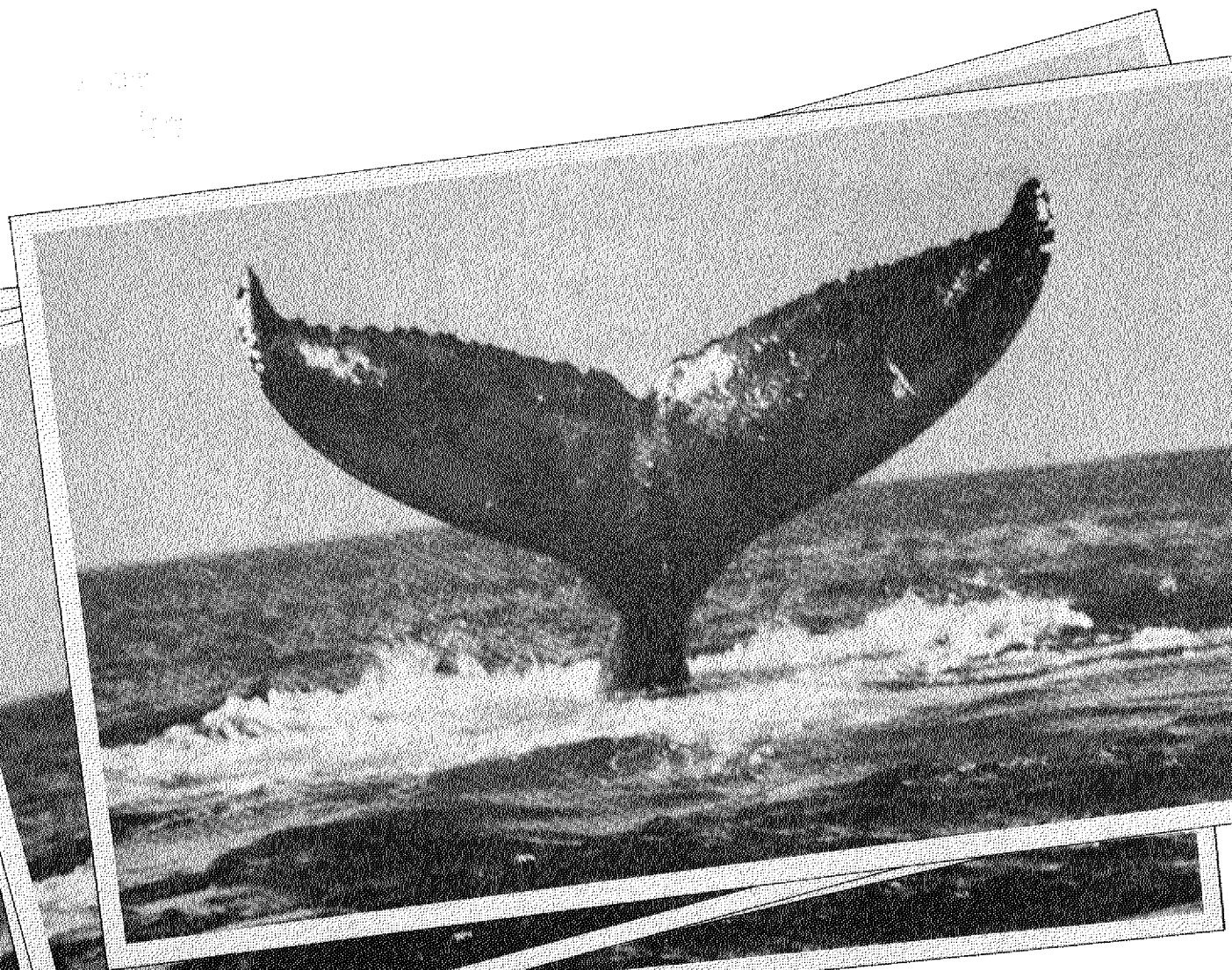


# Humpback Whales

OF THE CENTRAL AND  
EASTERN NORTH PACIFIC



A CATALOG OF INDIVIDUAL IDENTIFICATION PHOTOGRAPHS

**\$15.00**

**HUMPBACK WHALES OF THE  
CENTRAL AND EASTERN  
NORTH PACIFIC**



# **HUMPBACK WHALES OF THE CENTRAL AND EASTERN NORTH PACIFIC**

## **A CATALOG OF INDIVIDUAL IDENTIFICATION PHOTOGRAPHS**

Edited by

Anjanette Perry  
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Published by

University of Hawaii Sea Grant College Program  
1000 Pope Road, MSB 200  
Honolulu, HI 96822

**Sea Grant Miscellaneous Report  
UNIHI-SEAGRANT-MR-88-02**

This work was jointly sponsored by the University of Hawaii Sea Grant College Program (project PM/M-2) under Institutional Grant No. NA85AA-D-SG082 from NOAA Office of Sea Grant, Department of Commerce; and by the University of Alaska Sea Grant College Program (projects RR/85-07 and M/81-01) under Institutional Grant No. NA82AA-D-00044F from NOAA Office of Sea Grant, Department of Commerce. The U.S. Government is authorized to produce and distribute reprints for governmental purposes notwithstanding any copyright notations that may appear hereon.

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Library of Congress Cataloging in Publication Data

Humpback Whales of the Central and Eastern North Pacific

Sea Grant Miscellaneous Report, UNIHI-SEAGRANT-MR-88-02

1. Humpback Whale            2. Marine Mammals  
I. Perry, Anjanette   II. Mobley, Joseph R.   III. Baker, C. Scott   IV. Herman, Louis M.  
QL 737.C424                      599.51

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## PREFACE

In recent years, researchers have found that humpback whales can be individually identified using photographs of the unique markings on the undersides of their tails, or flukes. By comparing photographs taken at different times and locations, the movement patterns and social interactions of individual whales throughout their lifetimes can now be documented.

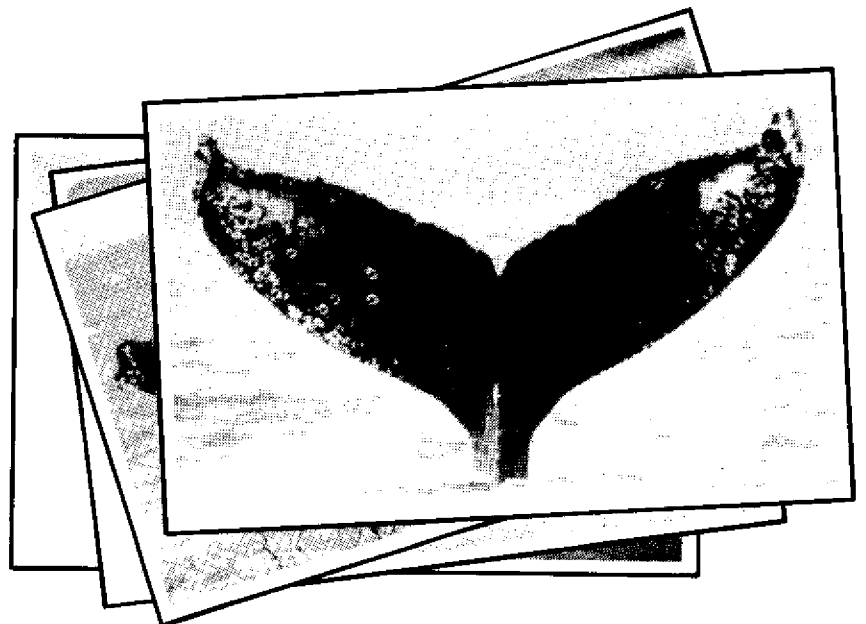
This catalog includes fluke photographs collected by researchers working throughout the central and eastern North Pacific. Our primary purpose is to provide a comprehensive library of whales sighted in recent years on both the breeding and feeding grounds of this area. We hope that scientists and amateur whale watchers will find the catalog an interesting and useful aid in determining where and when whales they might photograph have been sighted previously.

The text accompanying the catalog provides background and reference information. The introduction discusses the distribution of humpback whales in the world's oceans, their status prior to protection from whaling, and the locations where photographs for the catalog were collected. The section on the use of natural markings describes how researchers have used coloration and marking patterns to identify individual animals within a population. This section also includes a description of the features noted in humpback whale identification. In the section on obtaining fluke photographs we explain how whales are photographically "captured" in the wild, and how comparisons between photographs are made. And finally, the summary of research findings gives information on humpback whale natural history that has resulted from the comparison of identification photographs, including the movements of whales between seasonal habitats, estimates of abundance, and notes on reproductive roles and social behavior. Also included are some prospective future research goals and an appendix containing a summary of protective legislation currently in force for the prevention of harassment of whales by vessels.

In the catalog the photographs are preceded by an explanation of the catalog format and instructions on interpreting the accompanying sighting data. A reader attempting to compare photographs with those in the catalog should first read through this section. In brief, the photographs are organized by the region where the whales were sighted. Hawaii is first, followed by Mexico, central California, southeastern Alaska, and the western Gulf of Alaska. A whale sighted in more than one region, for example in Hawaii and southeastern Alaska, is represented by a photograph in each regional division. Within the regional divisions, photographs are presented in approximate order of decreasing amount of white pigmentation on the flukes' surface, from all white to moderately white to all black. Whales with similar scarring and coloration patterns are grouped together, so that any new photograph can be compared to a small subset of the entire catalog. The photographs are accompanied by identification numbers. A description of how these numbers are referenced is provided in the explanation of the catalog format. Sighting information for individual whales, organized by these identification numbers, can be found in Index I and Index II, which follow the photographs.

# Humpback Whales

OF THE CENTRAL AND EASTERN NORTH PACIFIC







## INTRODUCTION

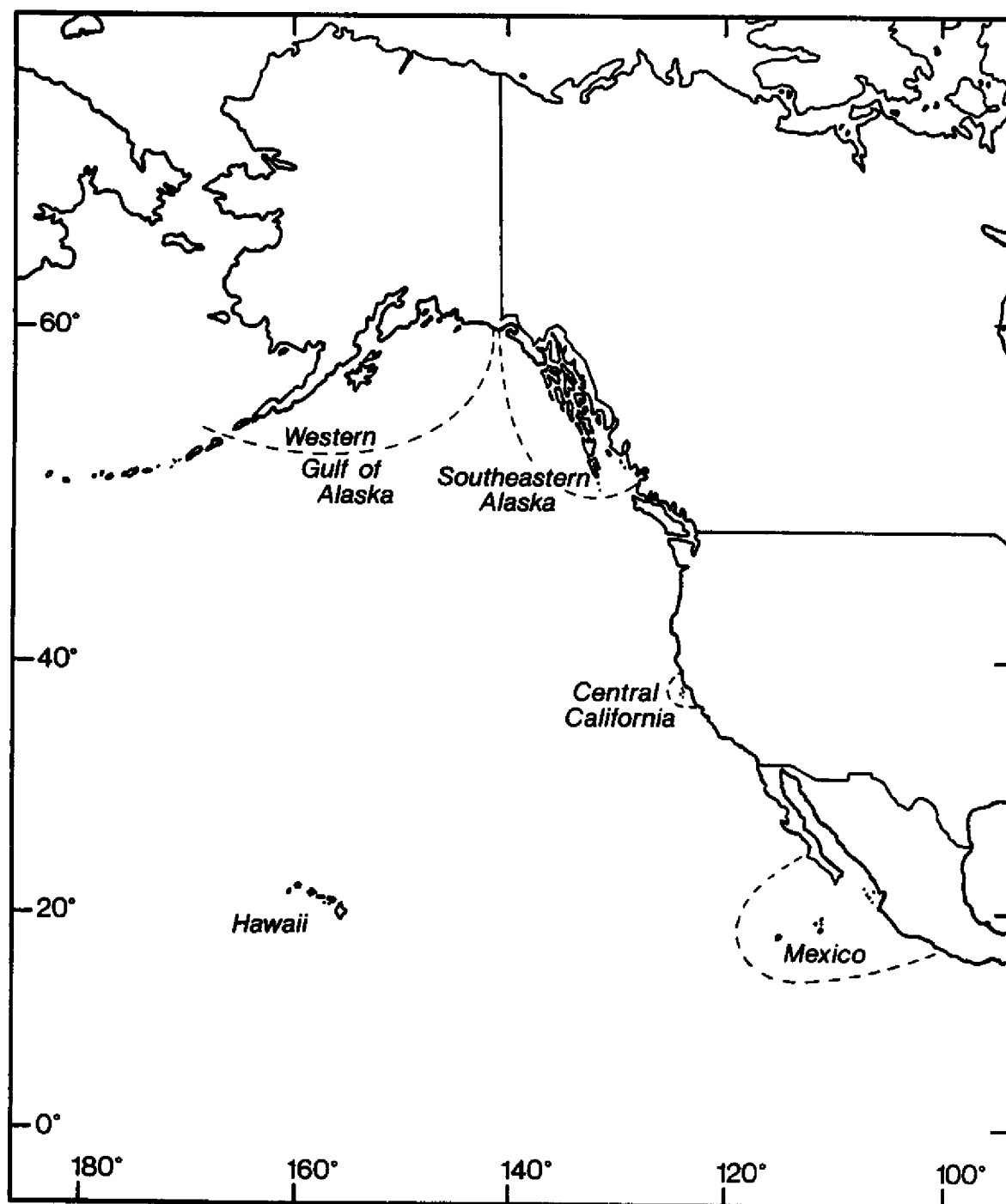
Humpback whales (*Megaptera novaeangliae* or "giant-winged New Englander") are a cosmopolitan species, inhabiting the North Pacific, North Atlantic, and southern oceans. Whales in these three oceanic regions are reproductively isolated from one another due to continental barriers and the opposing seasonality of the northern and southern oceans. Within each oceanic population, whales migrate during winter months towards the equator to coastal or island breeding grounds in tropical or subtropical waters. In summer months, the whales return to the colder, higher-latitude areas where food resources exist in greater abundance.

In the North Pacific, whales feed in nearshore waters along the northern rim of the ocean. These areas extend eastward from the Sea of Okhotsk to the Kamchatka Peninsula and the Aleutian Island chain, and across the Gulf of Alaska to the Alexander Archipelago. Strong currents offshore of the North American west coast cause upwelling of nutrient-rich deep water, resulting in rich feeding areas off central California as well. North Pacific whales travel in winter to warm-water breeding grounds off the Mariana, Ryukyu, and Bonin Islands in the western Pacific, to islands off western Mexico, and to the main Hawaiian Islands.

As many as 15,000 to 25,000 humpback whales may have inhabited the North Pacific prior to their 20th-century exploitation by the whaling industry (Rice, 1978; Wolman, 1978). Despite their international protection since 1966, present estimates vary from less than 1,000 to slightly more than 2,000 — only a fraction of their original estimated abundance. As a result, humpback whales are classified as an endangered species and are protected under the Endangered Species Act of 1973 as well as under the Marine Mammal Protection Act of 1972.

Ironically, much of the biological information that has guided policies protecting humpback whales was gathered during the commercial harvest of these animals. Since active hunting ceased, however, the single method which has contributed most to understanding the migration, reproductive cycles, and social behavior of humpback whales has been the photographic identification of individuals. This method relies on natural variations in marking and coloration of the underside, or ventral, surface of the tail flukes, which uniquely identify each individual.

The 1,247 photographs of whale flukes in this catalog were assembled through the cooperation of researchers working throughout the eastern and central North Pacific. The complete catalog includes photographs from two known wintering grounds: the Hawaiian Islands and the west coast of Mexico (Islas Tres Marias and the Islas de Revillagigedo); and three of the major summer feeding grounds: southeastern Alaska (the Alexander Archipelago), the western Gulf of Alaska including Prince William Sound, and the waters off central California (Figure 1). No data are yet available for the western Pacific population. Through the analysis of photographs from the available regions, we are gaining new



*Figure 1. Major study regions of the central and eastern North Pacific*

insights into the migratory movement, natural history, and social organization of this unique species.

## USE OF NATURAL MARKINGS AND COLORATION AS A GUIDE TO INDIVIDUAL IDENTIFICATION

### *Background*

Any study of animal behavior is greatly enhanced when particular individuals of the population can be easily recognized. With individual identification, the chaos of group activity can be rendered into orderly descriptions of the patterns of individual associations and movements. From these individual descriptions emerge the rules governing the social structure of the group as a whole.

At first encounter with many animal species, the initial impression is one of remarkable homogeneity — each individual appears identical to the next. With patience and practice, however, the regions of variation begin to emerge and the basis for individual identification is made possible. The earliest descriptions of the use of individualized coloration and markings appeared in the field of primate research. The early primatologist, Yerkes (1929), noted variations in the facial features as well as the color, texture, and density of hair among individuals of the great ape species. Haddow (1952) and van Lawick-Goodall (1971) reported using variations in shapes and colors of facial features as a means of recognizing individuals in field studies of red-tailed monkeys and chimpanzees, respectively. Schaller (1963) and later Fossey (1972) relied on variations in the shape and markings of the noses of individual gorillas for their investigations of social behavior in the wild.

### *Cetacean Species*

The social behaviors of several coastal cetacean species have been studied intensively in recent years, aided by a focus on individual animals. The dorsal fins of dolphins show variations in shape, scarring, and coloration patterns among individuals, allowing investigators to track movements of individuals, their social affiliations, and behavior. Species that have been studied in the wild using variations in the dorsal fin include the bottlenosed dolphin (Wursig and Wursig, 1977; Wells et al., 1980); dusky dolphin (Wursig and Wursig, 1980); spinner dolphin (Norris and Dohl, 1980); and humpbacked dolphin (Saayman and Taylor, 1979). The orca, or killer whale, displays individual variation not only in the size and characteristics of its large dorsal fin, but in the color and shape of body markings. These variations have been used by Balcomb (1977) and others to uncover the relatively stable structure of orca pods over substantial periods of time. Payne (1976) noted the variable patterns of callosities (bumps) on the heads of right whales and used these to identify individuals. Swartz and Jones (1980) reported that some individual gray whales possessed distinctive scarring patterns, white areas, and “deformities” which were reliable

indicators of identity. Recently, Sears and Williamson (1985) identified blue whales from photographs of the mottled pigmentation patterns on the backs of individuals.

### ***Photographic Identification of Humpback Whales***

The humpback whale shows considerable individual variation in markings and coloration. The earliest published description of the use of idiosyncratic variations to discriminate individual humpback whales is that of Schevill and Backus (1960):

*Megaptera novaeangliae* is a species in which minor individual variations are often sufficiently conspicuous and distinctive to enable even a shipboard observer to recognize individual whales out of small groups. Of the four *Megaptera* that we saw . . . our subject was readily distinguishable by its larger size, by the shape of the dorsal fin or hump (especially variable in this species), and by the distinctive color pattern of the underside of the flukes. . . . (p. 279)

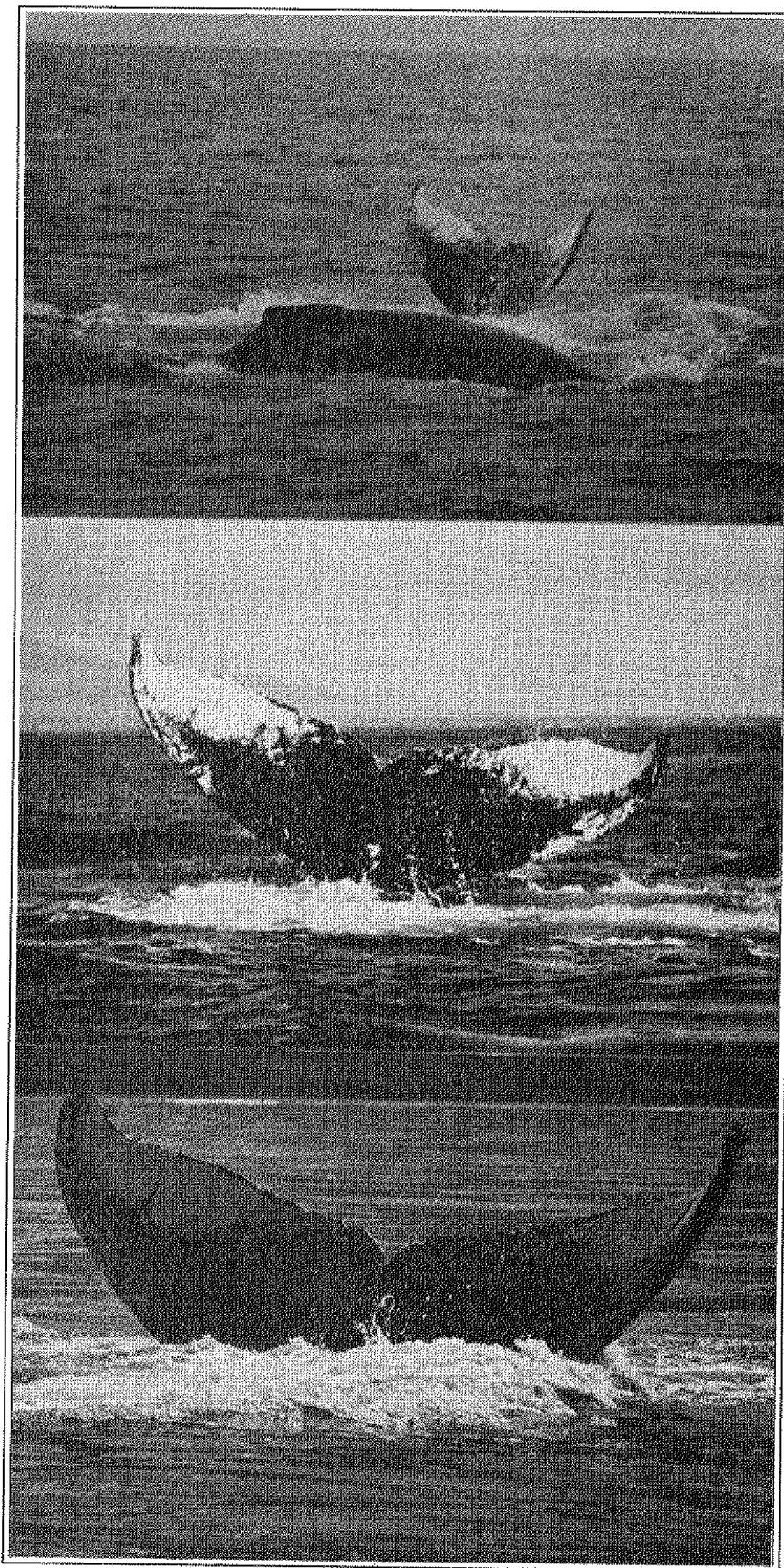
The use of distinctive fluke coloration patterns and dorsal fin shapes to identify individual humpback whales remained largely unexplored for at least the next decade. It was fully developed for field use primarily through the work of two independent programs of research — the work of Charles Jurasz and his associates in southeastern Alaska (e.g., Jurasz and Palmer, 1981) and that of Steve Katona and his associates in the North Atlantic (Katona et al., 1979). Though considerable variation exists in the shapes of dorsal fins, as noted by Schevill and Backus, the features which best lend themselves to the use of photographic techniques are the markings, scarring, and distinctive patterns of white and black coloration on the underside of the flukes. The variation in coloration is extreme, ranging from individuals with all black flukes to nearly pure white, and all variations in between. Although some variation in the degree of pigmentation in young animals has been noted (Carlson and Mayo, 1983), by about 3 years of age the coloration pattern stabilizes. The pattern of ridges along the fluke's trailing edge is fixed from birth. Adult individuals have been resighted across intervals as long as 13 years (Perry et al., 1985) in the North Pacific with little alteration in their coloration patterns (Figure 2).

## **OBTAINING FLUKE PHOTOGRAPHS AND ESTABLISHING RESIGHTS**

### ***Photographic Methods***

Humpback whales show a characteristic pattern of diving or sounding which typically involves "rounding out" at the surface — so-called because the animal appears to be rolling forward into the water in an almost snake-like motion. The last portion of the dorsal column to leave the water's surface is the tailstock, or peduncle. During shallower dives, the peduncle is the last visible part of the animal as it arches into the water. During deeper





*Figure 2. Whale #049 sighted on several occasions in Hawaii between 1976 and 1983. The shape and patterns of pigmentation on the underside of adult flukes change very little, and probably serve as reliable indicators of identity across a humpback whale's lifetime.*

dives, however, a humpback whale will extend its tail flukes above the water's surface, granting a photographer a few seconds viewing as the flukes sink into the sea.

Most of the photographs included here were taken with 35-mm SLR cameras by researchers following whales from small boats. Telephoto or zoom lenses with at least 200-mm focal length capability were used. High speed film and fast shutter speeds were used to obtain clear images of moving whales from a moving vessel. (See appendix.)

### ***Establishing Resights***

The best photograph of a whale's flukes taken during a given observation is printed and assigned an observation number. Additional information noted includes the date, time, and location the photograph was taken; the composition of the pod in which the animal was traveling (i.e., number of whales in pod); and, when possible, the social role of the animal seen (i.e., cow, calf, escort, or singer). Each photograph is then compared with all others on file that share similar color patterns.

If a match is established between two or more observation photographs, the whale is assigned a unique resight number. The resight number allows us to reference all observations of a given individual. Thus, every photograph is assigned an observation number, yet only individuals which have been sighted more than once receive resight numbers.

## **SUMMARY OF RESEARCH FINDINGS**

The use of the photographic identification technique has greatly expanded our understanding of the migratory destinations, abundance, and social behavior of humpback whales in the eastern and central North Pacific. The following is a brief summary of some of the more significant findings which were derived from the use of this method.

### ***Migratory Movements***

The details of migratory movement and stock segregation of humpback whales in the North Pacific are still not fully understood. Kellogg (1929), using the observations of early whalers, suggested that humpback whales in the North Pacific were divided into an American and Asian stock. He proposed that the Asian stock winters in tropical waters south of Japan and travels north to feeding areas in the Sea of Okhotsk and along the Kamchatka Peninsula. The American stock was thought to breed in the waters off the west coast of Mexico and travel northward along the coast of North America to feeding grounds in the Gulf of Alaska, in the Bering Sea, and near the Aleutian Islands. There was no evidence, one way or the other, of exchange between the American and Asian stocks.

The Hawaiian wintering grounds were apparently not known to Kellogg, nor to other authors discussing the North Pacific humpback whales (e.g., Nishiwaki, 1966). The

Hawaiian grounds have been studied intensively only since the mid-1970s (e.g., Herman and Antinova, 1977; Tyack, 1981; Darling, Gibson, and Silber, 1983; Glockner and Venus, 1983). Herman (1979) has provided a historical account of humpback whales in these waters.

Rice (1978) proposed that the animals found in the Hawaiian wintering grounds were an extended part of the American stock. However, as evidence presented below suggests (see Population structure), the "American stock" may not represent a fully intermingling group as the name implies.

The major study regions contained in this catalog include the two known winter calving and breeding areas for the eastern and central North Pacific (Hawaii and western Mexico) as well as three of the major summer feeding areas (southeastern Alaska, the Gulf of Alaska, and central California). Comparisons of photographs from these regions have helped answer the following questions:

1. Do whales sighted in a given study region return to that region in following years?
2. Do whales wintering one year in Mexico travel to Hawaii in other years, and vice versa? Where do the whales in each of the two wintering grounds travel to feed during the summer months?
3. Do these whales form a unified stock in which all individuals freely intermingle?

### ***Regional return***

To determine if whales are likely to return to particular regions across years, all of the fluke photographs we collected for each region were compared within a given year, and then across years. Certain individual whales were sighted repeatedly in most of the regions where photographs were collected in more than 1 year (Table 1). Of the 464 whales sighted in southeastern Alaska, 225 (48 percent) were sighted in more than 1 year. In Hawaii, 123 of the 634 individuals (19 percent) were sighted in more than 1 year. For the western Gulf of Alaska, 20 of the 95 individuals (21 percent) were seen in more than one study year. Mexico and California were the only regions that did not have some resights across years. However, these two areas were not extensively sampled. Photographs of 36 individual whales were submitted for the catalog by researchers working in Mexican waters (24 whales sighted in 1978, 11 in 1980, and 1 in 1985). Photographs of 18 whales were submitted by researchers working in California waters (1 whale sighted in 1979 and 1 in 1980, 5 in 1981, 7 in 1983, and 4 in 1985).

TABLE 1. SUMMARY OF HUMPBACK WHALE RESIGHTINGS ACROSS YEARS FOR EACH REGIONAL HABITAT

Regional Habitat	Number of Years Sighted					Total Whales
	1	2	3	4	>4	
Hawaii (HI)	511 (81%)	89 (14%)	22 (3%)	9 (1%)	3 (.4%)	634 —
Mexico (MEX)	36 (100%)	— —	— —	— —	— —	36 —
Southeastern Alaska (SEA)	239 (52%)	76 (16%)	58 (13%)	40 (9%)	51 (11%)	464 —
Western Gulf of Alaska (WGA)	75 (79%)	18 (19%)	2 (2%)	— —	— —	95 —
California (CAL)	18 (100%)	— —	— —	— —	— —	18 —

Note: Percentages (rounded) of total whales photographed over the given number of years in each region are shown in parentheses. For example, 81% of all whales photographed in Hawaii were sighted in only 1 year, 14% were sighted in 2 years, 3% in 3 years, etc.

### *Regional exchange*

The fluke photographs for each region were compared against each other to determine the movement of individual whales across regions. The results of this analysis and previously published reports showed the movement of individuals from both wintering grounds to all the feeding areas presented in this catalog (Figure 3, Table 2):

1. Hawaii to central California (Baker et al., 1986)
2. Hawaii to southeastern Alaska (Baker et al., 1982, 1983, 1986; Darling and Jurasz, 1983)
3. Hawaii to western Gulf of Alaska, including Prince William Sound (Baker et al., 1983, 1986; Darling and McSweeney, 1983; von Ziegesar and Matkin, 1985)
4. Hawaii to Mexico (Darling and Jurasz, 1983; Baker et al., 1986)
5. Mexico to central California (Baker et al., 1986)
6. Mexico to southeastern Alaska (Baker et al., 1985, 1986)
7. Mexico to western Gulf of Alaska (Baker et al., 1986)

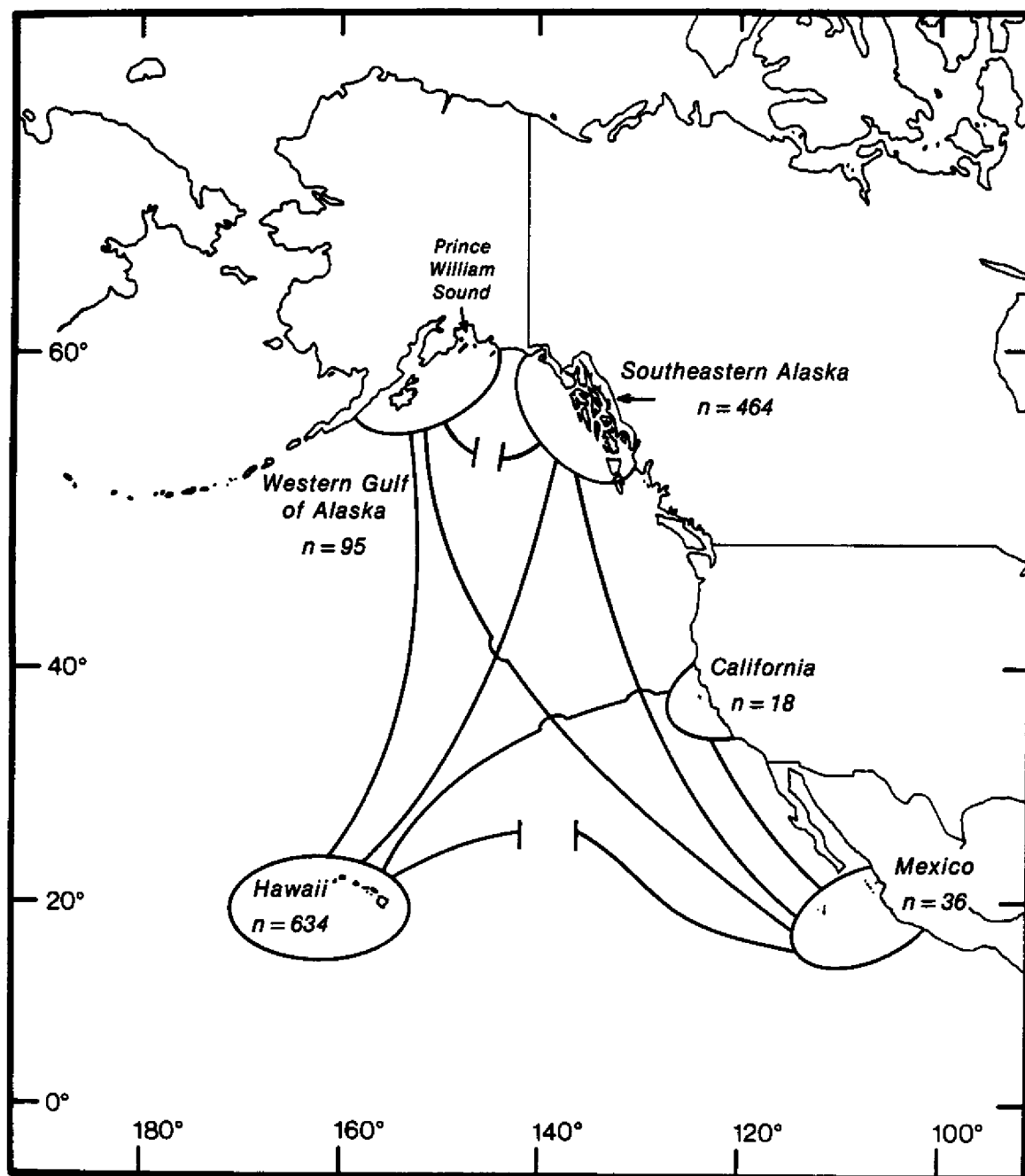


Figure 3. The migratory movement of humpback whales in the central and eastern North Pacific. Lines connect seasonal habitats visited by individually identified whales. Lines do not necessarily indicate migratory routes. The broken lines indicate a probable intervening migration between sightings in alternate regional habitats.



TABLE 2. RESIGHTS ACROSS REGIONS FOR HUMPBACK WHALES IN THE CENTRAL AND EASTERN NORTH PACIFIC

Sighting Region	Resighting Region				
	HI	MEX	SEA	WGA	CAL
Hawaii	(634)	2	82	17	1
Mexico	—	(36)	1	1	1
Southeastern Alaska	—	—	(464)	2	0
Western Gulf of Alaska	—	—	—	(95)	0
California	—	—	—	—	(18)
Total sightings					1,247
Total unique individuals*					1,140

Note: The number of whales sighted in each region is shown in parentheses.

\*Total whales minus resights across regions

In contrast to migration from winter to summer regions, movement from one summer feeding area to another was rare. For example, only two whales sighted in the western Gulf of Alaska were later seen in southeastern Alaska. Movement across wintering grounds also seemed to be rare, with only two whales sighted one winter in Mexico and another in Hawaii.

The majority of resightings across regions were animals seen wintering in Hawaii and later seen feeding in southeastern Alaska (82) or in the western Gulf of Alaska (17). Certainly the greater number of resights between Hawaii and southeastern Alaska reflects, in large part, the fact that more of the research effort was concentrated in these two regions. Even after accounting for the small number of photographs from some regions, however, statistical analyses of expected frequencies of resights show that the number of whales resighted in different feeding areas from where they were first observed is much lower than would be expected if the whales moved randomly among regions (Baker et al., 1986).

### *Population structure*

The predictable return of individuals to specific feeding areas suggests that humpback whales in the North Pacific, like those in the northwest Atlantic (Katona et al., 1980), form several geographically isolated feeding herds during summer months. Individuals from these feeding herds intermingle in either Hawaii or Mexico during the breeding season. This pattern of humpback whale movement reveals the inadequacy of viewing these whales as a unified "stock." By definition, all individuals within a given stock should have the potential to freely intermingle during both summer and winter. Baker et al. (1986) suggested instead that humpback whale groups in the North Pacific are best described as

“structured demes” (Wilson, 1975, 1977) or, in keeping with whaling terminology, “structured stocks.” Each structured stock consists of several feeding herds which intermingle to breed on one or more wintering grounds.

## ***Abundance***

Resighting data based on photographic analysis can be used to generate estimates of abundance using mark and recapture methods. Given the “structured stock” interpretation of the North Pacific population, the most accurate estimates of humpback whale abundance can probably be obtained from particular feeding regions, where the presence of discrete feeding herds of whales results in an approximation to a “closed” population.

### ***Southeastern Alaska***

Mark and recapture estimates for the southeastern Alaska feeding region may be the most accurate of those available for the central and northeast Pacific regions, owing to the large sample sizes and intensity of study effort in this region. Baker et al. (1985) derived an abundance estimate of 310 whales (95 percent confidence limits  $L_1 = 270$ ,  $L_2 = 372$ ) for the southeastern Alaska region, based on the sightings and resightings of individuals during the 1981-82 summer feeding seasons. This estimate is less than the total number of animals photo-identified, as it relies only on resights between contiguous years, thus reducing the potential contribution of deaths, births, and emigrations.

### ***Hawaii***

The mark and recapture methods may be less reliable for estimating abundance in Hawaii since the same individuals may not return each year. For example, we do not have sufficient photographs from the Mexican breeding region to determine if there is extensive exchange between Hawaii and Mexico. Further, some animals may overwinter on the feeding grounds. Thus, we do not know whether there is an equal probability of recapture when estimating abundance on the Hawaiian grounds, i.e., whether Hawaii, like southeastern Alaska, approximates a closed population. Baker et al. (1986) estimated that 1,627 individuals (95 percent confidence limits  $L_1 = 1,320$ ,  $L_2 = 1,934$ ) visited Hawaii across a 7-year period. Darling and Morowitz (1986) estimated that 2,100 individuals visited Hawaii across a 5-year period. Until more data are available for other regions, these estimates should be considered cautiously.

## ***Reproductive Roles***

One of the difficulties facing field investigators of humpback whales is the determination of an individual's gender. Humpback whales have no obvious sexually dimorphic features. Differences in the external genitalia have been described by a number of early investigators using harvested specimens (e.g., True, 1904; Lillie, 1915), but direct inspection of this area on a free-ranging whale's body is difficult. A better method was proposed by Glockner (1983), who noted sexual dimorphism in the lateral profiles of individual

whales. This method is more readily applied in the field but still requires an underwater view of the animal in question.

For surface-based observation, inferences concerning gender are necessarily limited to those cases where the reproductive role of the individual is readily discernible. For females, an obvious reproductive role is that of a cow with calf. For males, long-term behavioral observations and direct sexing of a few individuals now suggest two interchangeable gender-specific roles: "singers" and "escorts" (Winn and Winn, 1978; Tyack, 1981; Glockner, 1983; Darling et al., 1983; Tyack and Whitehead, 1983; Baker and Herman, 1984).

### *Females*

For pods containing a calf, the cow is presumed to be the animal in closest association with the calf. This assumption is reinforced by repeated sightings of cow-calf pairs across a season. Once a given cow has been identified photographically, its reproductive history may be traced across subsequent and previous sightings. Such case histories, though relatively few in number, serve as the only means by which estimates of calving rates for individuals may be derived from an unexploited population (Glockner-Ferrari and Ferrari, 1984; Baker et al., 1987).

Seven known females were sighted each summer from 1981 through 1985 in southeastern Alaska (Table 3). Two of the cows, No. 530 and No. 539, had calves in two of the five years — all the others had a calf in only one of the years. Possibly, these whales gave birth in other years, but lost the calves before or during the migration from the breeding grounds. An additional 34 females have been sighted across two or more years

TABLE 3. REPRODUCTIVE HISTORIES OF SEVEN FEMALE HUMPBACK WHALES SIGHTED ACROSS FIVE SEASONS IN SOUTHEASTERN ALASKA

Case	Animal Number	Sighting Year					Number of Calves
		1981	1982	1983	1984	1985	
1	161	A	A	C	A	A	1
2	193	A	C	A	A	A	1
3	530	A	C	A	C	A	2
4	539	A	C	A	A	C	2
5	581	A	A	A	C	A	1
6	587	A	A	A	C	A	1
7	593	A	A	C	A	A	1

Note: The letter C indicates the presence of a calf in that sighting year. The letter A indicates the absence of a calf. (Adapted from Baker et al., 1987)

in southeastern Alaska. Based on the sightings of all 41 females, our best estimate of the reproductive rate of North Pacific humpback whales is 0.37 (Baker et al., 1987). This means that, on average, each mature female gives birth once every 2.7 years to a calf that survives its first migratory transit to the feeding grounds.

### ***Males***

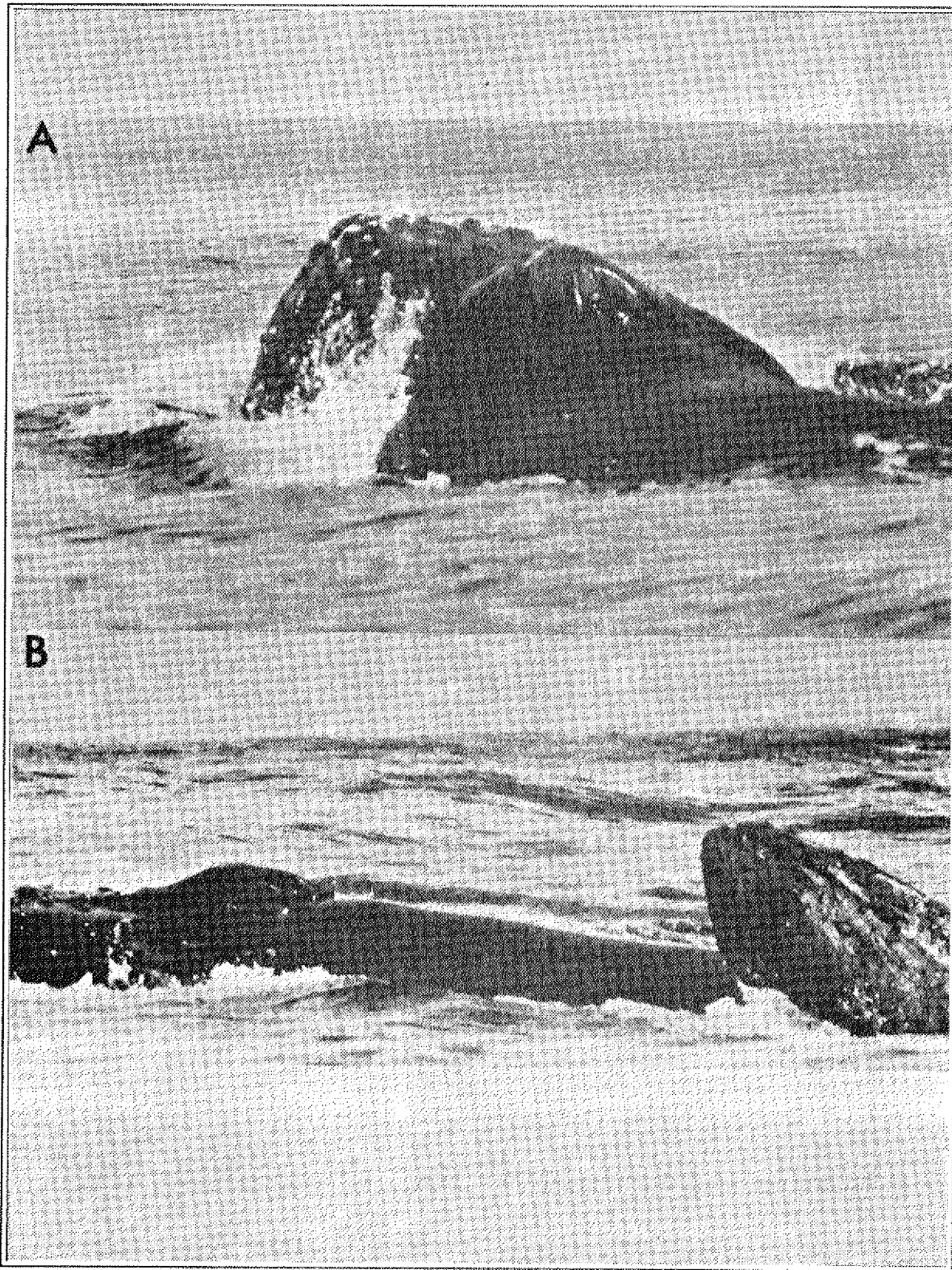
A cow and her calf in the Hawaiian breeding grounds are commonly accompanied by one or more additional adults, termed “escorts” by Herman and Antinof (1977). These authors speculated that such escorts might be “auntie” whales — mature females who assist the cow in allomaternal care for the calf, or, alternatively, were courting males. Since that time, a number of researchers have determined the escorts to be mature males, using the underwater identification method of Glockner (1983).

Pods containing multiple escorts typically show aggressive behavior of varying levels of intensity as the escorts vie for apparent access to the cow (Tyack and Whitehead, 1983; Baker and Herman, 1984). A single escort is usually seen behind and a little below a female or cow-calf pair. If other whales approach the pod, they are met with a series of threat displays by the initial escort, including broadside threats and “headlunging” (Figure 4). If the intruders are not discouraged, these displays may escalate to physical displacements and charge-strikes. In our observations to date, the initial escort was always successful in maintaining its proximity during a single observation, with the trailing escorts eventually departing (Baker and Herman, 1984). However, it is apparent from repeated sightings that escorts rarely continue to accompany a particular female for longer than a day (Tyack and Whitehead, 1983; Darling et al., 1983; Mobley and Herman, 1985).

As was noted, the role of escort has been shown to be interchangeable with another behavioral role of interest to researchers — that of “singer.” Although usually solitary, singing whales have been observed to join with cow-calf pods during the breeding season (Figure 5). The precise function of singing remains unknown, but recent studies in which recordings of song are played back to whales show promise of shedding light on this issue (Tyack, 1983; Mobley et al., 1986). As in many bird species, the song may attract sexually receptive females, synchronize ovulation, maintain spacing among singers, or serve as a form of ritualistic competition among males.

### ***Pod Composition and Social Organization***

Early whalers generally assumed that pods of humpback whales represented stable family groups which remained together throughout the year. This assumption was based on the age and sex composition of a few pods in which all or most of the members were killed. Through our analysis of individual resighting histories, however, we have found that pod composition is dynamic and that the social organization of humpback whales is dramatically different in each seasonal habitat.



*Figure 4. Typical postures of headlunging humpback whales. (A) The posterior to anterior aspect shows the engorgement of the ventral pouch, which may make the whale appear larger to an intruding escort. (B) Lateral view of whales headlunging. The forward whale blocked the rear whale's approach to a cow and calf in the lead of the pod. (Photos by William Stüfel, Kewalo Basin Marine Mammal Laboratory.)*

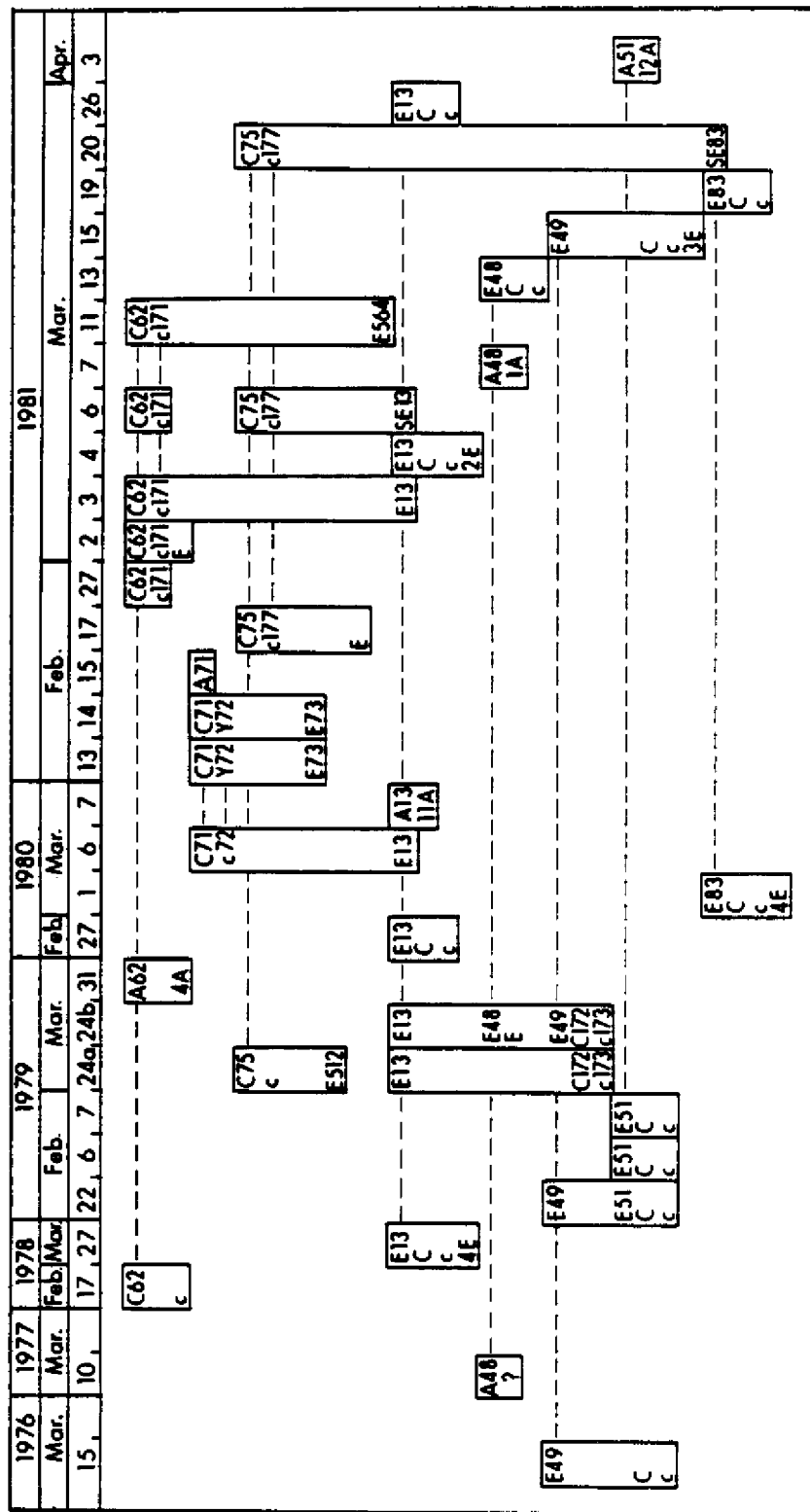


Figure 5. The associations of cows and escorts in Hawaii. Individually identified whales are designated by their whale number and behavioral role. Resighted individuals are shown across rows connected by dashed lines. Boxes enclose pods. Letters indicate behavioral role or age class: A = adult; C = cow with calf or yearling; c = calf; E = escort; SE = singer-escort, and Y = yearling. (Figure from Baker and Herman, 1984)

## *Hawaii*

The social structure of humpback whales in Hawaii is extremely fluid and associations between individuals in a group are transient. The resighting histories of individuals in Figure 5 give some idea of the complexity of these associations. With a single exception, no adults were seen together for more than a few hours in the 33 sightings collected over the 6 years of study. Only escort No. 73 and cow No. 71, accompanied by her calf of the previous year, were seen together across a 2-day period, apparently at a time when the cow was weaning her yearling. Assuming the cow and escort remained together between the two sightings, this association is one of the longest documented between adult whales in Hawaii, and perhaps indicates the formation of a brief mating bond (Baker and Herman, 1984).

Other sighting records of whales of known sex show that females are seen serially and simultaneously with multiple males and that males are seen serially with a succession of females. Cow No. 62, for example, was serially escorted by at least three different males during the period of March 2 to March 11, 1981. In 1979, she was sighted in a pod with four other adults, thought to be males competing for the chance to mate with her. Whenever multiple escorts are seen with a female, aggressive competition typically occurs, often resulting in the departure of the trailing or secondary escorts (Tyack and Whitehead, 1983; Baker and Herman, 1984). Mobley and Herman (1985) estimated that some change in pod composition occurs, on average, every 7 hours. They suggest that these changes in pod composition are the result of males "prospecting" for females in estrus, as well as the aggressive competition between males seeking access to these females.

It seems clear that humpback whales are not monogamous and do not form stable pair-bonds during the winter breeding season. Instead, the social organization of humpback whales in Hawaii can be described as a polygynous or promiscuous mating system involving male-male competition for sexually mature females. In a polygynous mating system, males attempt to mate with many females but females usually mate with only a single male. In a promiscuous system, both males and females may mate with several individuals. Recent observations by Swartz (1986) suggest a promiscuous mating system in the gray whale, *Eschrichtius robustus*. Further resights may help to clarify which mating system is used by humpback whales.

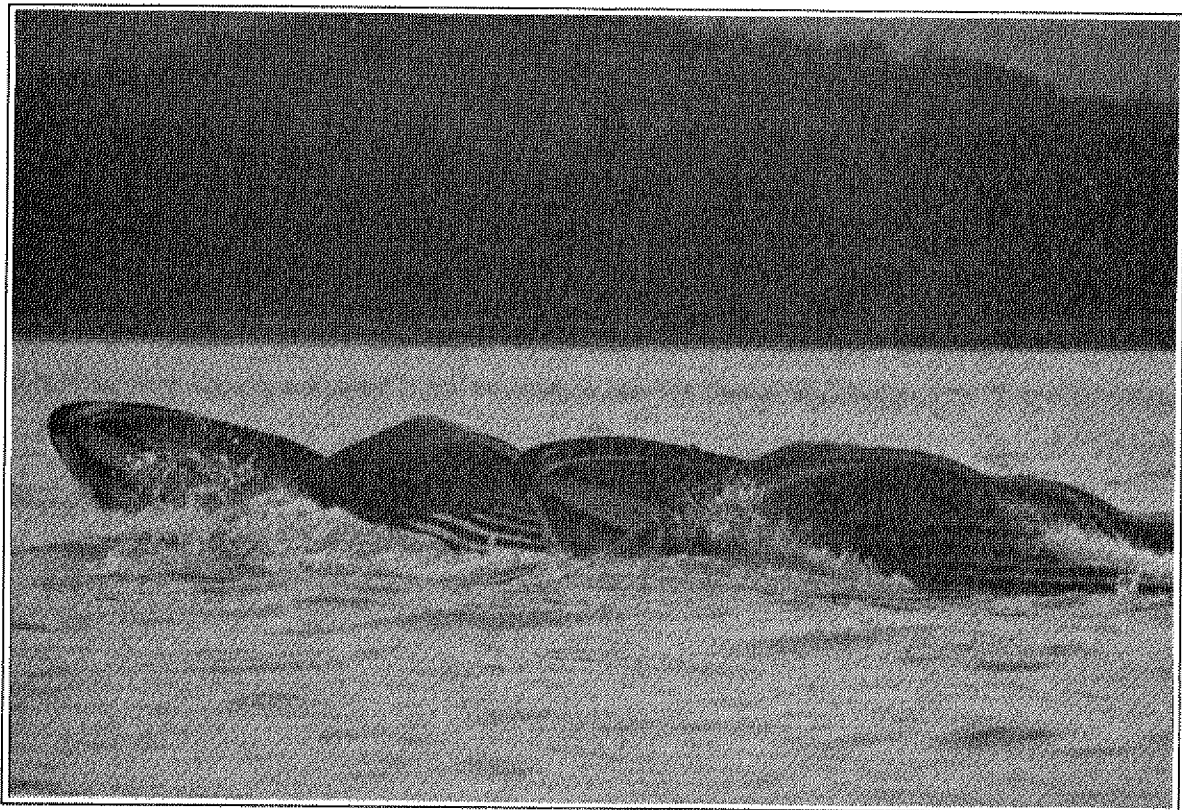
## *Southeastern Alaska*

We have been able to distinguish two patterns of social associations between individual whales feeding in southeastern Alaska (Baker, 1985): (1) fluid associations between whales feeding on swarming krill (a planktonic crustacean), and (2) stable or repeated associations between individuals feeding on schooling fish.

When feeding on swarms of krill, humpback whales will sometimes form aggregations of up to 80 individuals in an area a few kilometers in extent. Early whalers referred to these aggregations as "shoals" (Nemoto, 1964). Within these shoals, whales casually join and

leave smaller pods of four or fewer members. Although the transient membership of these feeding groups is similar to that of mating groups, their sexual composition and behavior differ markedly. Associations between individuals in southeastern Alaska follow no rigid rules; feeding groups may be all males, all females, or males and females (Baker, 1985; Perry et al., 1985). Even more striking is the lack of overt aggression among feeding whales. Rather than competing for access to food, humpback whales seem quite tolerant of each other and may even cooperate with each other in foraging strategies such as echelon feeding. Echelon feeding involves two to four whales lunge-feeding together in close synchrony (Jurasz and Jurasz, 1979) (Figure 6). During each lunge the whales are parallel to each other and separated by half a body length. The positioning of the whales presumably increases the feeding efficiency for one or more of the individuals in the echelon.

In pods of whales feeding on schooling fish, cooperative behavior may extend far beyond the casual level seen in echelon feeding. On three occasions in 1981, we observed a pod of seven to eleven whales feeding together on schooling herring. We observed this pod again on three occasions in 1984. The examination of individual identification photographs showed that associations between some of the individuals in this pod extended across all six sightings in the 3-year period (Figure 7). Adult females seemed to predominate among the regular members of this pod, but males were also present (Baker, 1985).



*Figure 6. Echelon feeding by two whales in southeastern Alaska. (Photo by William Stifel, Kewalo Basin Marine Mammal Laboratory.)*



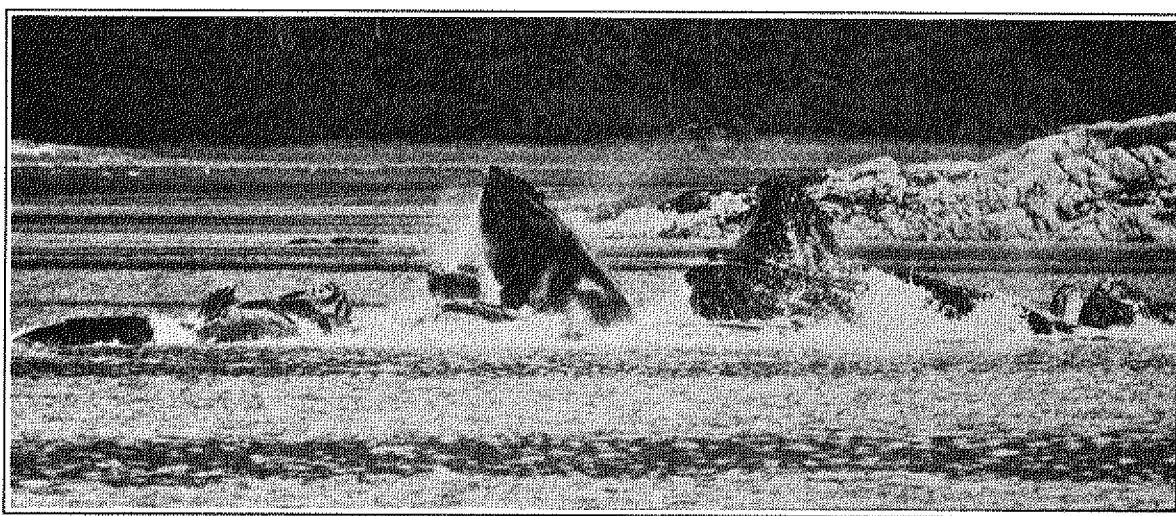
Animal Number	1981 Alaska			1984 Alaska		
	Jul	Aug	Sept	Jul	Aug	Sept
	17, 20		7, 1	27	18	13, 1
561 ♀	A	A	A	C	C	C
578	A	A	A	A	A	A
549	A	A	A	A	A	
569 ♀	A	A				
562	A	A				
?	A					
230		A				
541 ♀		A				
566		A				
740		A				
2526		A				
252			A		A	A
556 ♀			A	A		
545			A			
590			A			
947			A			
385				c	c	c
557				A		A
224				A		
384					A	
403					A	
407					A	
40 ♂						A
104 ♂						A
3423						A

Figure 7. The sighting record and associations of whales in the surface-feeding pods. Boxes enclose pods. A=adult; C=cow with calf; c=calf. (Figure from Baker, 1985)

The whales in this cooperative group were remarkable not only for their social stability, but for their dramatic feeding behavior as well. After diving together, the entire group would remain submerged for 3 to 5 minutes before lunging simultaneously through the surface (Figure 8). On one occasion, we could see herring leaping out of the water in an unsuccessful attempt to escape the gaping jaws of the whales. On another, the entire group of whales surfaced through the center of a single bubble net nearly 25 m in diameter. It was unclear whether this bubble net was formed by one or several of the whales in the group.

By monitoring the underwater vocalizations of the group with a hydrophone, we found that one whale produced a series of trumpet-like calls as the group rose to the surface (Baker, 1985). The calls were rhythmic and stereotyped in both 1981 and 1984. Although the exact function of this "feeding call" is unknown, it seems to have a compelling effect on whales in other contexts. In Hawaii, we have found that some whales swim rapidly from several kilometers away to investigate the playback of this feeding call through an underwater speaker (Mobley et al., 1986). In 1985, a recording of the call was used to lure Humphrey, the "lost" humpback whale, down the Sacramento River and out to San Francisco Bay.

Why is feeding on schooling fish associated with such closely coordinated behavior and long-term associations between individuals? It seems likely to us that these groups are more efficient than singles or pairs at herding agile and fast-swimming fish. Like the pack-hunting strategies of lions, wolves, and killer whales, cooperative feeding may allow humpback whales to pool their energies and achieve greater feeding success than they could as solitary feeders. Further observations of these individual whales may help us to learn more about how the social behavior and foraging strategies of humpback whales influence each other.



*Figure 8. Surface lunge of cooperatively feeding whales. Seven whales lunged through the surface in pursuit of schooling herring at the mouth of Tenakee Inlet on August 18, 1984. (Photo by C. Scott Baker, Auke Bay Laboratory, NMFS.)*

## **FUTURE RESEARCH GOALS**

The information on migration, abundance, reproductive roles, and social structure summarized here represents only a sampling of what can be gleaned from long-term photo documentation of humpback whales. Resights of individual whales across many years can eventually provide more definitive estimates concerning the longevity of individuals, the use and abandonment of feeding or breeding sites, the patterns of kinship relations among feeding whales, recruitment rates within the structured stocks, and overall growth and decline of the population in the eastern North Pacific.

The collaborative effort represented by this catalog provides an important beginning to investigating these questions. We hope the catalog will be useful to researchers engaged in humpback whale studies, and of interest to the many amateur "whale-watchers" who are concerned with the conservation and protection of this fascinating marine mammal.

## **APPENDIX: PROTECTIVE LEGISLATION**

The National Marine Fisheries Service (NMFS) of the National Oceanic and Atmospheric Administration is the federal agency charged with promulgating, interpreting, and enforcing protective legislation concerning marine mammals. The various regional offices of NMFS have established regulations and guidelines defining the harassment of humpback whales in designated areas, such as the waters surrounding the major Hawaiian Islands. Harassment has usually been interpreted to mean any activities of a vessel that change the behavior of a whale, including approaching closer than a specified minimum distance. In Hawaii, NMFS considers 100 yards to be the legal limit for approach. In Glacier Bay, Alaska, however, the National Park Service considers 440 yards (0.25 miles) to be the lower limit. Obtaining fluke photographs of sufficient quality often requires approach within these limits. For this reason humpback whale researchers are issued special research permits by NMFS which allow them to approach the whales under carefully prescribed conditions.



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**CATALOG OF  
PHOTOGRAPHS AND  
PHOTOGRAPHIC INDEXES**



## CATALOG OF PHOTOGRAPHS

### *Acknowledgments*

Many of the photographs in this catalog were obtained in association with research projects funded by various agencies and organizations. We are aware of the following sources whose financial or logistical support has resulted in photographs for this collection: National Park Service, Glacier Bay National Park, and Alaska Regional Office; Auke Bay Laboratory, National Marine Fisheries Service (NMFS); National Marine Mammal Laboratory, NMFS; Center for Field Research; University of Hawaii Sea Grant College Program; National Science Foundation; National Wildlife Federation; Oceanic Society; American Cetacean Society; and U.S. Forest Service, Admiralty Island Monument.

We wish to thank the following people for valuable technical assistance and logistical support: Al Lovaas of the National Park Service, Alaska Regional Office; Don Chase and Gary Vequist of the Glacier Bay National Park and Preserve; Ken Krieger, Dr. George Snyder, and Dr. Bruce Wing of the Auke Bay Laboratory; and Dr. Linda Jones, Sally Mizroch, Mary Nerini, Dr. Michael Tillman, and the late James Johnson of the National Marine Mammal Laboratory.

The compilation of this catalog would not have been possible without the careful and dedicated assistance of Teal Akaret, Paul Bass, Steve Graham, Lark Meyers, and Elizabeth Ng. Takumi Tashima of the University of Hawaii Reprography Services prepared black and white negatives from hundreds of color slides. Keala Kobashigawa, Gene Nitahara, and the staff of Honolulu Photo Lab did a fine job developing and printing the majority of the photographs.

We are particularly grateful to the University of Hawaii and University of Alaska Sea Grant College Programs for providing funding for the costs of preparing and publishing this catalog.

### *Contributors of Photographs*

Many researchers generously contributed photographs or sighting data to this catalog. Contributors are listed by their initials in the catalog's Observations Index (Index I), and are listed here alphabetically. We wish to thank all of them for providing this information.

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### ***Format of Catalog***

All photographs contained in this catalog were obtained from five major feeding or breeding areas of the central and eastern North Pacific (Table 4). In cases where several photographs of a given whale may be on record, only the best quality photograph was used. In cases where the same individual was photographed in more than one region, the best photograph from each region was included.

TABLE 4. SUMMARY OF IDENTIFICATION PHOTOGRAPHS BY  
MAJOR REGIONS

Region	No. Photographs	Years Studied
Hawaii	634	1977-85
Southeastern Alaska	464	1979-85
Western Gulf of Alaska	95	1977, 1980, 1982-85
Mexico	36	1978, 1980, 1985
California	18	1979-81, 1983, 1985
Total	1,247	



### ***Variability of study effort***

The numbers of photographs listed for each major study region are an indication of the relative amount of study effort for each region and are not necessarily an indication of relative abundance. The primary research effort of the Kewalo Basin Marine Mammal Laboratory has been in Hawaii and southeastern Alaska, which together account for the majority of photographs. Photographs from the other three regions have been made available by contributing researchers with affiliations other than the Kewalo Basin Marine Mammal Laboratory.

### ***Description of major regions***

Figure 1 shows the major study regions of the central and eastern North Pacific. Hawaii and Mexico are winter calving and breeding grounds and the remaining three regions are summer feeding habitats (central California; southeastern Alaska; and western Gulf of Alaska). The Hawaiian region refers to the main islands of the Hawaiian archipelago, with the majority of photographs taken from waters off west Maui and along the west coast of the Big Island. The Mexico region refers to the west coast of Mexico, primarily the waters surrounding the Islas Tres Marias and the Islas de Revillagigedo. The central California region corresponds to the waters surrounding the Farallon Islands and the coast of central California. Southeastern Alaska includes the waters surrounding the Alexander Archipelago, the adjacent mainland between 50 and 60 degrees north latitude, and Yakutat Bay. Finally, the western Gulf of Alaska region includes the area from Prince William Sound west to Chirikov Island.

### ***Organization by coloration***

Within each major study region, individual photographs have been organized according to decreasing amount of white coloration: from all-white to moderately white to all-black. Additionally, whales with similar scarring and coloration patterns have been grouped together. Thus, any new photograph may be compared to a smaller subset of the entire catalog to establish a resight.

### ***Format of photographic indexes***

Each photograph in the catalog is identified by two numbers: (1) a 2 to 4-digit "observation number"; and (2) a 1 to 3-digit "resight number." The observation number corresponds to a specific sighting of a given whale. The resight number is the unique number assigned to an animal that has been photographed more than once. (Note: A resight number of zero indicates that that individual has only been sighted once.) The resight number allows us to recall all observations of a particular individual. Thus, an individual whale is represented by its observation number if it was seen only once, or by its resight number if it was seen more than once.

A given whale will appear only once within a region, but may appear again in another region. The observation index (Index I) is organized by observation number, and a specific photograph should first be referenced using that number. A sample of the format of Index I appears below:

REGION = HAWAII									
Observation Number	Resight Number	Year	Photographer		Additional Contributors			First Year Sighted	Page
1070	0	1982	KBL	—	—			—	31
1071	22	1982	KBL	—	PWF			1979	20
1072	0	1982	KBL	—	—			—	12
REGION = SOUTHEASTERN ALASKA									
Observation Number	Resight Number	Year	Photographer		Additional Contributors			First Year Sighted	Page
1213	241	1982	KBL	—	—	—	—	1982	95
1217	22	1982	KBL	AAW	CMJ	WSL	JMS	1977	97
1224	221	1982	KBL	WSL	PD	BT	JMS	1980	96

As shown above, Observation No. 1071 from Hawaii and Observation No. 1217 from southeastern Alaska are of the same animal — Resight No. 22. This whale has been seen repeatedly in both Hawaii and Alaska. YEAR refers to the year that particular photograph (e.g., Observation No. 1217) was taken; PHOTOGRAPHER refers to the photographer for that particular observation number; ADDITIONAL CONTRIBUTORS refers to any contributing photographers who may have supplied other pictures of that same whale for that same region; FIRST YEAR SIGHTED indicates the year in which that whale was first photographed in that region; and PAGE refers to the catalog page number where the fluke photograph corresponding to that observation number may be found.

A total of 105 animals were resighted in more than one region. The resight index (Index II) provides the resight numbers of all these whales, and lists the regions where each animal was sighted.

### *Erratum*

Two observations of Resight No. 852 were inadvertently included within the Hawaii region photographs — Observation No. 2200 (C-77) and No. 2211 (C-64).

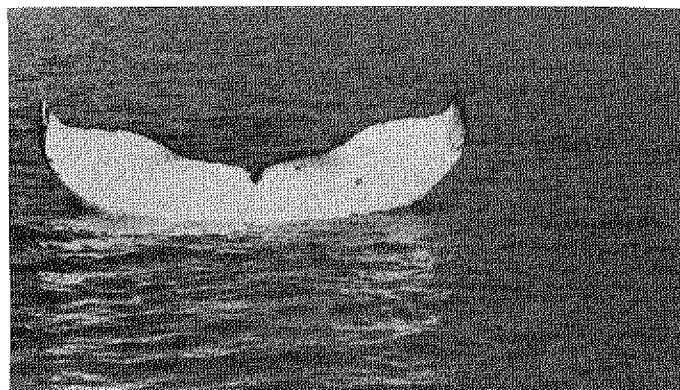


# Humpback Whales

CATALOG OF INDIVIDUAL IDENTIFICATION PHOTOGRAPHS  
AND PHOTOGRAPHIC INDEXES







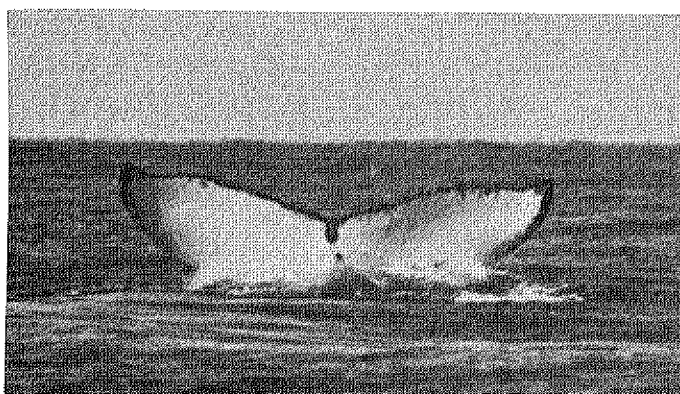
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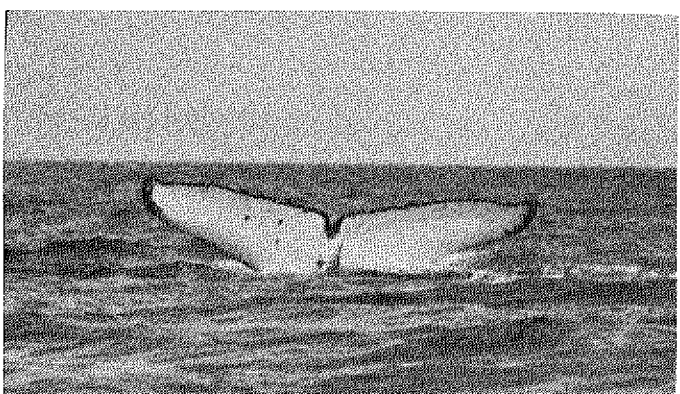
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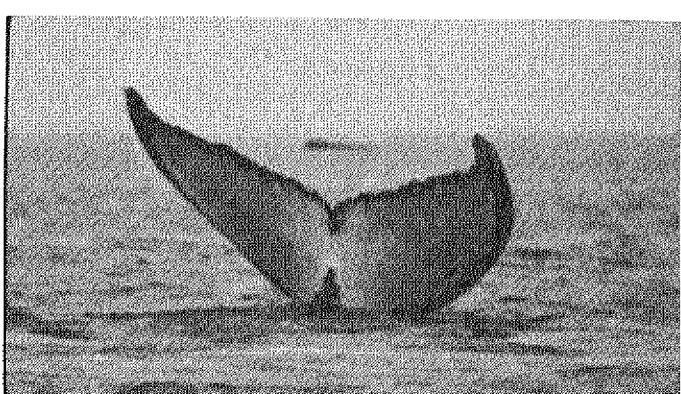
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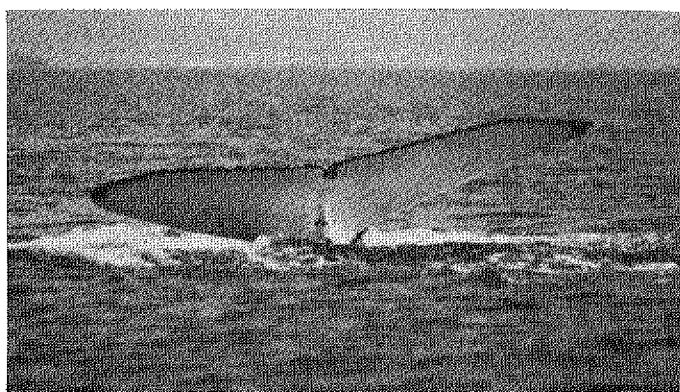
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335



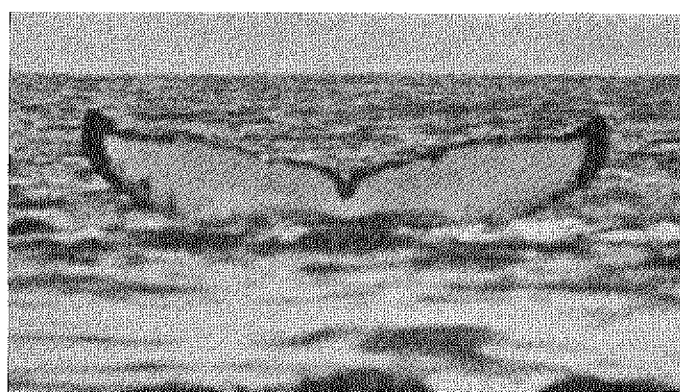
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183



2110

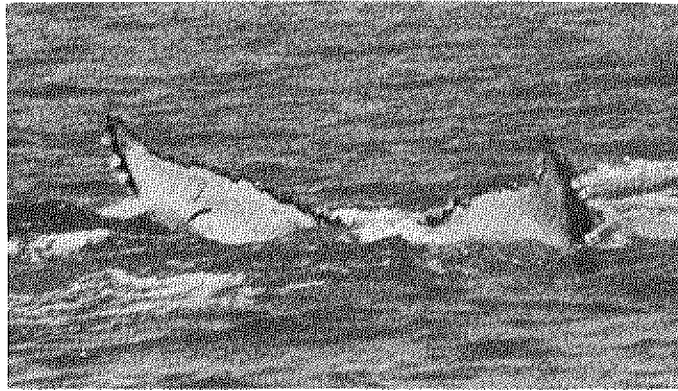
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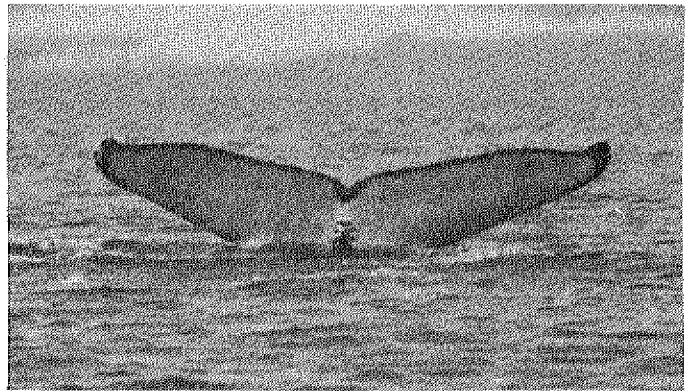
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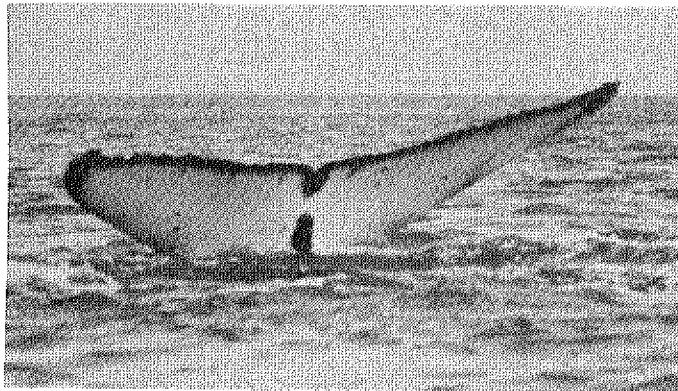
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1180

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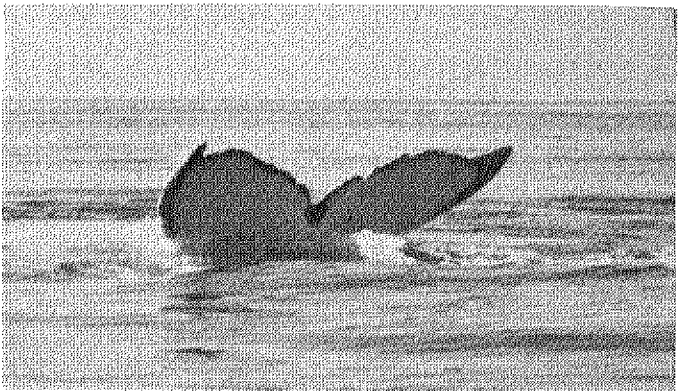
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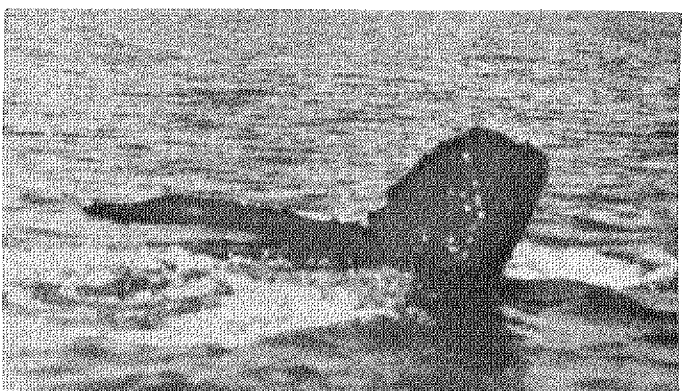
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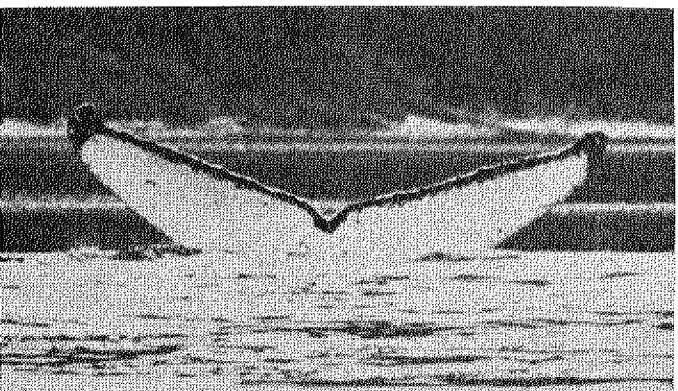
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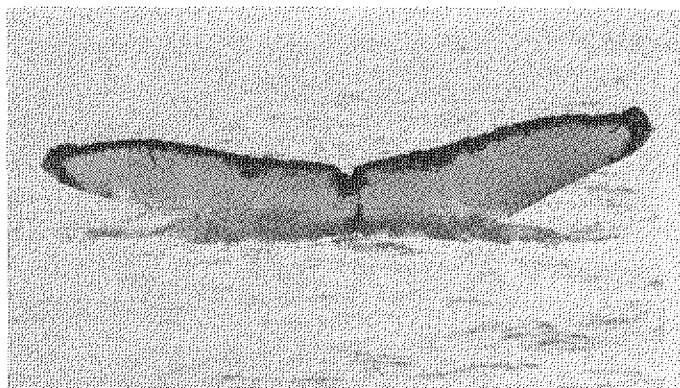
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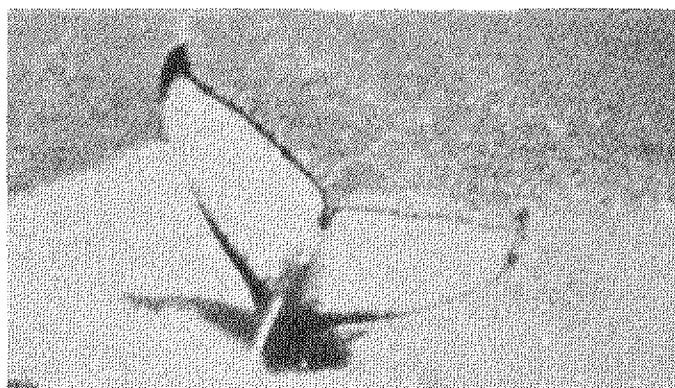
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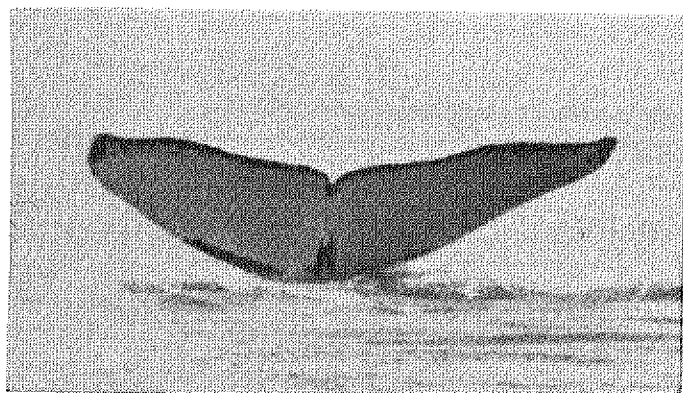
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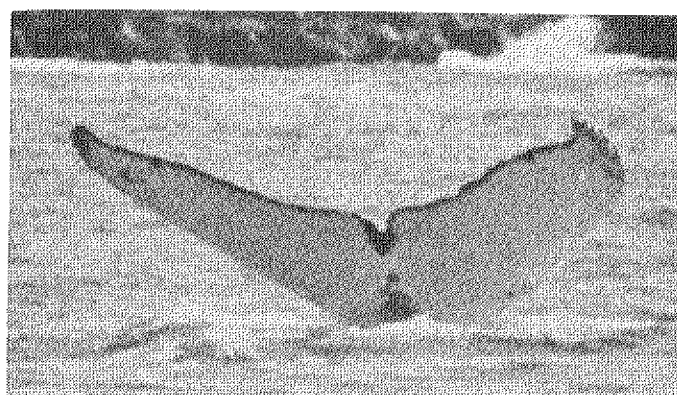
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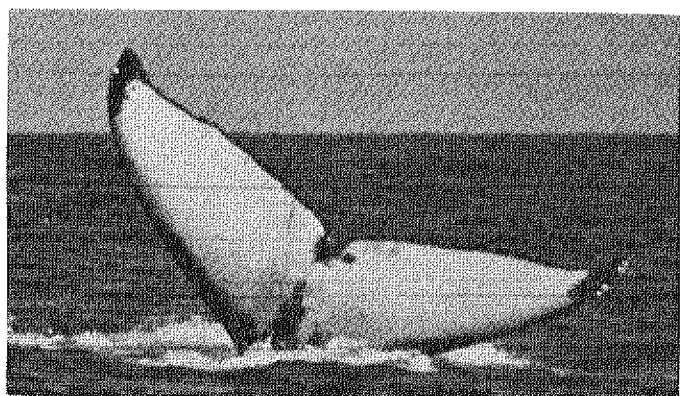
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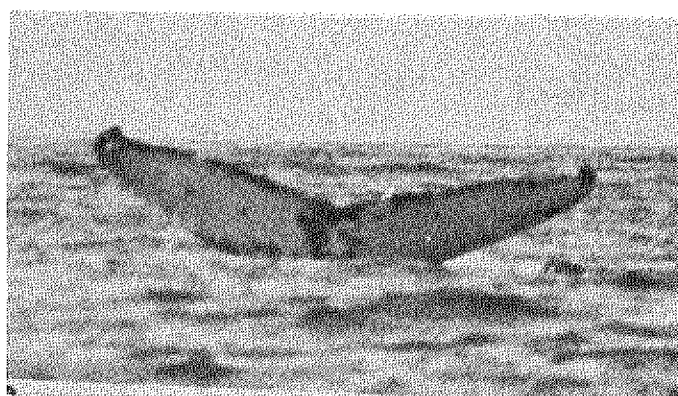
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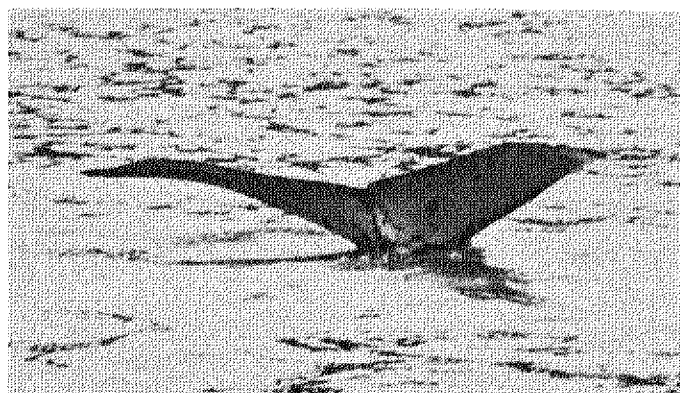
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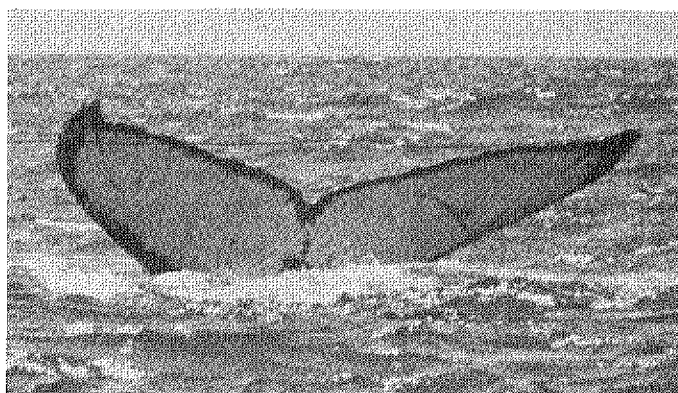
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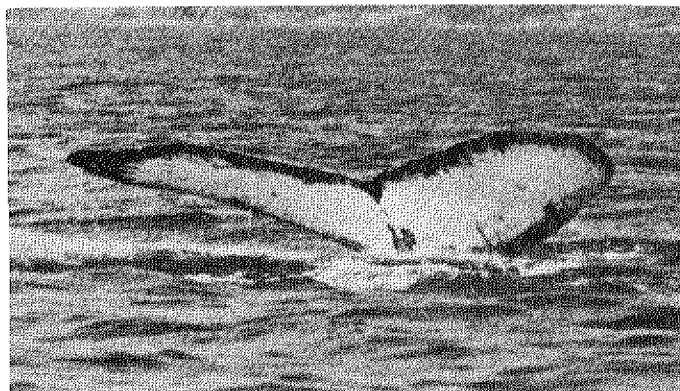
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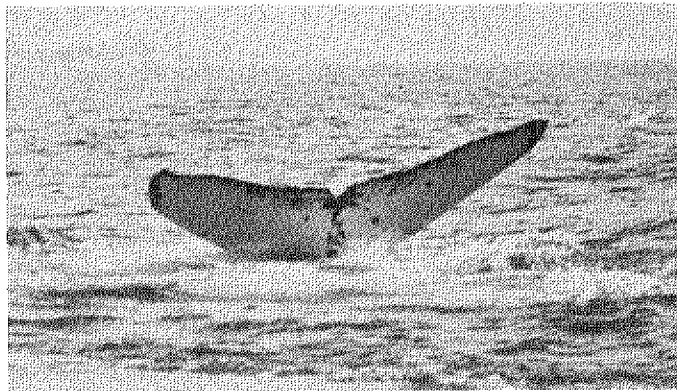
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2161

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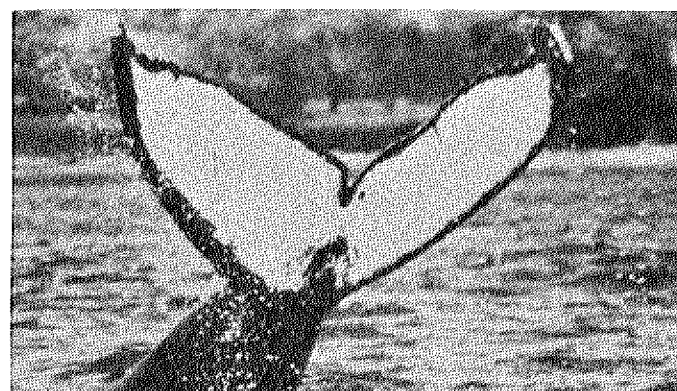
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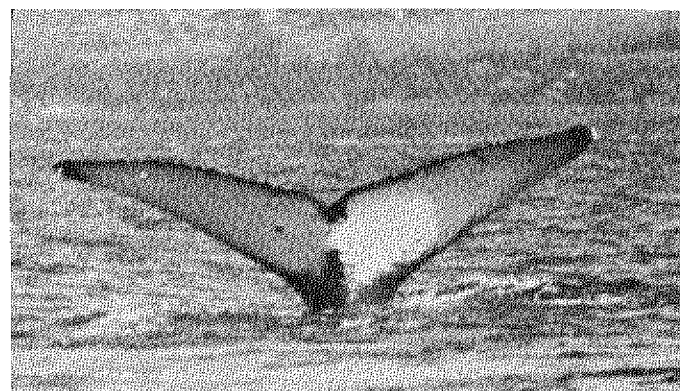
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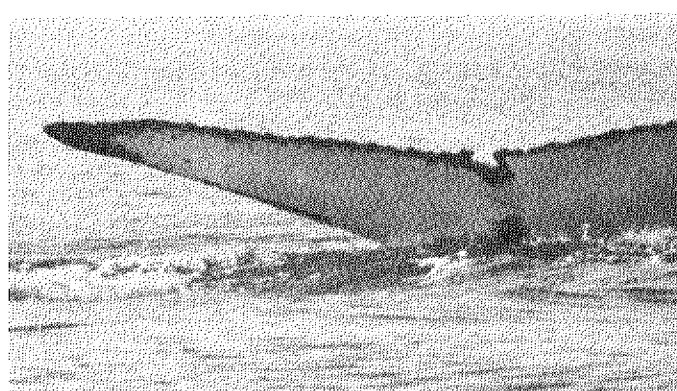
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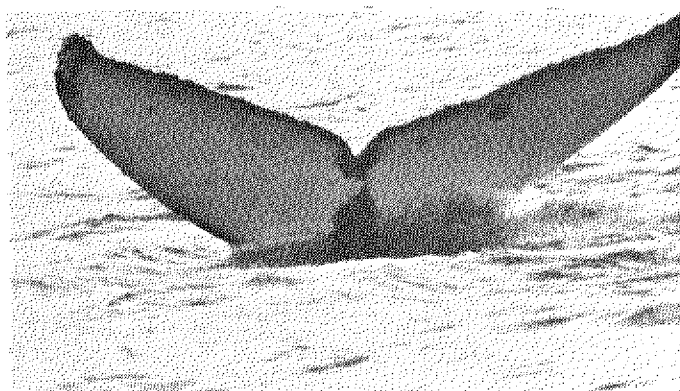
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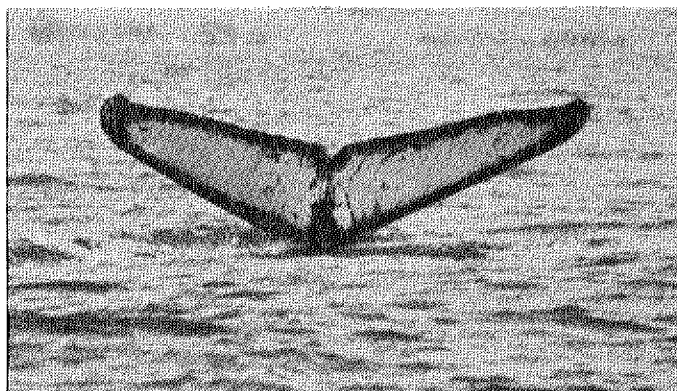
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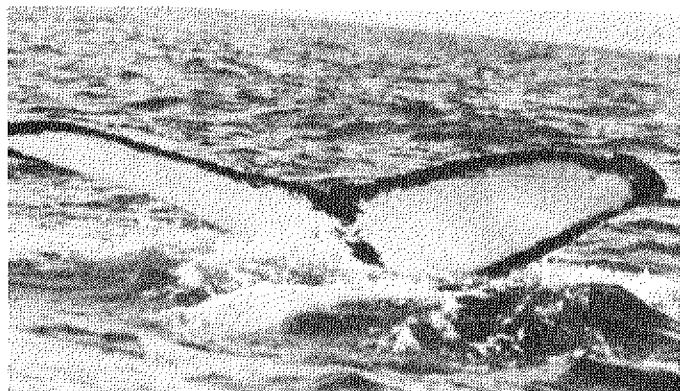
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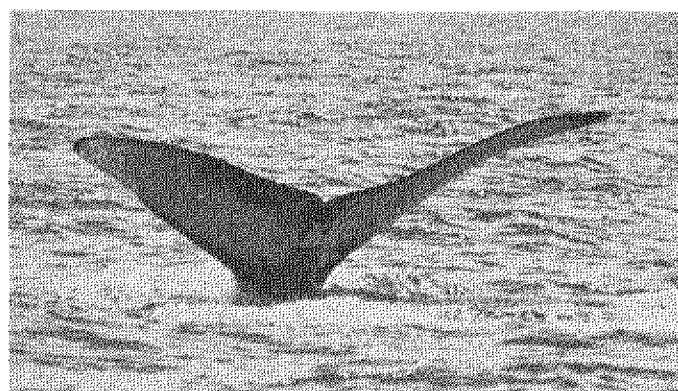
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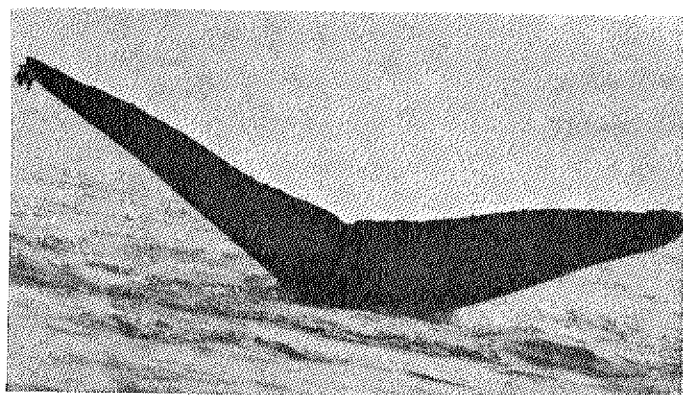
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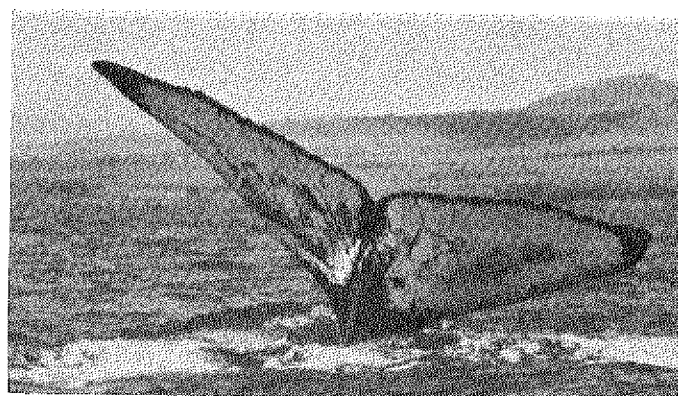
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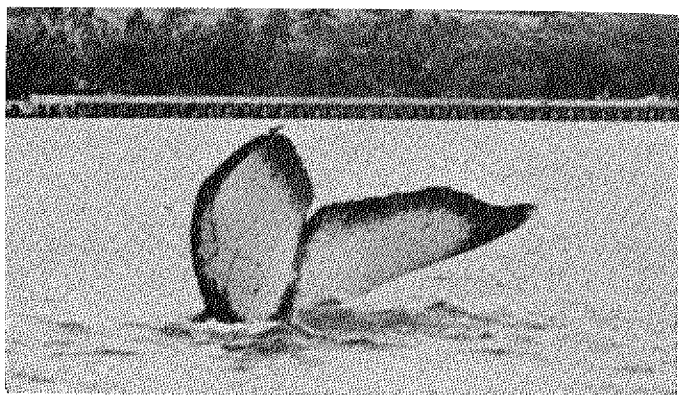
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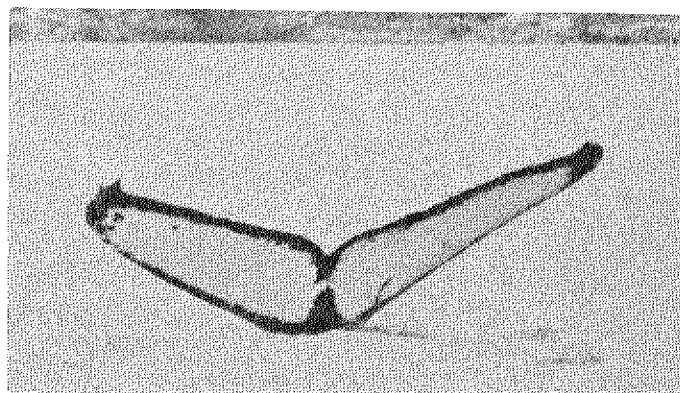
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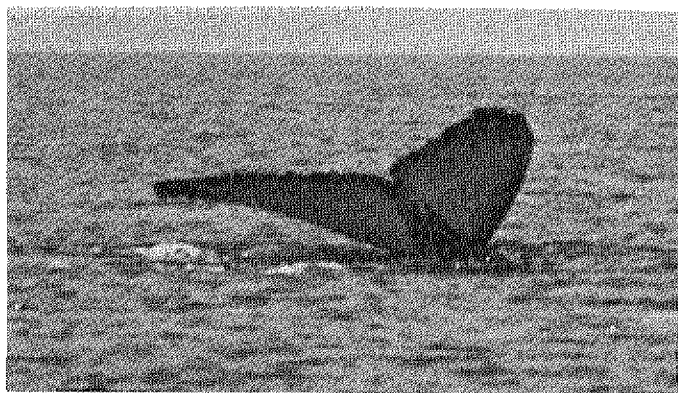
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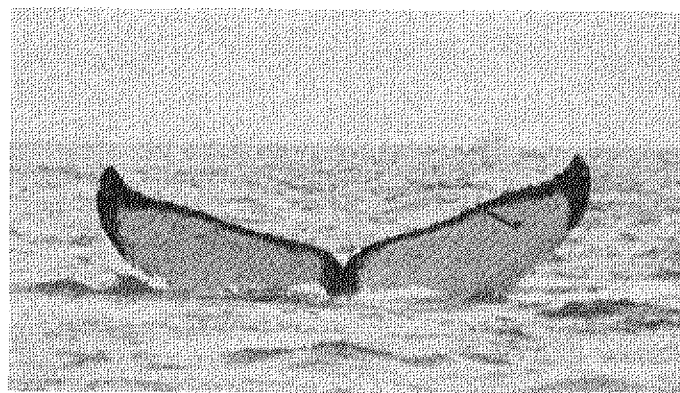
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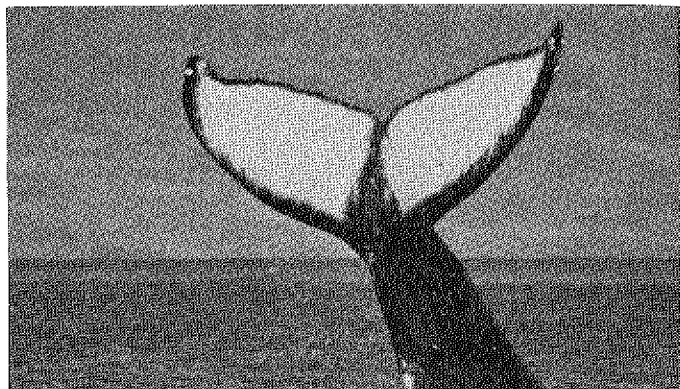


