size of the contract he had with the captain and how much he had taken in advance.

Ideally, an average diver of five years' experience might negotiate a 42 per cent contract with a captain. He would expect to catch 165 kilos of dry sponge and would take 26,000 drachmas in advance, as established by the Agricultural Bank and by law (Table 7). At sea, the diver would keep his

**Table 7**  
Legally Established Limits for Advanced Payment  
to Divers\*†

Type of Equipment	Class of Diver	Platika Limit
<i>Foreign Waters</i>		
Skafandra and fernez	A'	26,000 dx.
	B'	22,000
	C'	18,000
Narghile and nude divers and bottle divers	A'	34,200
	B'	19,800
	C'	16,200
<i>Greek Waters—All Types of Equipment</i>		
	A'	17,100
	B'	15,300
	C'	13,500

\* Source: Agricultural Bank of Greece.

† In depths up to 18 fathoms the diver must contract for a minimum of 26 per cent of his own catch. In depths beyond 18 fathoms the minimum allowable contract is 28 per cent. The actual mean contract in 1964 was 35 per cent, with variations ranging from 30 per cent to 50 per cent for a few divers. The maximum percentage of a contract allowed by the Agricultural Bank for loan purposes is 43 per cent. This was exceeded in numerous cases.

sponge on strings marked with his personal symbol—a coin, a swatch of cloth, a piece of leather—so the captain could keep track of his production. If the captain should sell the sponge catch of all his men at an average of 700 drachmas per kilo, then the above diver would receive 22,510 drachmas

( $165 \times 700 \times 0.42 - 26,000$ ) at the end of the sponge market, usually around mid-December.

The new system created its own problems. Kalymnian folklore is filled with grizzly stories of death at sea in the old days when there was supposedly no limit to the captain's power over his men. The captains ruled their boats absolutely and forced their men to dive into dangerously deep waters. Among men who dived with deep-sea gear, casualty rates are said to have been astronomical. The greed of the buyers, who demanded sponge for their lucrative foreign markets, was transferred to the captains who overworked their men to the point of death. This is the way the picture is usually painted on Kalymnos about life in the sponge business "in the old days."

The nature of the industry and its socioeconomic structure ring true, for there is nothing so intimately "Greek" as the game of mutual social and economic exploitation. The most vivid explanation of this game was what one informant called the "drowning-man theory of Greek life." "Picture, if you will," he said, "humanity drowning shoulder to shoulder in the sea—such that to save oneself the only way is to put your right hand on the shoulder of the man to your right and your left hand on the shoulder of the man to your left and push, thereby keeping yourself above water."

Many writers have noticed this behavior (Friedl, Campbell, Vasiliou, and so on), and Campbell (1968:339–40) has aptly shown its basis in the values and child-rearing practices of Greece.<sup>3</sup> He says,

*The members of a family are united in the face of a hostile world. . . . The mother who in her person is the moral and expressive center of family life, continues . . . throughout her life to pour an almost unconditional affection and admiration upon her children; especially her sons, in contrast (and perhaps in compensation for) the often pragmatic relations with her husband. But, as a means to control her children, a mother also resorts to stratagems of deceit and promised rewards which are rarely delivered. Although the transparent dishonesty is soon comprehended by an intelligent child, his dependence forces him to accept the terms and idiom of this behavior. Thus, attitudes of suspicion and cunning which in later life are to be so appropriate in dealings with unrelated persons are in part learned within the context of the relationship that stands for the quintessence of love and confidence.*

In fact, it is not only common for a man to find these qualities appropriate, but the nature of family life in Greece makes a virtue of exploitation of everyone but godparents and close friends, close neighbors, and "poor people." Aside from the people in one's "in-group," as George Vasiliou calls it,

<sup>3</sup> Vasiliou has also addressed himself to this issue, saying that Greeks have "in-groups" composed of family, ritual kin, and close friends who are not to be exploited; everyone else is part of the "out-group" and is fair game. He also gives great weight to the Turkish occupation of Greece and the successful use of cunning to prevent de-Hellenization during those 375 years of Ottoman rule. Campbell does not emphasize male-female role conflict as much as I have (Bernard, 1967) in this development of the mutually exploitative behavior exhibited by adult Greek men and women. But both the historical and sex-role-conflict explanations are still open to serious question and testing, so I have left them out of this discussion.

everyone else is a *ksenos*, or stranger,<sup>4</sup> and fair game. Thus it did not take the captains long to find ways of exploiting divers within the framework of the new law.<sup>5</sup> The tactics were not one-sided, however. If the new law did not stop captains from cheating their divers, it at least gave the divers equal opportunity to cheat the captains. *Platika* was this opportunity.

The proper Greek word for prepayment is *prokatavoli*. It carries the connotation that the advance is a downpayment and that the balance of the wages will be paid at the end of the sponge trip. On Kalymnos this is not the case; divers receive *all* their year's earnings, or *platika*, in advance.

The system works in this manner: A typical sponge-fishing expedition comprises two diving boats and a mother ship on which food supplies and processed sponges are stored during the six months' voyage. The total crew averages between thirty-five and forty men. Excluding the cost of this basic hardware and its depreciation, the cost of running such an expedition is roughly 850,000 drachmas or \$28,000.

Ideally, the crew and divers are signed on by March. In April the boats are provisioned with food and fuel for the half-year voyage ahead. By Easter the boats have left for North Africa, where they remain until fall weather drives them home. When the expedition returns in October or November, the sponge market begins. By January the sponges have changed hands from the captains to the buyers; the divers have begun six months of ostentatious leisure; the captains have paid off their debts to the bank and to the private financiers, banked their profits, and resumed their search for capital to finance the next trip.

The captains begin early in January to negotiate loans from the Agricultural Bank for the cost of the trip. The bank is only licensed to lend the captains a part of the total cost, because as we have seen, the law stipulates that only part of a man's wages may be paid in advance (compare Table 8, line 1, with Table 9, total). Captains are forced to borrow the balance from the buyers at 20 to 40 per cent annual interest.

