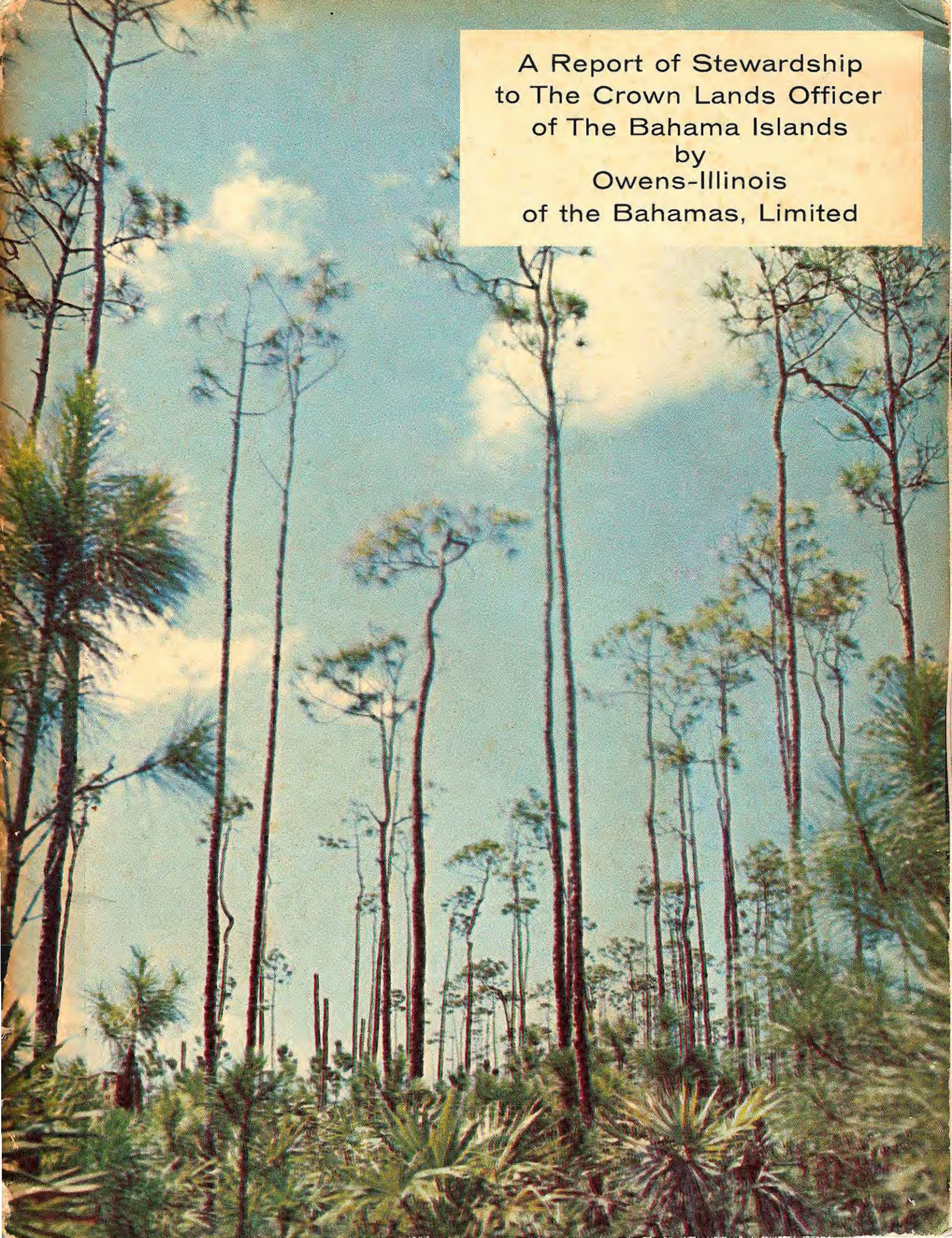


A Report of Stewardship
to The Crown Lands Officer
of The Bahama Islands
by
Owens-Illinois
of the Bahamas, Limited



OWENS-ILLINOIS OF THE BAHAMAS, LIMITED

SNAKE CAY, MARSH HARBOUR, GREAT ABACO ISLAND, BAHAMAS

February 20, 1961

The Honorable R. E. A. Sweetnam
Crown Lands Officer
Crown Lands Office
Nassau, Bahamas

Dear Mr. Sweetnam:

Owens-Illinois of the Bahamas, Limited has been engaged for the past four and one-half years in pulpwood cutting operations under licenses from the Crown on Grand Bahama Island and Great Abaco Island.