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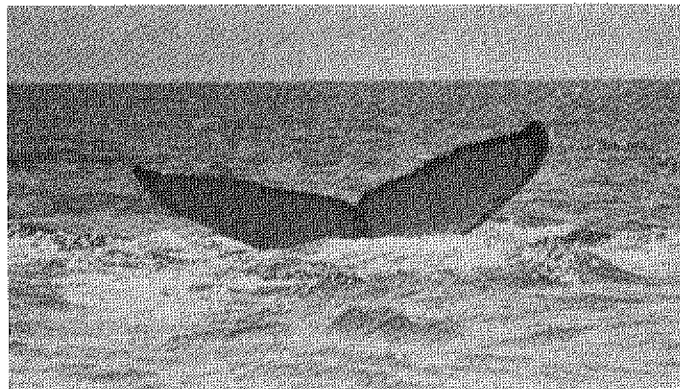


# HAWAII



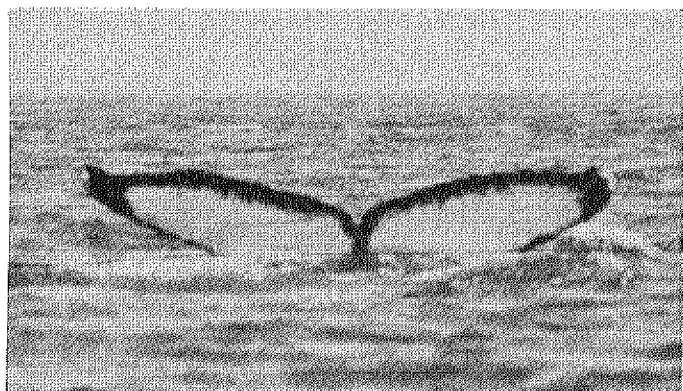
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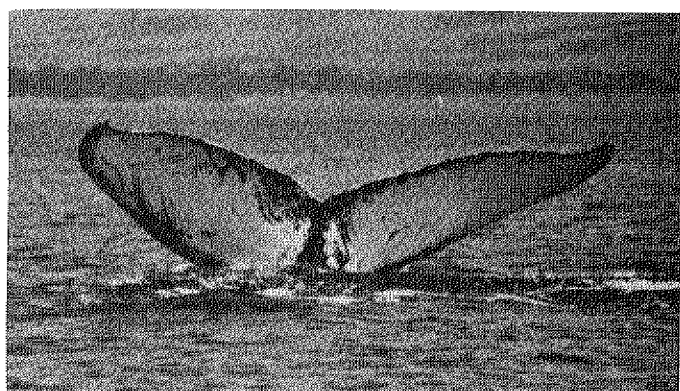
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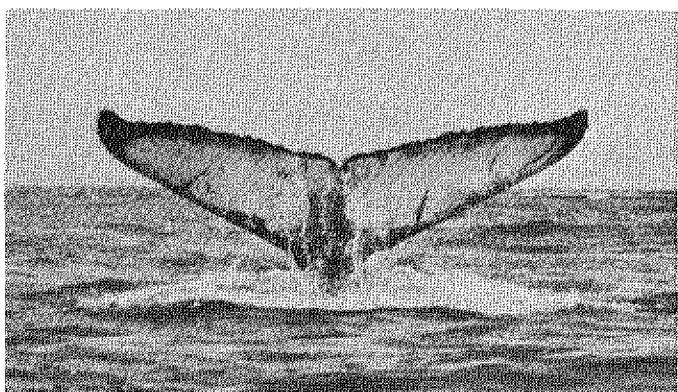
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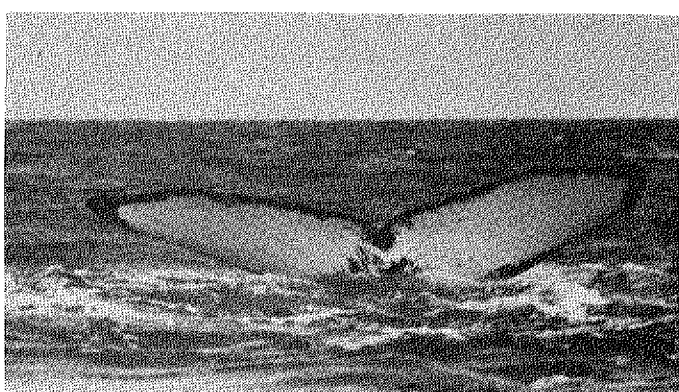
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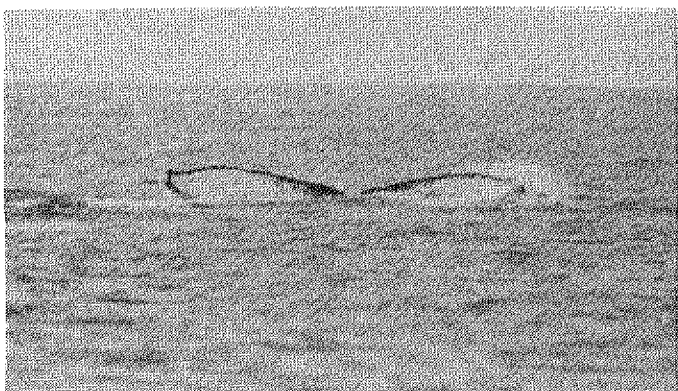
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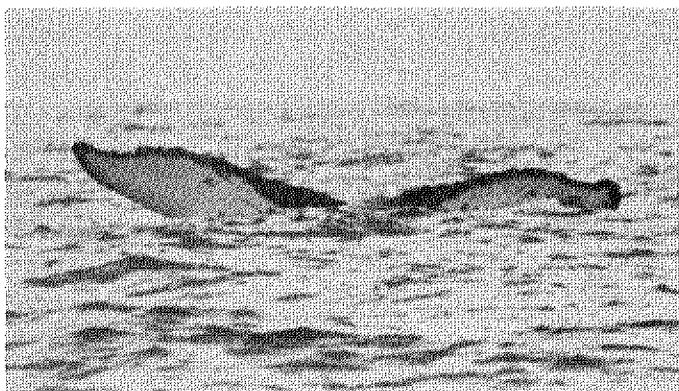
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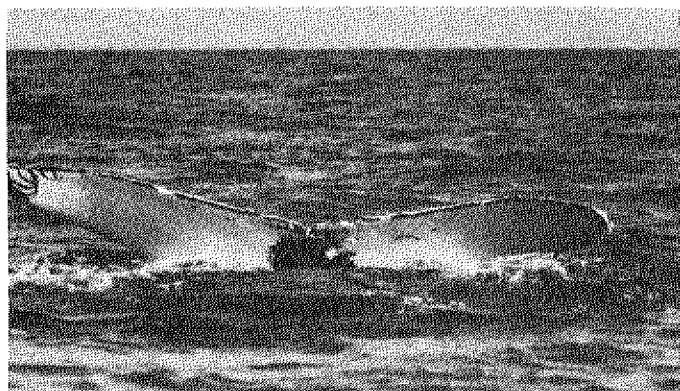
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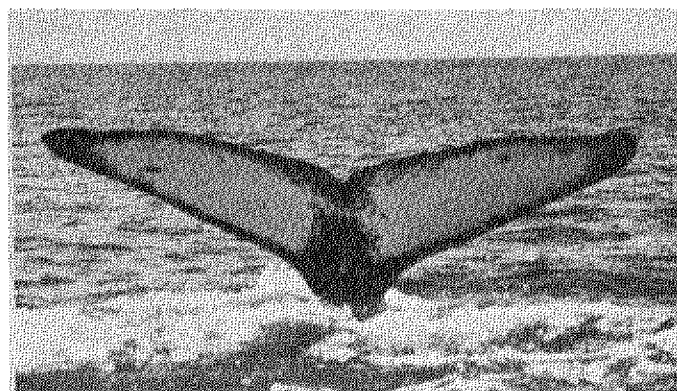
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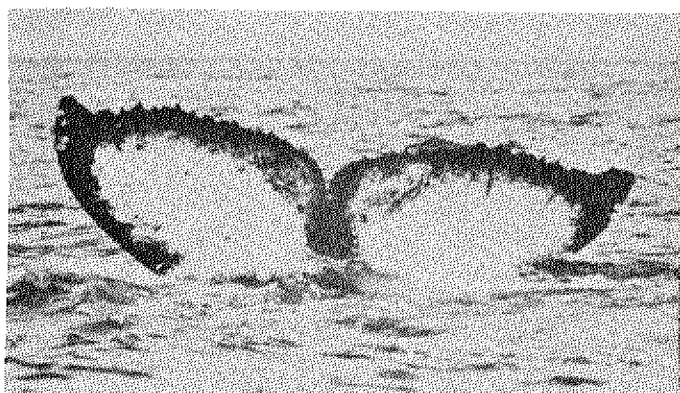
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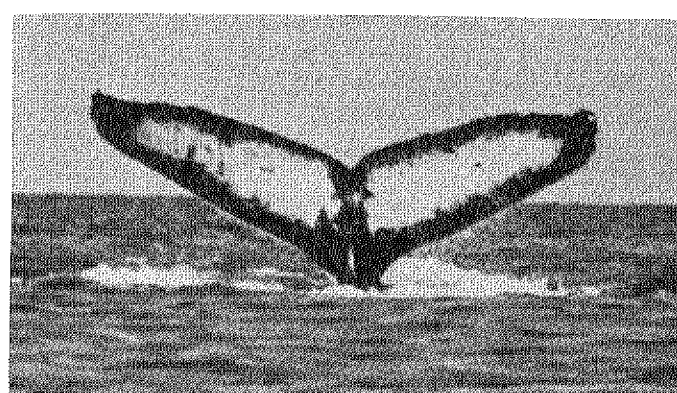
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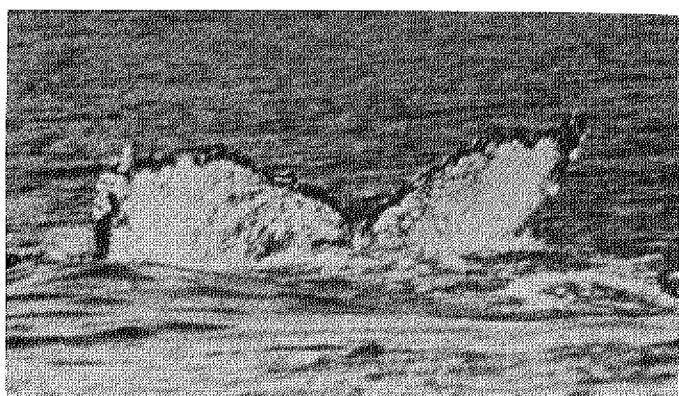
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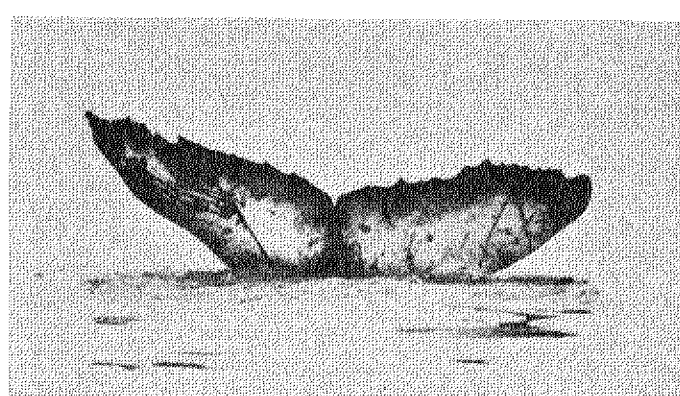
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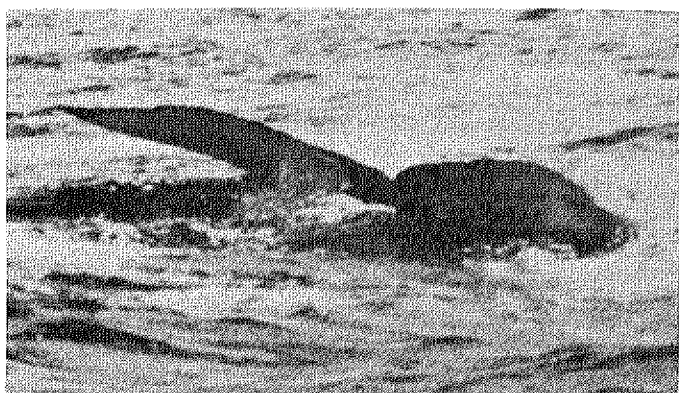
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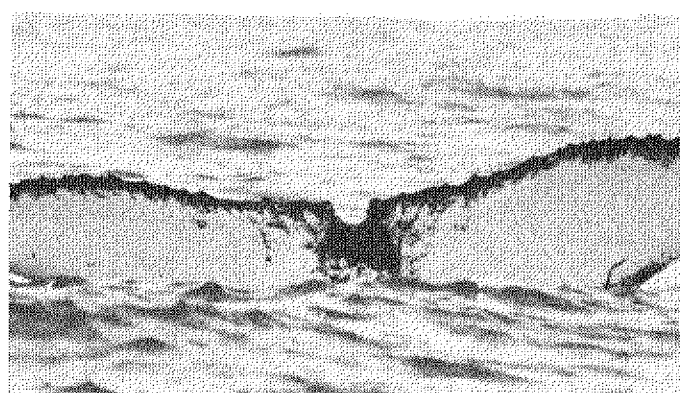
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225

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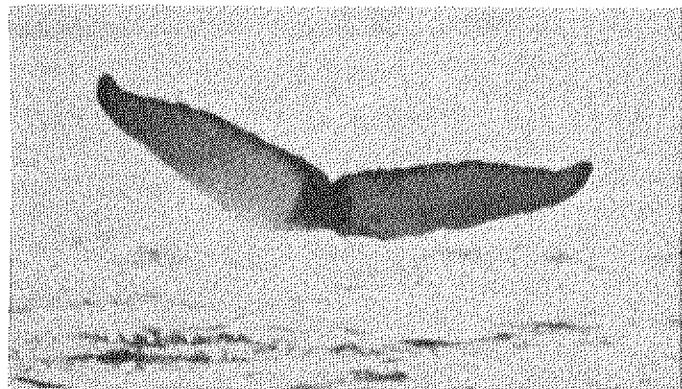


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370



# HAWAII



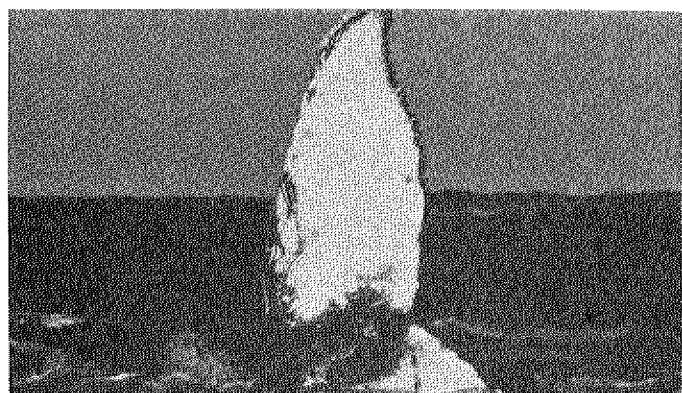
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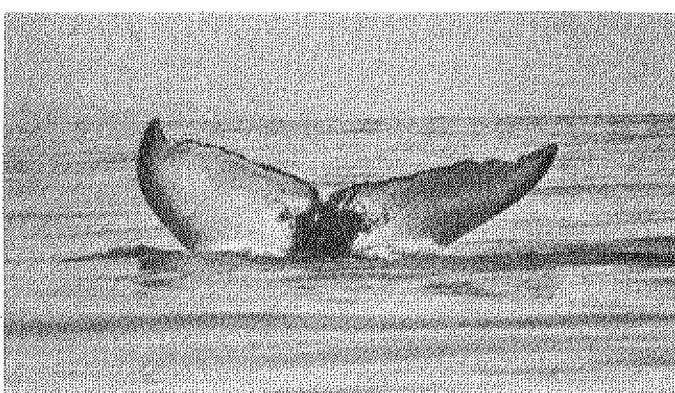
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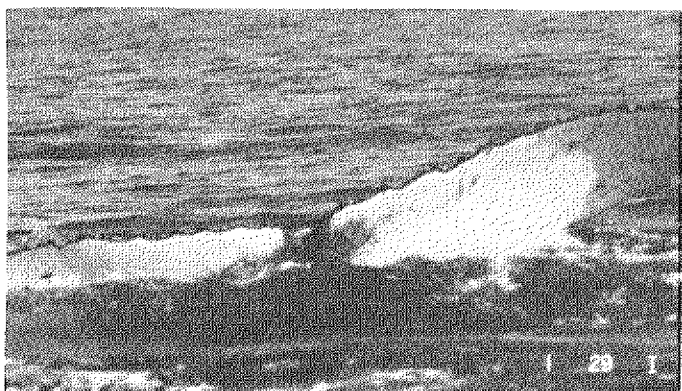
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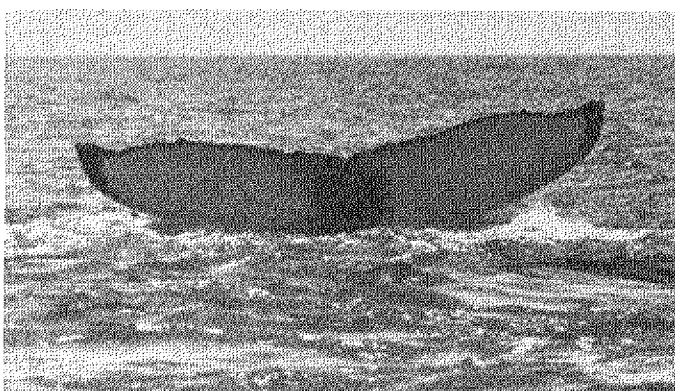
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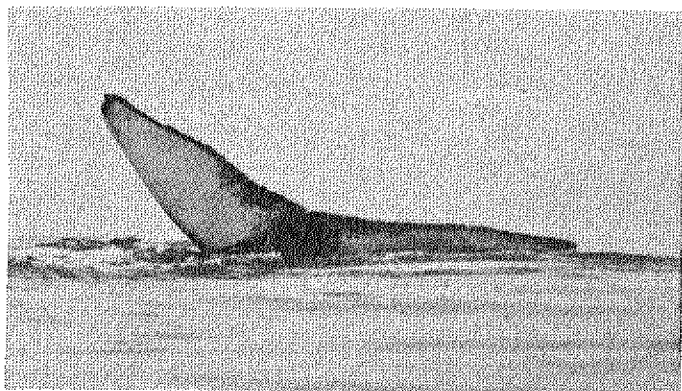
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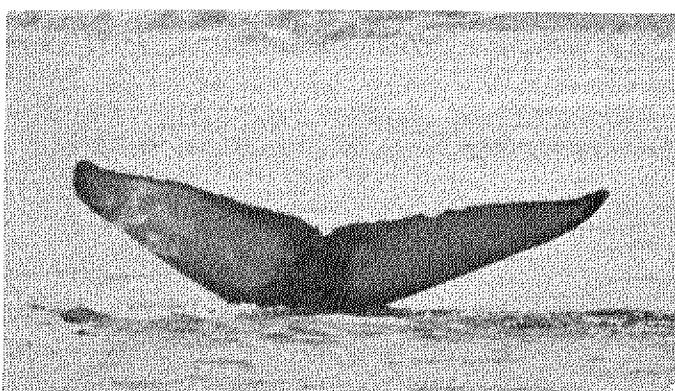
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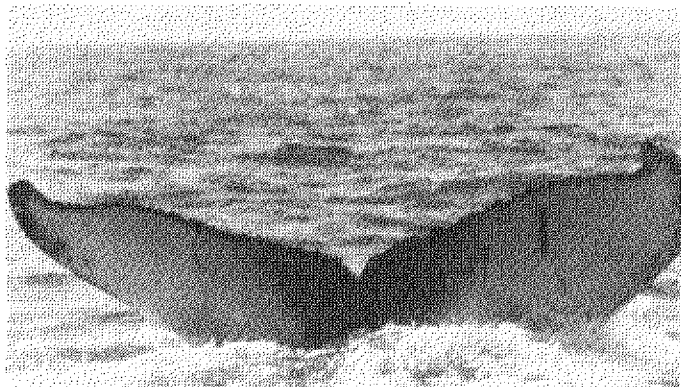
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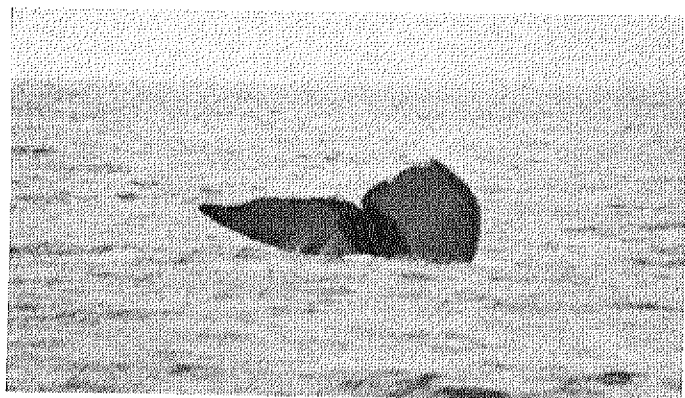
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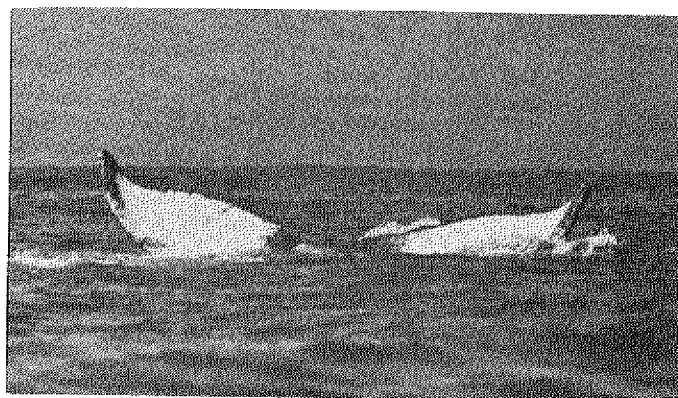
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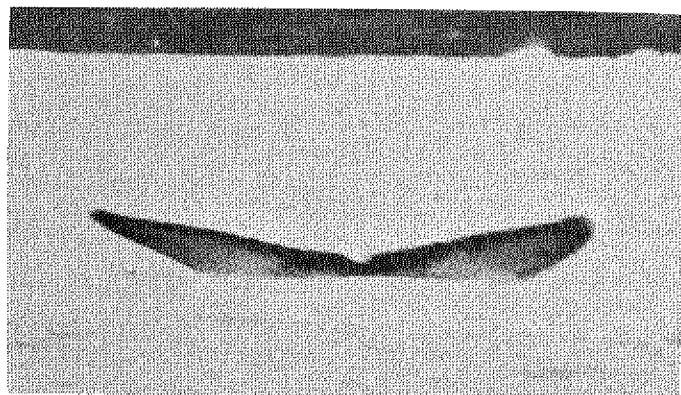
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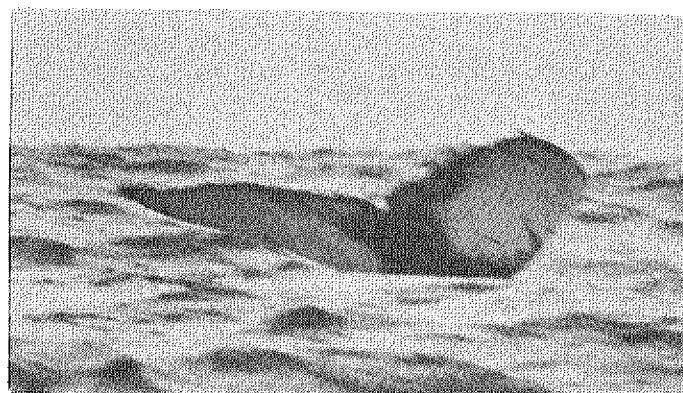
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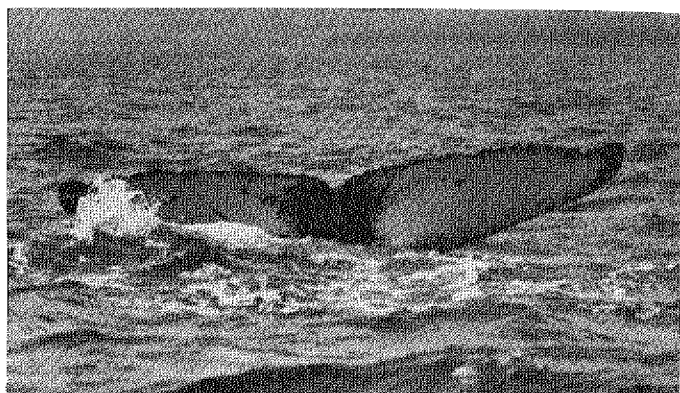
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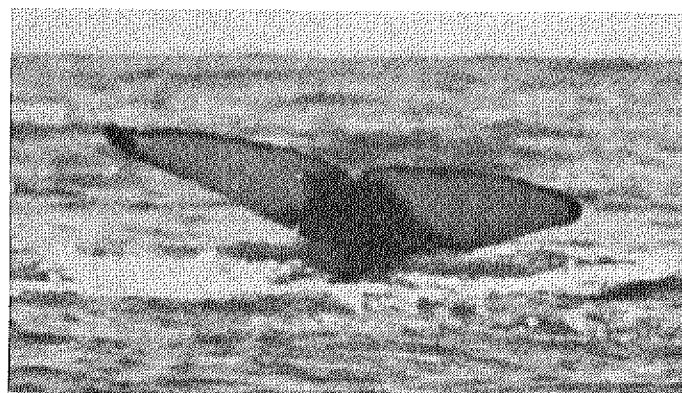
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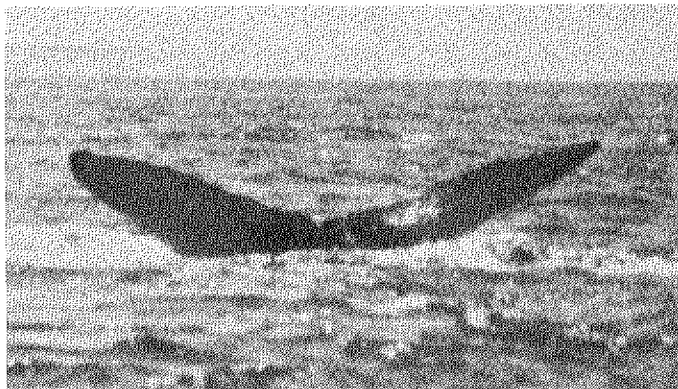


# HAWAII



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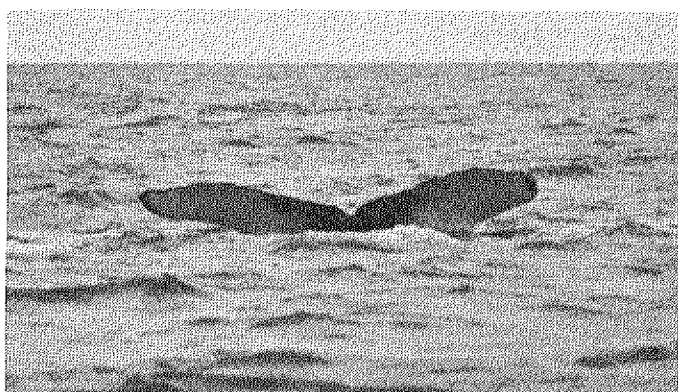
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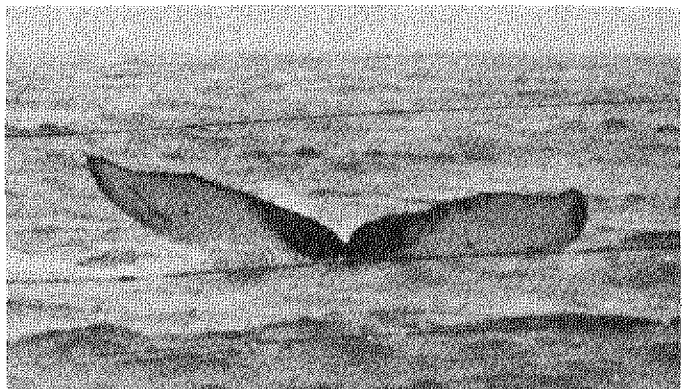
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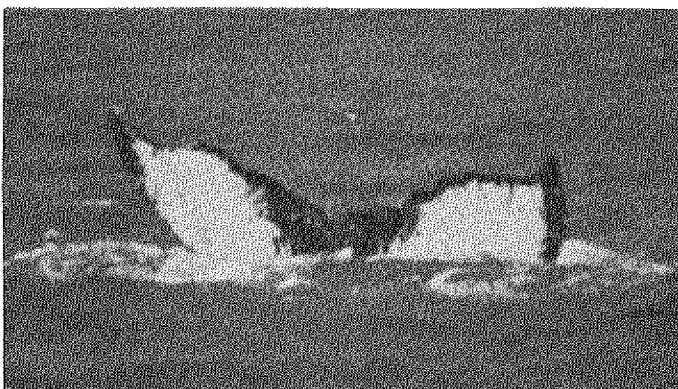
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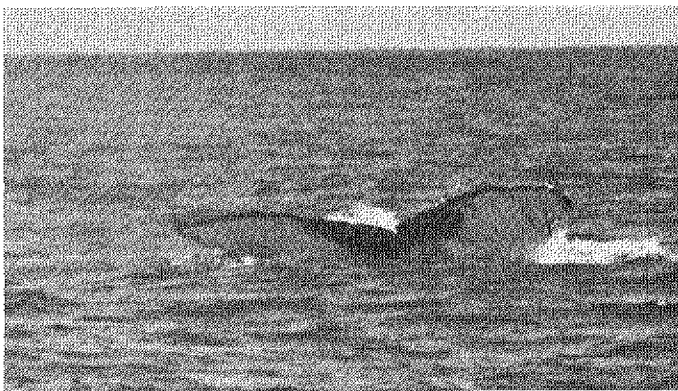
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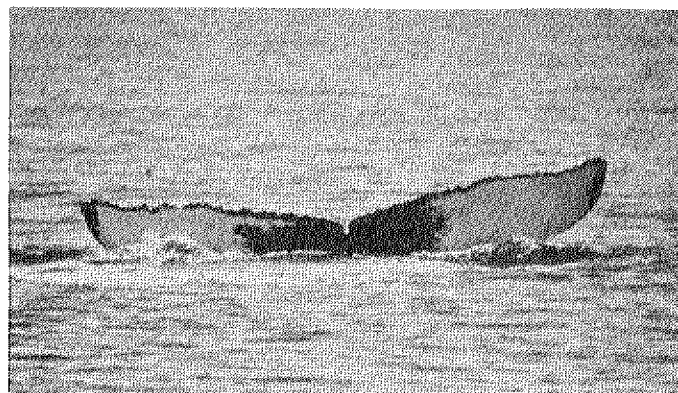
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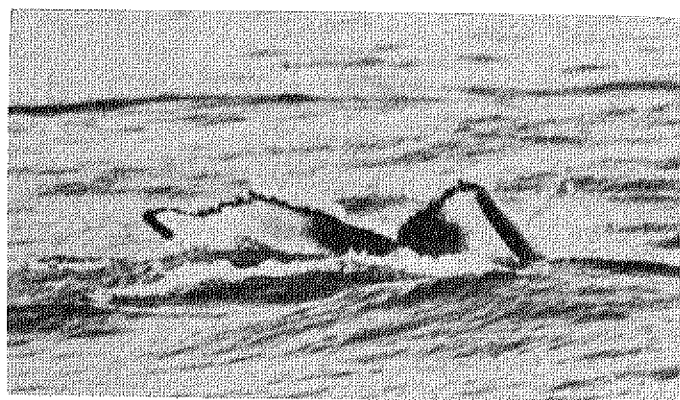
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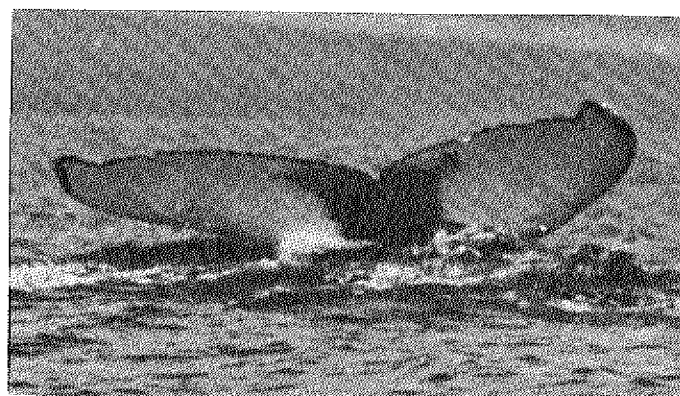
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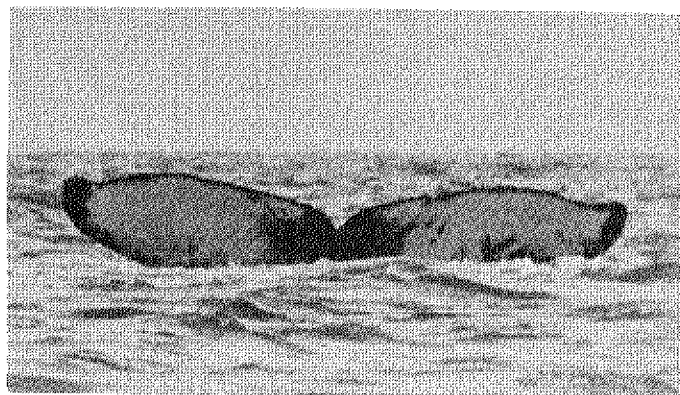
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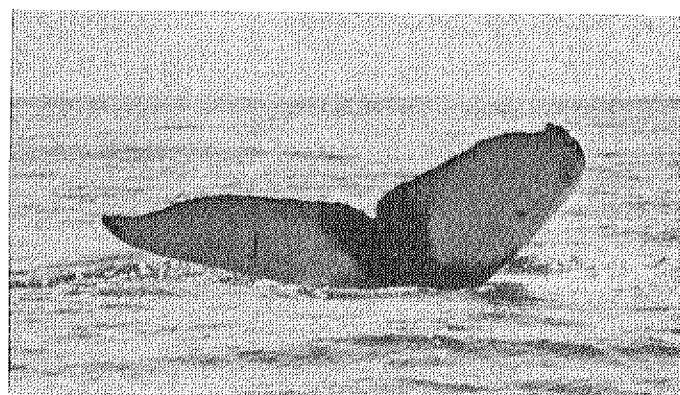
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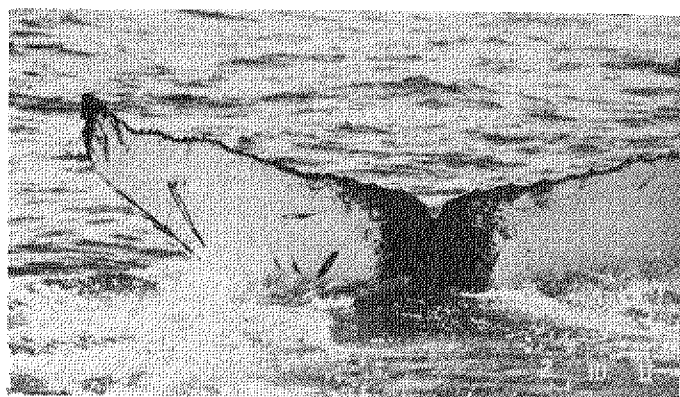
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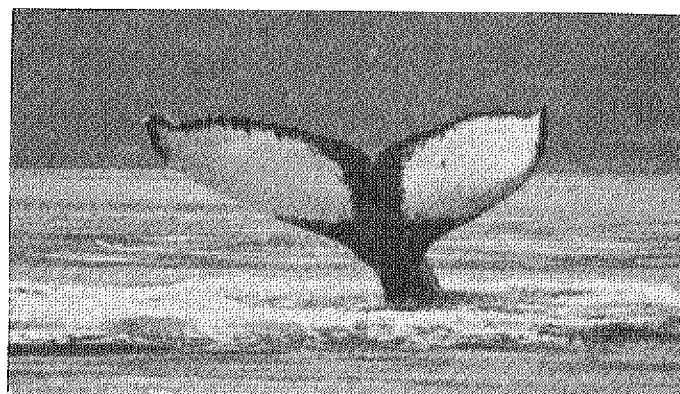
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121

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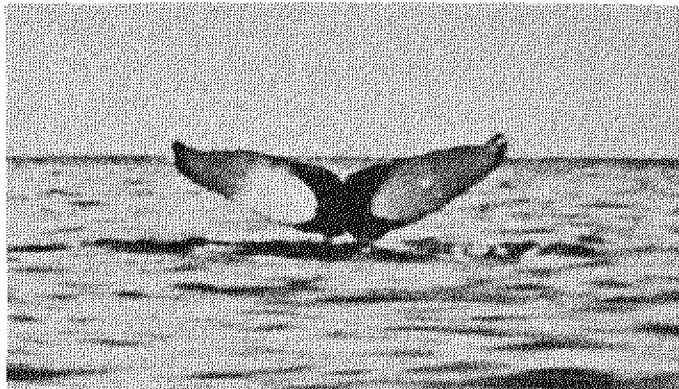


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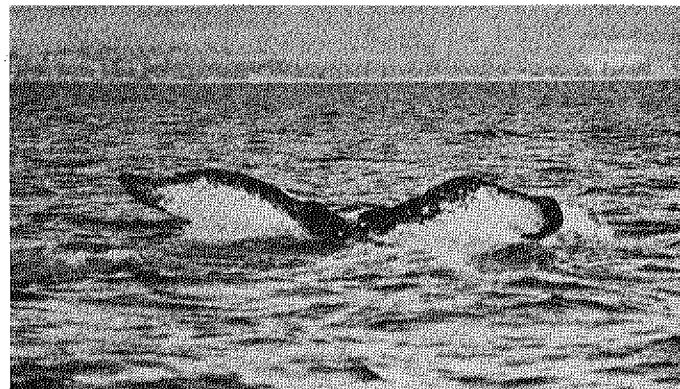


# HAWAII



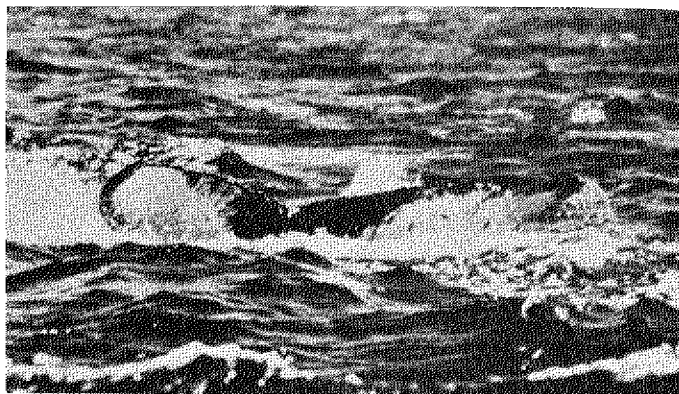
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660

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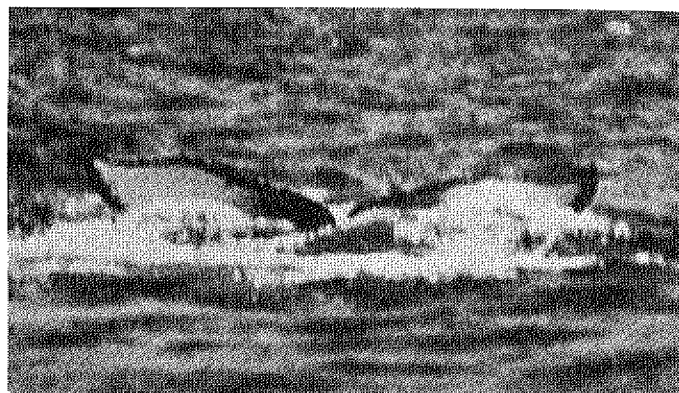
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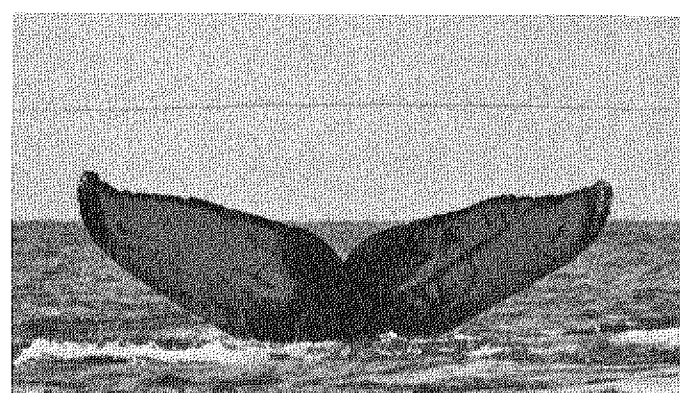
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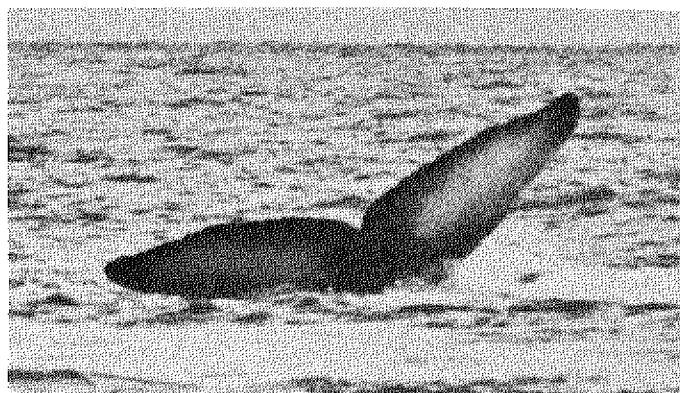
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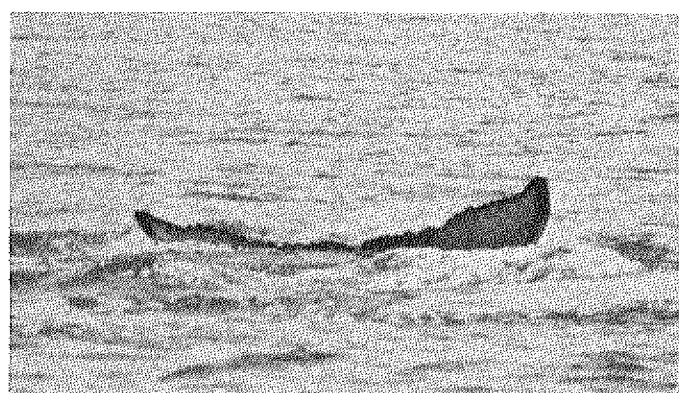
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50



1072

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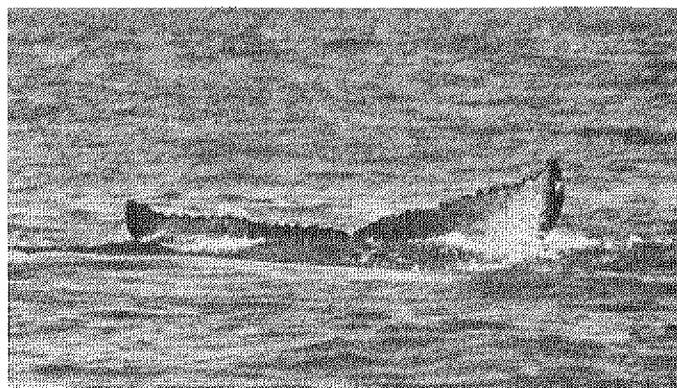
530

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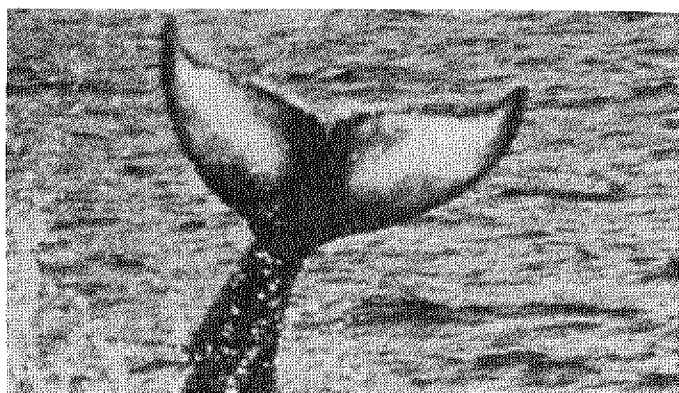
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386

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1004

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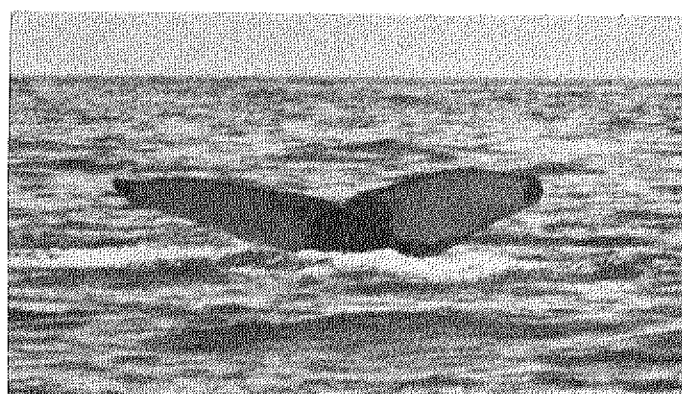
155

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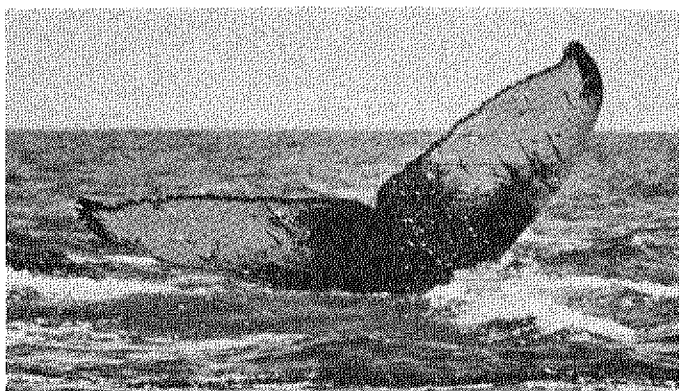
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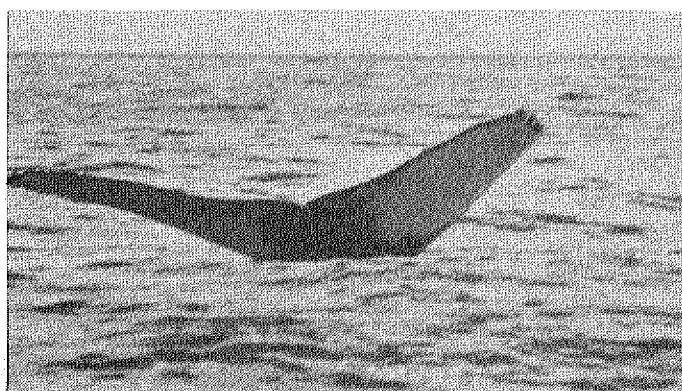
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338



2391

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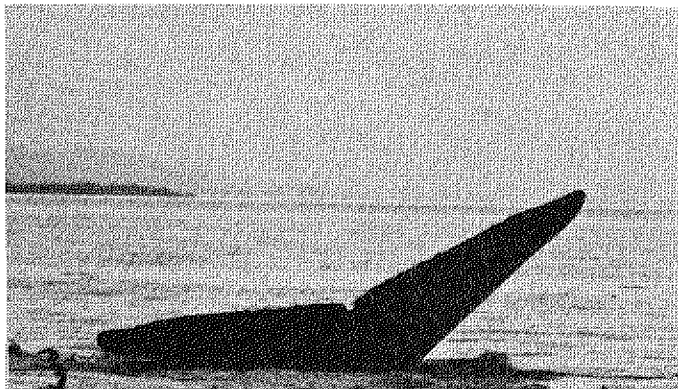


2335

362

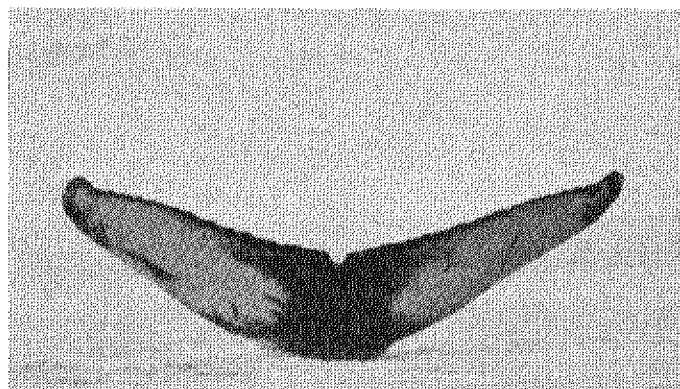


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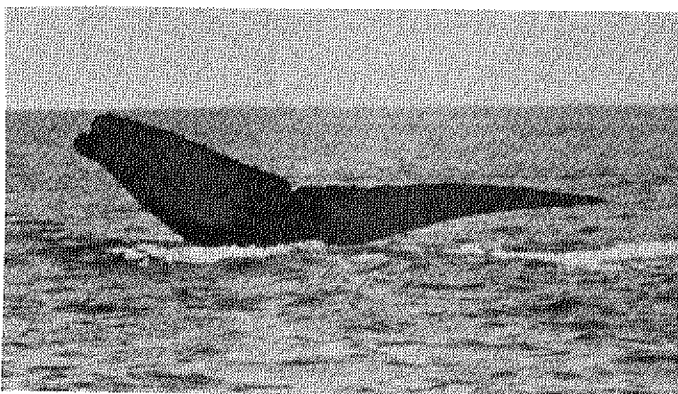
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241



2458

418



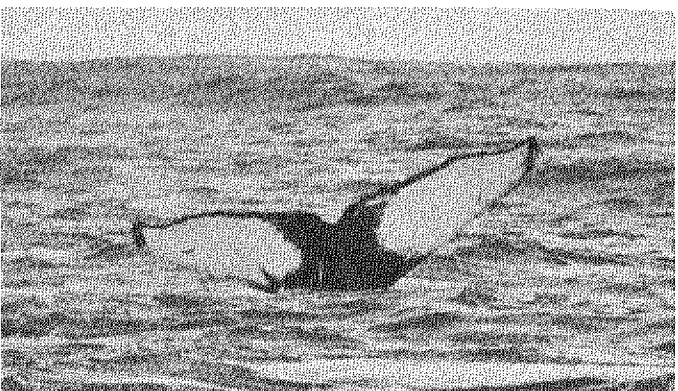
2439

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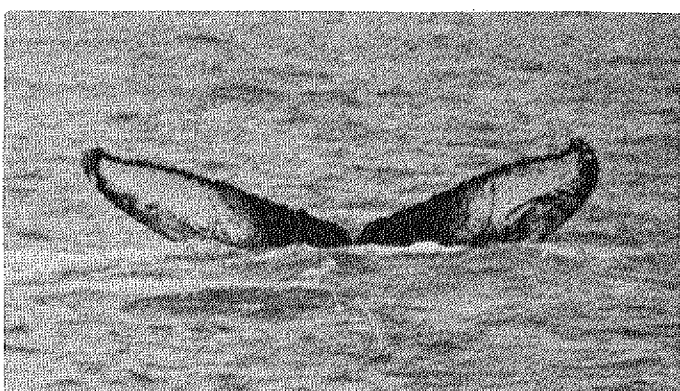
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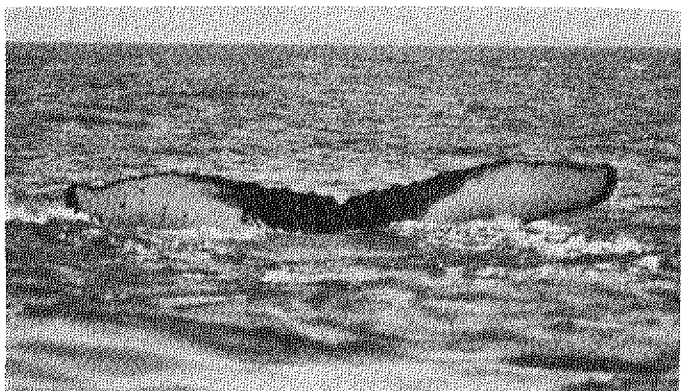
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93



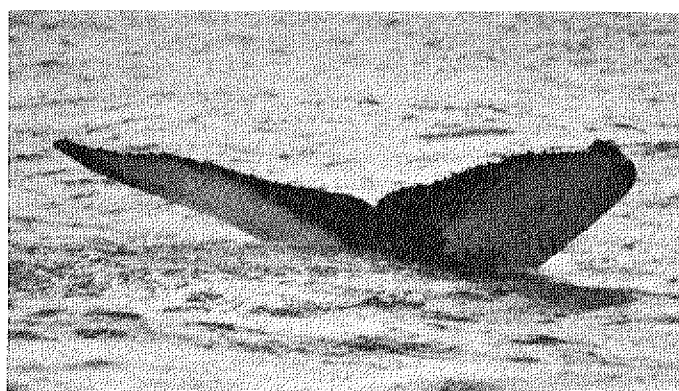
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339



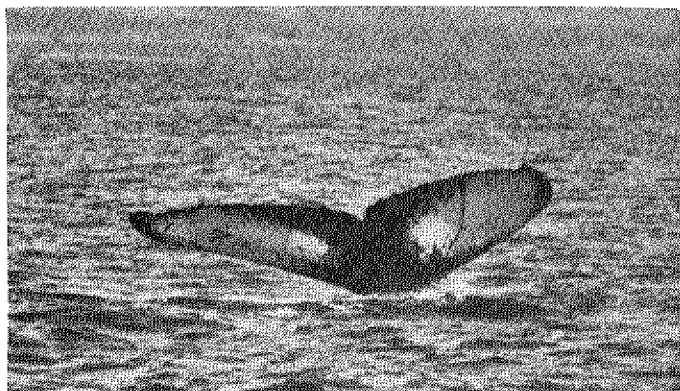
2136

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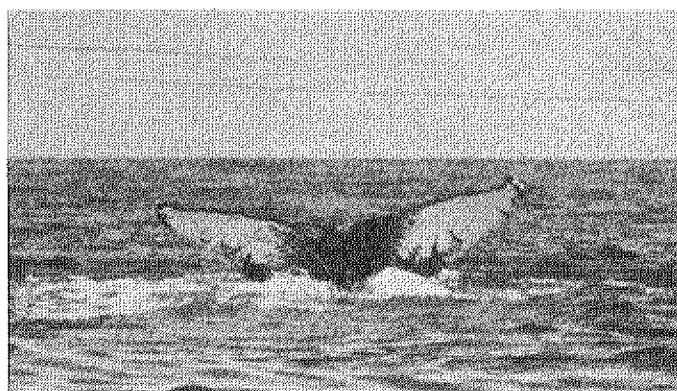
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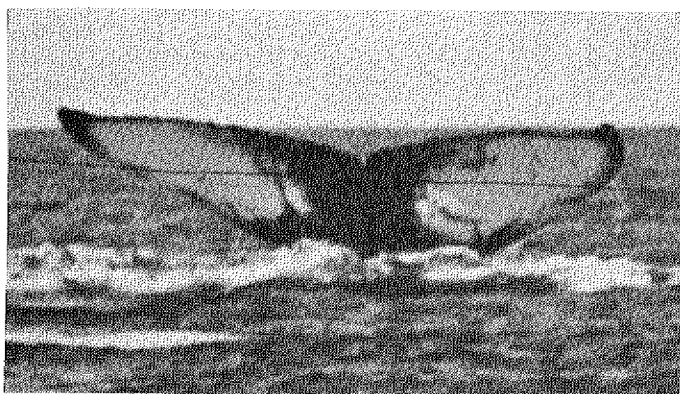
1124

105



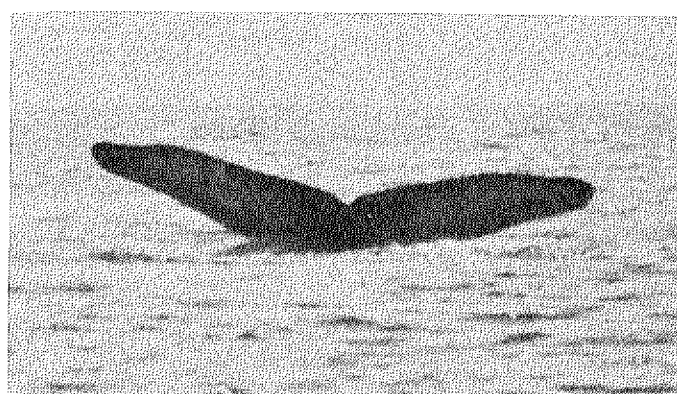
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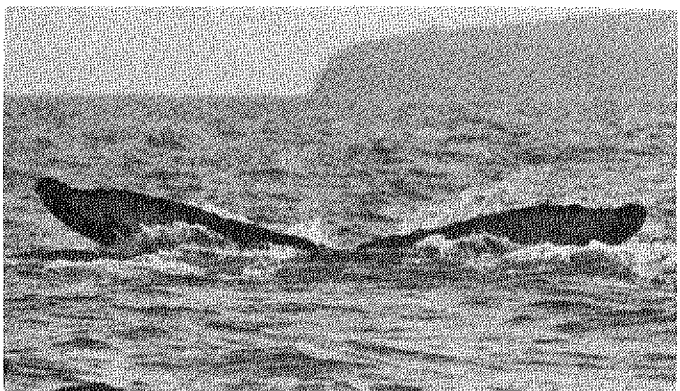
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421



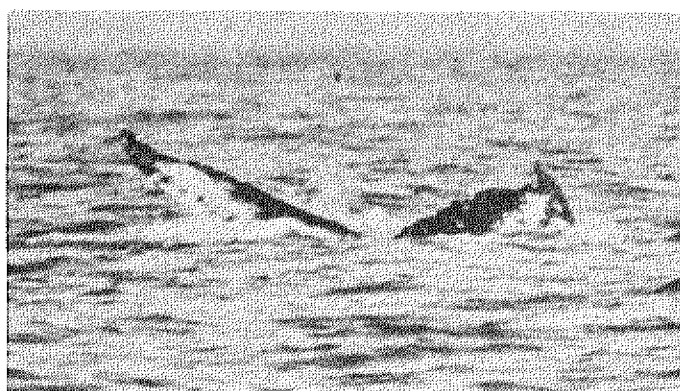
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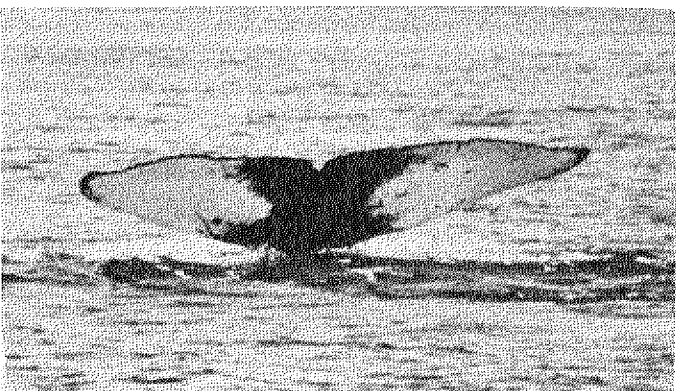
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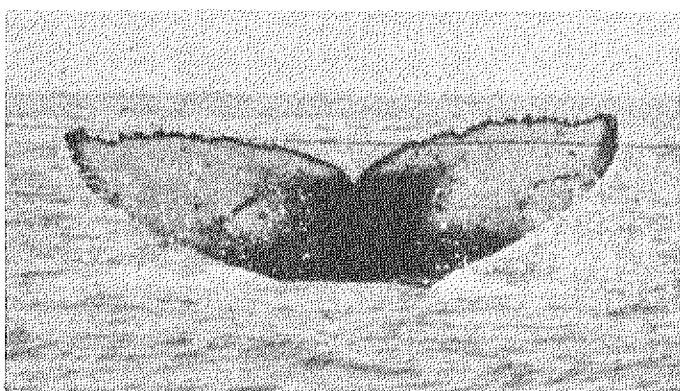
211

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1024

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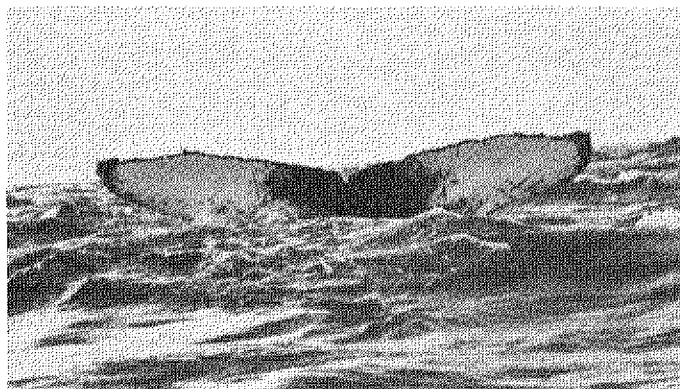


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379

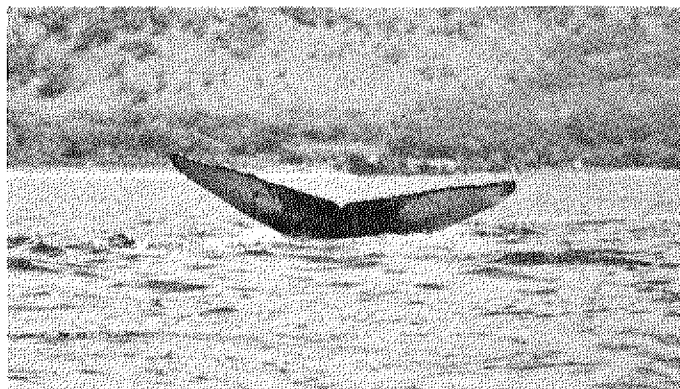


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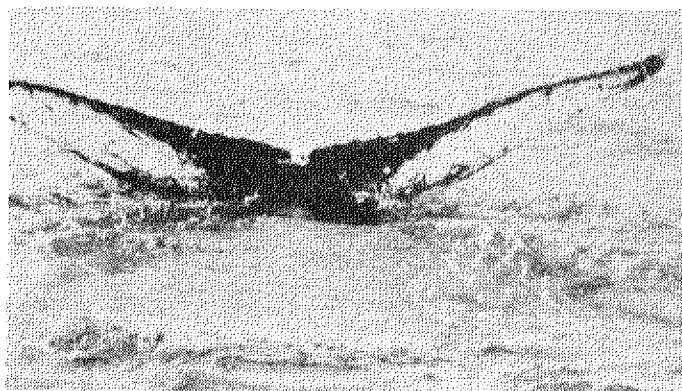
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82



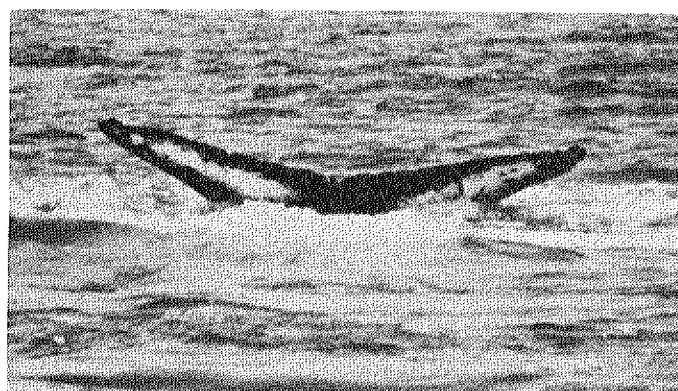
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329



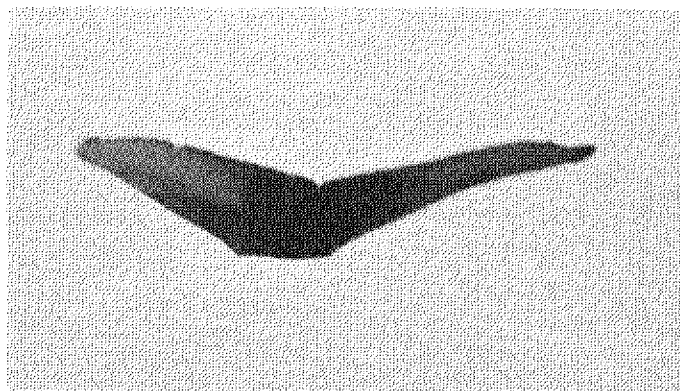
510

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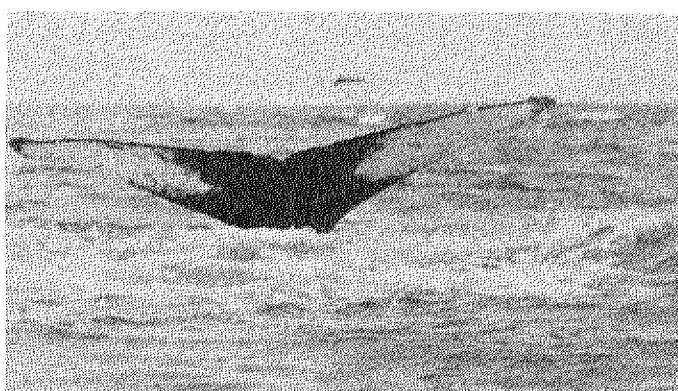
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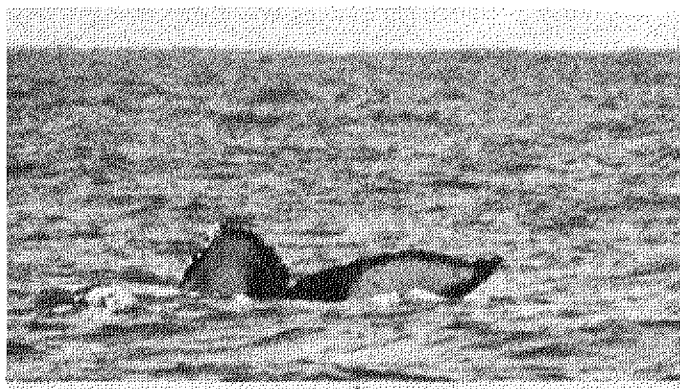
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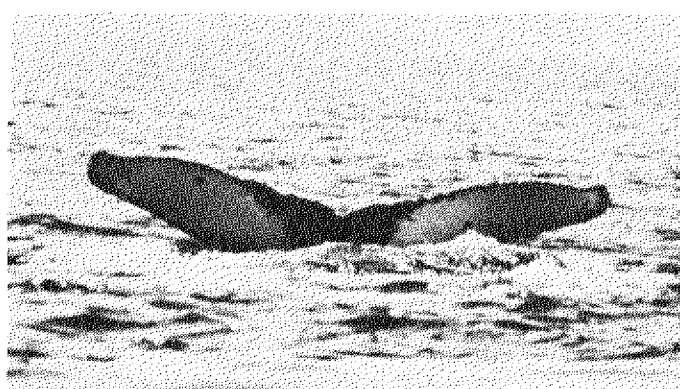
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13



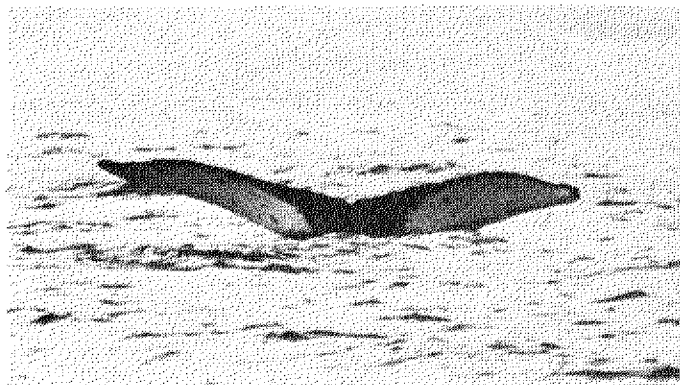
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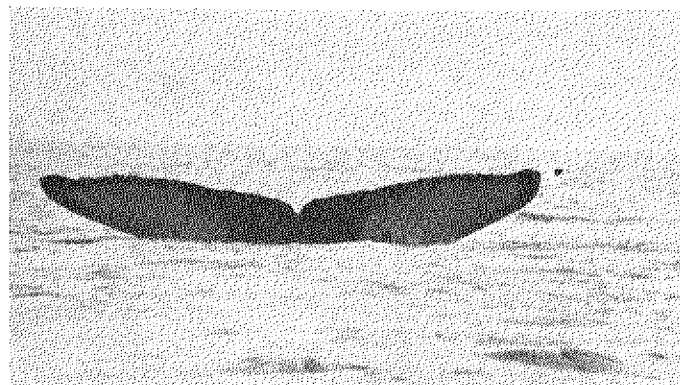
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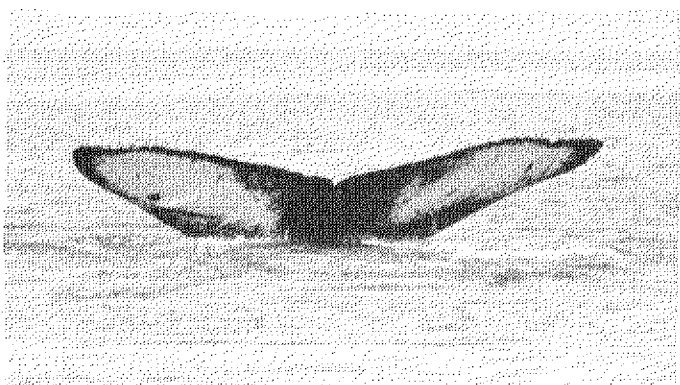
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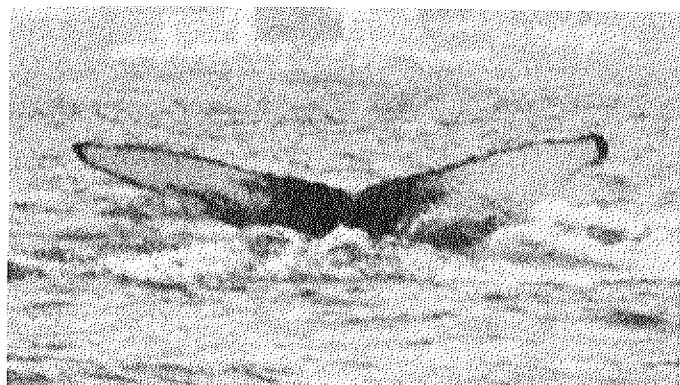
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378



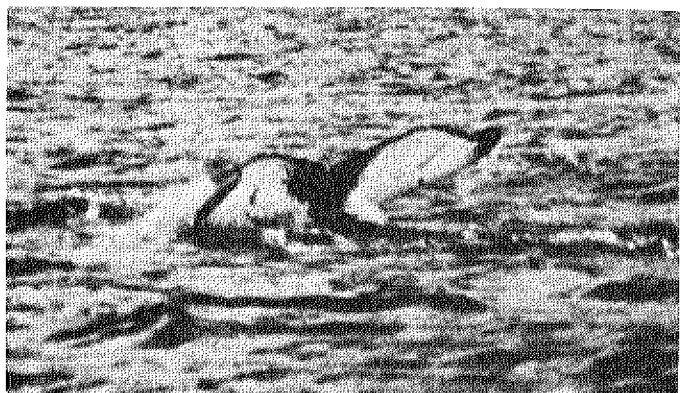
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361



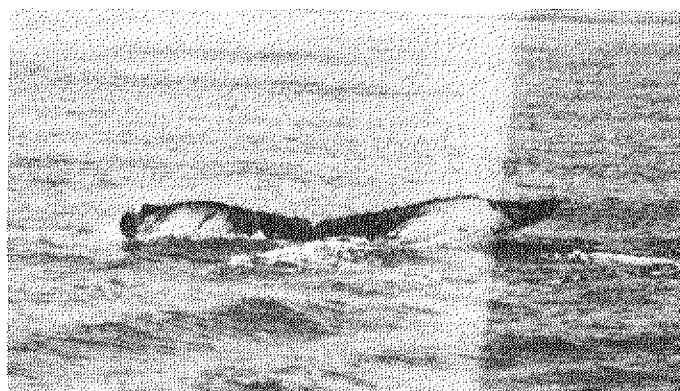
2804

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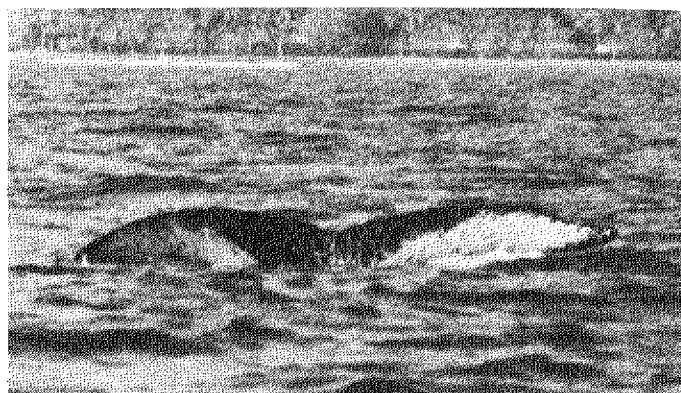
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88



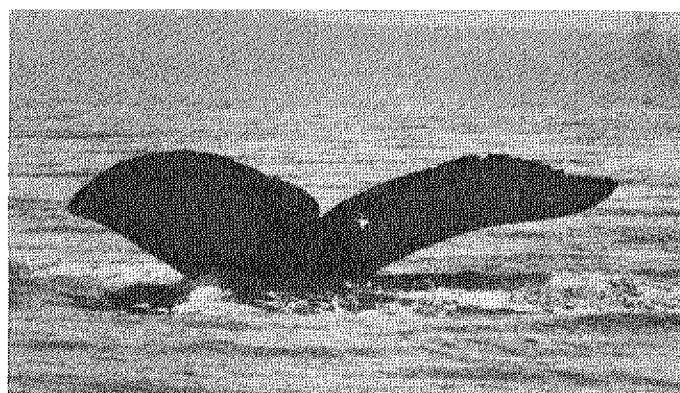
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344



2160

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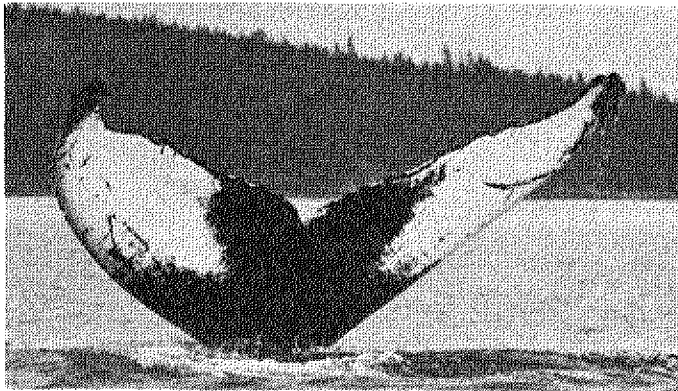


2306

324

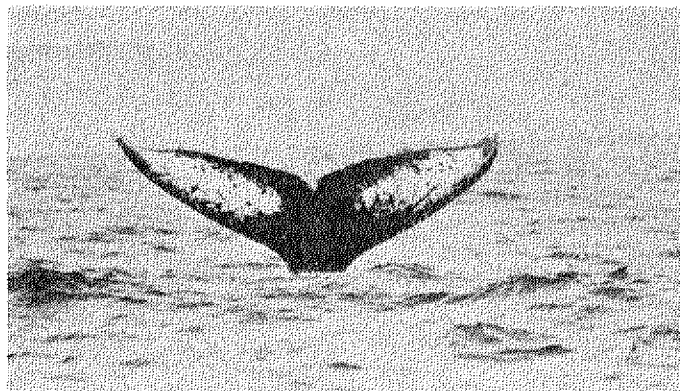


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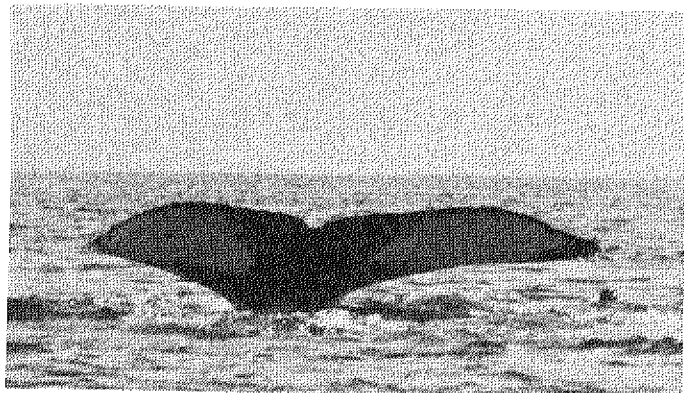
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43



239

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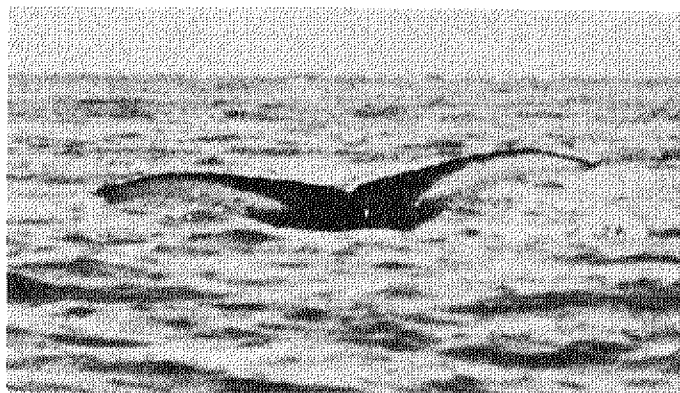
2441

368



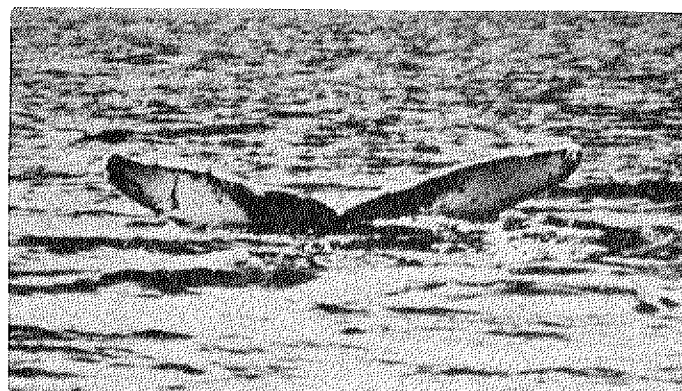
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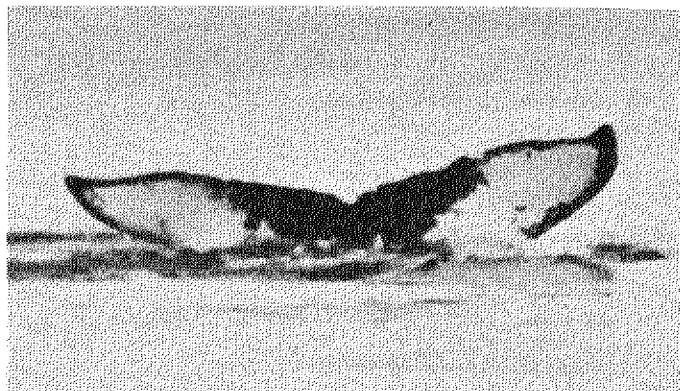
338

260



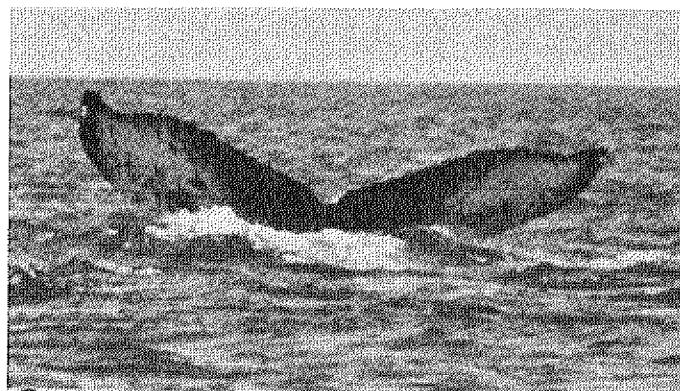
461

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153

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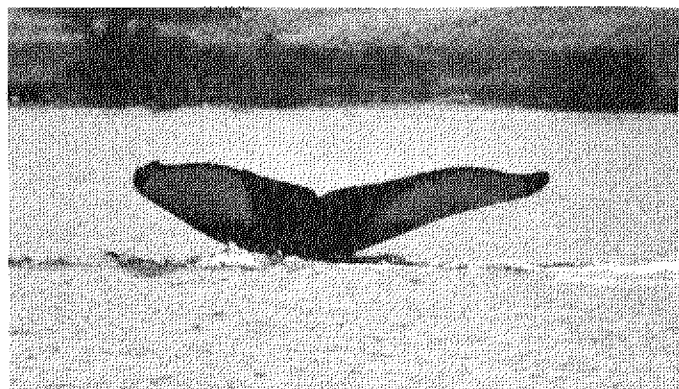
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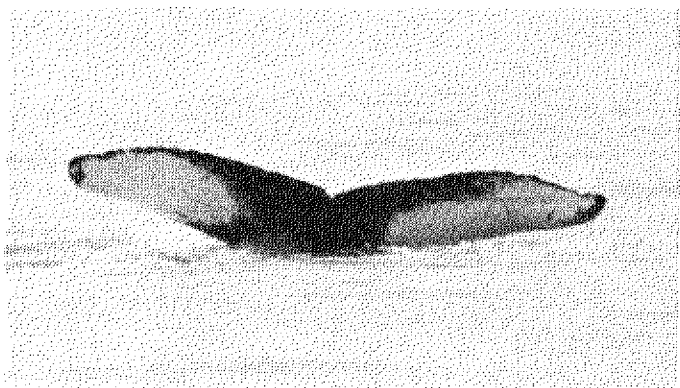
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95



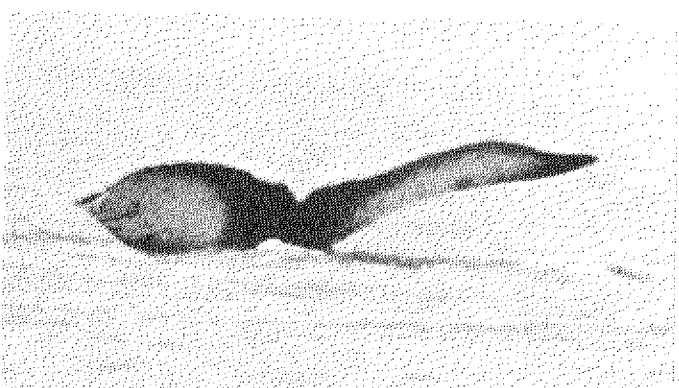
2282

299



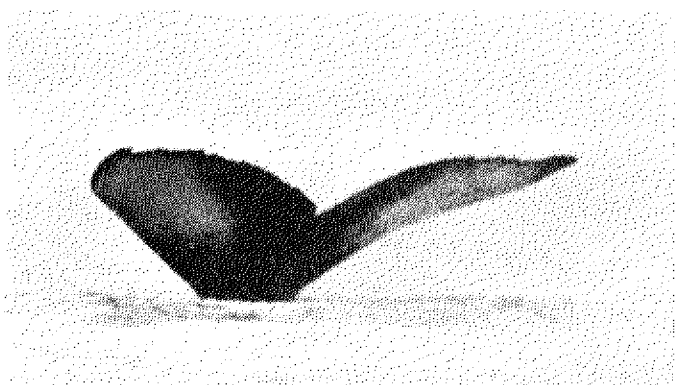
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2120

86



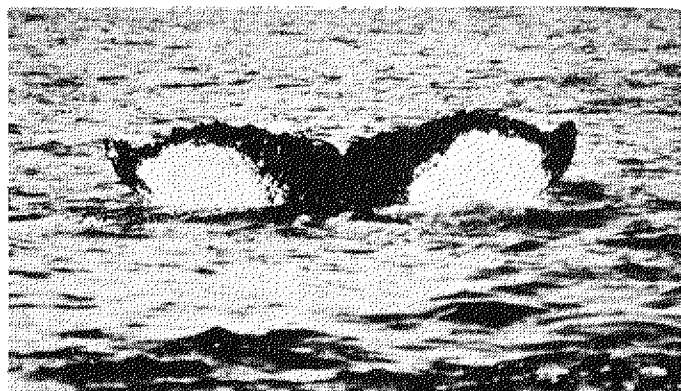
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395

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1064

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73

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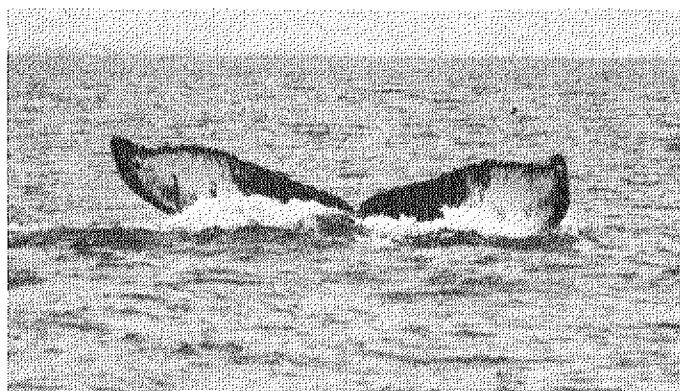


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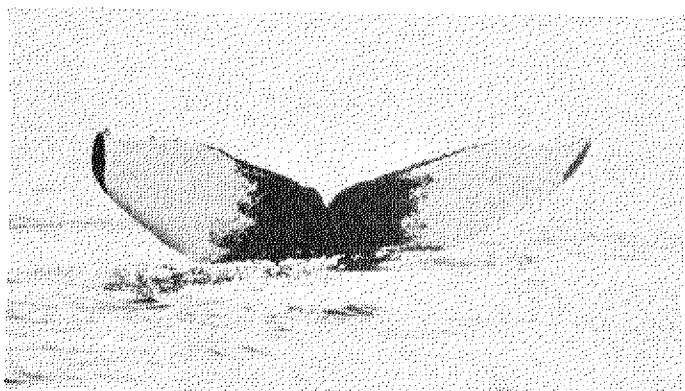
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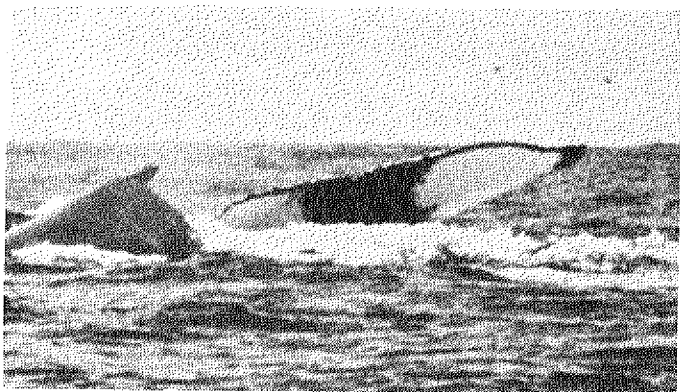
526

74



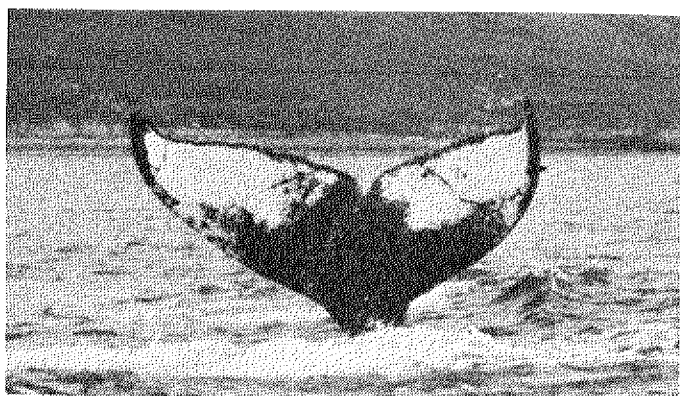
499

83



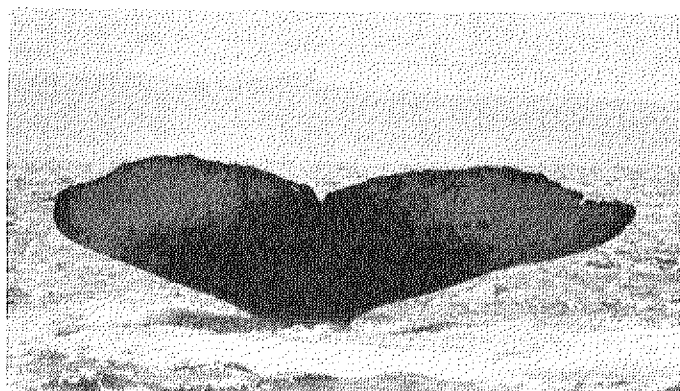
1018

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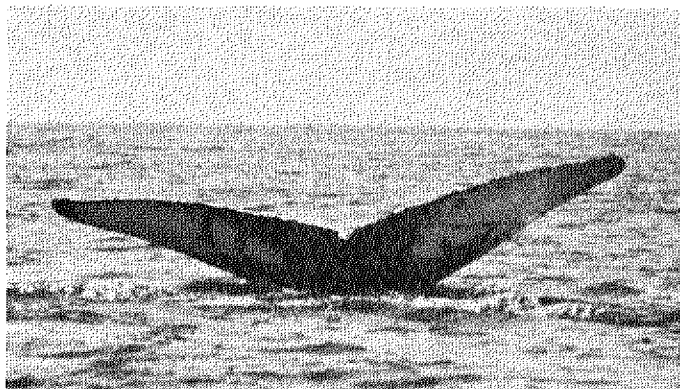
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22



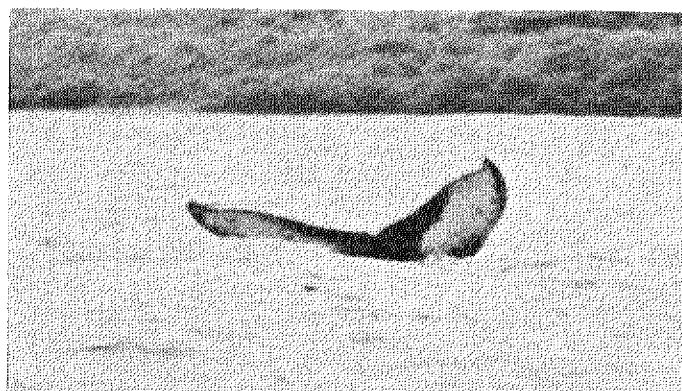
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2



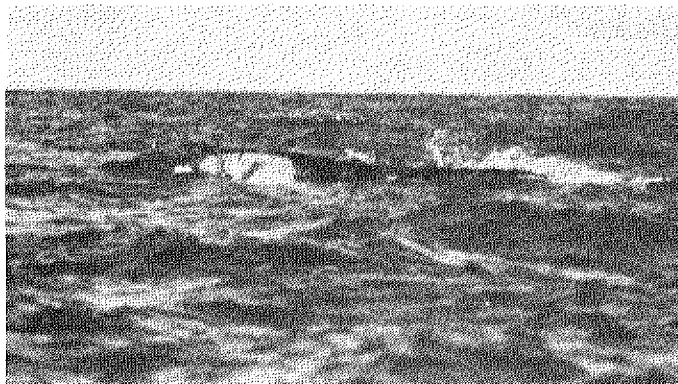
2452

497



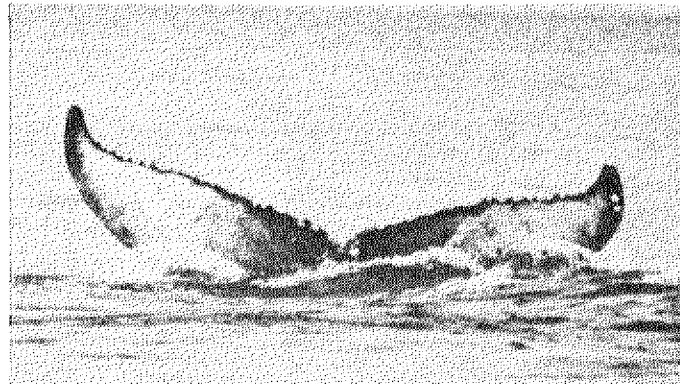
620

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2734

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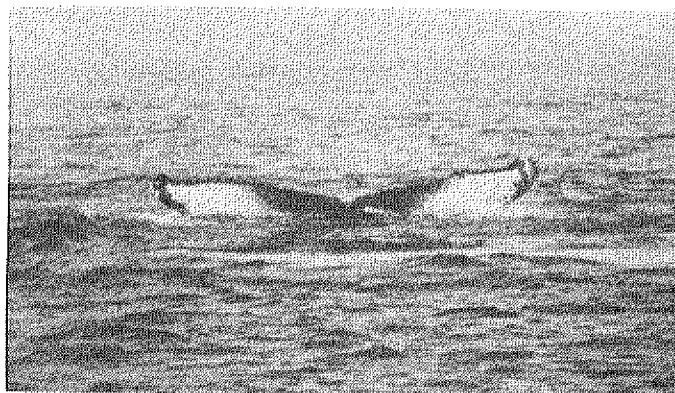
2462

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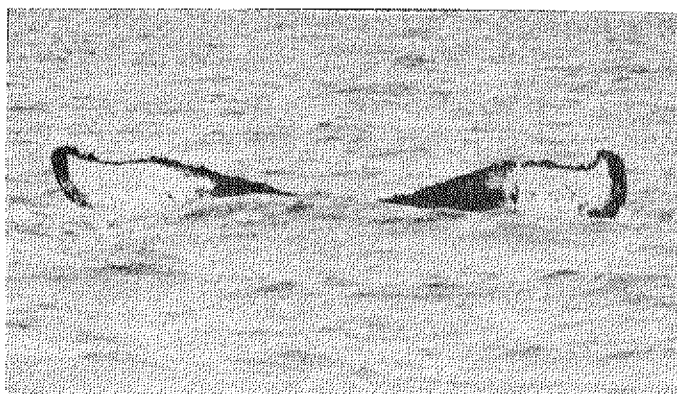
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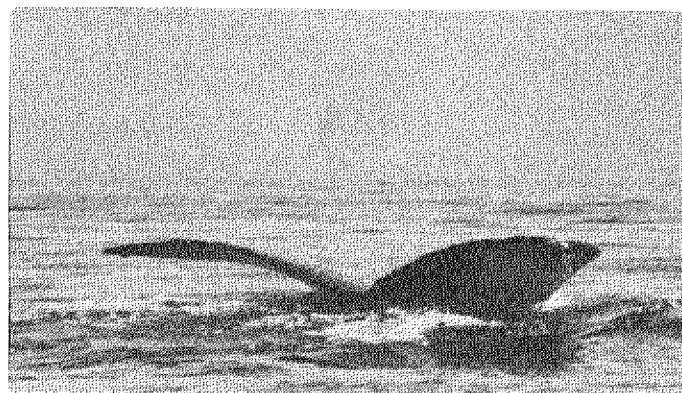
399

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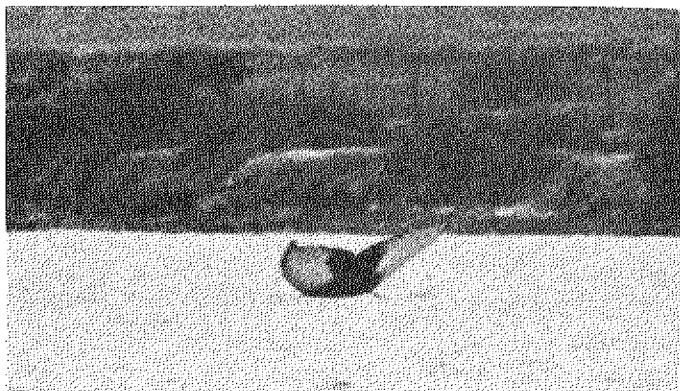
3801