In 1965 the largest *platika* received was 90,000 dx. On a 50 per cent contract a man would have to catch 257 kilos of sponge selling at 700 drachmas a kilo just to come out even ( $257 \times 700 \times 0.50$ ). This is more than any man could produce. The captain who paid this *platika* took a theoretical "loss" in order to make some actual gain. A novice diver might receive only 20,000

<sup>4</sup> This word is one of the most difficult I have found to translate into English. Its use varies, depending on the nature of the "threat" one feels. To the people of a village, when they stand together against another village, the outsiders are all *ksenoi*. To the people of a neighborhood, those of adjacent neighborhoods or parishes are *ksenoi*. If a close family friend or godparent betrays the trust of his in-group by exploiting his friend, it may be said, "Well, he was a *ksenos* anyway; we should have known better than to trust him."

<sup>5</sup> In an effort to establish bonds which prevent exploitation, divers may ask captains to baptize their children, or captains may ask buyers. It is very rare for divers to ask buyers; and in fact, there seem to be fewer cases of captains asking buyers than divers asking captains. These differences appear related to social distance and a rather intuitive approach to the "appropriateness" of asking someone very much out of one's social class.



Table 8

## Agricultural Bank Loan Schedule for a Captain Employing Ten Divers\*

Expense	Amount
1. Divers' advance pay. For ten divers. Four first-class divers, three each second and third class (see Table 7).	224,000 dx.
2. Crew's wages.	104,265 dx.
3. Food for sponge boat crew and divers and for mother ship crew for six months.	92,820 dx.
4. Fuel, oil, and grease for mother ship and sponge boat.	20,160 dx.
5. Licenses, port pilot fees, etc.	41,000 dx.
6. Insurance for vessels and sponge catch.	13,000 dx.
7. Maintenance and ship's provisions (compass, maps, lines, pulleys, hardware, etc.).	45,000 dx.
8. Mother ship (rental, crew salaries).	105,000 dx.
9. Miscellaneous unforeseen expenses.	6,755 dx.
10. Emergency fund held in abeyance at the bank.	16,000 dx.
Total	668,000 dx.

\* Source: Agricultural Bank of Greece, Kalymnos Branch, 1965.

Table 9

Typical *Platika* Payments to Ten Divers on a Sponge Boat

Diver	Experience	Platika (advance)
1	Novice	30,000 dx.
2	Novice	25,000 dx.
3	Three years	37,500 dx.
4	Four years	40,000 dx.
5	Four years	42,000 dx.
6	Seventeen years	45,000 dx.
7	Twenty-two years	47,500 dx.
8	Seven years	65,000 dx.
9	Eight years	70,000 dx.
10	Twelve years	55,000 dx.
Total		457,000 dx.

drachmas in *platika*; with a minimum 35 per cent contract, and with sponges selling at 700 drachmas per kilo, he would have to harvest 86 kilos ( $86 \times 700 \times 0.35$ ) to come out even. A novice might not make up even that small quota. Even if he does, the most the captain can expect in profits is 39,135 dx. ( $86 \times 700 \times 0.65$ ). A master diver can expect to catch around 205 kilos in a

good year. If the man receiving 90,000 drachmas makes this quota, the captain's actual profit is 53,500 drachmas ( $205 \times 700 - 90,000$ ), even though the *platika* is actually 63 per cent of the catch ( $205 \times 700 \times 0.63 \times 90,405$ ), and thus is an illegal contract. In a sense, of course, the captain is cheated. By law the diver is responsible only for fulfilling the *prokatavoli*, or 26,000 drachmas. If he failed to make the expected gain, the captain could lower the *platika* offer the next year and spread the word among other captains to do likewise. But this was a rarely used sanction, for *platika* was a debt of honor. If a diver did not fulfill the debt, it was usually not because he slacked off. In this actual case the diver died partway through the trip. He had already made enough to fulfill the *prokatavoli*. Theoretically, the money beyond the *prokatavoli* had never been paid. The captain had no recourse but to write off a portion of the *platika* at a huge loss.

Each diver naturally demands as much *platika* as he can get, the amount being a linear measure of his virility. It is computed according to the following formula: the current market price of sponge per kilo, plus about 5 per cent inflation on next year's price. This is multiplied by the number of kilos a man expects to produce based on his previous record plus a small yearly increase during the first six or eight years of his career as he reaches a maximum production plateau. And finally, this is in turn multiplied by the maximum percentage contract a diver feels he can negotiate with a captain. A few thousand drachmas are added as a bargaining cushion.

Whereas deck crews and nondiving personnel tend to remain fairly stable from year to year, the diving population is fickle, shifting among the various captains every season. When a diver is approached by a captain to sign on, he demands his prereckoned earnings in advance. He asserts his right to the *platika* by pointing to the continuing high casualty rates (Table 10).

When the boats are at sea, they work all day some miles from the mother ship. When they return at night for food, they hand over the day's catch to a special crew which processes it and reports the dry weight to the captain. Every three or four weeks the divers are given a tally of their progress by the captain. But there is no way to check the captain's figures. If a high-*platika* diver is producing poorly or if a novice diver turns out to be a prodigy, the captain shuffles the sponge around to cover his risks. This way he is owed no *platika*, nor does he owe extra wages at the end of the trip.

Divers rationalize their scheming to gain *platika* by saying, "Everything you get in advance is everything you're going to get." In spite of this, there is normally more sponge produced than the cost of the *platika*, so captains usually wind up owing their men money.<sup>6</sup> The captain's "bonus wage" debt is reduced through collusion with the buyers against the divers.

<sup>6</sup> Consider a diver who negotiates a 40 per cent contract and 54,000 drachmas in *platika*, based on the assumption that he will catch 192 kilos of sponge selling at 700 drachmas per kilo. He catches 211. Thirteen kilos are secretly juggled to make up the *platika* debt of a similarly contracted man who produced only 179. Ideally, the captain still owes the first diver 40 per cent of 6 kilos times 700 drachmas, or 1,680 drachmas.