You and your foresters are well acquainted with our operation and program, but do not have recorded in a single report a resume of all of our activities. For this reason we are documenting pictorially and factually our stewardship.

In the attached report Owens-Illinois submits an account of:

1. How Bahamian timber stands are being improved through good forestry practices;
2. How Owens-Illinois' operations reduce the fire hazard on these islands;
3. The contribution of Owens-Illinois to the economy of the Islands through monies paid to the Crown, the Bahamian government, to employees and to Bahamian businesses as a result of our operations on Grand Bahama and Great Abaco Islands.

We also report to you on other matters, such as:

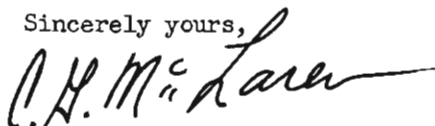
1. Permanent road networks built on both islands by the company;
2. Permanent docking facilities at Riding Point, Grand Bahama, and Snake Cay, Great Abaco, built by the company;
3. Church, school, medical and other facilities made available to employees of the company in the Bahamas.

Because many of those to whom you may wish to give copies of this report are not familiar with the technical details of forestry, we have attempted to simplify the report. In certain places we have given more detailed information than would be necessary if the report were to be seen only by you and your associates.

We in Owens-Illinois hope that you will find this report of our stewardship interesting and helpful to you. We look forward to many years of mutually beneficial relations with the Crown, the Bahamian government and its citizens.

With every personal good wish, I am

Sincerely yours,



C. G. McLaren
Executive Vice President

COVER PHOTO: Seed trees stretch high above lush new pine growth on Grand Bahama Island.

Growing for the Future

"It is very easy to exploit the forests, to take what you can out of the land and not put anything back. It is not easy to take the long view, as Owens-Illinois does, and to practice the kind of conservation that Owens-Illinois has practiced in the Bahamas.

"I can see that you try to manage our forests the same way you manage your own. Generations to come will have you to thank for what you are doing to insure our forests continue to grow as abundantly as they do now."

*Sir Raynor Arthur, K.C.M.G., C.V.O.,
Then Governor of the Bahamas,
During Visit to Owens-Illinois
Woodlands in November of 1958.*



At least five dominant trees in each acre are marked with white paint to assure they will remain as seed trees to guarantee reproduction of new trees.

The scientific approach to forestry is relatively new. For centuries men believed there would never be a shortage of timber or of land itself. This theory vanished as the world's constantly growing population brought with it a corresponding need for more timber and other products of the world's land. Men learned the hard way, through generations of waste that spoiled vast areas, that careful use of timberlands and their constant and careful replenishment, are essential to a nation and all its citizens, as well as to the owners and the cutters of the timber. In so learning, men also found that good forestry practices are good business as well.

Men have learned much in recent years about the efficient use of woodlands and wood products. As a result, landowners get more for their timber, governments get more in taxes, industry gets more value from the wood it cuts, and industry employees receive more for their labor.

The islands of Grand Bahama and Great Abaco are blessed with good stands of Caribbean pine, a species which can be used either as pulpwood for paper production or as saw timber for lumber. The general nature of the trees and the rocky soil conditions of the islands, however, make pulpwood cutting the most economically sound use that can be made of these Bahamas timberlands. The faster reforestation and shorter periods between cuttings with pulpwood will make these lands even more valuable to the Crown, the Bahamian Government, and the people of the Bahamas.

The statistical table on Page 2, compiled from surveys conducted on Grand Bahama and Great Abaco during the past four years, show how pulpwood rotation can give the Bahamas a cash crop of timber every 25 years.

The totals show that an average acre of virgin timber—timber that has never been cut—has 115 trees of an average diameter of 8.5 inches or a total of 10.42 cords of wood. These trees are between 125 and 150 years old. A second growth stand, on the other hand, has produced 10.54 cords in about 50 years, or about one-third of the time. An acre of young 25-year-old pines has reached 8.23 cords which can be cut for pulpwood.

How is this possible? Just like humans, trees grow faster in their earlier years, gradually slow down, and even lose some volume in their old age. There are fewer trees to an acre of virgin timber because the land has just so much plant food to keep trees alive and growing. Smaller trees trying to get started are either killed or stunted by lack of food and sunshine. Fires also probably took their toll years ago. And some trees have simply died of diseases of old age.

An expert forester is able to determine when a stand

should be harvested. Each cutting, with new root structures breaking up more of the rocky soil, gives the next stand more food to draw upon.