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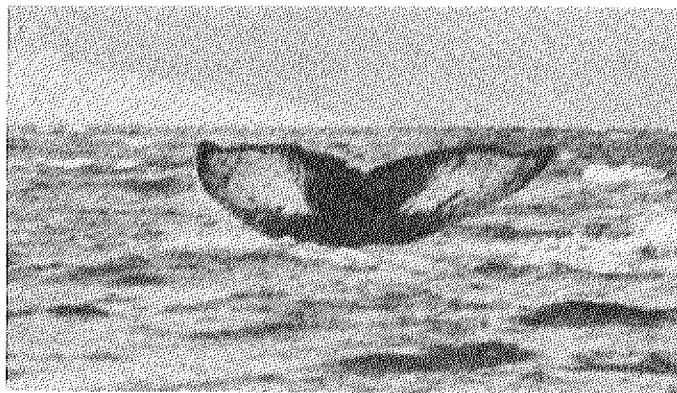
2100

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2733

420

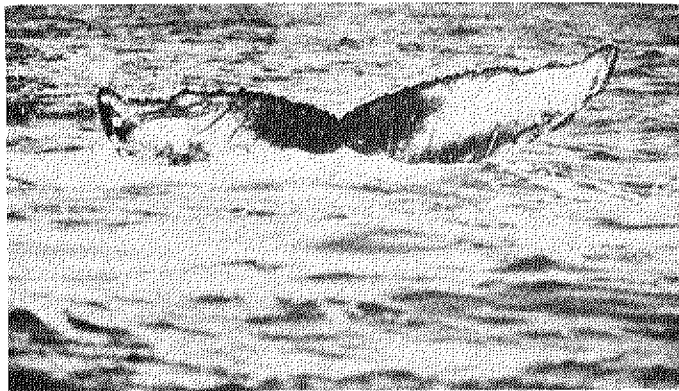


1067

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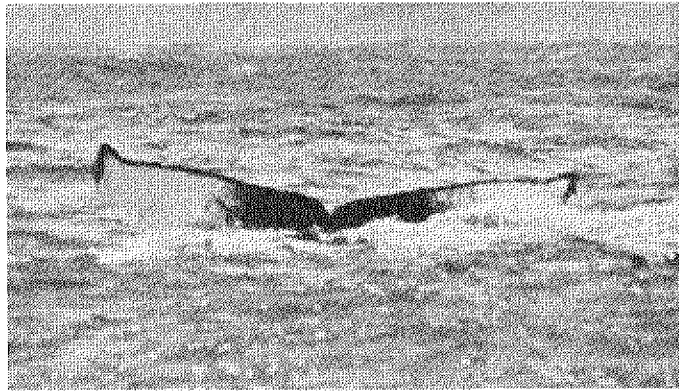


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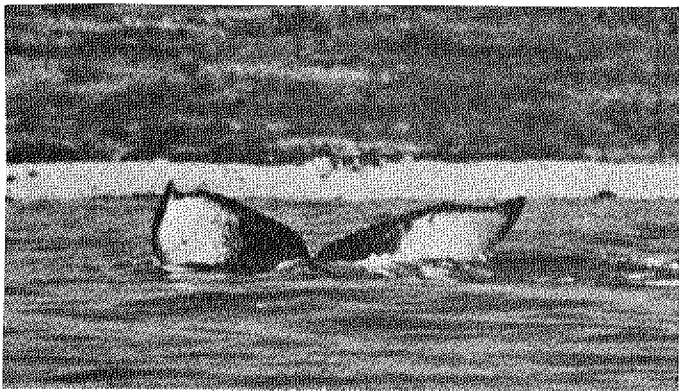
69

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3800

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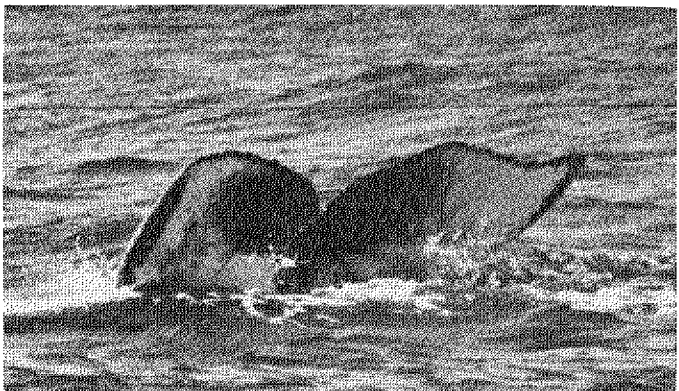
366

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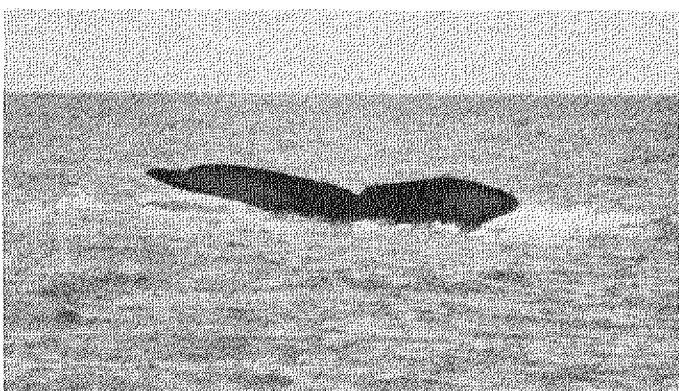
2049

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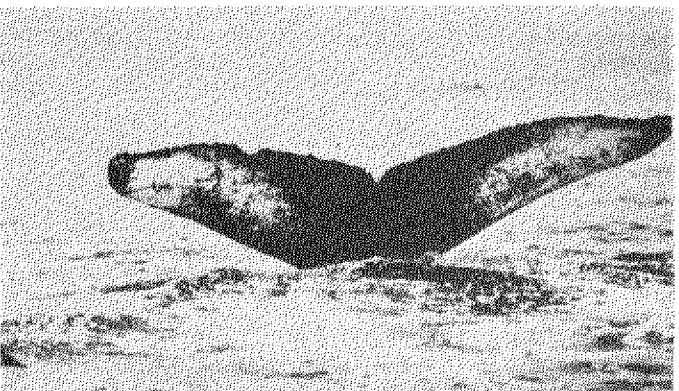
2437

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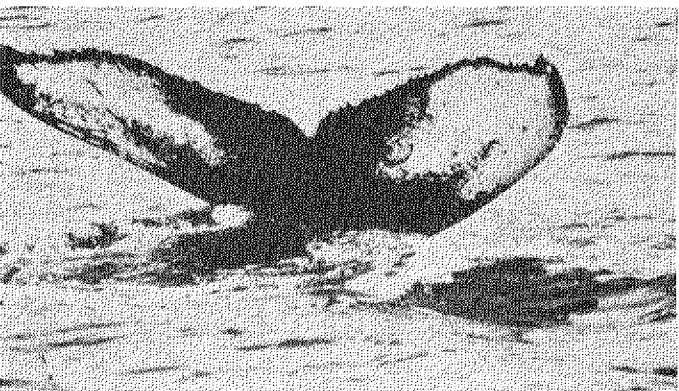
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317



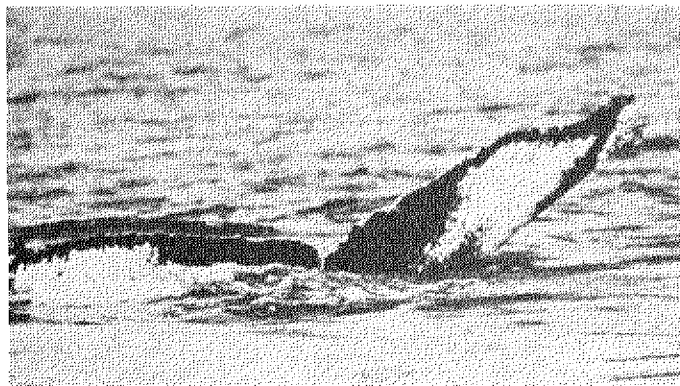
1134

428



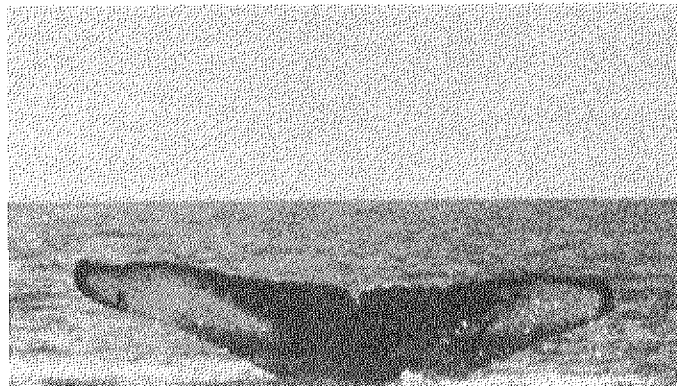
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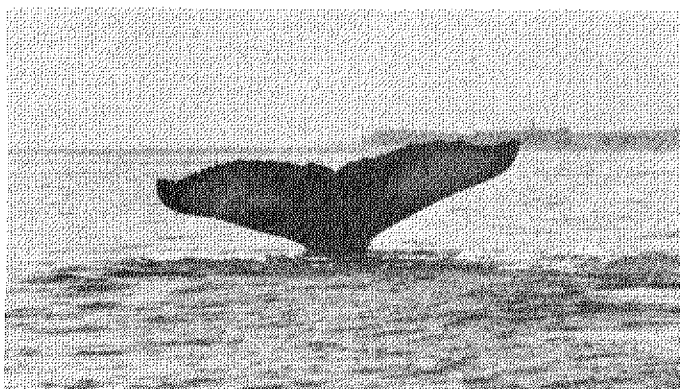
311

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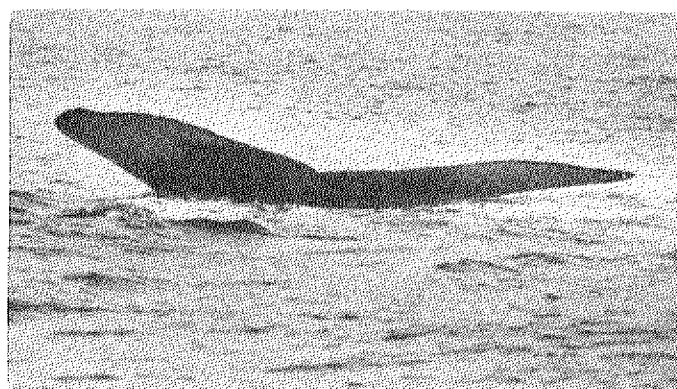
2396

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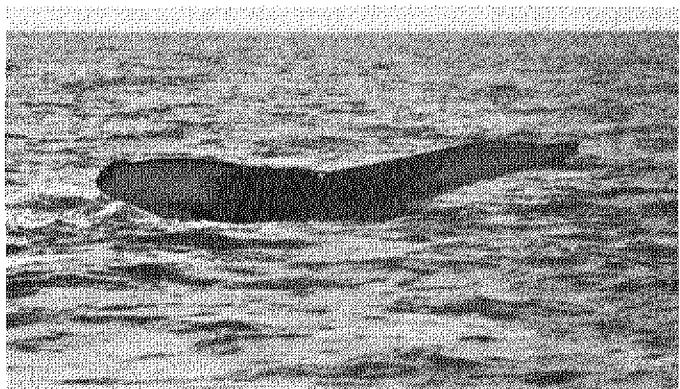
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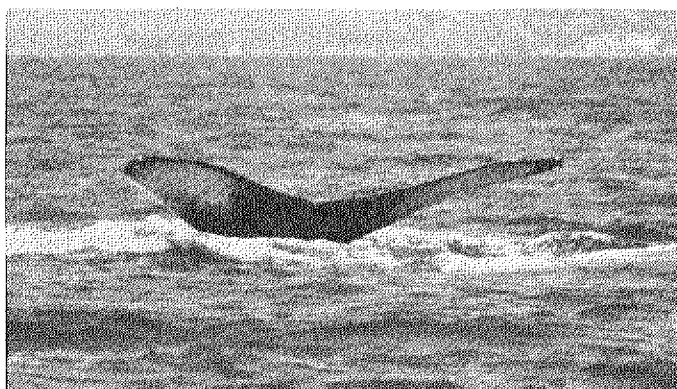
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2258

346



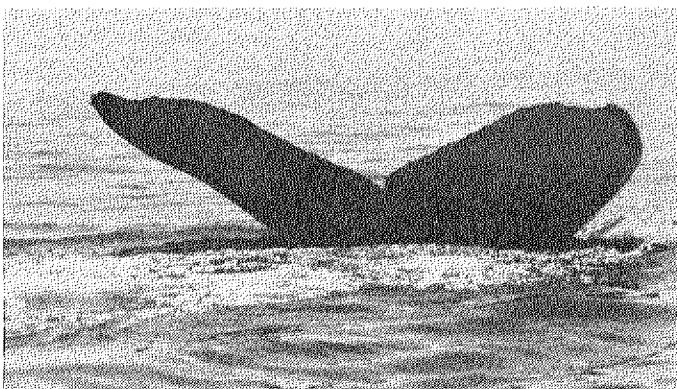
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2712

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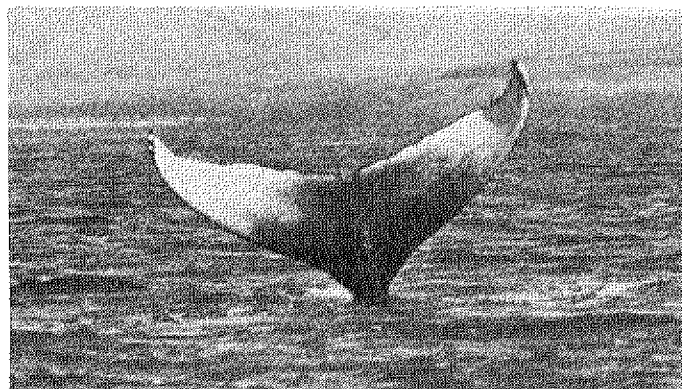


2371

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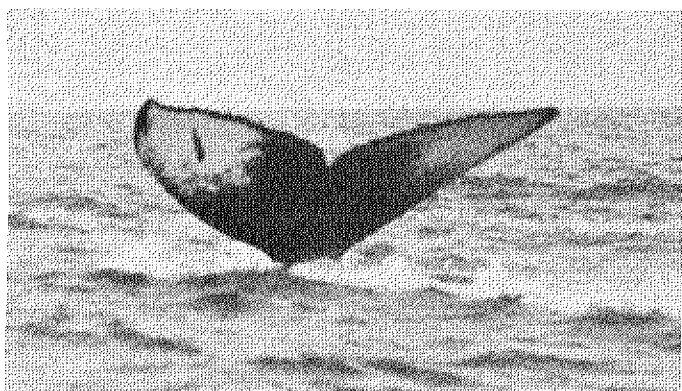
359

153



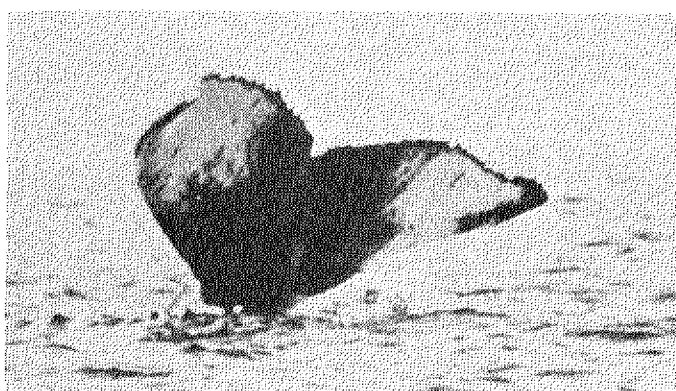
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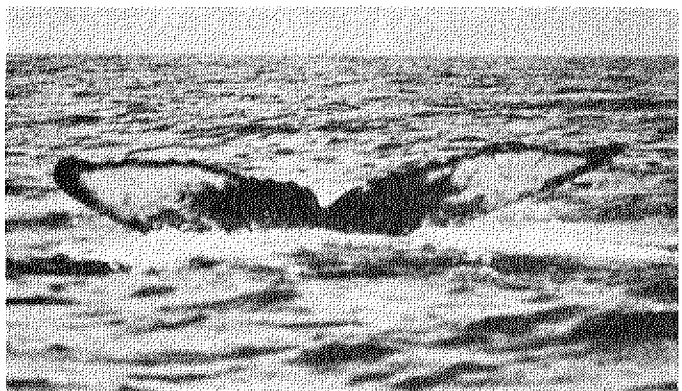
2167

322



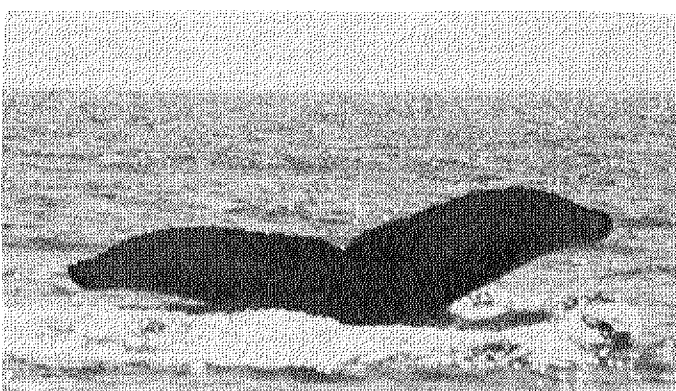
29

46



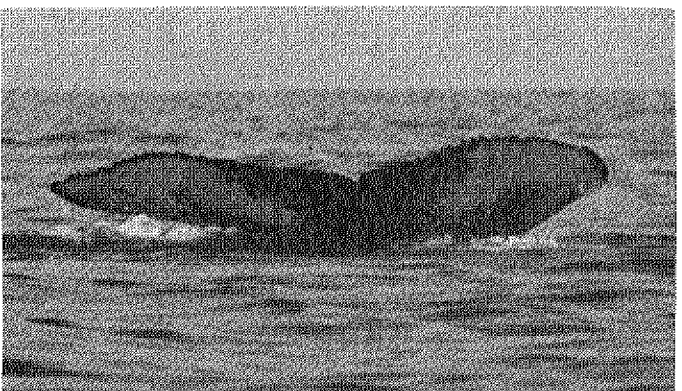
2657

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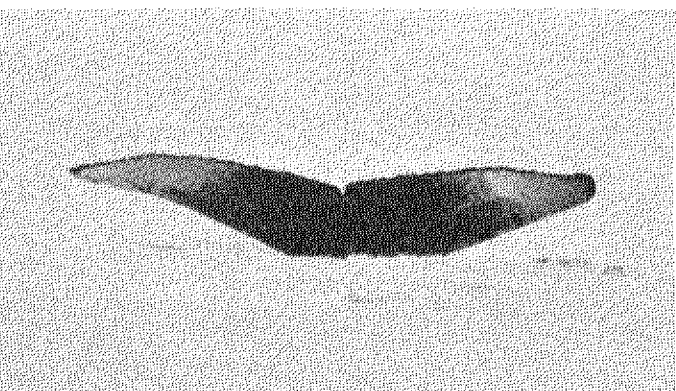
2346

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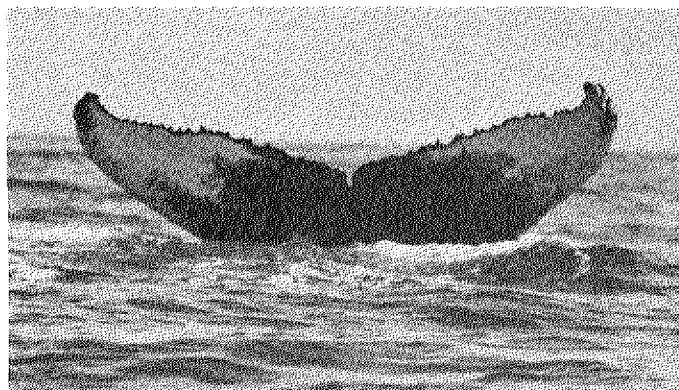
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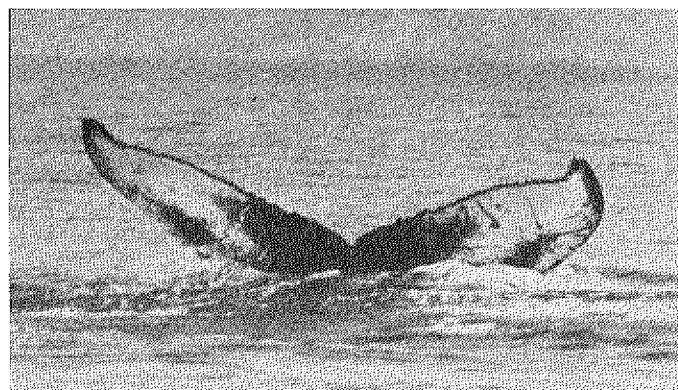
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824



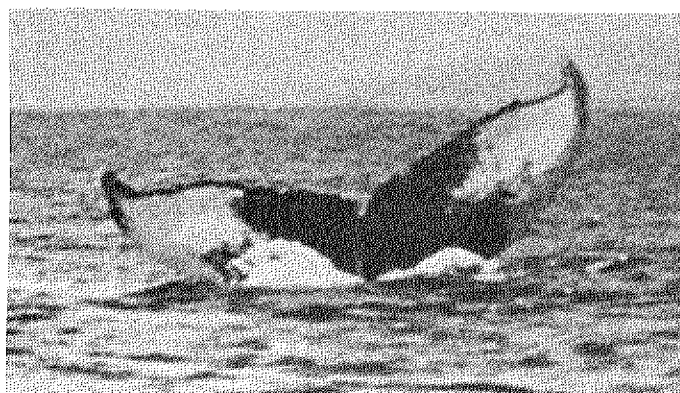
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2402

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196

8



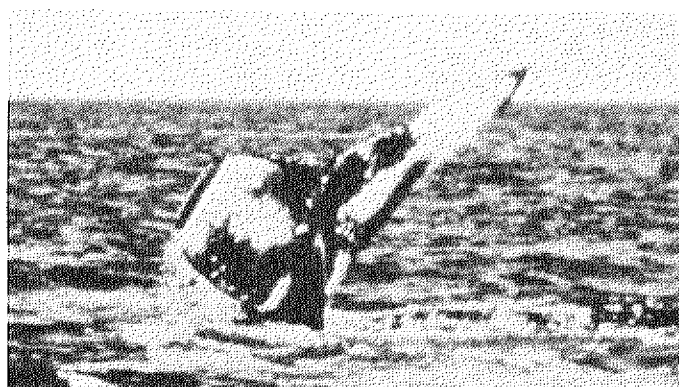
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39



135

0



512

244



2406

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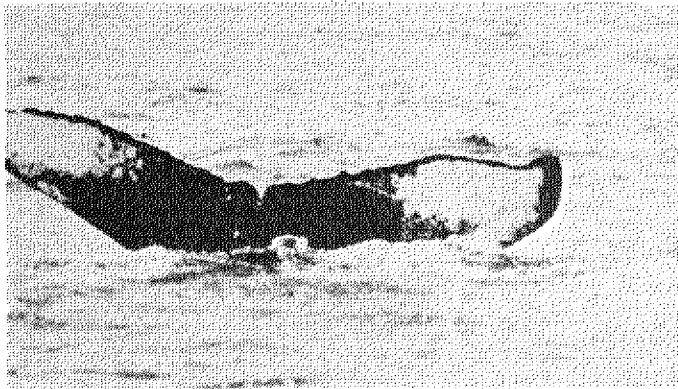


2159

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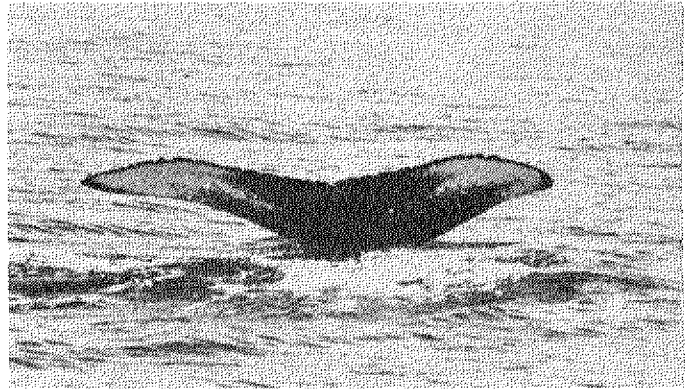


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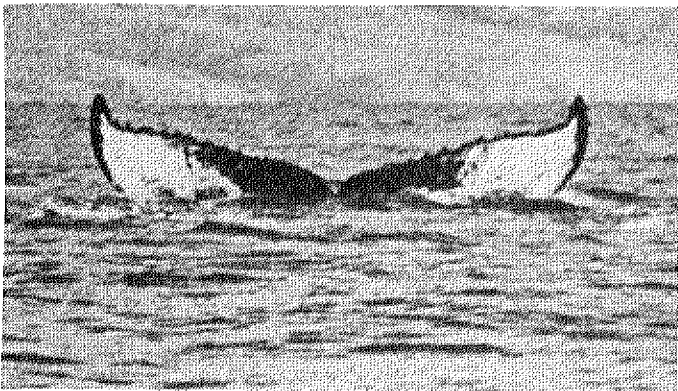
462

76



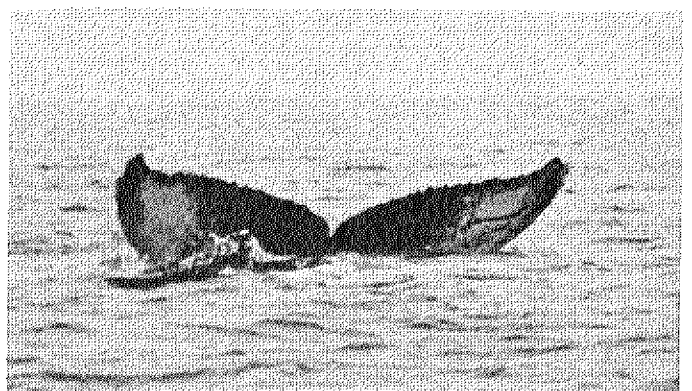
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41



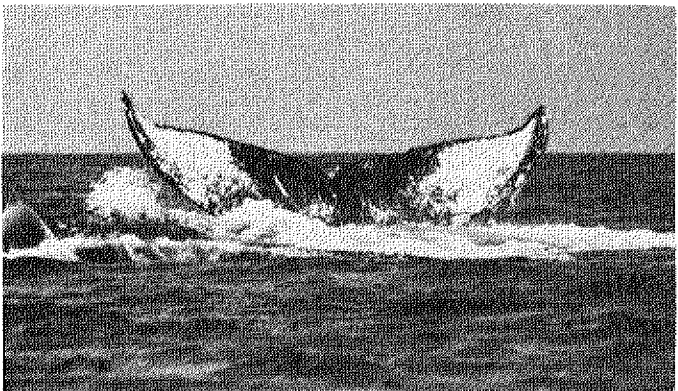
132

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284

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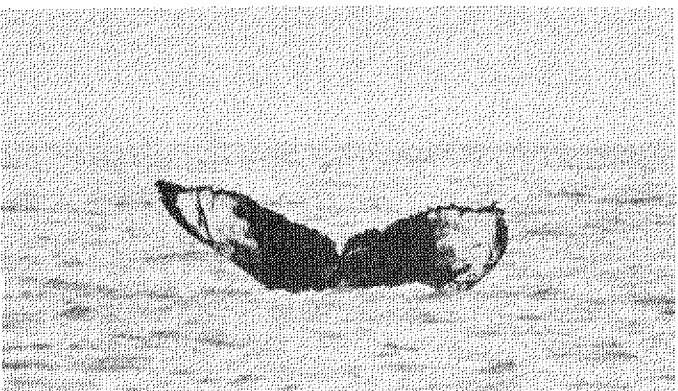
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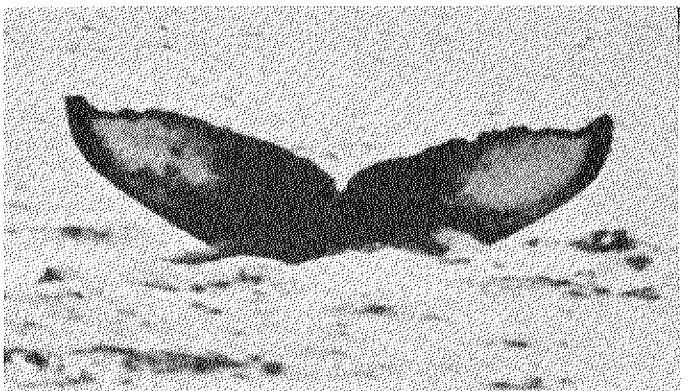
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316



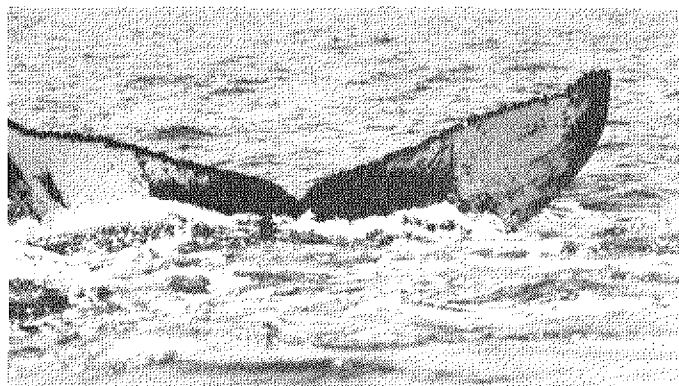
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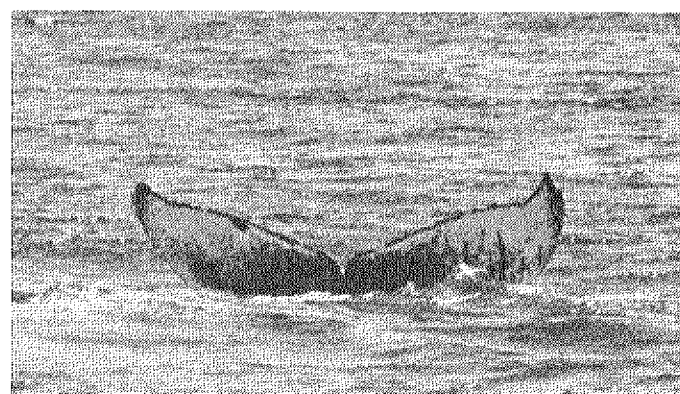
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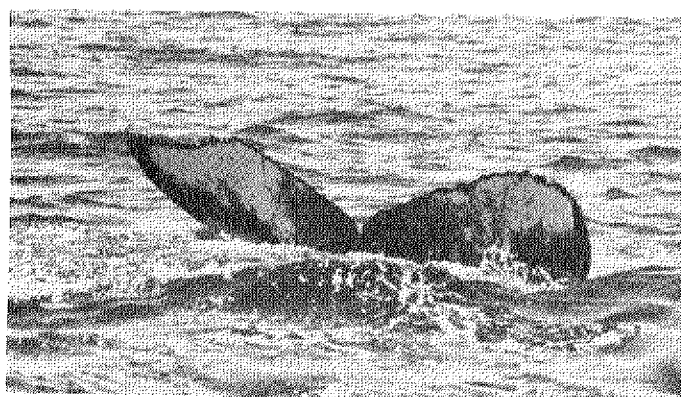
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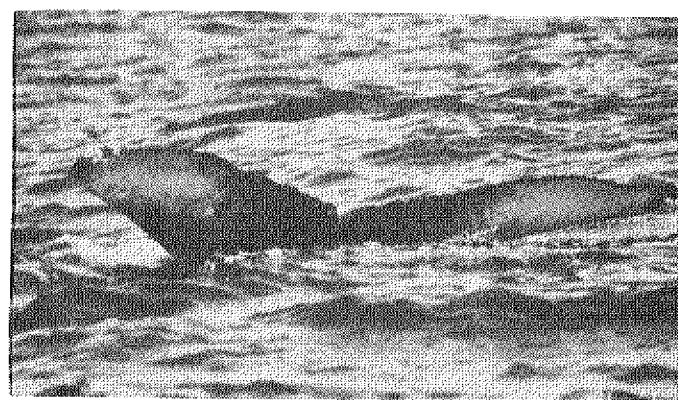
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48



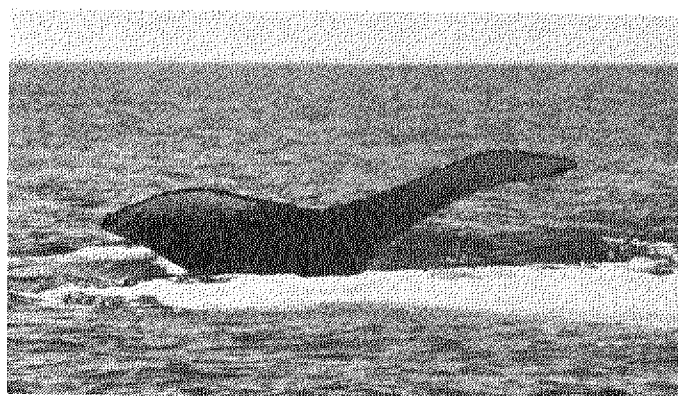
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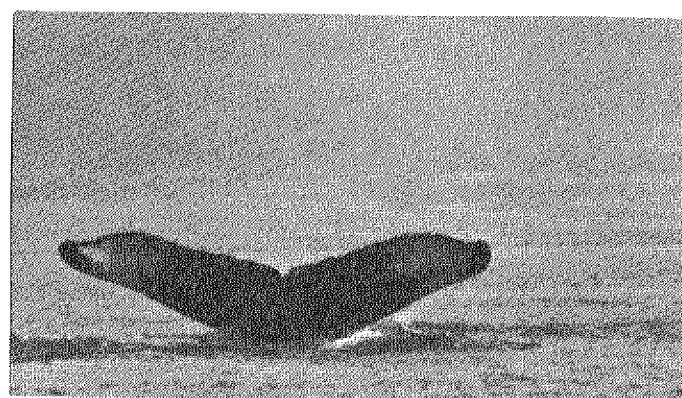
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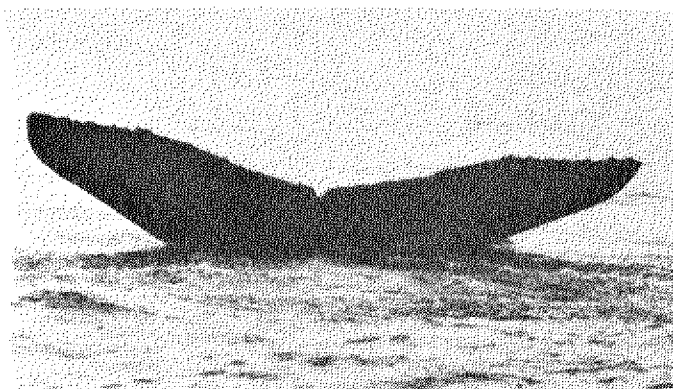
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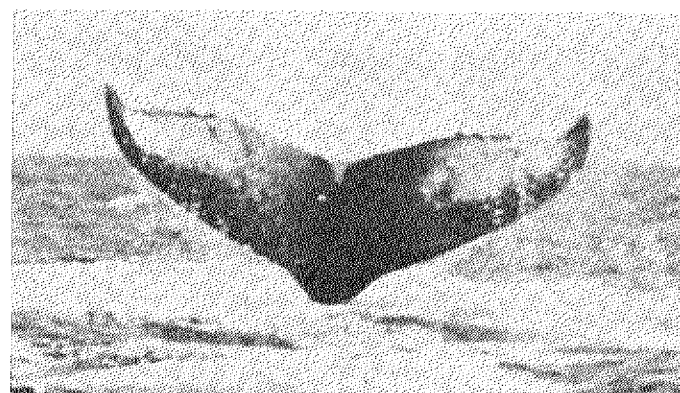
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343



2237

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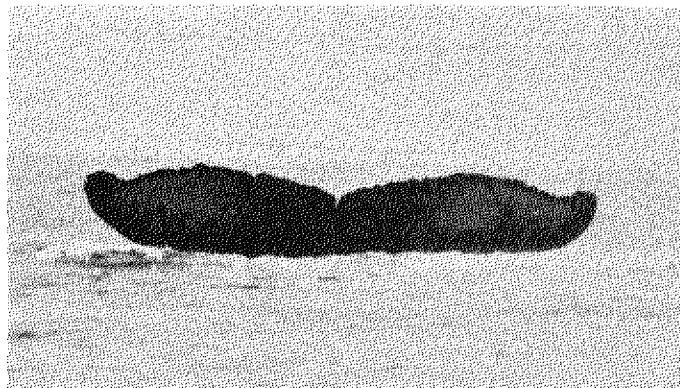


171

414



# HAWAII



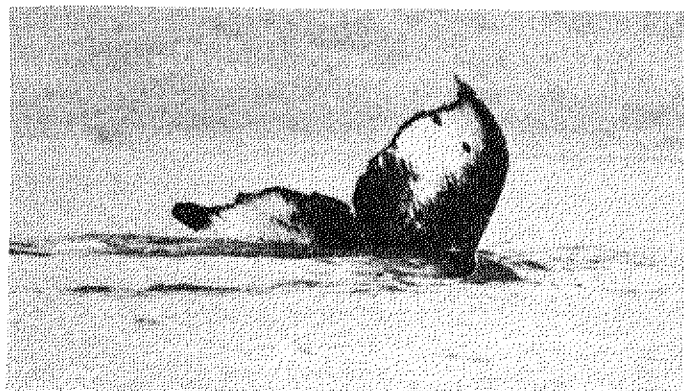
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425



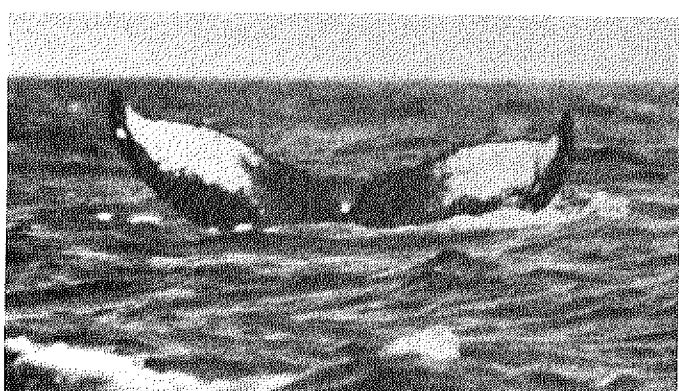
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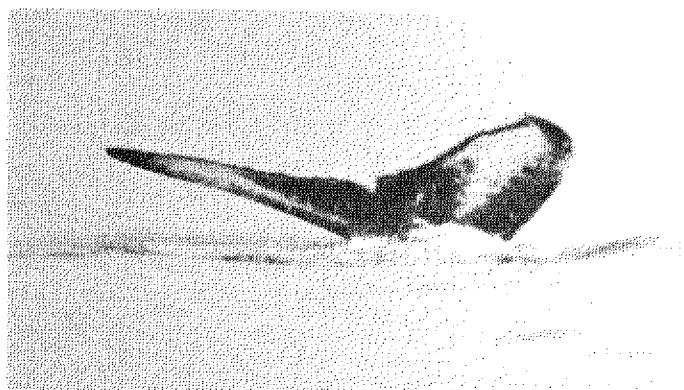
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342



268

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2078

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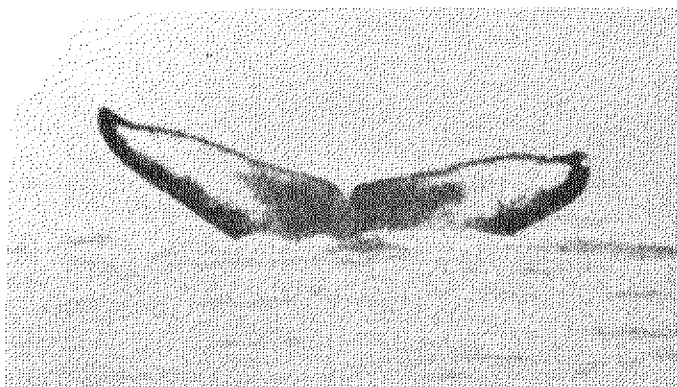
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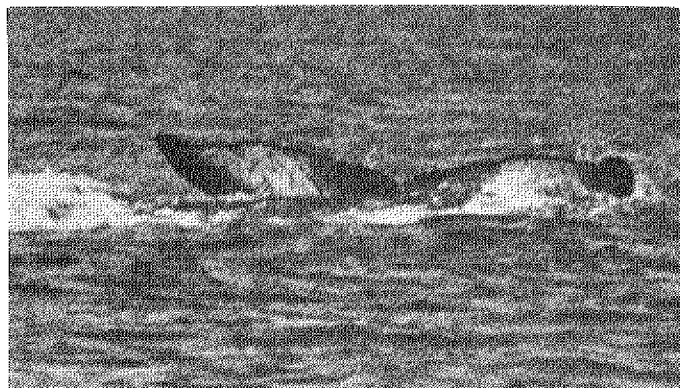
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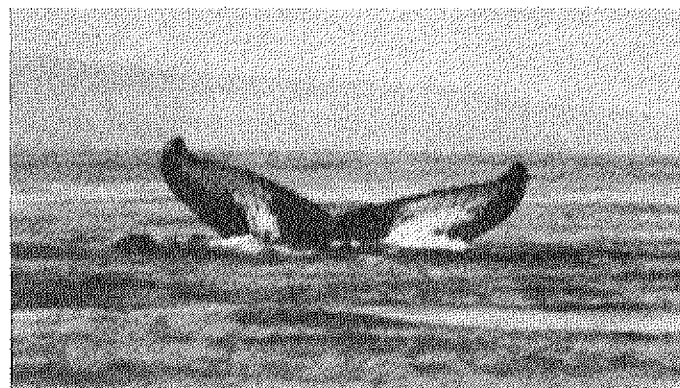
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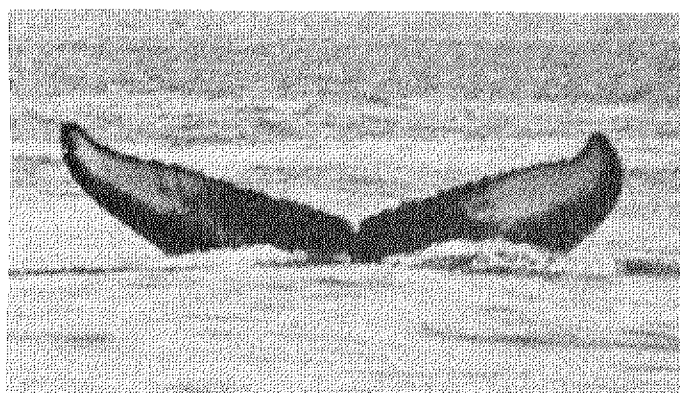
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2041

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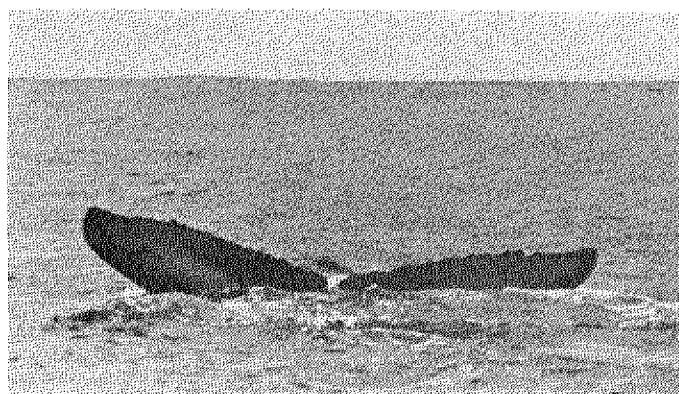
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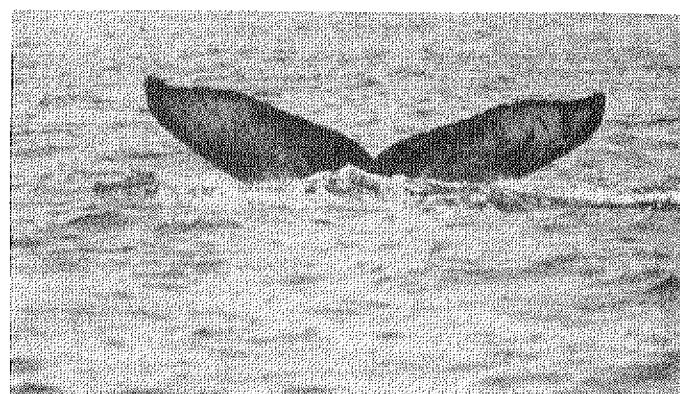
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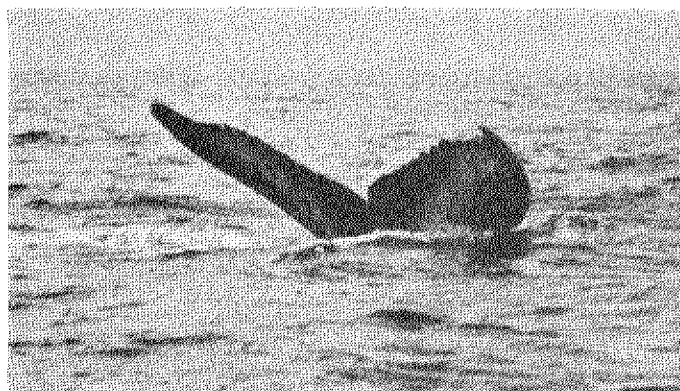
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422



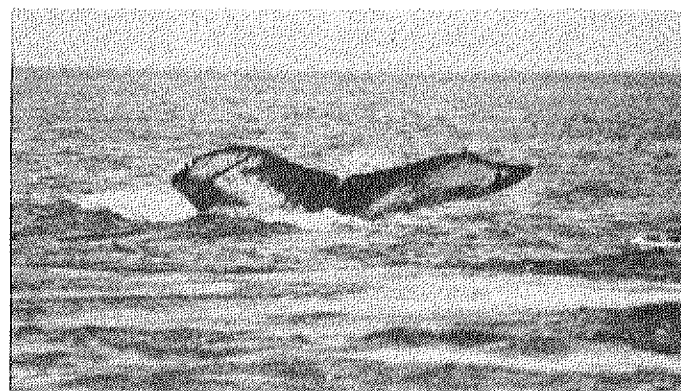
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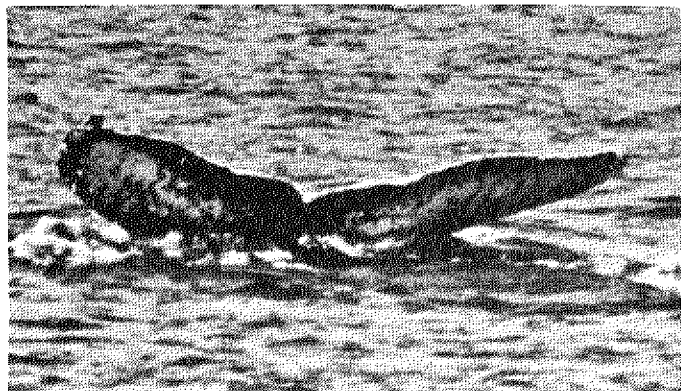
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2303

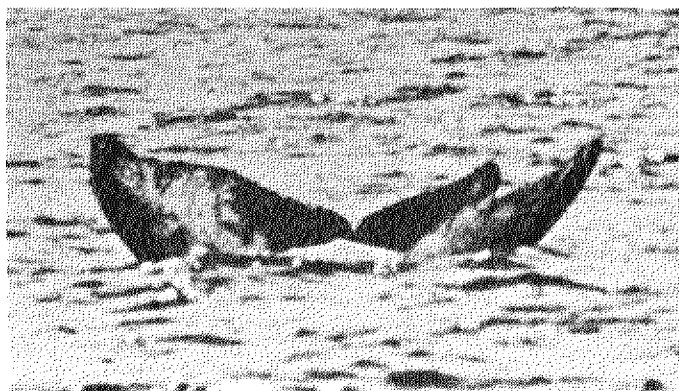
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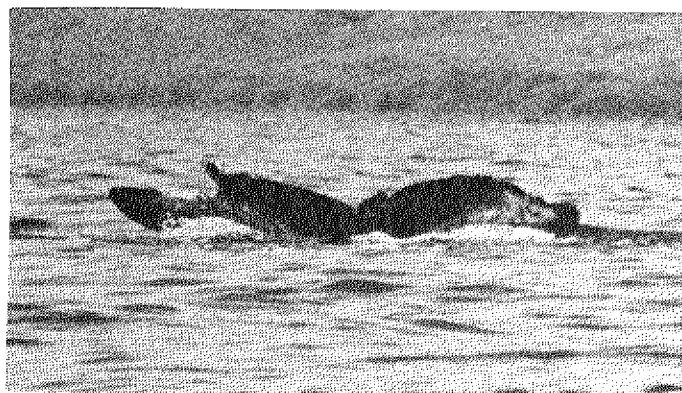
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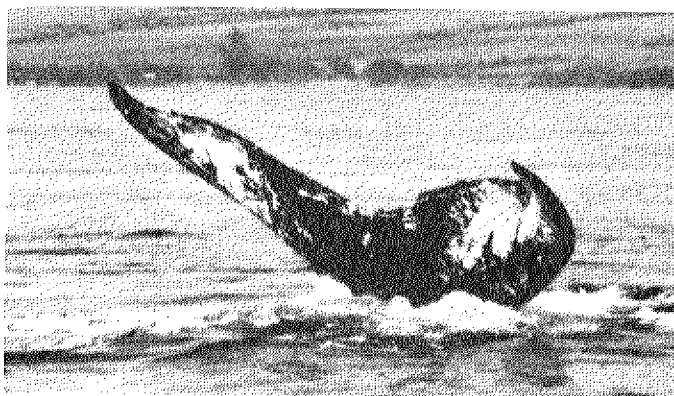
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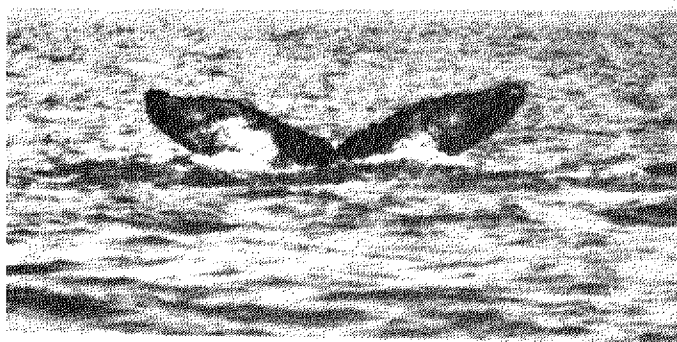
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18



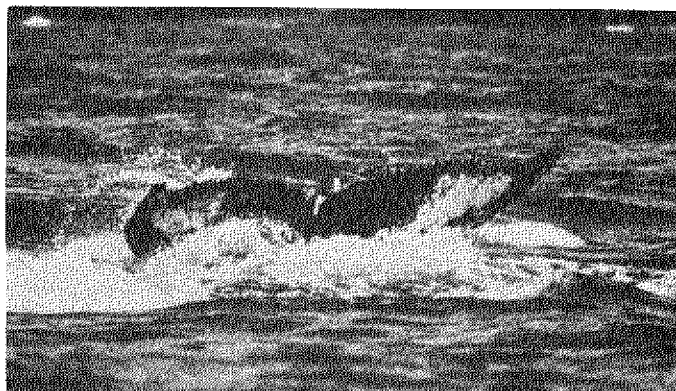
2141

126



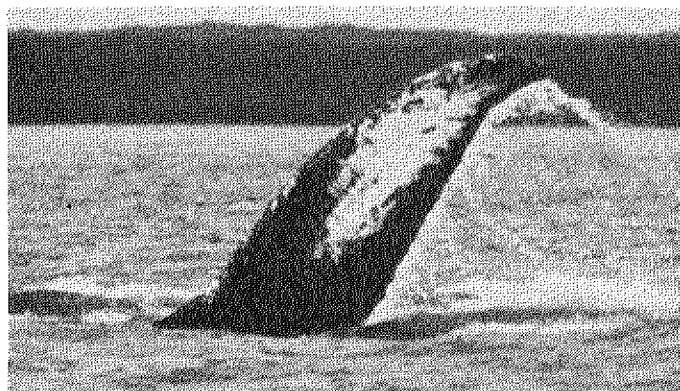
349

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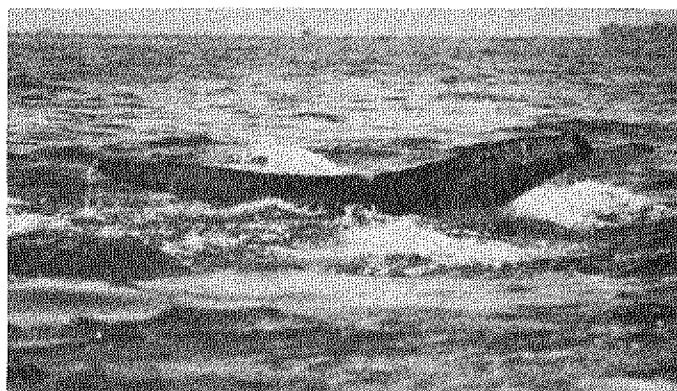
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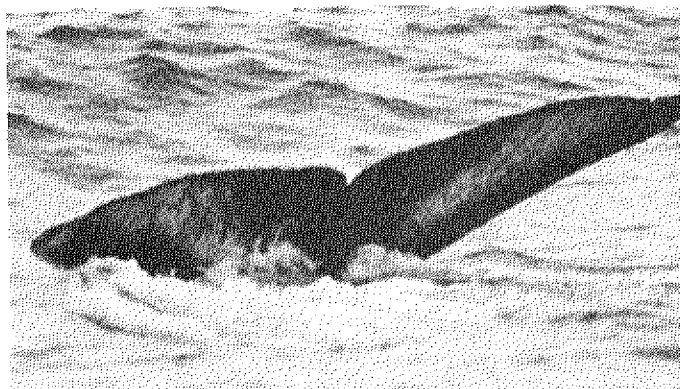
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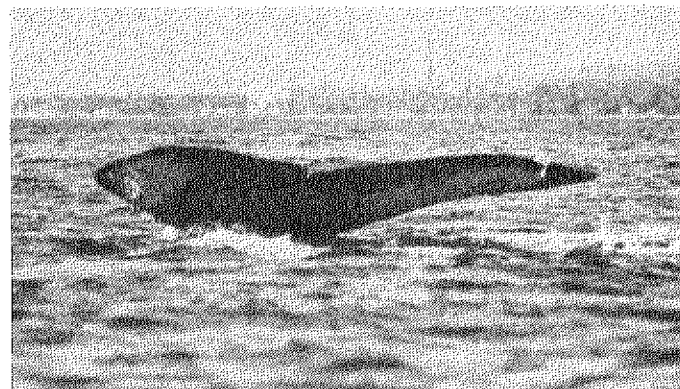
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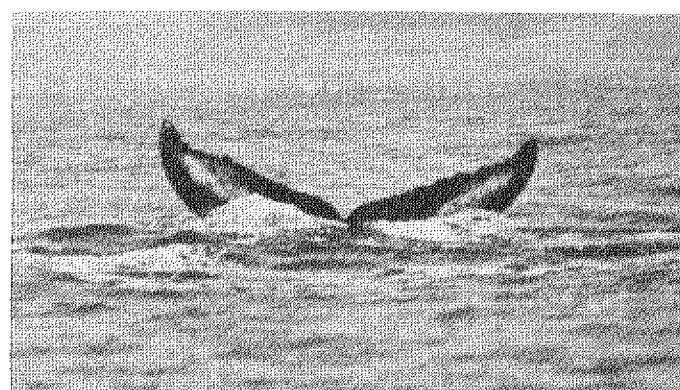
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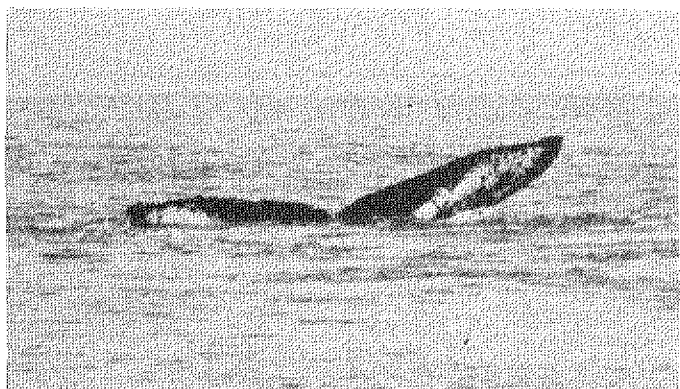
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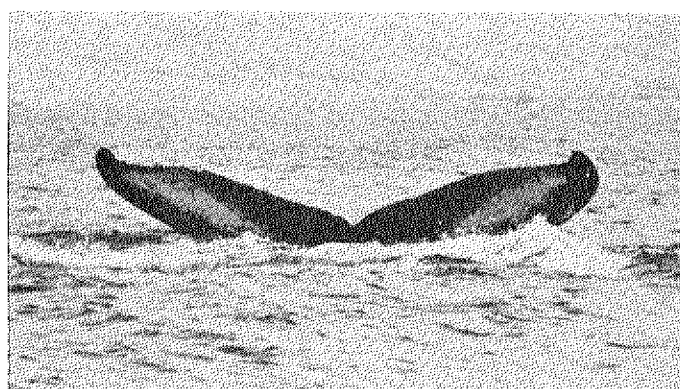
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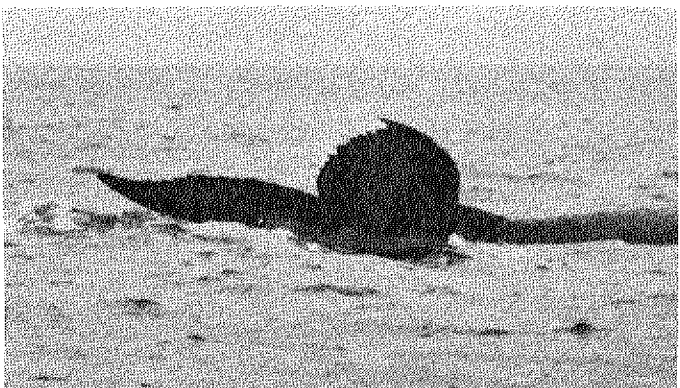
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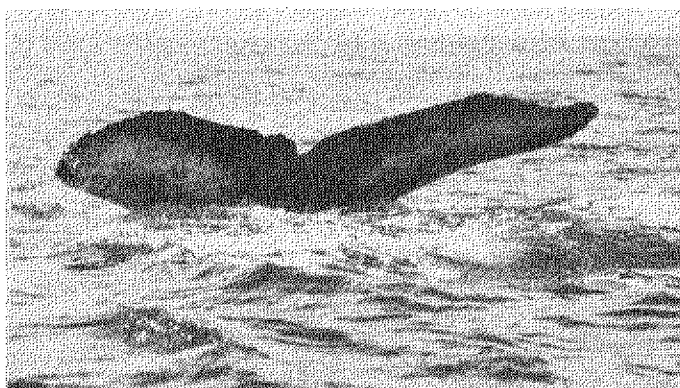
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1070

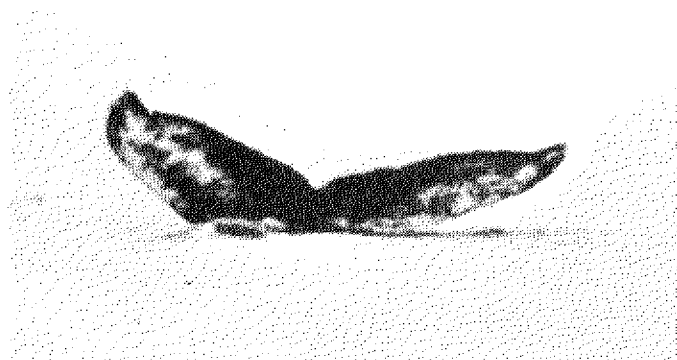
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2248

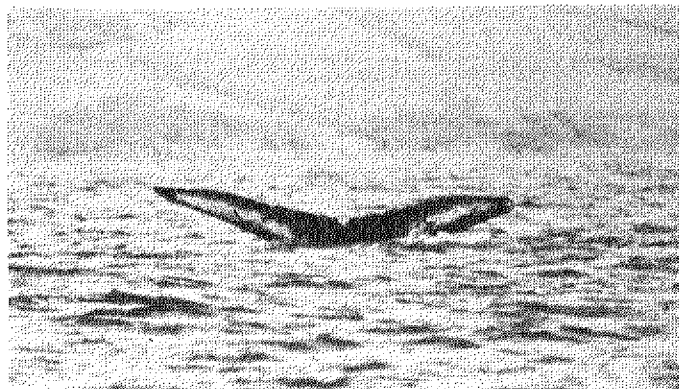
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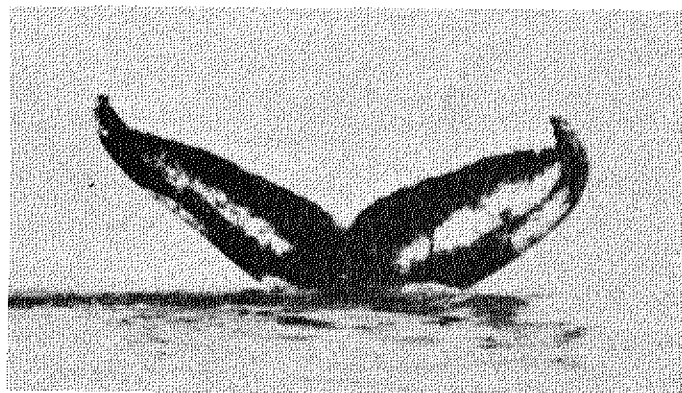
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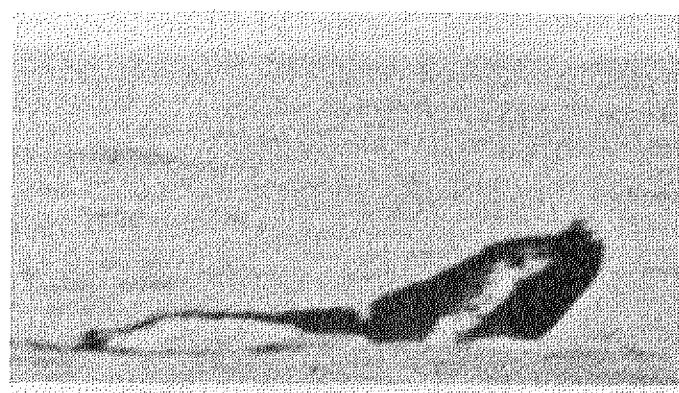
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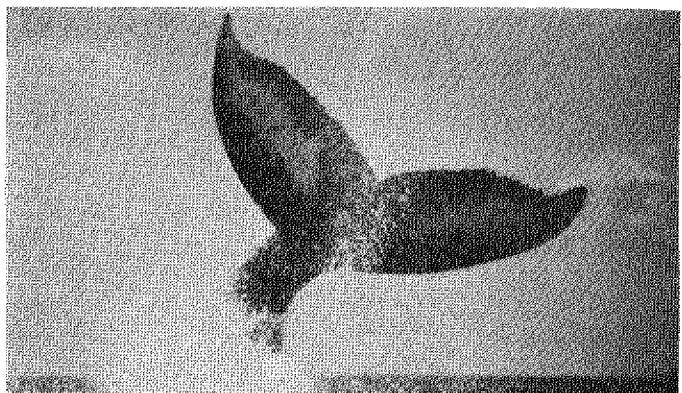
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318



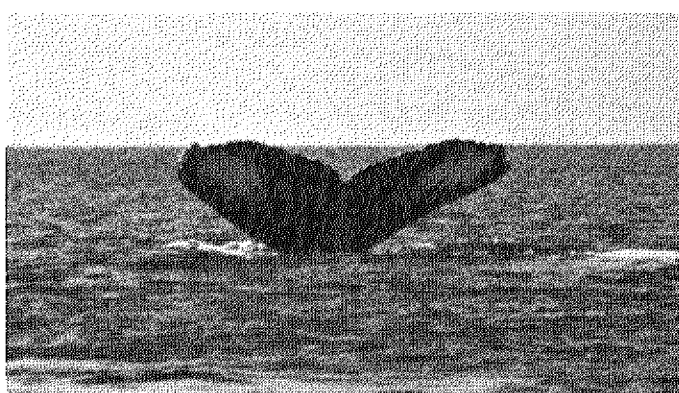
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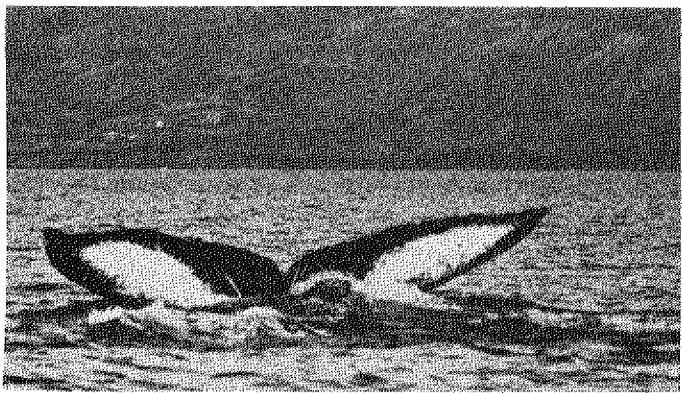
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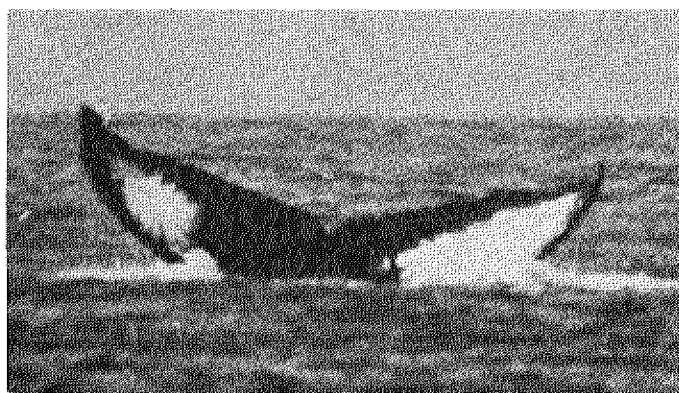
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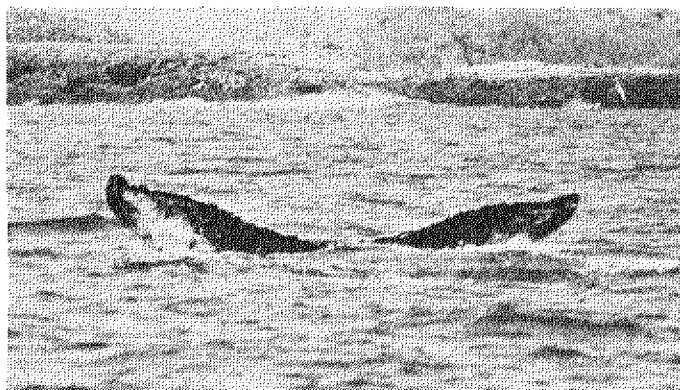
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2817

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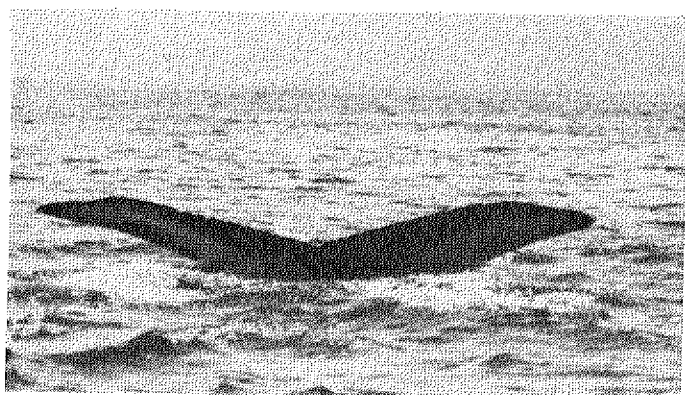
383

539



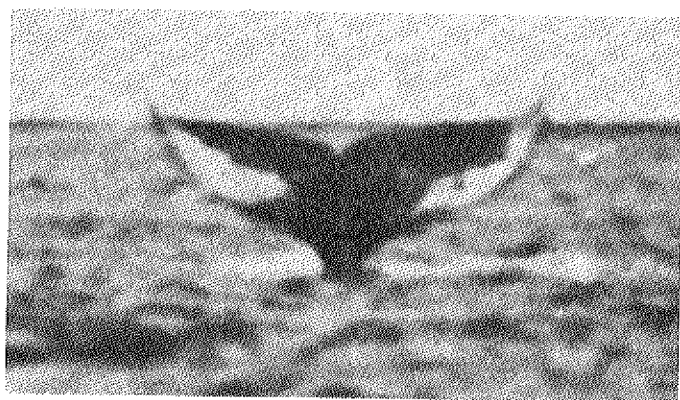
971

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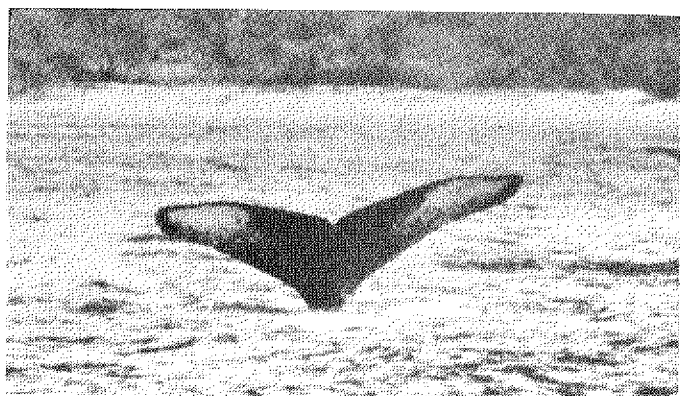
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326



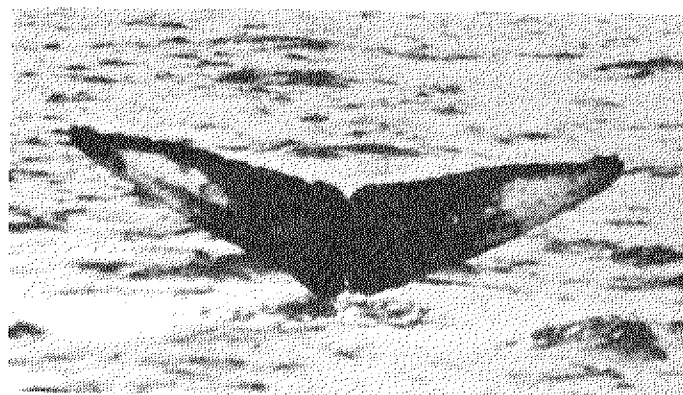
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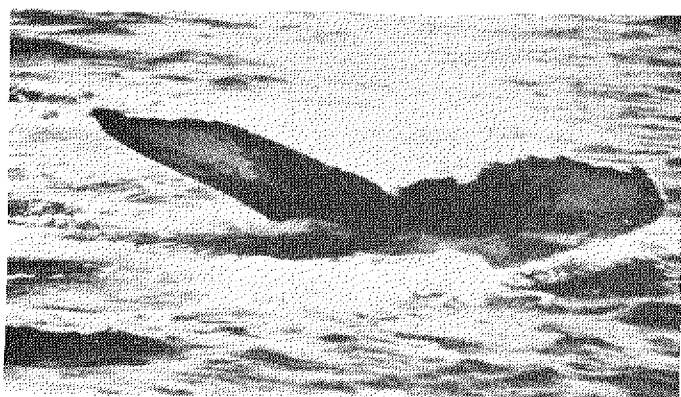
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812



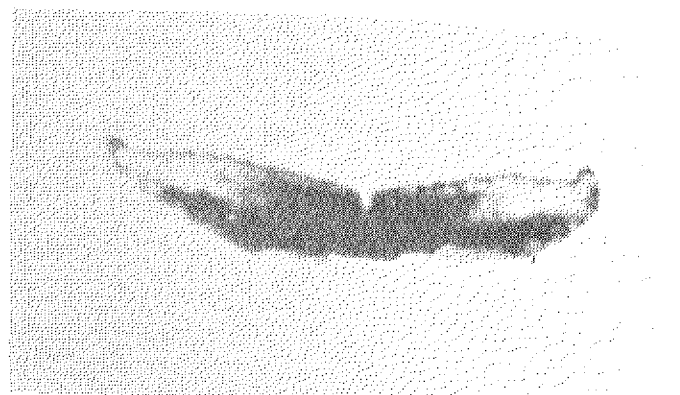
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1010

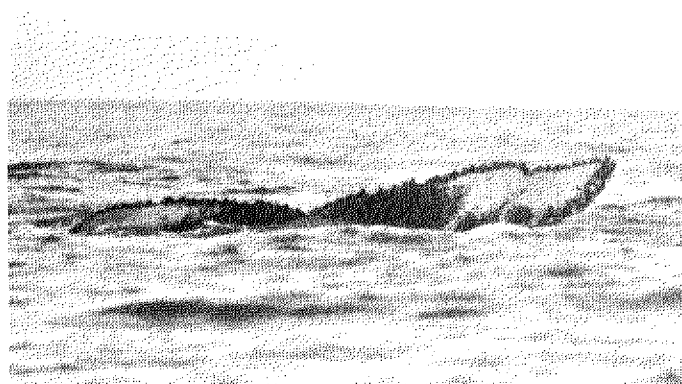
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2047

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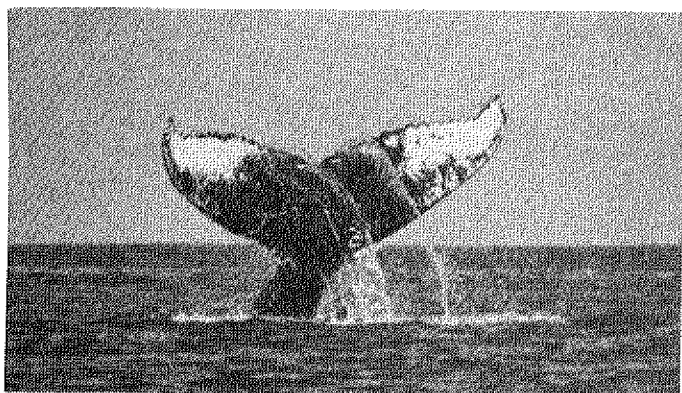
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168



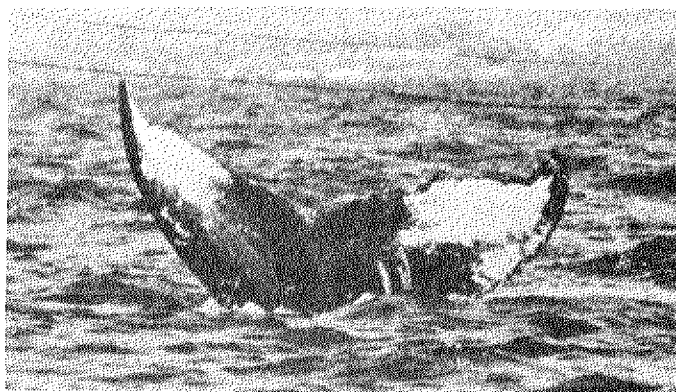
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538



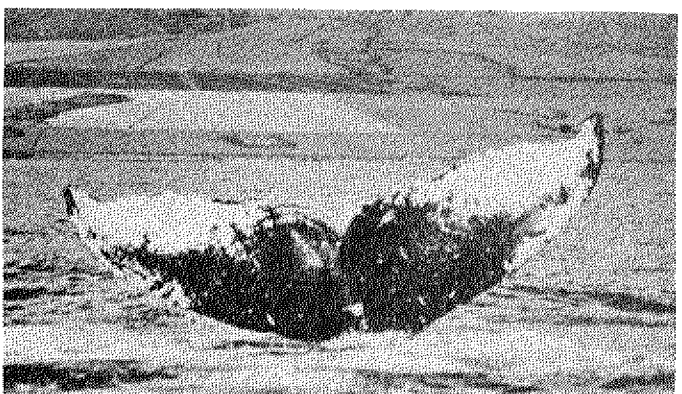
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2738

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26

49



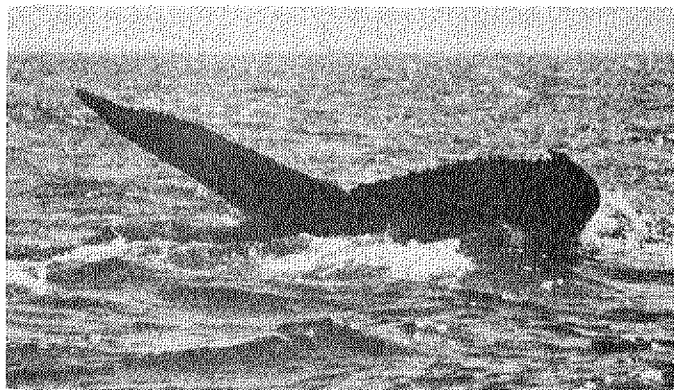
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89



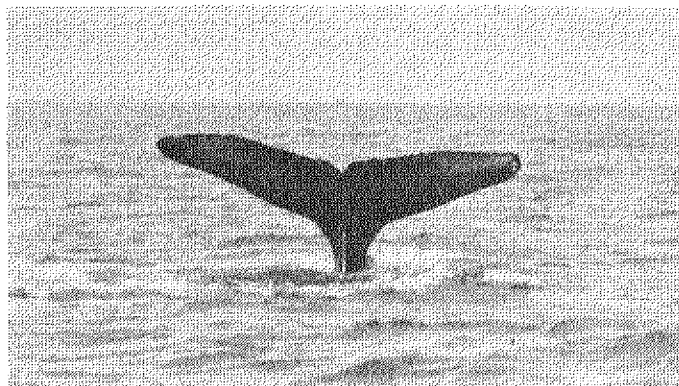
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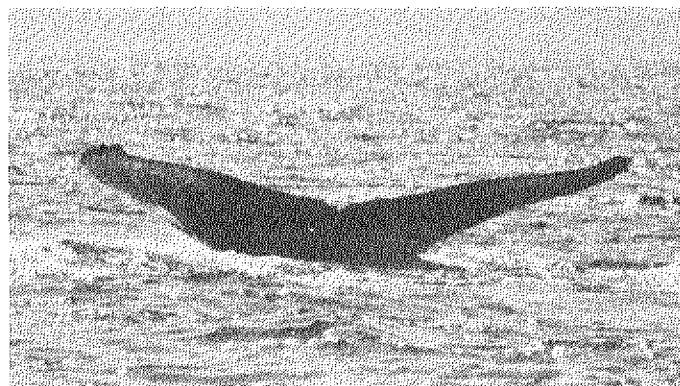
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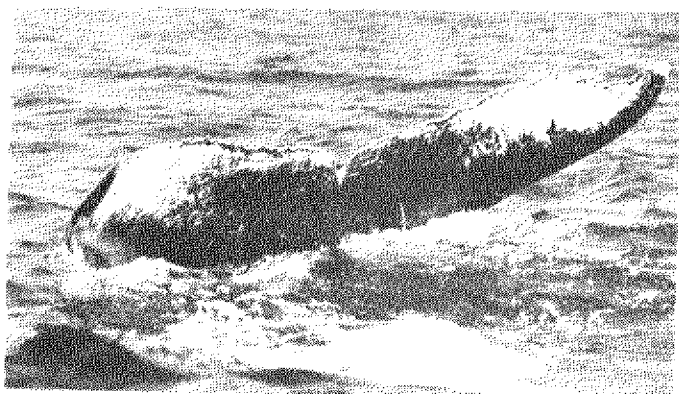
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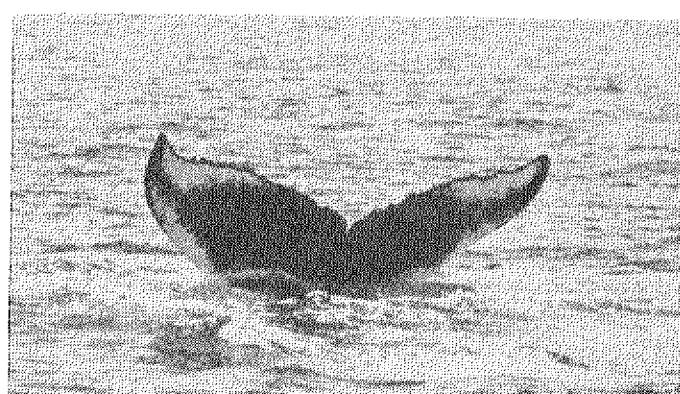
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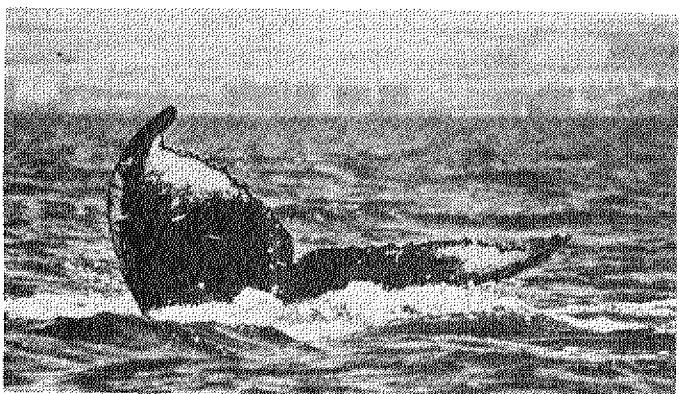
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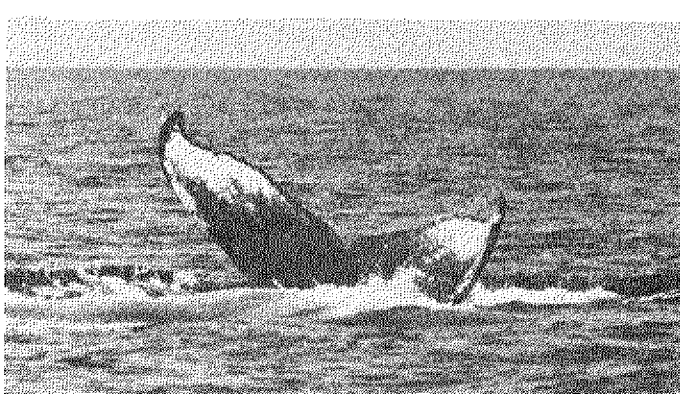
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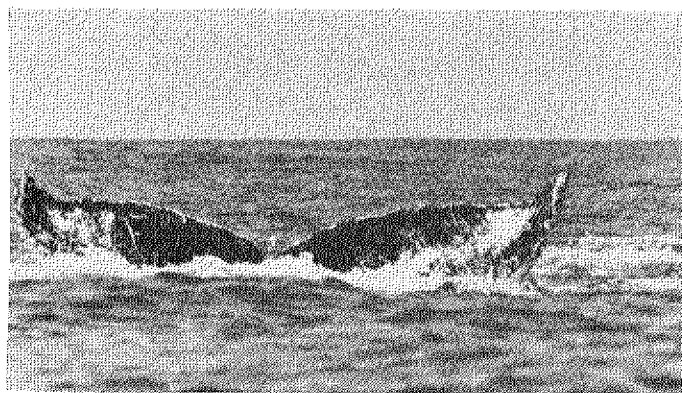
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819



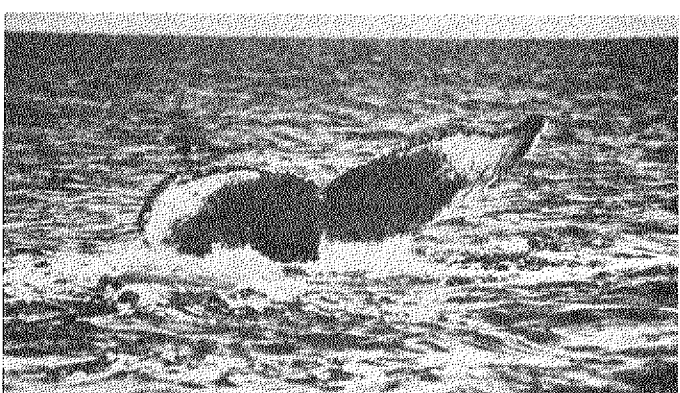
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533

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673

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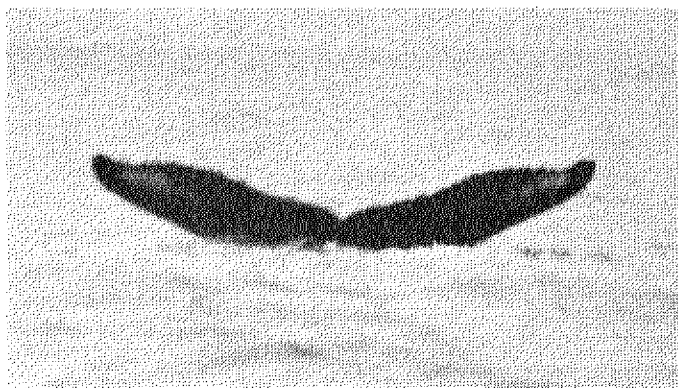


# HAWAII



118

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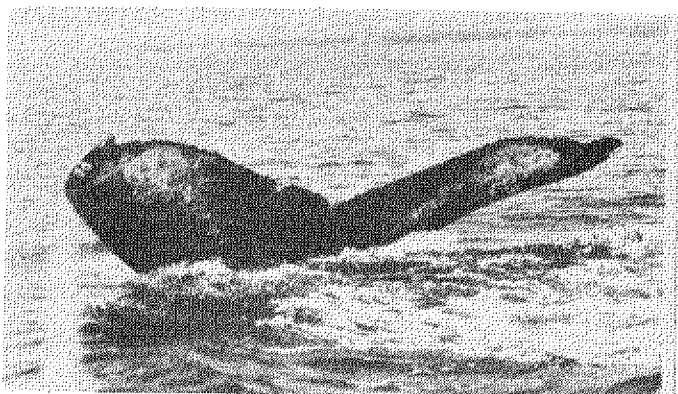
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130



519

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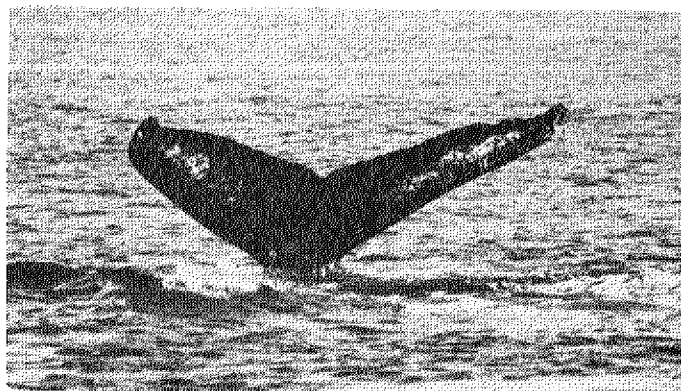
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184



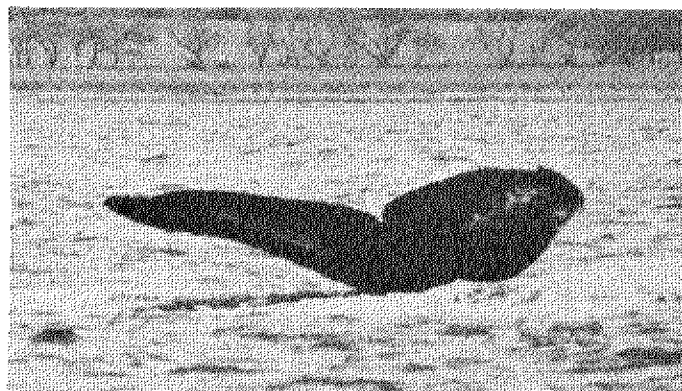
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535



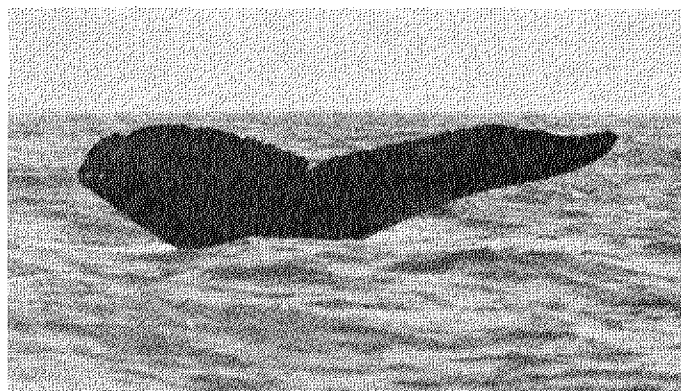
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52



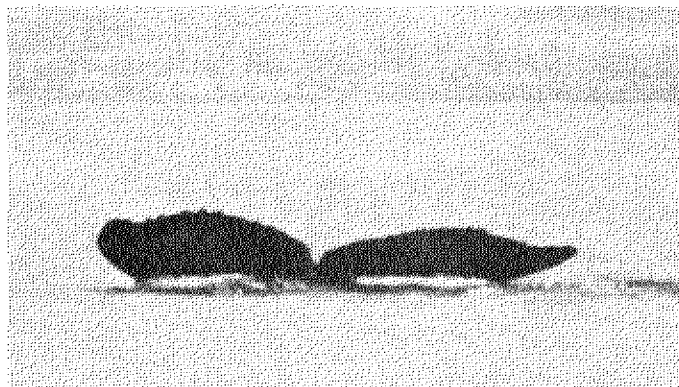
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245



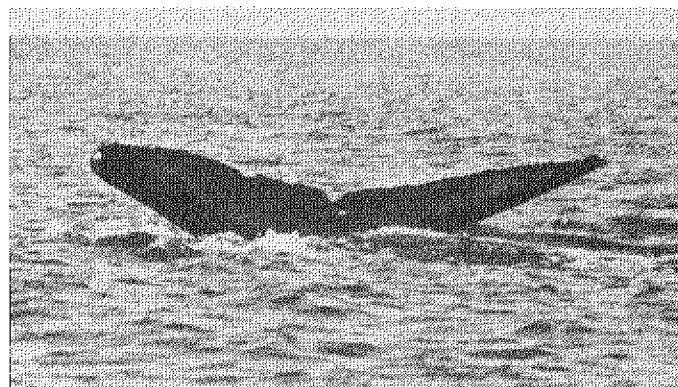
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435



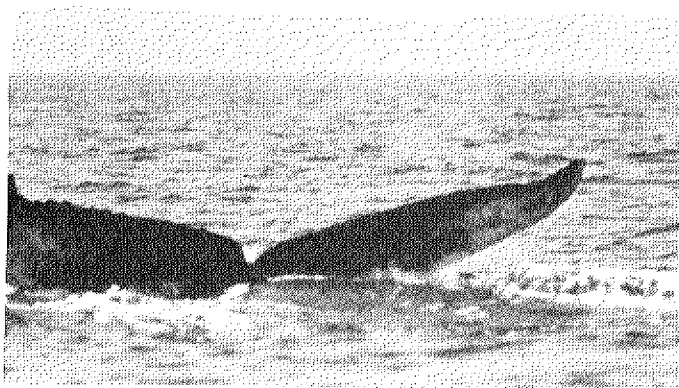
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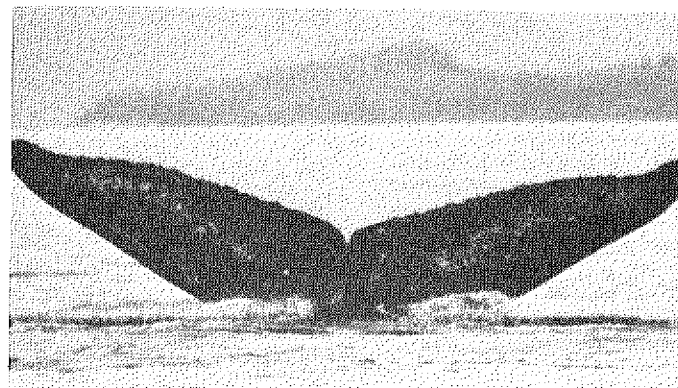
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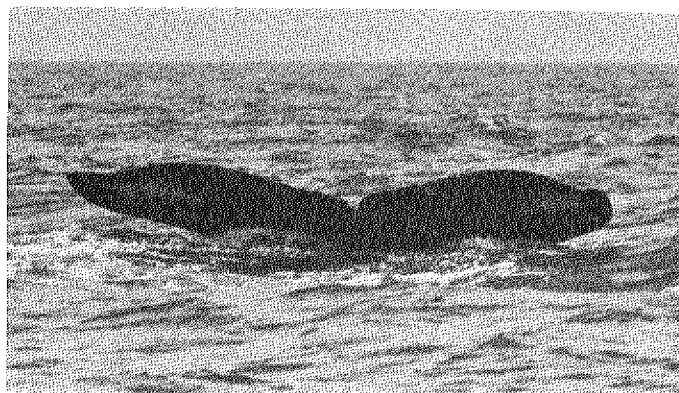
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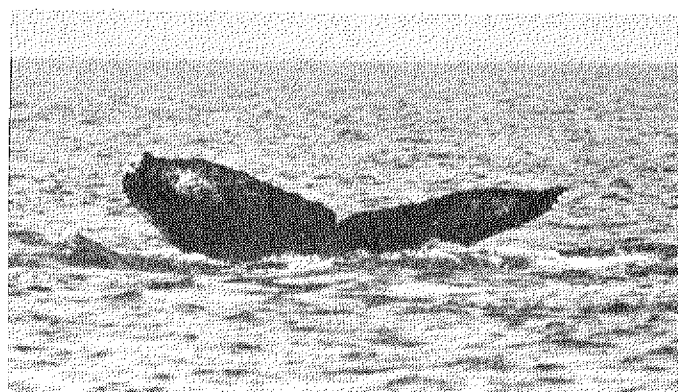
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190



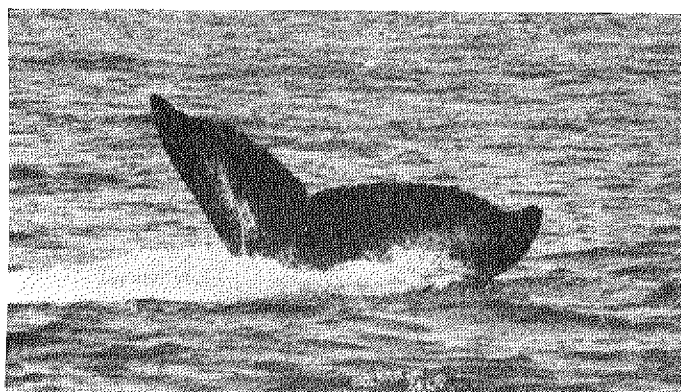
2171

536



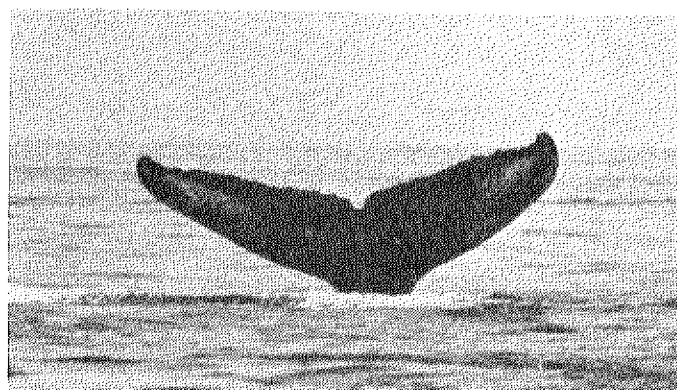
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552



437

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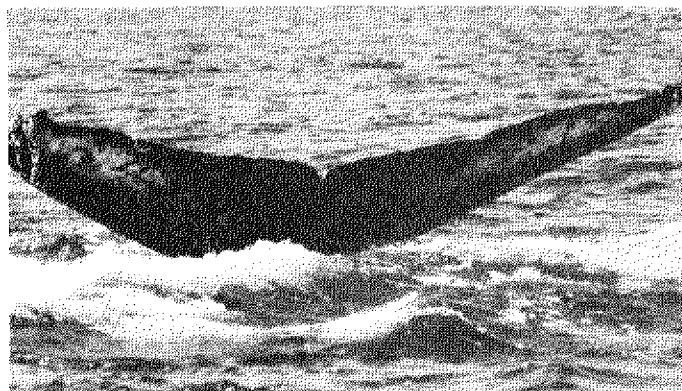


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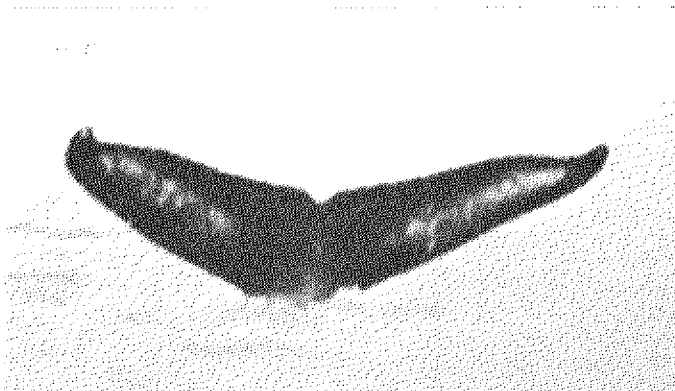


# HAWAII



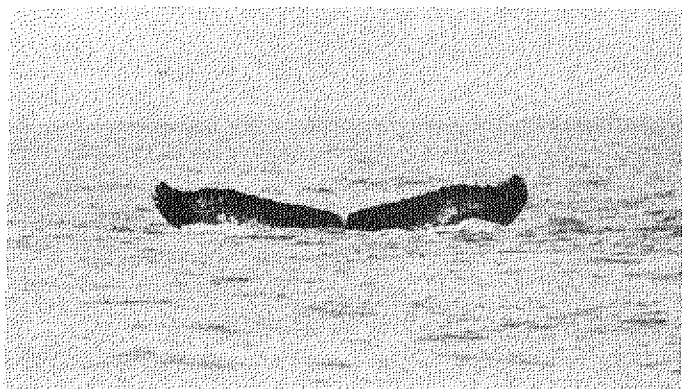
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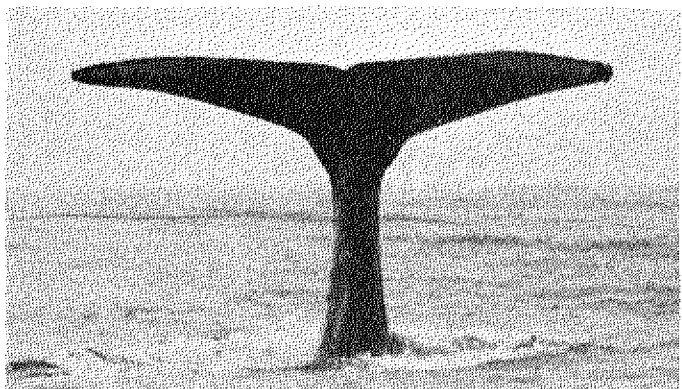
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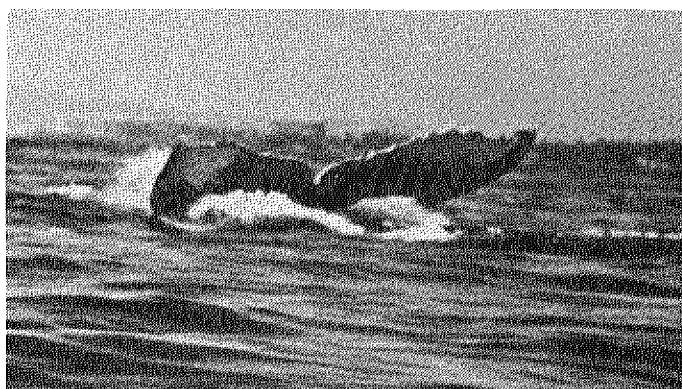
412