**Table 10**  
**Casualty Rates for Kalymnian Divers\***

Year	Divers	No. of Boats	Avg. No. Divers per Boat	Paralyses	Deaths	Casualty Rate (%)
1950	513	56	9.16	15	0	2.92
1951	429	48	8.94	12	3	3.50
1952	409	42	9.74	12	8	4.89
1953	305	34	8.97	7	1	2.62
1954	386	41	9.41	9	2	2.85
1955	409	44	9.30	10	2	2.93
1956	342	41	8.35	10	1	2.92
1957	386	44	8.77	11	6	4.40
1958	384	43	8.93	12	2	3.65
1959	351	36	9.75	8	0	2.28
1960	279	29	9.62	11	1	4.30
1961	247	28	8.82	7	1	3.24
1962	240	25	9.60	7	1	3.33
1963	257	39	6.60	7	3	3.89
1964	235	36	6.53	1	8	3.83
1965	197	27	7.30	9	6	7.61
1966	94	15	6.27	3	0	3.19
1967	229	39	5.87	6	1	3.05
1968	199	38	5.23	7	1	4.02
1969	250	44	5.68	3	1	1.60

\* Sources: Harbor Master's office, Kalymnos, and Agricultural Bank of Greece for 1967, 1968, and 1969.

In a typical sponge sale there is a direct conflict of interest. The captain demands a price and the buyer counters with a lower one. When negotiations reach an impasse, the captain agrees to accept the buyer's "final offer" of, say, 700 drachmas per kilo. He insists he is capitulating and that he really should be getting 710. The buyer lets the record state that only 670 drachmas were paid. The captain does not account to his divers for the 30 drachmas difference, and this puts money into the captain's pockets when payments beyond *platika* are computed.

In the end it seemed that everyone came out fairly even. In the Kalymnian world it appeared almost heresy to replace this system with one less taxing on the wits. Some men (divers as well as captains) went so far as to say that life otherwise would be dull. They were proud of the Kalymnian tradition and their genuine fame throughout the Dodecanese as slick businessmen (the inhabitants of Kos were especially vocal on this point), and they seemed to relish the idea that non-Kalymnians could not operate successfully with a *platika* system such as theirs.

*Platika* was more than an economic plan, of course. It was a total social

experience for the sponge men and for other Kalymnians who extended credit to the divers and to their wives while the men were at sea. A complex of myths, values, social norms, and physical realities justified it. People battled one another like chess players, to be sure. But the system contained its own set of brakes that kept the actual extortion behavior within fairly well-understood limits. Buyers held captains in debt at usurious rates; captains distributed the wealth of the buyers and the Agricultural Bank to their crews, chandlers, merchants, machinists, and divers whom they held in debt with *platika*. Buyers were aristocrats, powerful in local politics. Captains were intermediaries playing both ends against the middle and rewarded with substantial wealth, if not prestige. Divers were rewarded with wealth and a strange kind of homage.

The average diver earns twice in six months what a similarly educated day laborer earns in a year. In addition, he used to enjoy a social license for antisocial behavior, freedom to spend his money hedonistically, and a spurious adulation from society in general as a folk hero. The lower socioeconomic levels of Kalymnos really did admire divers. Small boys listened eagerly to divers' tales of heroics at sea; for them it was an honor to serve a really virile, high-*platika* diver his coffee. On the other hand, the genteel levels of society, the landlubbers, have always had great disdain for the divers as a class. They gossip about the divers' wives, saying that divers are regularly cuckolded during their absence at sea. In fact, there is little justification for the gossip, but it persists. The same landlubbers give the divers a great send-off each year, and a "banquet of love," but in reality they despise them as a

Table 11  
Diving Statistics for Fernez Divers, 1965

Depth (Meters)	Average Time on Bottom (Minutes)	Extreme Bottom Time (Minutes)	Average Ascent (Minutes)	Recommended Ascent†
33	31	45	7.9	20
37	31	50	4.8	25
40	29	40	4.2	25
43	22	29	4.6	20
46	21	38	7.1	30
49	16	28	6.1	25
52	14	19	5.2	15
55	12	16	5.1	20

\* Source: Observation.

† Recommended ascent time (in minutes) is for the average dive, not the extreme. Staying down for 38 minutes at 46 meters, for example, necessitates a 65-minute ascent for safety. Also, these figures are for single dives. Ascent time rises radically when three dives are made in eight or ten hours.

low, uneducated, rowdy class. One merchant said, "The divers are the shame of Kalymnos. How can we ask tourists to come here? What can we show them, a bunch of drunks?" Still, until recently, the colorful antics of divers were more than tolerated, even venerated. In the final analysis they did risk their lives for the economic well-being of Kalymnos. Their casualty rates proved that (Table 10).

As it turns out, the reality of death and paralysis from bends, and its mythological underpinning of Kalymnian landlubber-seafarer social relations, are all tied to *platika*. By taking 60,000 drachmas in advance, a man needs 215 kilos of sponge to fulfill his debt. It is impossible to do this without making at least three dives a day. A boat working in waters of 35 to 40 meters (intermediary depths by Kalymnian standards) would have seven divers, all with similar obligations. Twenty-one dives a day requires each man to spend maximum time on the bottom and surface rapidly. According to the diving statistics I collected at sea in 1965, it is surprising that the casualty rates are not higher (Table 11). They are terrifying enough, however, and they give meaning to the demand for *platika* and all that goes with it.

During the last decade the Greek government has tried to reduce the casualty rates of Kalymnian divers through educational programs,<sup>7</sup> and has failed. It was assumed that the problem of the Kalymnian divers was technological and that proper equipment and training would solve it. Kalymnians *knew* they were risking their lives. They even knew how to lower the risk. There was simply no way of stopping *platika* and the social edifice built on it.

## PLATIKA AND SOCIAL CHANGE

The system was overly complex, adjusted to an insulated socioeconomic climate, and so specialized that it was incapable of change. As divers left and sponge production fell, the power in Kalymnian society reassessed the role of the industry and men in it. Tourism was envisioned enthusiastically, and remittances were on the increase. The mothers of boys who might have died 20 fathoms down were not the only ones glad to see their sons go abroad. The merchants who did not want "drunken bums" around were delighted, especially because it meant an increase in the flow of hard, foreign exchange on Kalymnos with which more overseas consumer goods could be ordered. The divers' license for antisocial behavior was revoked.