In the Bahamas, each cutting also brings an increase in the amount of fresh water available in the rocky soil. Removing large trees reduces the demand for moisture necessary for normal growth. Evaporation from the soil, especially in soils like those in the islands, does not approach the demands of an established timber stand. Thus the amount of water in the soil rises after each cutting and remains higher than normal until the next stand of timber approaches merchantable size.

For these reasons trees of equal ages can vary greatly in size. Wide ranges of sizes also are found because certain

trees were not large enough to cut when the area was last harvested. For pulpwood rotation no tree under five inches in diameter is cut; on the other hand, a tree should be at least nine inches in diameter before it is cut for saw timber. The tables show half the trees even in the 125-year-old virgin stands are unsuitable for saw timber.

Growth rings tell the age of a tree—a ring for each year—and they also tell the rate of growth. Wide rings in the first 20 to 40 years and then gradually narrower ones show graphically how a younger stand outgrows an older one. The rings naturally are narrower as the diameter increases, but these virgin trees show abnormally thin rings in their latter years.

What about trees for tomorrow? A Caribbean pine virtually takes care of itself, but it must have a chance to do so. Time and the Bahamian climate will do the rest.

Seed trees, the large dominant members of a stand, cast their seeds over wide, wind-blown areas. In accordance with our contract with the Crown, five or more seed trees per acre are left by Owens-Illinois. This number assures an abundant supply of seeds for new trees.

Since in most areas Owens-Illinois is making second cuts, we have ample evidence that Mother Nature has not slowed down in her endless good works. All of the trees we have cut in the past four years, except for a limited number of virgin tracts, began from seed trees since the turn of the century.

Reproduction which has already begun in the areas Owens-Illinois has cut on Grand Bahama during the past four years is excellent in both quality and quantity. With the roadways we have built acting as firebreaks, these young trees have an even better chance to reach maturity than did their predecessors.

Diameter at Breast Height	VIRGIN (125-150 Yrs.)			SECOND GROWTH (50 Yrs.)			SECOND GROWTH (25 Yrs.)		
	Trees per Acre	Vol. in Cords	Cum. Vol. in Cords	Trees per Acre	Vol. in Cords	Cum. Vol. in Cords	Trees per Acre	Vol. in Cords	Cum. Vol. in Cords
5 Inches	16	.42	.42	50	1.30	1.30	68	1.77	1.77
6 Inches	7	.28	.70	54	2.16	3.46	55	2.20	3.97
7 Inches	13	.74	1.44	40	2.28	5.74	28	1.60	5.57
8 Inches	22	1.67	3.11	31	2.36	8.10	20	1.52	7.09
9 Inches	23	2.30	5.41	12	1.20	9.30	4	.40	7.49
10 Inches	18	2.25	7.66	6	.75	10.05	2	.25	7.74
11 Inches	10	1.53	9.15	2	.31	10.36	2	.31	8.05
12 Inches	2	.37	9.56	1	.18	10.54	1	.18	8.23
13 Inches	4	.86	10.42						
TOTAL:	115	10.42		196	10.54		180	8.23	
	Avg. Diameter 8.5			Avg. Diameter 6.7			Avg. Diameter 6.2		

This cross section of virgin timber was cut from a tree that has been growing on Great Abaco Island for at least 130 years. It measures over 13 inches in diameter. The distance between rings—one year's growth—demonstrates the slowdown in growth that occurs in a tree's later years. Rings toward the center are easily distinguished as growth was fast in the early years. The rings become narrower toward the outside because the diameter increases but these are unusually thin and virtually run together during the last 30 or more years.



Putting a ruler to two cross sections of pine tells a story of growth. The log at right measures about 7½ inches and is 45 years old. The log at left is about a half inch less in diameter and is 20 years younger—only 25 years old. The rings show us that the older tree, growing under unfavorable conditions, advanced slowly in its early years, picked up some in middle age, and slowed again in later years which can be expected as shown in the virgin cross section in the photograph above. The 25-year-old tree has the ring structure of good growing conditions—rapid early growth and steady middle age expansion. It was cut before its semi-dormant stage.

Two years after mature timber is cut, hundreds of these pine seedlings are growing on each acre from seeds dropped by seed trees left standing solely for this natural reproduction process.





At seven years, new trees are as tall as a man. This area on Grand Bahama Island is beside the main road leading to the dock facilities built by Owens-Illinois.