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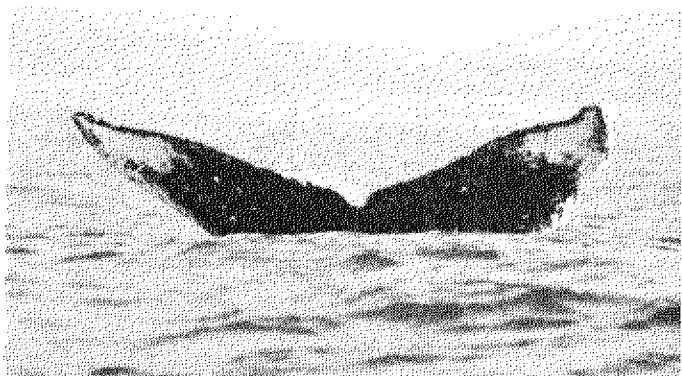
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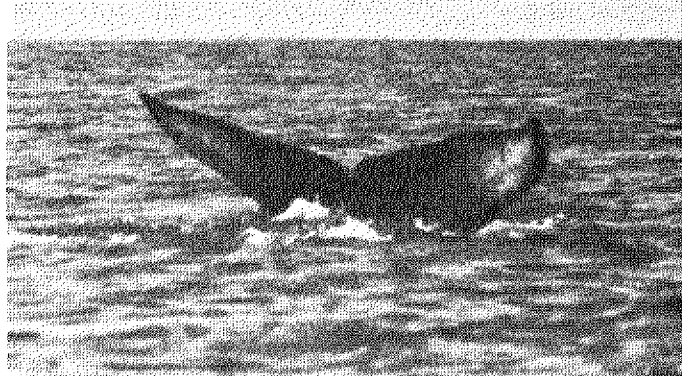
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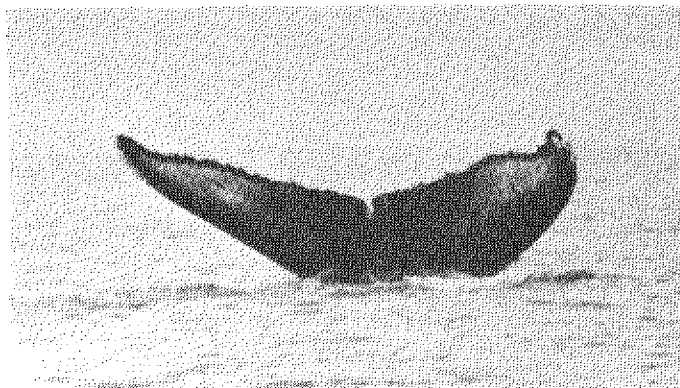
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68



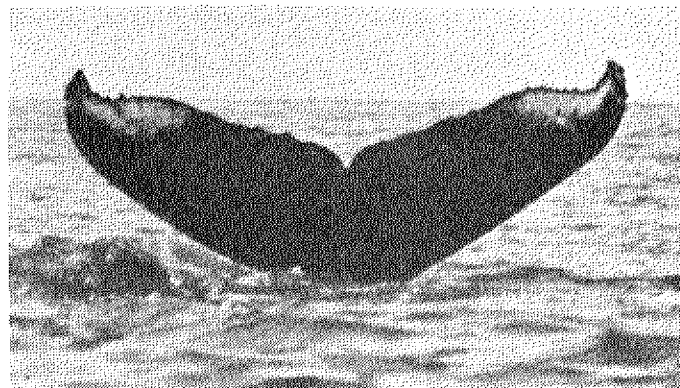
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497

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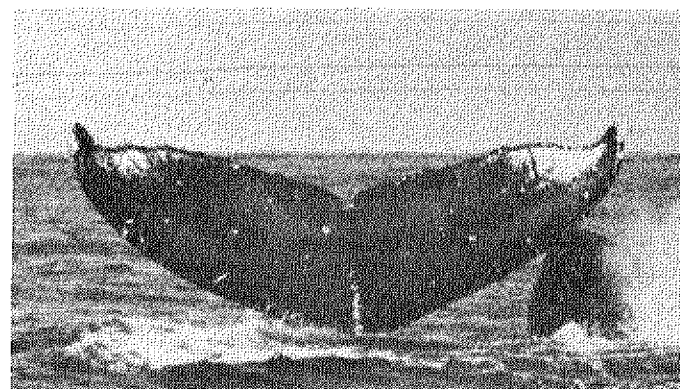
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376



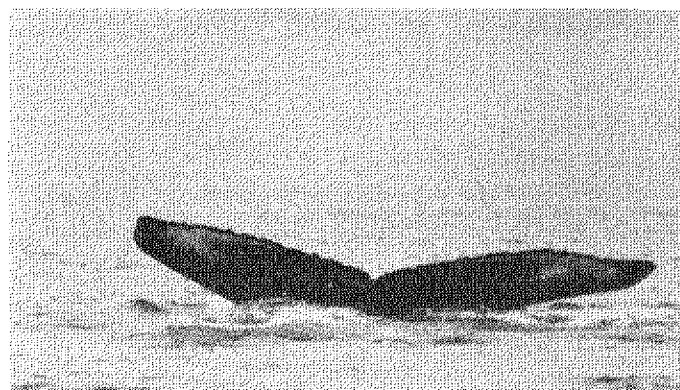
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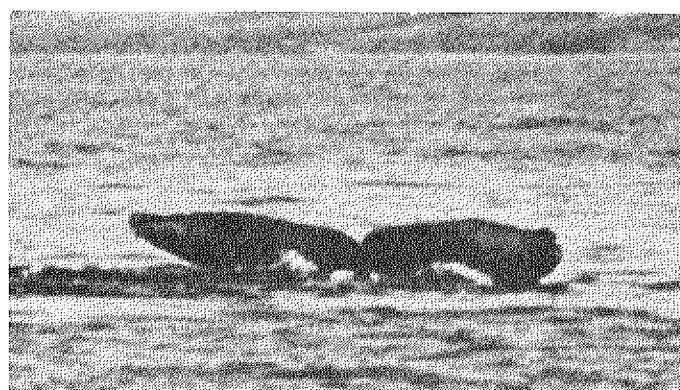
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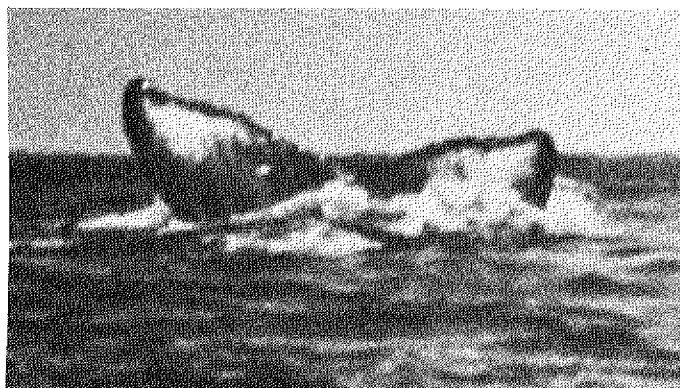
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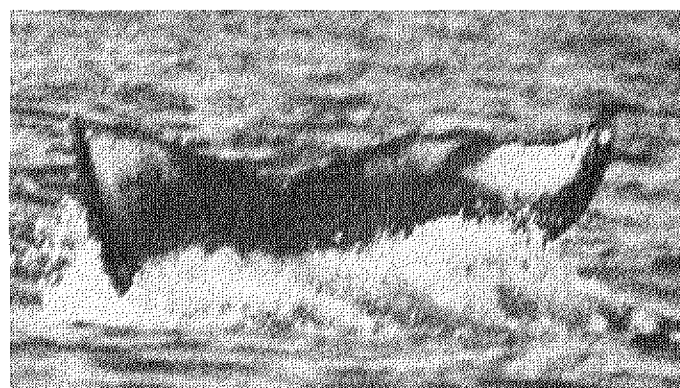
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49

36

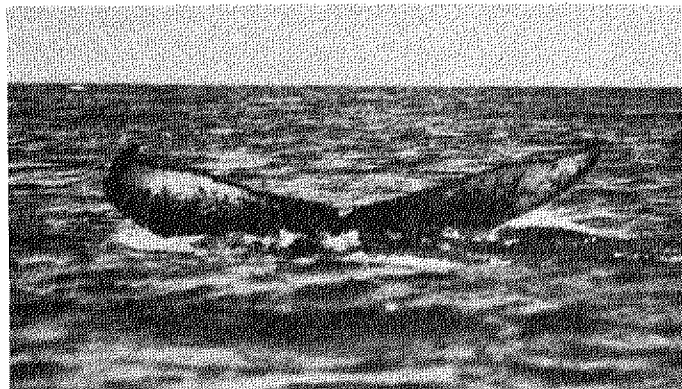


141

24

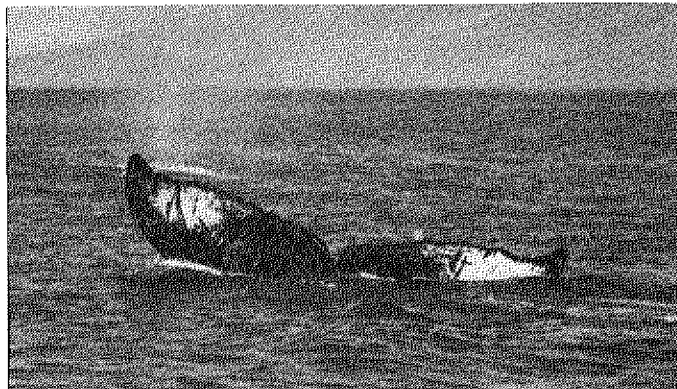


# HAWAII



2027

203



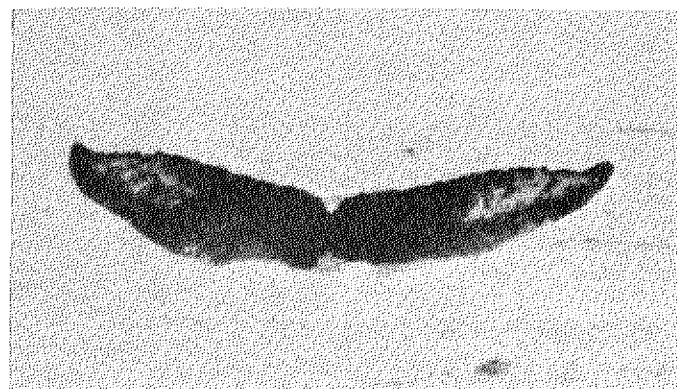
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372

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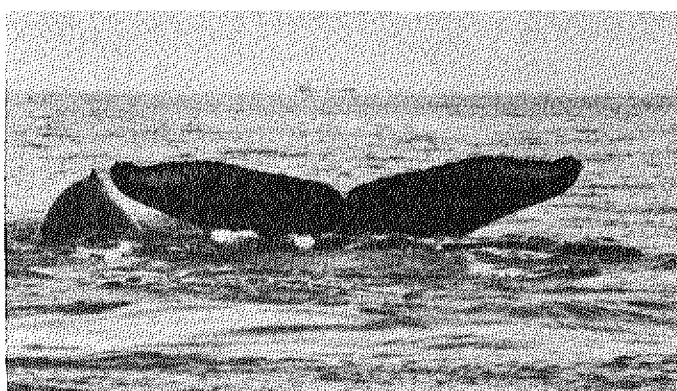
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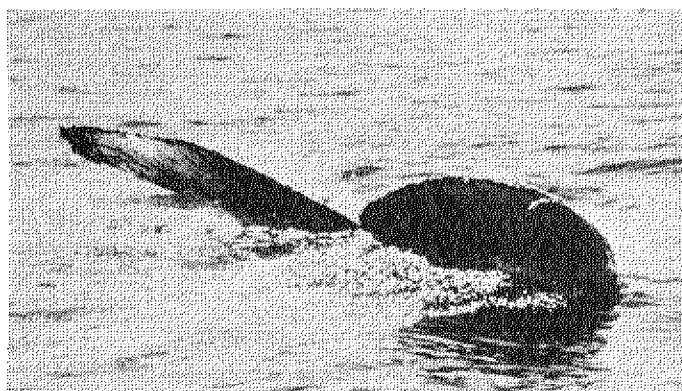
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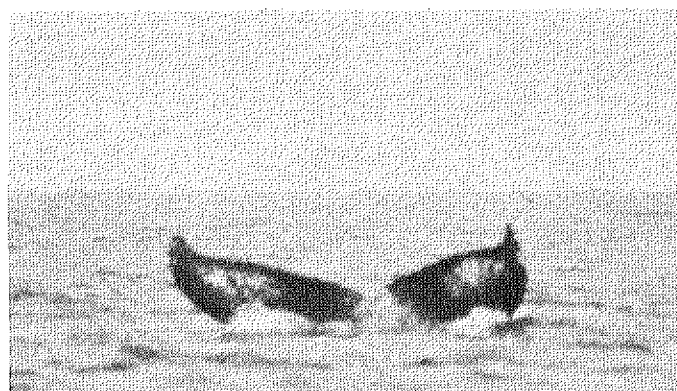
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301



1045

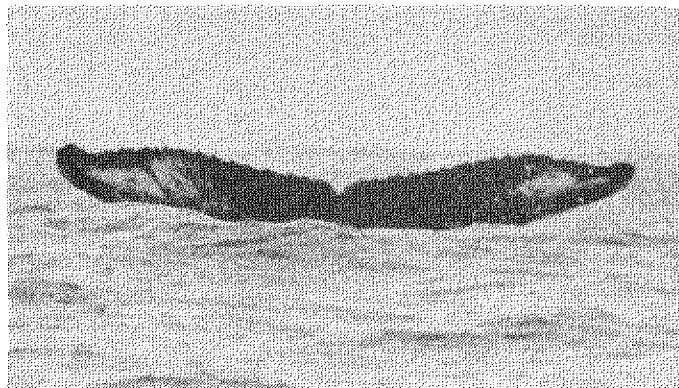
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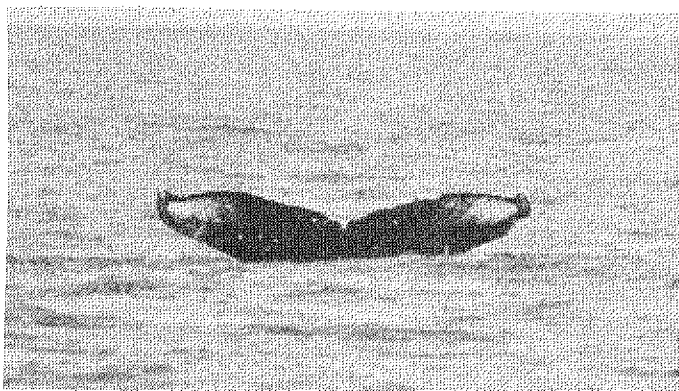
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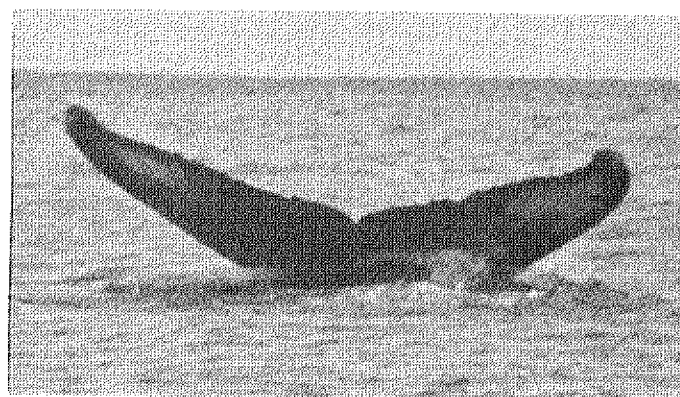
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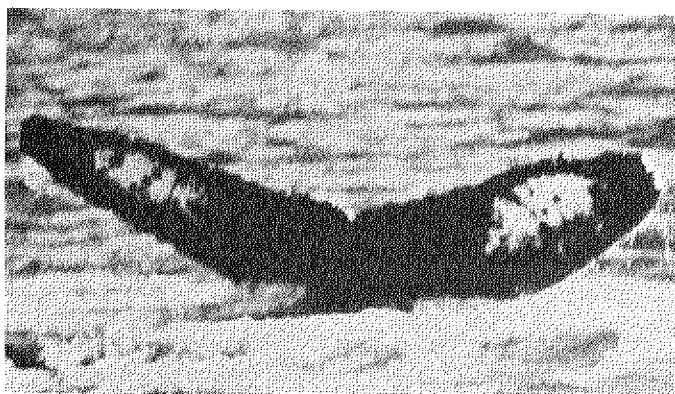
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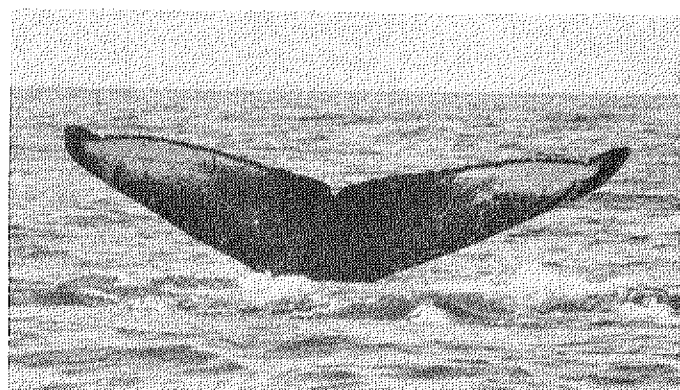
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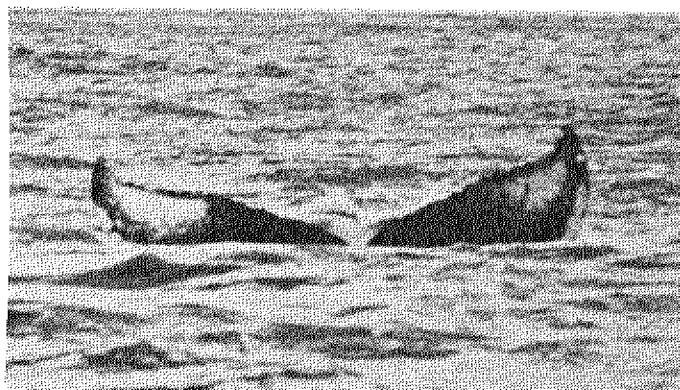
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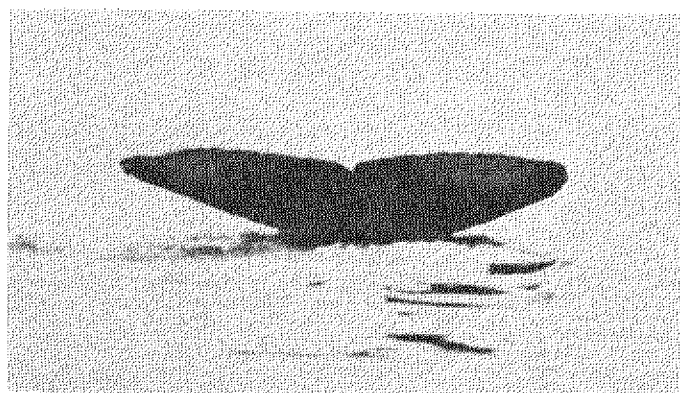
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264

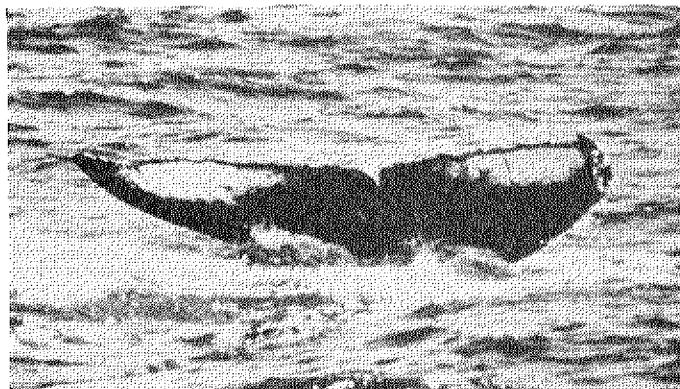
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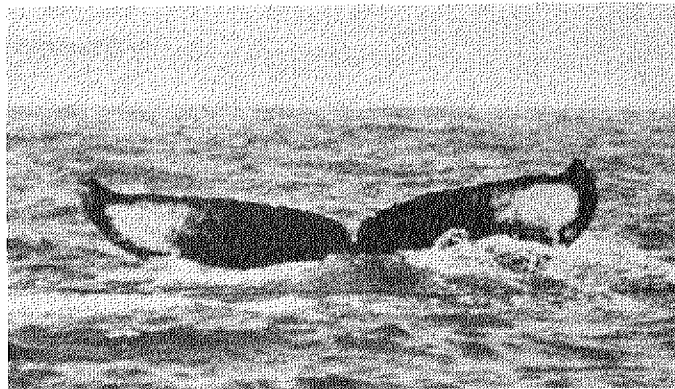
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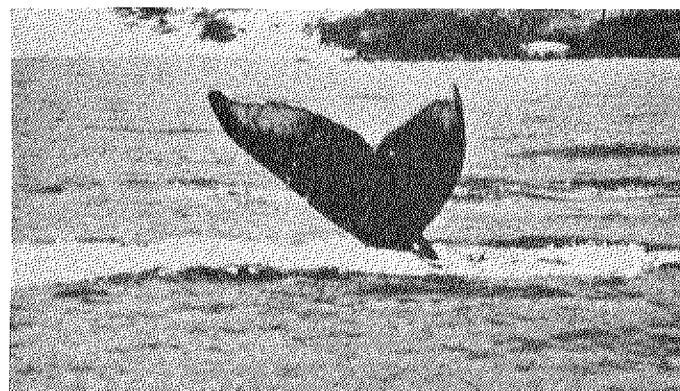
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136



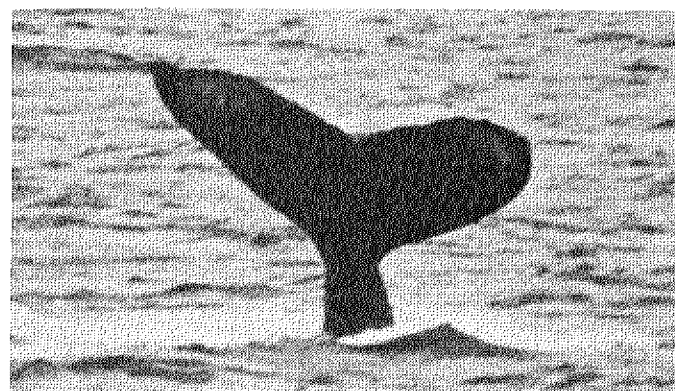
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567

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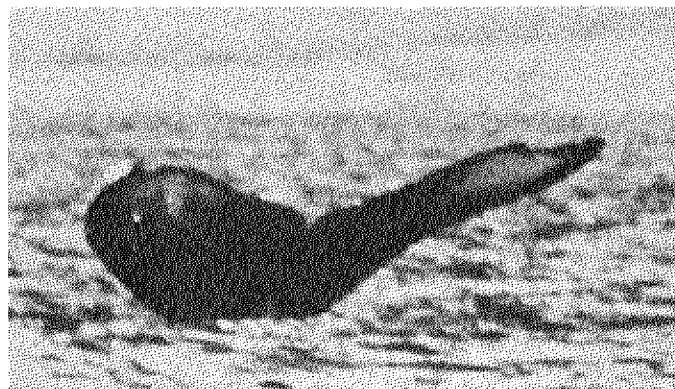
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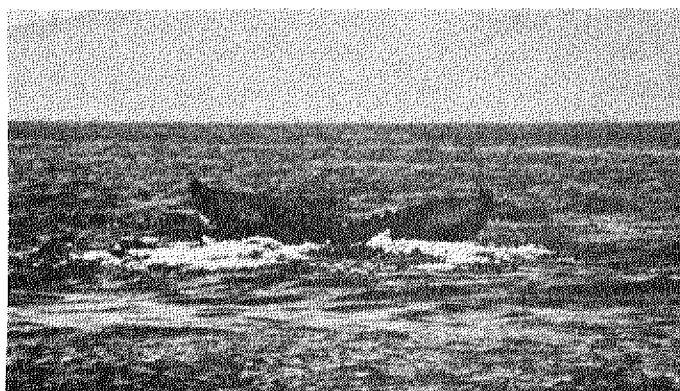
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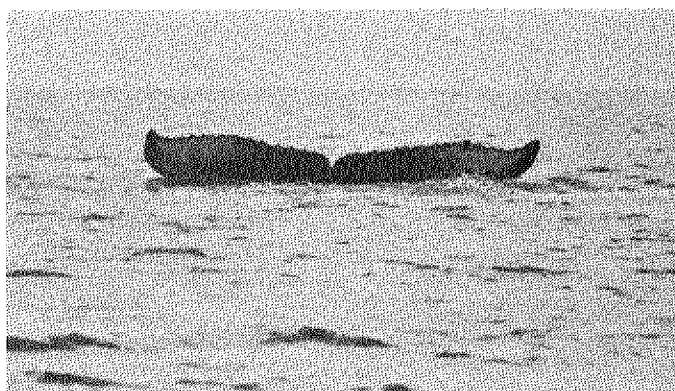
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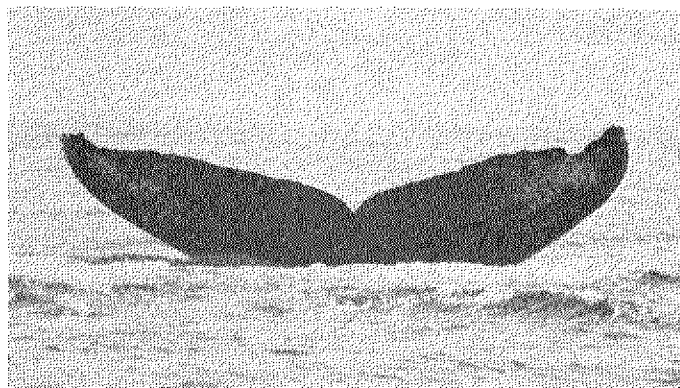
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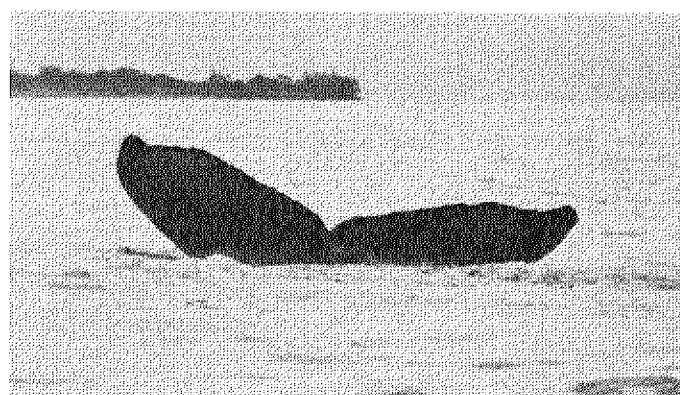
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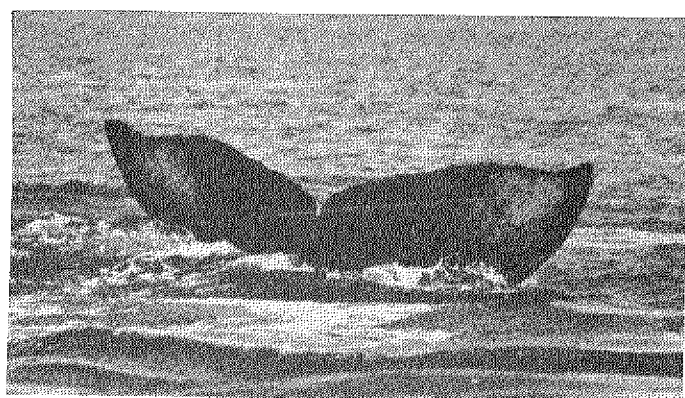
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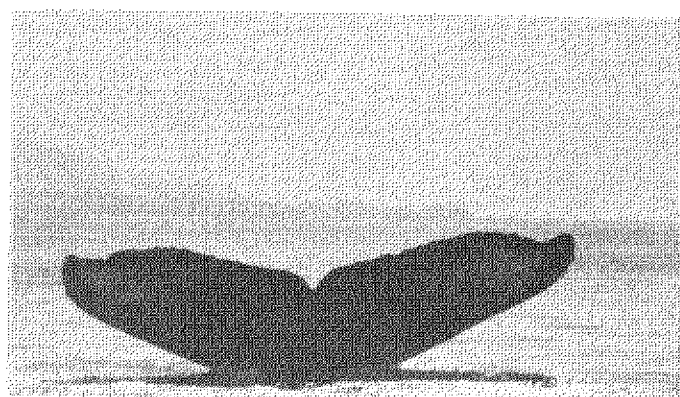
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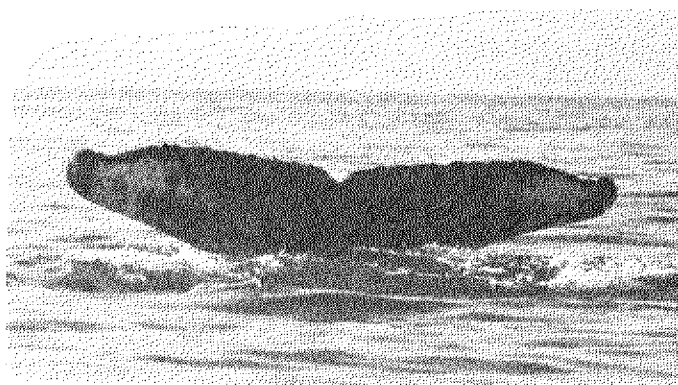
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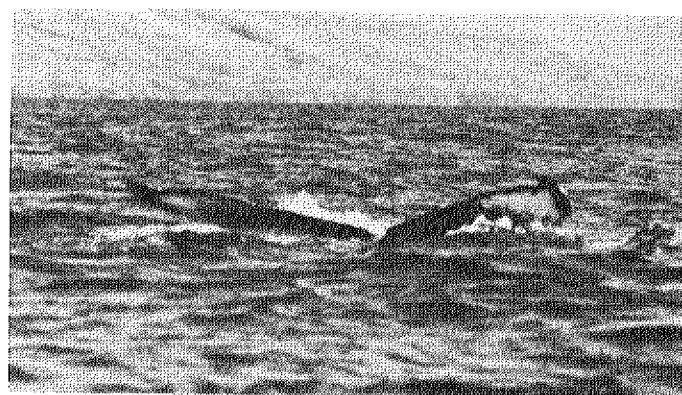
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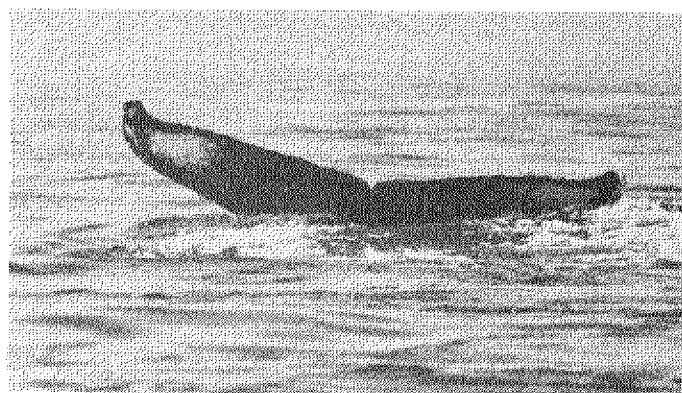
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366



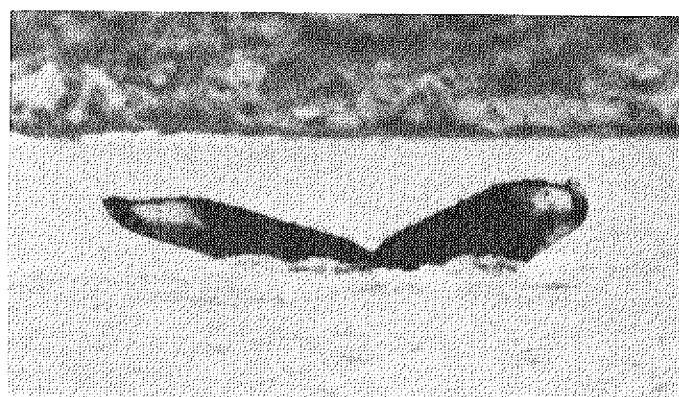
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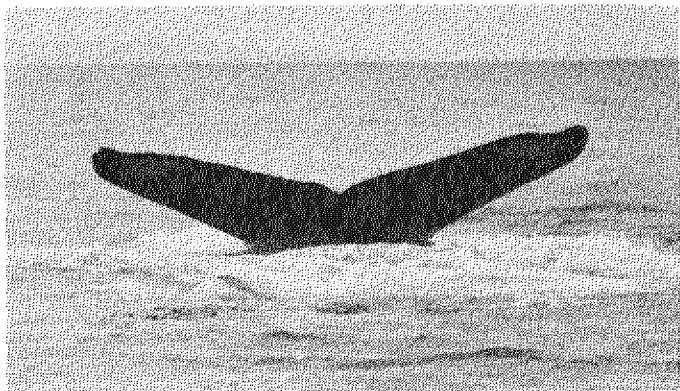
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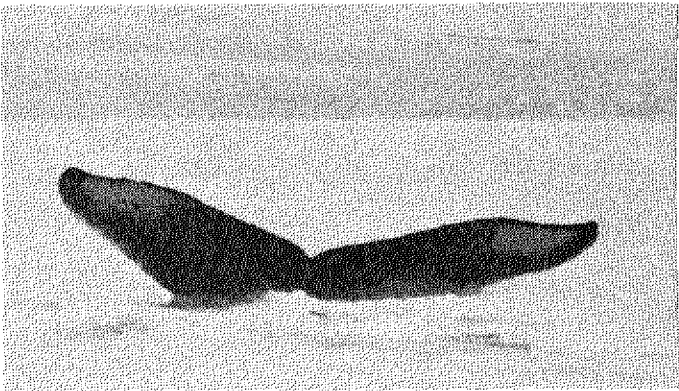
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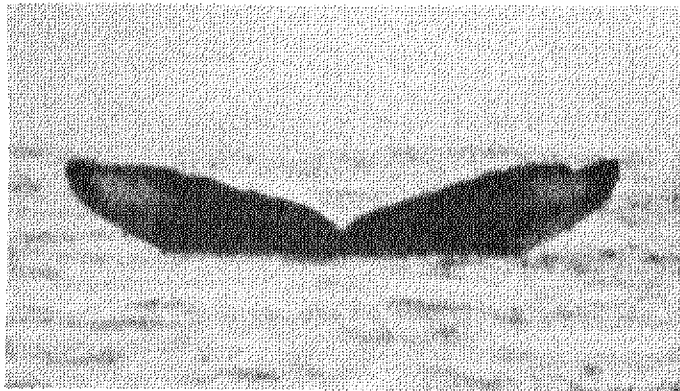
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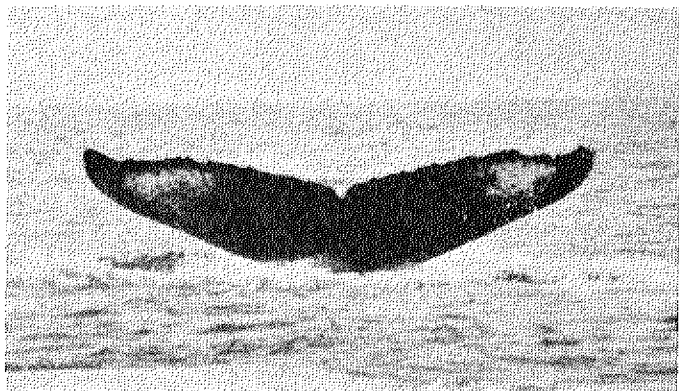
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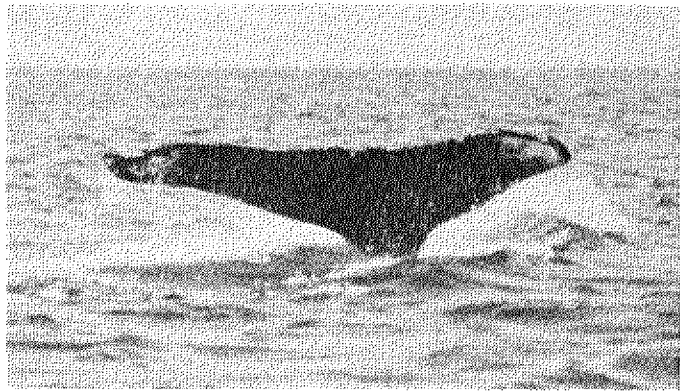
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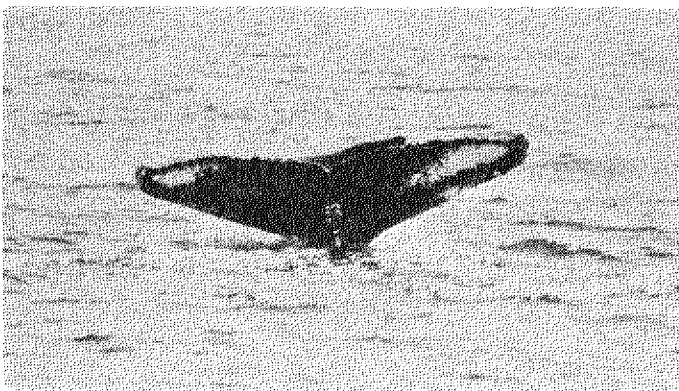
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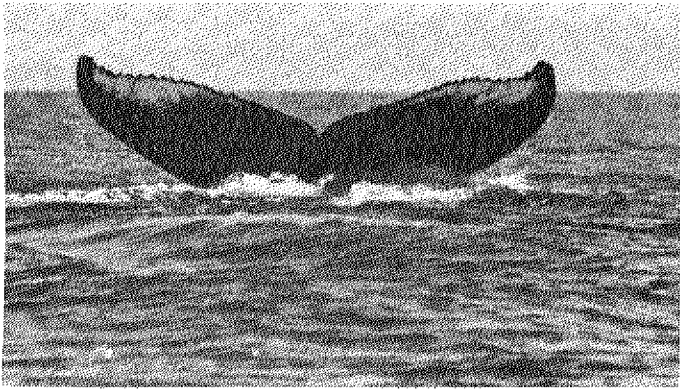
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431

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536

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2281

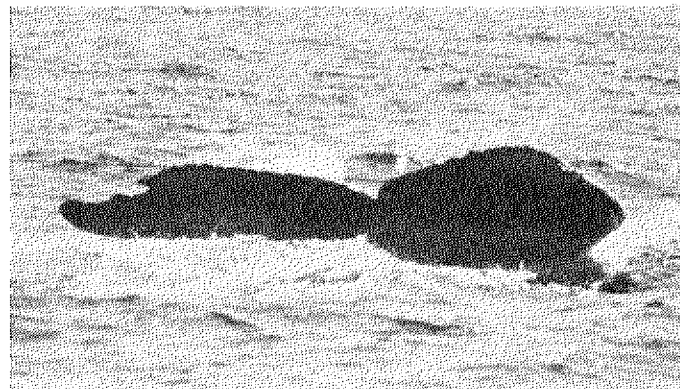
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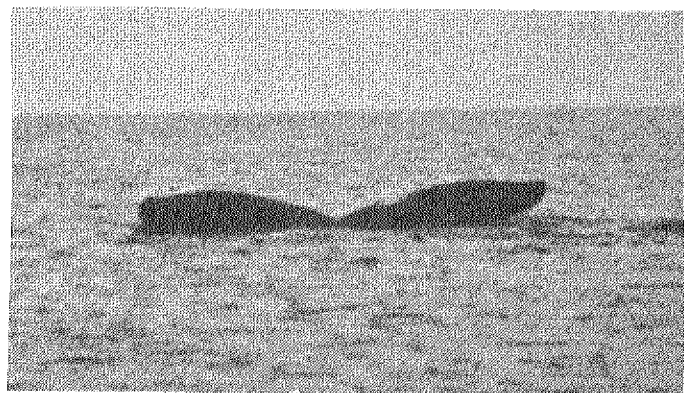
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2363

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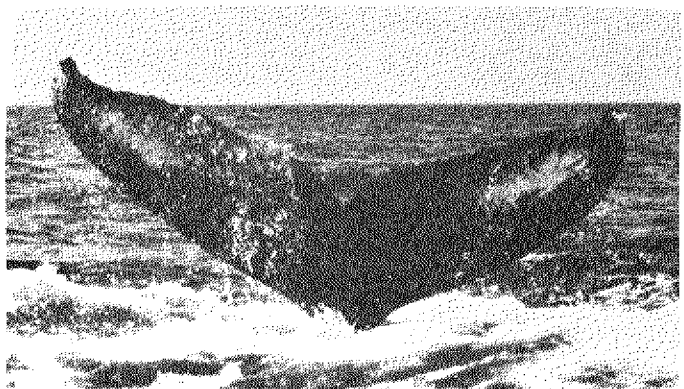
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447



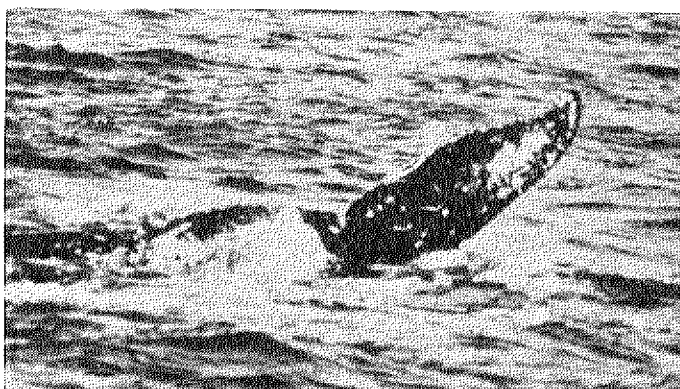
1126

247



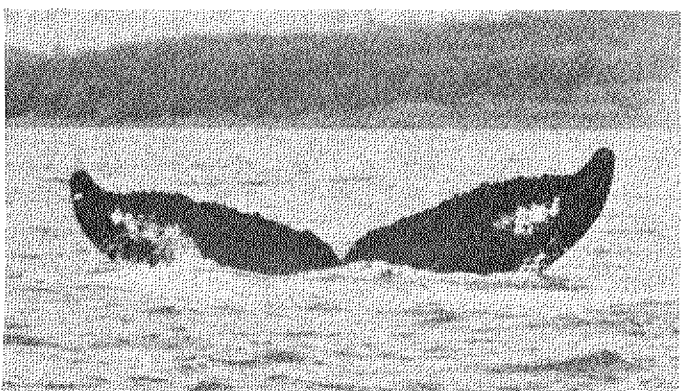
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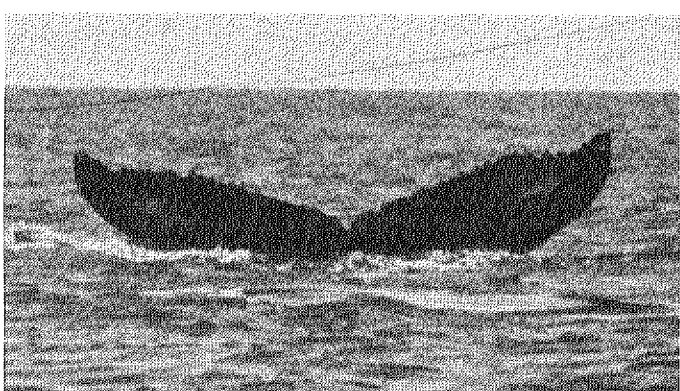
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254



2422

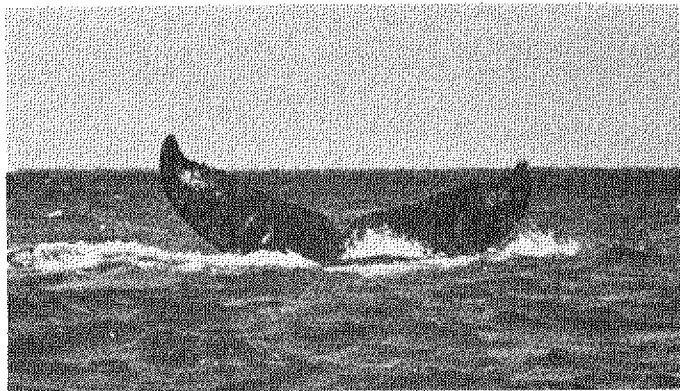
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2792

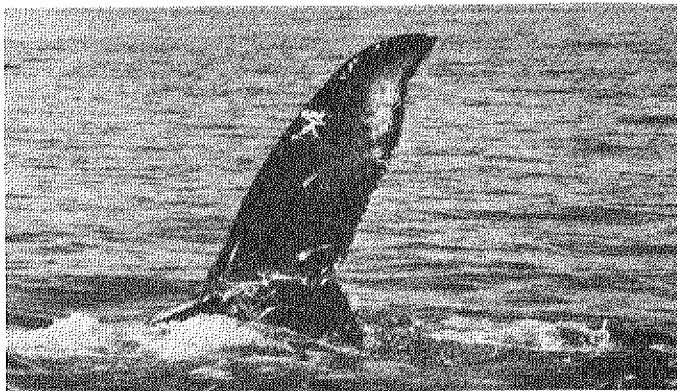
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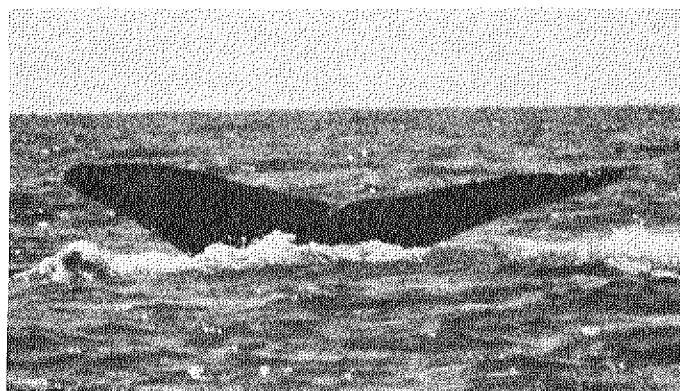
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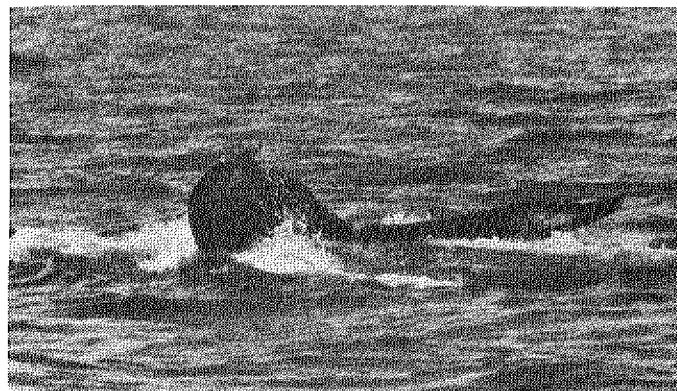
2131

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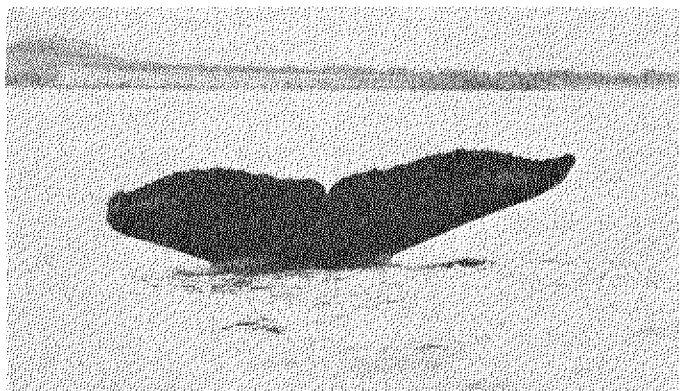
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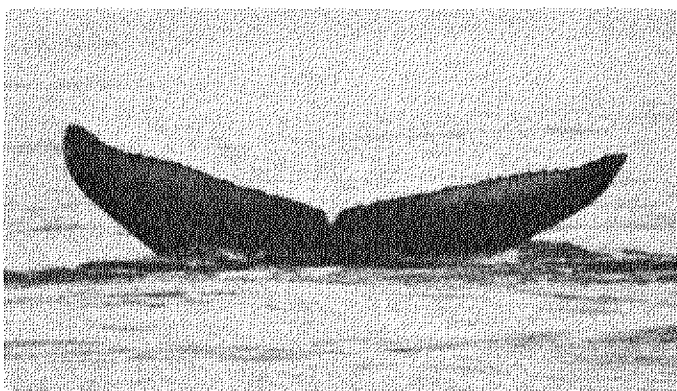
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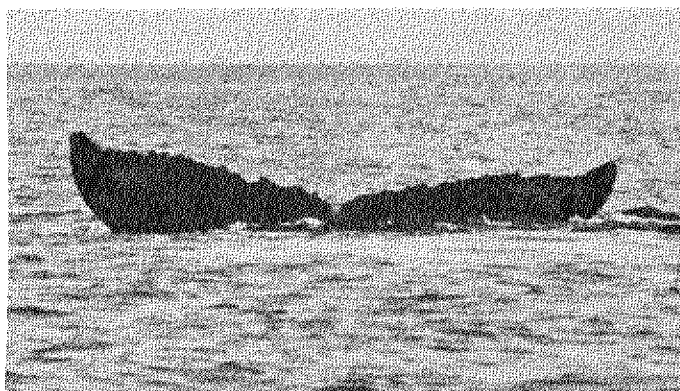
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309



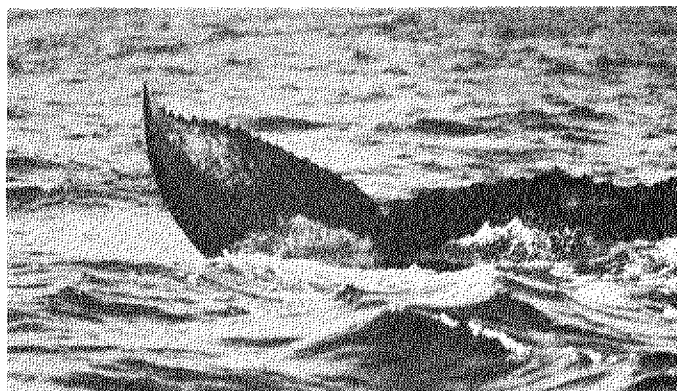
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827



2386

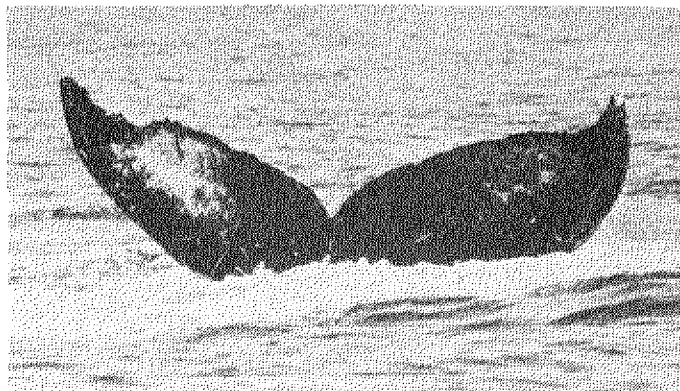
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411

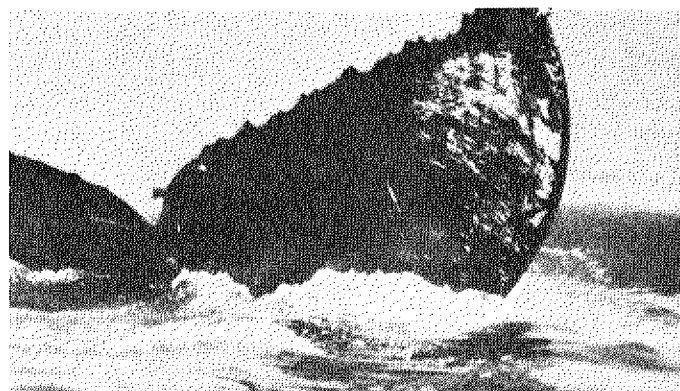
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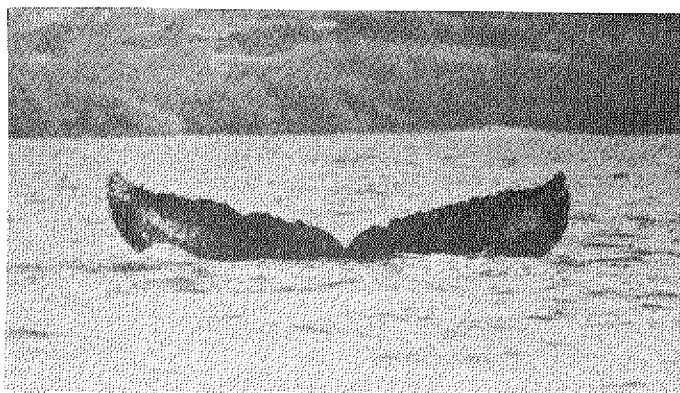
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377



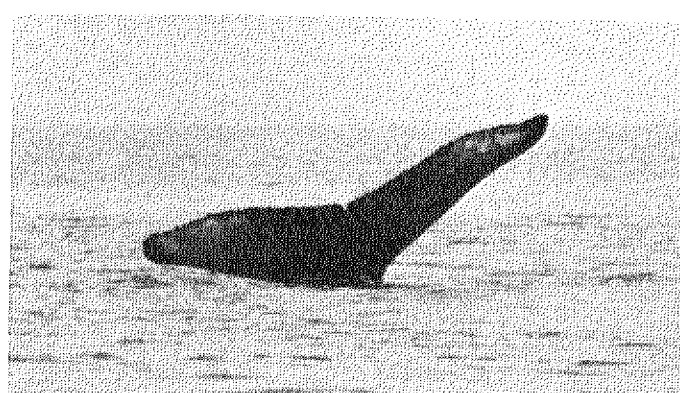
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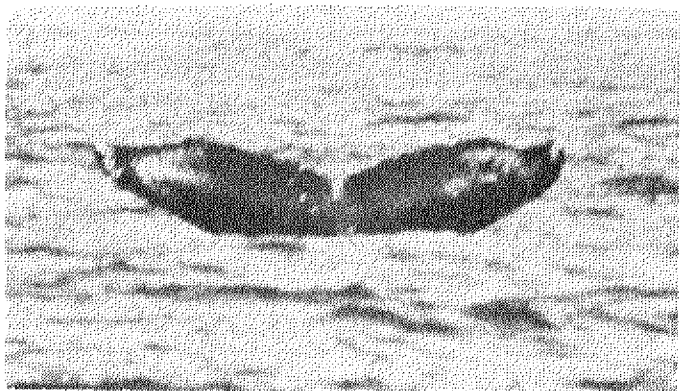
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71



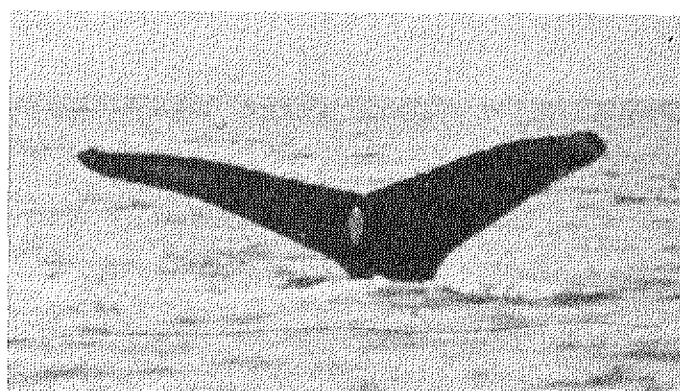
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231

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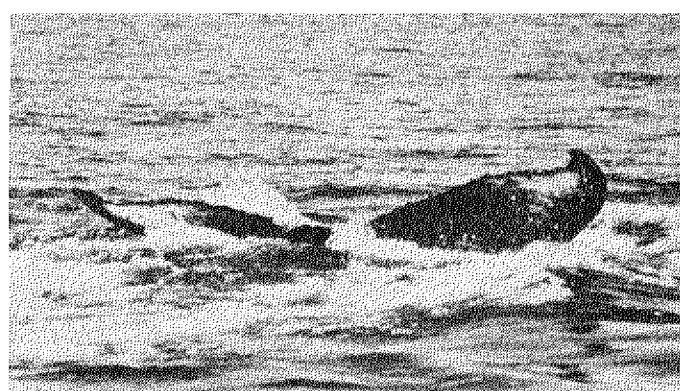
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429

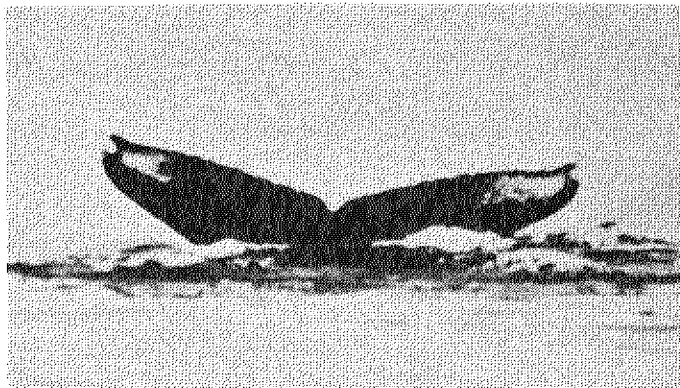
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1022

129

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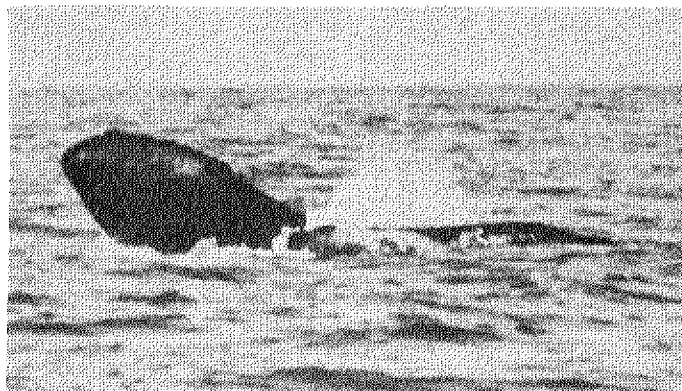
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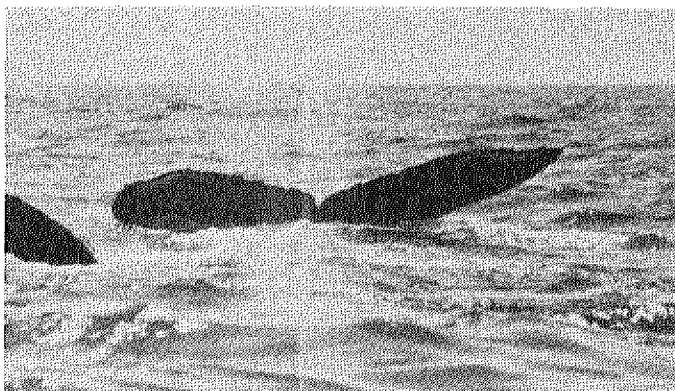
2820

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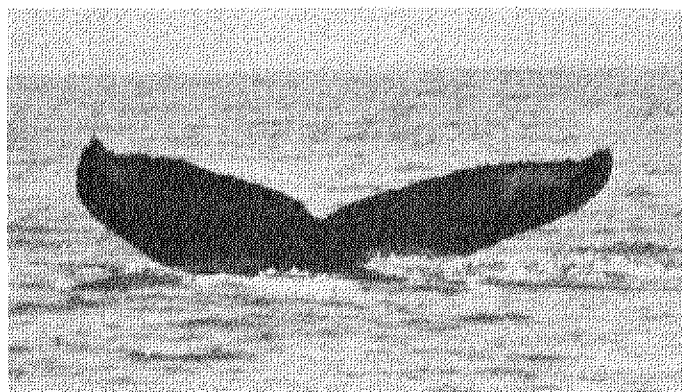
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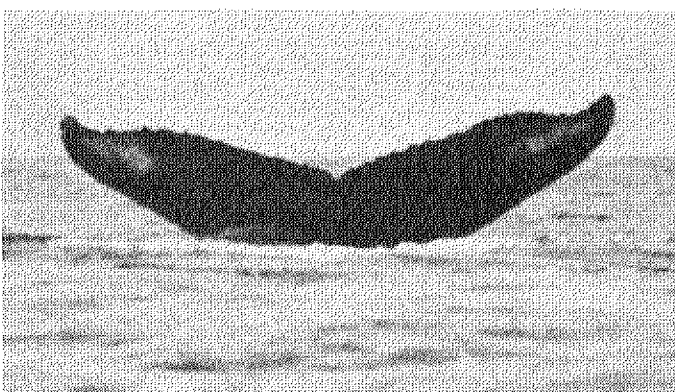
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431



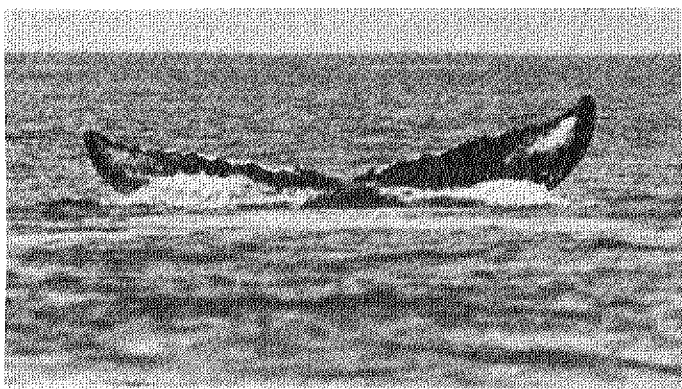
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2414

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363

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1317

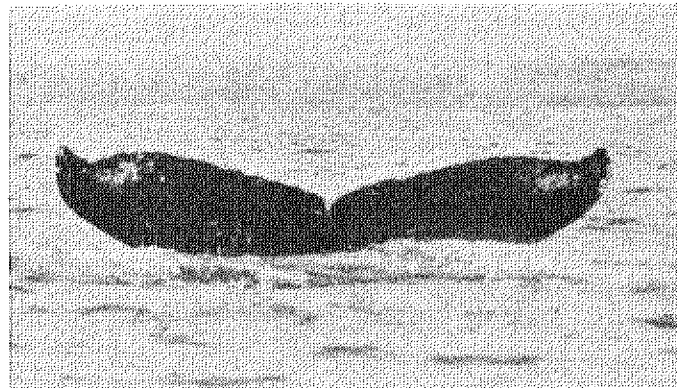
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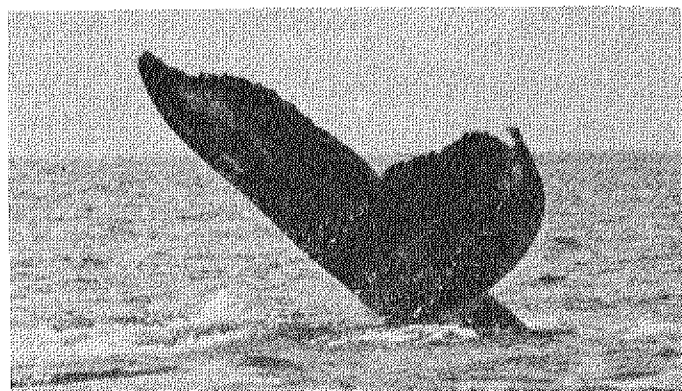
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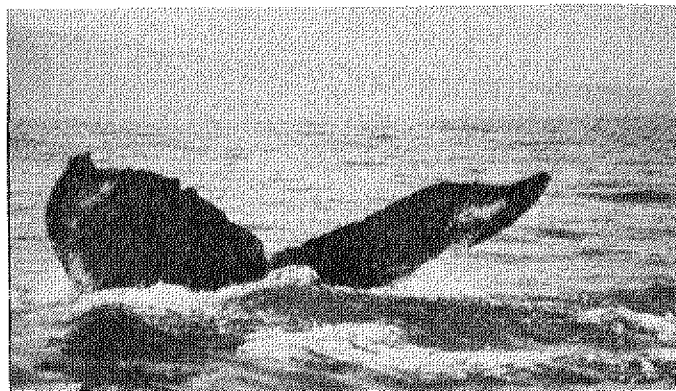
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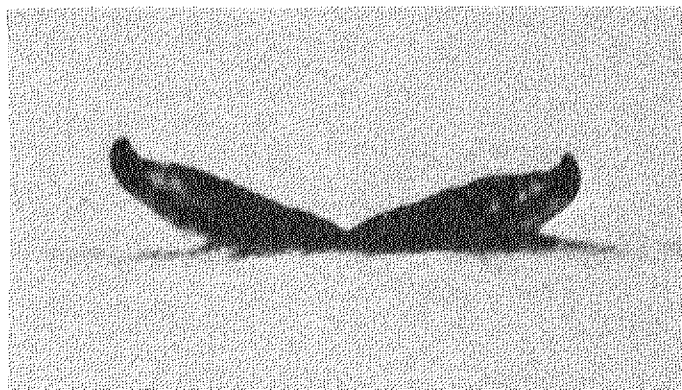
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347



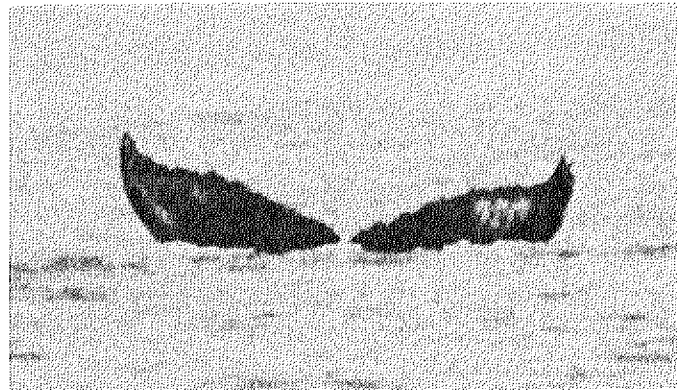
2265

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1030

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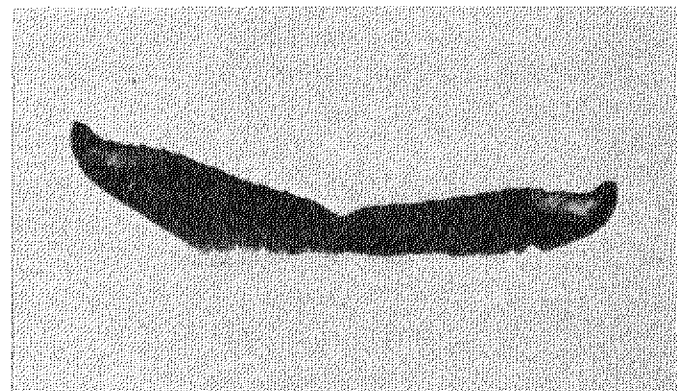
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102



1028

432



2074

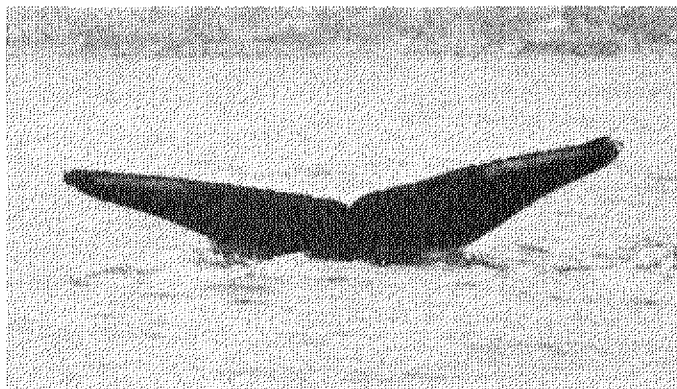
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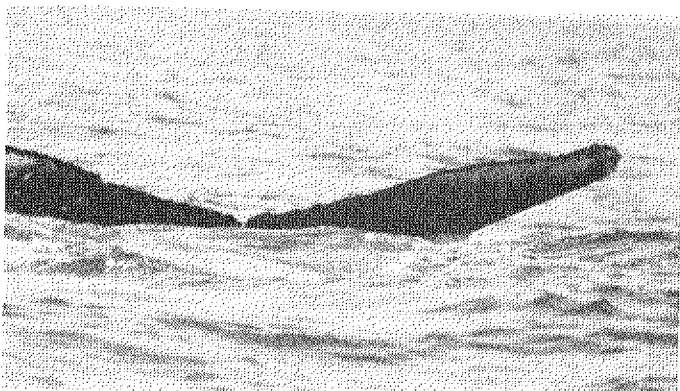
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259



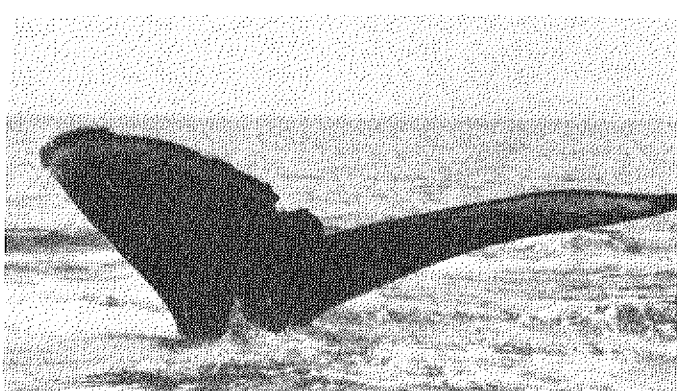
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2360

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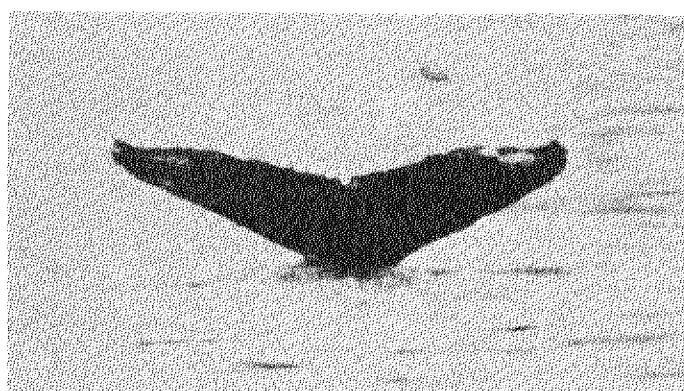
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152



2055

375



1029

0



2061

820



1748

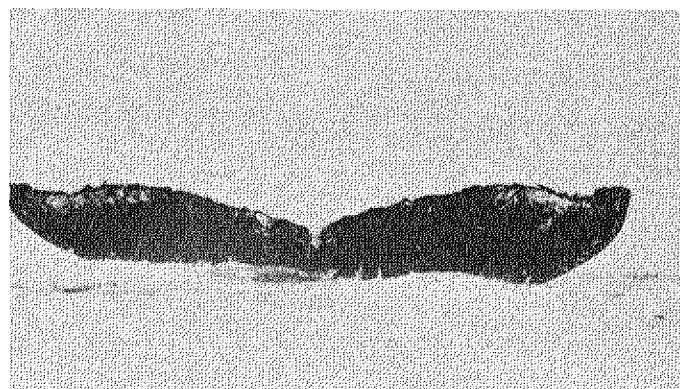
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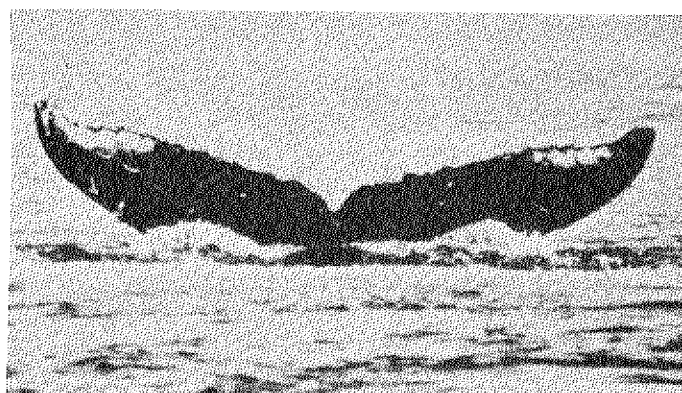
2686

157



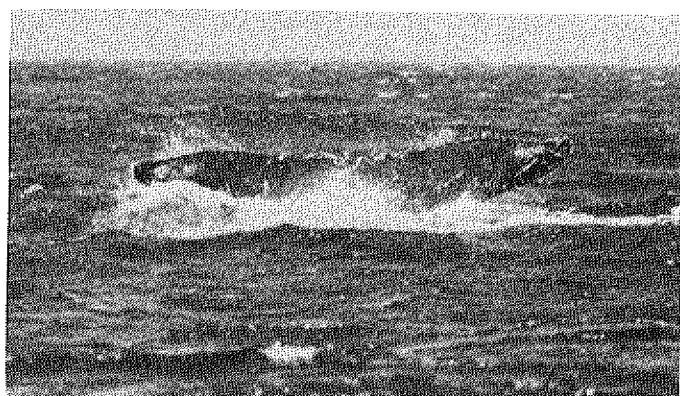
243

15



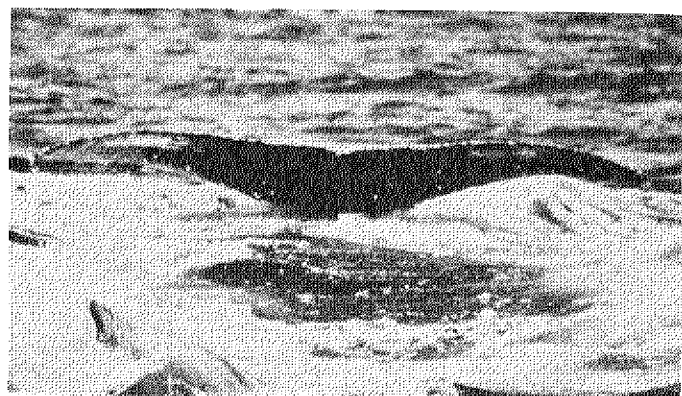
1019

127



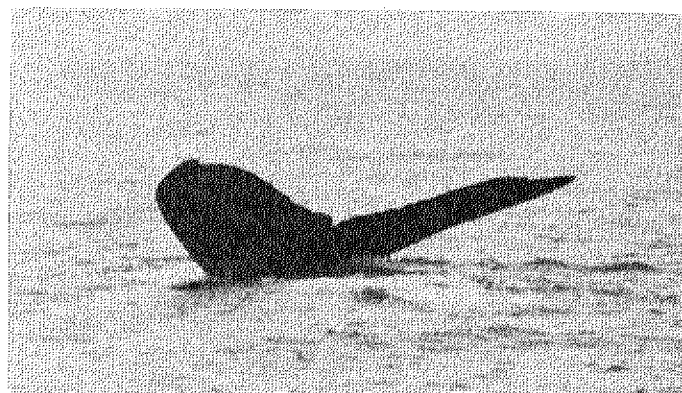
136

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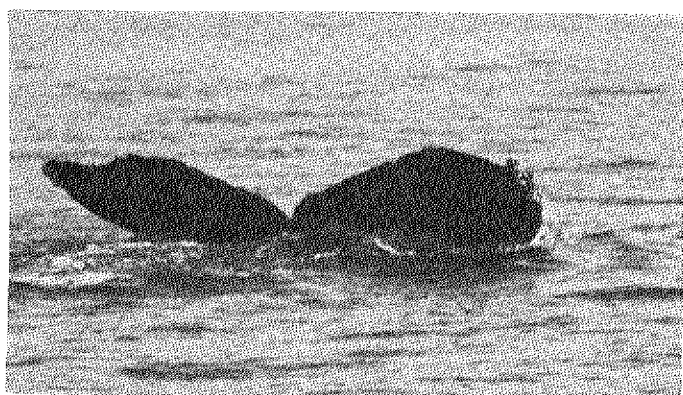
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1104

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74

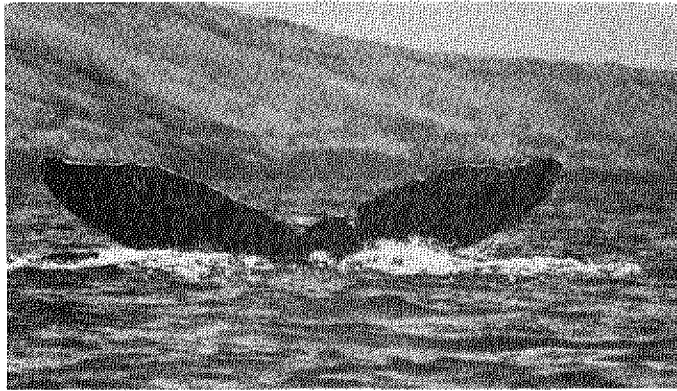
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2325

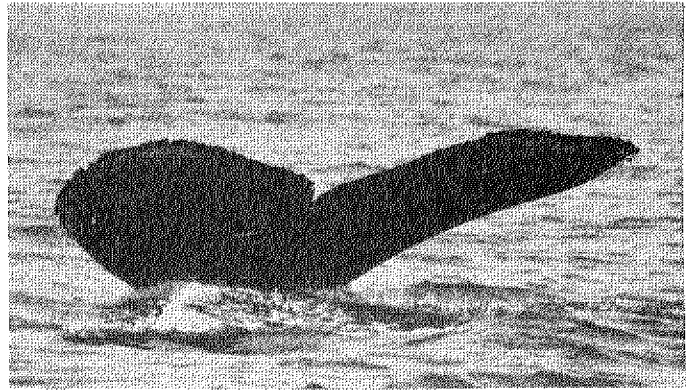
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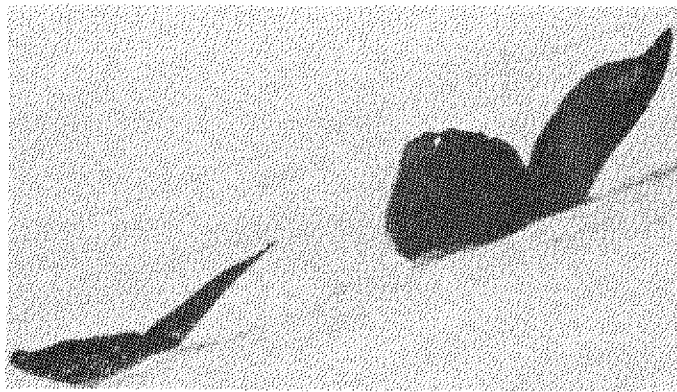
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553



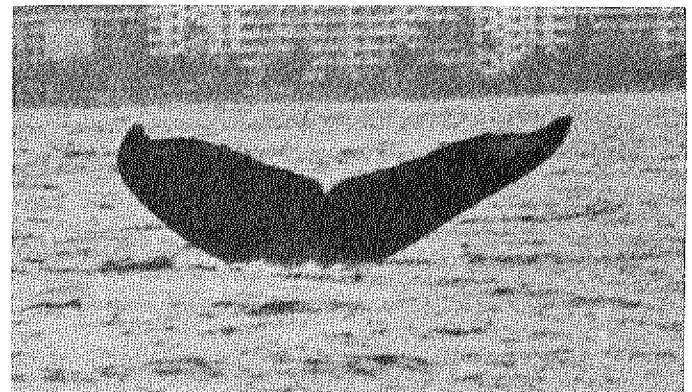
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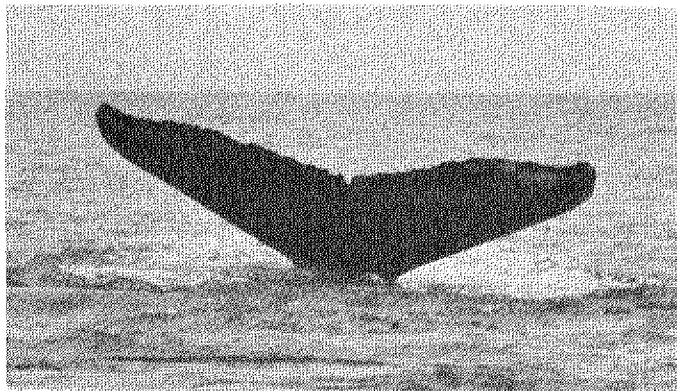
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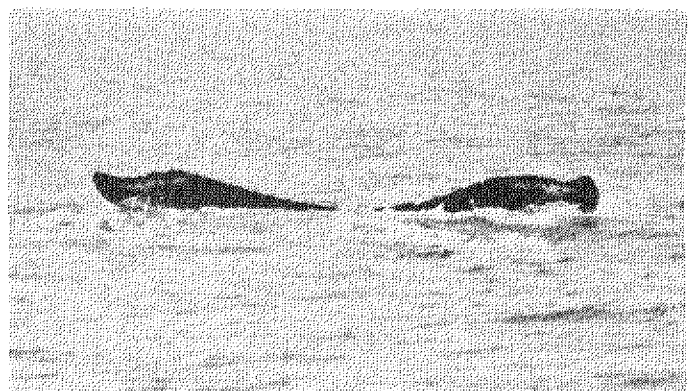
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443



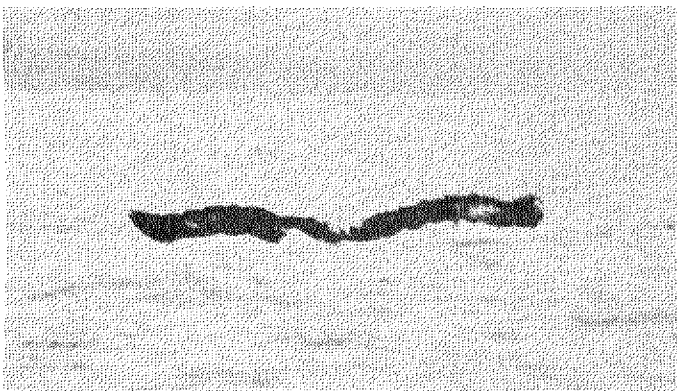
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133



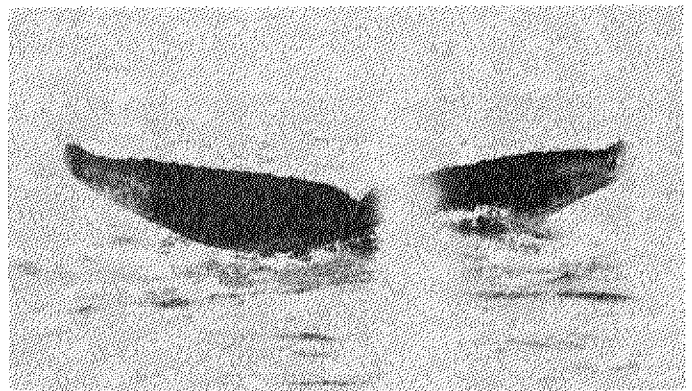
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105

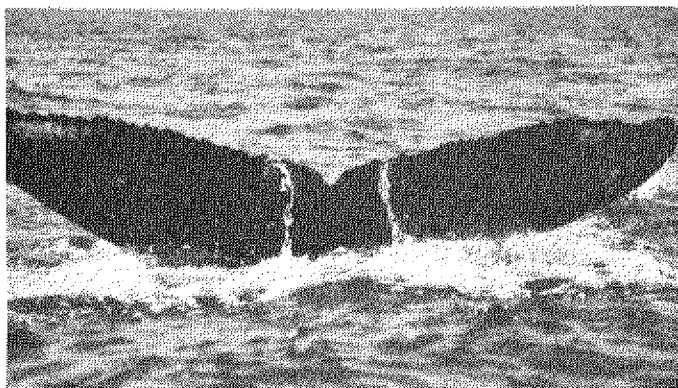
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2721

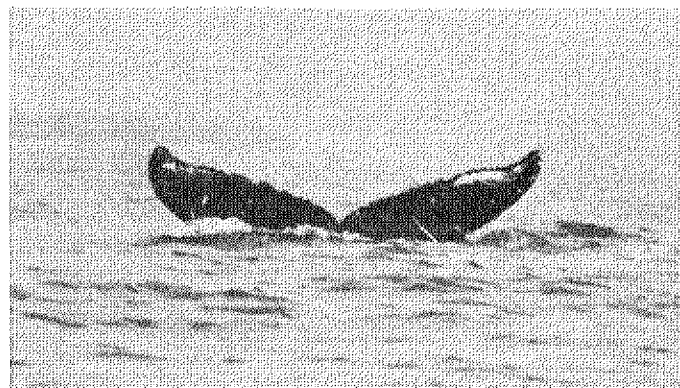
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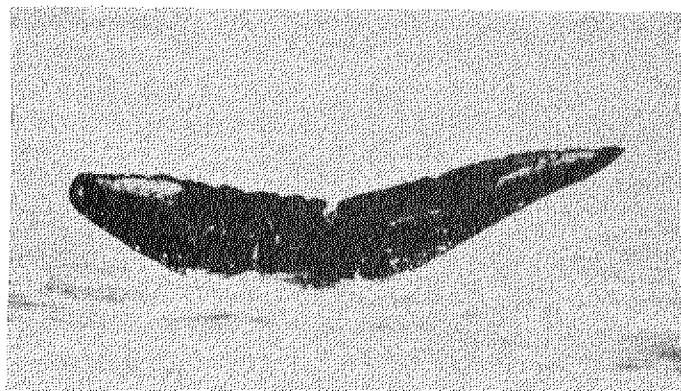
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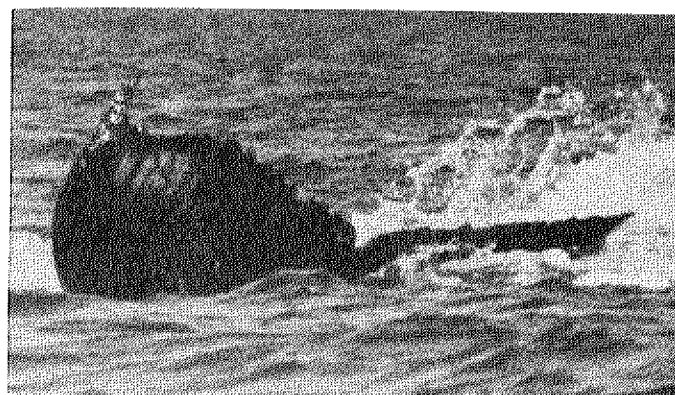
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815



991

103



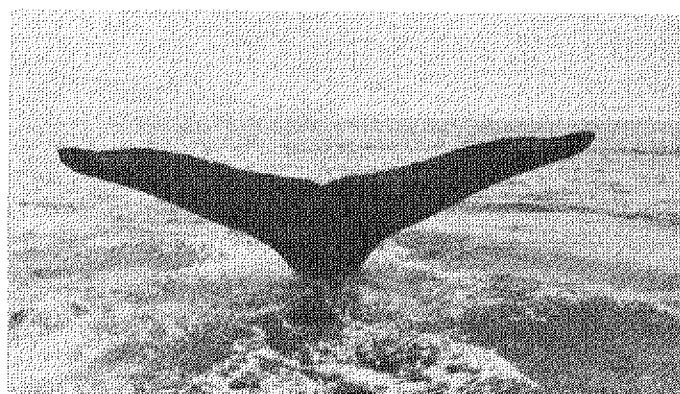
2470

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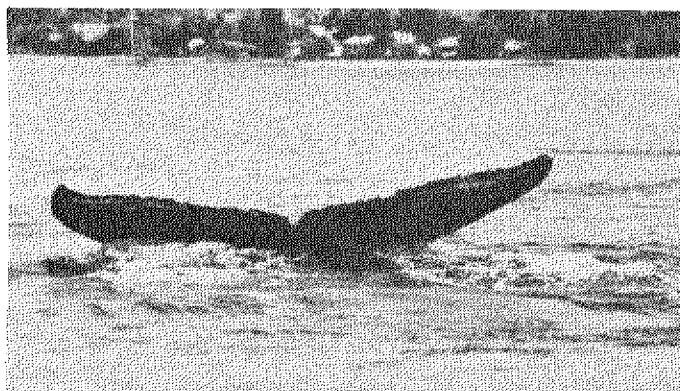
2330

373



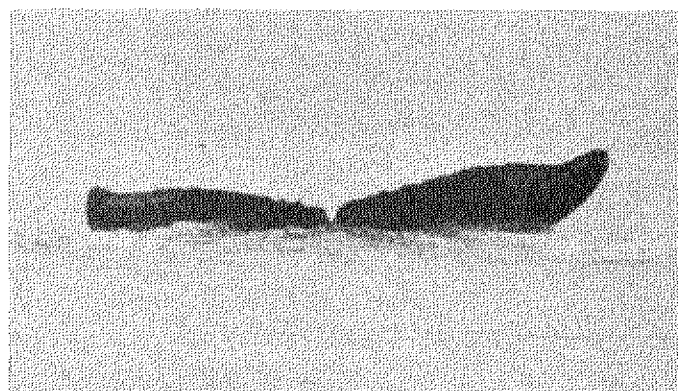
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825



2197

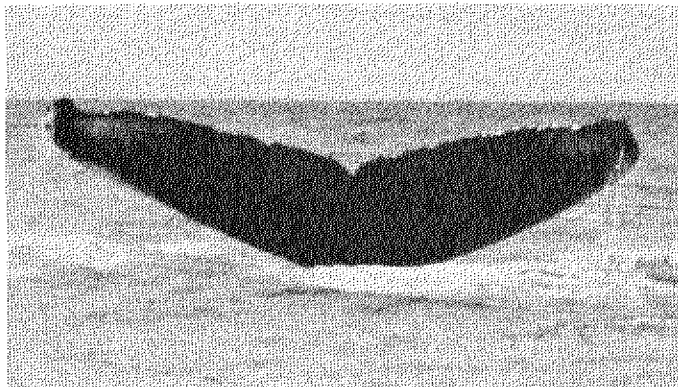
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2490

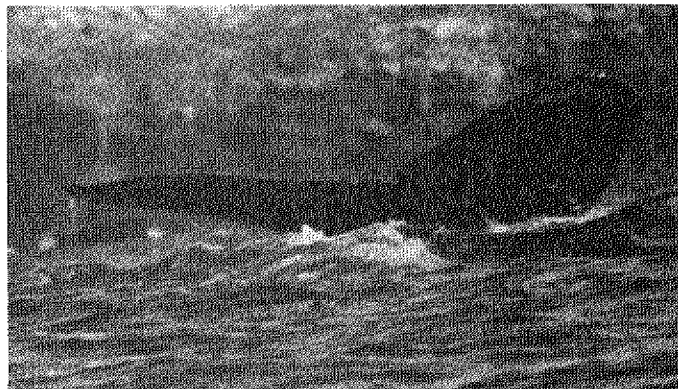
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2709

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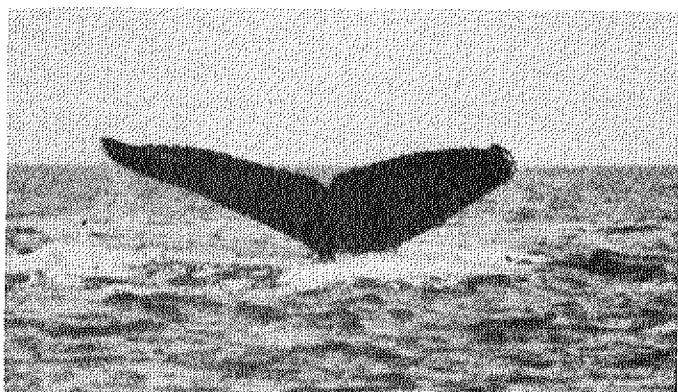
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476



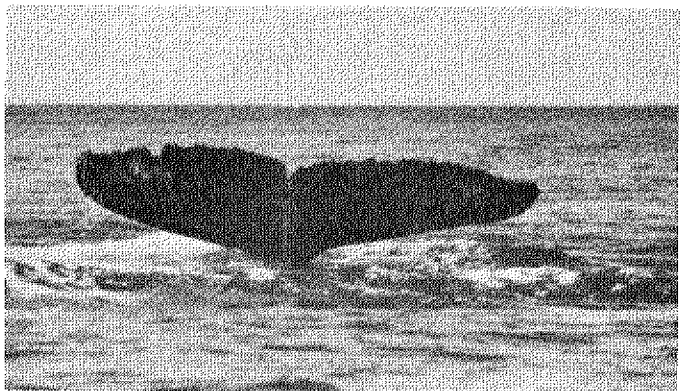
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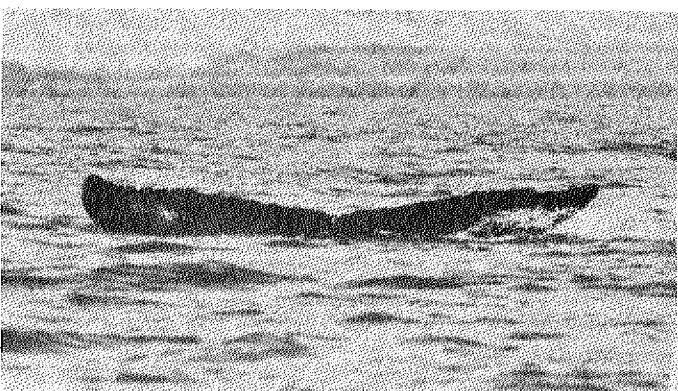
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355



2263

134



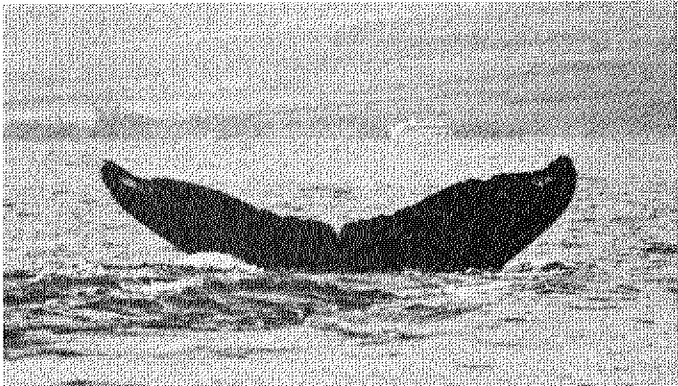
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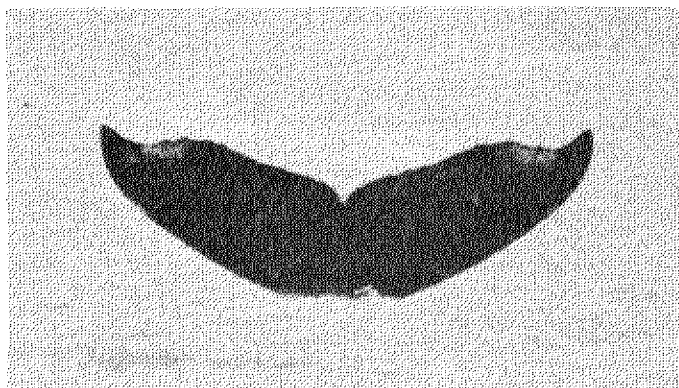
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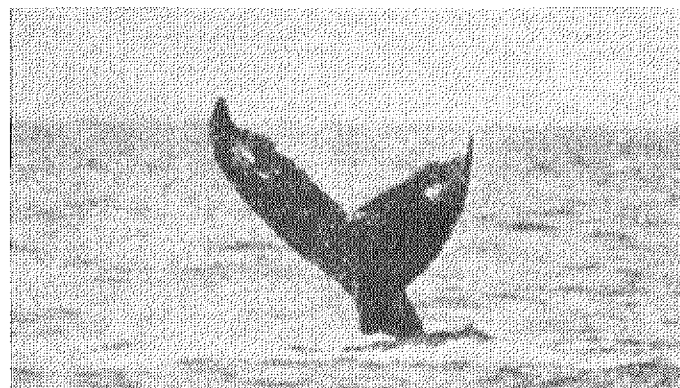
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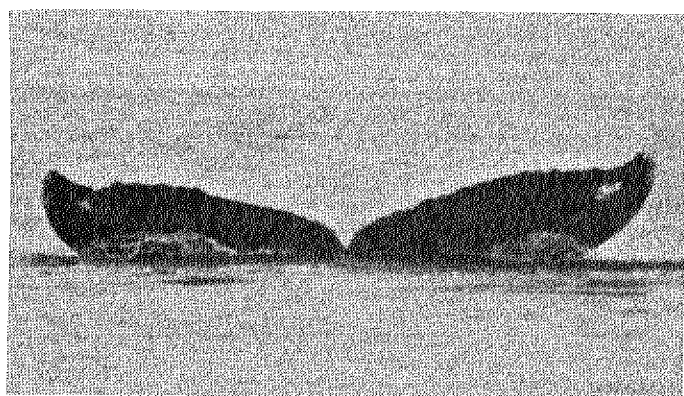
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386



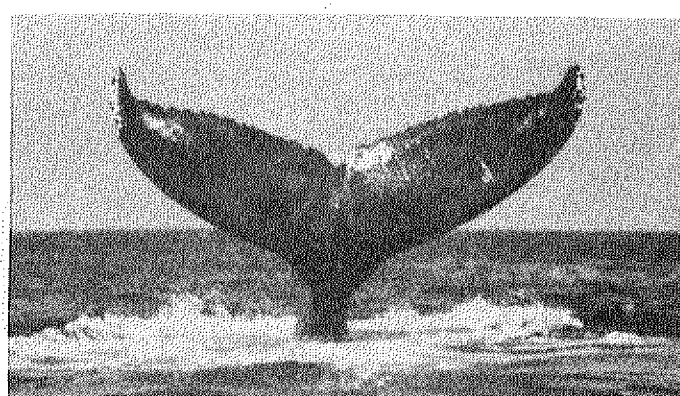
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84