In 1960 a law was passed requiring divers to place one half of their legal advance (still only one third or less of the actual *platika*) in a bank under

<sup>7</sup> The only diving school in Greece was opened; today it is inoperative from lack of interest and funds. In 1969 the government formally requested an American naval vessel to call on Kalymnos so the frogmen could instruct the local divers on techniques for avoiding the bends. In 1965 La Spirotechnique, a company which markets diving gear designed by M. Jacques Cousteau, attempted a similar venture.

their wives' names before they could ship out. In 1964 female entertainment was banned in Pothea during the winter months when the sponge fishermen are at home. This has since been relaxed somewhat by allowing nightclubs in outlying villages to open with live entertainment. But at the time the law was passed it was clearly designed to protect the Kalymnian women. The women, in fact, had gone in a group to the mayor's office demanding that something be done. Response to such demands would have been unthinkable ten or fifteen years before.

The overt antagonism and ambivalence between townspeople and sponge fishermen erupted openly. The Kalymnian Tourist Union began propagandizing the "banquet of love" and the departure of the sponge fleet as major tourist attractions. Athenian dignitaries and a few tourists had always been drawn to the affair, but now Kalymnians were systematically exploiting the "sponge festival" along the same lines as the famous yearly "wine festival" at Daphne. In 1965 the authorities on Kalymnos arranged elaborate programs of native dancing and dramatic productions. Great banners were hung over the main quay proclaiming slogans such as, "Come Back Safely, Our Heroes." Hundreds of people crowded the yacht club to attend the banquet and it was a matter of social prestige to be invited. No divers were invited, except for a few officers of the Divers' Union. The same was true in 1970, when the island turned out an elaborate program to honor the visit of the Greek Foreign



The sailing of the sponge fleet is a major ceremony on Kalymnos; recently it has become a tourist attraction. Here Kalymnians sincerely wish their divers "Bon voyage and come back safely."



The exodus of the sponge fleet is a religious and public affair. Dignitaries, priests, and official naval personnel all take part.

Minister on the occasion. The sponge festival has become an ever more important tourist attraction, even as the old-time sponge fishermen have faded from the scene.

Redefinition of the divers' role was the beginning of a reaction that sent ripples through the Kalymnian social structure. *Platika* was a perfect vehicle for increasing the monetary rewards of diving in lieu of the nonmonetary ones which had been taken away. Where 60,000 drachmas in *platika* was astronomical in 1960, by 1965 it had become a common figure. The man who got 90,000 in 1965 was considered a superman. In 1970 many diving contracts were reportedly negotiated between 70,000 and 100,000 drachmas.

Divers started taking small advances from several captains, telling each that he would go to sea with him. Captains retaliated by taking the divers' sea papers as insurance when the first advance was made. Divers continued to negotiate contracts with more than one captain. The second would have to buy the sea papers from the first, the third from the second, and so on. This set the captains against one another in the fight for scarce labor.

Captains made expeditions to other islands and even to Piraeus to recruit divers. One put ads in the Athenian and Piraeus newspapers offering *platika* to men who would become divers. Kos and other nearby agricultural



islands, where disenchanted youths did not want to continue in their fathers' steps as farmers, provided a temporary respite to the shortage. In 1965 more than 40 per cent of the diving population in the sponge fleet was non-Kalymnian.

Traditional relationships between captains and buyers and among buyers changed. Buyers used to control the market and the bargaining behavior of captains because captains were in debt to them. Production scarcities tended to reverse this situation. When the market began in October, the captains would wait to be approached by the buyer or his representative. Once the initial haggling had been accomplished and the two parties had agreed to negotiate a price for the captain's sponge, it was a matter of honor that negotiations would continue until the buyer had bought the sponge or negotiations had been broken off by mutual agreement. Buyers were restrained by custom from approaching a captain with a bid once a captain had opened official negotiations with one of their confrères. Captains were similarly restrained from seeking out new offers after bargaining began with a particular merchant. It was incumbent upon the captain to make sure, during the initial dickering, that the buyer was the one with whom he wanted to continue to deal, before the parties reached an agreement to go to the bargaining table. Now captains pit buyers against one another, initiating negotiations with one, while secretly seeking out counteroffers by others. The buyers respond eagerly and have become more suspicious and exploitative of one another as they compete for scarcer and ever more expensive sponges.<sup>8</sup>

Still further difficulties arose, beginning in 1963, and continuing to the present, when a sponge buyer from Japan came to Kalymnos during the winter market season. Acting through an English-Japanese interpreter, he bought silk sponges (particularly the variety known as *fino-mantapas*) for use in the cosmetic industry as applicators. Because his markets are for piece goods, whereas those of the Kalymnian buyers are generally for bulk weight, the Japanese merchant was able to outbid every Kalymnian by as much as 200 drachmas per kilogram. In 1963 this was 20 per cent more than the established market price.

The intrusion of a non-Kalymnian (not to mention non-Western) buyer into the system created mild havoc. In the traditional market system the buyers always approached the captains. For the Japanese this rule was

<sup>8</sup> A common practice among the buyers is to trade off parts of sponge catches. This may be a cash transaction or a direct barter or a combination of the two. A sponge catch consists of six grades in three species, and buyers negotiate for all grades in a single species at a time. If a buyer acquires several hundred kilograms of a grade of sponge for which he has no market, then another buyer may take them in trade or for cash, or both. One buyer purchased some silk sponge in 1965 from another merchant who had acquired them on consignment from a wholesale customer in Europe who had failed to resell them. The first buyer offered his colleague a direct cash payment to take over the consignment. Prior to this a third buyer had made the second an offer and an agreement had been reached on price. The agreement was broken when the first buyer offered the same price, plus an option on some sponges that the second needed for his own markets. This failure to live up to an agreement would have been an unlikely occurrence a decade ago.

suspended, and captains sought him out to take advantage of his high offer. By the time the local buyers capitulated, it was too late. The outsider had cornered the market on silks. The Kalymnians felt betrayed by their own people; the captains had not given them a chance to make a competitive offer. The captains, however, observing the etiquette of Kalymnos with other Kalymnians, could not approach the buyers first. Because the Japanese buyer did not know any of these rules, there was no loss of ethics in approaching him. This practice has added measurably to the breakdown in buyer-captain relations.