A new tree growing up beside a stump symbolizes the wonder of reproduction. The rotting stump supplies food for its successor.



At 15 to 20 years pines are nearly as tall as the seed trees. This area will produce two pulpwood crops before the year 2000.



These second-growth trees, between 30 and 45 years old, have reached merchantable pulpwood size, over five inches in diameter.

Numerous posters on Abaco warn of the fire danger. ▶

A burned over area on Great Abaco Island is a reminder of what fire can do to a valuable stand of timber. The fire in this location occurred several years ago before this road, constructed by Owens-Illinois, could help prevent its spread. ▼



Helping Prevent Fire Losses

Fire is the greatest of all menaces to timber. Unfortunately it can come through natural causes which no one can prevent. Until recently the timberlands of Grand Bahama and Great Abaco were especially vulnerable because of the inaccessibility of many areas and the lush undergrowth which helps fires spread.

Roads constructed in connection with our operations will help ease both these problems, for the roads make it possible to reach isolated areas quickly. They also act as firebreaks which generally stop fires.

Fortunately, the rapid reproduction of trees with which the Bahamas are blessed keeps any burned-over area from being bare long. However, fires show their lasting effects in thinned and stunted areas.

A program to keep those connected with our operation constantly alert to the dangers of forest fires is being actively pursued. Large red, green and black posters signed by the Crown Lands Officer, the Honorable R. E. A. Sweetnam, are placed at key locations as an ever-present reminder to both workers and visitors to protect the woodlands by being careful with matches and cigarettes.

Other fire prevention measures are being taken by Owens-Illinois in cooperation with the Crown Lands Officer.



Monies Paid to the Crown, the Bahamas Government, and the Bahamian Economy

In slightly more than four and a half years, Owens-Illinois of the Bahamas has paid out more to the Crown, to the government of the Colony of the Bahama Islands, or the Bahamian economy than it did for the assignment of the original Crown timber license on Grand Bahama and Abaco from the Bahamian corporation, Abaco Lumber Company, Limited. An additional £ 35,714 was paid to the Crown for timber license at Normans Castle, Little Abaco.

The total is £ 3,561,797 in these three areas, £ 2,269,773 since we began operations, and £ 1,292,024 for the original rights. Additional amounts will be spent in the immediate future while second cutting operations later in this century will bring still more expenditures.

Through Dec. 31, 1960, customs duties paid to the government amounted to £ 172,888, royalties and rentals paid to the Crown were £ 25,629 for a total of £ 198,517.

Monies paid to British subjects for services, mostly in the form of wages, equaled £ 870,470. These employees, in turn, spent a portion of their wages with local businessmen and others on the islands.

To sum up, every cord of timber cut brings an average of £ 6 to the Bahamas in wages, rentals, royalties, customs duties, etc.

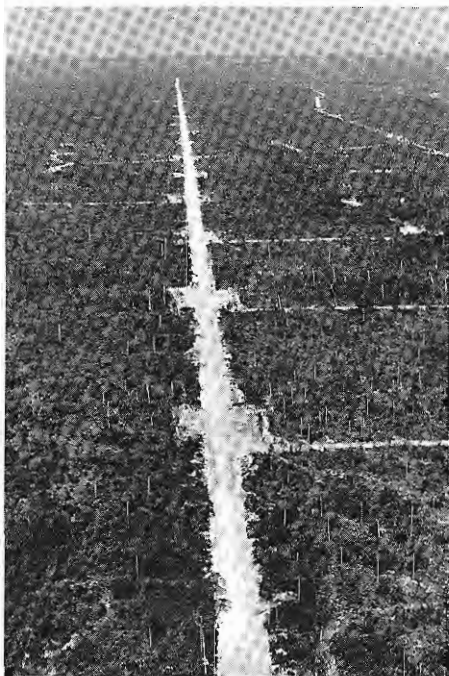
Investments in permanent dock facilities at Riding Point and Snake Cay have been sizeable. Our investment at Riding Point amounted to £ 105,181 and to date we have spent £ 111,044 at Snake Cay. In addition, £ 38,561 has been paid to the Crown or individuals for the purchase of land in these areas.

Road expenditures on the two islands have totaled £ 205,502, and about two-thirds of the roads planned for Abaco are still to be built.



Customs officer Silbert Sawyer meets each arrival of the timber barges and the numerous flights of the Owens-Illinois plane bringing in goods to Abaco. Duties to be paid by the company are verified by his inspection. The Custom officer's home, furnished to the Bahamas' government by Owens-Illinois, is located near the Snake Cay dock where most incoming goods arrive.