3609

554



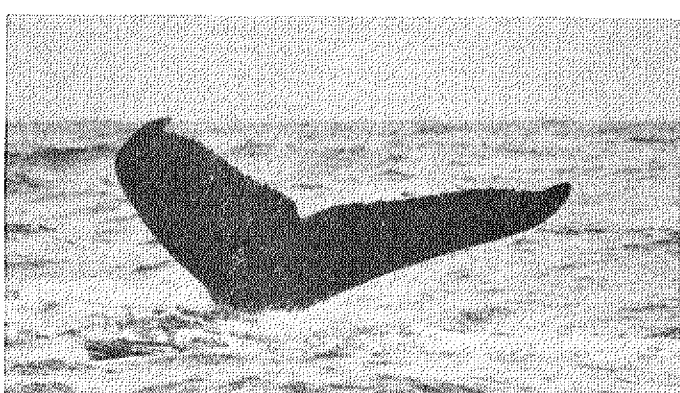
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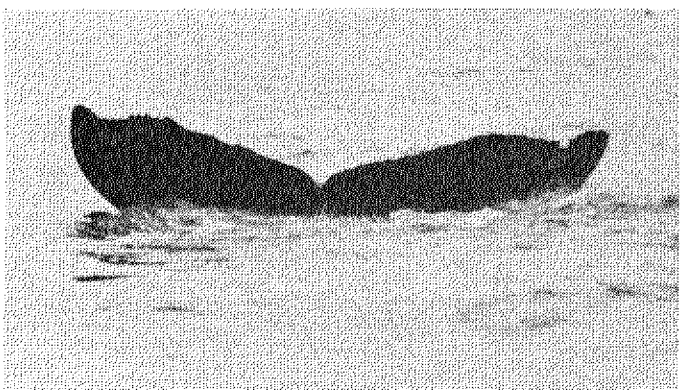
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547



1077

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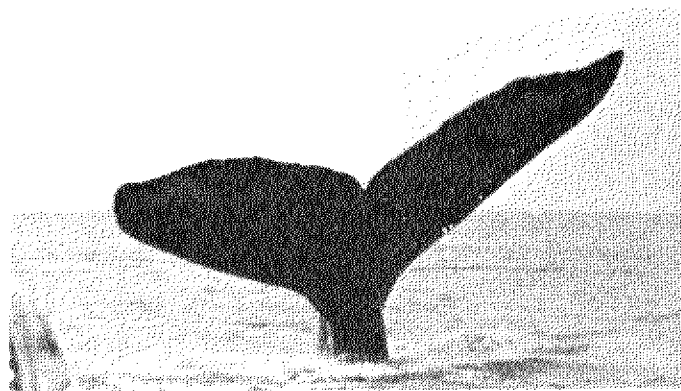
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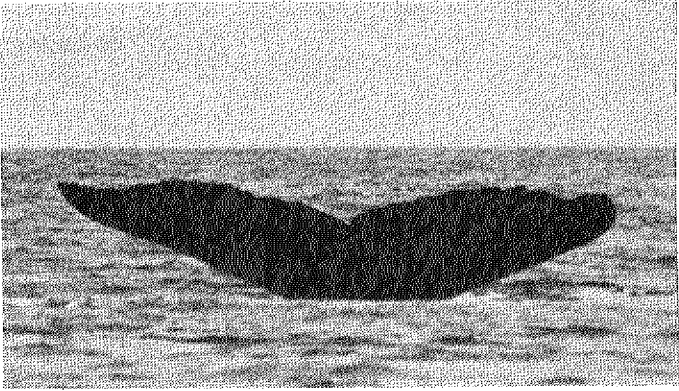
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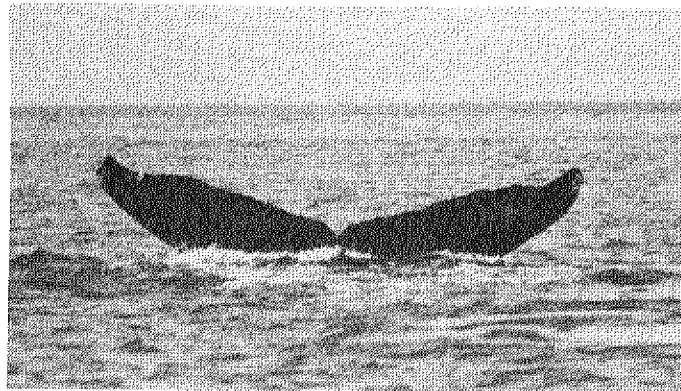
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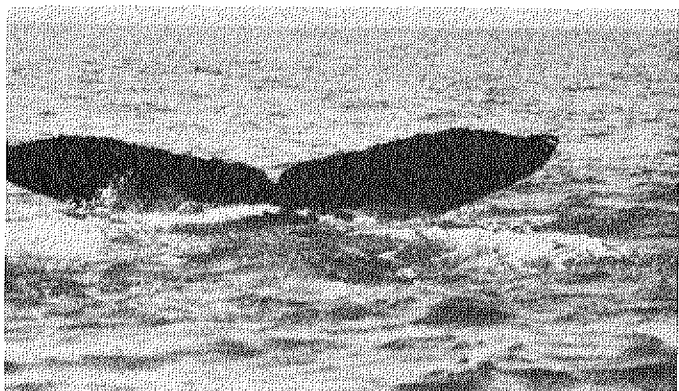
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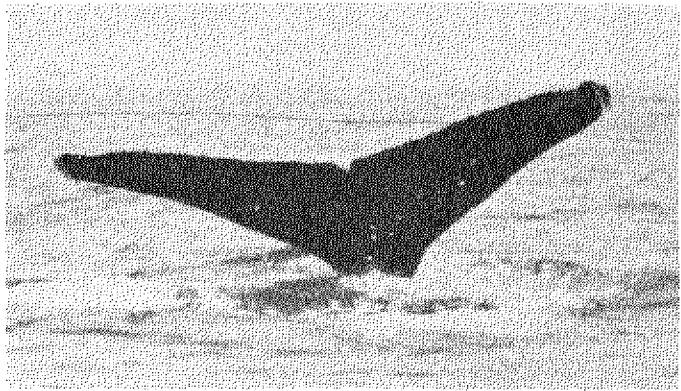
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332



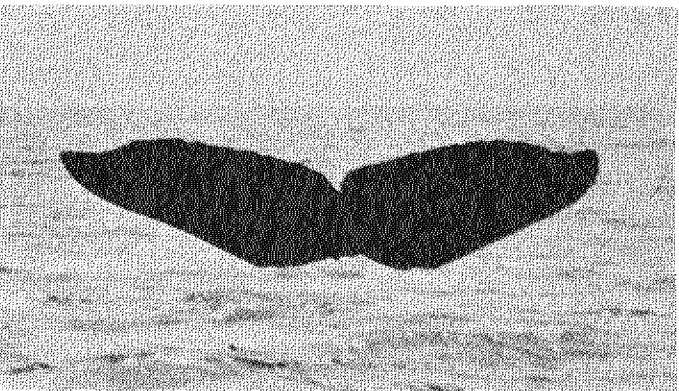
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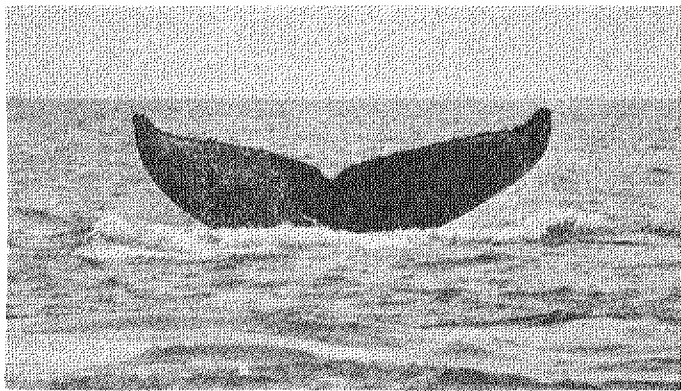
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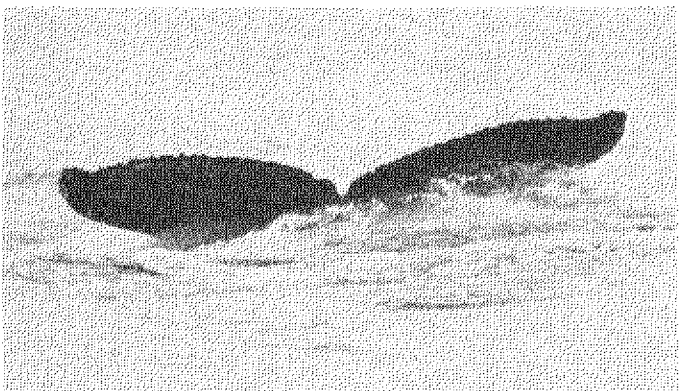
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542



1094

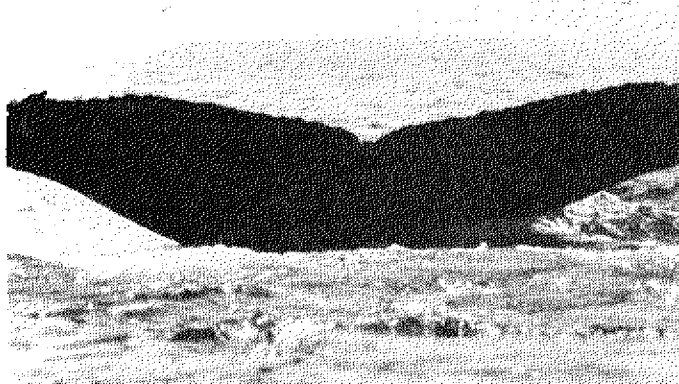
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538

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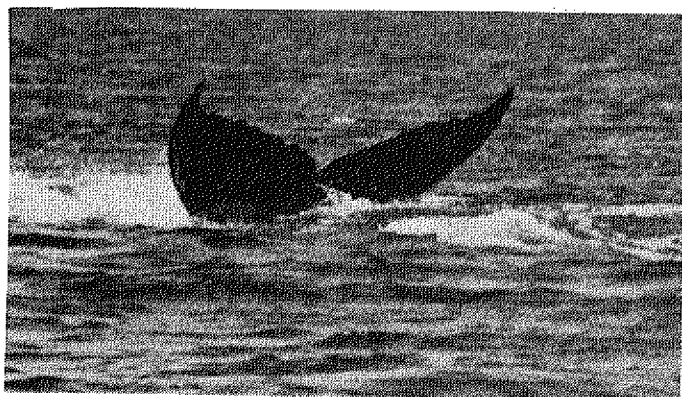
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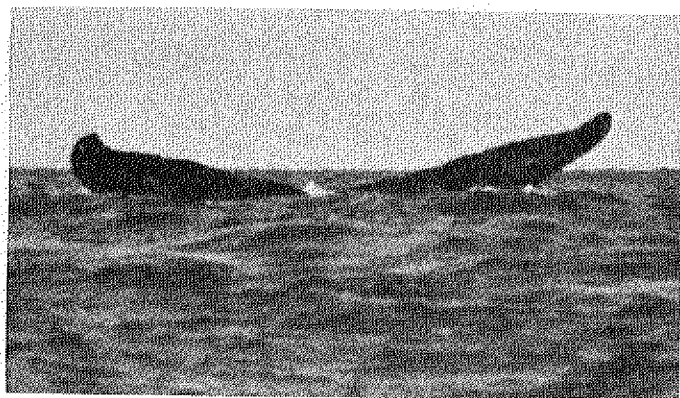
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278

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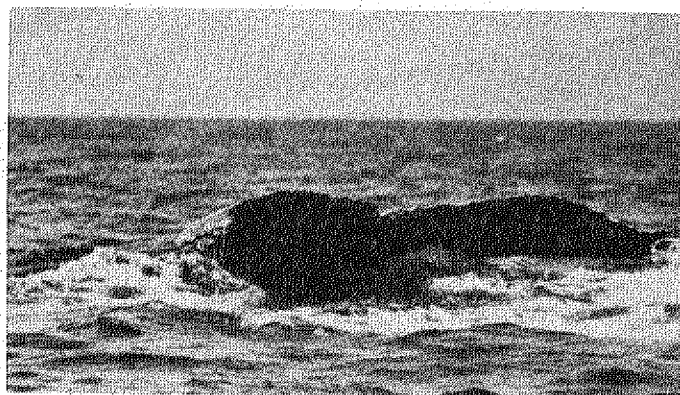
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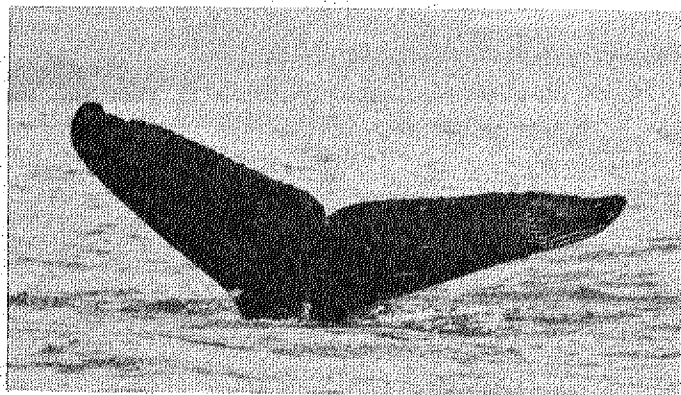
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60

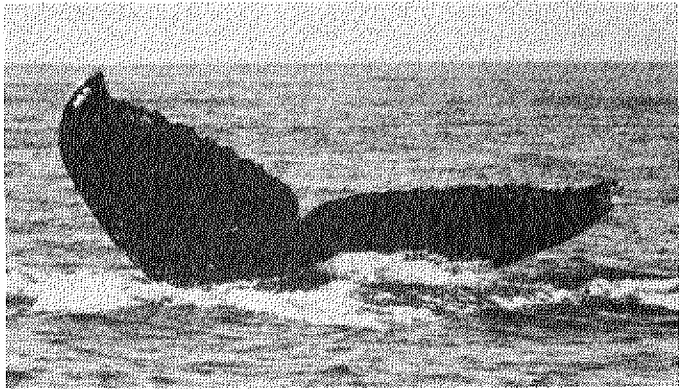
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2802

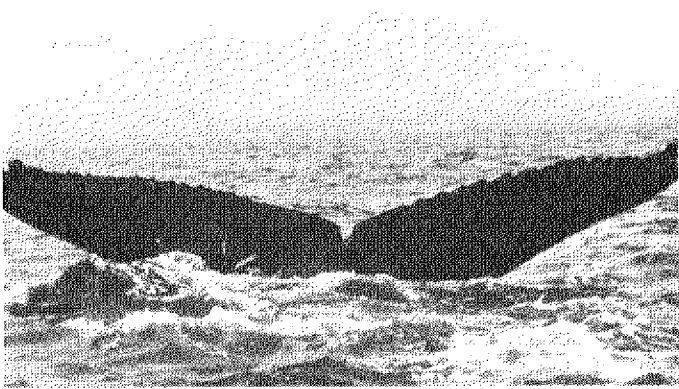
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HAWAII



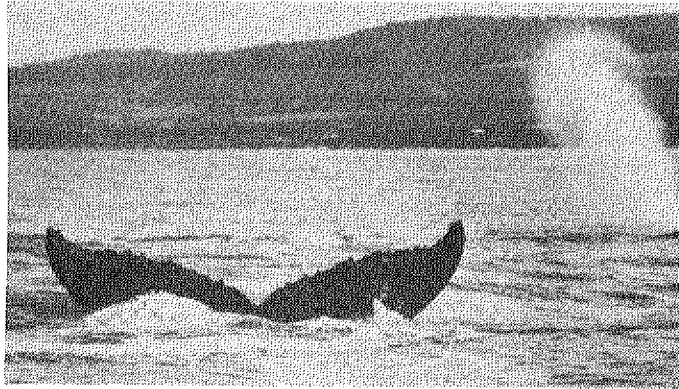
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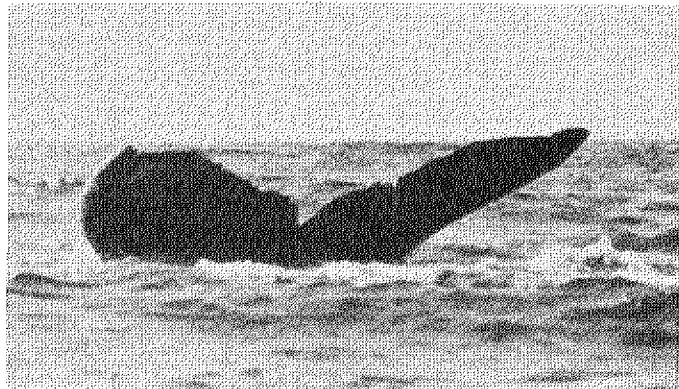
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311



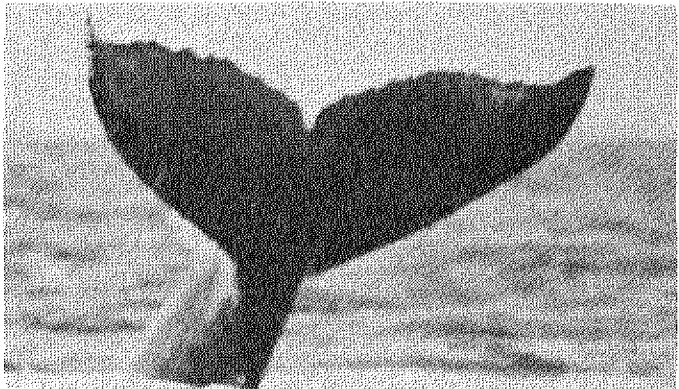
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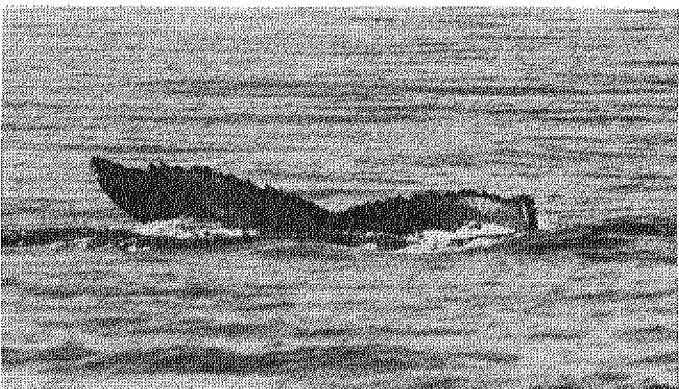
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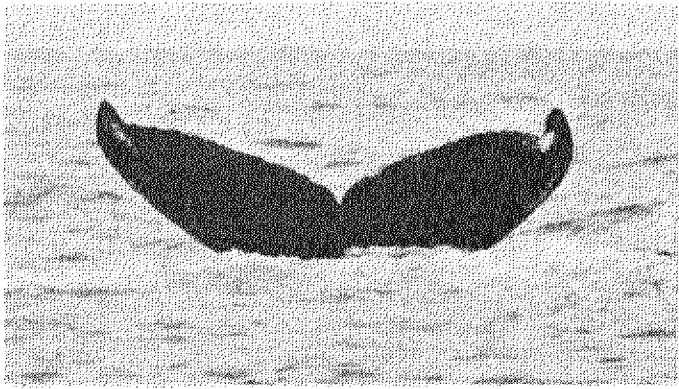
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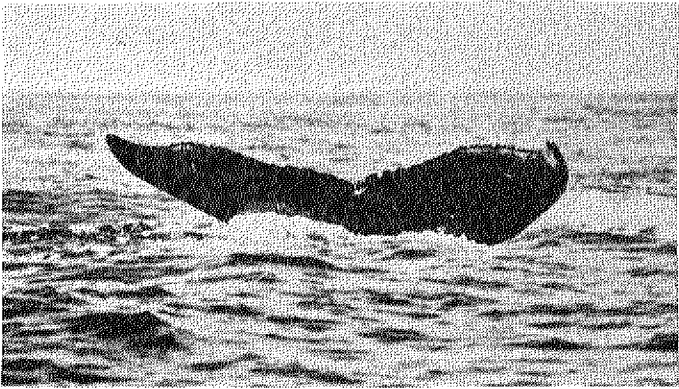
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119



1061

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641

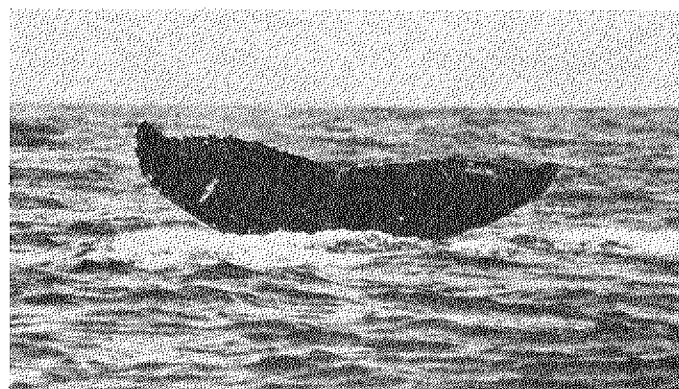
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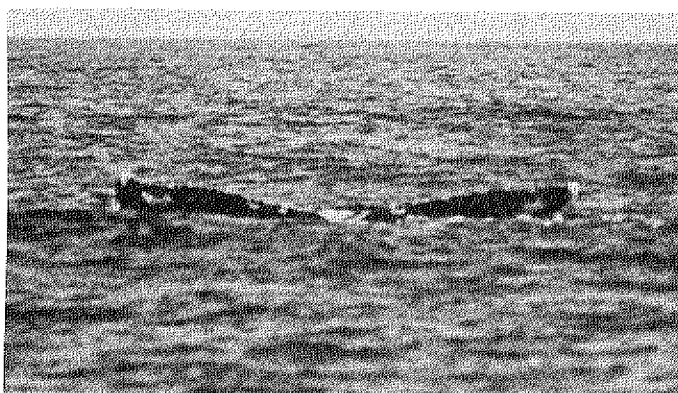
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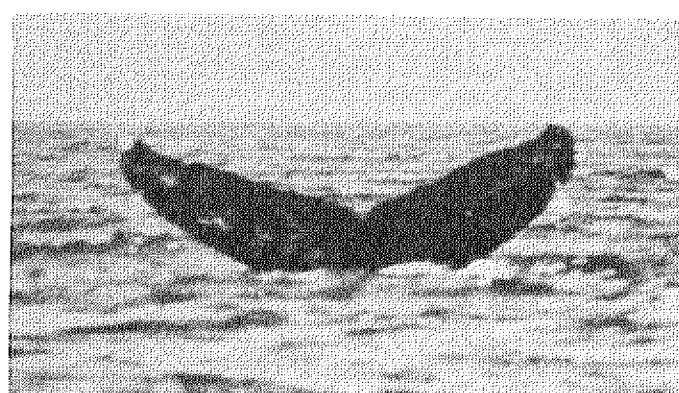
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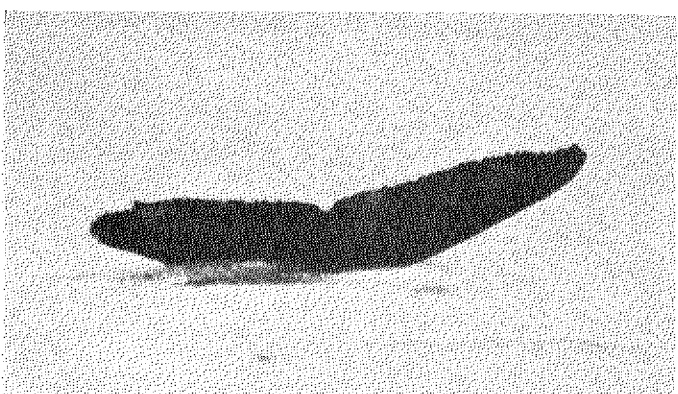
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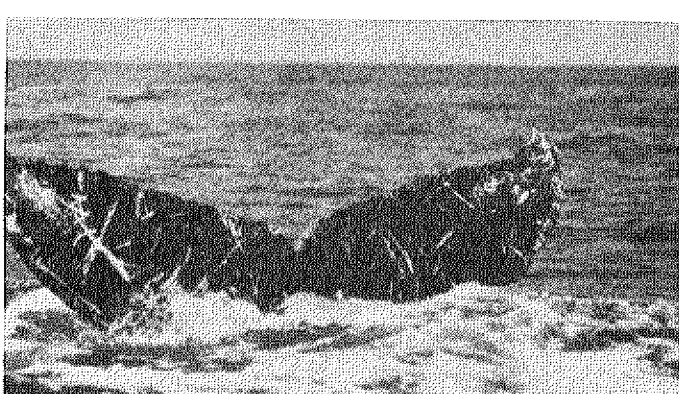
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91



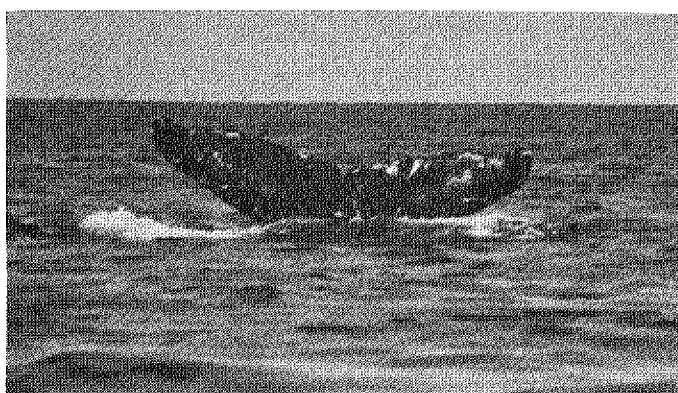
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2233

159



2051

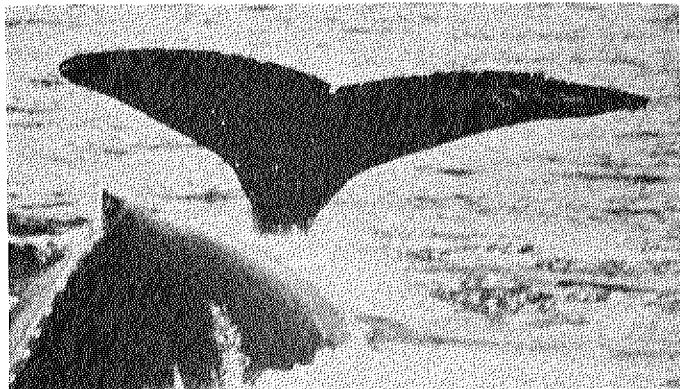
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2803

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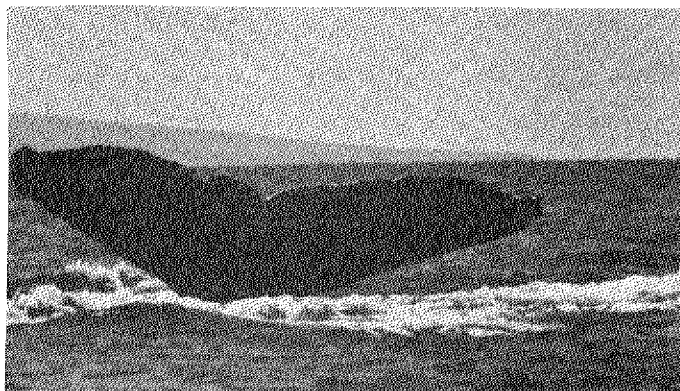
1007

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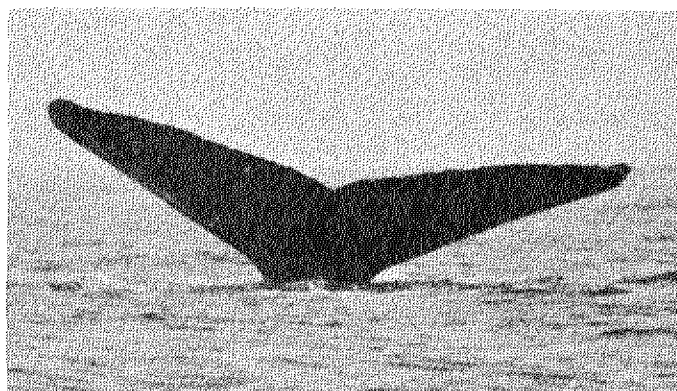
496

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2194

371



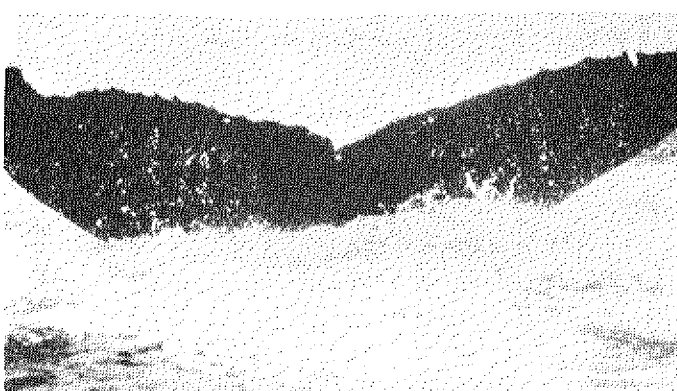
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829



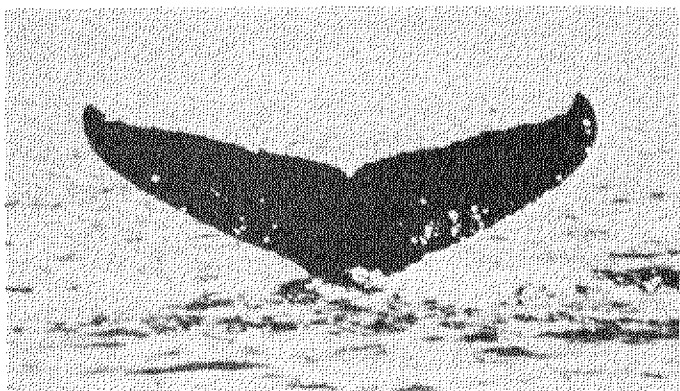
488

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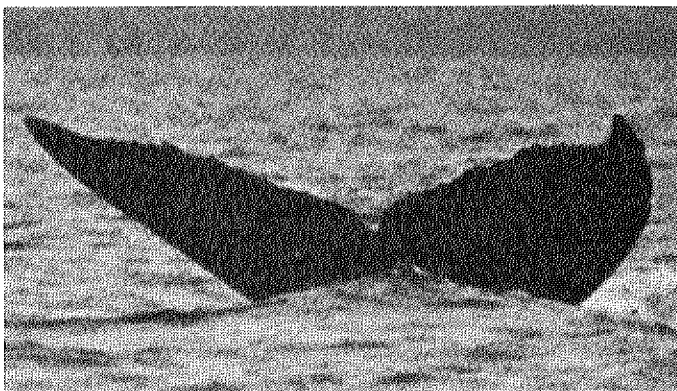
1132

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547

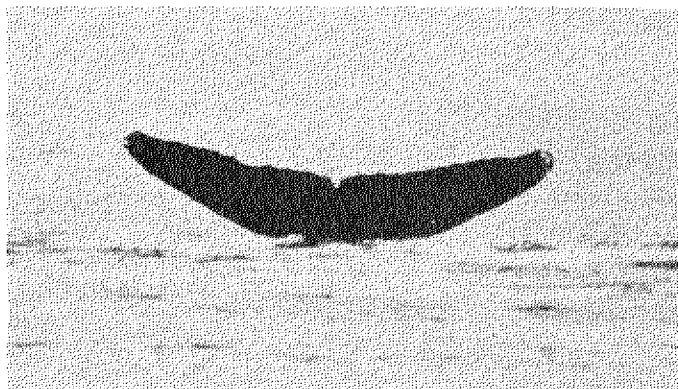
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3820

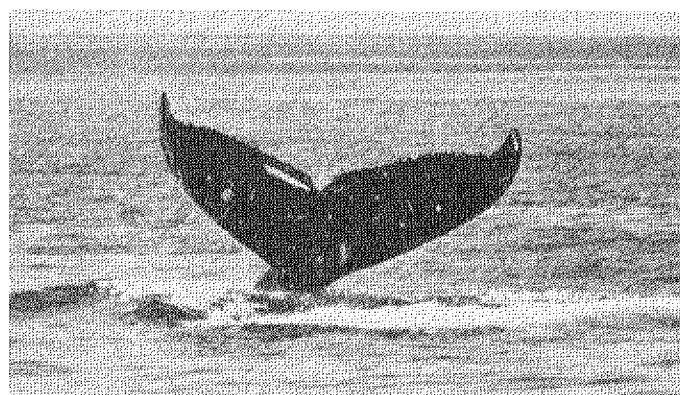
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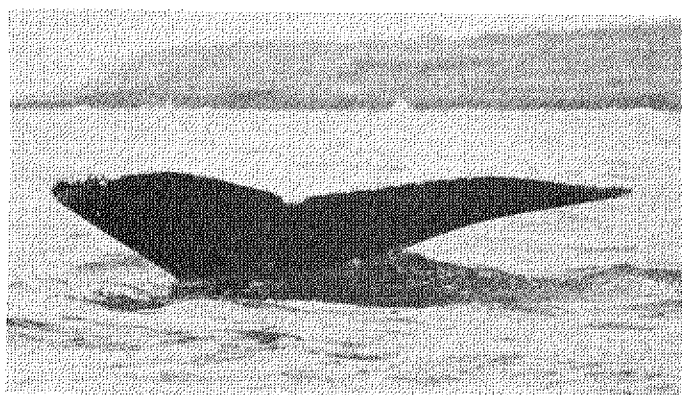
275

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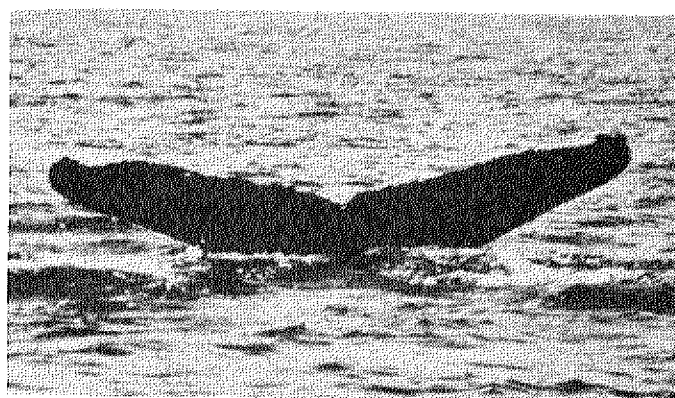
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69



3794

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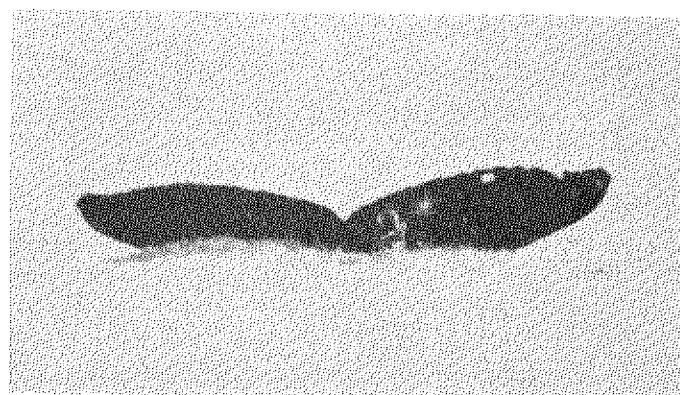
464

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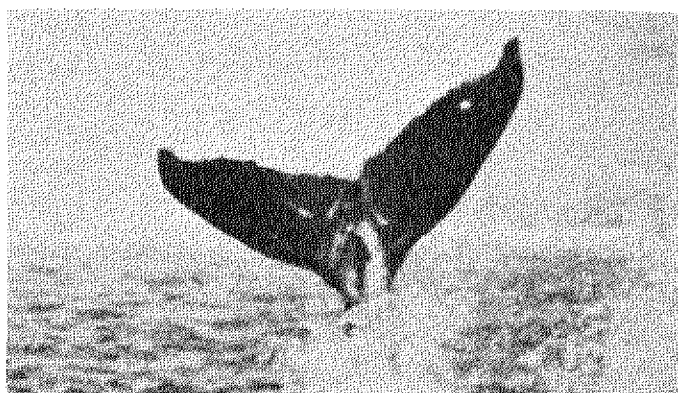
2426

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2075

302



2666

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2478

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# HAWAII



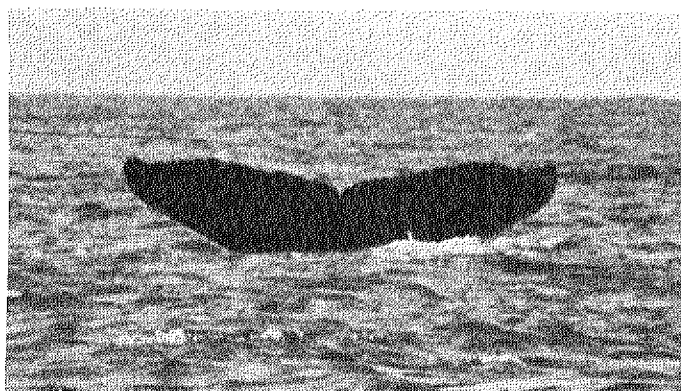
2847

118



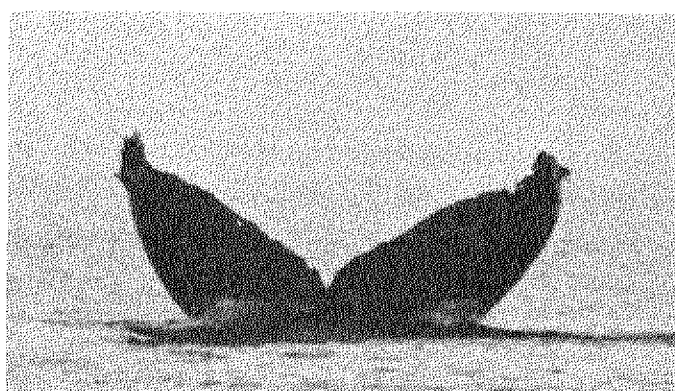
2241

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2791

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811

572



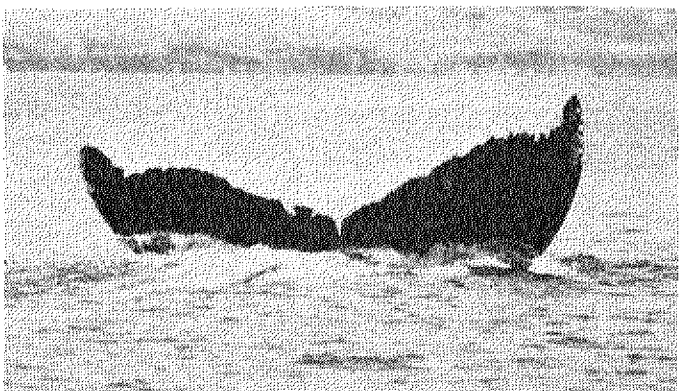
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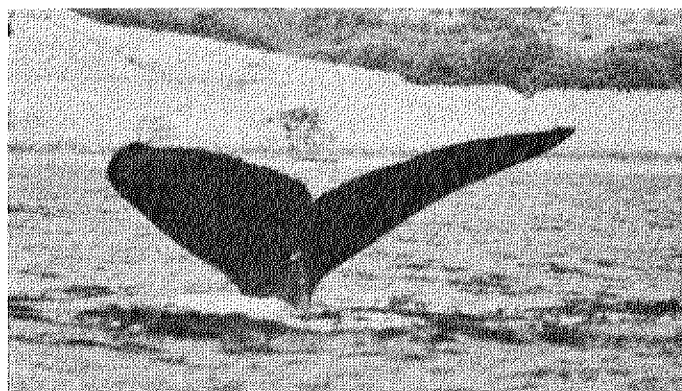
2245

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75

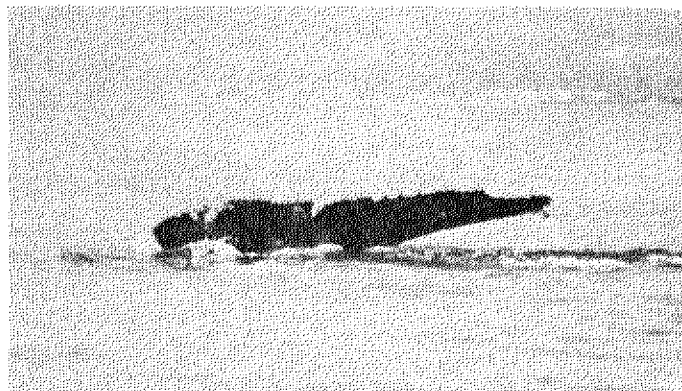
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2029

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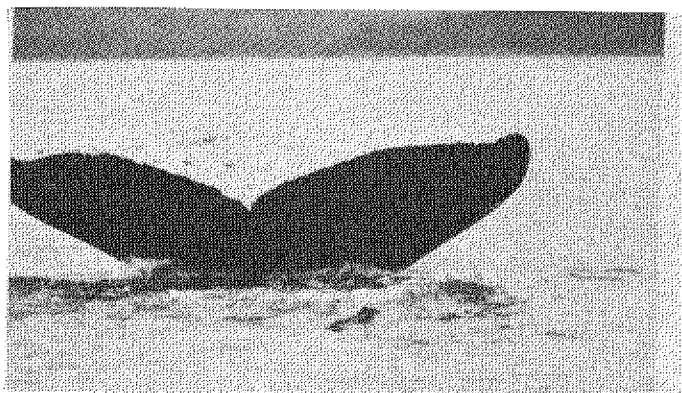
2072

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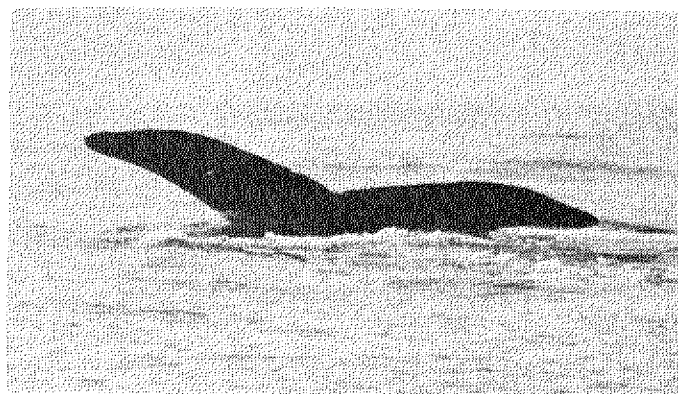
2189

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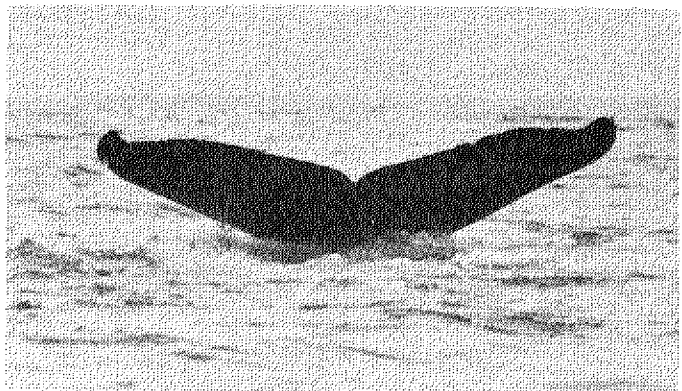
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591



2350

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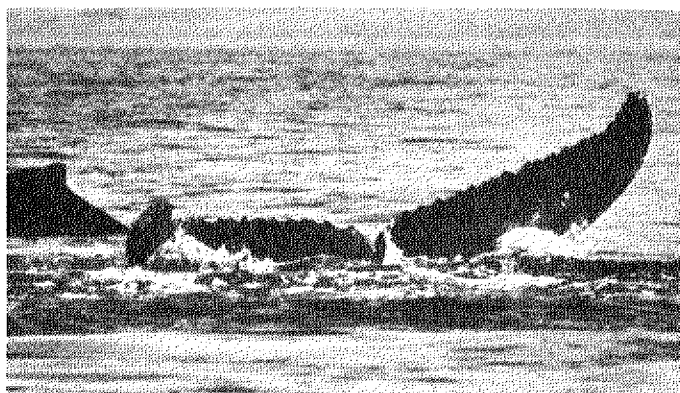
2284

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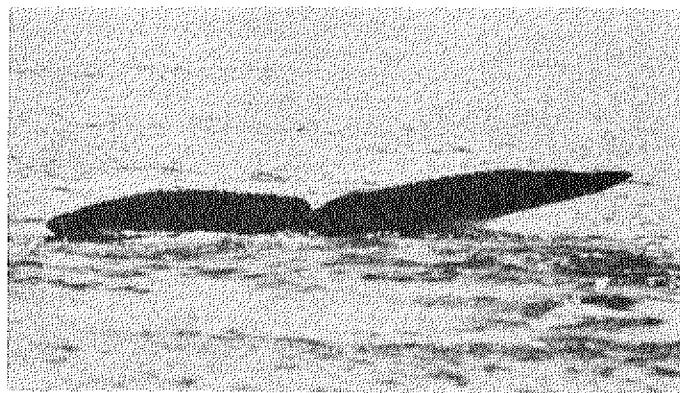
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436



78

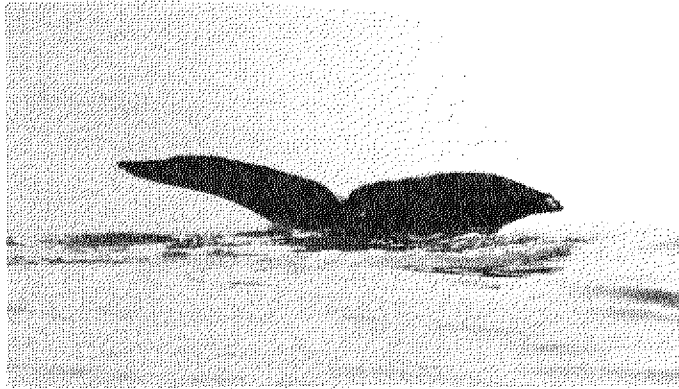
606



2322

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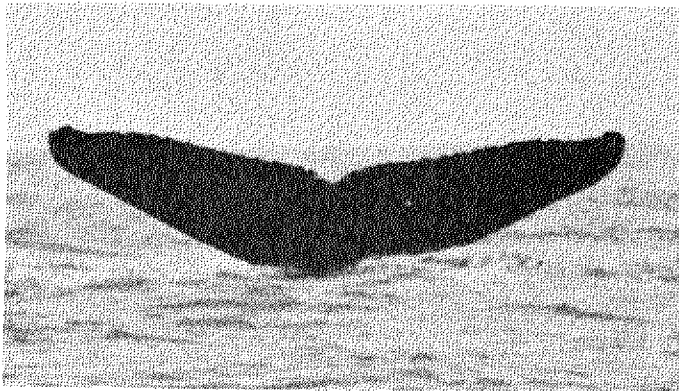
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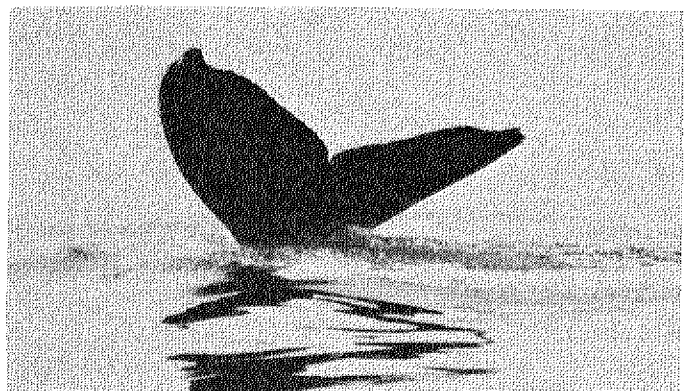
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438



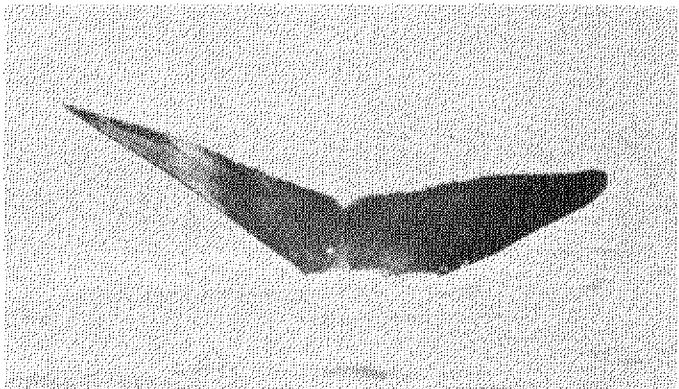
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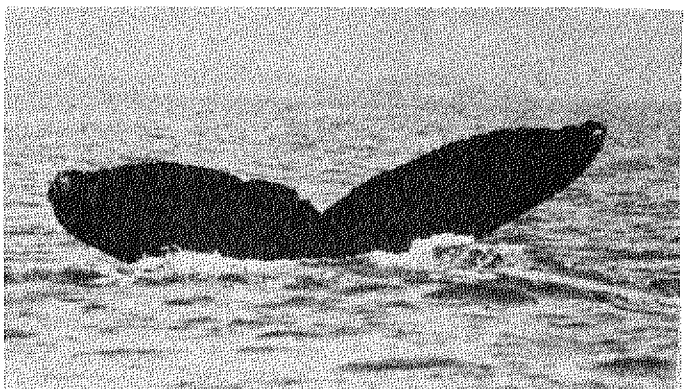
2123

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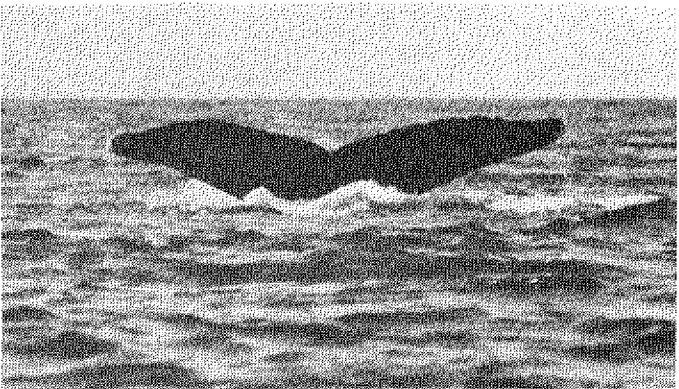
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804



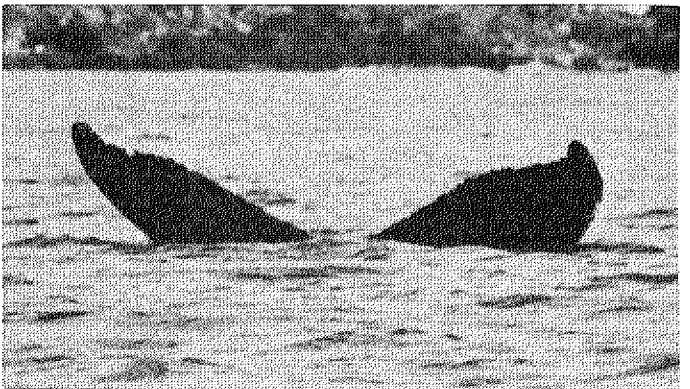
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415



2211

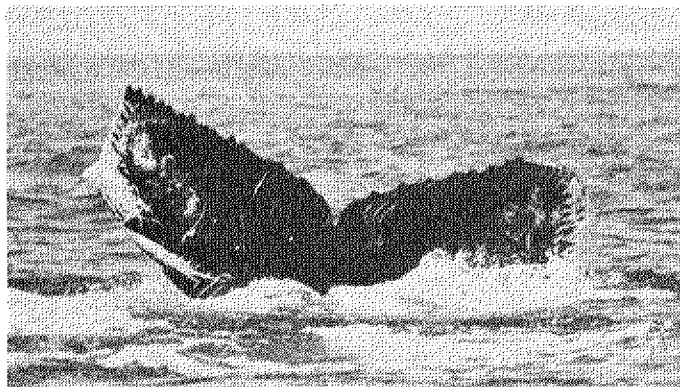
852



3791

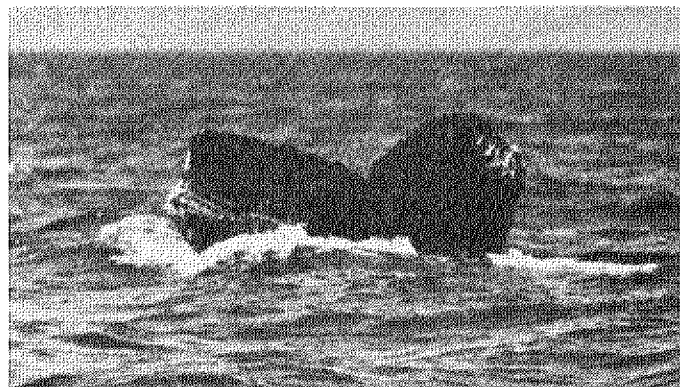
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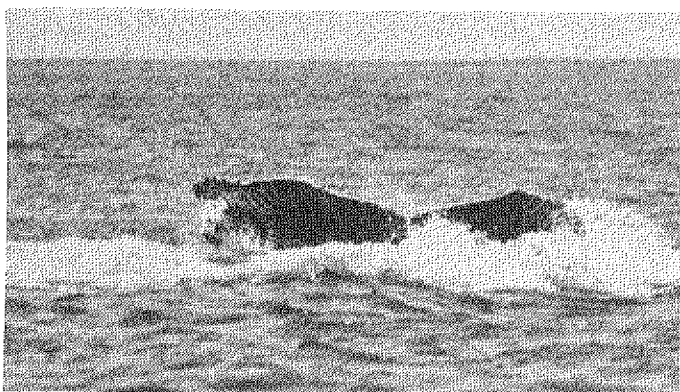
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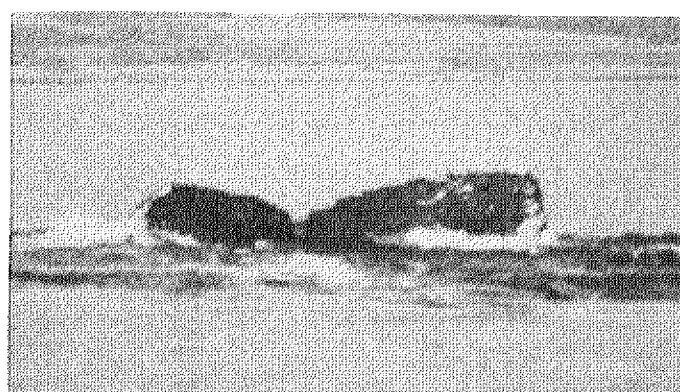
2096

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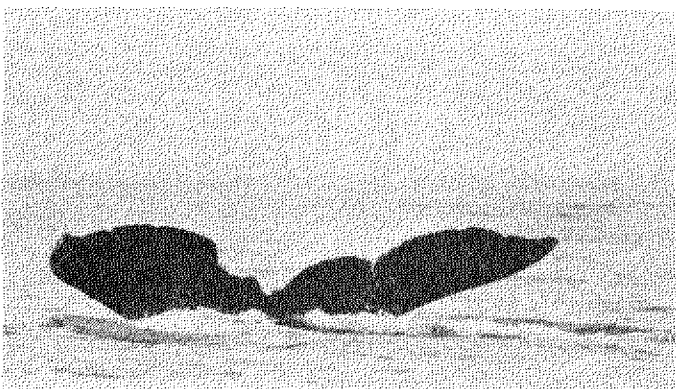
534

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2076

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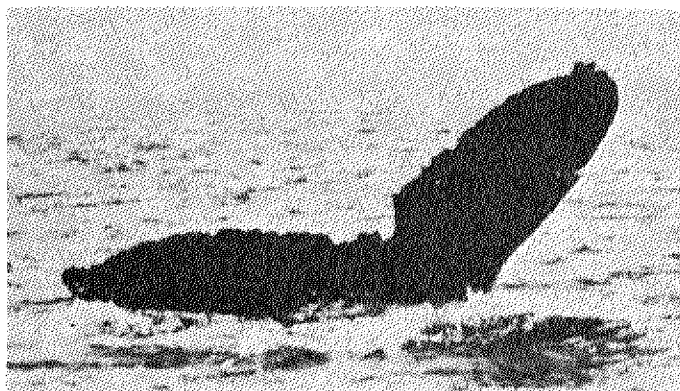
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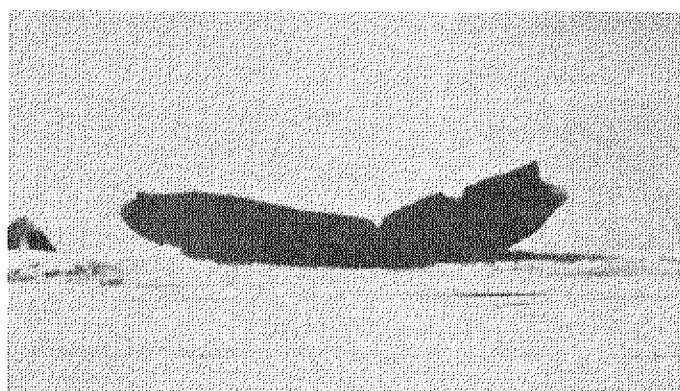
439

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463

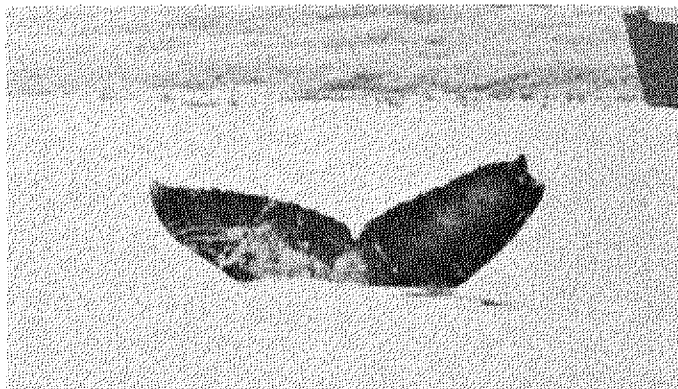
92



515

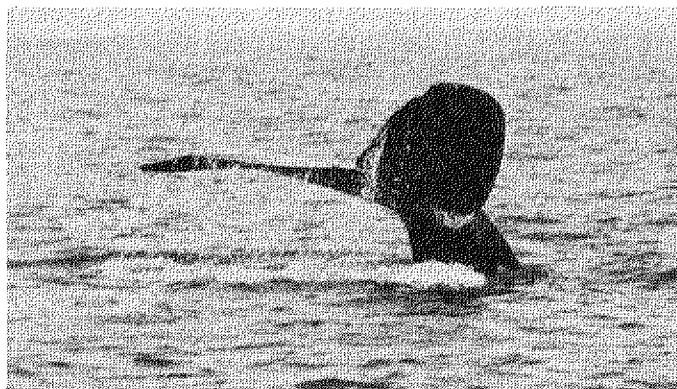
114

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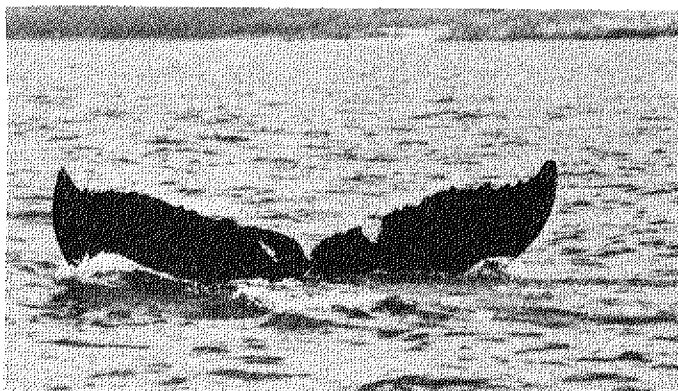
520

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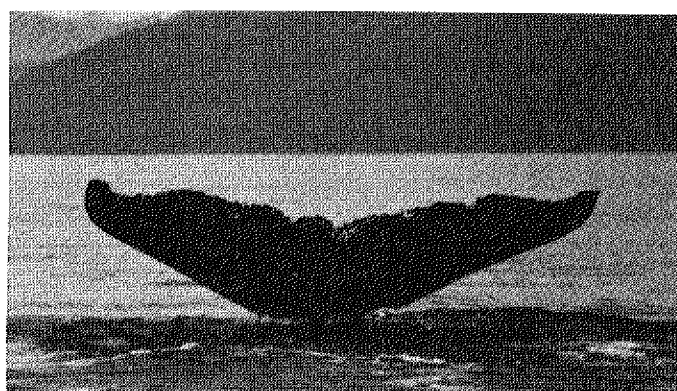
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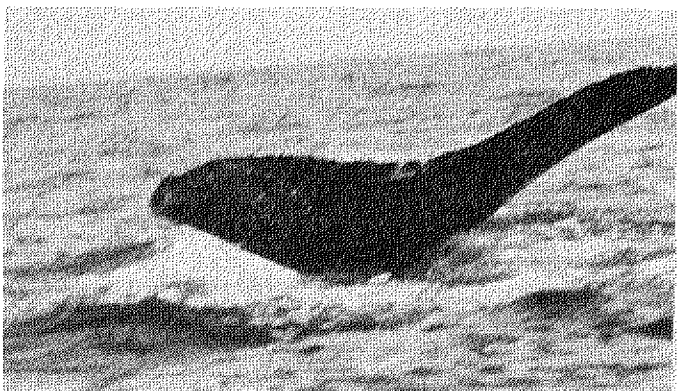
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564



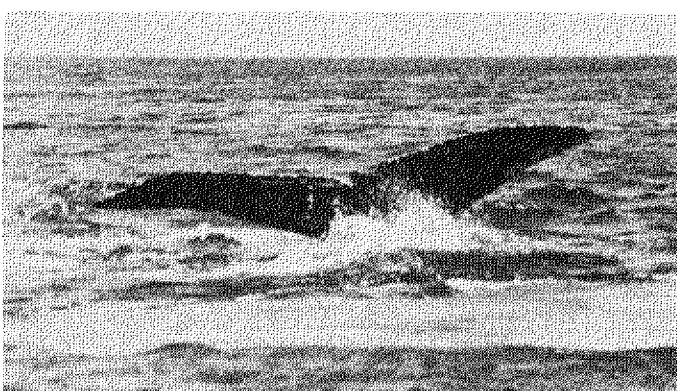
901

104



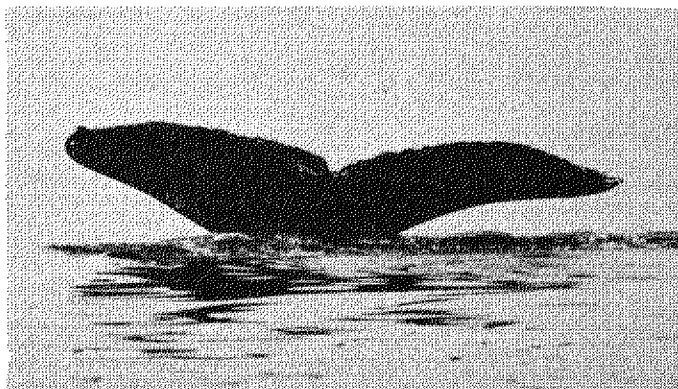
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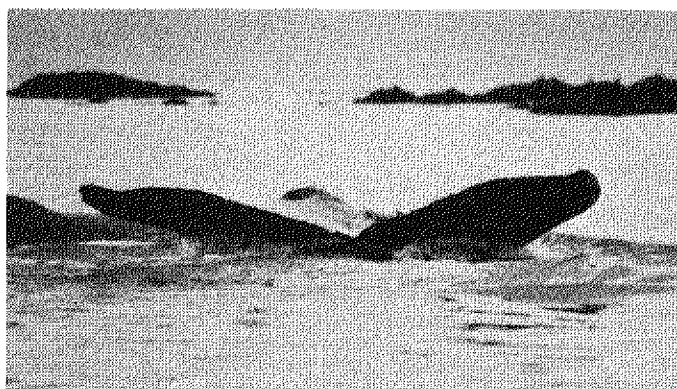
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1469

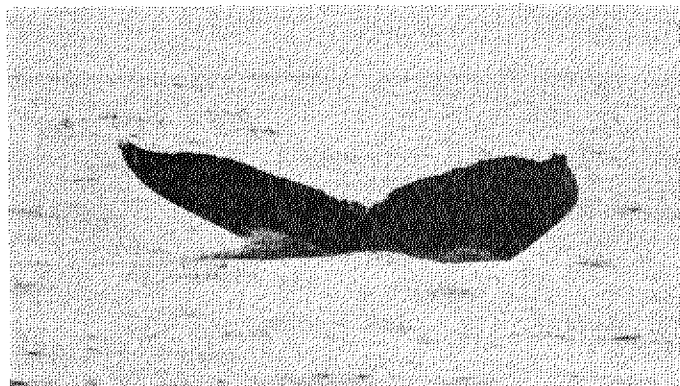
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1448

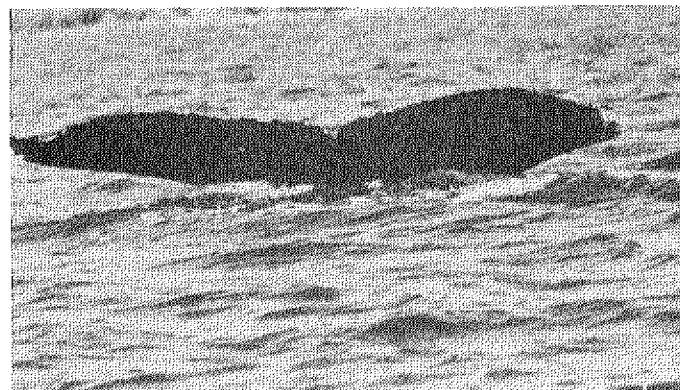
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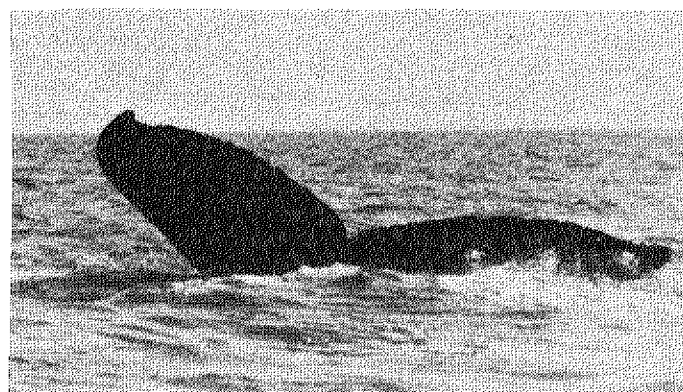
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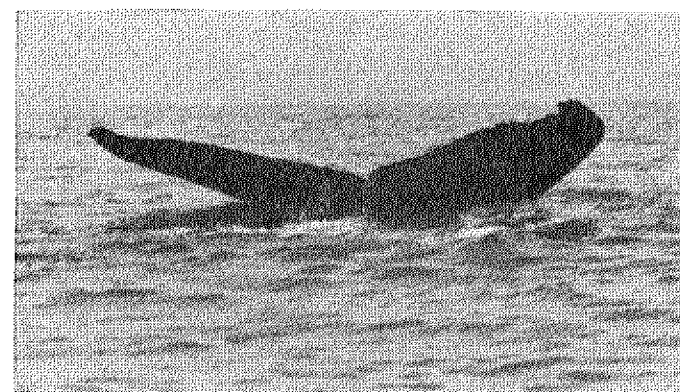
79

21



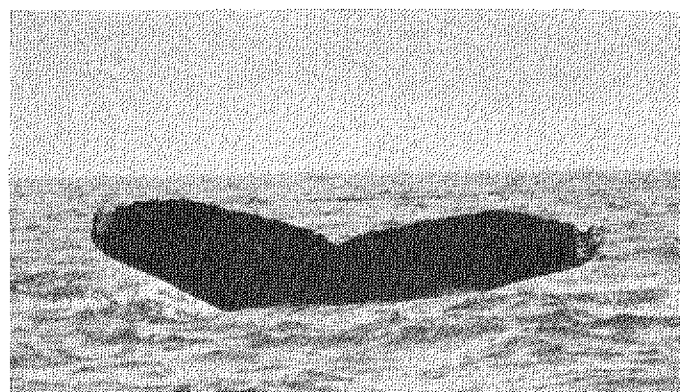
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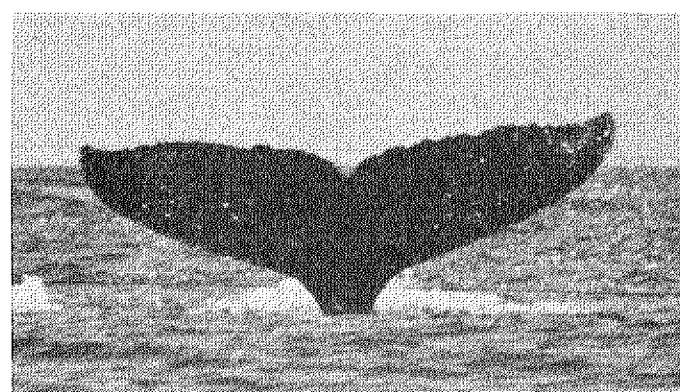
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232



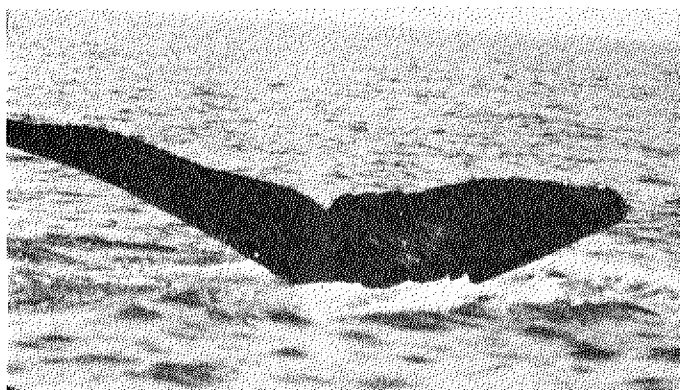
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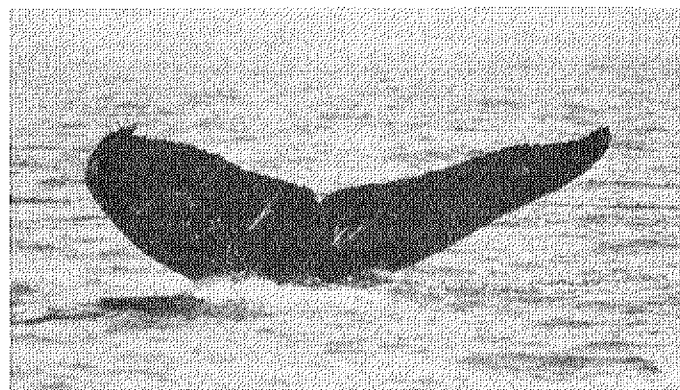
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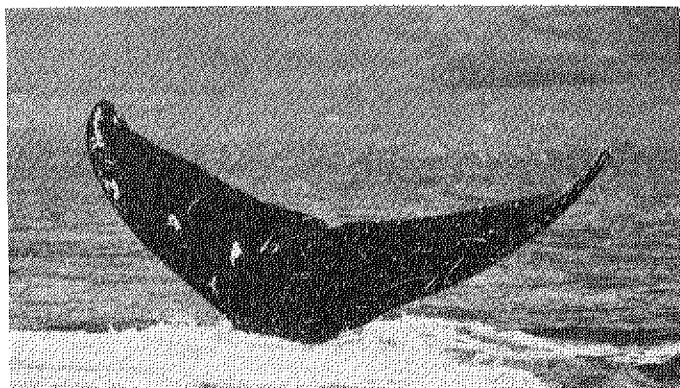
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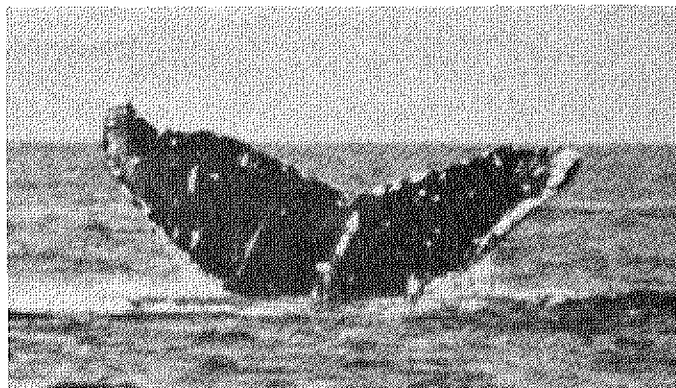
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# HAWAII



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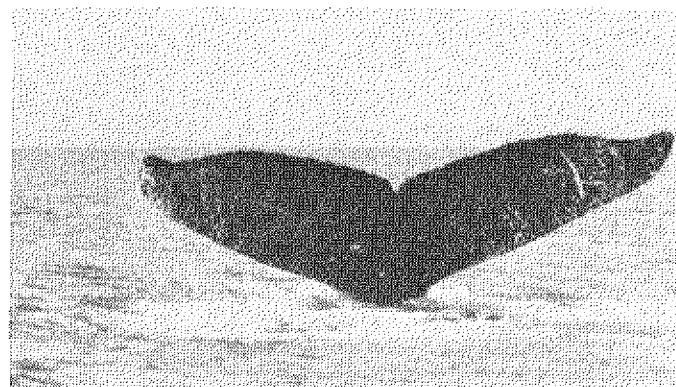
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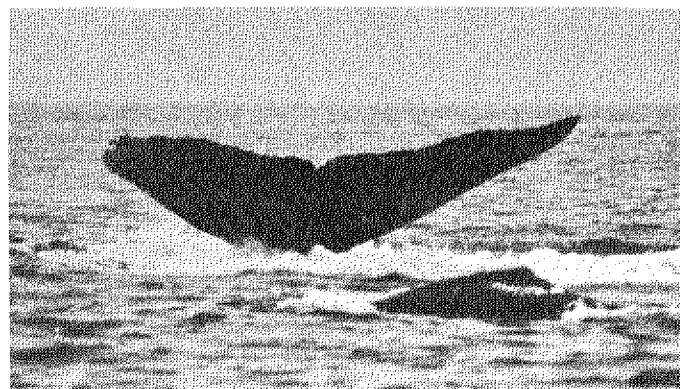
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304



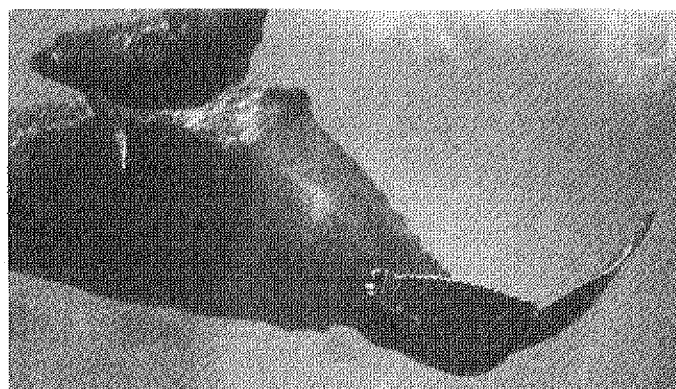
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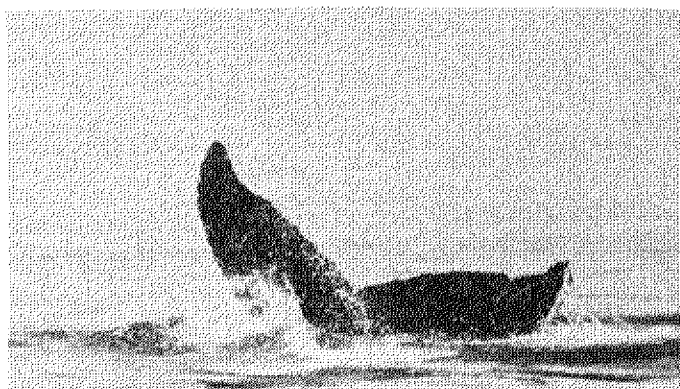
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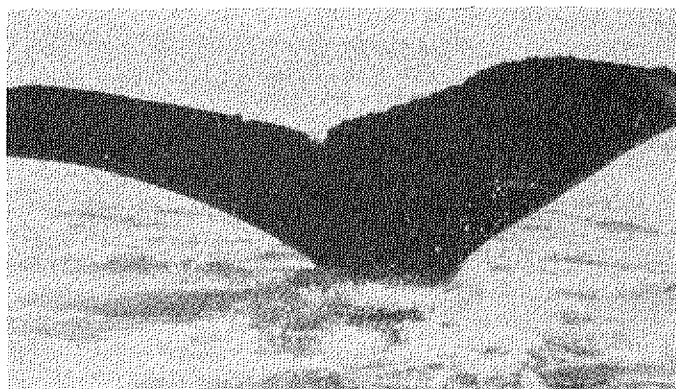
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31



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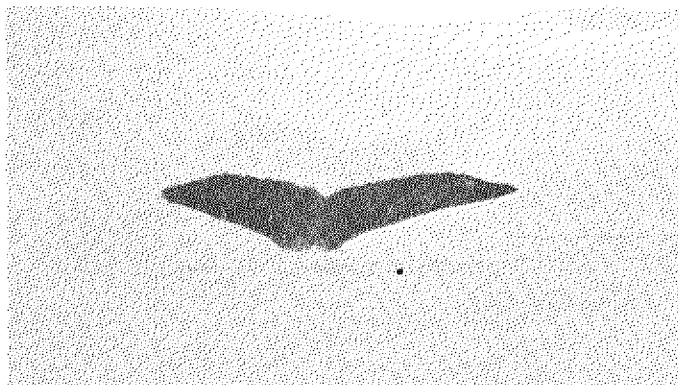
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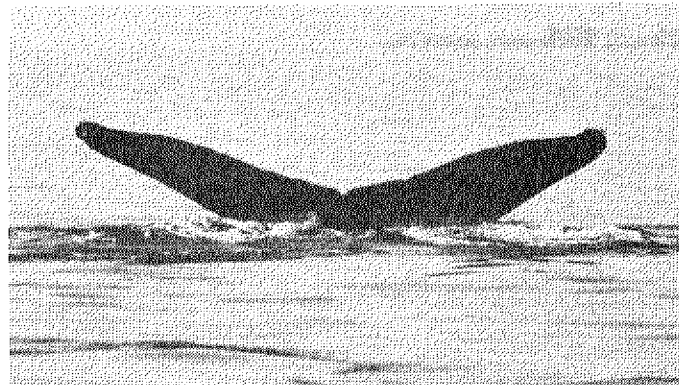
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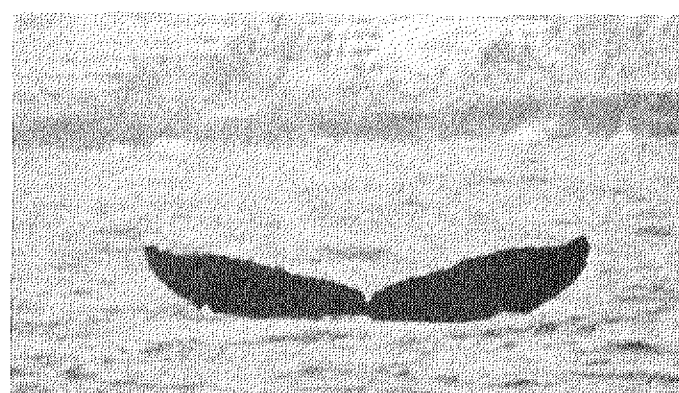
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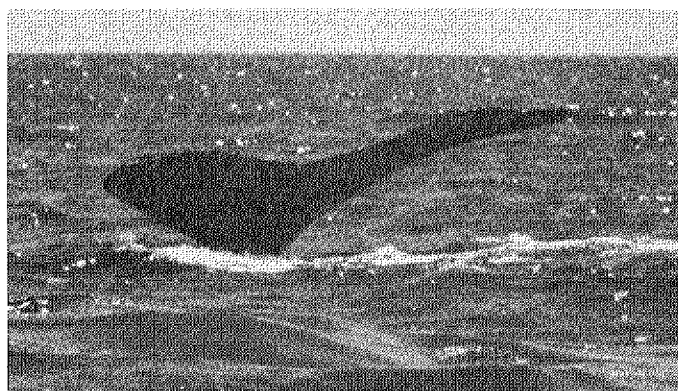
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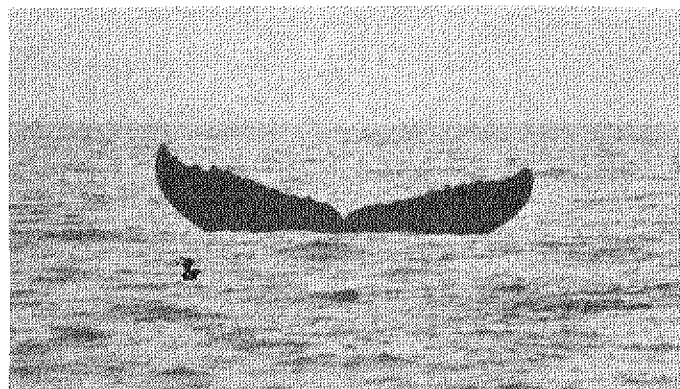
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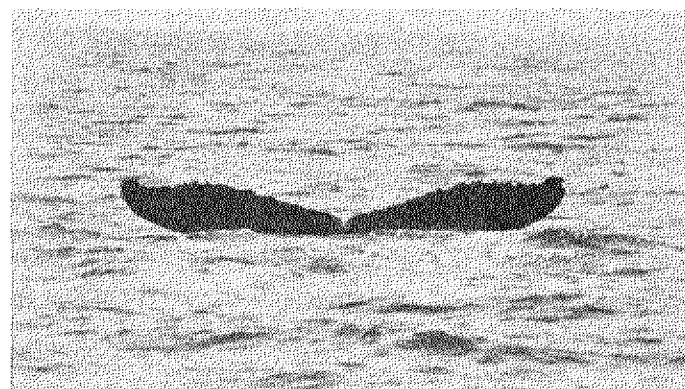
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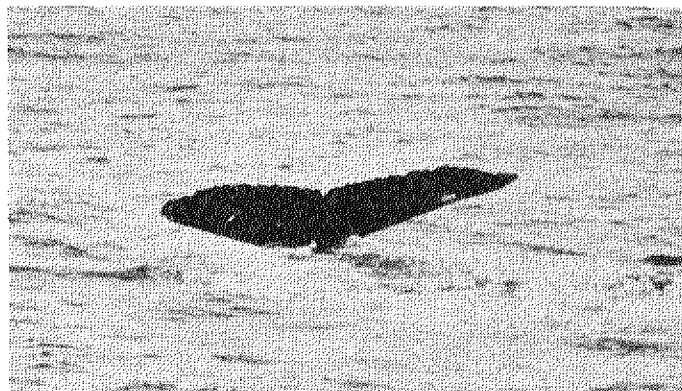
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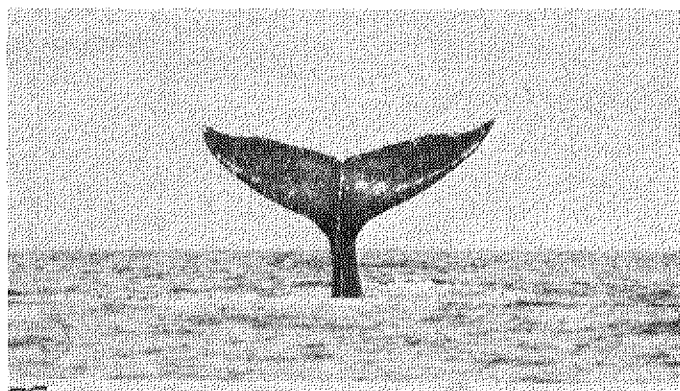
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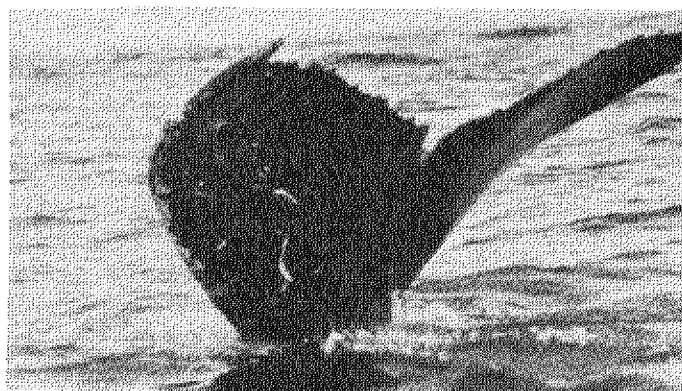
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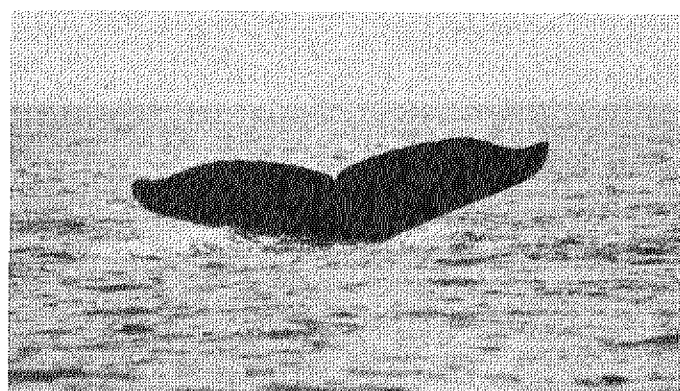
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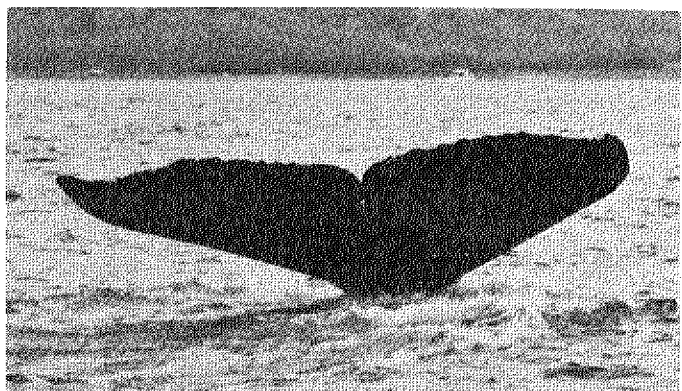
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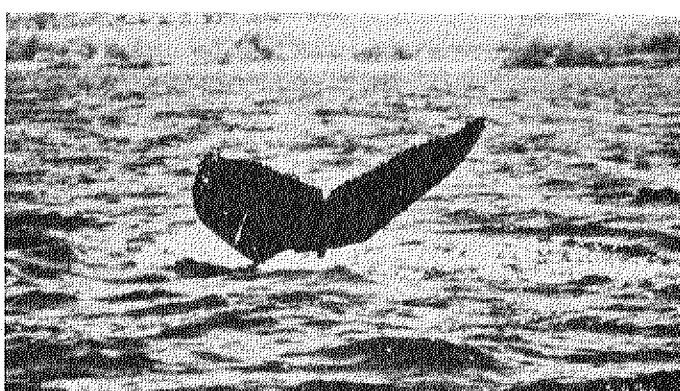
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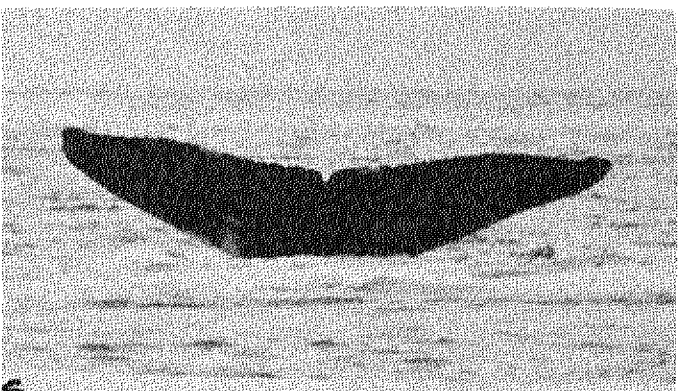
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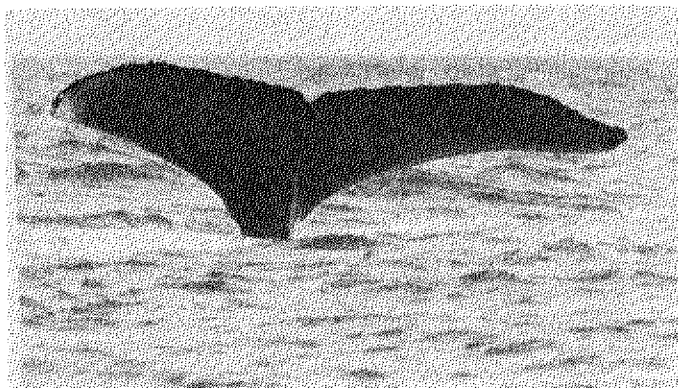
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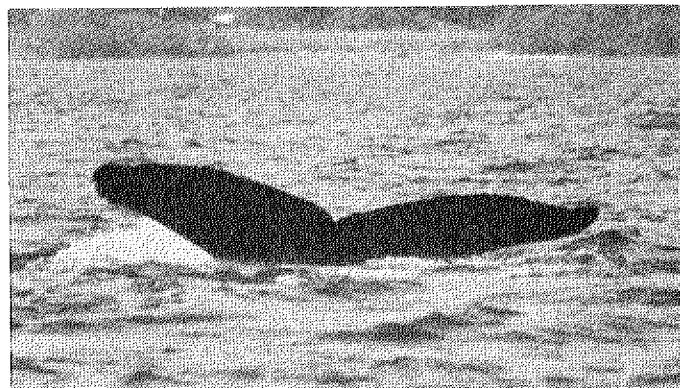
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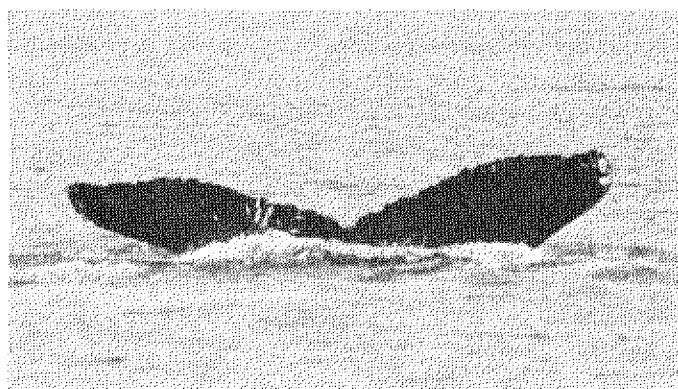
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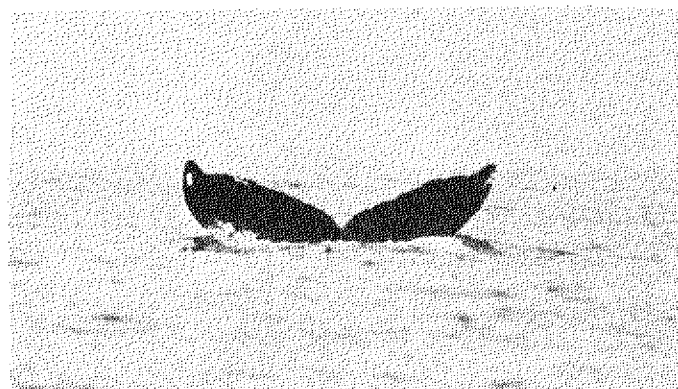
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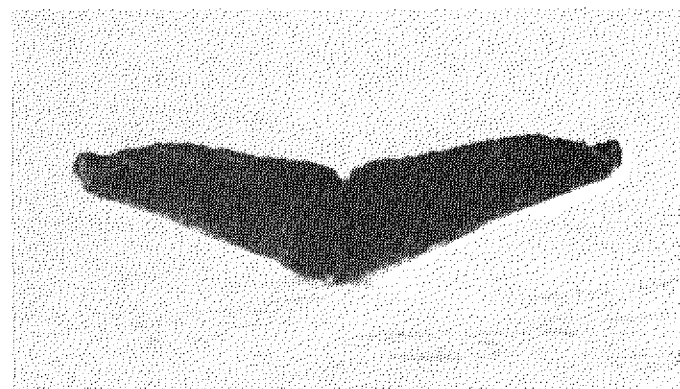
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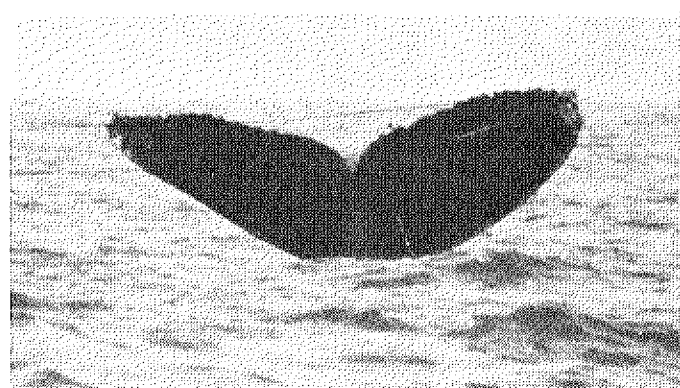
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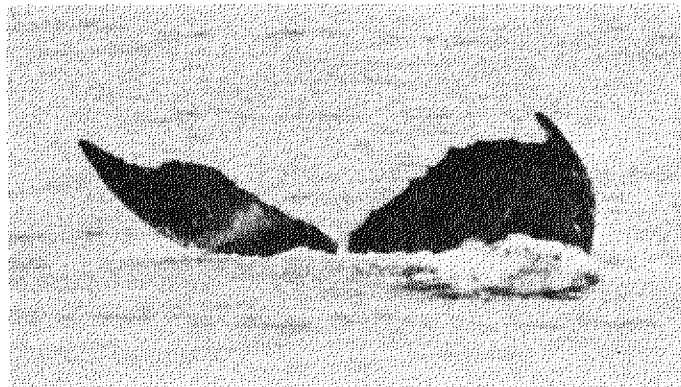
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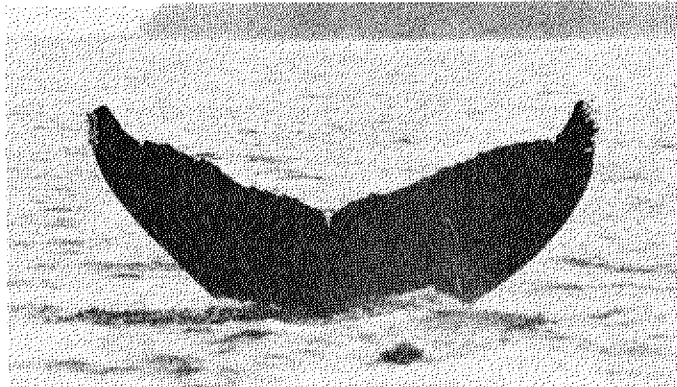
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# HAWAII



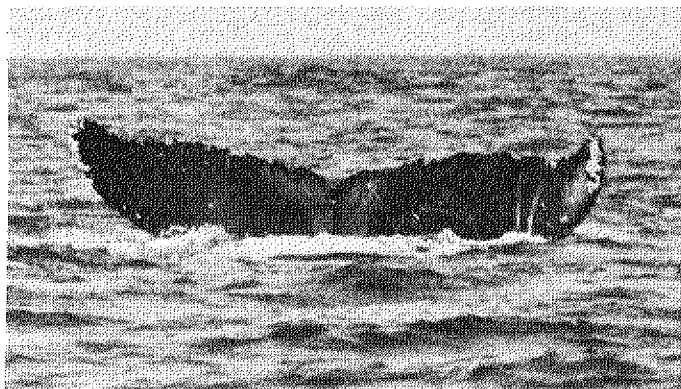
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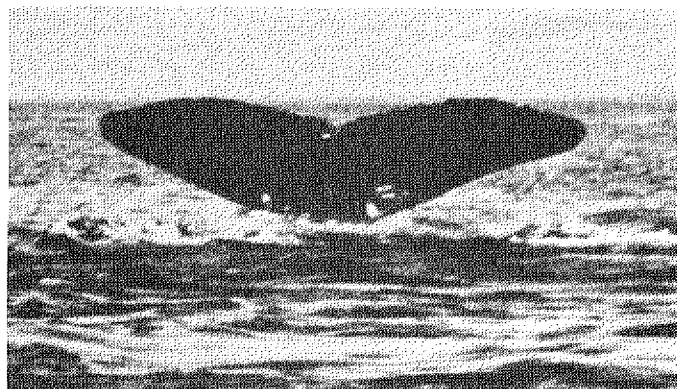
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285



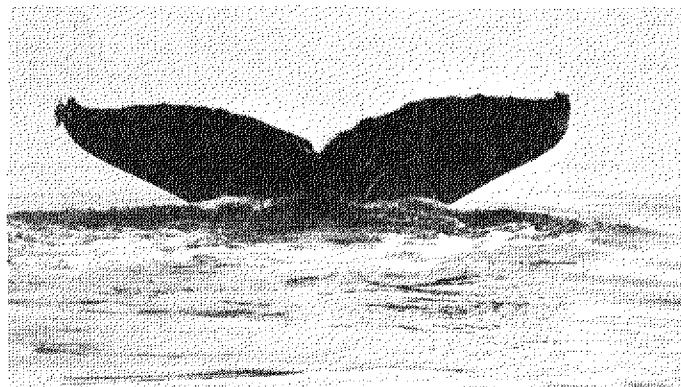
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408



186

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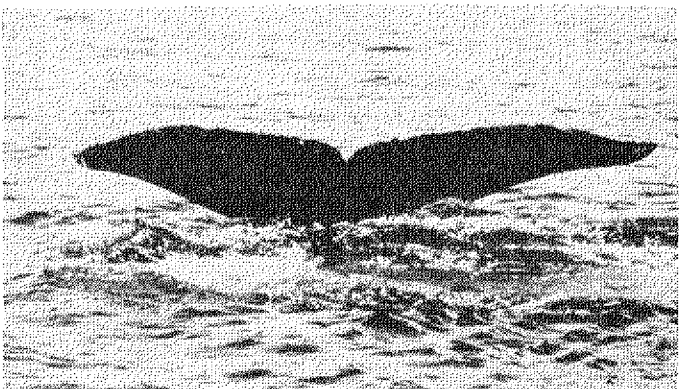
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262