During all of this, sponge economics went out of control. Divers imported from other islands just to work on the sponge boats held no loyalty to Kalymnos or its inhabitants, or its unspoken limits on the mutually exploitative system they called *platika*. And as the landlubbers redefined the social role of divers, and the noneconomic fringe benefits of being a diver disappeared, even local Kalymnians were relieved of the responsibility of maintaining those limits. A tremendous strain was placed on the men, for in spite of the pressure to demand all they could get from the captains, and more, the pressure of *filotimo*, that concept of personal and family honor that is central to all Greekness, remained strong. So the more *platika* they got, the more sponges they needed to fulfill the honor debt and the harder they worked at sea. The casualties of 1965, when the inevitable market crisis came, are the results of the *platika* system run wild and traditional values that have remained constant.

Higher *platika*, high casualty rates among men with *filotimo*, and progressively worse shirking and malingering among men without it, sent captains into increasing debt. Sponge prices skyrocketed. The buyers could not raise their resale price because synthetics were getting better and cheaper. They cut profit margins to meet the captains' prices. In mid-January of 1965, when negotiations for the next trip should have begun, only 30 per cent of the sponge catch had been sold. The buyers had formed a group and had decided not to give in, just to show the captains that they could not get away with yet another price increase. The captains said they could not sell for less because of the inflation of *platika*. The deadlock brought the Undersecretary of Industry (himself a Kalymnian) to the island for a meeting of captains and buyers. He heard both sides and ordered the captains to make some concessions to the buyers. He further ordered the buyers to send their representatives around to the captains' warehouses to search out individually suitable catches and to offer the captains a fair price (slightly below what the captains demanded). The prestige and authority of the Minister got the negotiations started and, with one exception, all catches were sold within a few months. But the resolution of the 1965 crisis did not solve the basic problem of labor shortage, competition from synthetics, runaway *platika*, a breakdown in interpersonal relations among members of the industry, and so on.

In April, 1970, after five more years of near crisis each market season, another deadlock was reached. Boats that should have been preparing to

leave remained in dry dock, and \$1.3 million in sponge lay unsold and baled in the captains' warehouses. The buyers were down to where there was really no room for bargaining. They could still sell every sponge they could get, they claimed, but they could simply not afford to acquire sponges at the current prices demanded by the captains. The latter could not afford to lower their prices any more. Their margins had been genuinely exhausted by *platika* increases. If they could not sell their sponges, they could not pay off their debts; nor could they negotiate further loans to go to sea. The situation was both critical and ludicrous, and everyone knew it. There were sellers with a product to sell and buyers in the market to buy; and no one could afford to do business.

To make matters worse, Egypt and Libya began to think of exploiting the sponge industry themselves. Although these countries have not yet been able to develop a large native industry, they have tried to protect their resources for future development by restricting the number of licenses for fishing by boats under Greek registry in their waters. Since the Arab-Israeli conflict of 1967, Egypt has restricted its waters entirely. In recent years Kalymnians have fished off the Tunisian coast. The prices of the licenses there included the training of native Tunisians aboard Kalymnian vessels, a stipulation acceded to only grudgingly. Cyprus has opened its waters to Kalymnian vessels on occasion, but the political situation there is precarious, so licenses are only issued irregularly. Besides, Cyprus has its own sponge industry to protect. For the most part, the Kalymnians have been forced to fish in local Greek waters where diving is more difficult (because of the mountainous configuration of the ocean floor) and where sponge quality is generally poorer than in North Africa.

## ECONOMIC AND SOCIAL ADJUSTMENT OF KALYMNOS AND THE SPONGE INDUSTRY

In the last twenty years two economically curious things have occurred on Kalymnos. First, there was a decline in marine sponge production that was more rapid than the decline in demand. And second, in spite of the economic and social strains this placed on Kalymnos and its sponge men, the island and sponge fishing continue to thrive, ever better than previously.

The prosperity is reflected, for example, by the fact that in 1970 Kalymnos had at least 200 per cent more telephones than a decade before. There are twice as many users consuming nearly three times the electrical power of 1961 (Table 12). The dollar cost of imports to Kalymnos and Kos rose nearly 500 per cent in the last ten years (Table 13). The most pressing economic problem in Greece is the unfavorable trade balance,<sup>9</sup> which reached \$620

<sup>9</sup> The adjusted trade balance used here refers to the difference, in United States dollars, of imports over exports after receipts from tourists and overseas migrants' remittances have been entered.

**Table 12**  
Use of Electricity on Kalymnos

Year	Households	Kilowatt Hours	Cost (Drachmas)
1961	2,632	1,101,532	1,530,002
1965	3,629	1,710,329	2,271,736
1969	4,841	2,800,000	3,650,000

million in 1968. This was nearly \$75 in the red for every man, woman, and child in the nation. On Kalymnos, on the other hand, the trade balance was about \$120 in the black of hard, convertible foreign currency for every one of the island's inhabitants, or \$600 per family.

The prosperity is translated into building construction. Currency devaluations have made Greeks wary of banks and savings accounts. Rising labor

**Table 13**  
Imports into Kalymnos  
and Kos, 1959-1969\*†

Year	Amount (in dollars)
1959	462,868
1960	595,490
1961	553,685
1962	651,872
1963	903,864
1964	829,284
1965	1,580,502
1968	2,154,126
1969	2,256,313

\* Source: Chamber of Commerce, Kalymnos-Kos.

† Between 1959 and 1961 the dollar value of imports to the two islands rose 48 per cent. Because the Chamber of Commerce does not keep separate records for the two islands, the figures are relative for each island rather than absolute. Personal interviews with the customs house manager on Kalymnos indicate the cost rise of imports in this period are at least the average for the two islands.

costs (up 10 per cent in 1969) and the need to provide every daughter with a house for her dowry have practically made piecemeal construction a cultural tradition. As soon as money is accumulated, land is purchased. When enough money is reaccumulated a foundation is laid, and so on. A never-ending series of government lotteries is in constant competition with brick and mortar for the public sector's liquid resources. Kalymnians paid nearly \$2.5 million for 1,923 building permits between 1966 and 1969.