This aerial view along the main Owens-Illinois road on Great Abaco shows the abundance of seed trees and smaller trees which remain standing following a pulpwood cutting.



Roads

To date Owens-Illinois has built more than 500 miles of roadway on the two islands, including 300 miles of primary and secondary roads suitable for Owens-Illinois heavy equipment. The remaining mileage is in "stub" roads—smaller roadways used by the cutting crews—which are wide enough to act as firebreaks.

Road building on Great Abaco got off to a good start during our first year of residence, but many sections of the island which have no roadways will be reached with primary and secondary roads as our operation expands.

Because of differences in topography, construction on Great Abaco is slower and more expensive than on Grand Bahama. The initial 45.8 miles of primary roads on Abaco cost £ 47,996 compared with £ 85,510 for the entire 135-mile primary road network on Grand Bahama.

The road complex on Grand Bahama was constructed as an essential part of our timber operation. Because they were sturdily built, the roads should need little repair when

our pulpwood operation returns to Grand Bahama years hence.

The meaning of the roads to Grand Bahama residents was expressed in a letter to our company from the Honorable S. R. Darville, Commissioner for Grand Bahama:

"Although I have, on behalf of the people of McLain's Town, our Government and myself, verbally expressed to you our sincere appreciation and thanks for what you have done for us in putting a well-built road into the settlement of McLain's Town and through McLain's Town Cay, I feel that this expression of our appreciation should be put in writing . . .

"I mention particularly this road, as I know that you built it where you have, more as a gesture of good will with a desire to help the people of McLain's Town, than to meet your own needs . . ."



Before this road was constructed by Owens-Illinois, residents of McLain's Town could travel to and from the town only by boat.



A bulldozer scrapes out a "stub" road on Great Abaco Island to permit harvesting an isolated stand of timber.



Although Great Abaco has generally level terrain, hills over 100 feet high had to be cut by the primary road.

Dock Facilities

Dock facilities are the heart of a sea-going operation such as ours and they represent the largest single investment on both islands. These permanent docking and loading areas will remain operational for many years to come.

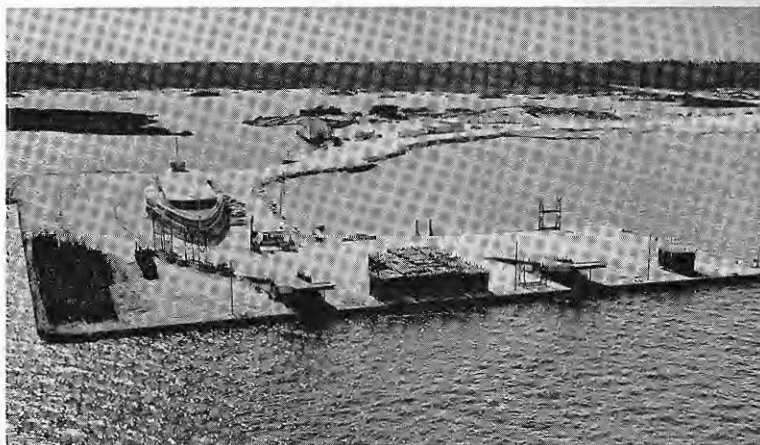
At Snake Cay, 136,000 cubic yards of fill material was required. Hundreds of 26-foot steel pilings were driven into the ocean's floor. Equipment for ship fueling has been in-

stalled and ships other than our own have used the docks on both islands.

As it was on Grand Bahama, our present docking area at Snake Cay is the scene of much activity. Here is located the S. S. Robert Fulton, a retired river steamer, which serves as a home for some workers, the medical clinic, the store and office headquarters.



A primary road connects many parts of Grand Bahama Island with the permanent Riding Point dock left following the move of the Owens-Illinois timber operation to Great Abaco Island. A ship of another company was using the dock when this photo was taken and it is expected the facility will serve others in the future.



The dock at Snake Cay stands ready to serve today's Owens-Illinois operation. Lined up to the left and center are pallets of timber being assembled for loading from the two ramps onto an ocean-going barge. Autos are parked beside the Robert Fulton, retired river steamer which serves as headquarters, living quarters, medical clinic and general store.

Other Facilities

A total of 278 persons were employed at Snake Cay at the time of this writing, only 30 of them Americans. Including wives and children, a total of about 1,300 persons live in the housing areas on Great Abaco.