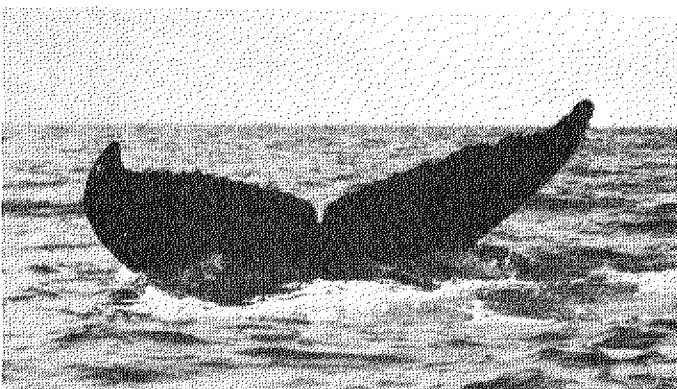
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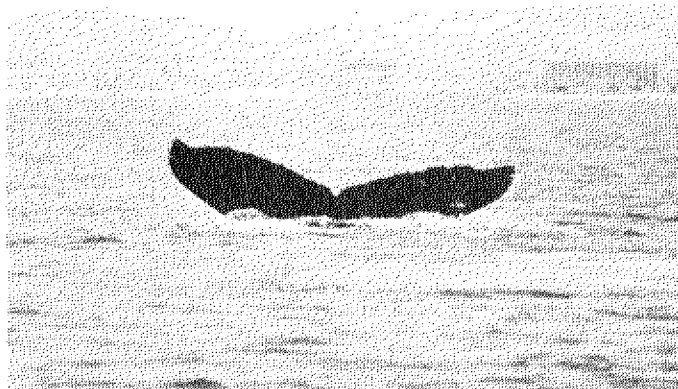
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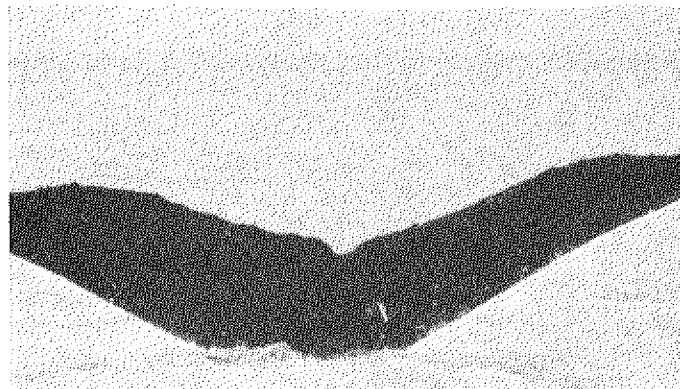
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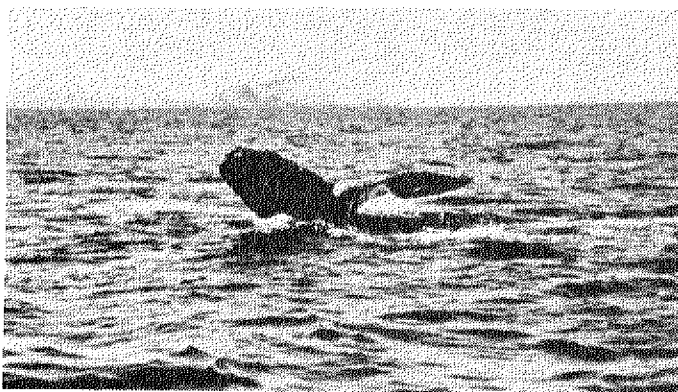
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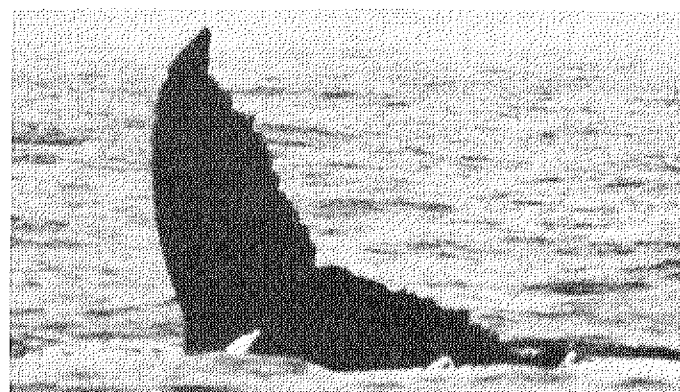
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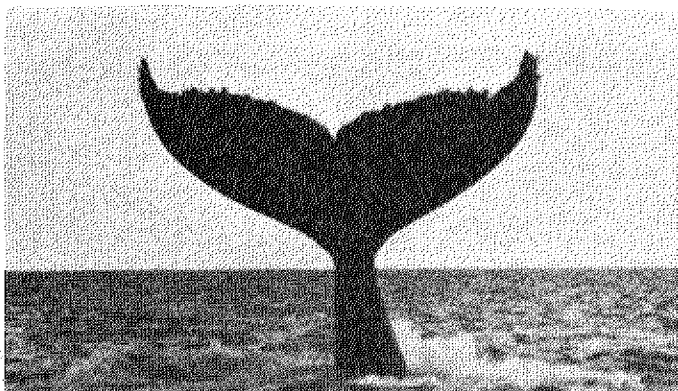
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440



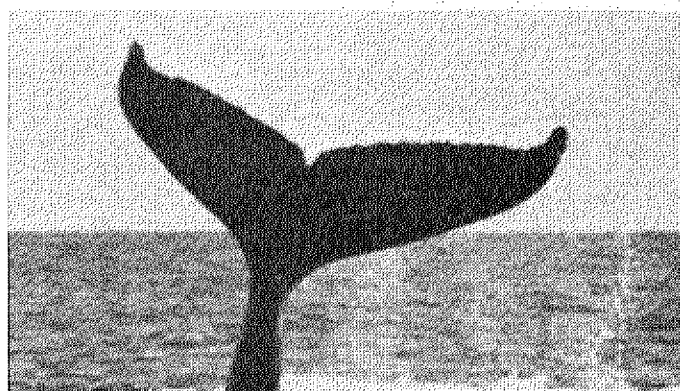
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2028

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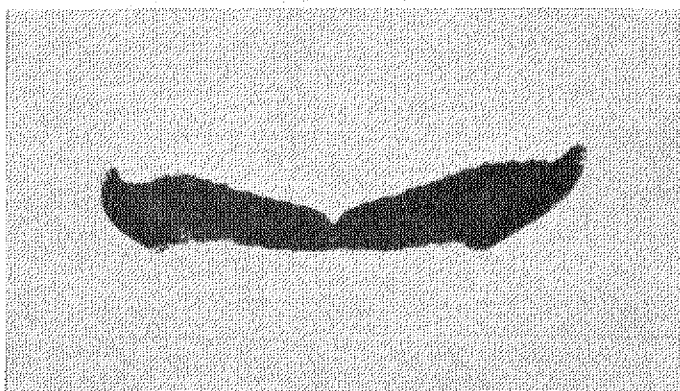
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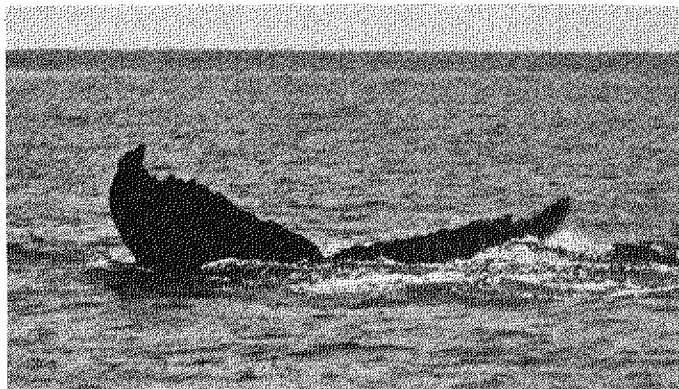
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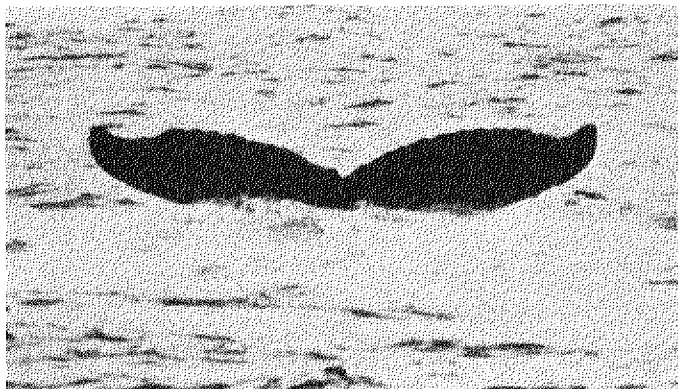
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308



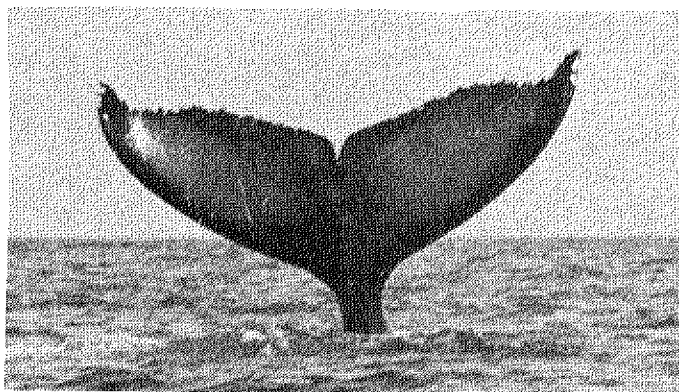
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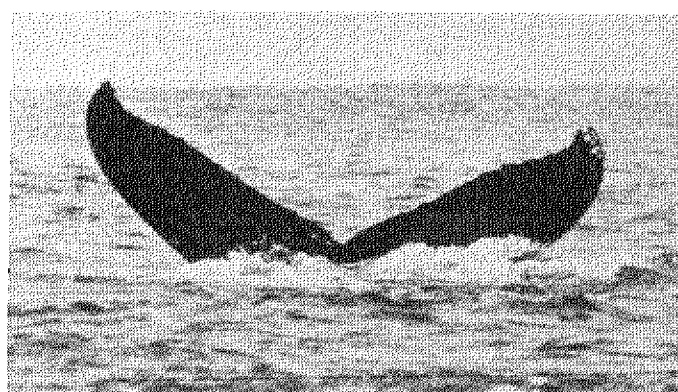
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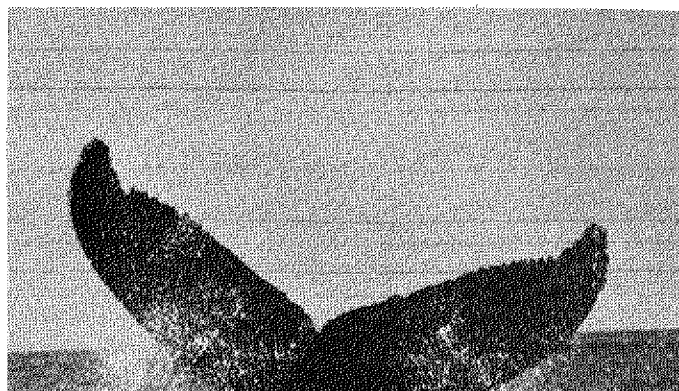
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2379

372



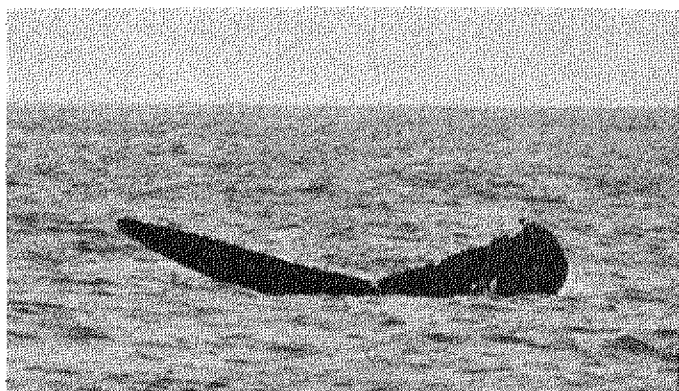
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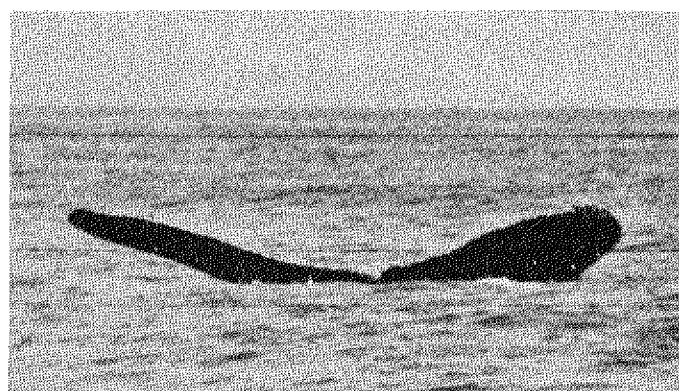
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437



2436

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2485

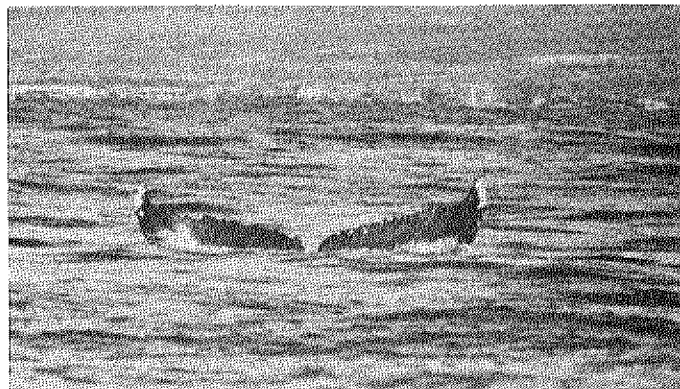
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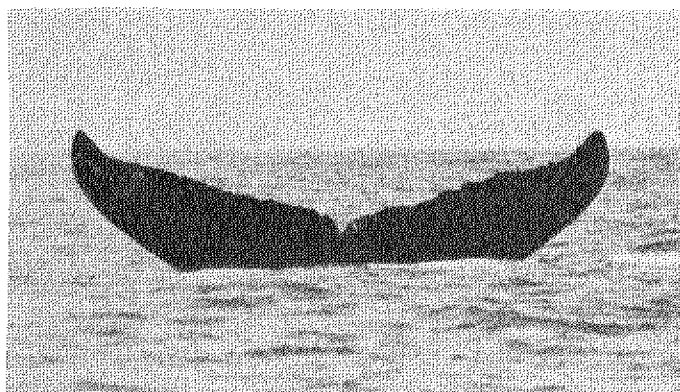
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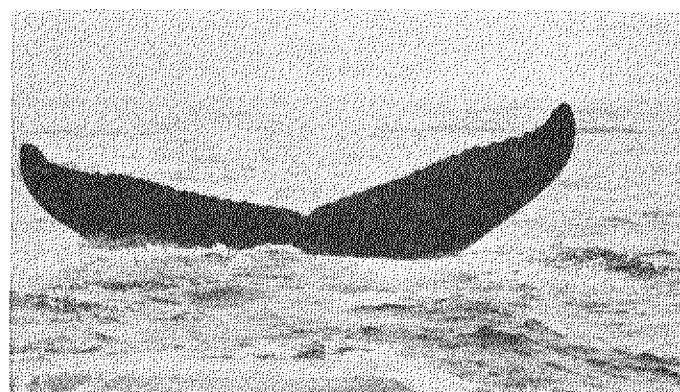
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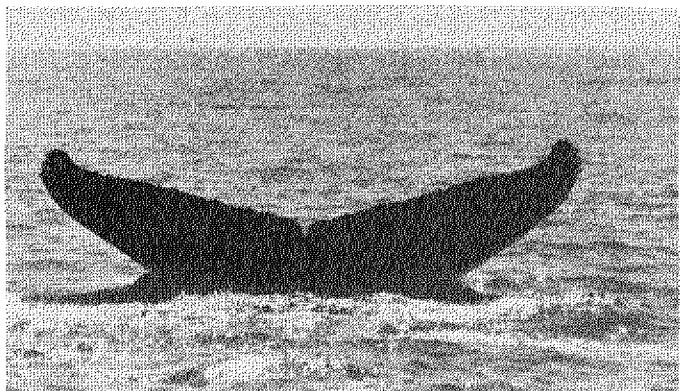
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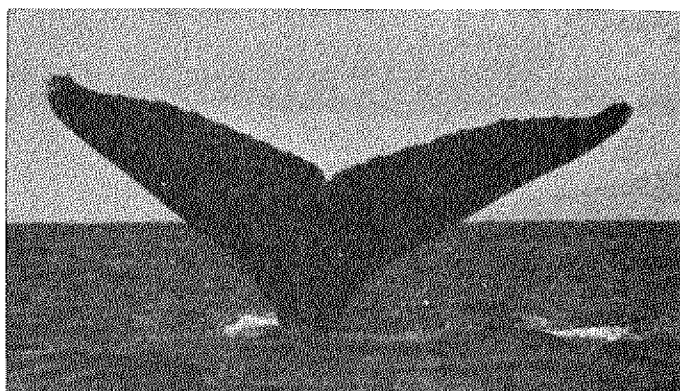
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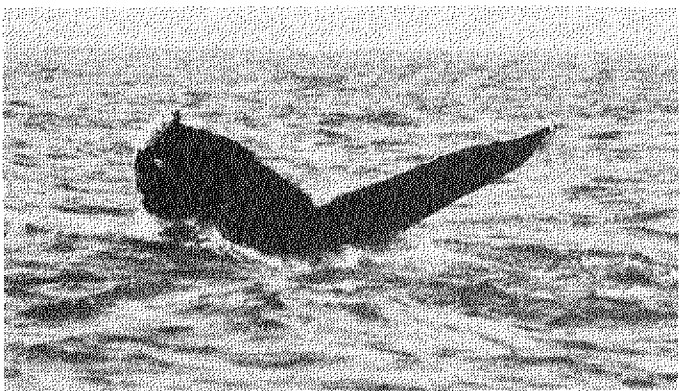
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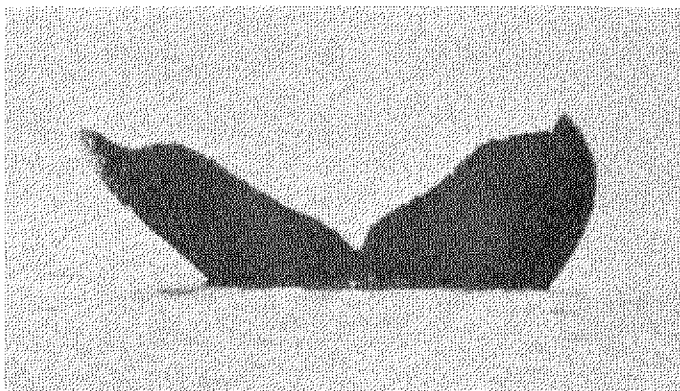
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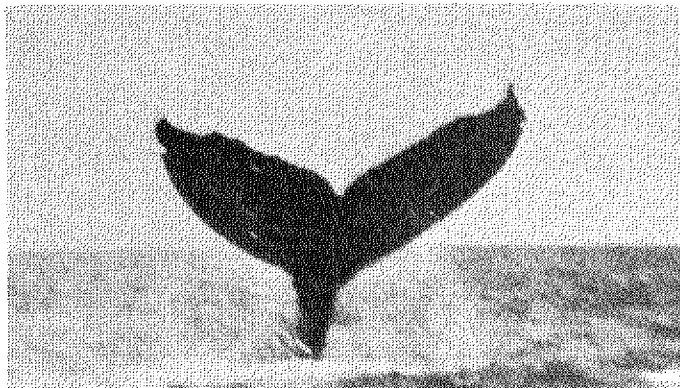


2103

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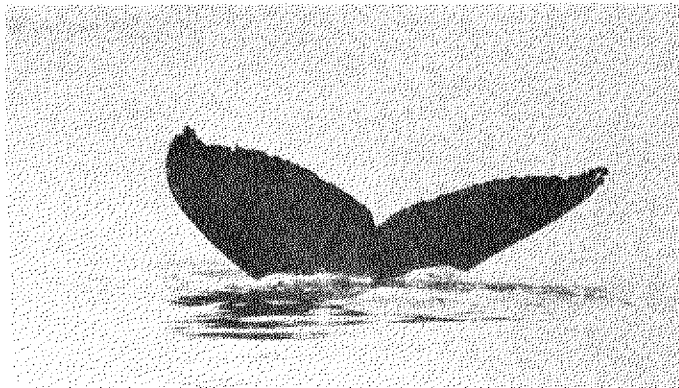


# HAWAII



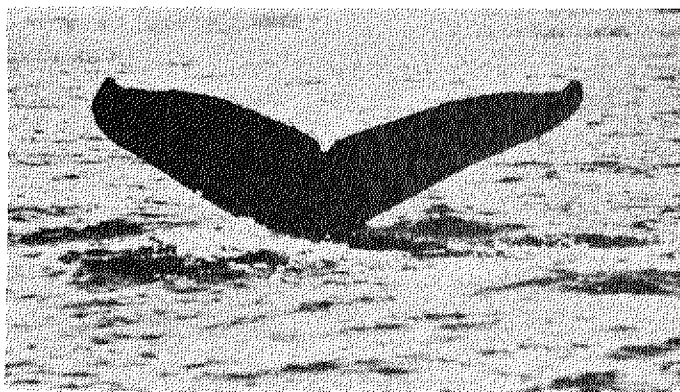
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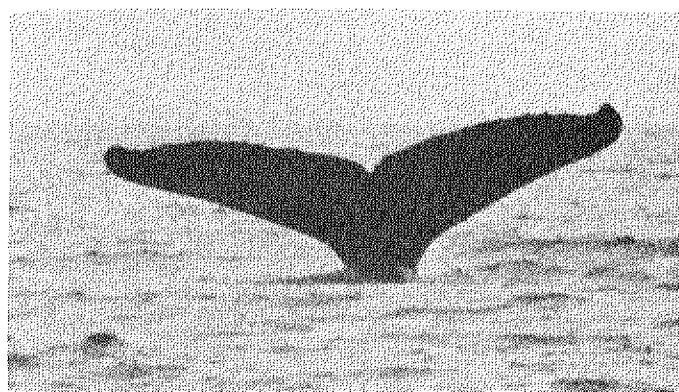
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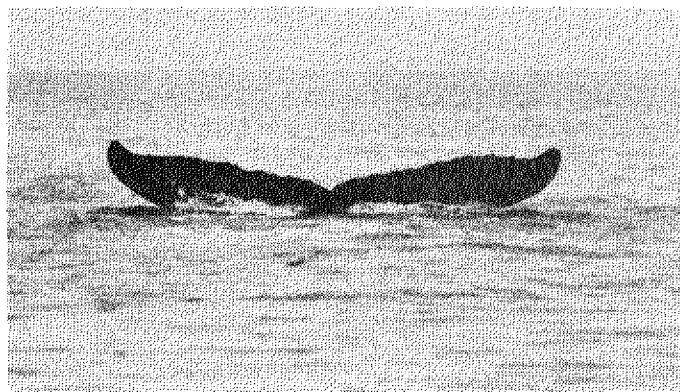
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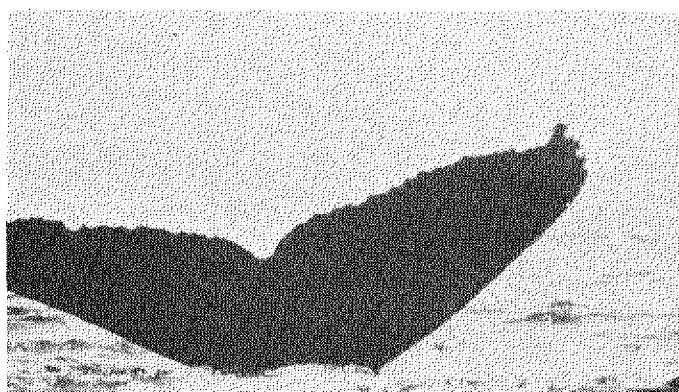
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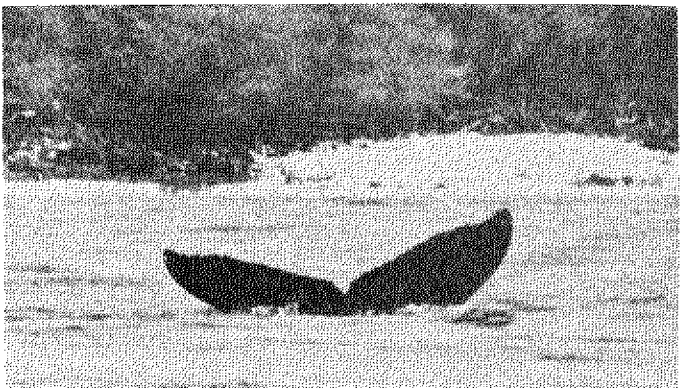
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92

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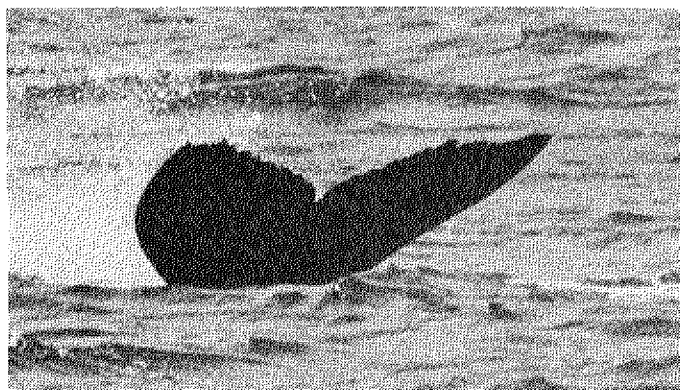
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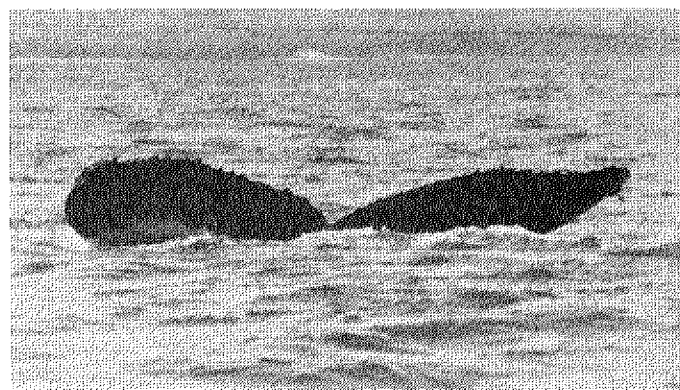
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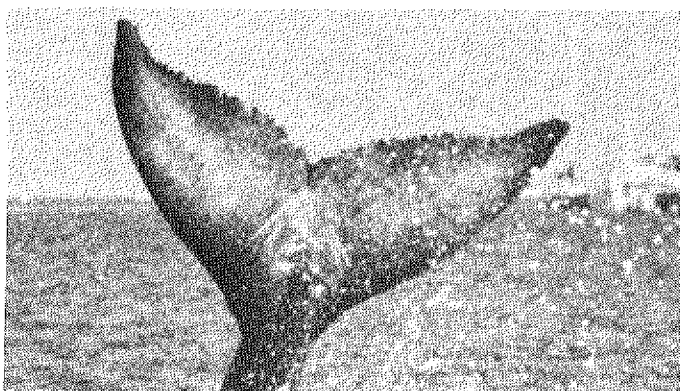
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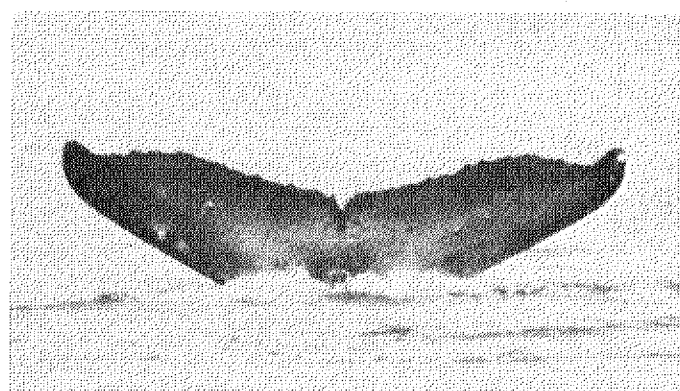
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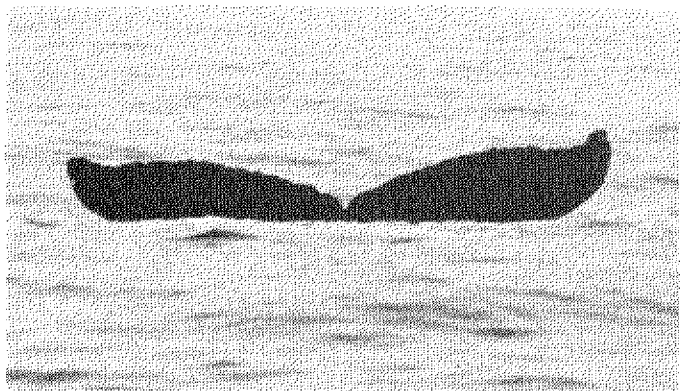
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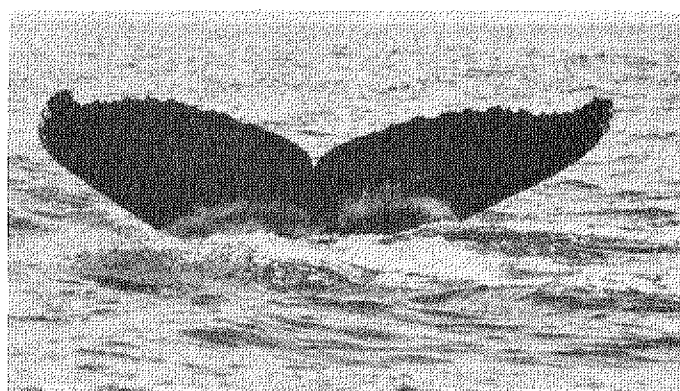
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257



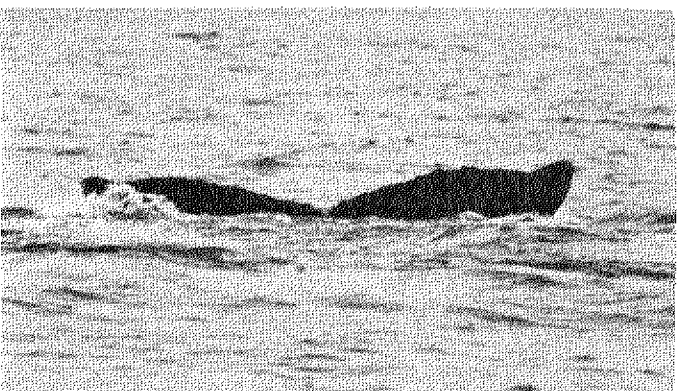
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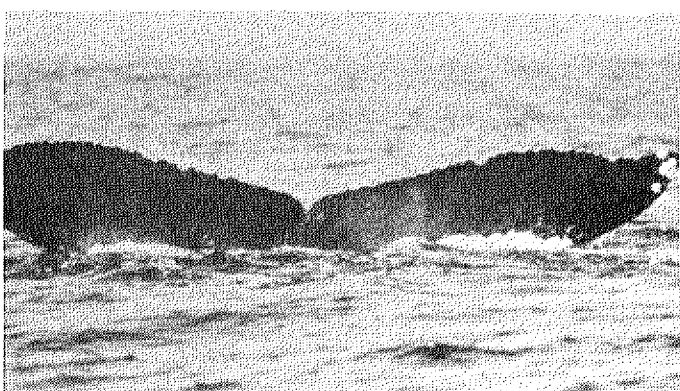
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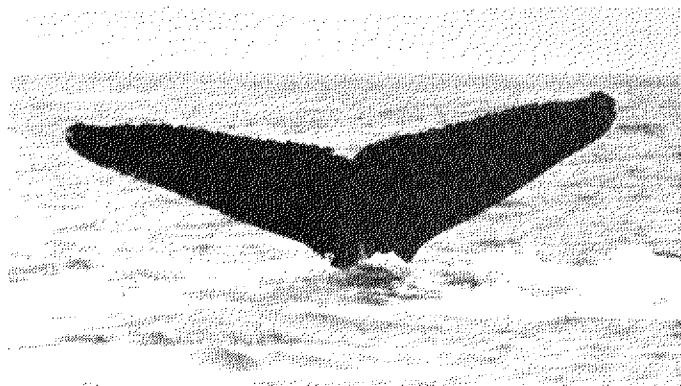
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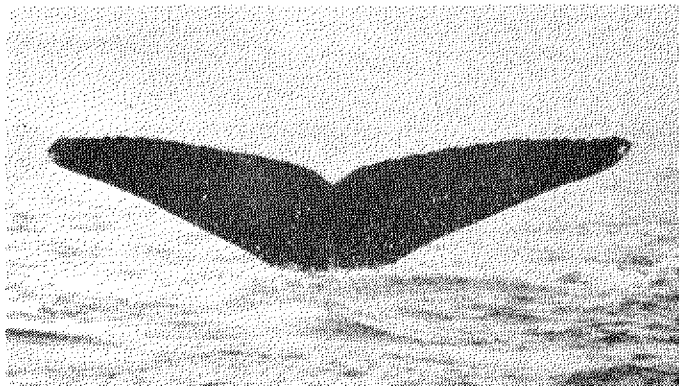
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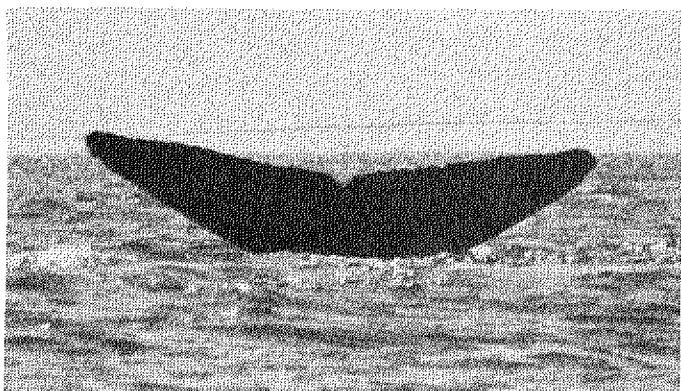
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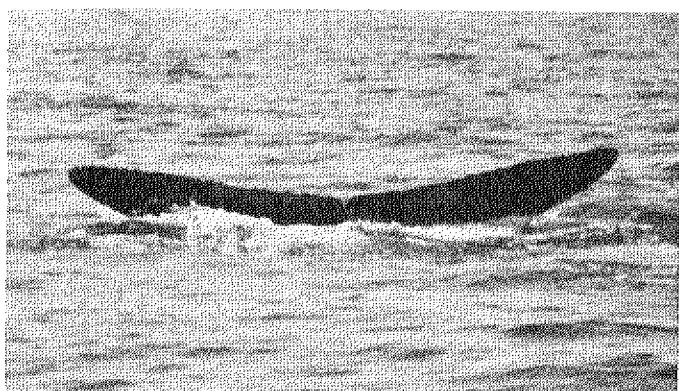
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2790

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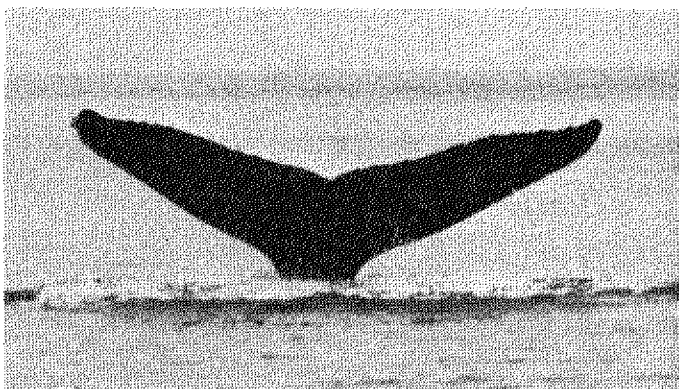
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814



438

150



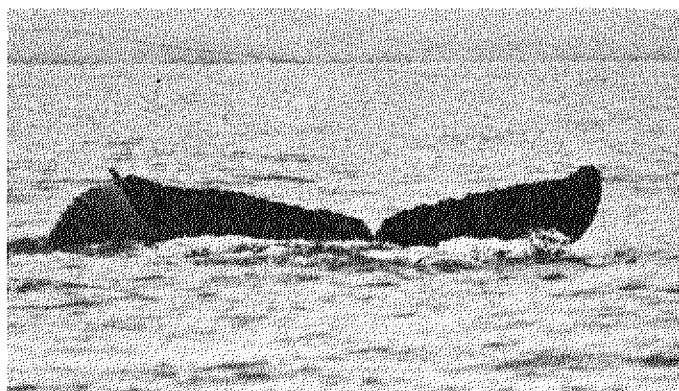
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2254

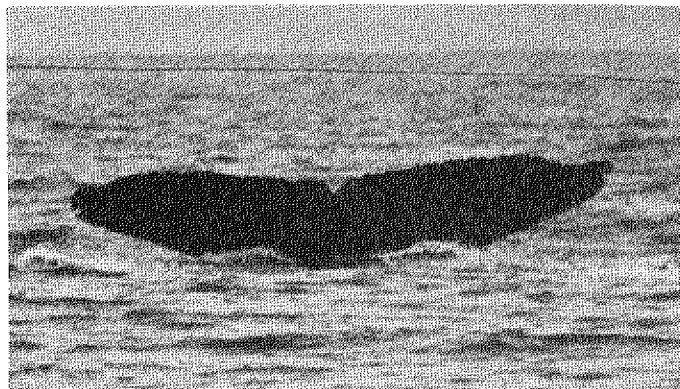
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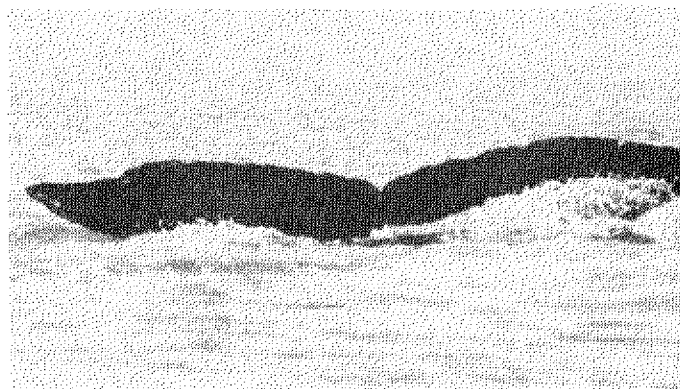
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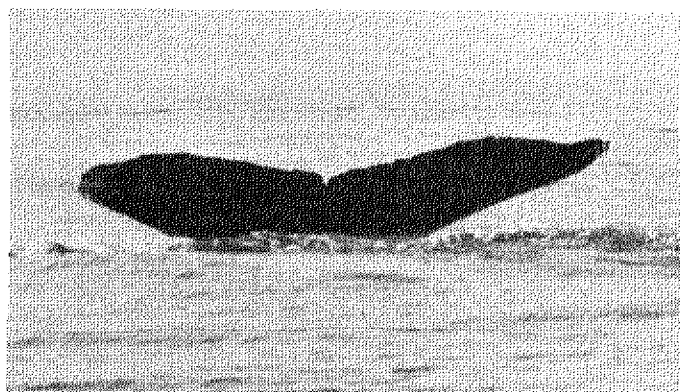
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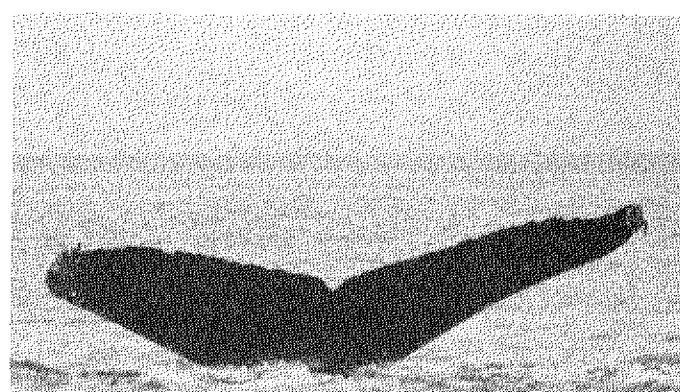
2718

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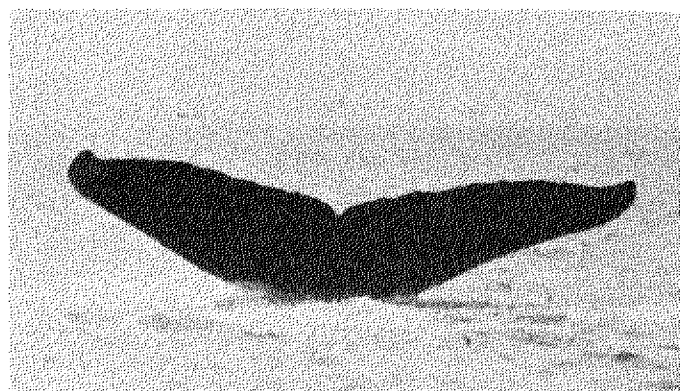
2348

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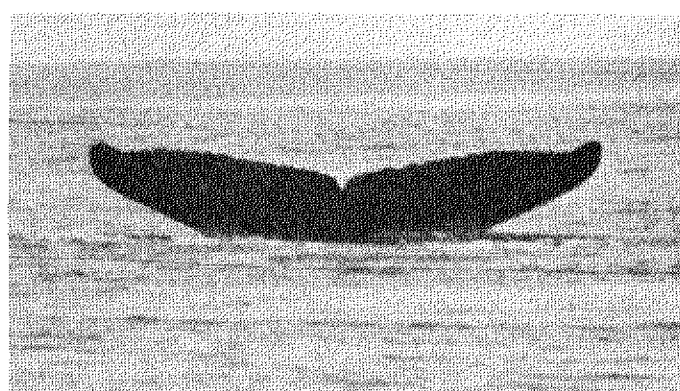
2459

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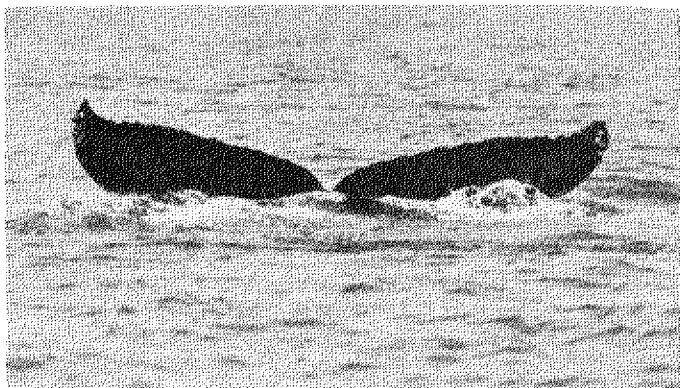
2173

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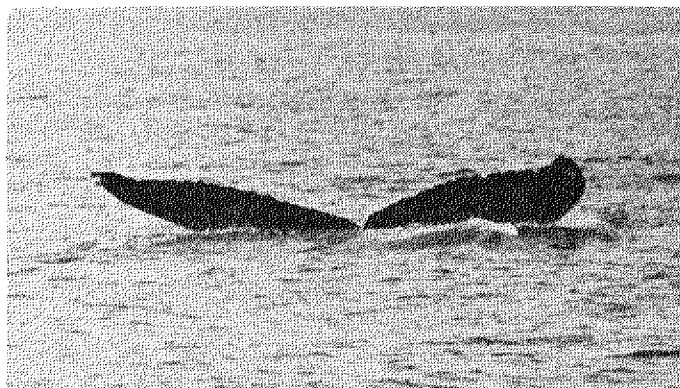
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2809

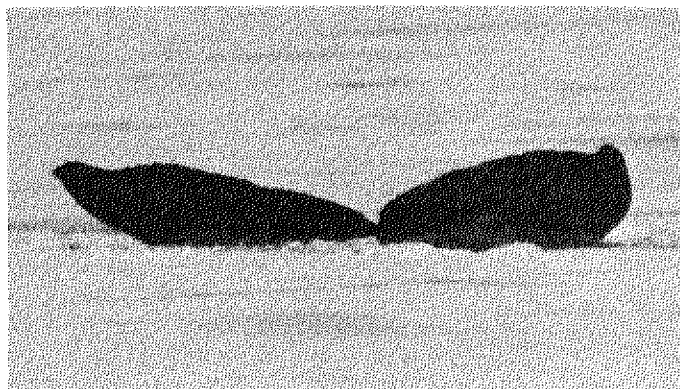
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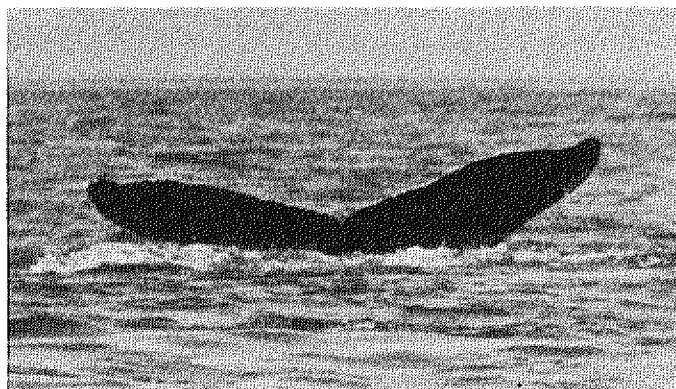
181

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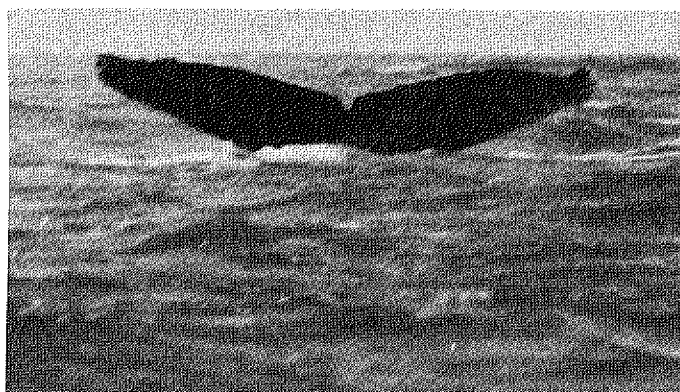
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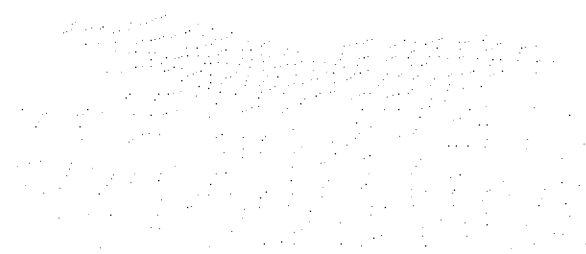
2403

441

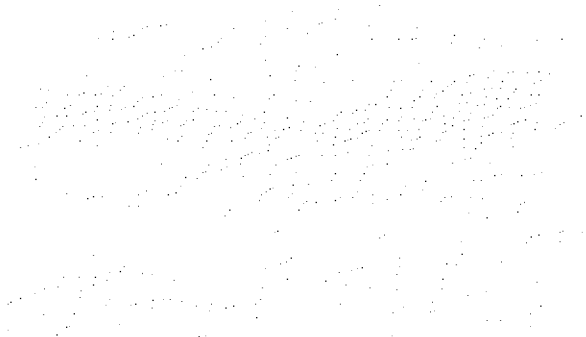
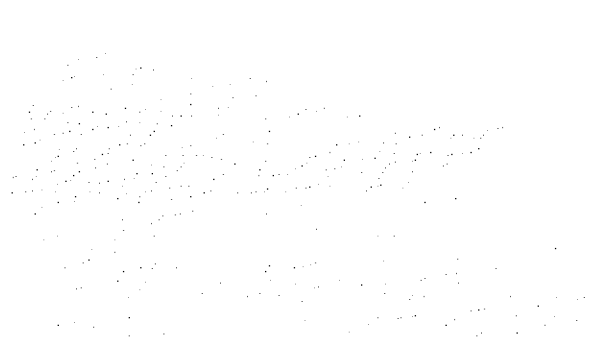
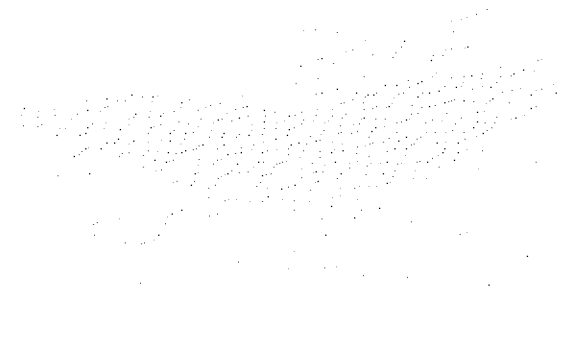
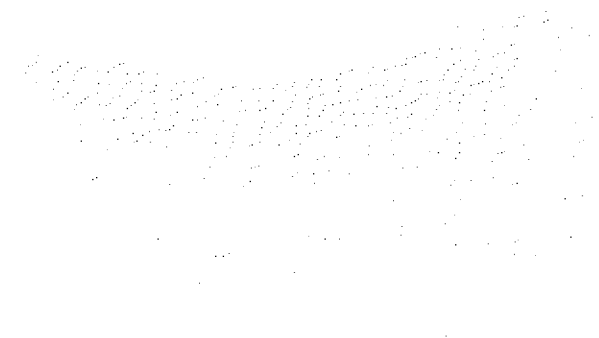


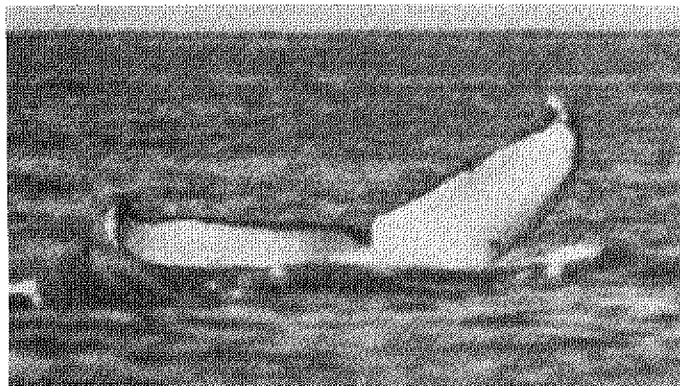
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441





2551

616



2627

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2625

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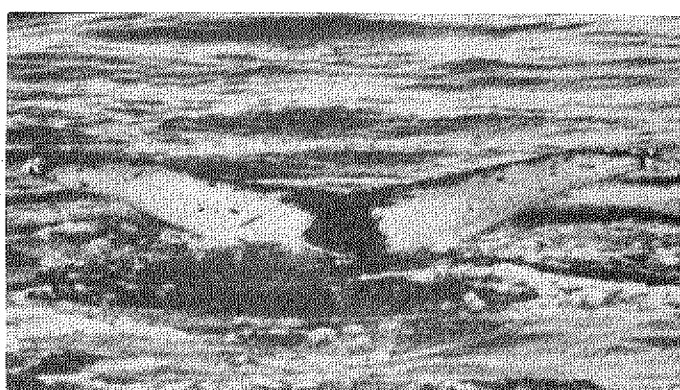
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2549

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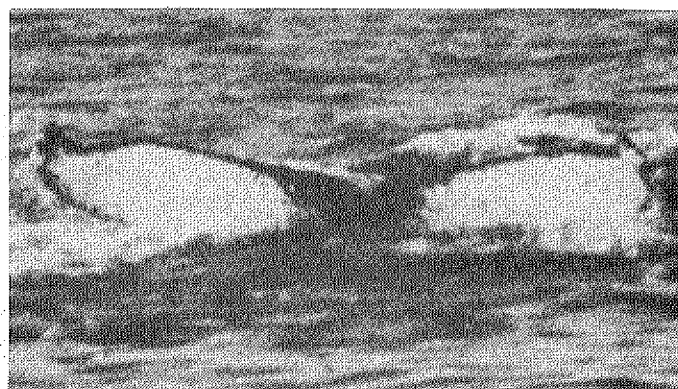
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2651

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2649

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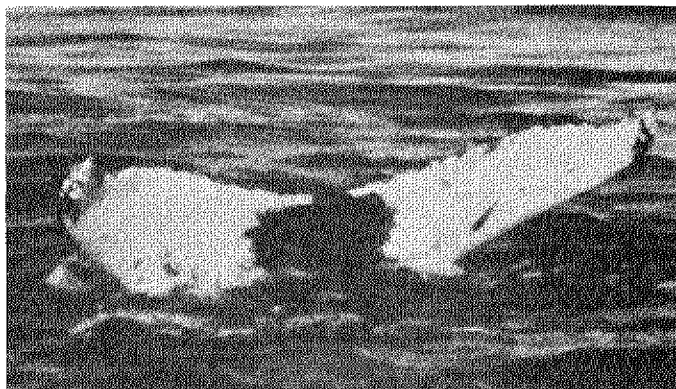


# MEXICO



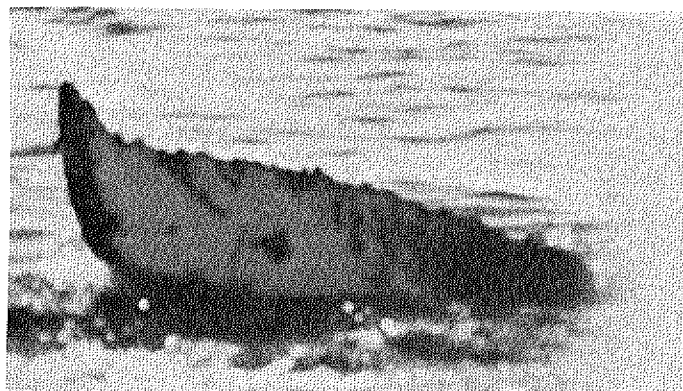
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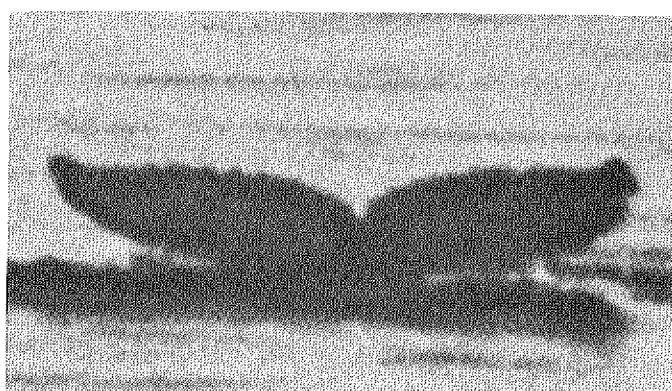
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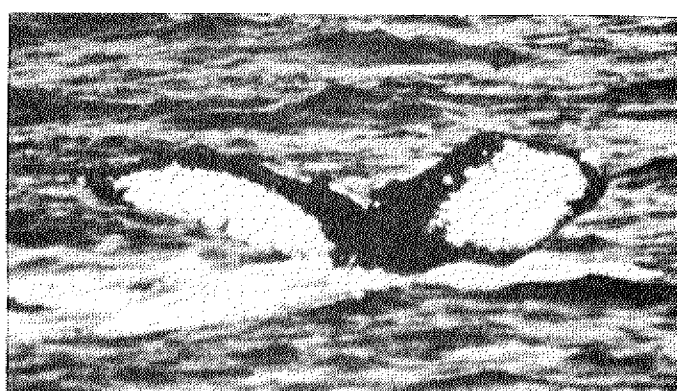
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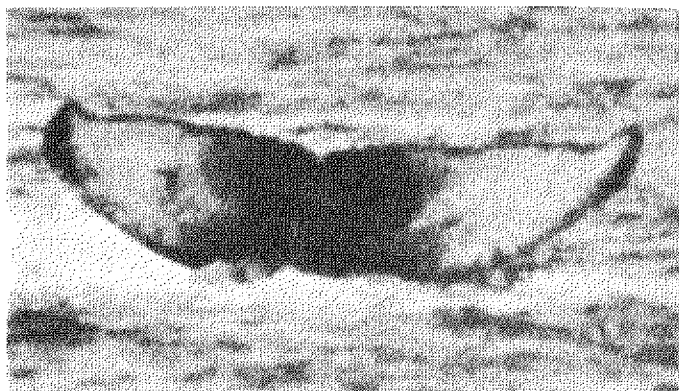
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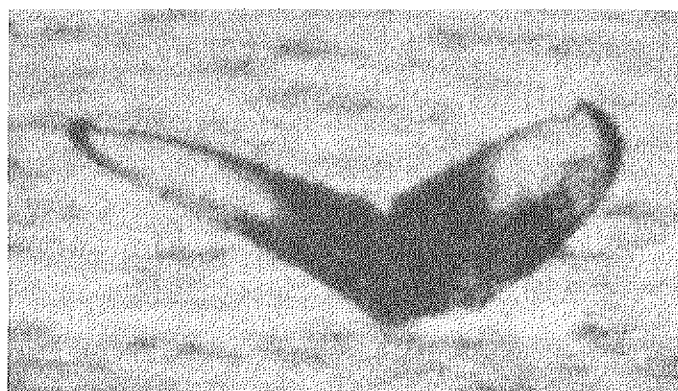
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6



2623

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2648

339



2621

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2547

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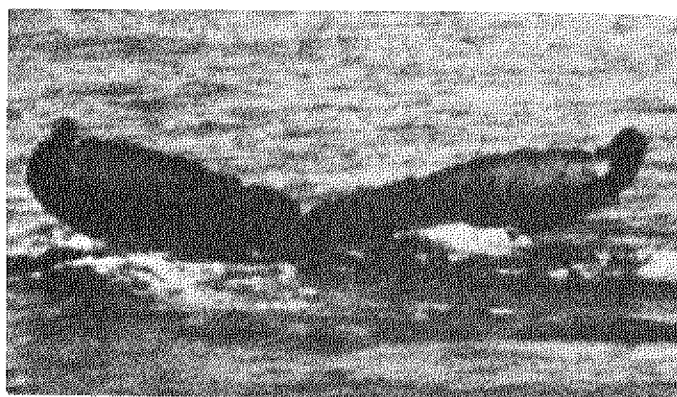
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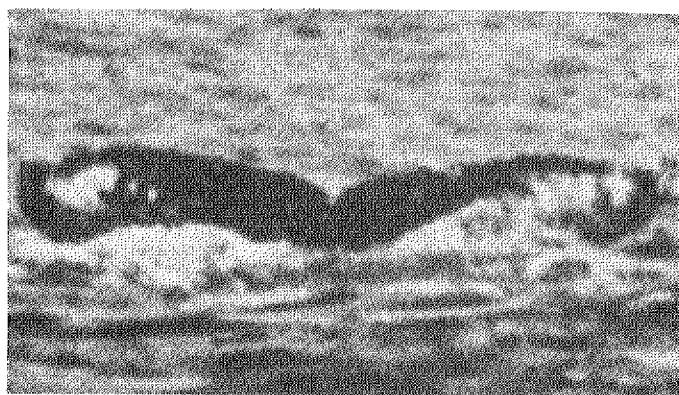
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298



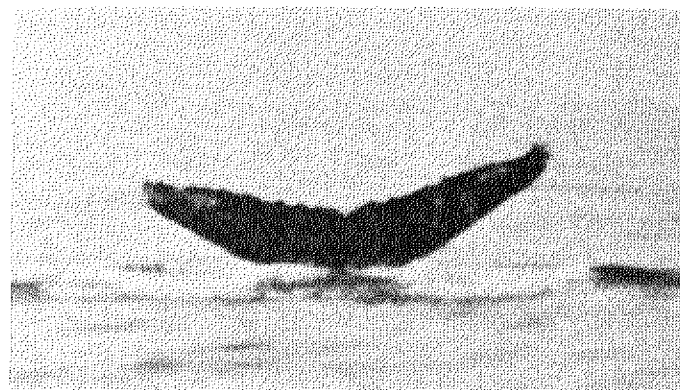
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2630

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2540

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# MEXICO



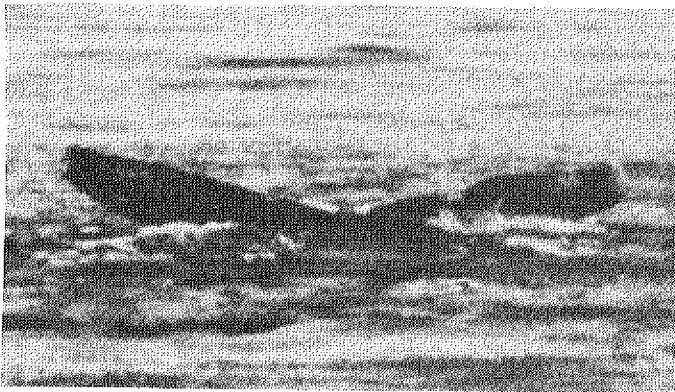
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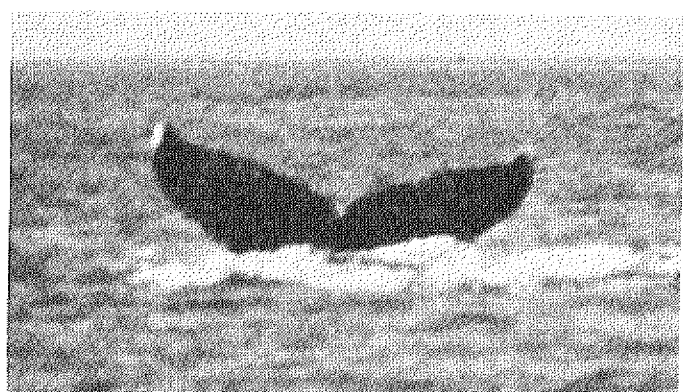
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2644

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2538

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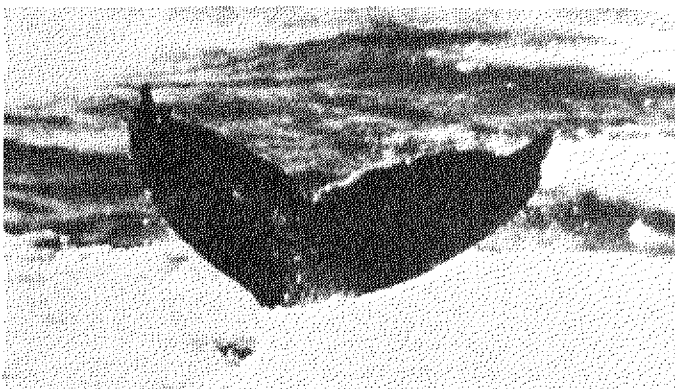
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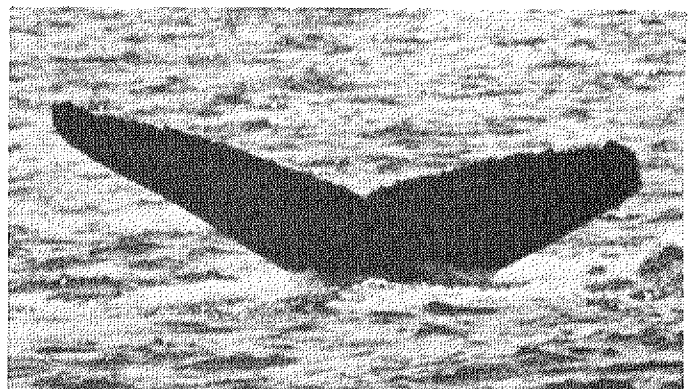
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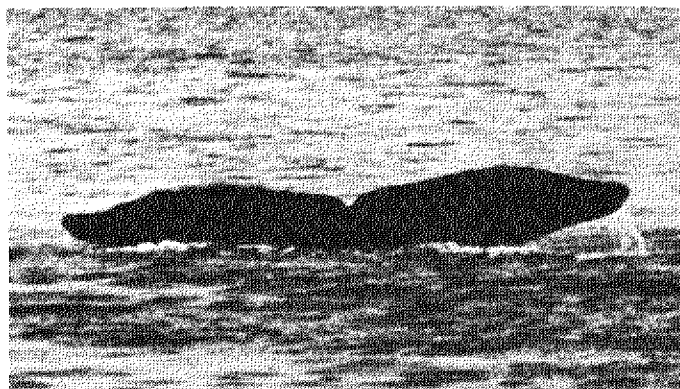
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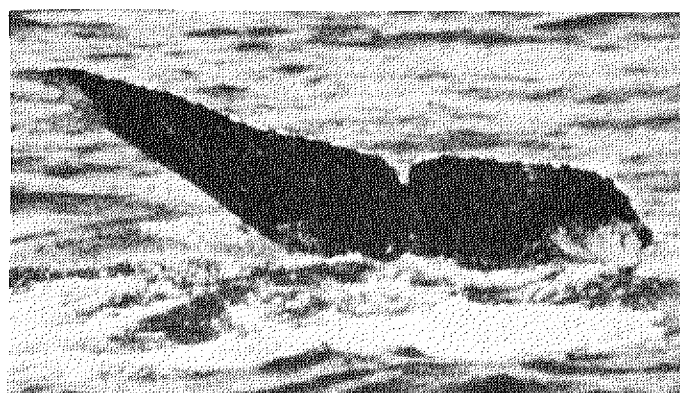
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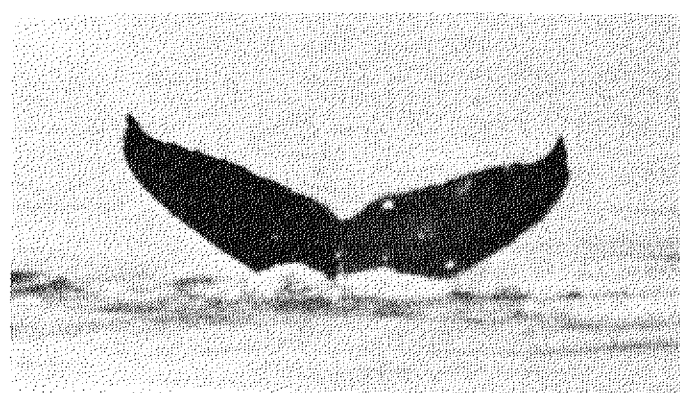
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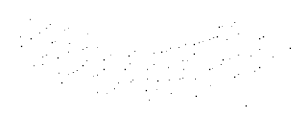
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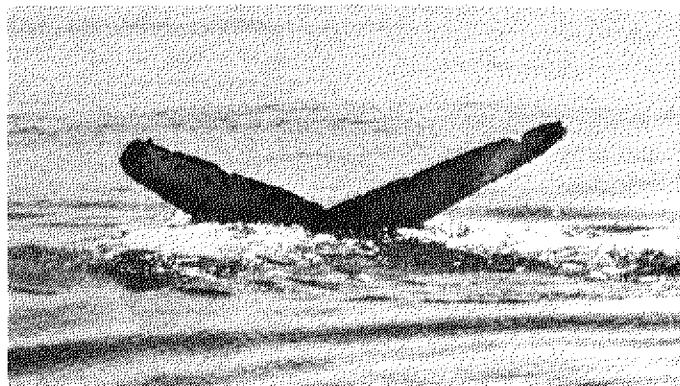


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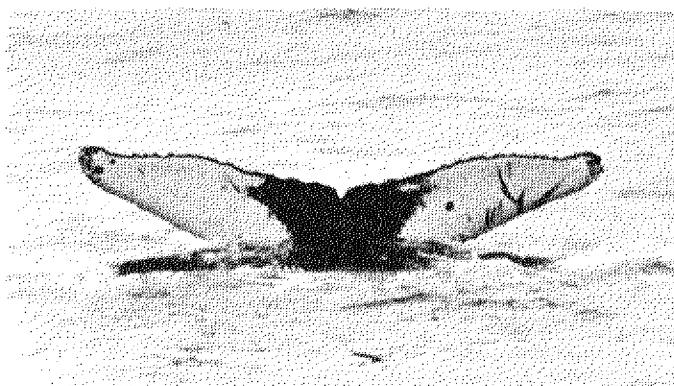


# CENTRAL CALIFORNIA



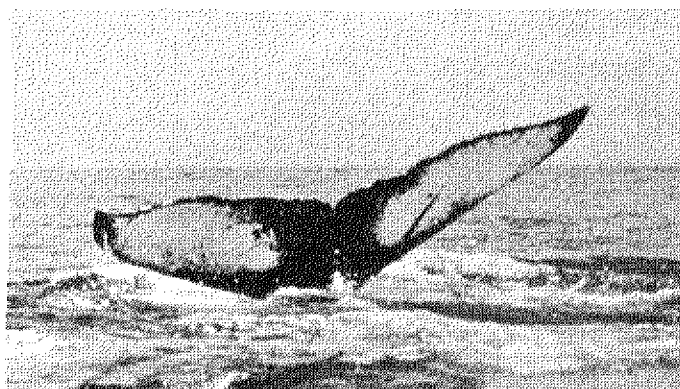
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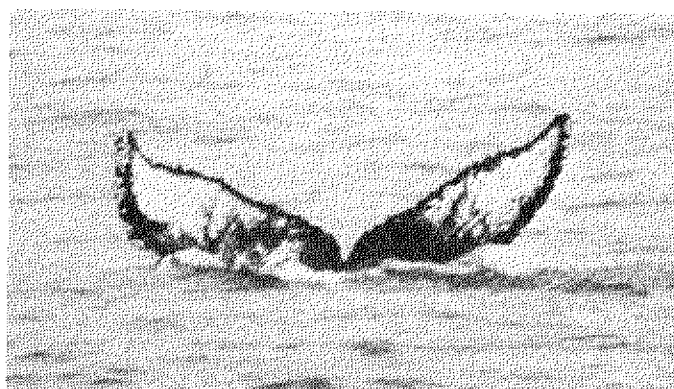
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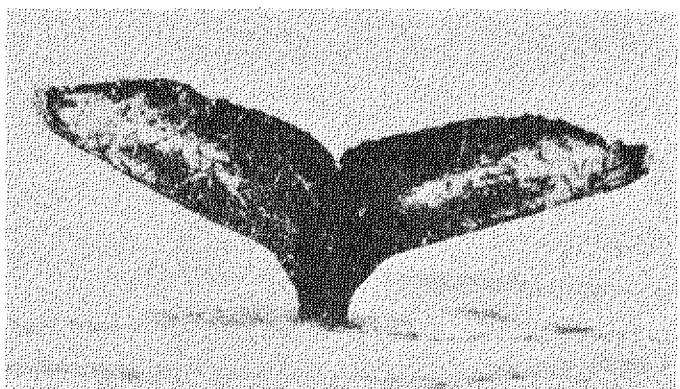
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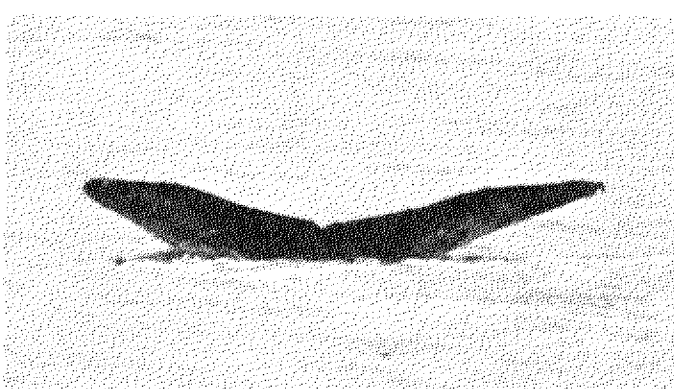
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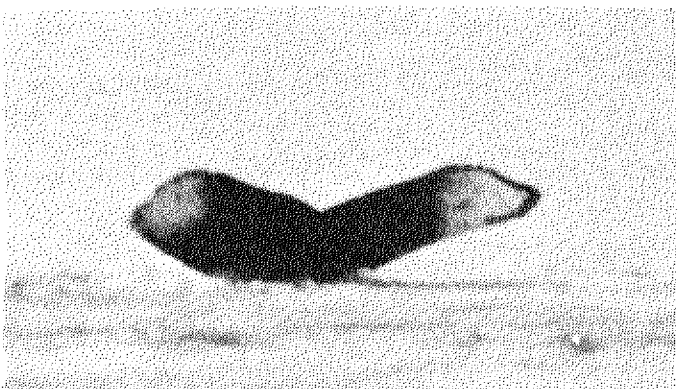
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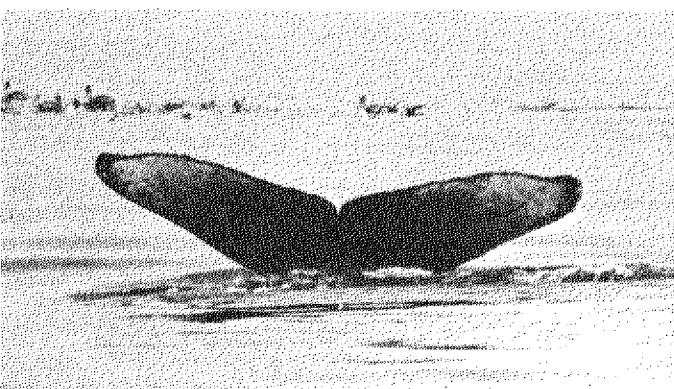
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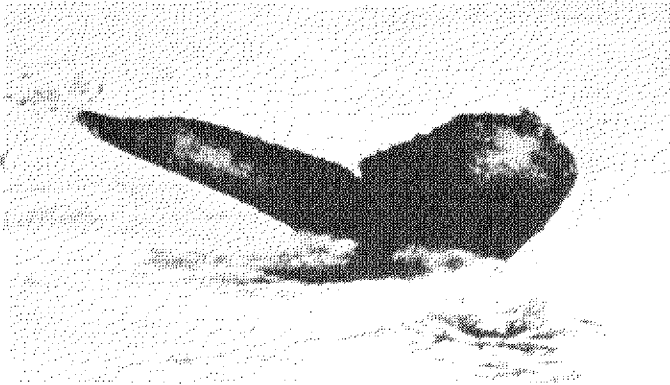
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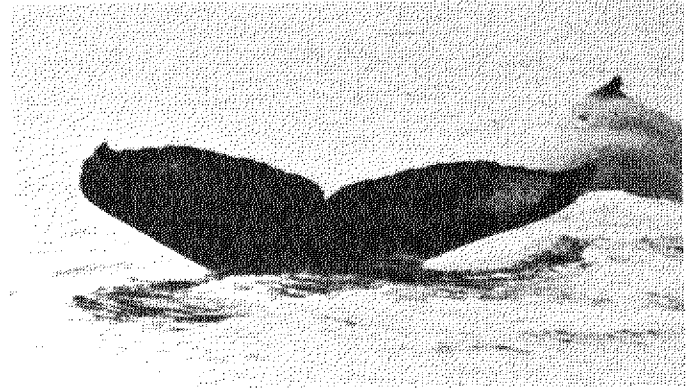
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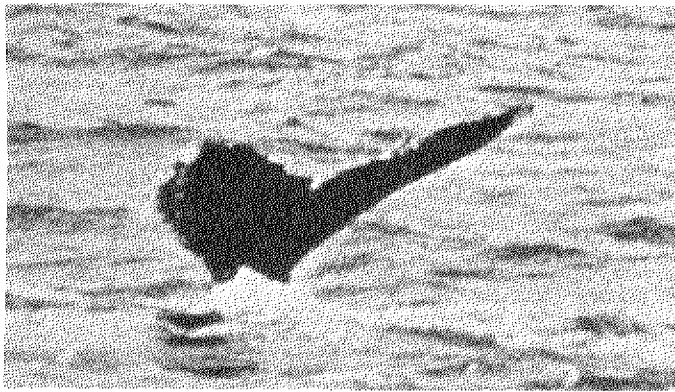
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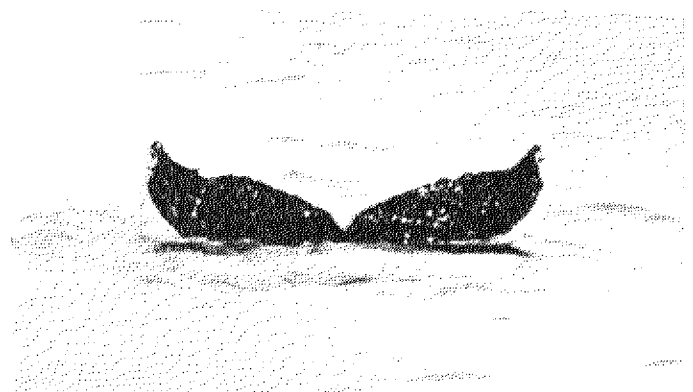
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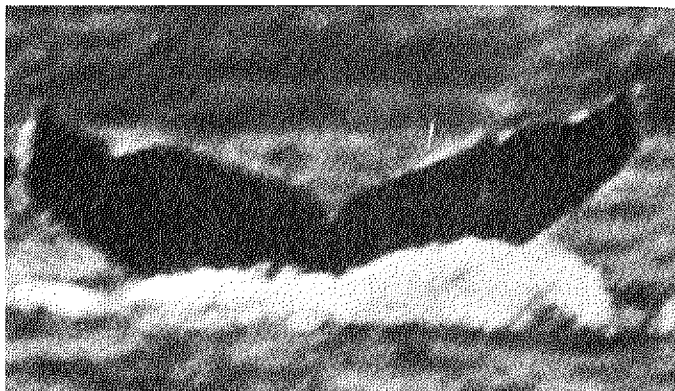
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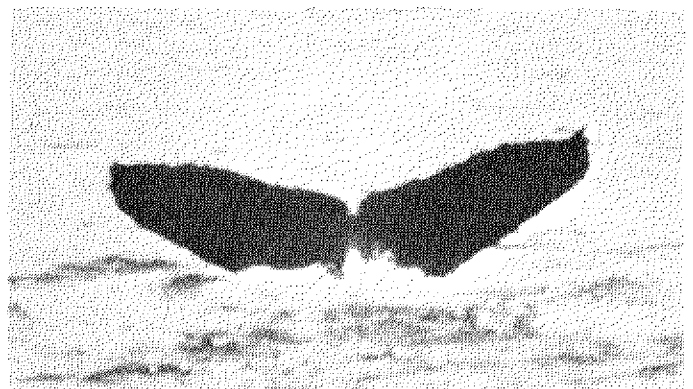
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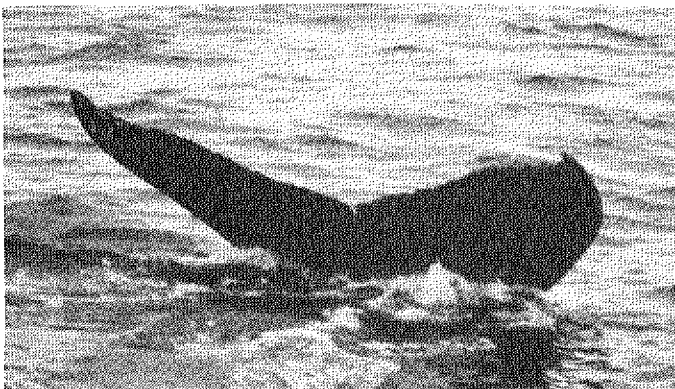
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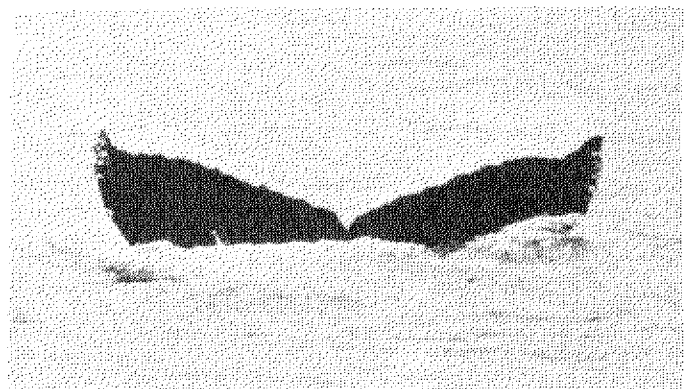
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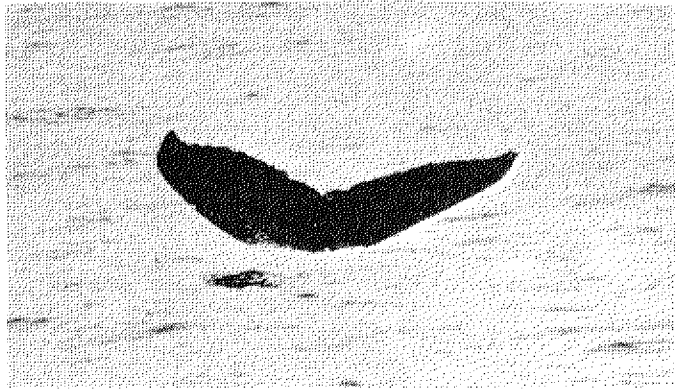


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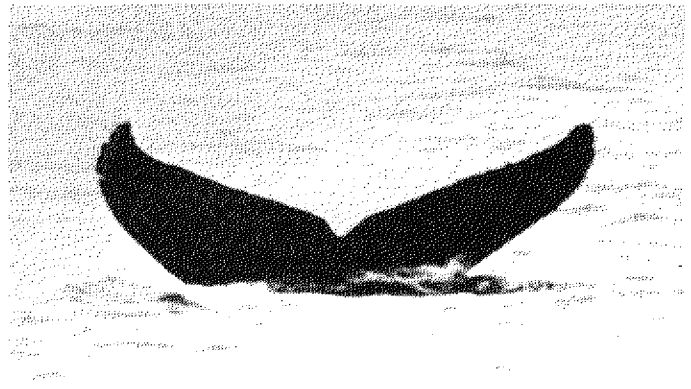


# CENTRAL CALIFORNIA



4260

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2564

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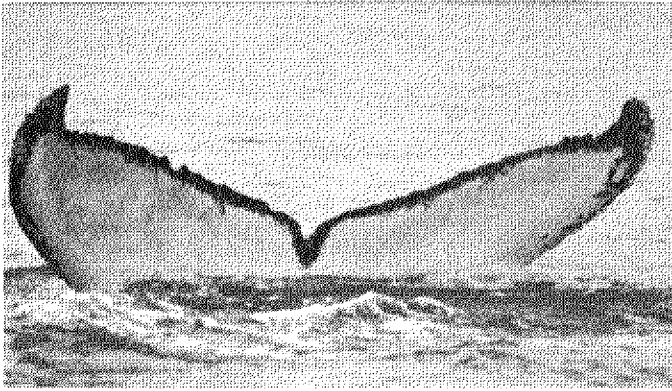
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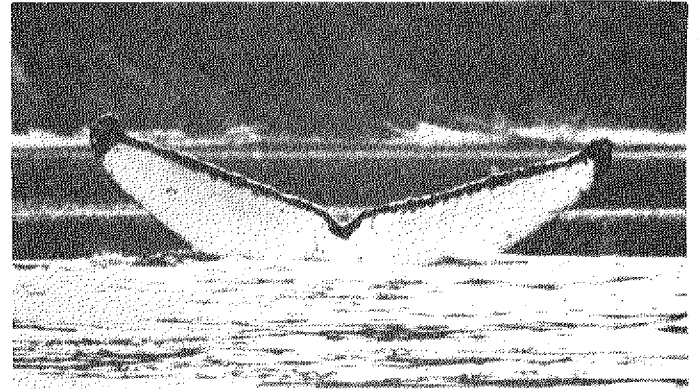
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*[Faint handwritten text]*



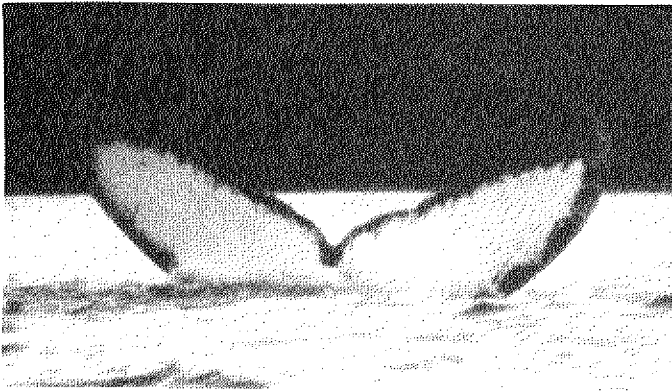
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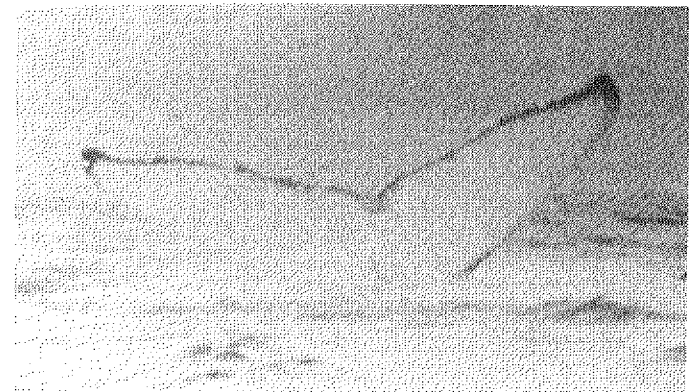
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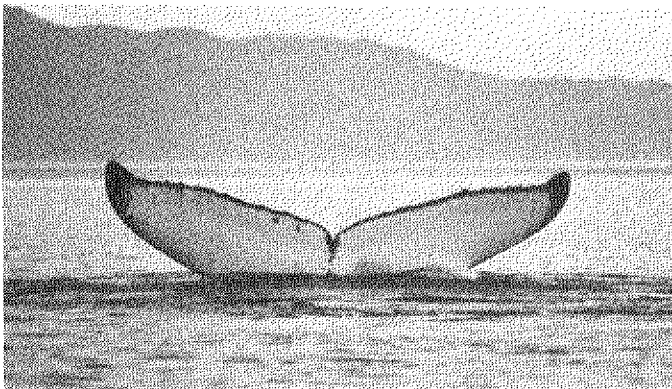
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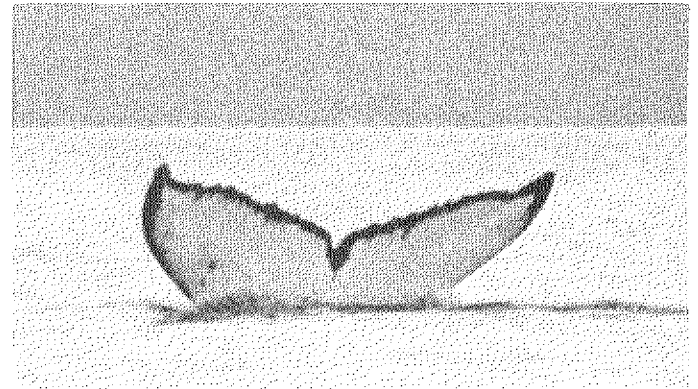
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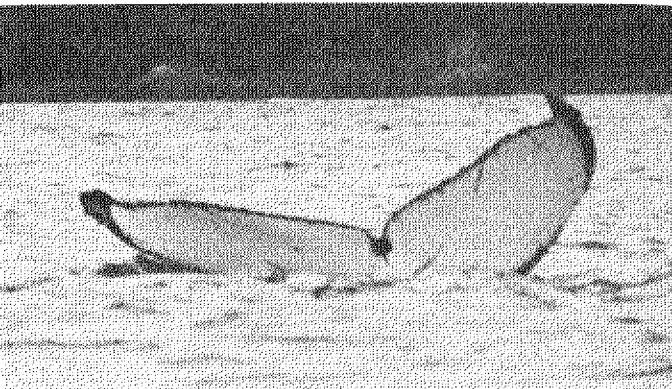
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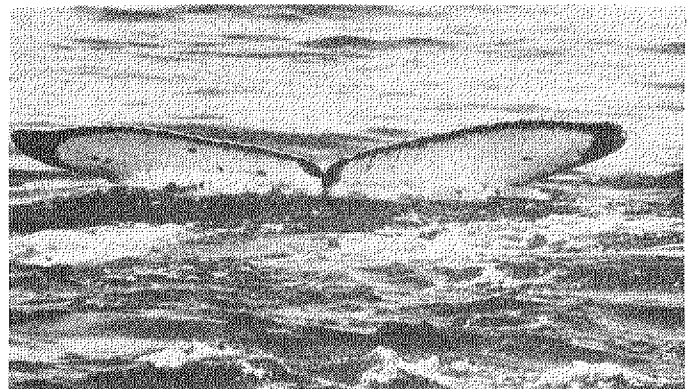
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501



730

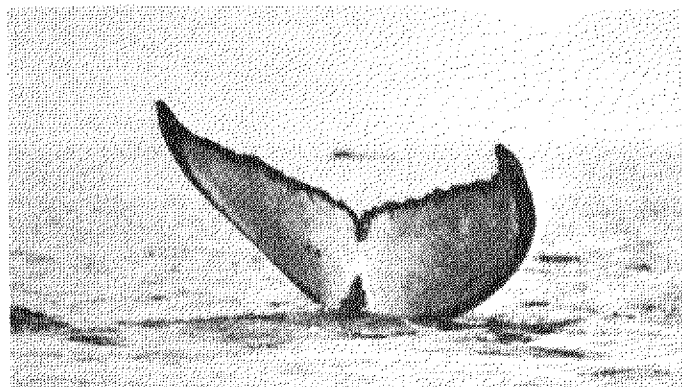
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3369

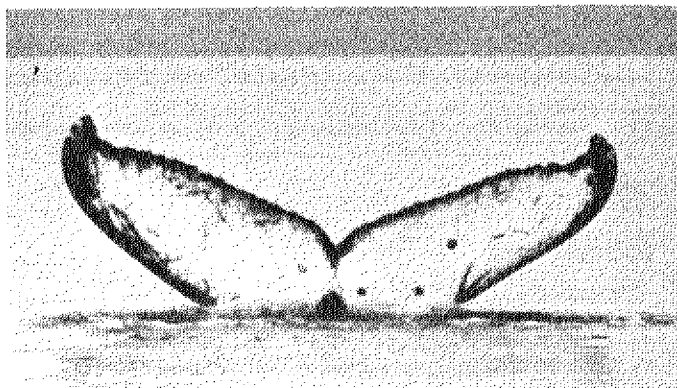
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# SOUTHEASTERN ALASKA



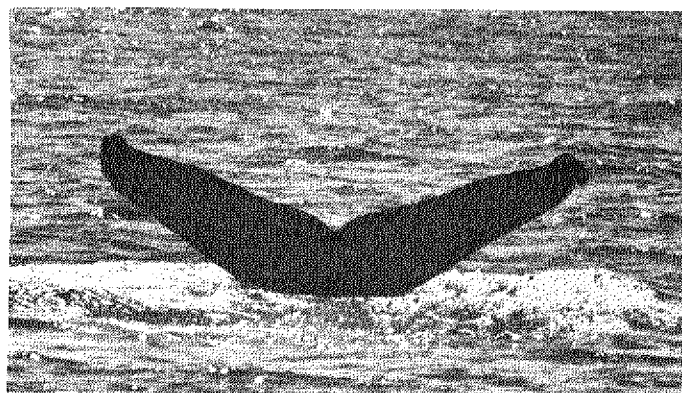
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183



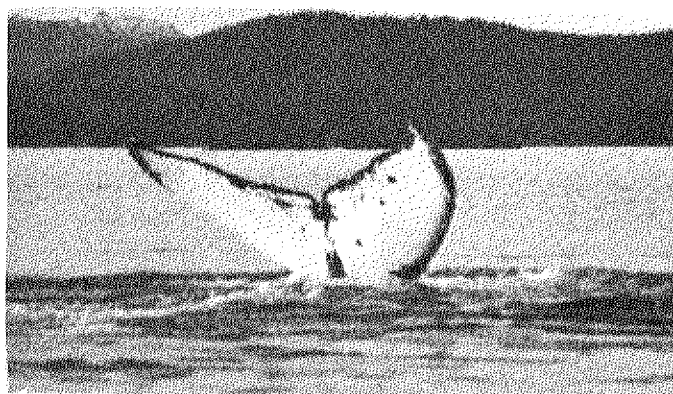
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479



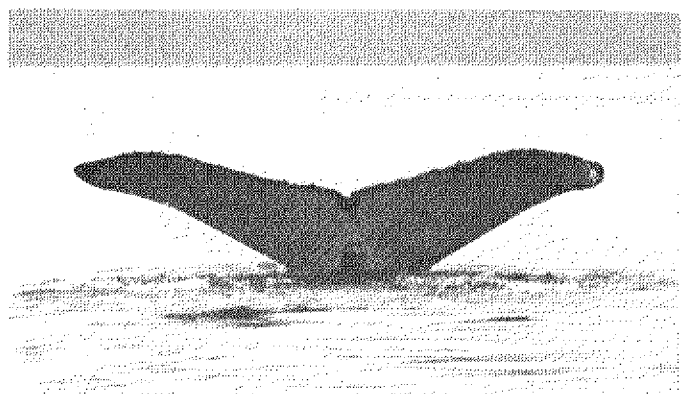
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3565

336



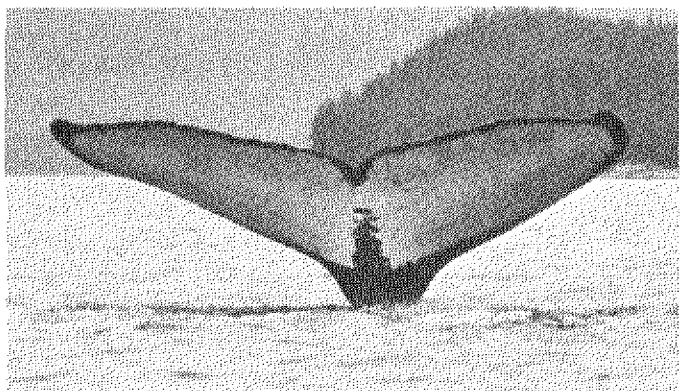
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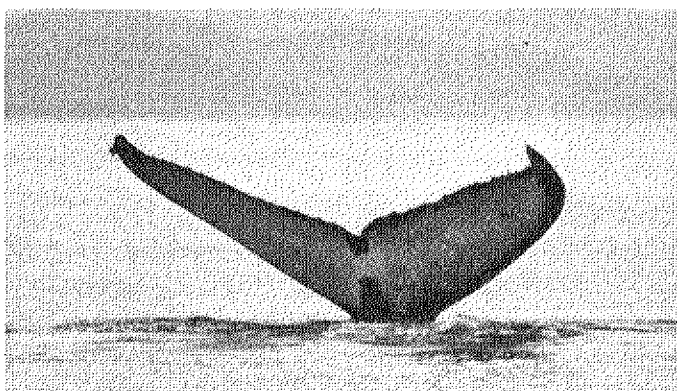
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156



753

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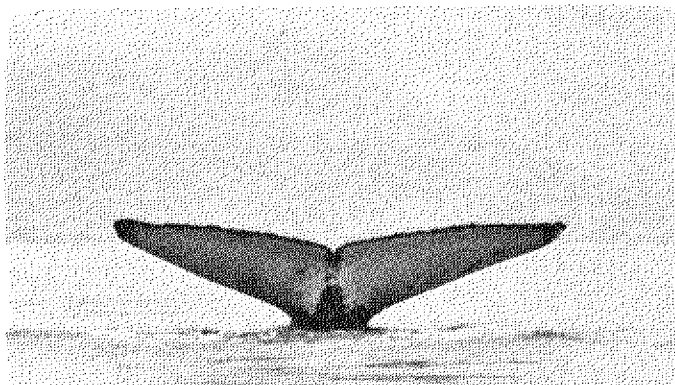


847

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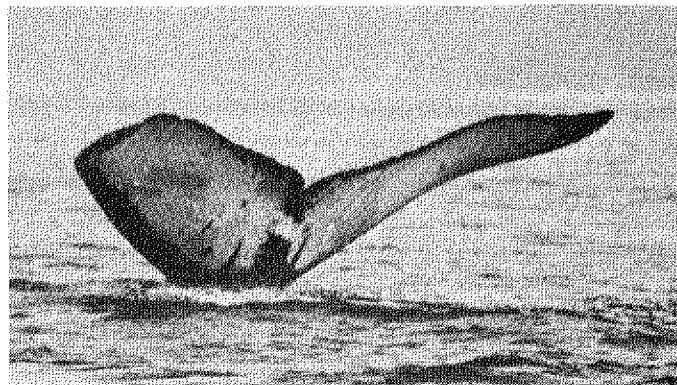


# SOUTHEASTERN ALASKA



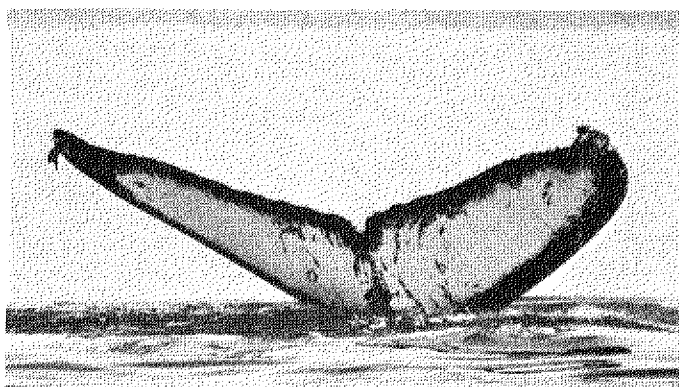
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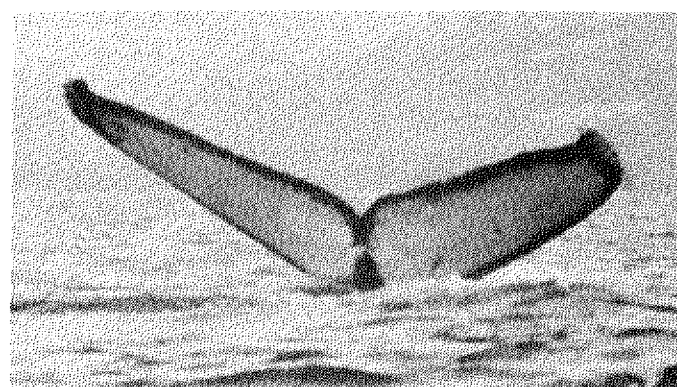
1181

182



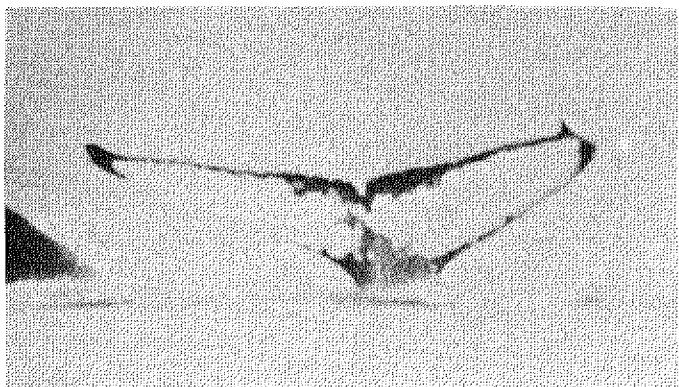
1199

177



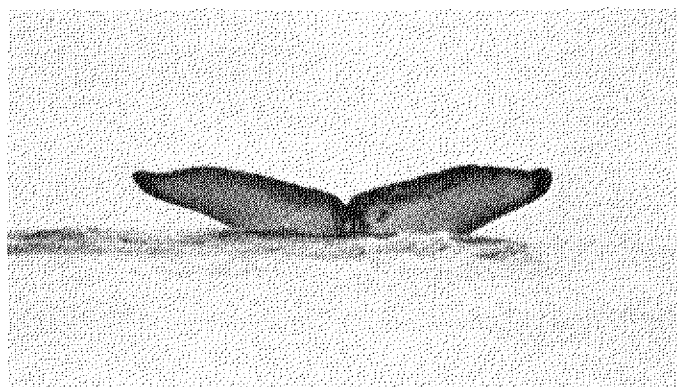
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389