There are three main reasons for the continuing prosperity of Kalymnos: (1) favorable customs-tax laws, (2) government support of job and revenue-producing public works, and (3) the diversification of the economy, including the reorientation of sponge fishing.

When the Dodecanese were passed to Greece by the United Nations in 1948, the government in Athens passed special tax laws to permit the importation of foreign products to the Dodecanese at greatly reduced rates of duty. Gasoline costs 90 cents a gallon in Athens, the highest price in non-Communist Europe. It is 59 cents in the Dodecanese. Gold, textiles, appliances, foodstuffs—all are at least 20 per cent less in the Dodecanese than in the rest of Greece. Mainlanders are not allowed to buy major items in the Dodecanese and take them home without paying duty. But they can order finished clothing of highly prized English or Italian cloth and they can vacation on the islands where prestige liquors like Scotch whiskey are half or less than in Athens.

In 1968 the twenty-year tax law expired; it had been designed to stimulate growth and tourism and it had done its job very well. It was renewed. Rhodes is one of Greece's main tourist attractions. Kos, the home of Hippocrates, has developed tourism to the point where it has replaced the tomato crop as the largest industry. Kalymnos is beginning to get the overflow, especially the young foreign tourists looking for "off the beaten track" islands. An estimated 10 million drachmas came into Kalymnos in 1968 from tourism (Koundouris, 1968). That figure will probably double in the next five years. This will result partly from the completion of new dock facilities begun in 1965. The first stage was completed in 1967 and permitted direct landing of ocean-going liners. Prior to this, passengers debarked onto small dinghies at sea, which shuttled them to the island. Departures and arrivals at the port of Kalymnos were up 25 per cent between 1967 and 1970, according to the harbor master.

The dock facilities are indicative of a continuing governmental interest in the development of a Kalymnian infrastructure. Since 1960, a 12-kilometer road was paved to Vathy (Figure 3). Another road is being extended to Emborios, though the population between there and Myrthies is less than 100 persons. The Boubalis hospital was nationalized in 1967, and since then has been totally remodeled and stocked with modern equipment at national government expense. A phone system was built linking every village, including Telendos and Pserimos, with Pothea. Two new schools were constructed and a third renovated. Direct loans have been extended to private and municipal

contractors to build tourist accommodations. And all this has gone on through vast political changes at the national level from right to left to extreme right again in less than ten years.

Kalymnos and all the Dodecanese play an important role in the defense of Greece against Turkey. Though the two nations are NATO allies, nightly watches are manned to this day in the Dodecanese against possible attack from the Turkish mainland. There can be no doubt that Greek governments of all political leanings see the development of a Dodecanese infrastructure as having military value.

The social and economic value of such development though is probably just as important. In a country where one fourth of the population lives in the capital, high priority is given to the growth of secondary population centers and the improvement of life in rural areas to cut down internal rural-urban migration. Kalymnos is particularly important, because it is a symbol of pride and virility, with undeniably romantic attributes deriving from the intrepid behavior and casualties of divers. More obviously, the sponge industry is a source of \$1.5 million to \$2 million a year in hard foreign currency. For this reason the central government undertook to save the sponge industry in the crisis of 1970. Though they were unable to negotiate licenses for the boats to go to North Africa, several permits were secured for work in Italian waters near Sicily and Corsica. Subsidies were also offered to break the market deadlock. Captains with sponge fished in 1969 outside Greek waters were given from 70 to 170 drachmas per kilo of sponge (depending on grade) by the Agricultural Bank. The balance of the captains' price was paid by the buyers. The bank is also undertaking a loan program to aid in the wholesale purchase of sponge expedition supplies by the Captains' Cooperative on Kalymnos; the loans for expedition expenses are being increased and interest rates lowered in an effort to break the buyer-captain-diver debt cycle. Further, in an attempt to get the sponge operations modernized technologically, loans are now offered for diving equipment purchases at from 2 to 4 per cent interest. The truly remarkable events of the past few years, however, may indicate that the government will not have to subsidize the industry for very long.

The economy of Kalymnos is booming. Capital production was \$4.5 million in 1968 (Table 14).

In 1969 the Agricultural Bank of Kalymnos lent over \$660,000 to the commercial fishing fleet, and officials say this industry will certainly grow. Remittances nationally averaged \$30 for each resident Greek in 1968. On Kalymnos the figure was \$138. Before 1950 the sponge industry was 60 to 70 per cent of the Kalymnian economy. Today it is only 30 per cent, but it is still the largest single item in Table 14. Three factors account for the continued vigor of sponge production and sales, in spite of synthetics, lack of licenses, and the shortages of labor: (1) the Bodrumi sponge industry, (2) the opening of the Japanese markets, and (3) a major technological and social structural change in Kalymnian sponge operation.

**Table 14**  
Kalymnian Economy, 1968

Source	Amount (\$)	Per Cent of Total
Agriculture†	500,000	11
Tourism‡	333,000	7
Commercial fishing	533,000	12
Remittances (merchant marine: \$1,000,000, 22% of total; migrants:§ \$800,000, 18% of total)	1,800,000	40
Sponge sales	1,333,000	30
Total	4,499,000	100

\* From Koundouris, 1968.

† Mostly the citrus exports from Vathy Valley.

‡ Not counting income derived from expenditures of several hundred non-Kalymnian students at Kalymnian high schools or incomes of doctors, lawyers, or dentists derived from non-Kalymnians.

§ There are currently an estimated 2,300 Kalymnians in Australia and 3,000 more in America, Canada, West Germany, and the Bahamas.