These persons have the services of a full-time physician who was with us on Grand Bahama and who plans to construct a permanent clinic on Abaco. He has treated many hundreds in the clinic which Owens-Illinois equipped for him aboard the Robert Fulton. The doctor's presence has enabled hundreds of persons to obtain better medical care. His services have also made it possible to eliminate many government-financed roundtrips to Nassau for treatment of emergency cases.

Employees live in company-built houses. Central shower houses, with separate facilities for men and women, are located in each housing area.

Employees and their families have the services of church and school buildings built by the company.

A store on the Robert Fulton offers items many Out Islanders were never able to buy before. Twice a week our timber-carrying barges bring to Snake Cay fresh meat, vegetables, dairy products and hundreds of other items.

The store is operated as a service to employees and does not attempt to undersell local store keepers. In fact, it sells some items to Abaco businessmen for resale in their own retail establishments on the island.



A group of six- and seven-year-olds pose with their teacher, Mr. Patrick Bethel, outside one of the schools built by Owens-Illinois on Great Abaco. The building also serves as a church.



An older student instructs a younger group at the school on Great Abaco. Owens-Illinois furnishes the buildings; the Bahamas government operates the schools.

From Bahama Timber to Paper

Bahamian timber finally becomes paperboard for corrugated boxes by one of the most unusual routes in logging. Since our operations began more than 300,000 cords have been shipped from the islands by barge to the company's paper mill at Jacksonville, Fla. The loaded barge is towed by one tug, the Parris Island, to a rendezvous point at Matanilla, where the barge is transferred to the tug Linden for the remainder of the trip to Jacksonville. The Parris Island returns with an empty barge to Snake Cay.

Three days after leaving Great Abaco, the timber travels up a conveyor belt into the mill to be made into containerboard for the steadily growing paper industry.

Researchers at Owens-Illinois and other companies are constantly looking for ways to use more of the tree than is now possible. Tall oil is currently the most important by-product and is used to produce rosin, detergents and other products, but work is being done with lignin and other extracts of the timber to make each tree more valuable.

Favorable results in research such as this will assure a continuing market for timber and help each tree to do a bigger job for the Crown, for the Bahamas and for Owens-Illinois.

Corrugated shipping boxes made from the Bahamian-grown pulp carry virtually every type of product, including many other products made by Owens-Illinois. Glass con-

tainers for foods, drugs, beverages and chemicals comprise the largest segment of Owens-Illinois' business and a majority of these containers are shipped in corrugated boxes.

Owens-Illinois is a company with wide international interests. The company operates plants in Canada, Colombia and Venezuela. It owns majority interests in glass companies in West Germany and Belgium and has technical assistance and patent license agreements with firms in France, Brazil, Japan and elsewhere. O-I's American-made products are exported throughout the world.

In addition to paperboard, corrugated boxes and glass containers, Owens-Illinois also manufactures glass television picture bulbs, blown plastic bottles, scientific and laboratory glassware, Libbey table glassware, glass construction materials, plastic and metal closures and fitments for packages, melamine dinnerware, multiwall bags, glass insulators, glass vials and ampuls and miscellaneous plastic items. Some of these products are shown on the inside back cover.

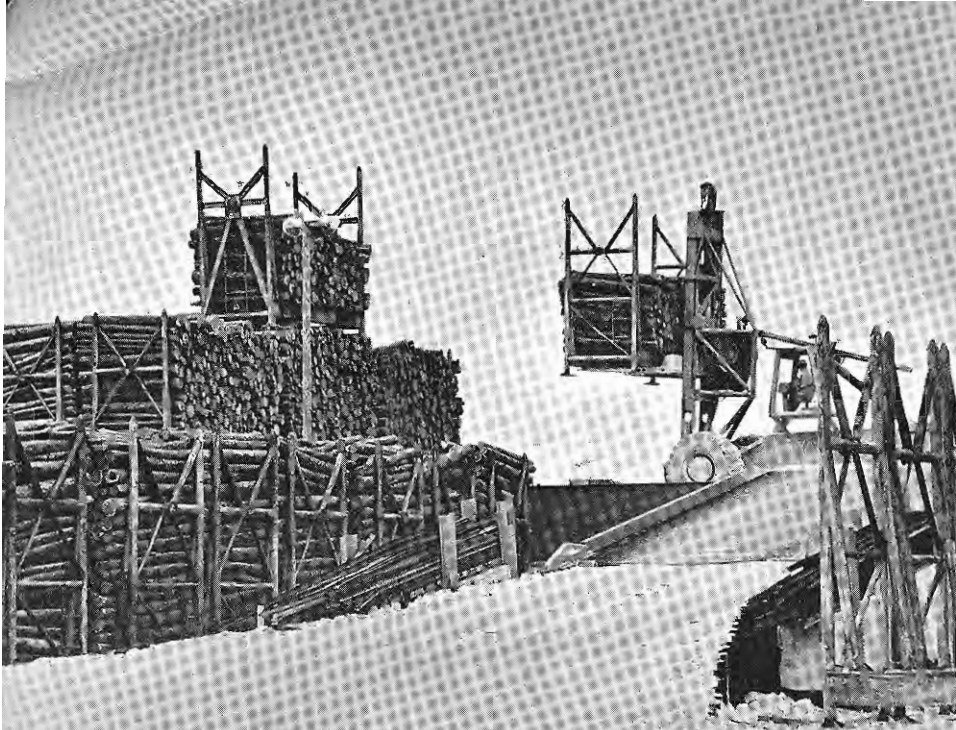
Virtually all of these, as well as hundreds of other products, go to market in corrugated boxes. The importance of pulpwood to the world's economy is a continuing and growing thing, a reassuring fact to the Bahamas since pulpwood is a source of revenue for both its government and its citizens.