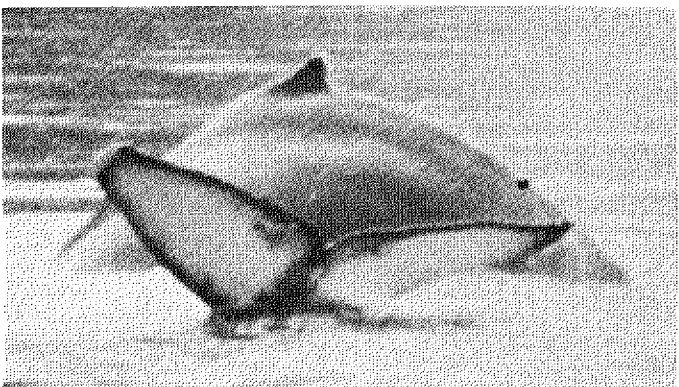
1967

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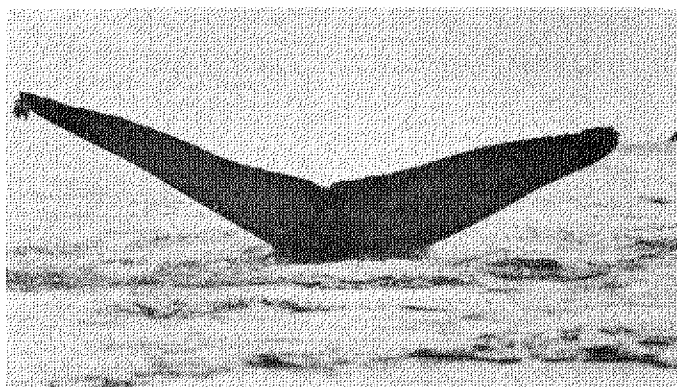
3305

455



1940

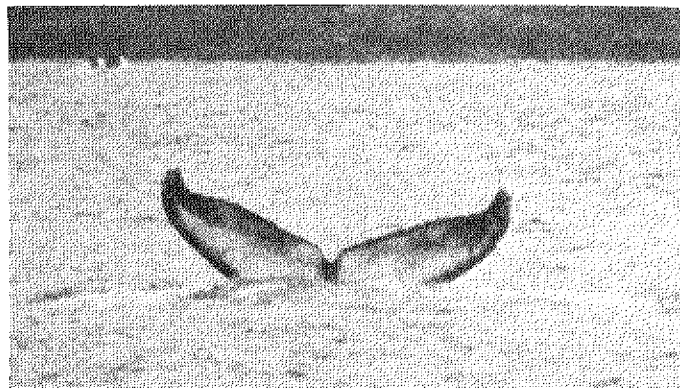
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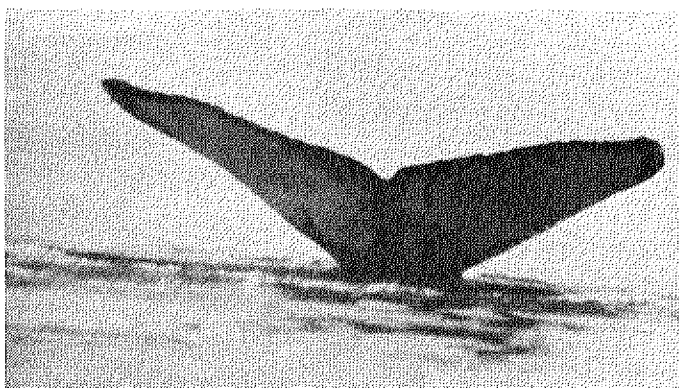
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# SOUTHEASTERN ALASKA



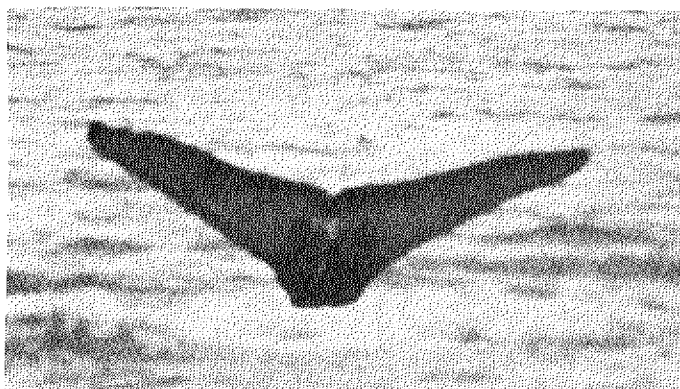
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385



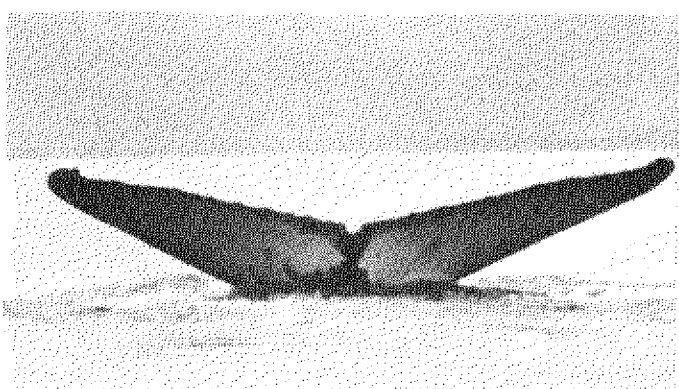
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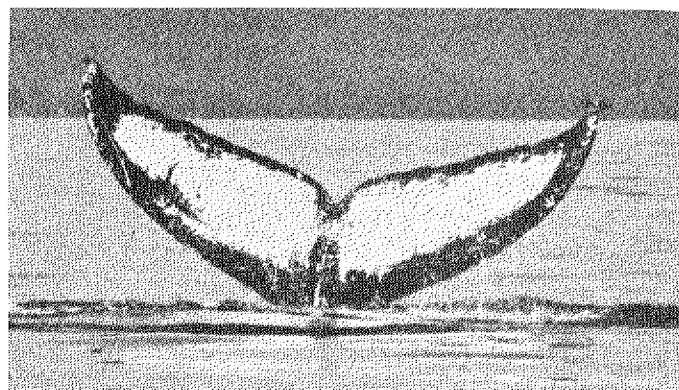
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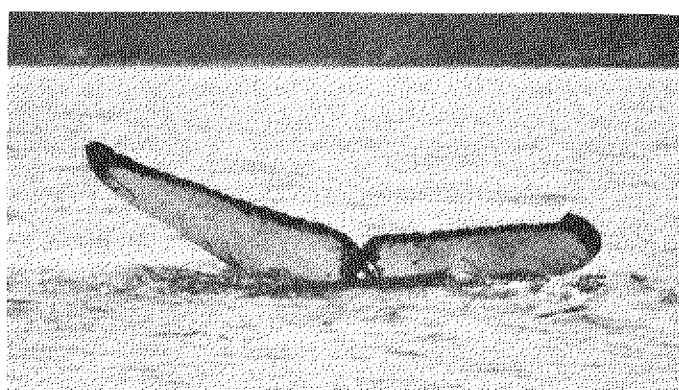
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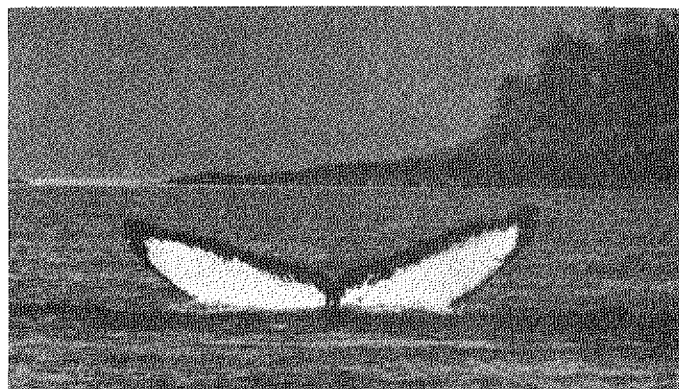
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78



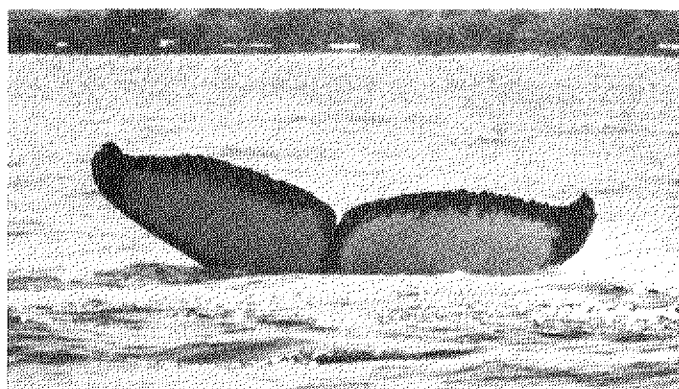
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510



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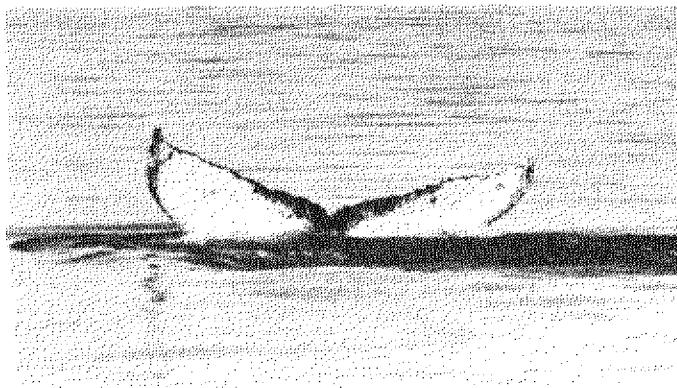
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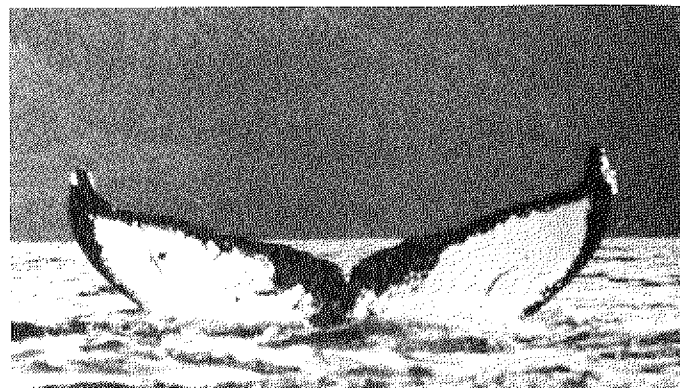
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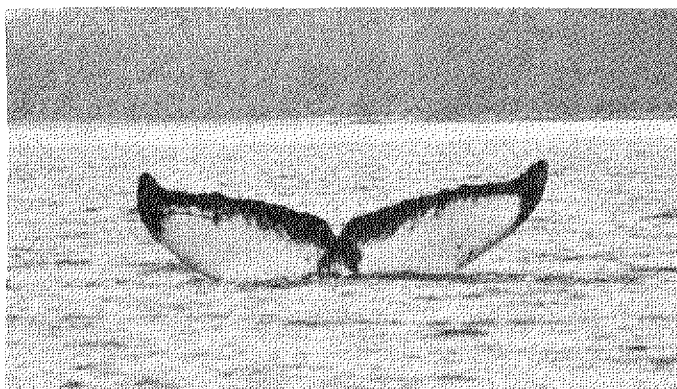
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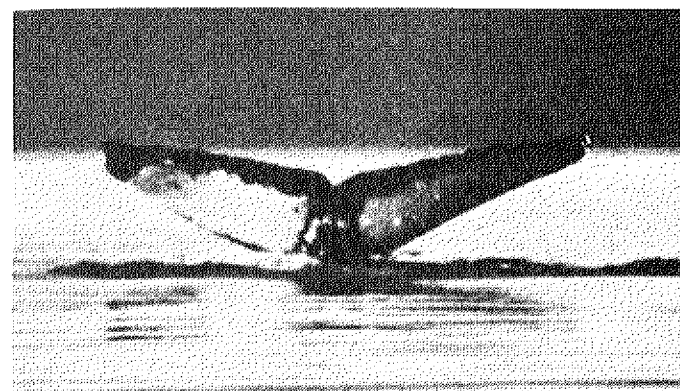
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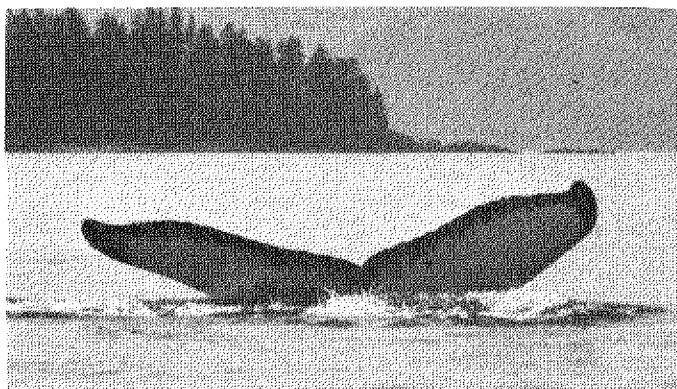
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509



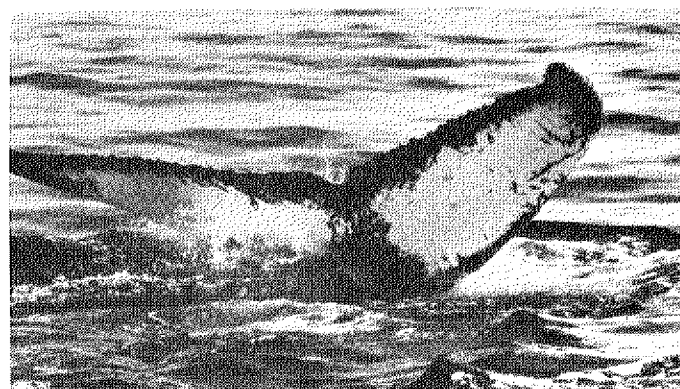
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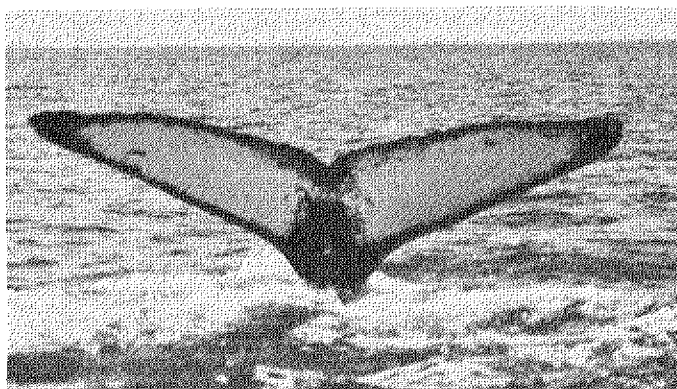
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508



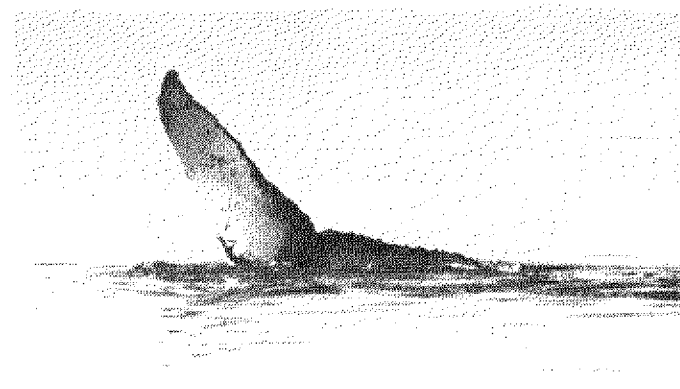
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122



2179

120

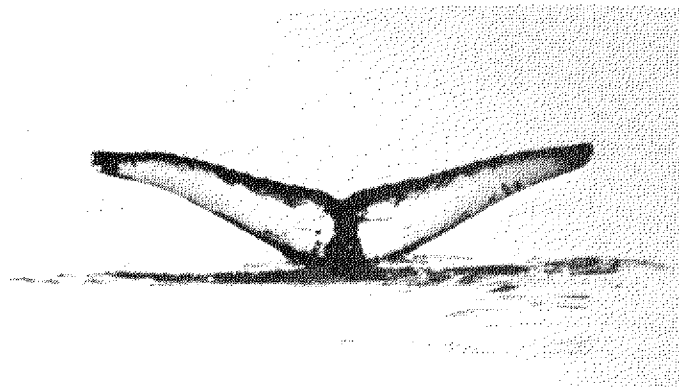


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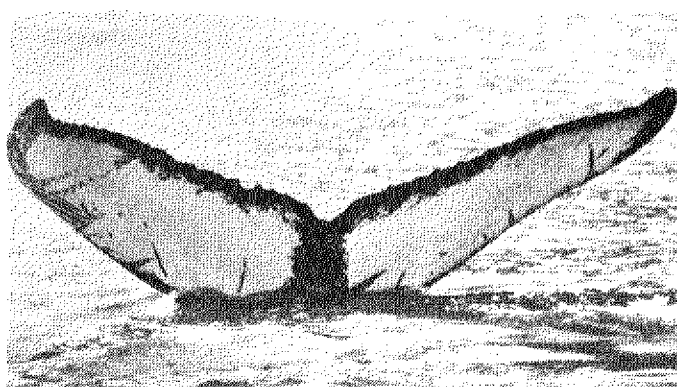


# SOUTHEASTERN ALASKA



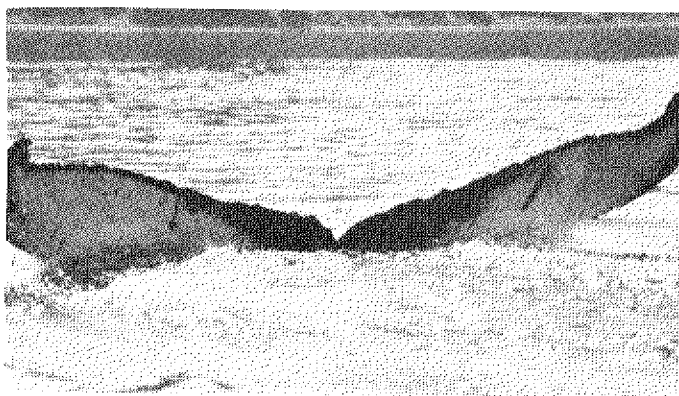
1937

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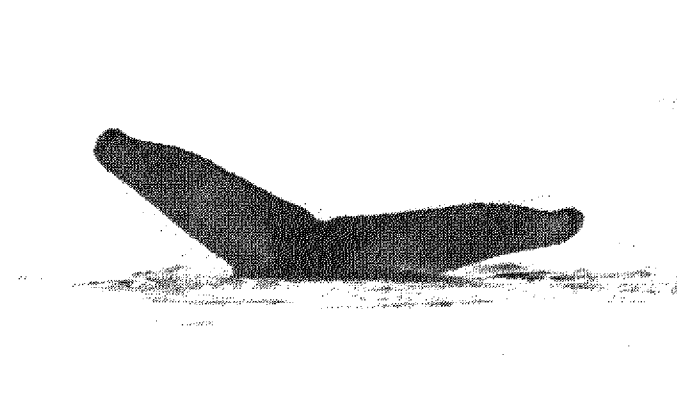
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161



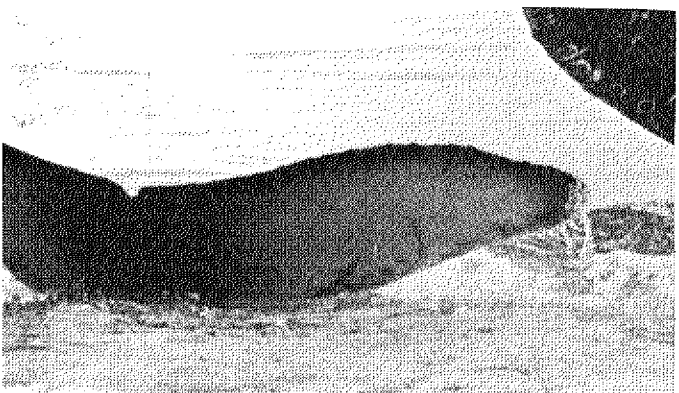
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416



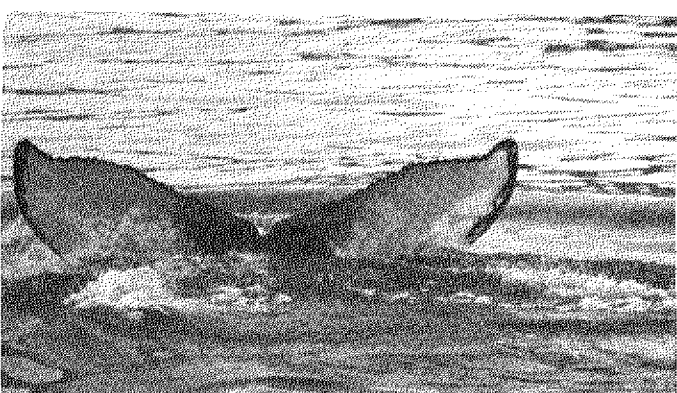
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197



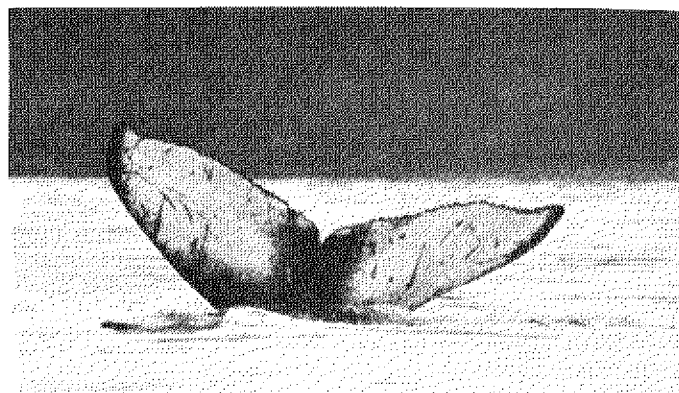
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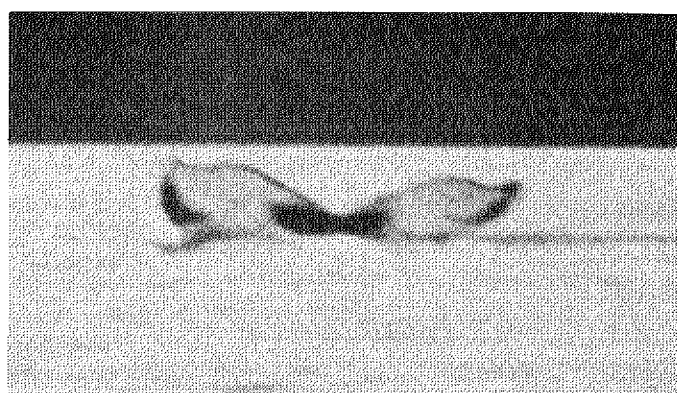
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352



3447

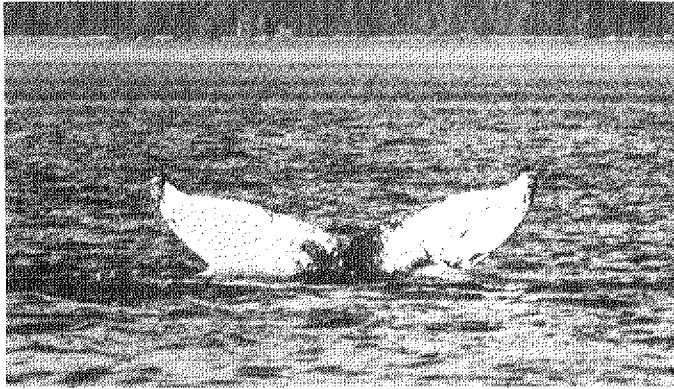
349



1900

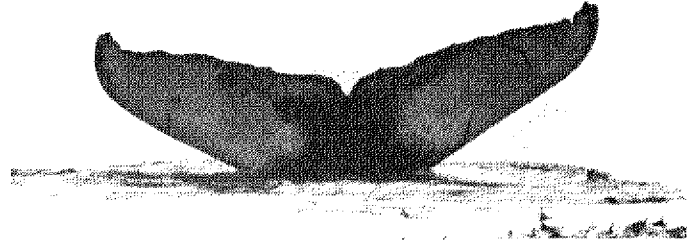
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# SOUTHEASTERN ALASKA



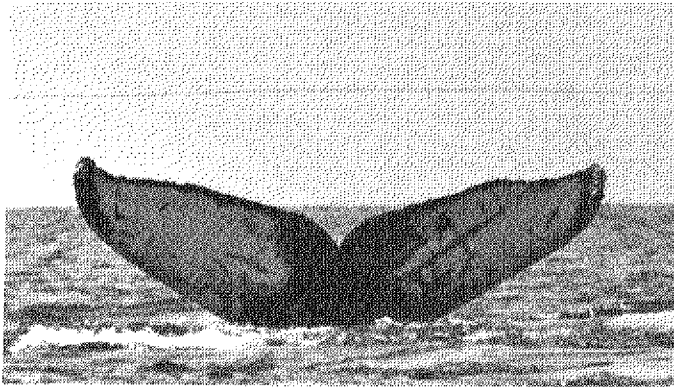
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1212

169



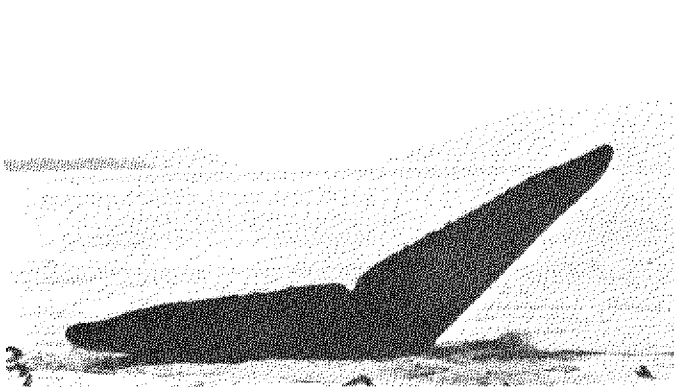
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50



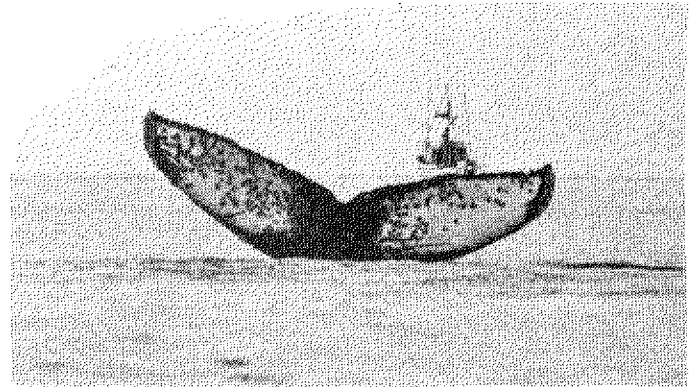
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276



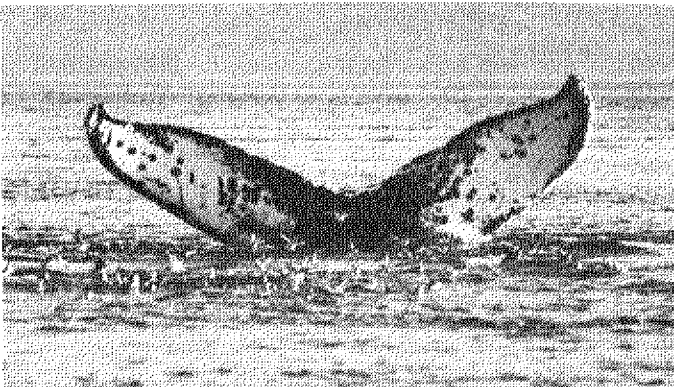
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241



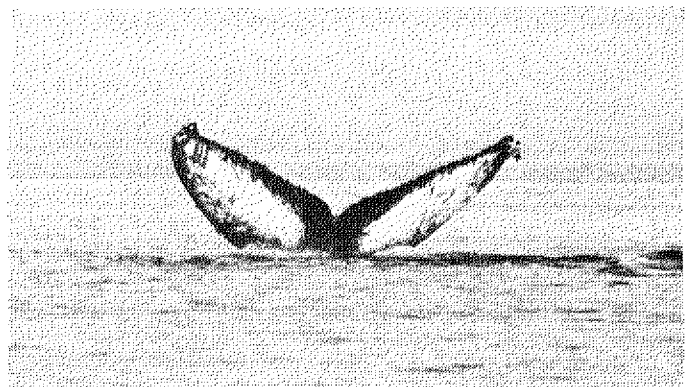
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522



1205

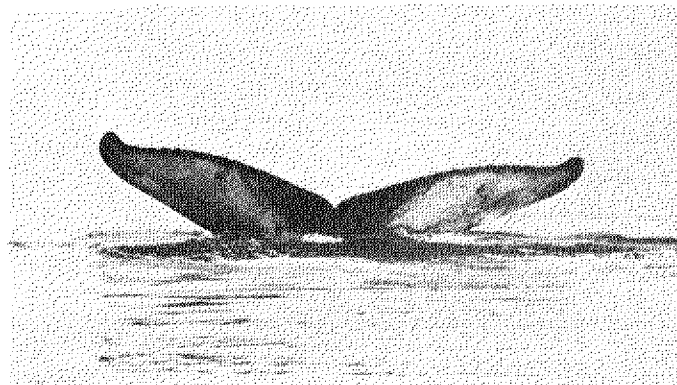
519



829

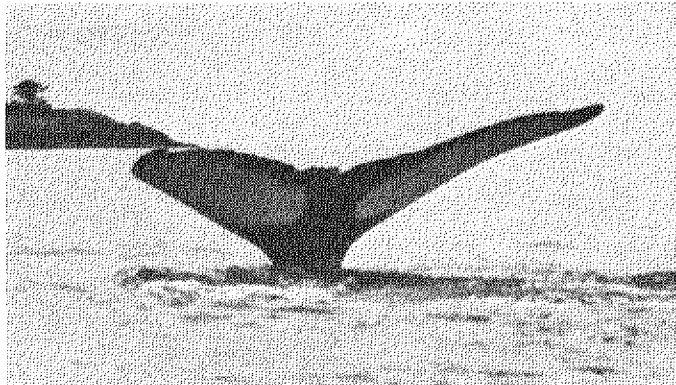
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# SOUTHEASTERN ALASKA



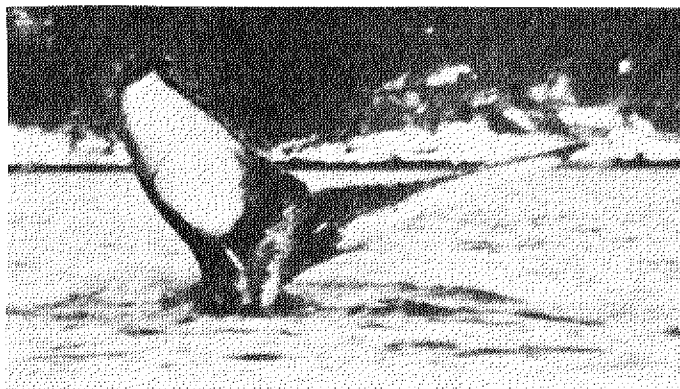
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393



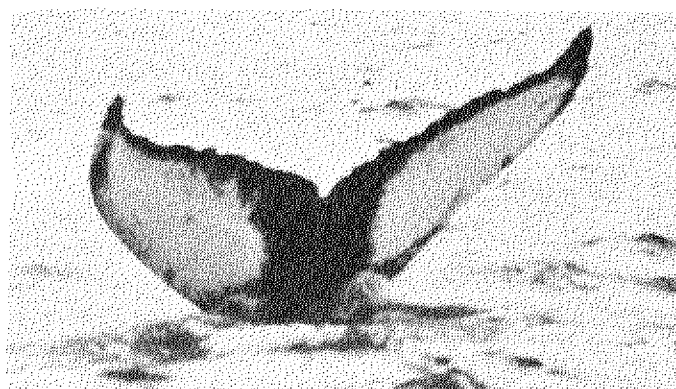
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221



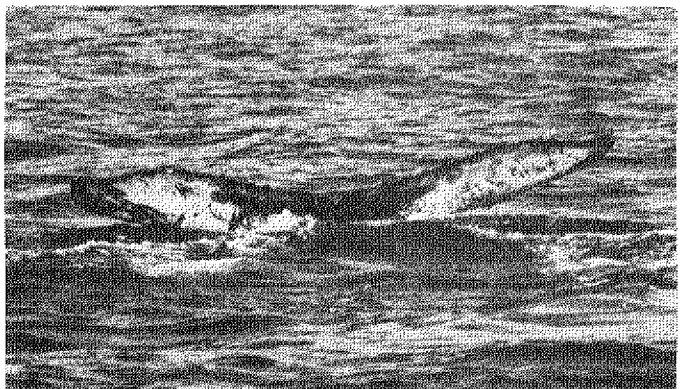
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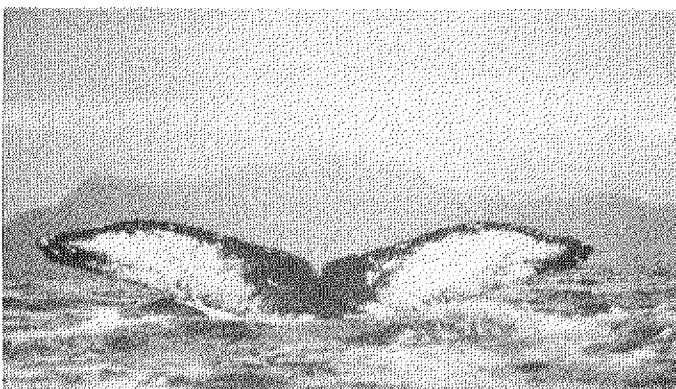
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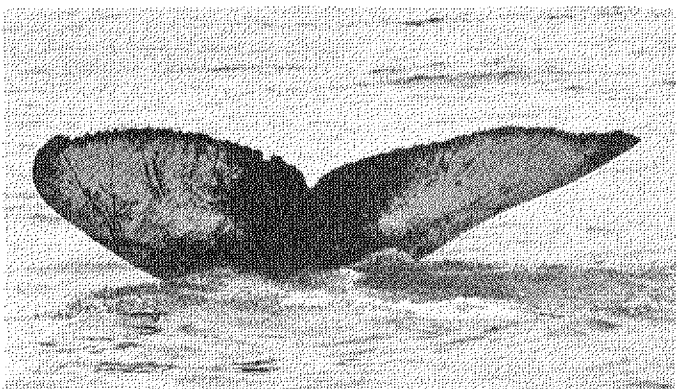
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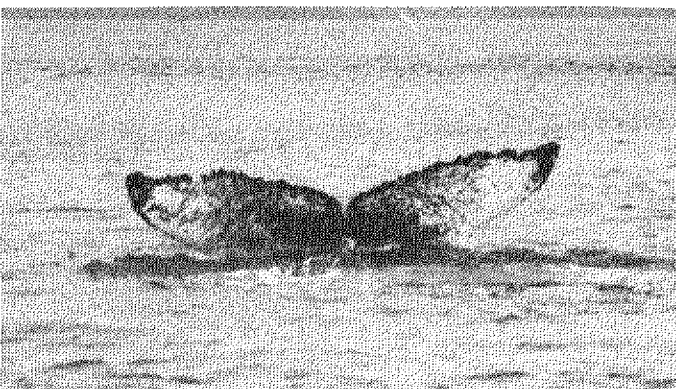
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1243

516



1635

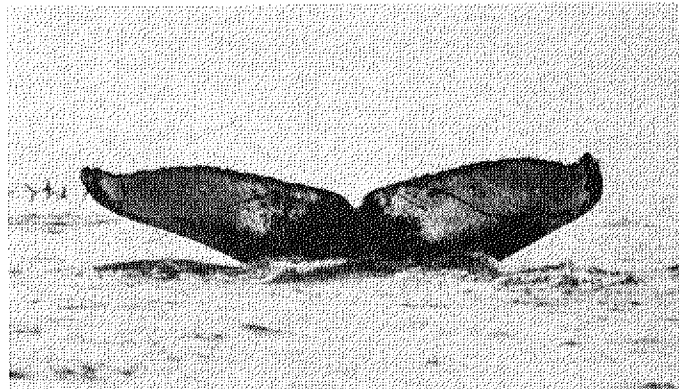
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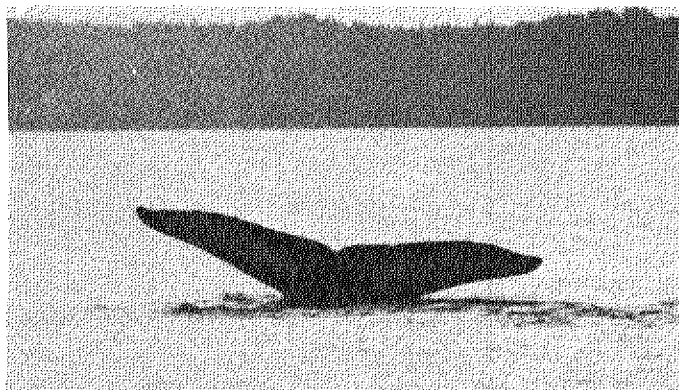
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512



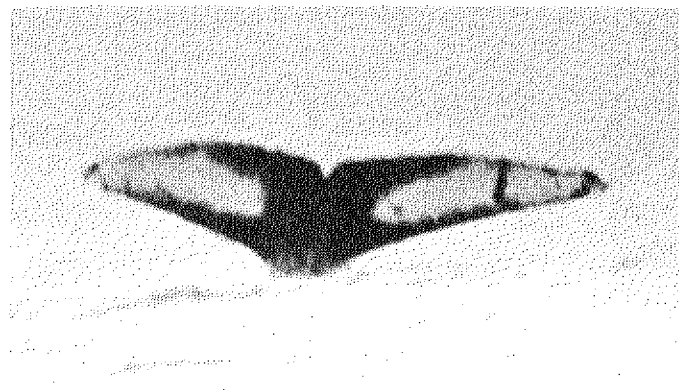
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22



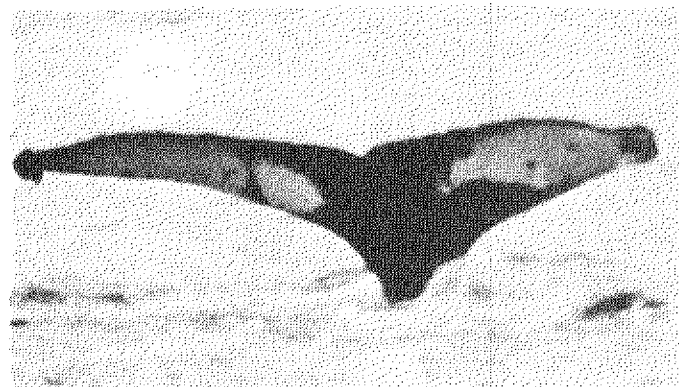
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267



3850

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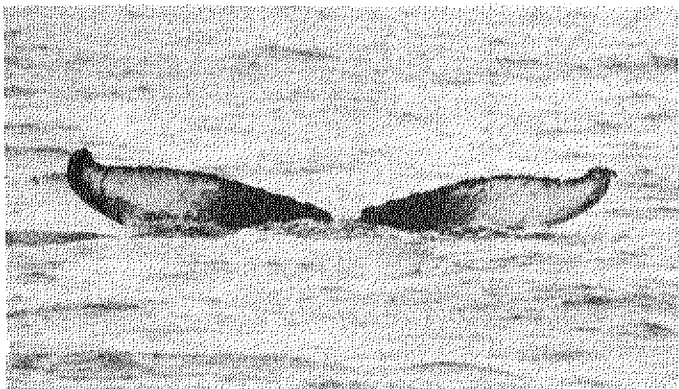
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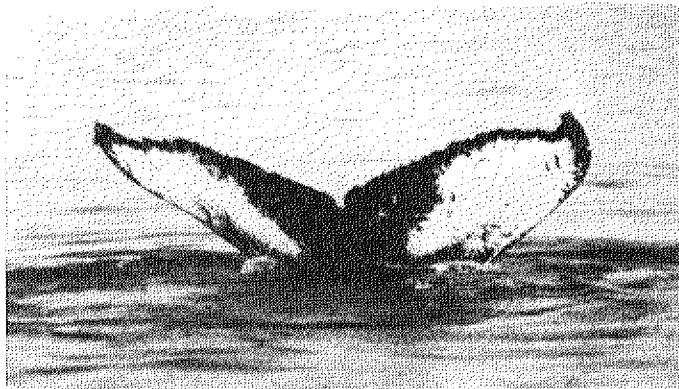
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3712

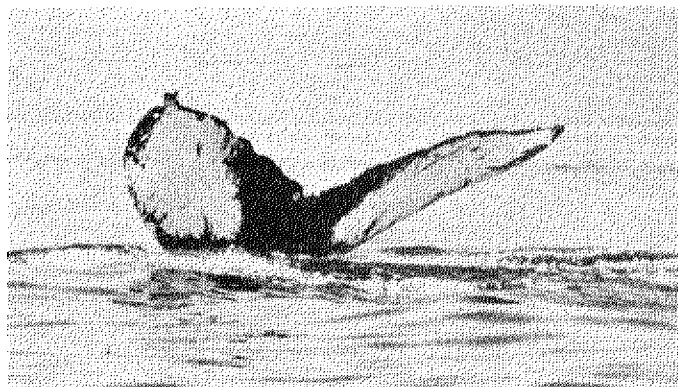
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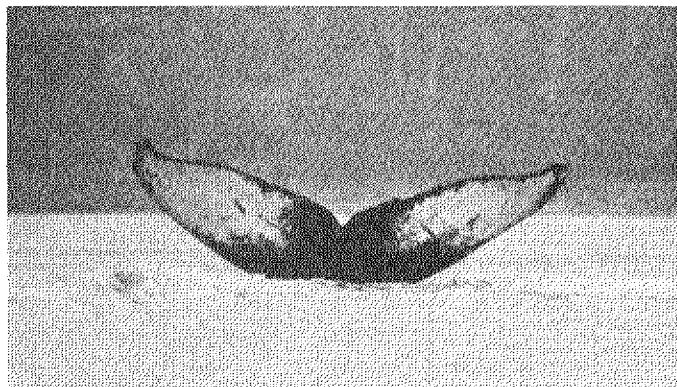
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# SOUTHEASTERN ALASKA



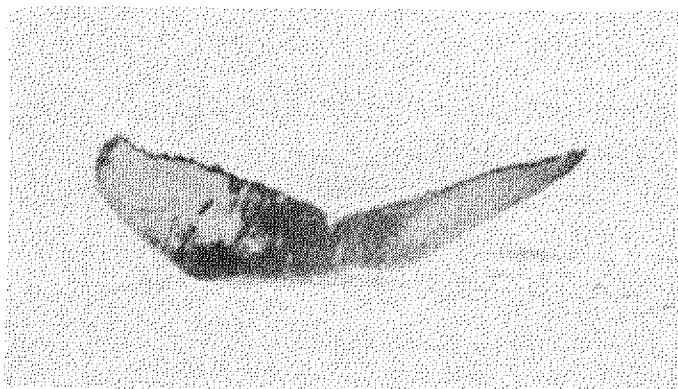
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3444

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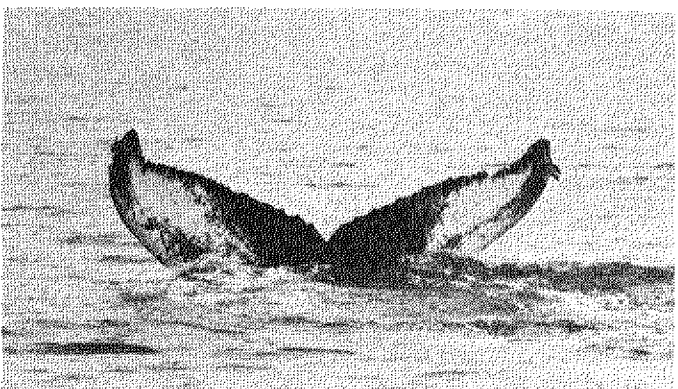
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329



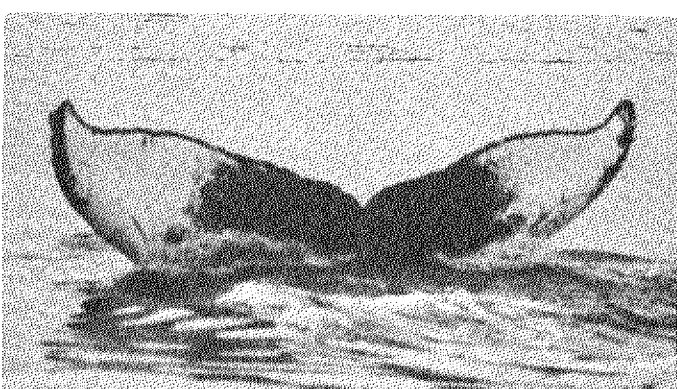
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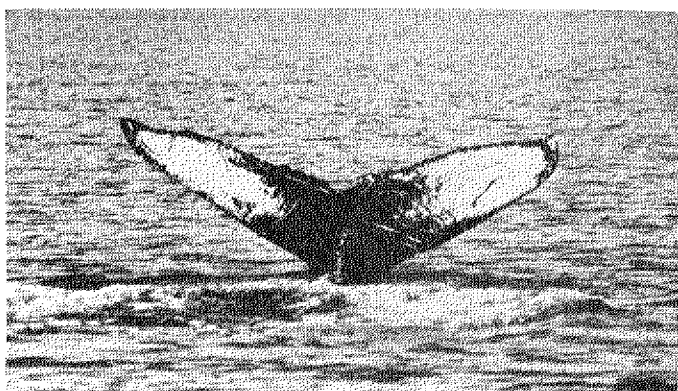
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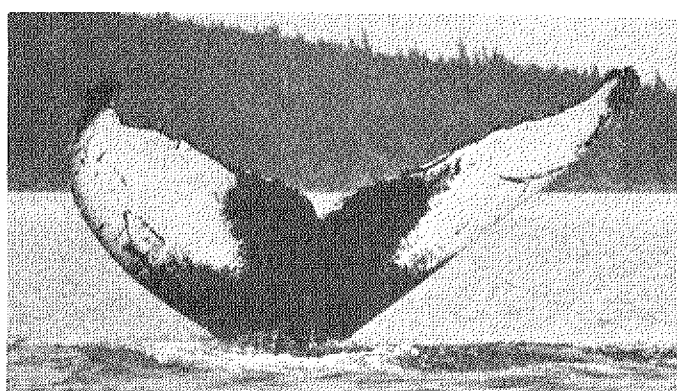
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458



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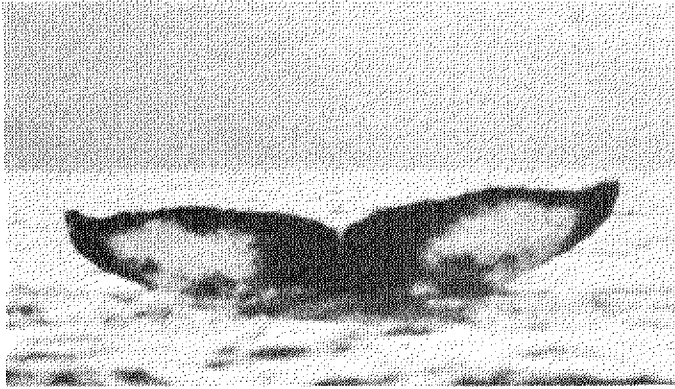
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768

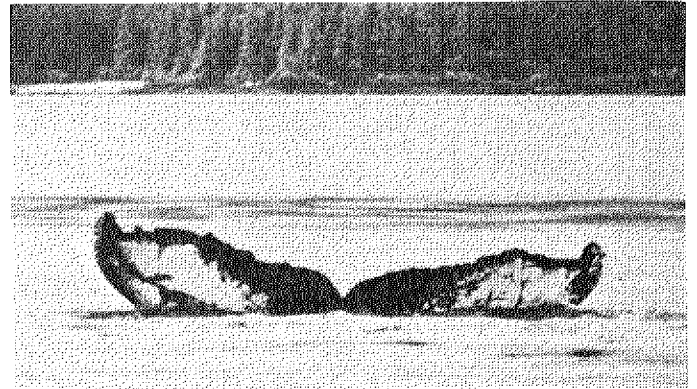
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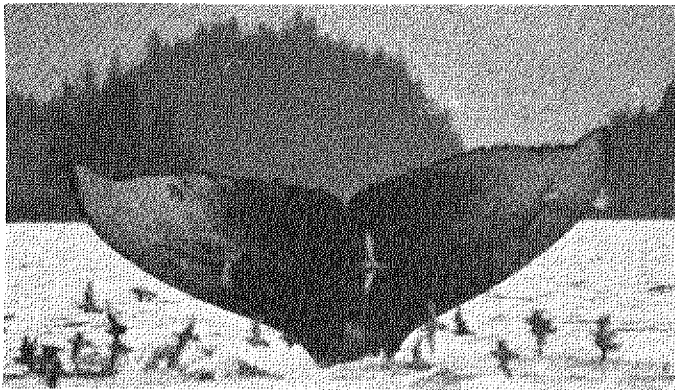
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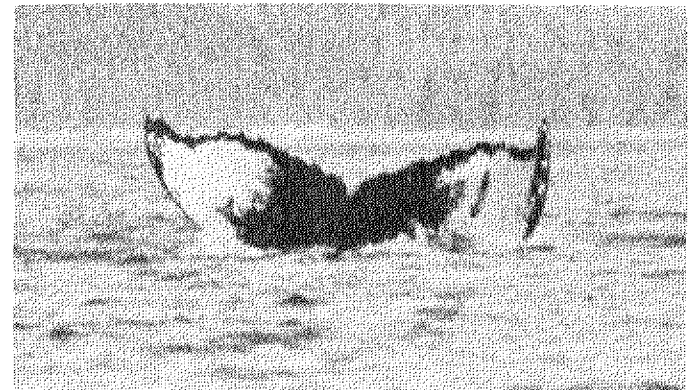
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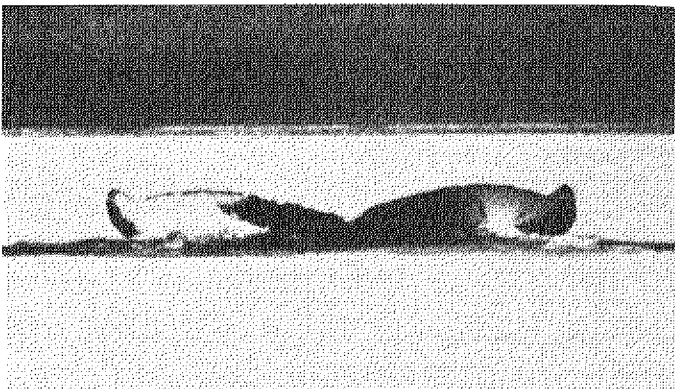
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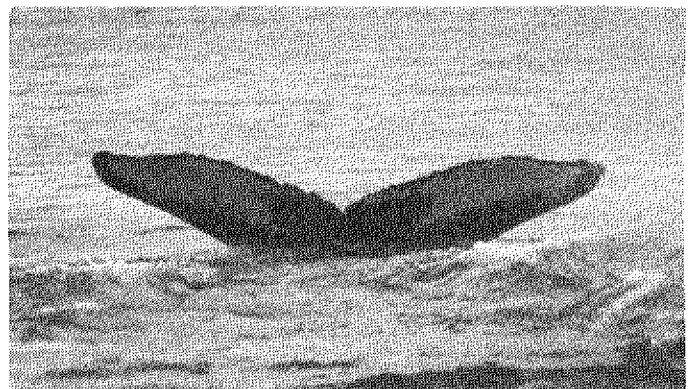
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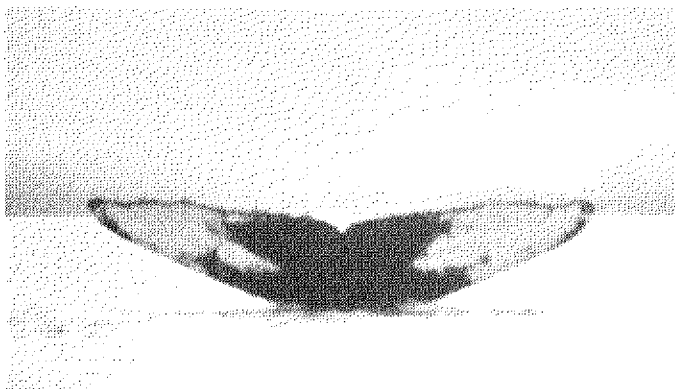
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3301

513



2517

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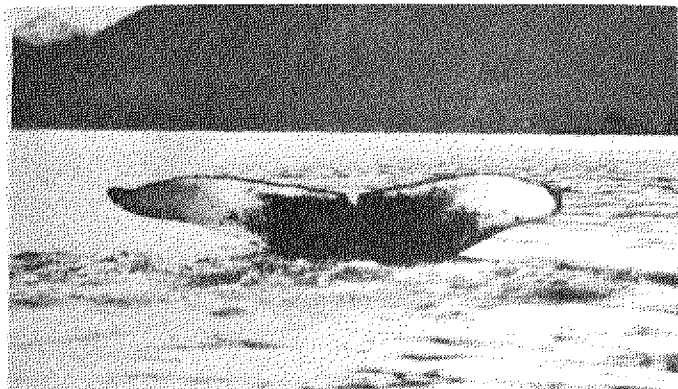


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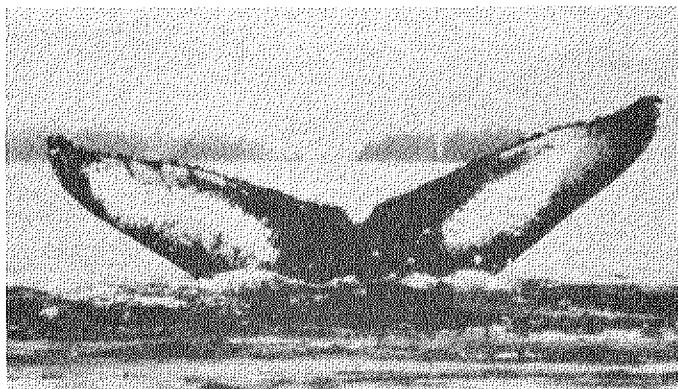


# SOUTHEASTERN ALASKA



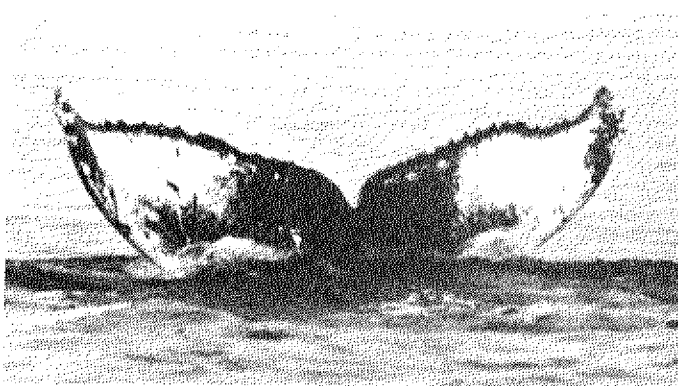
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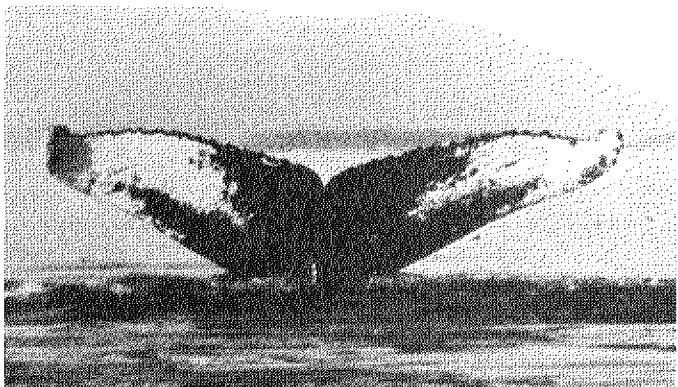
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515



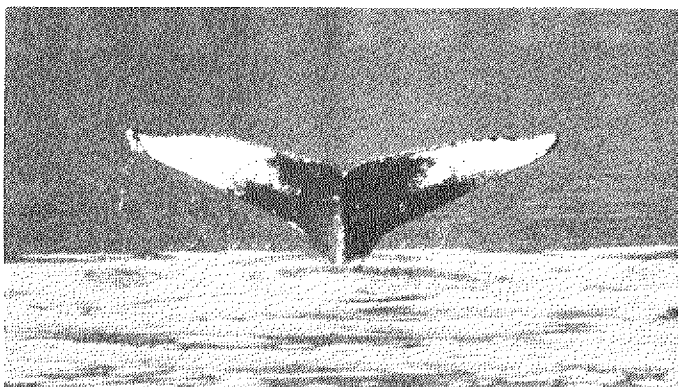
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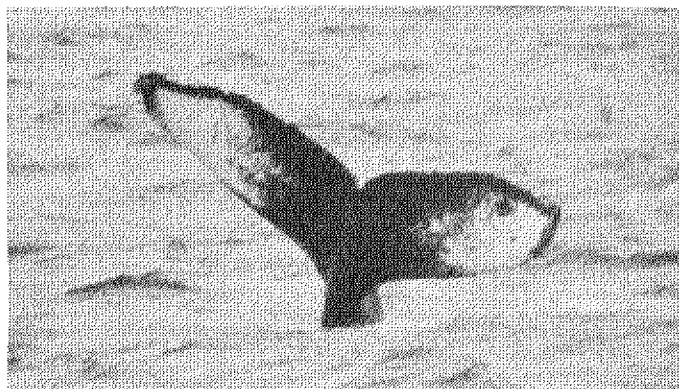
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3179

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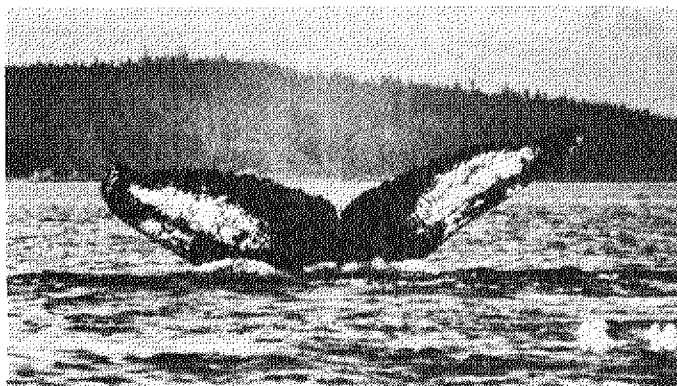
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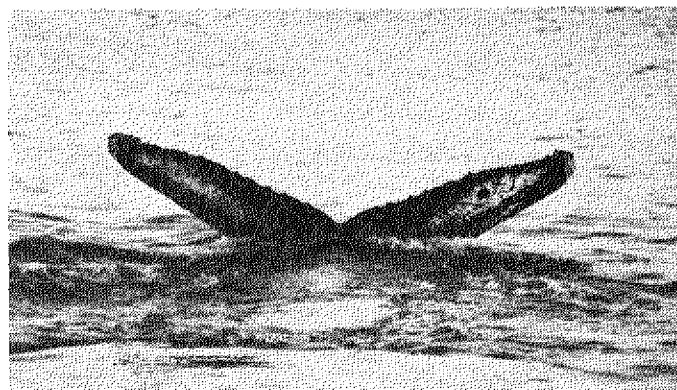
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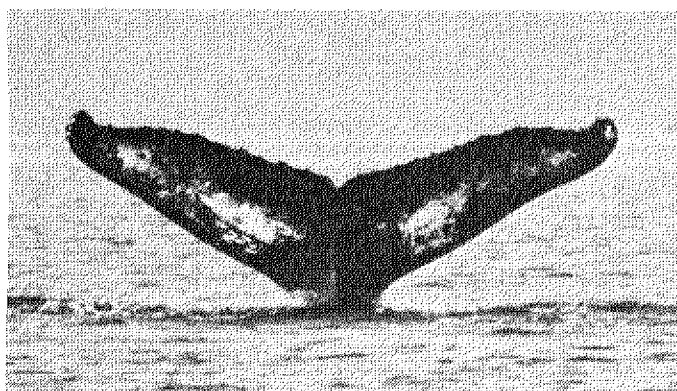
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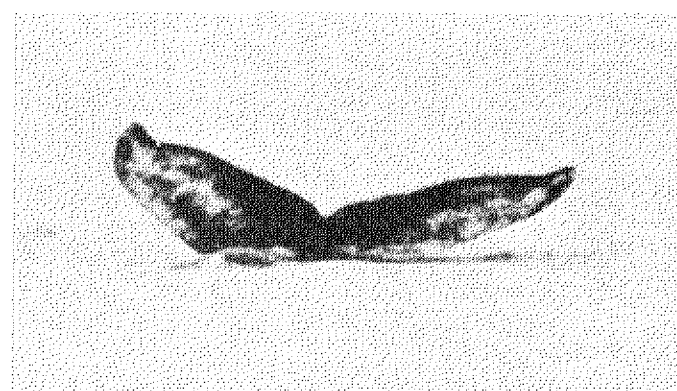
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482



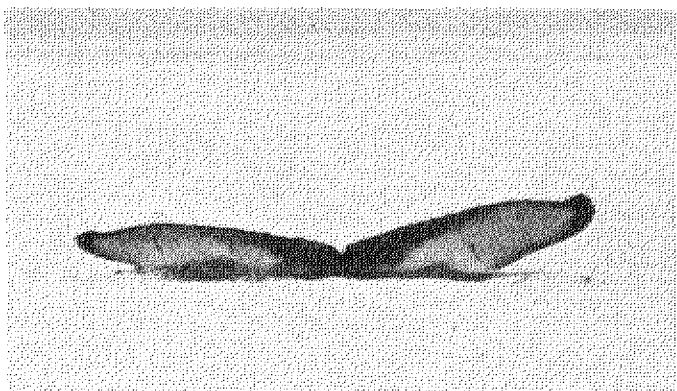
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211



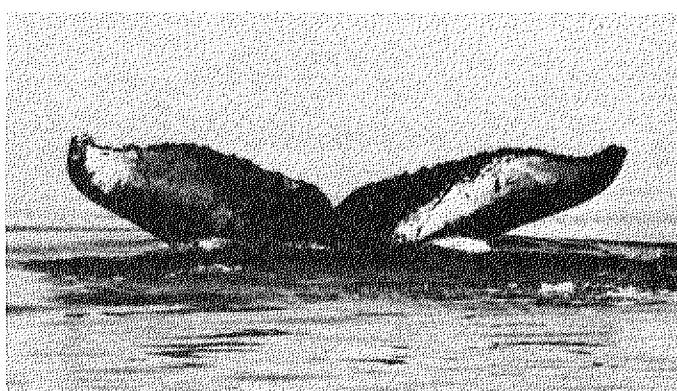
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170



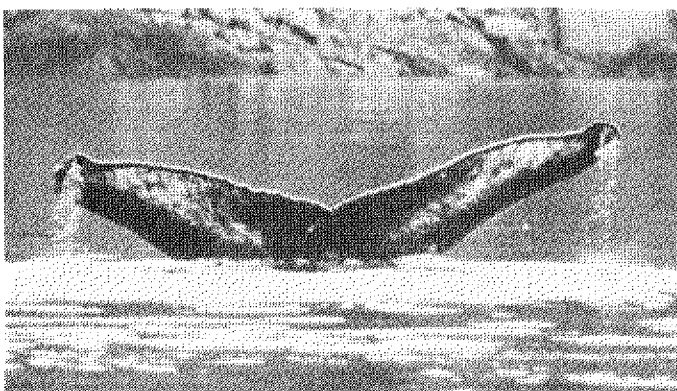
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271



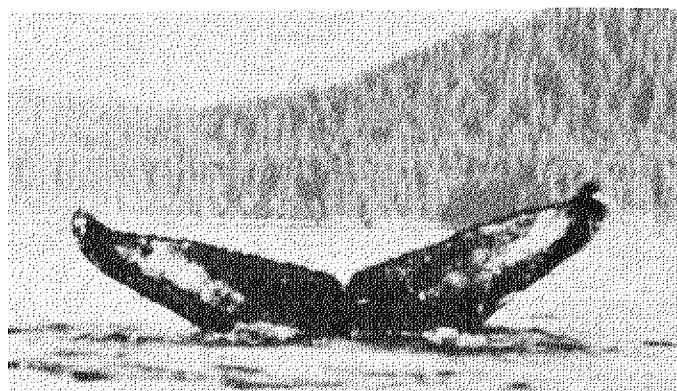
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392



803

523

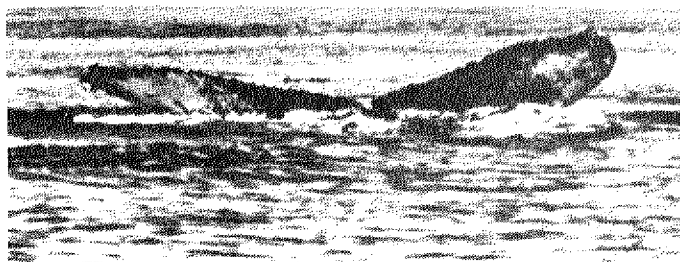


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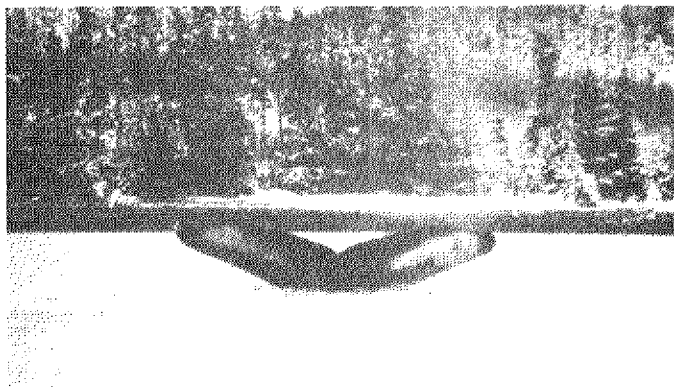


# SOUTHEASTERN ALASKA



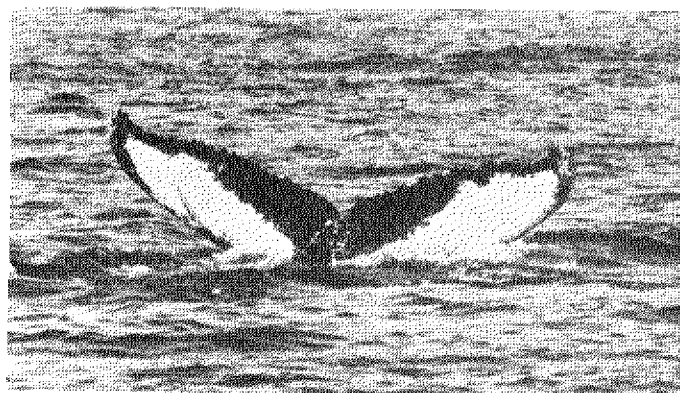
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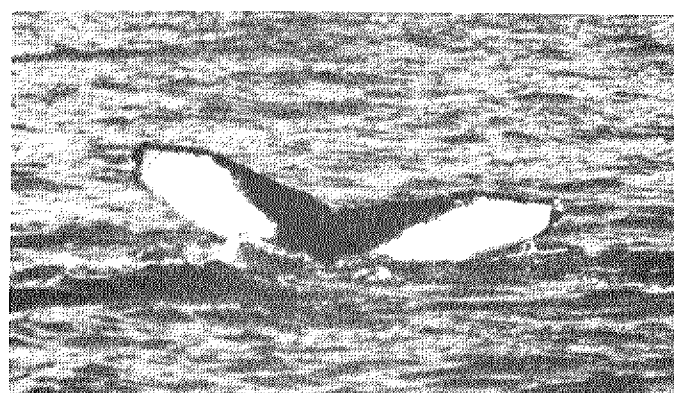
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278



3228

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3226

198



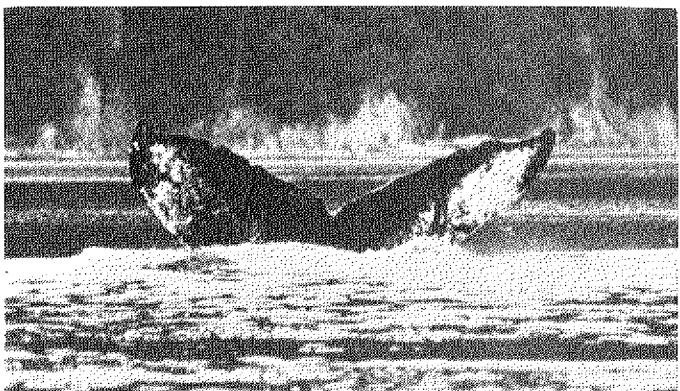
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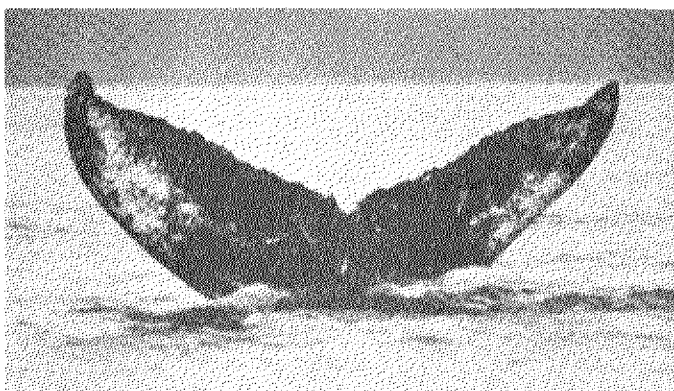
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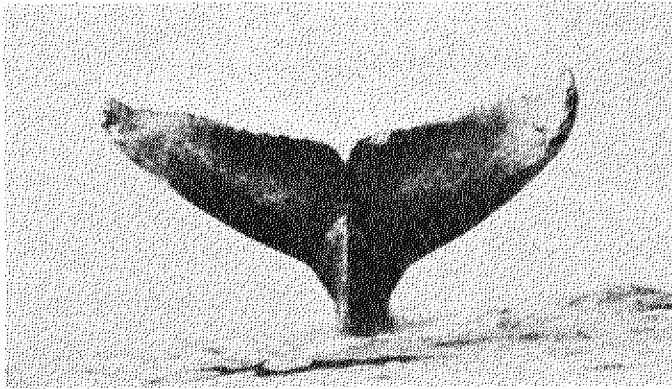
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2877

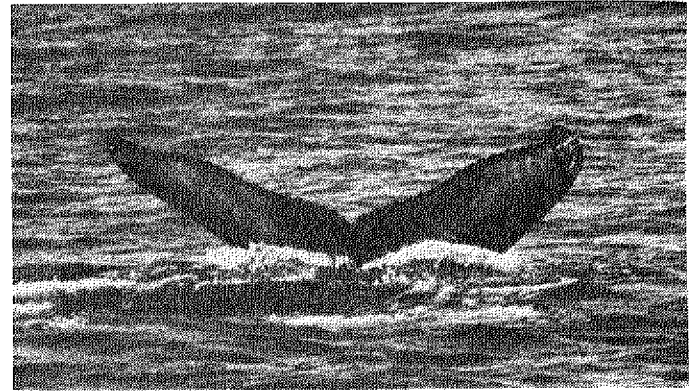
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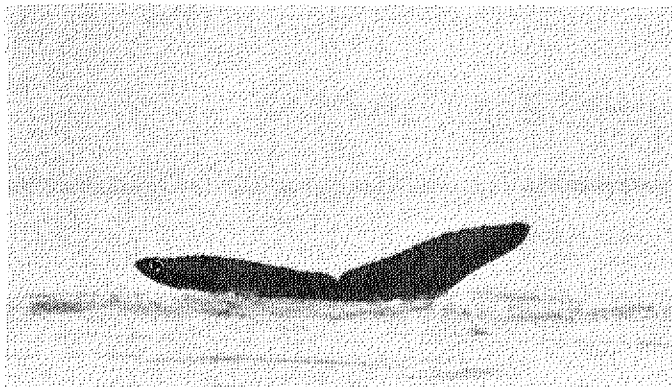
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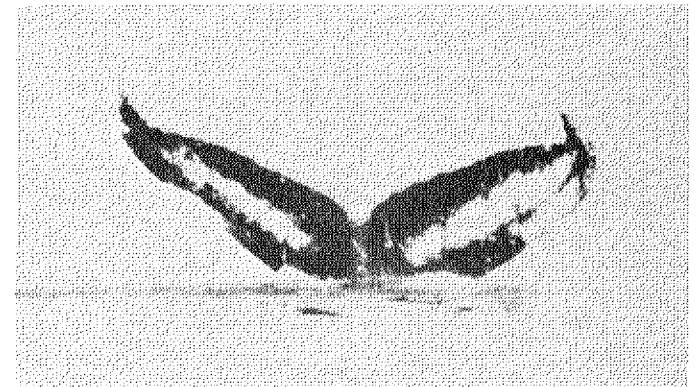
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3839

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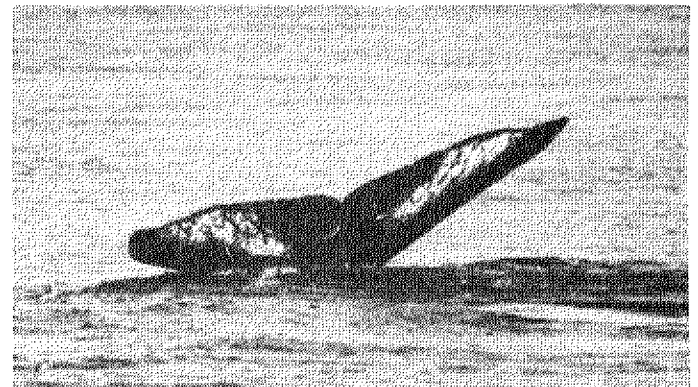
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318



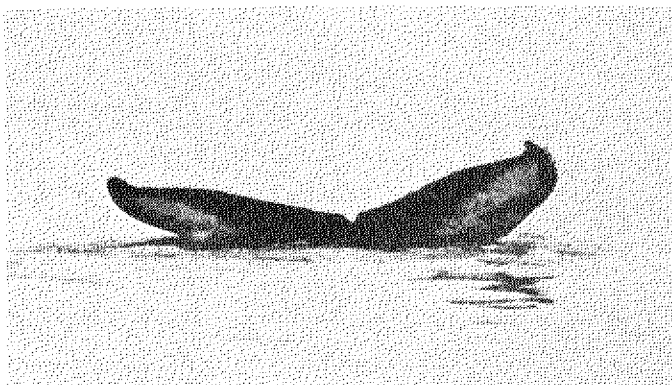
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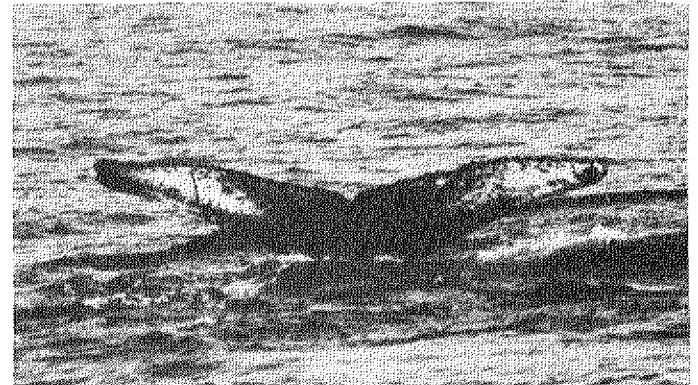
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811



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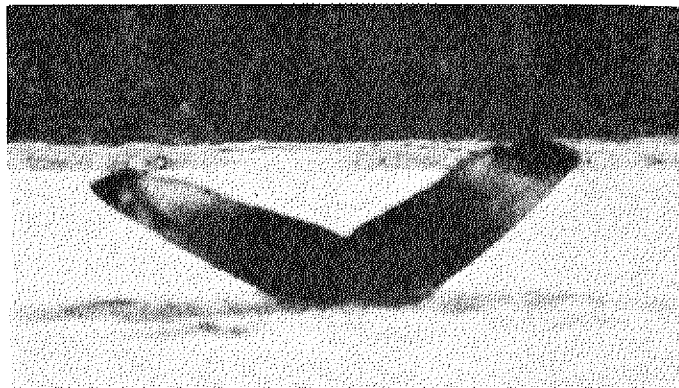
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3243

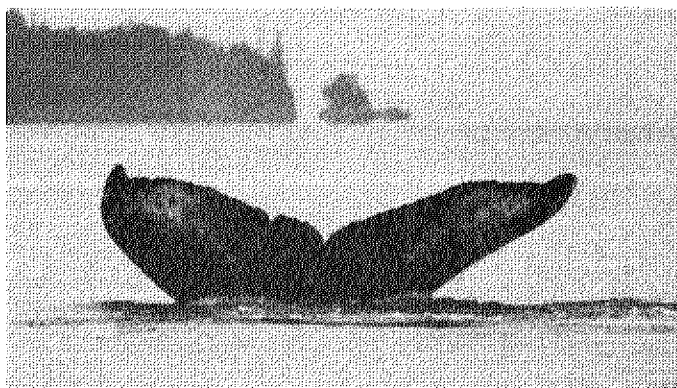
391

# SOUTHEASTERN ALASKA



4181

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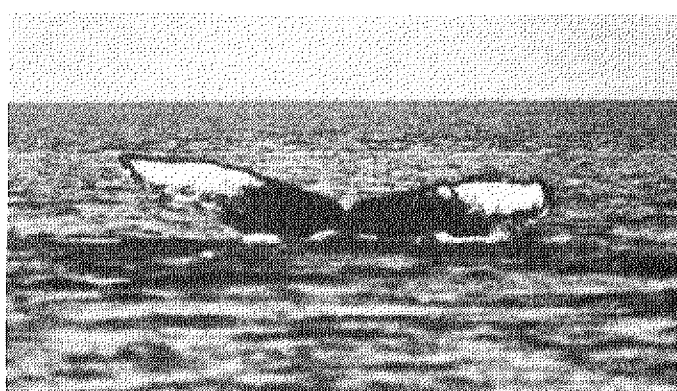
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184



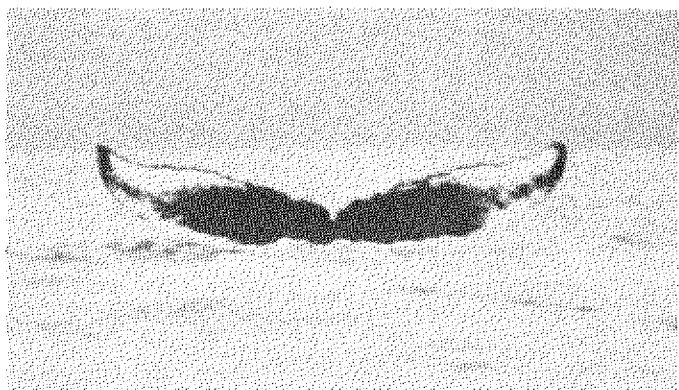
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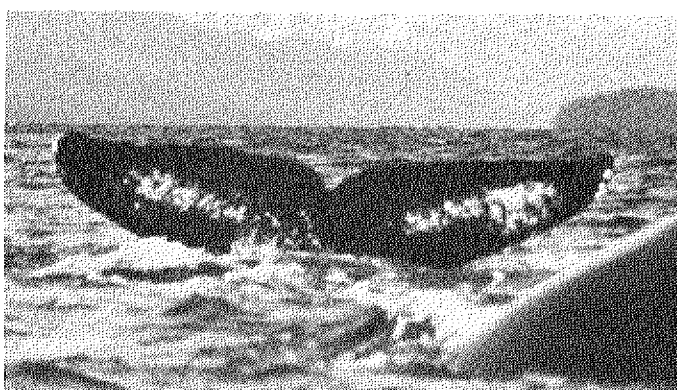
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266



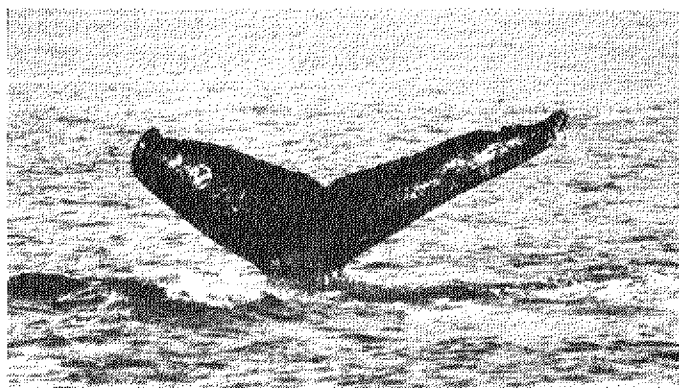
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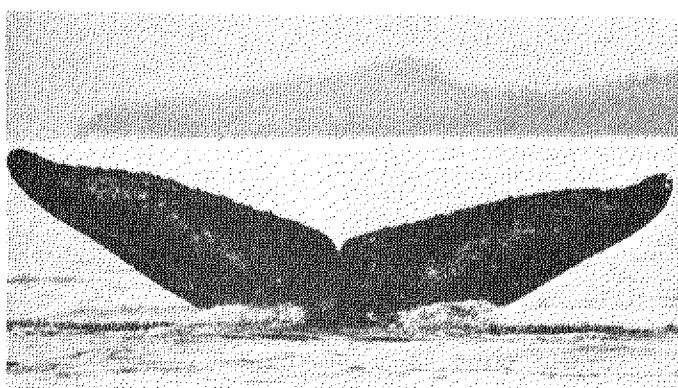
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3390

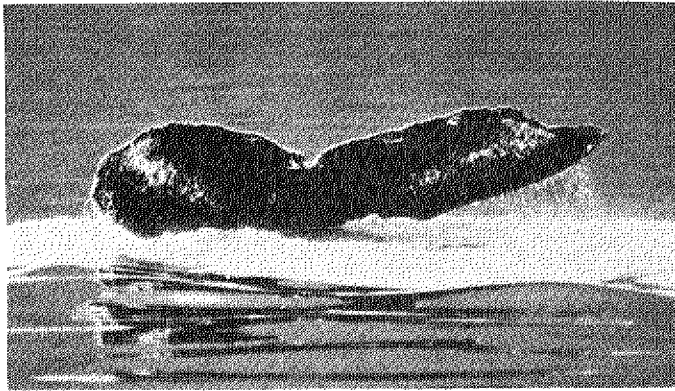
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1314

190





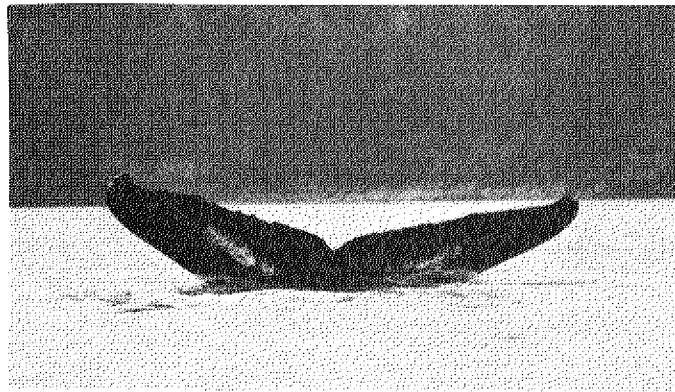
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577



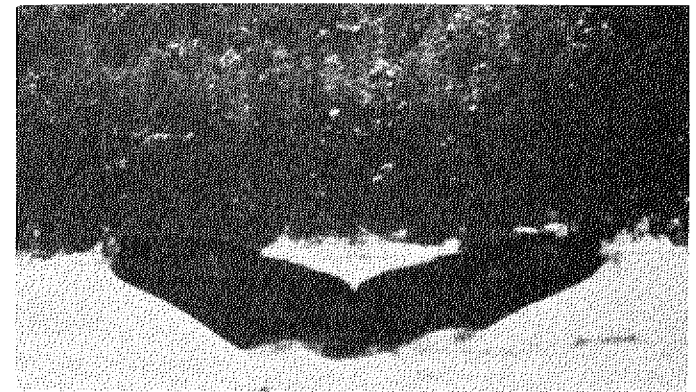
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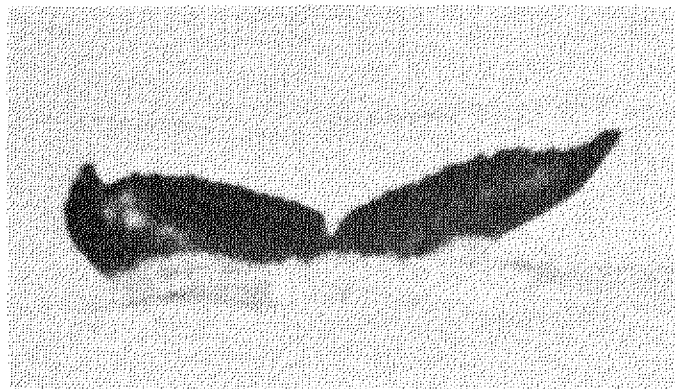
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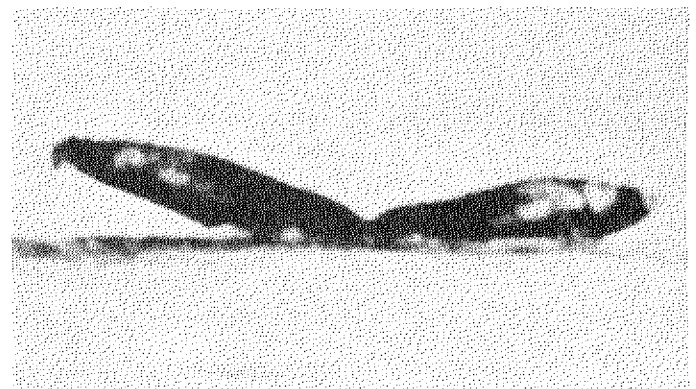
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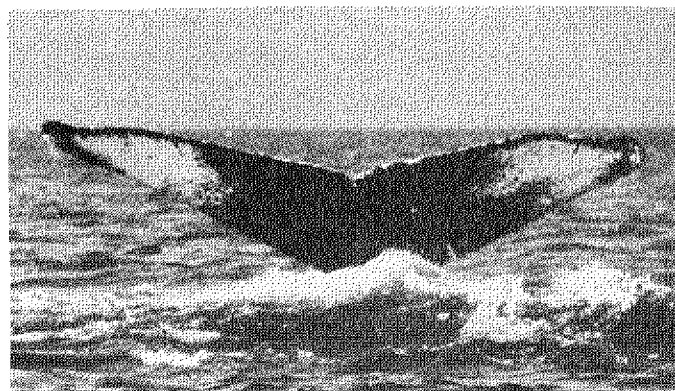
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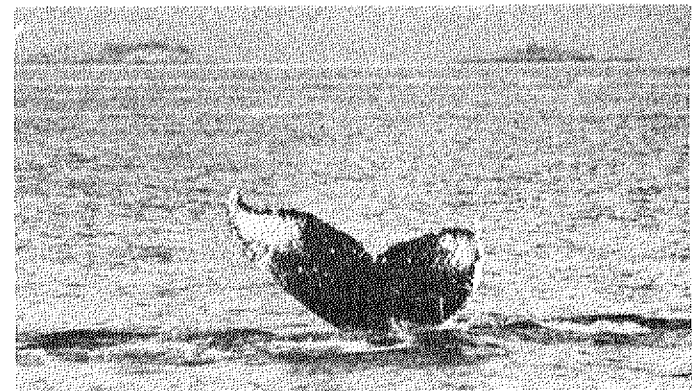
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877

526

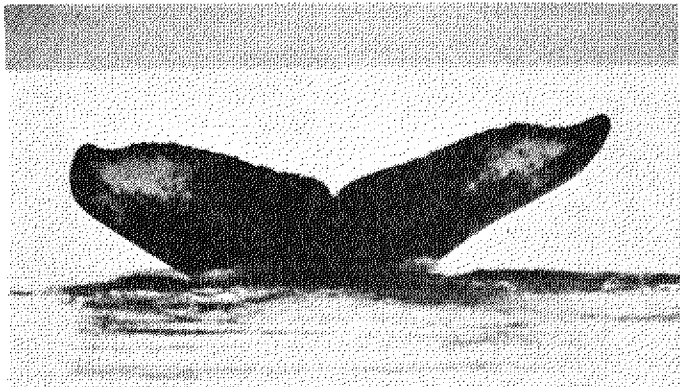


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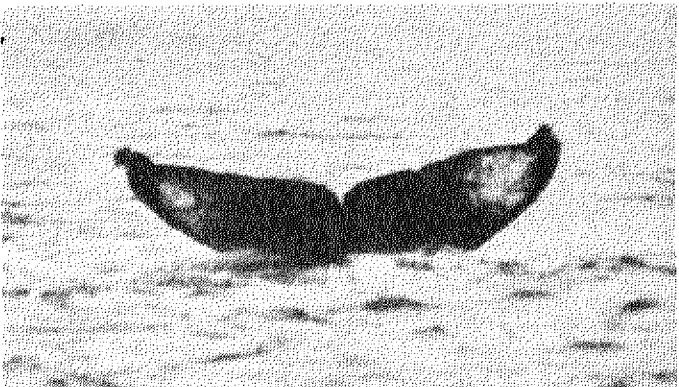


SOUTHEASTERN ALASKA



1251

525



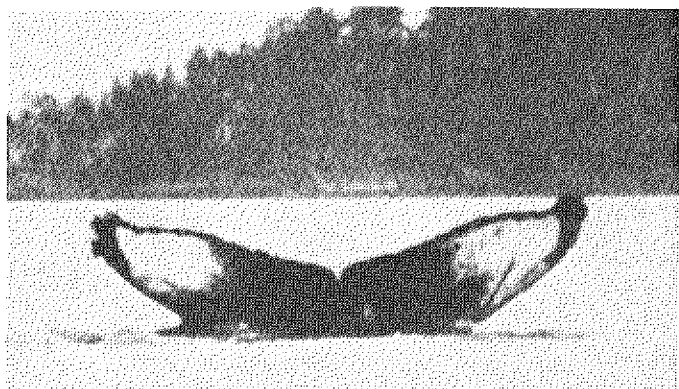
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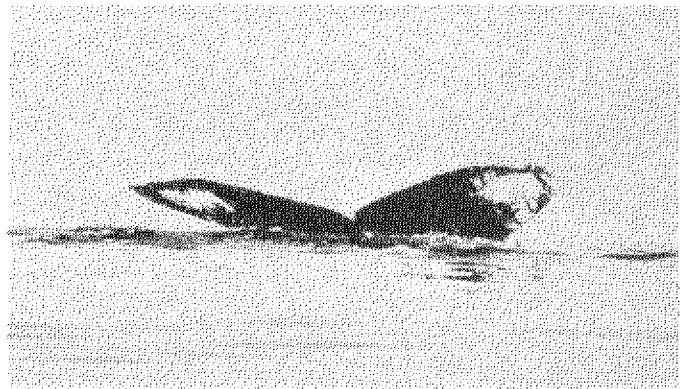
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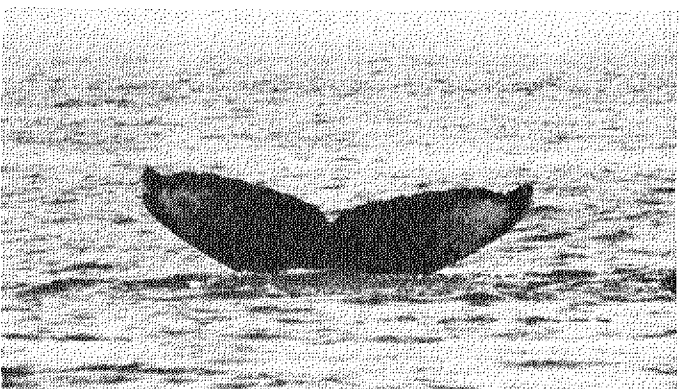
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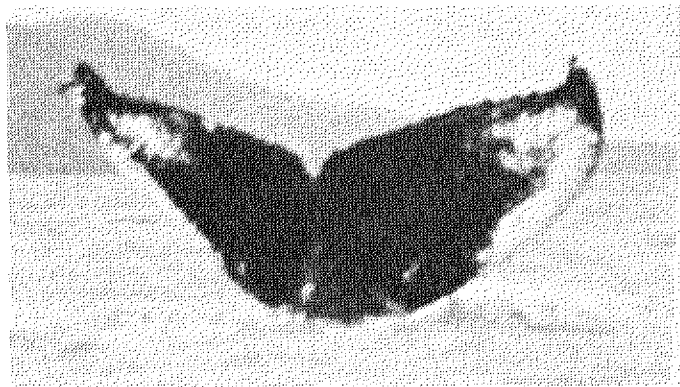
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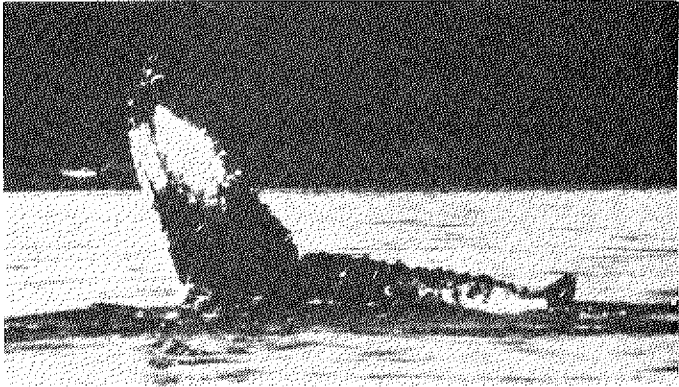
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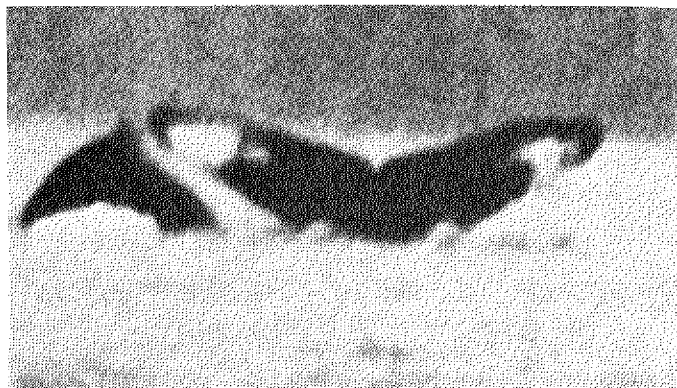
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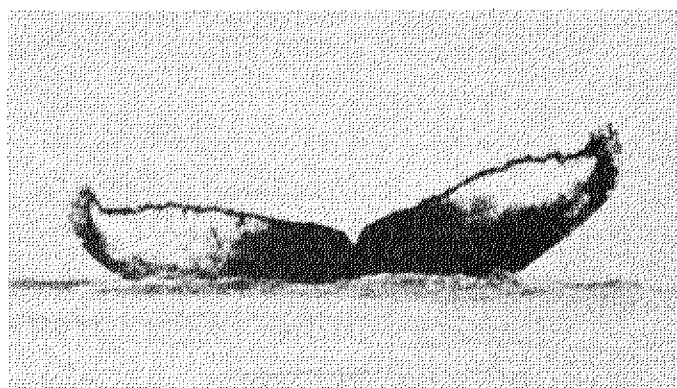
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# SOUTHEASTERN ALASKA



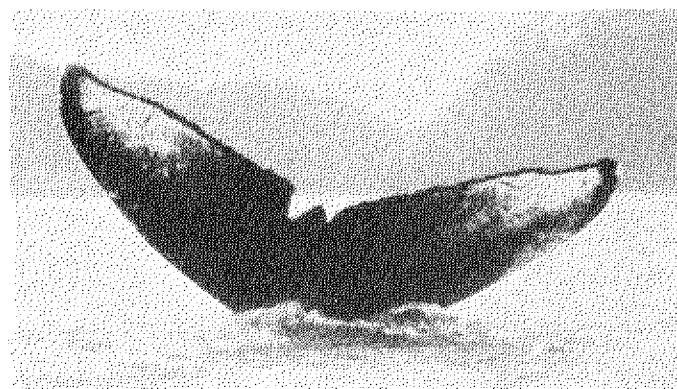
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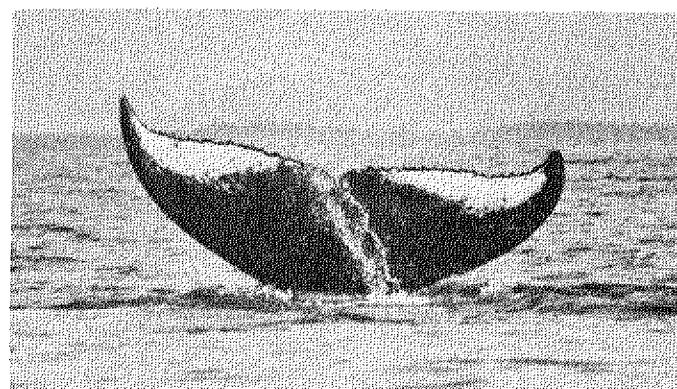
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484



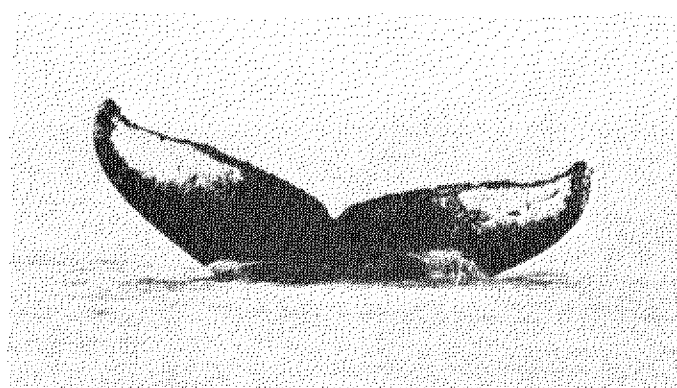
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453



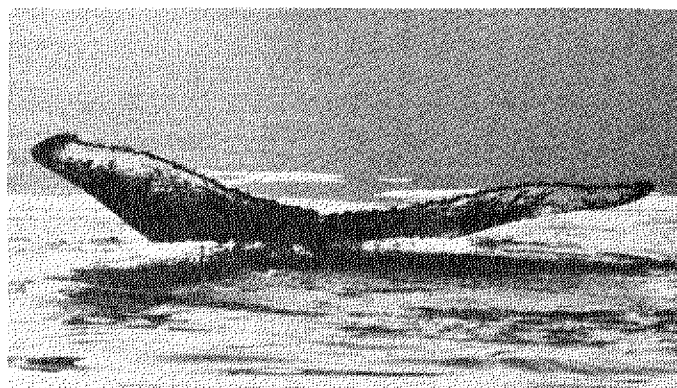
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185