Where business is involved, political and cultural animosities can be put aside. Kalymnian imports from Turkey were valued at \$45,000 in 1959. In 1965, the year of the first sponge crisis, this rose to nearly \$500,000. The simple fact is that Kalymnian merchants can sell all the sponge they can get, if it is cost-competitive. Table 15 shows the drastic profit cuts absorbed by buyers on Kalymnian sponge between 1960 and 1969. Profits similar to those

**Table 15**  
Buyer's Profits, 1960 and 1969

Year	Kilos Sold (Captains to Buyers)	Average Price per Kilo (\$)	Export Value per Kilo (\$)	Gross Mark-up (%)	Overhead (%)	Net* (%)
1960	44,000	14.56	20.55	41	22	19
1969	47,000	20.46	28.20	38	30†	8

\* This average does not reflect the differences among buyers on their profits from loans to captains.

† Reflecting higher wages, increased social security benefits, higher interest on financing, and increased freight and insurance costs.



**Table 16**  
**Sponge Production by Type of Boat, 1957-1969**

Year	Type of Boat	Number of Craft	Crew			Production (Kilos)	Value (\$)	Market Price per Kilo (\$)
			Divers	Deck	Total			
1957	<i>Skafandra</i>	24	255	268	523	32,834	660,000	20.10
	<i>Fernez</i>	8	69	85	154	9,812	145,600	14.83
	<i>Nude</i>	11	46	11	57	3,296	40,000	12.14
	<i>Total</i>	43	370	364	734	45,942	845,600	18.40 Avg.
1960	<i>Skafandra</i>	18	201	218	419	30,904	473,333	15.32
	<i>Fernez</i>	8	69	67	136	10,116	130,000	12.85
	<i>Nude</i>	9	45	13	58	3,132	40,333	12.88
	<i>Total</i>	35	315	298	613	44,152	643,666	14.57 Avg.
1965	<i>Skafandra</i>	14	117	120	237	19,361	333,333	17.22
	<i>Fernez</i>	11	77	89	166	12,541	193,333	15.42
	<i>Nude</i>	7	42	15	51	5,911	70,000	11.84
	<i>Narghile</i>	3	8	6	14	771	7,667	9.94
	<i>Scuba</i>	2	14	15	29	1,981	30,000	15.14
	<i>Dredge</i>	4	—0—	12	12	695	11,667	16.78
	<i>Total</i>	41	258	257	515	41,260	646,000	15.66 Avg.
1967	<i>Skagandra</i>	10	83	75	158	16,944	313,600	18.51
	<i>Fernez</i>	6	44	47	91	8,336	159,800	19.17
	<i>Nude</i>	10	77	19	96	10,583	151,533	14.32
	<i>Narghile</i>	7	25	11	36	5,526	94,806	17.16
	<i>Scuba</i>	—0—	—0—	—0—	—0—	—0—	—0—	—0—
	<i>Dredge</i>	6	—0—	18	18	920	23,833	25.91
	<i>Total</i>	39	229	170	399	42,309	743,572	17.57
1969	<i>Skafandra</i>	7	59	62	121	11,870	272,233	22.93
	<i>Fernez</i>	10	68	83	151	14,230	288,967	20.31
	<i>Nude</i>	15	96	47	143	13,877	257,233	18.54
	<i>Narghile</i>	5	17	20	37	4,688	81,667	17.42
	<i>Scuba</i>	1	10	6	16	1,312	32,000	24.39
	<i>Dredge</i>	6	—0—	18	18	1,390	37,333	26.86
	<i>Total</i>	44	250	236	486	47,367	969,433	20.47 Avg.

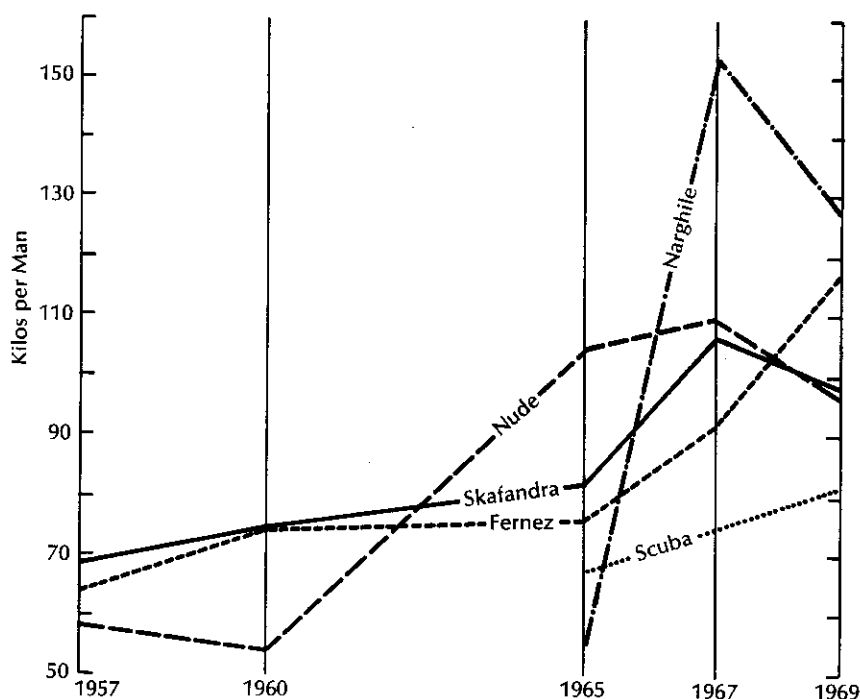


FIGURE 4. Individual sponge production by year and type of equipment.

of 1960 are reported for Turkish sponge processes on Kalymnos and sold on the world markets.

Meanwhile, the opening of markets in the Far East has given a new lease on life to sponge production. These markets require a low-grade species known as *fino-mantapas*, which are readily fished in Greek waters at all depths. One result of this has been indiscriminate deep-water dredging which is very destructive of the ocean environment. A more fortunate effect has been the resurrection of nude diving, along with a modified *fernez* technology called *narghile*, and the abandonment of the mutually exploitative, counterproductive *platika* system. Table 16 shows the results of this latest shift in technology.