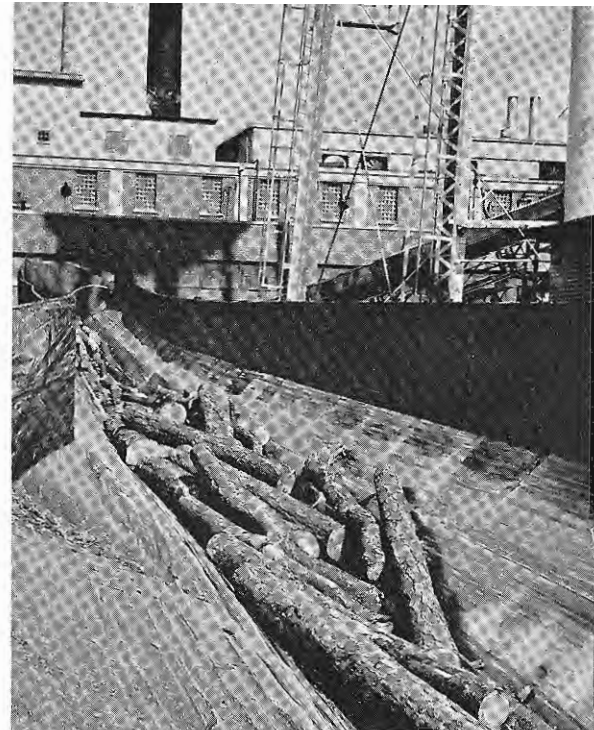
A load of timber weighing many tons moves by truck down the heavy-duty main road built by Owens-Illinois on Great Abaco. The timber will remain in the steel pallets until it is unloaded at the Owens-Illinois mill in Jacksonville, Fla.



A Customs official and others wait on ramp as a barge pulls into Snake Cay dock for its load of timber. Empty pallets, which will be filled for the barge's next trip, stand like a building's superstructure on the deck of the barge.



A 20-ton half pallet of timber is loaded on a barge at the Owens-Illinois dock on Great Abaco. Limitations of equipment make the stacking of half pallets on top of full ones, the most efficient system for transporting the timber.



Bahamian timber travels up a conveyor at the Jacksonville paper mill of Owens-Illinois within three days after it has been shipped from Snake Cay.

Summary of Owens-Illinois Expenditures in the Bahamas

April, 1956 — December, 1960

Royalties, Duties and Rentals to the Crown and the Bahamas Government

Royalties and Rentals.....	£ 25,629
Duties.....	172,888

£ 198,517

Paid to British Subjects for Services..... 870,470

Paid for other Services and Supplies in the Colony..... 440,866

Paid for Purchase of Land in Fee

Crown.....	3,490
Individuals.....	35,071

38,561

Investment in Permanent Dock Facilities

Riding Point.....	105,181
Snake Cay.....	111,044

216,225

Investment in Other Facilities

Grand Bahama.....	100,178
Great Abaco.....	163,740

263,918

Primary Road Construction

Grand Bahama - - - 135 miles.....	85,510
Great Abaco - - - 45.8 ".....	47,996
180.8 miles.....	133,506

Secondary Road Construction

Grand Bahama - - - 250 miles.....	52,040
Great Abaco - - - 100.6 ".....	19,956
350.6 miles.....	71,996