The *narghile* system is named after the traditional Turkish water pipe smoked in the Dodecanese until very recently. The divers wear a wet suit, lead belt, weights, flippers, and a mask. Air is delivered to the mask through a thin hose from a small compressor, independent of the boat's motor. The diver cruises the bottom horizontally rather than on foot as the *skafandra* and *fernez* divers do. The method is thus particularly suited to the rough underwater terrain in Greek waters.

The *narghile* and nude-diving systems are inexpensive to initiate and maintain. As Table 16 and Figures 4, 5, and 6 show, they are very effective as well. The rapid development of these types of operations since 1965 has been in direct

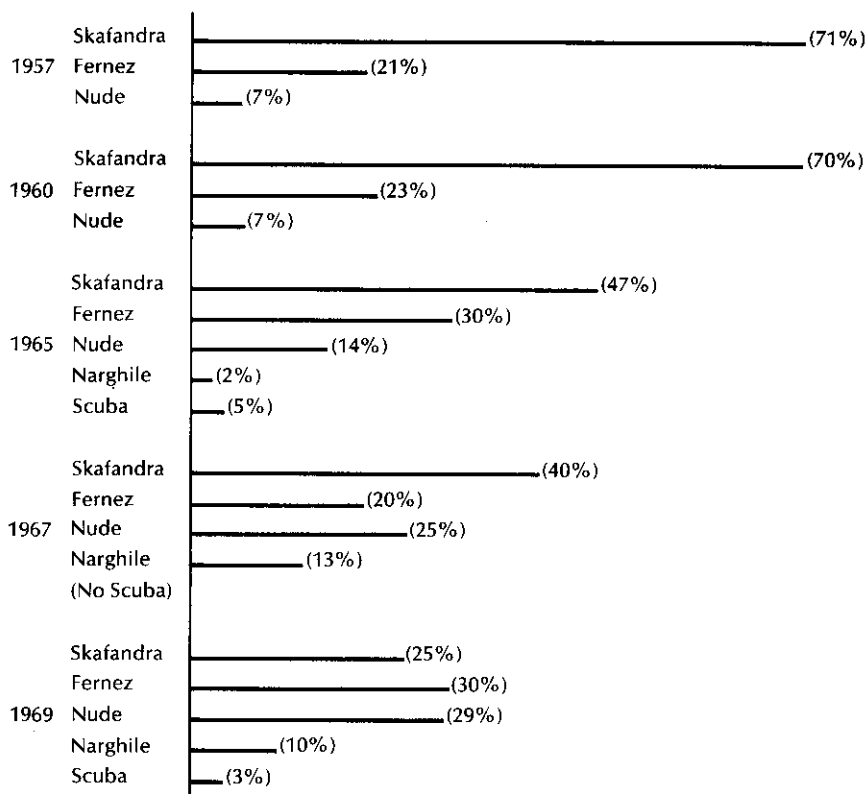


FIGURE 5. Type of diving equipment in use by year.

proportion to the disappearance of the *skafandra* and *fernez*. Those works depended on chicanery, intrepidity, and financial juggling. The new operations using *narghile* equipment and nude divers are staffed by youth from Pserimos and Telendos and other isolated parts of Kalymnos. They rely on commonality of residence and family ties to maintain an equitable share system. They operate on trust and cooperation, rather than on suspicion and invidious competition. Their record of production amply demonstrates the power of this social change. Production effectiveness is further enhanced by the fact that nude diving precludes the bends.<sup>10</sup>

<sup>10</sup> It has recently come to my attention that a similar technological change was made on Cyprus at an earlier date. Cypriot fisheries data show a very erratic industry on that island from 1900 to the present. Fifteen *skafandra* and *fernez* boats were operative in 1934 with only three nude-diving works. In 1948, twenty-eight nude operations and two *skafandra* and *fernez* boats fished. There is no record of the number of divers involved, but in 1948 the thirty boats fished 3,794 kilos of sponge. In 1964 there were still twenty-eight boats (including six *skafandra* and *fernez*, only two nude-diving boats, and twenty *narghile* vessels) which produced 6,976 kilos of sponge. The Cyprus fisheries, however, (1) did not operate

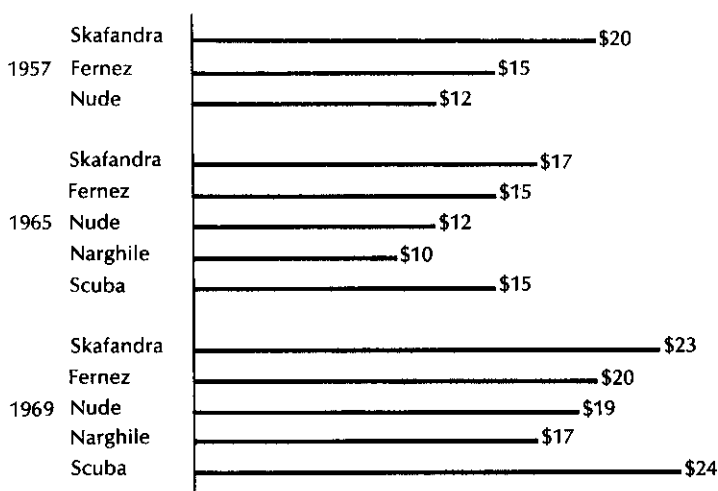


FIGURE 6. Average price per kilo for sponge by year and method of retrieval.

The success of the new boats has ushered in a new era on Kalymnos. If this era is to be marked by fewer deaths and paralysis, it is certainly not going to be characterized by lack of color. In 1970 a wedding was held on Pserimos in the best sponge-diving tradition. Five hundred dollars was spent on music alone in the three-day, nonstop fete. It reminded Kalymnians of the "old days," when divers lit cigarettes with 1,000-drachma notes.

If buyers can continue to find markets for competitively priced marine sponges, then the old spirit and culture of the "island of the sponge fishermen" should continue to provide Kalymnos with a colorful source of income for many years.

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on a *platika* like that of the Kalymnians, (2) mostly fished in Cypriot waters with periodic stops at home port, and (3) were never a very large or important focus of the economy or social order of the island. For certain purposes a study of social change, if any, accompanying the shift in technology from *skafandra* to nude to *narghile* on Cyprus would make an interesting control case.