Total All Roads — Grand Bahama.....	137,550
Great Abaco.....	67,952

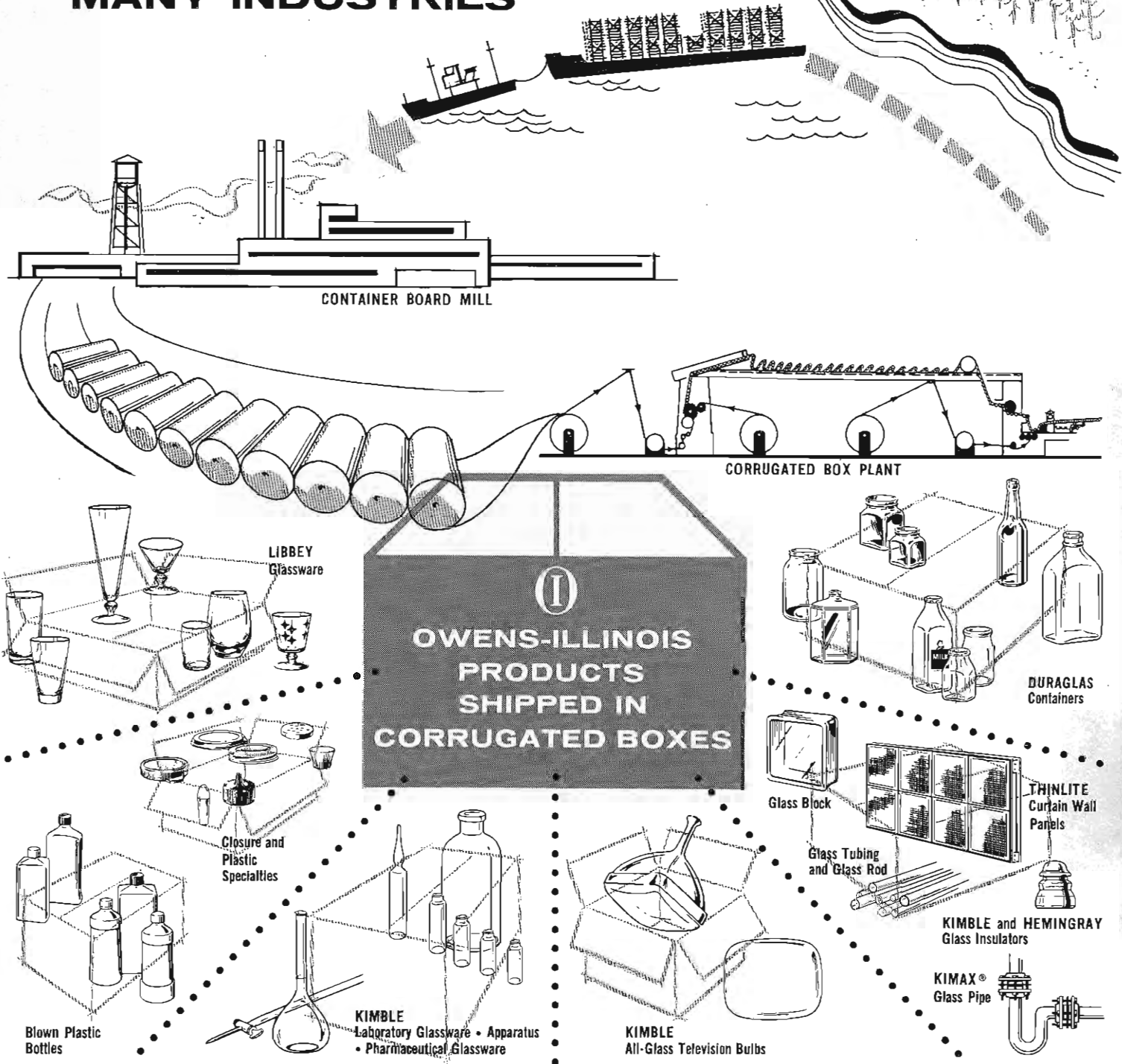
205,502

Paid to Crown for Timber License Normans Castle, Little Abaco..... 35,714

Paid to Bahamian Corporation for Assignment of Timber License..... 1,292,024

GRAND TOTAL..... £3,561,797

BAHAMAS' PULPWOOD SERVES MANY INDUSTRIES



SOME PRODUCTS OF OTHER COMPANIES SHIPPED IN CORRUGATED BOXES