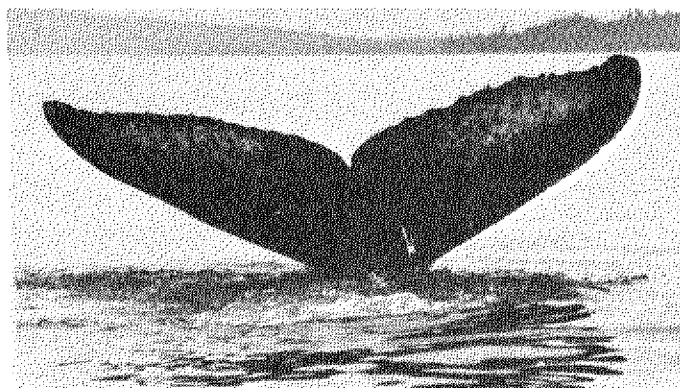
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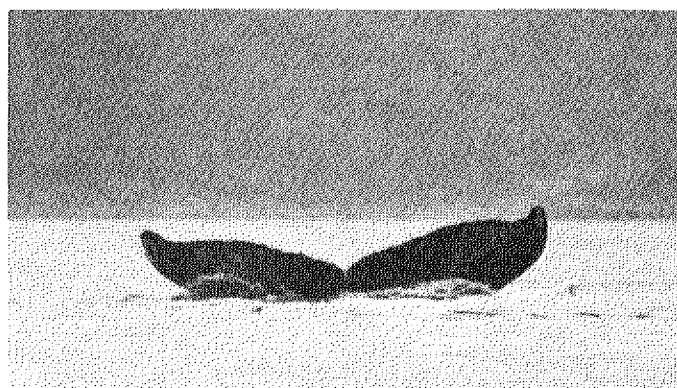
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203



1260

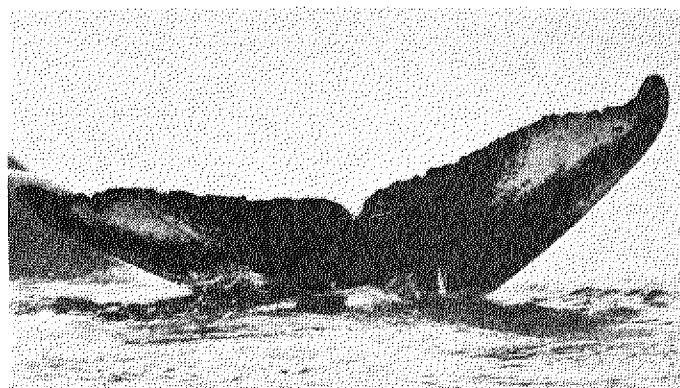
533



3445

0

SOUTHEASTERN ALASKA



3353

538



1370

45



1890

0



3692

0



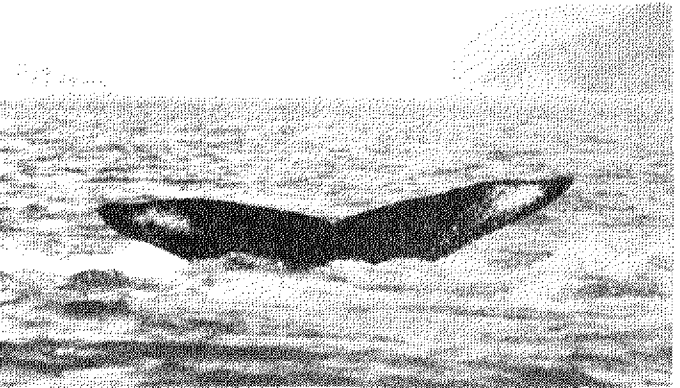
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531



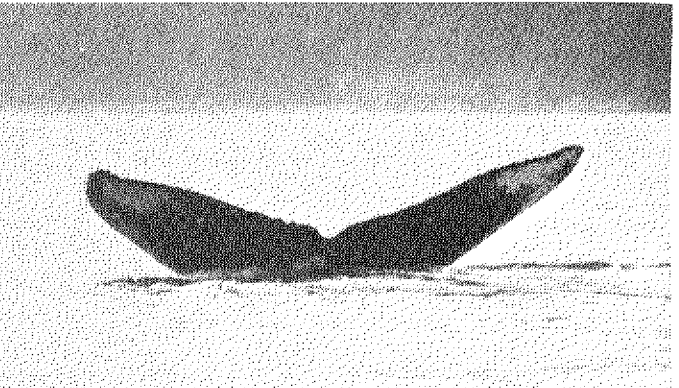
3103

394



1285

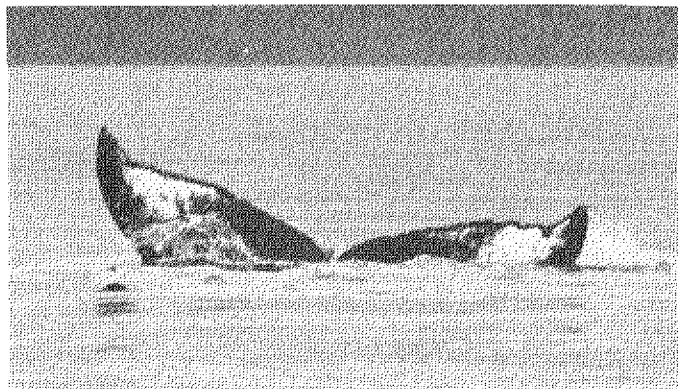
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1297

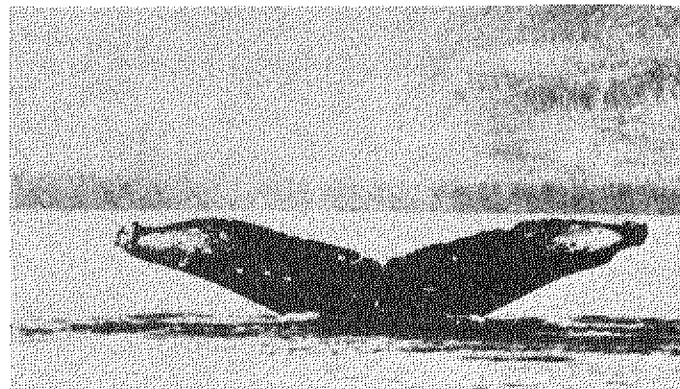
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918

528



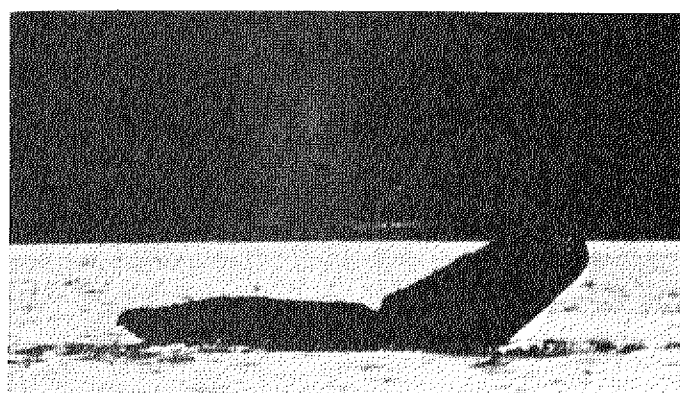
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265



1847

373



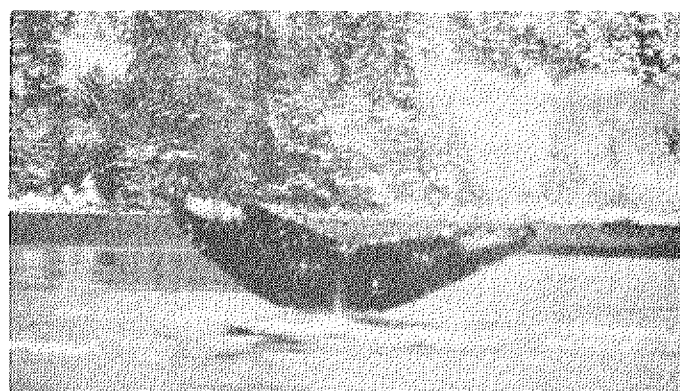
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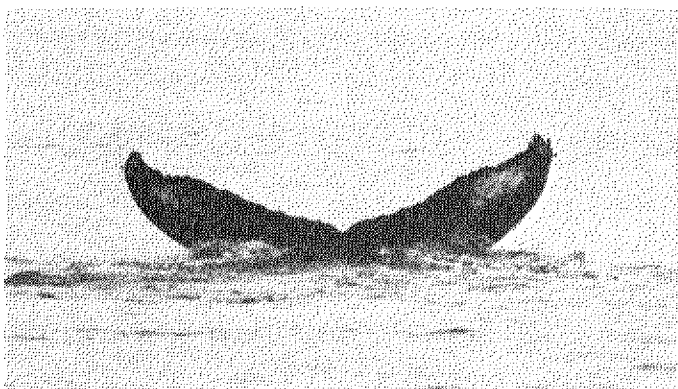
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527



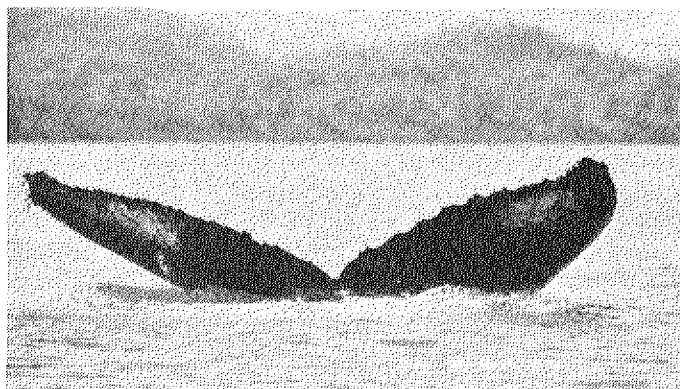
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3357

281



4060

801

# SOUTHEASTERN ALASKA



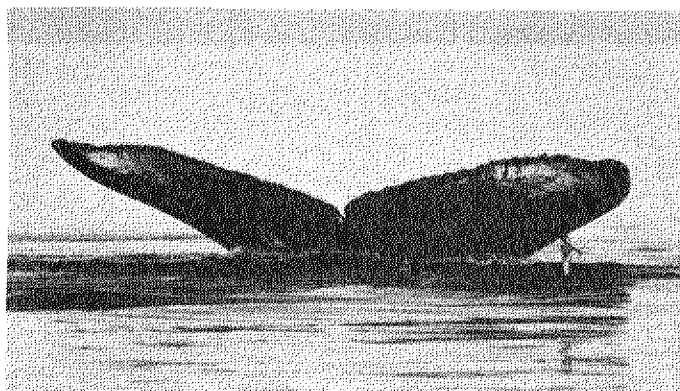
1301

530



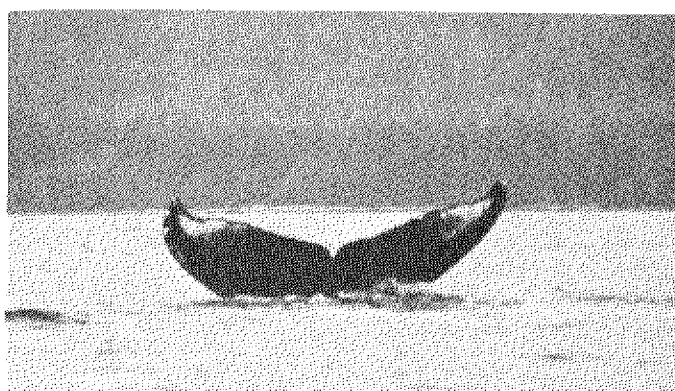
3662

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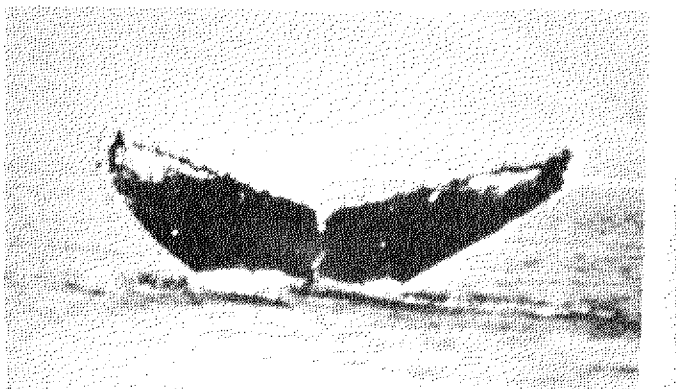
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187



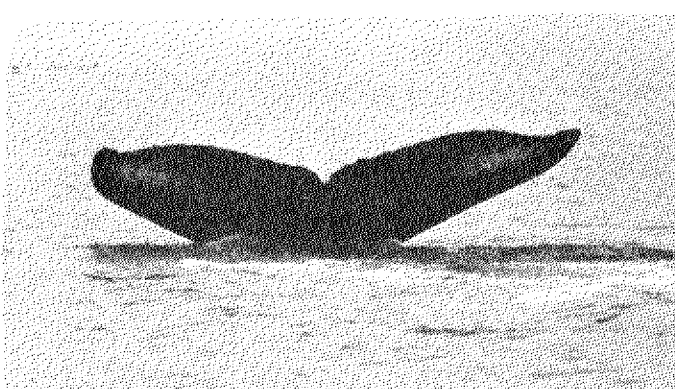
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284



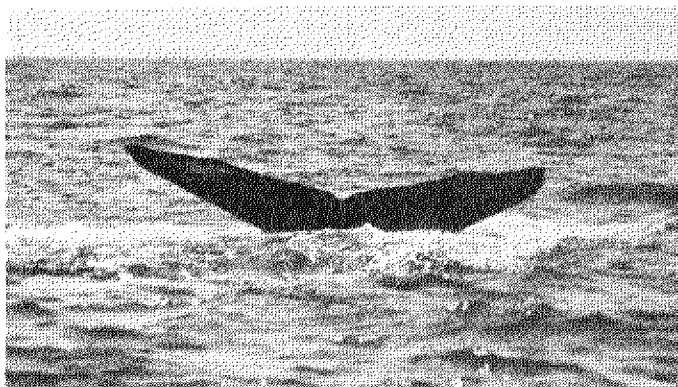
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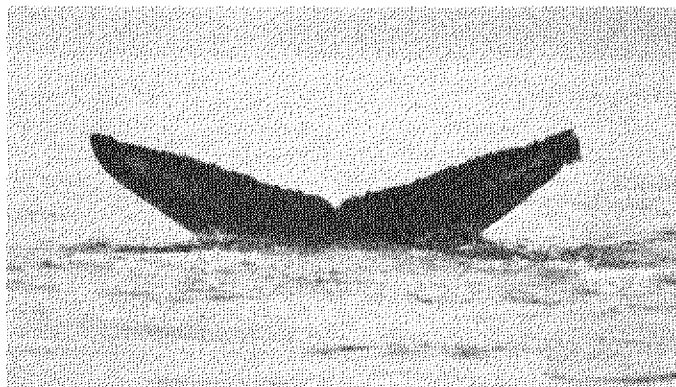
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536



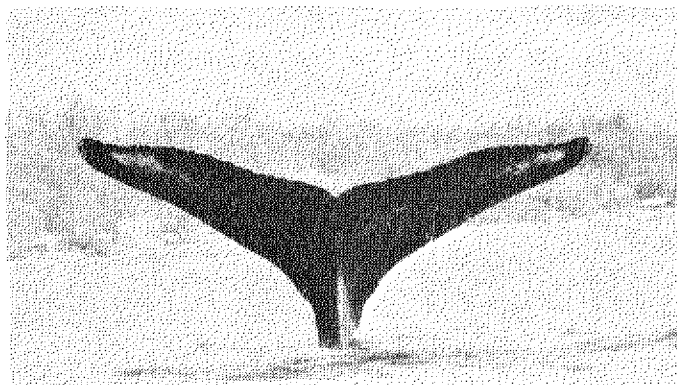
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320



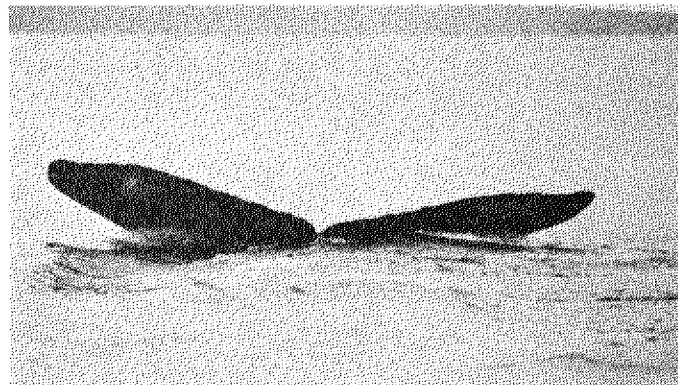
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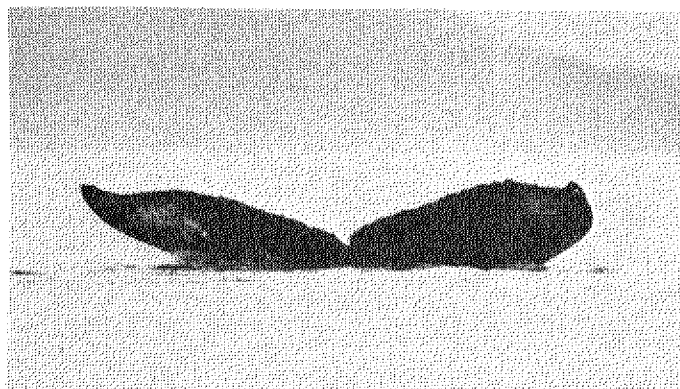
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130



923

552



1389

208



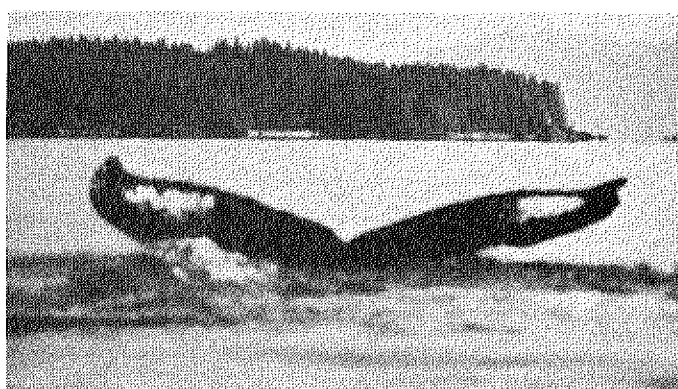
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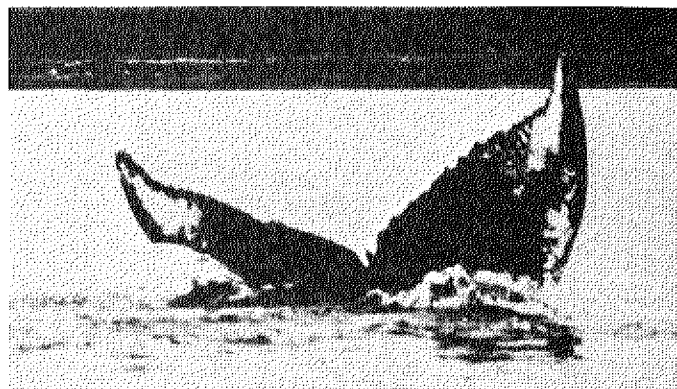
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853

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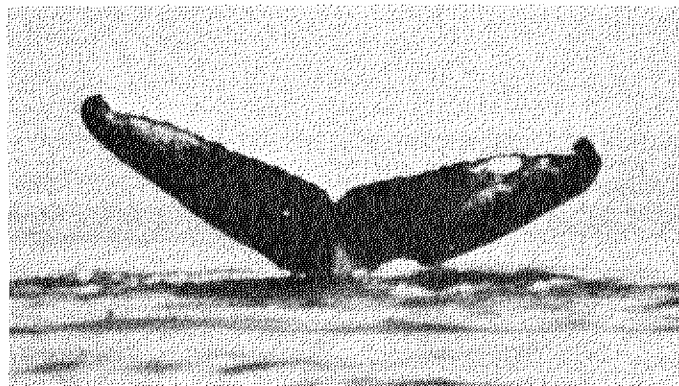


1837

287

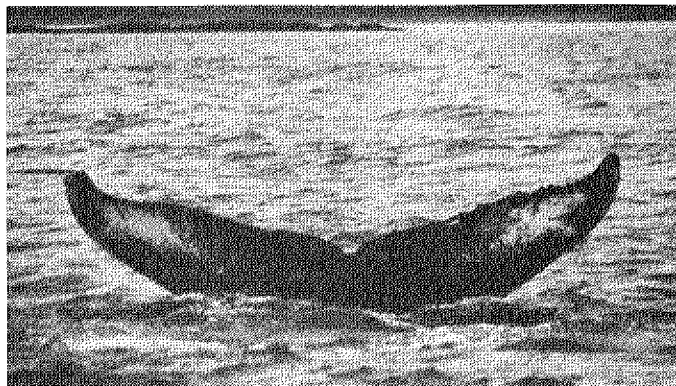


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1868

264



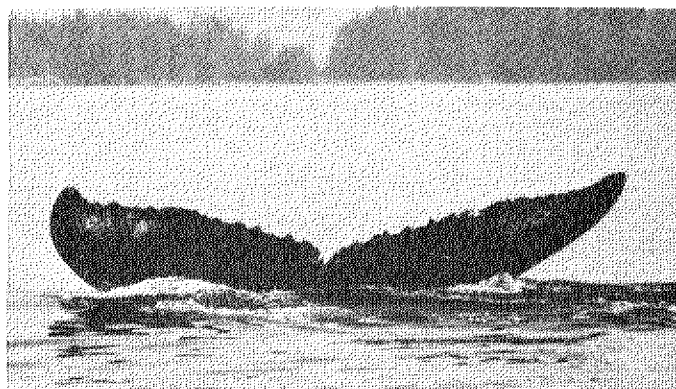
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613



1320

192



1318

546



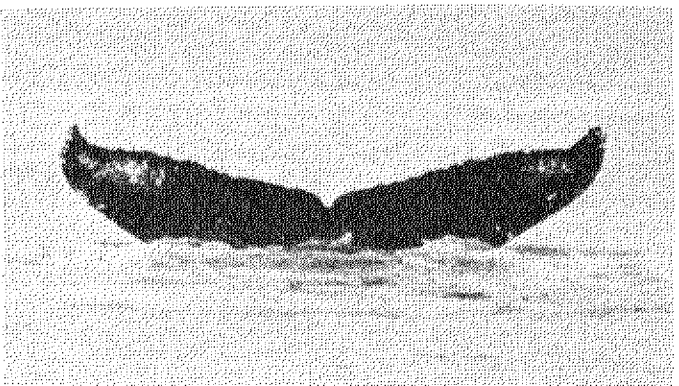
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558



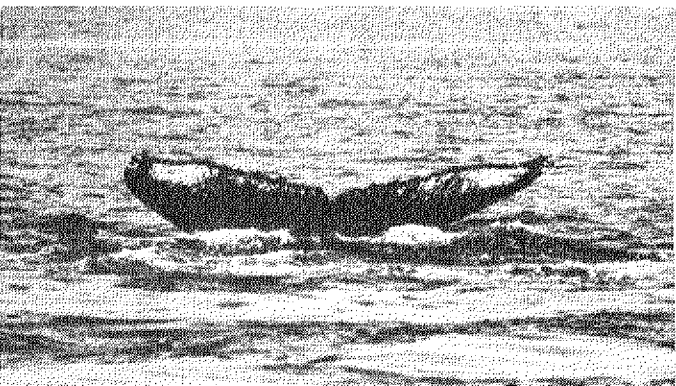
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555



3750

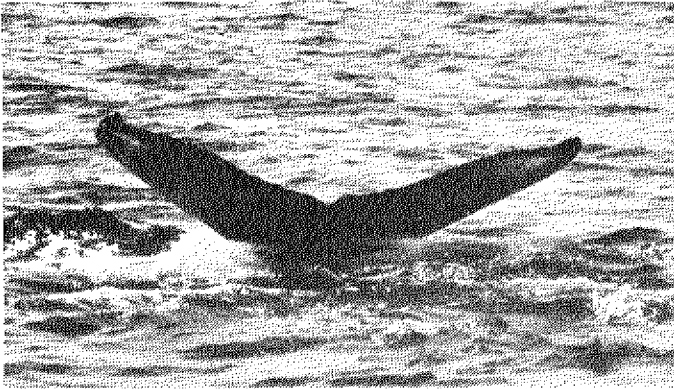
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3389

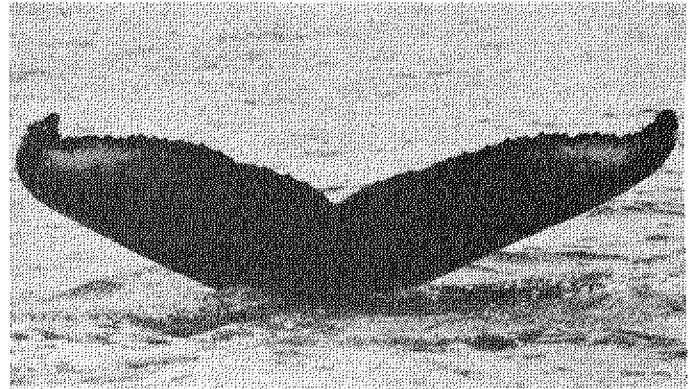
395

# SOUTHEASTERN ALASKA



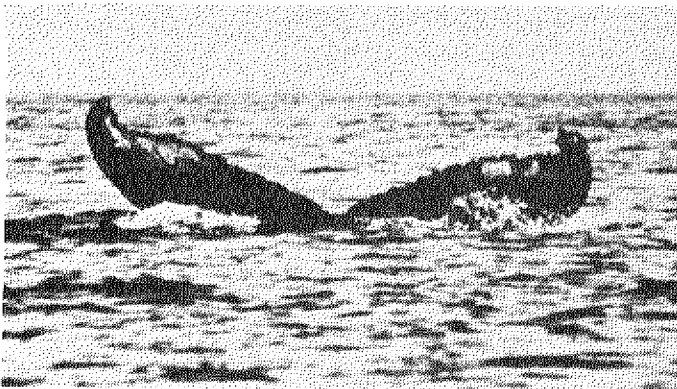
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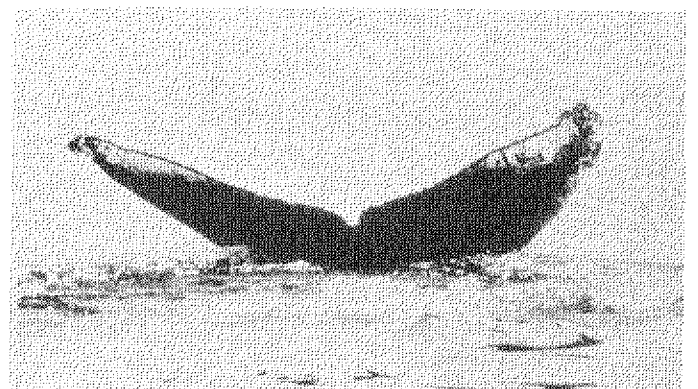
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496



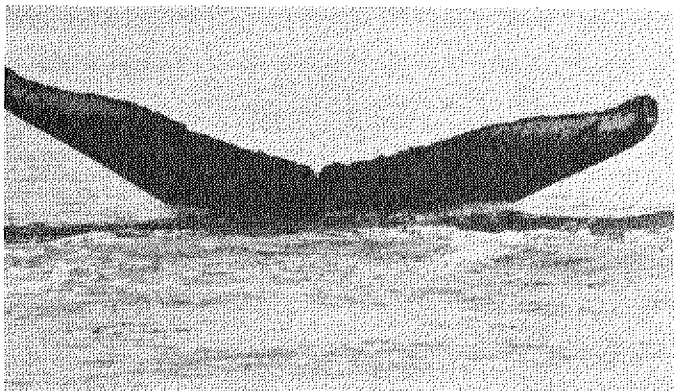
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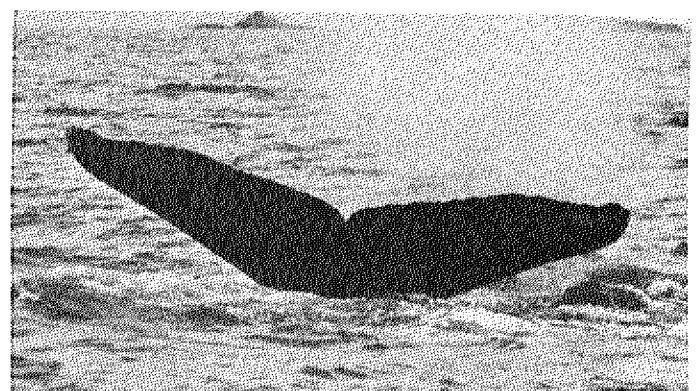
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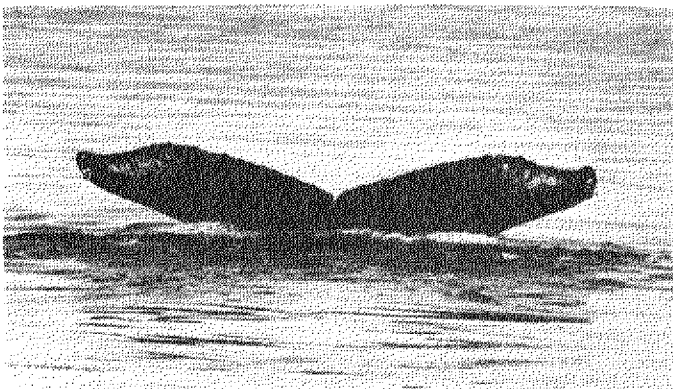
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540



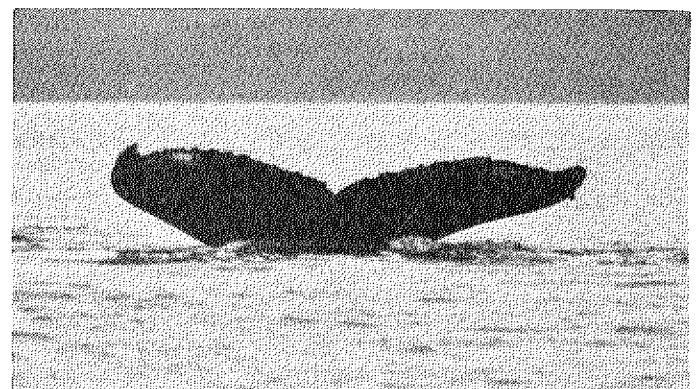
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3205

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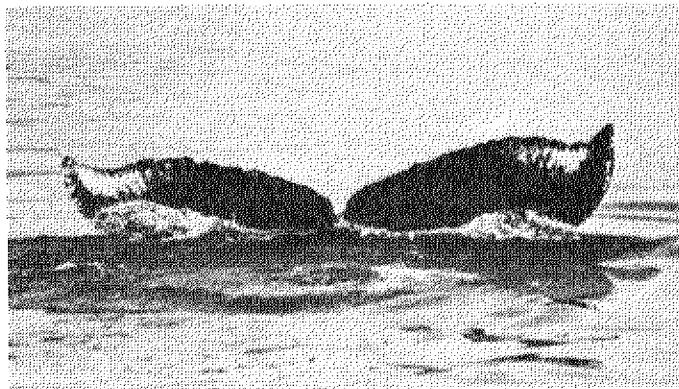


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541

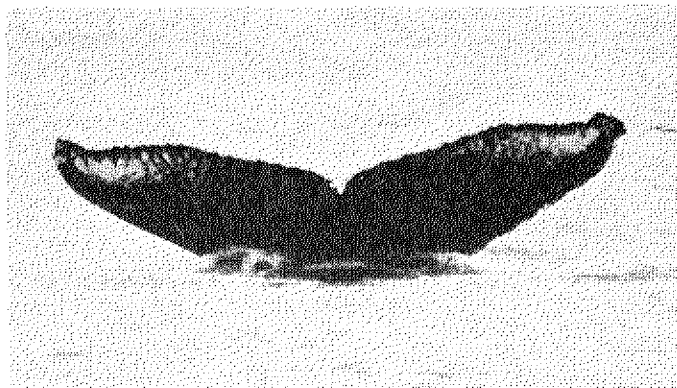


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3106

542



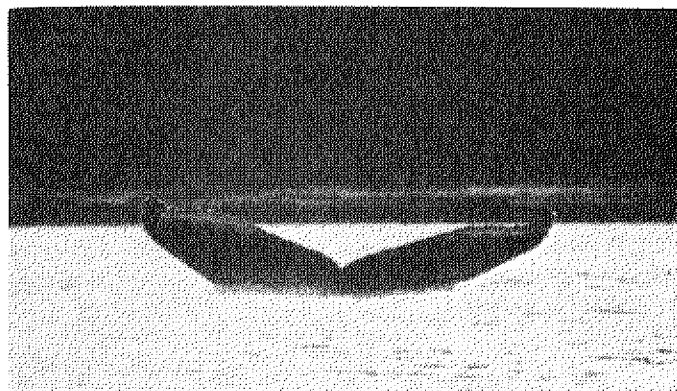
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301



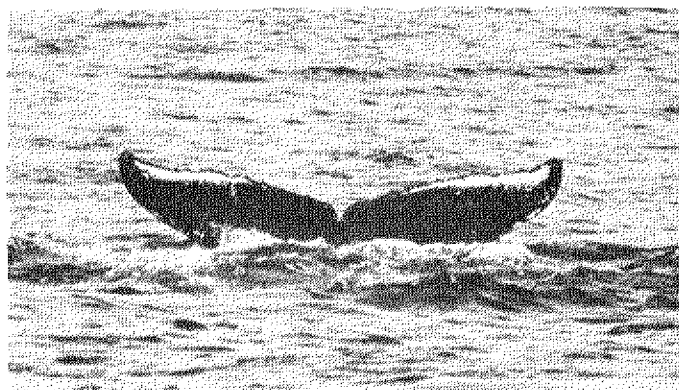
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559



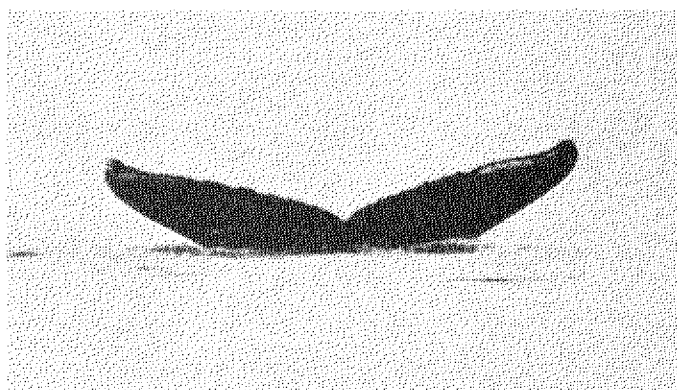
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259



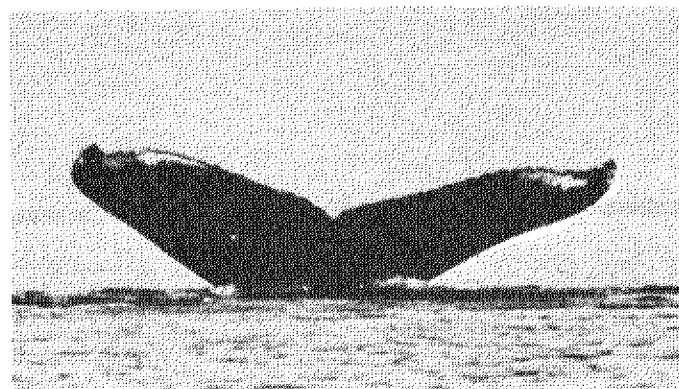
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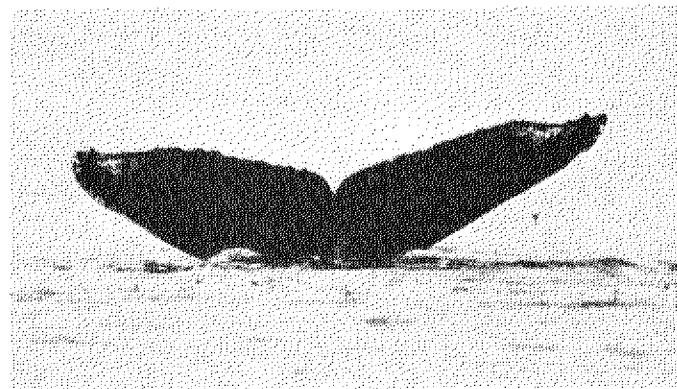
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815



1853

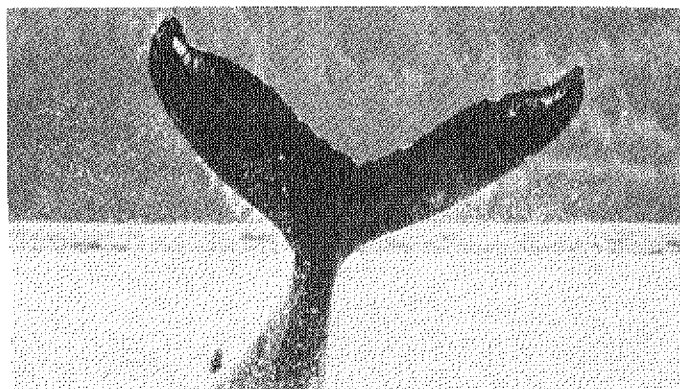
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2789

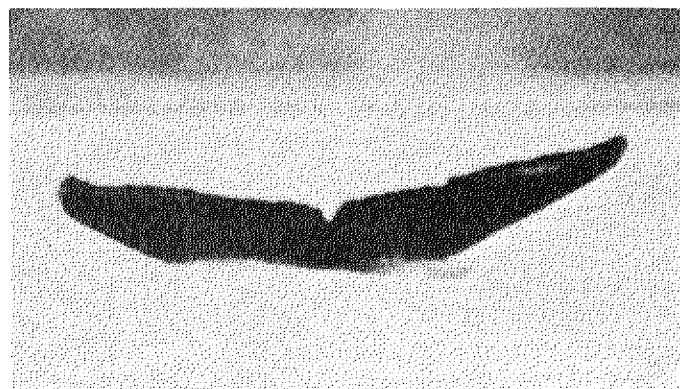
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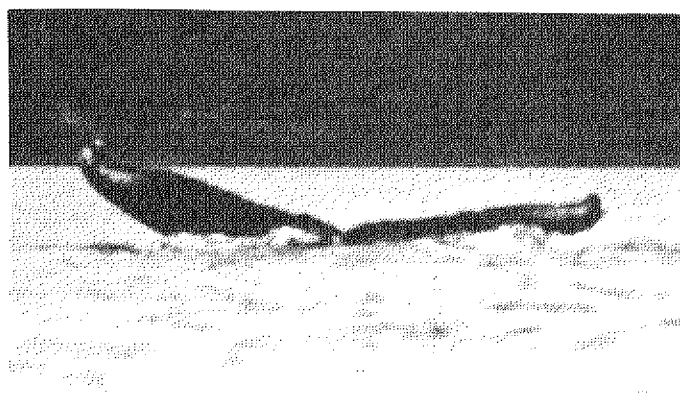
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237



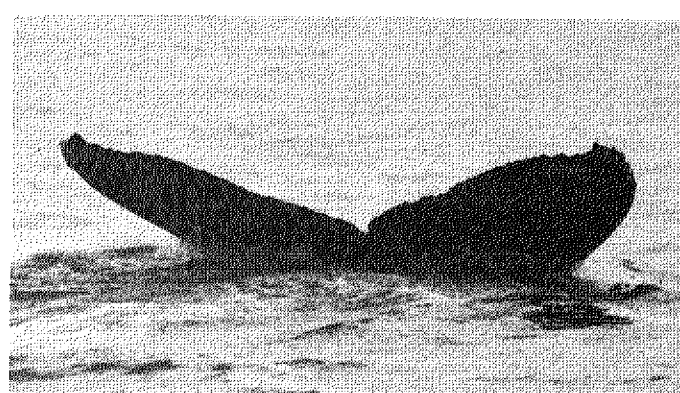
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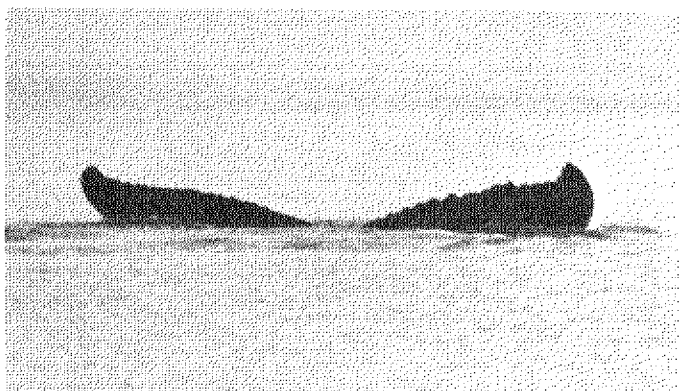
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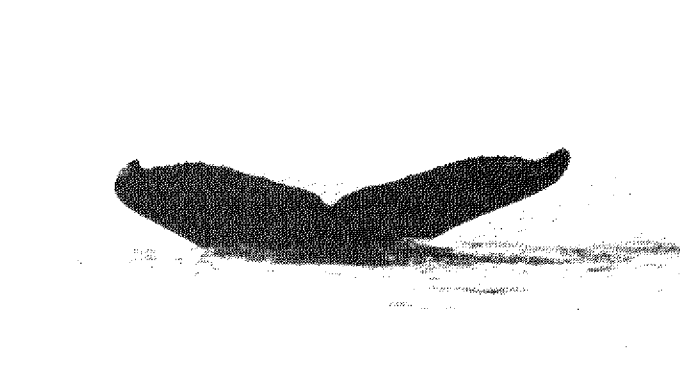
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476



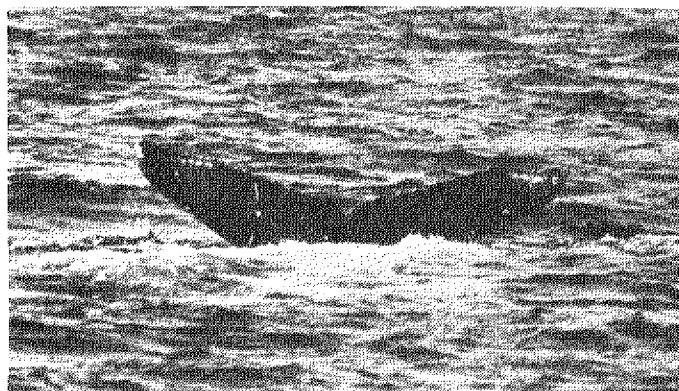
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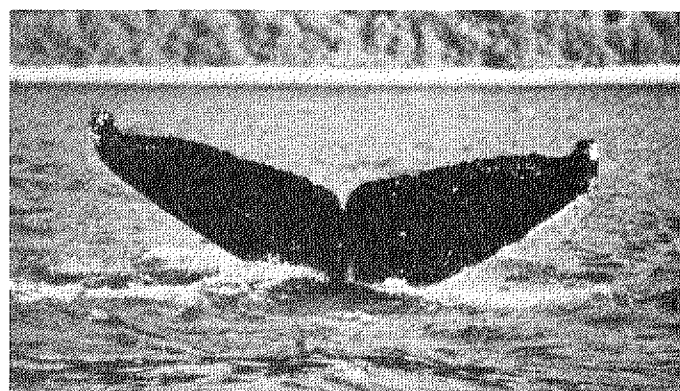
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216



3374

310



3951

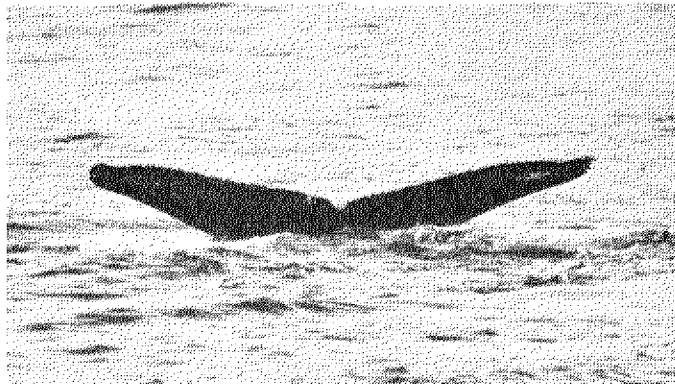
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# SOUTHEASTERN ALASKA



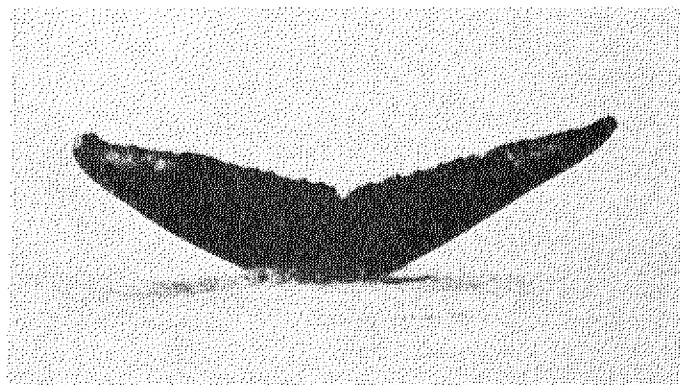
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311



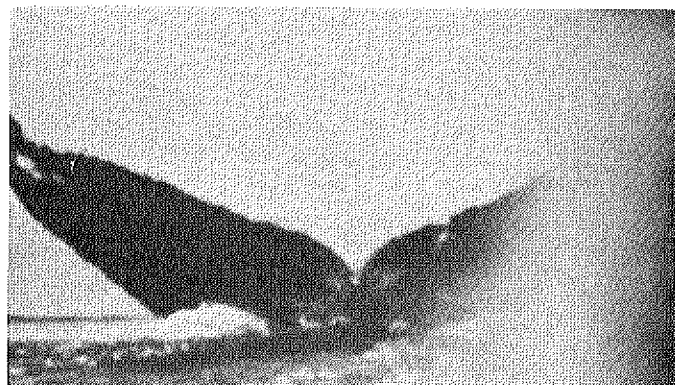
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402



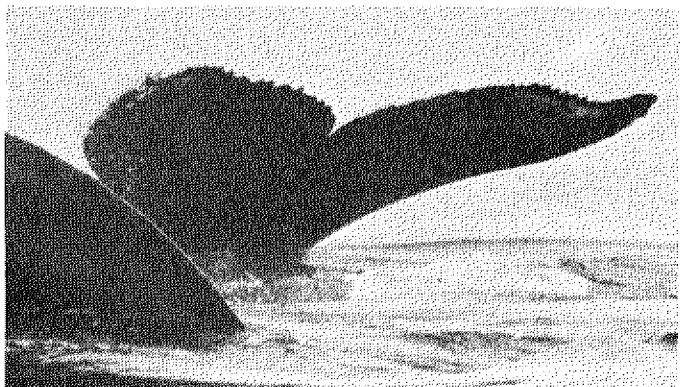
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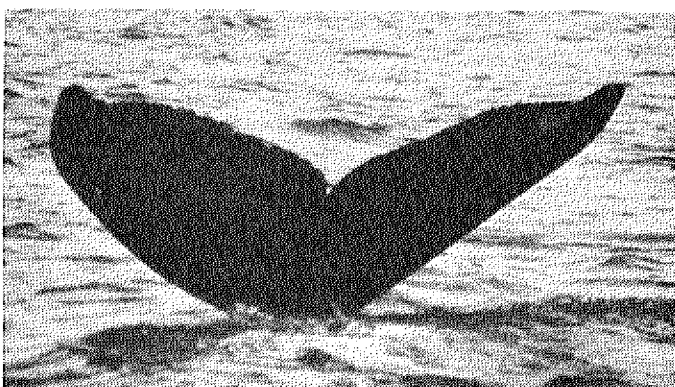
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154



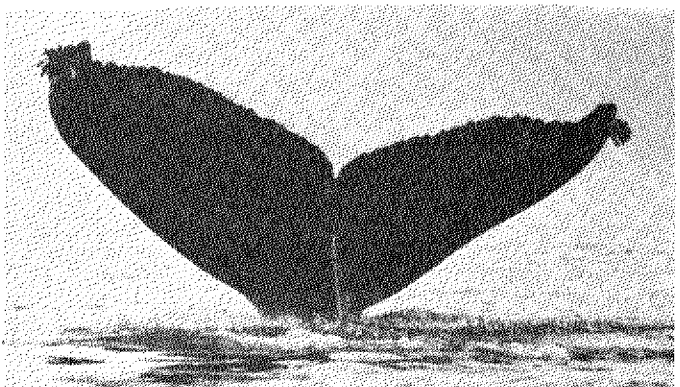
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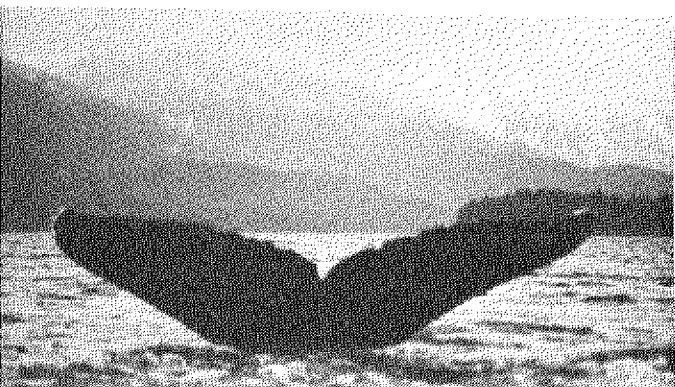
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475



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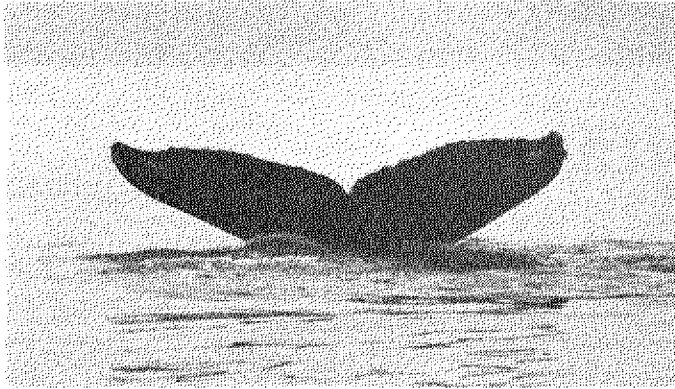
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3831

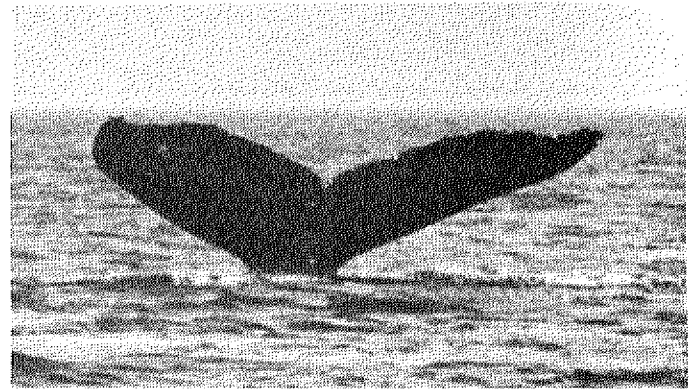
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SOUTHEASTERN ALASKA



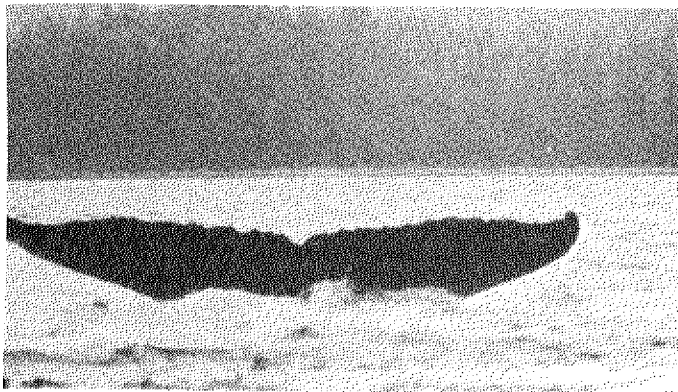
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554



1484

160



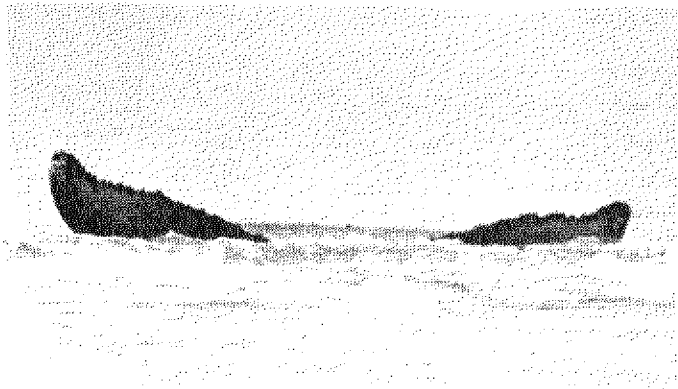
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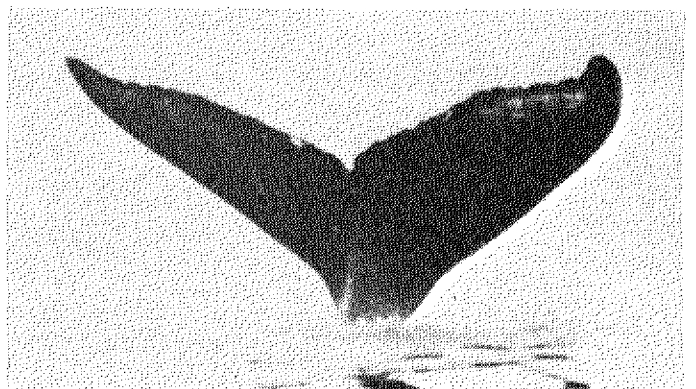
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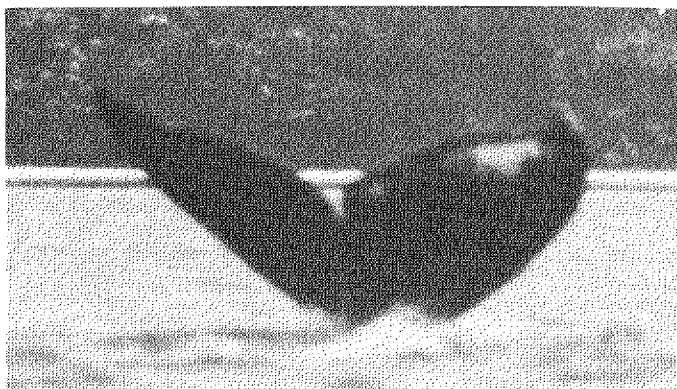
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529



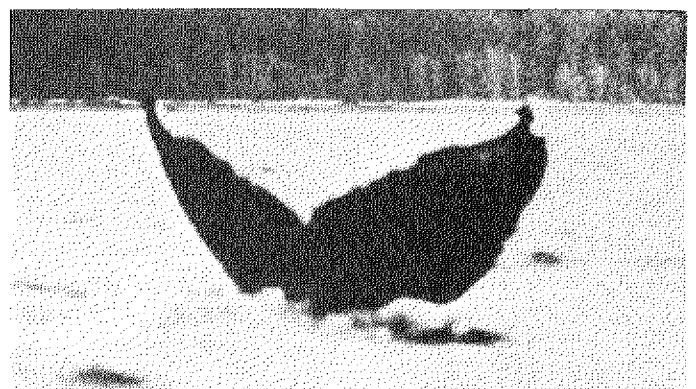
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3855

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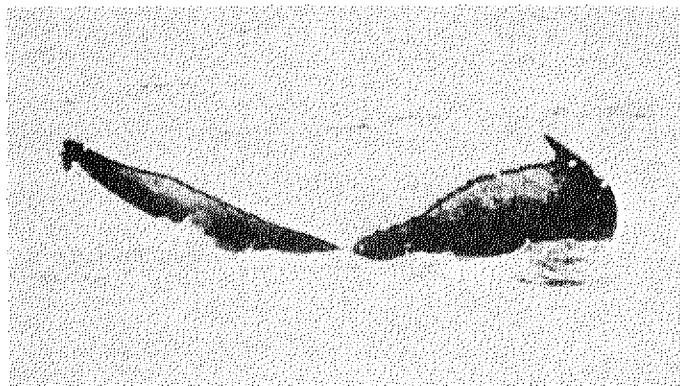


2519

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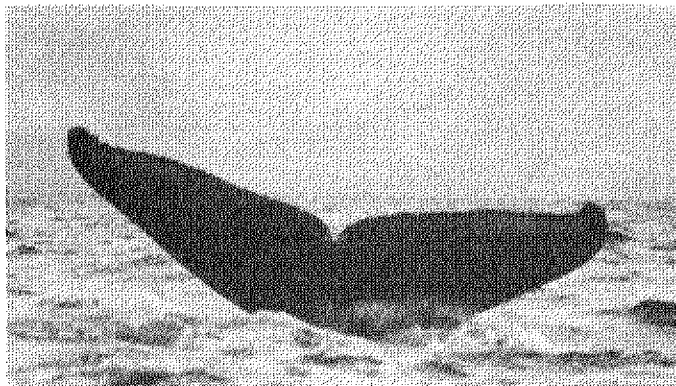


# SOUTHEASTERN ALASKA



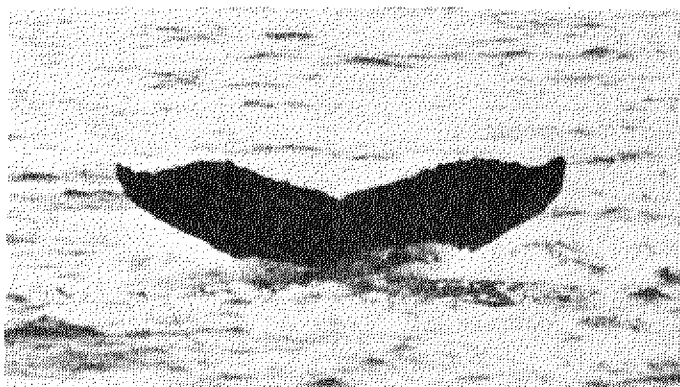
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478



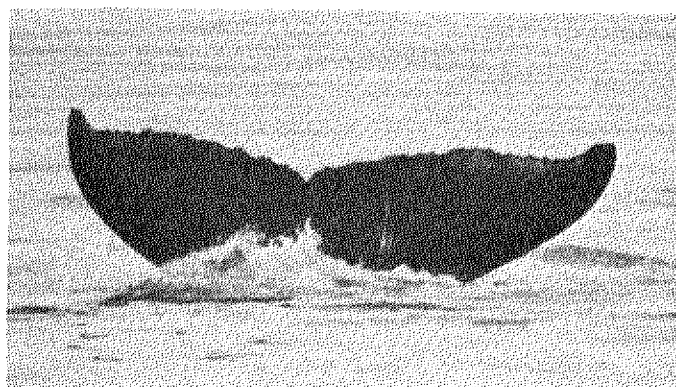
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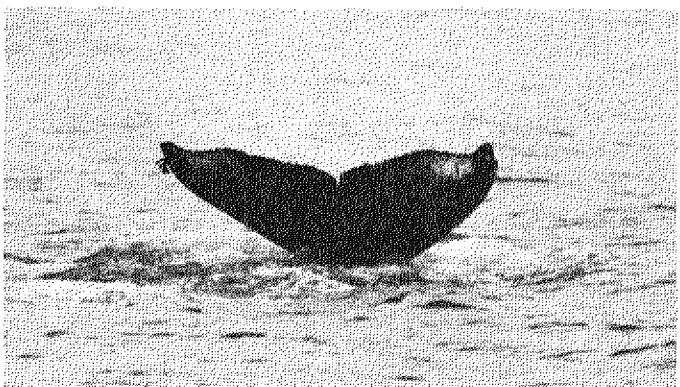
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4138

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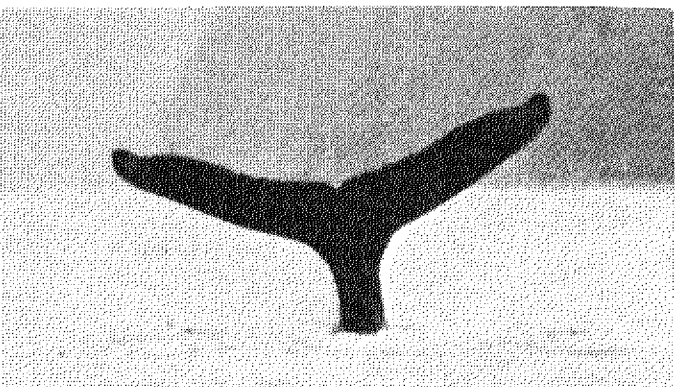
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481



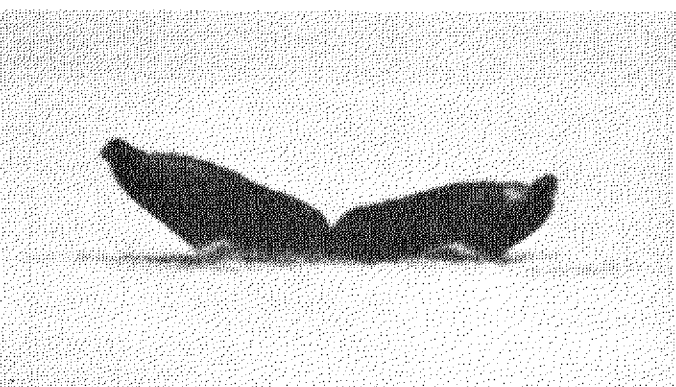
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186



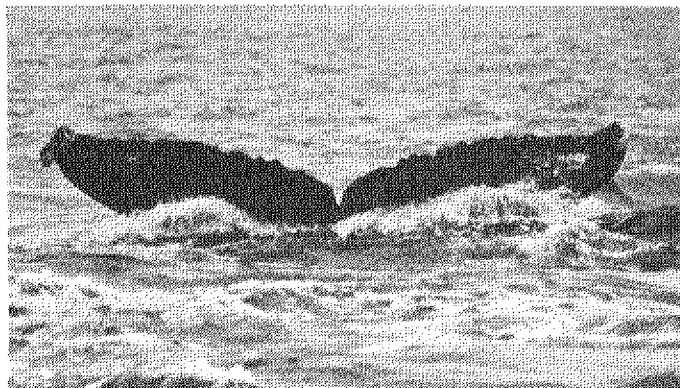
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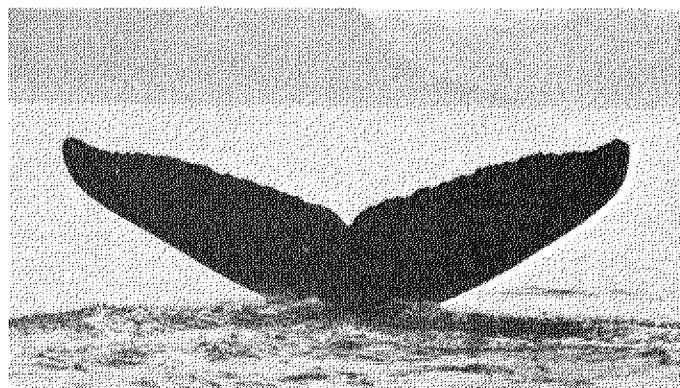
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220



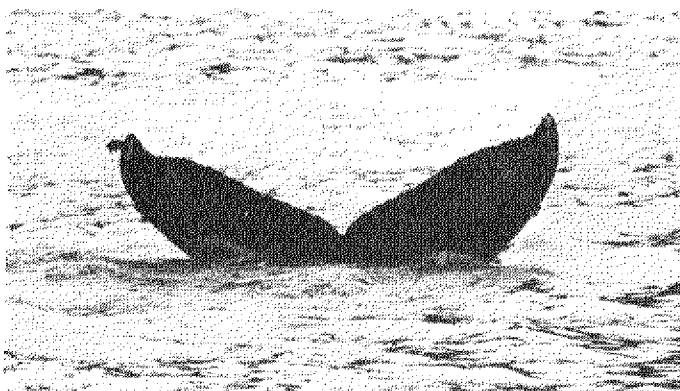
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556



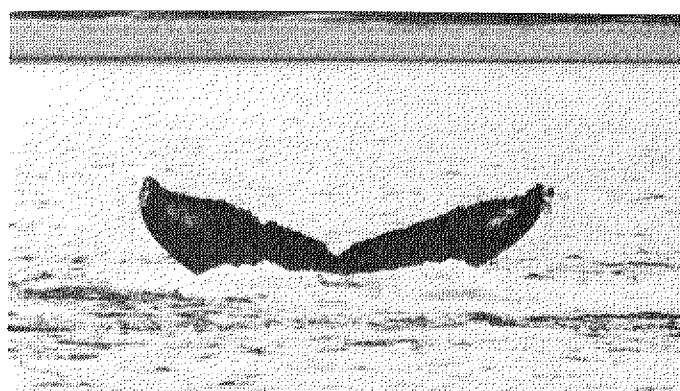
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575



3415

401



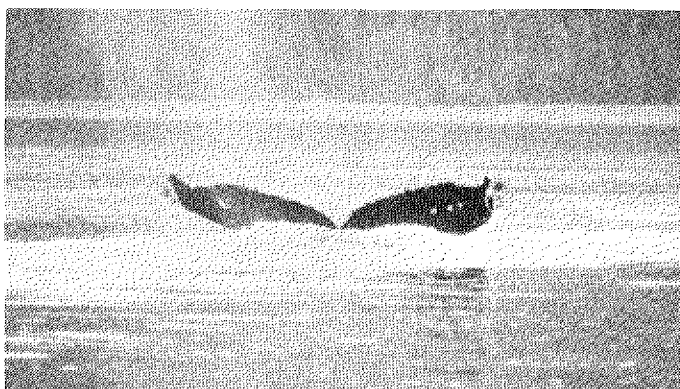
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549



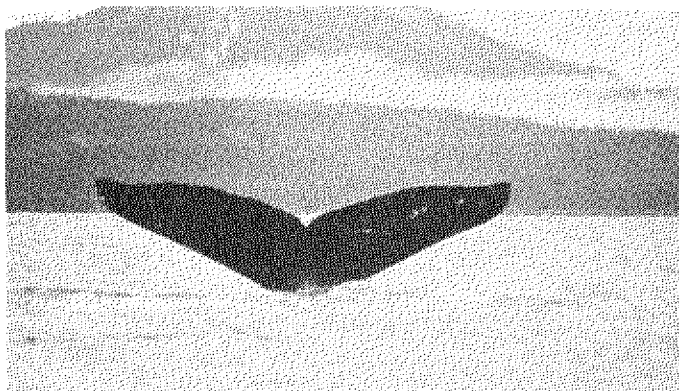
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332



1667

573



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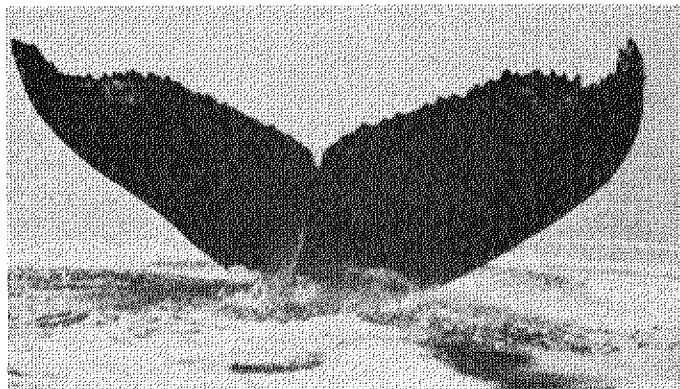
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3274

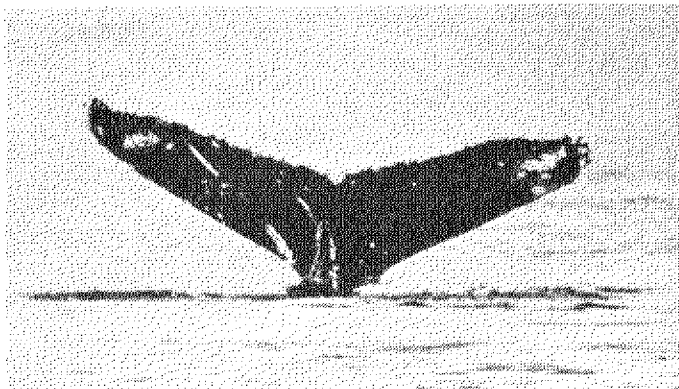
157

# SOUTHEASTERN ALASKA



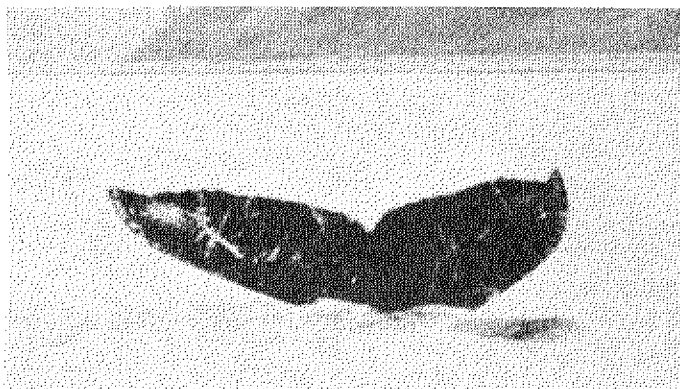
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477



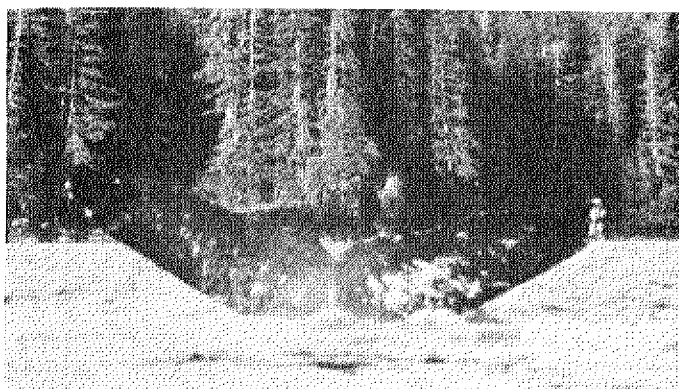
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215



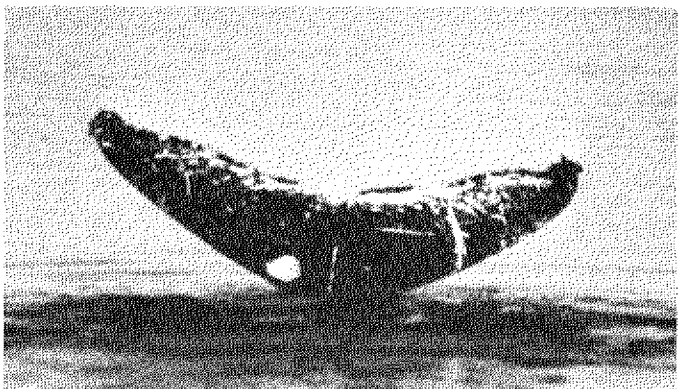
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159



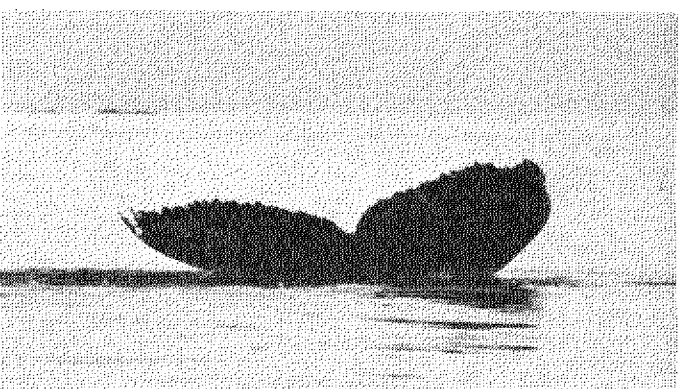
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3181

480



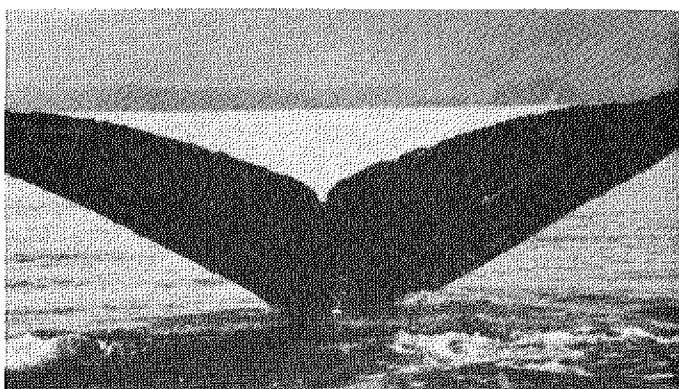
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567



1327

553



896

544

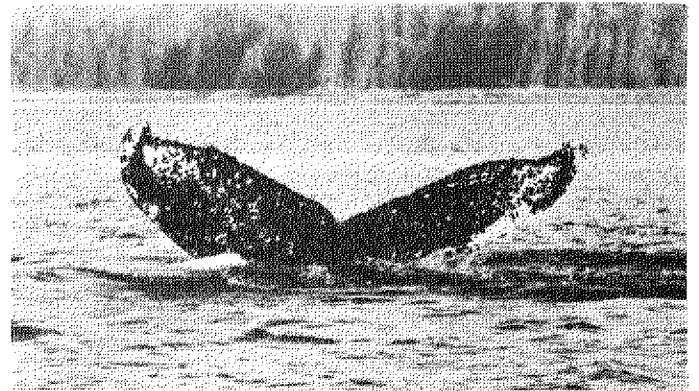


# SOUTHEASTERN ALASKA



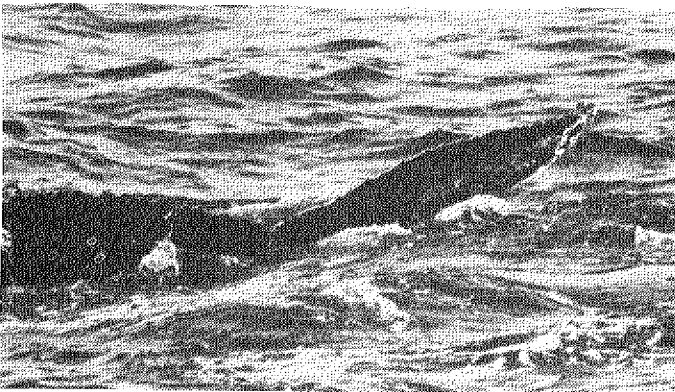
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545



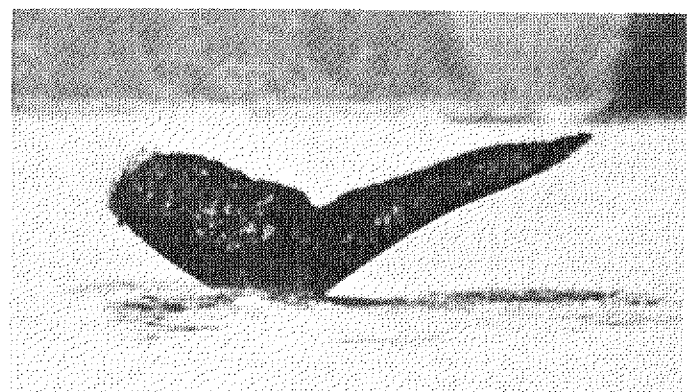
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195



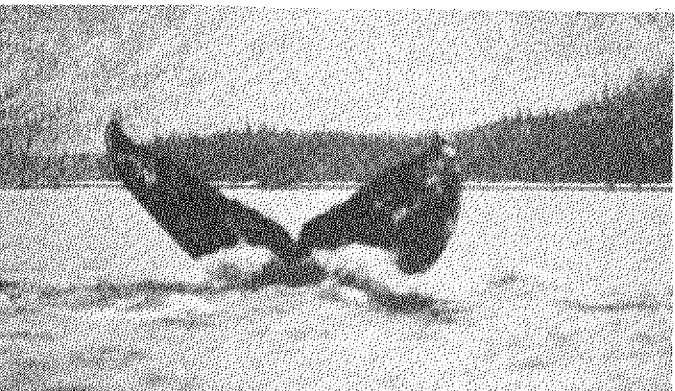
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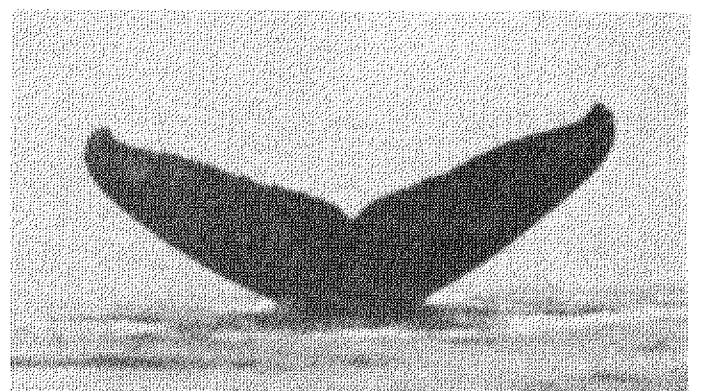
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202



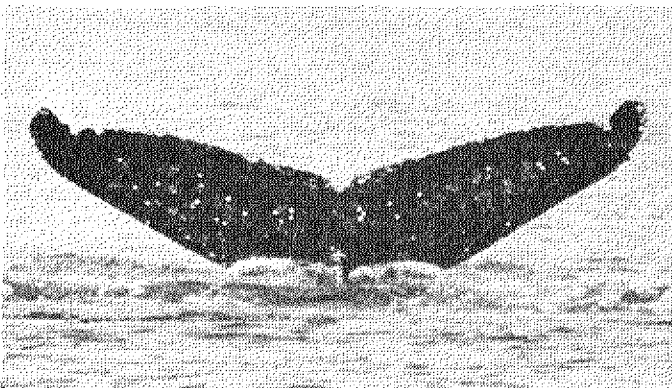
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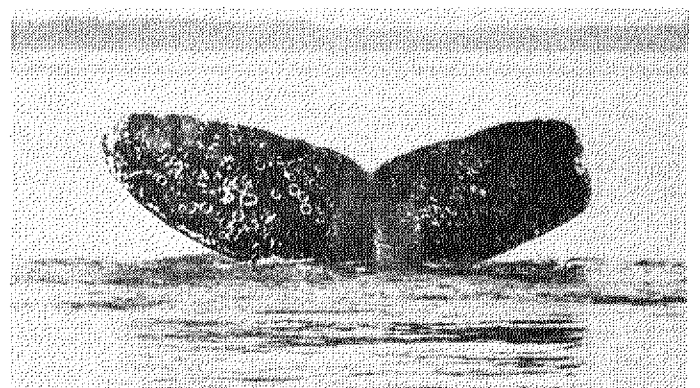
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3688

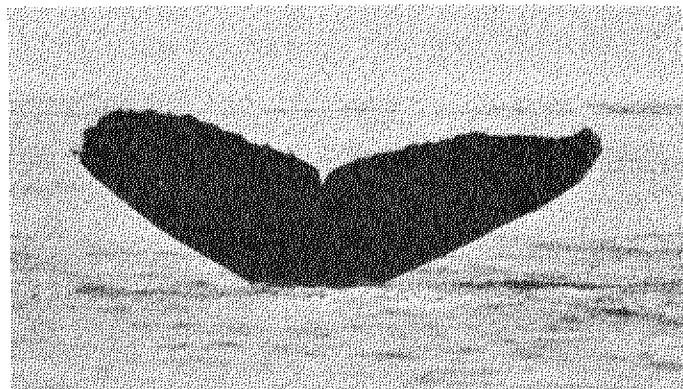
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2834

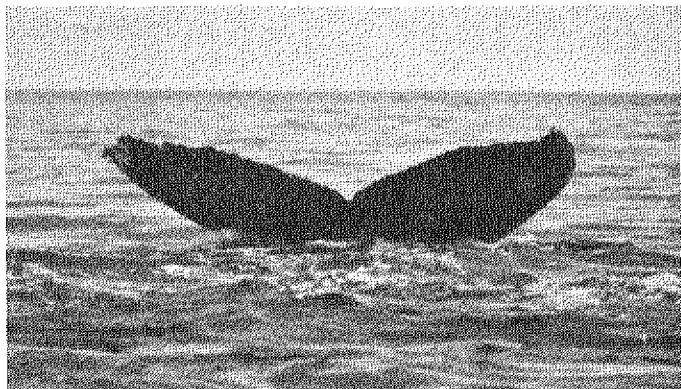
566

# SOUTHEASTERN ALASKA



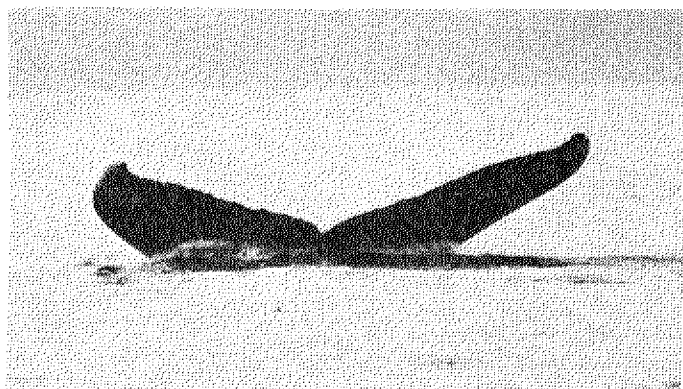
1405

154



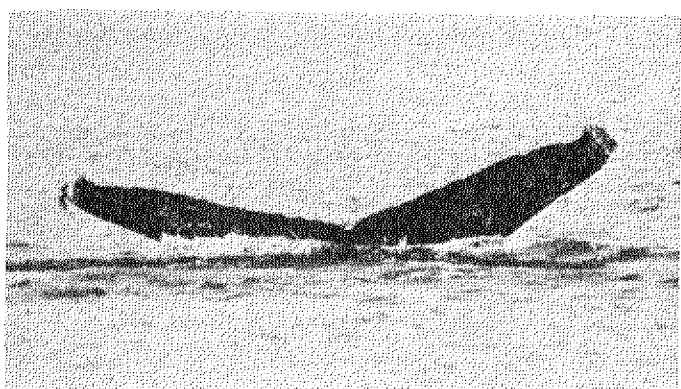
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569



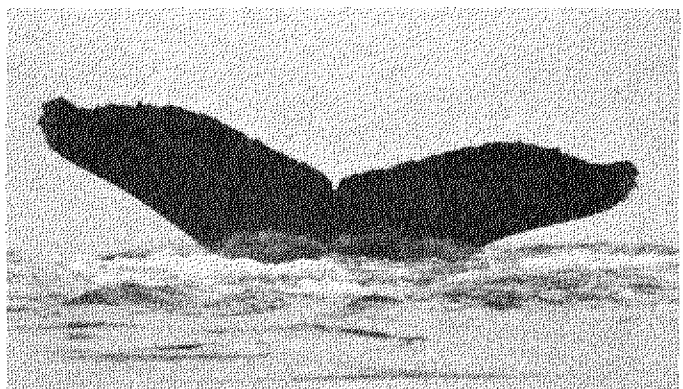
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225



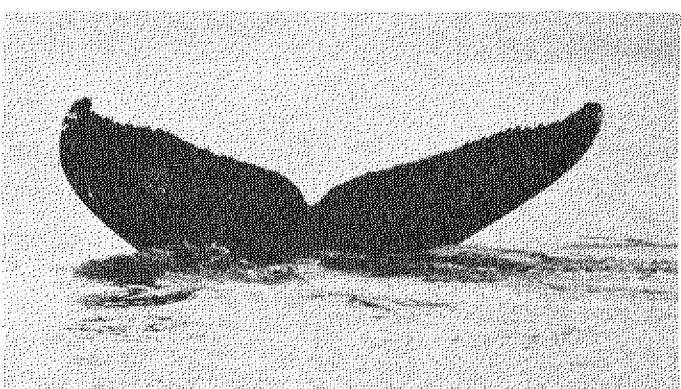
3687

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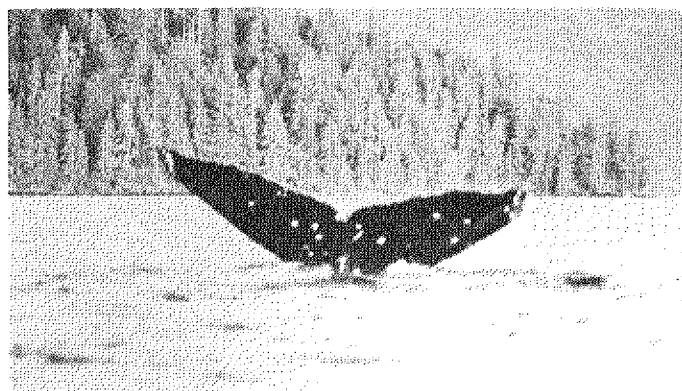
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155



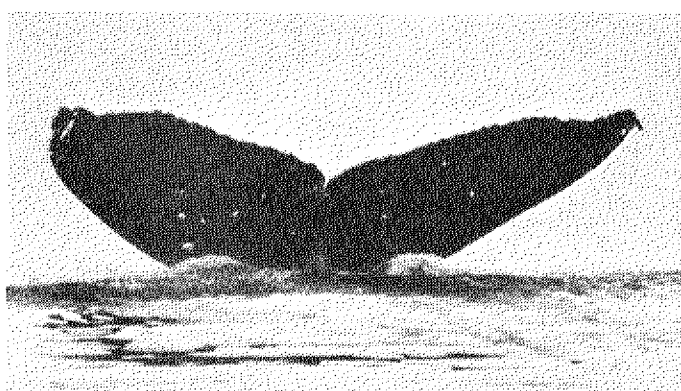
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741



1982

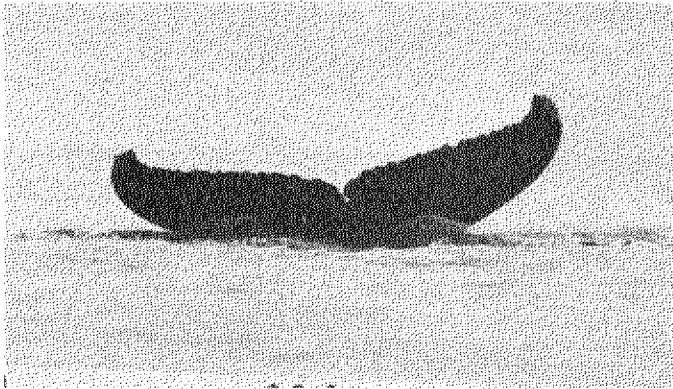
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3698

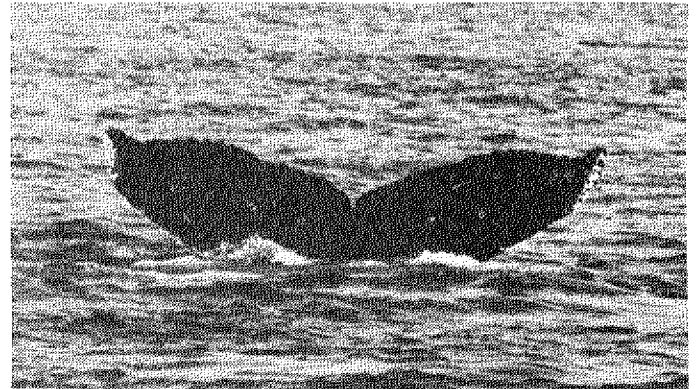
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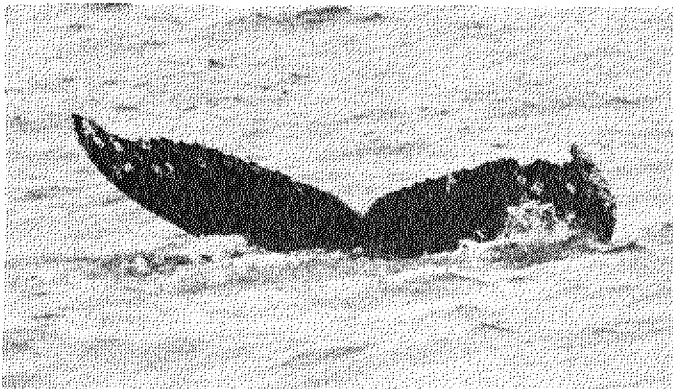
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606



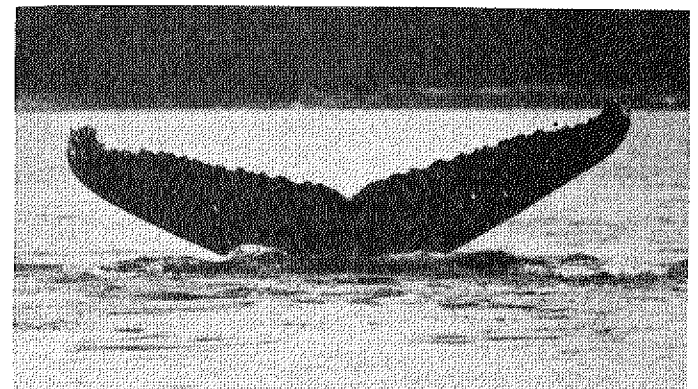
3227

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3679

472



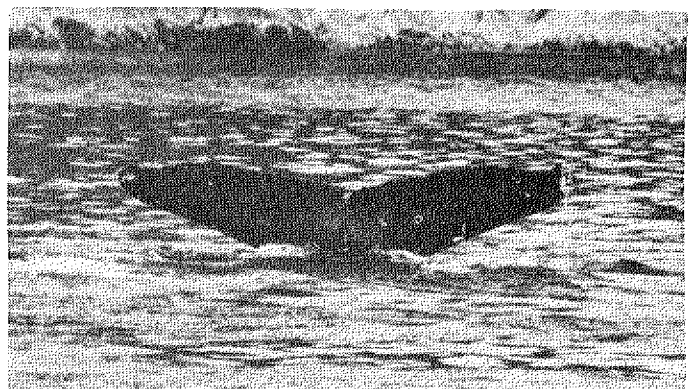
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586



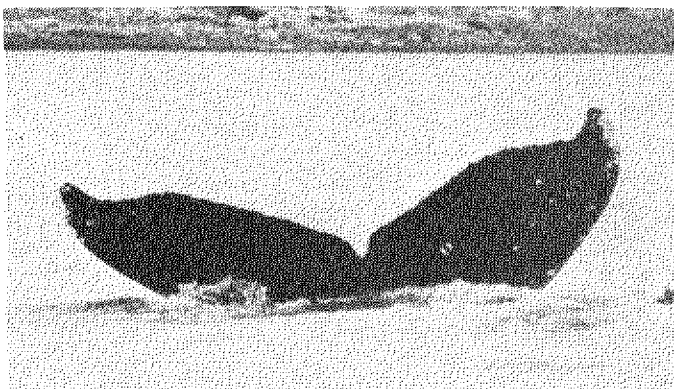
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459



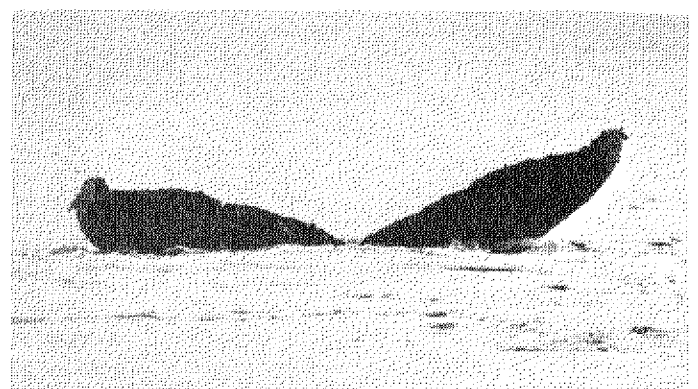
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3913

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744

598

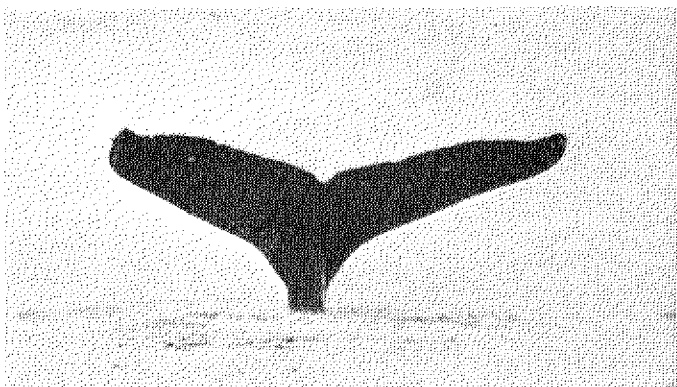


# SOUTHEASTERN ALASKA



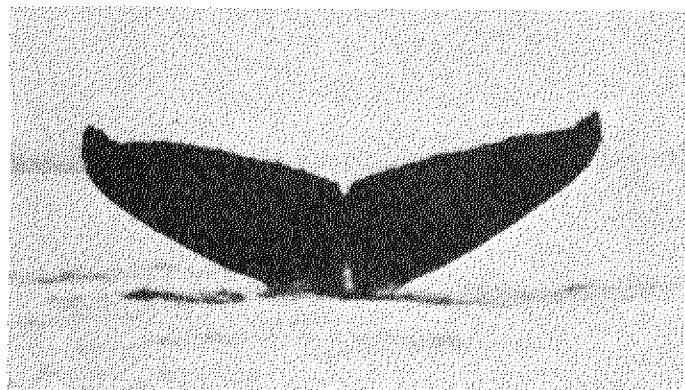
3211

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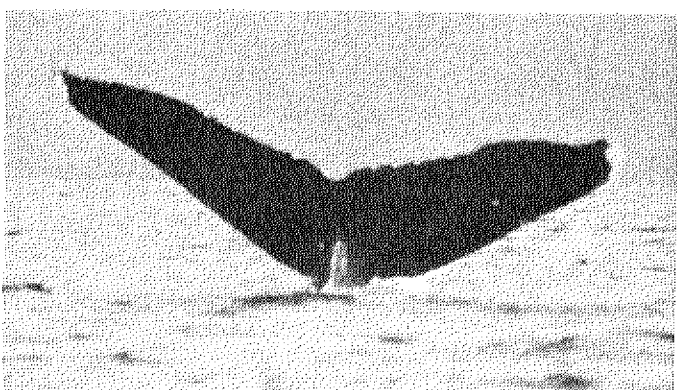
3837

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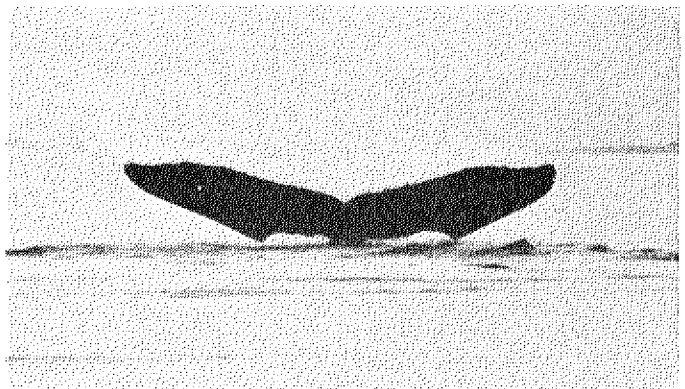
2524

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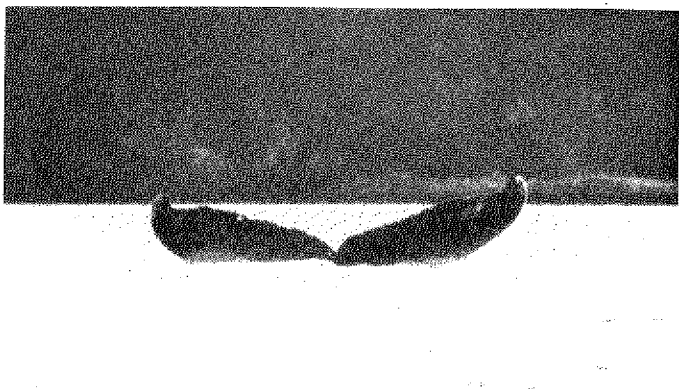
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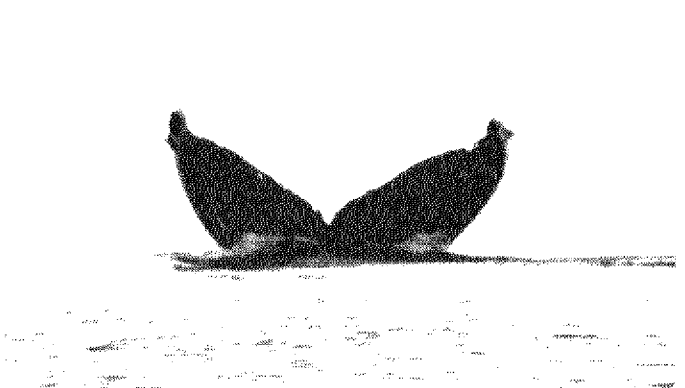
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236



1759

263



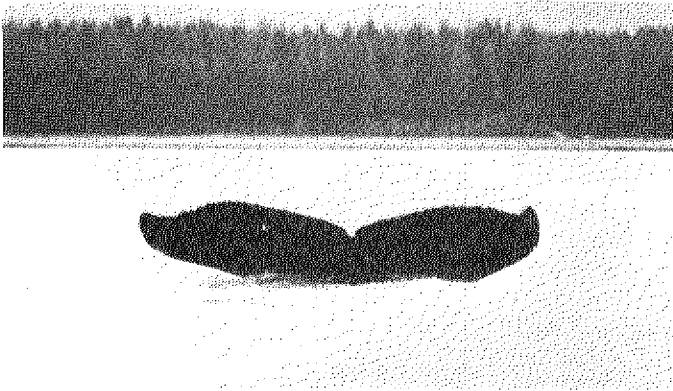
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572



1459

213



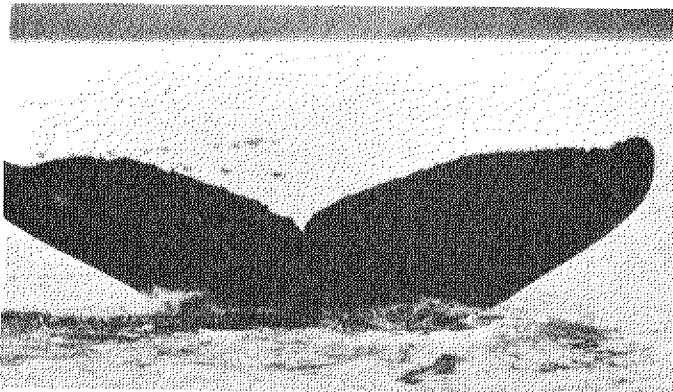
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850

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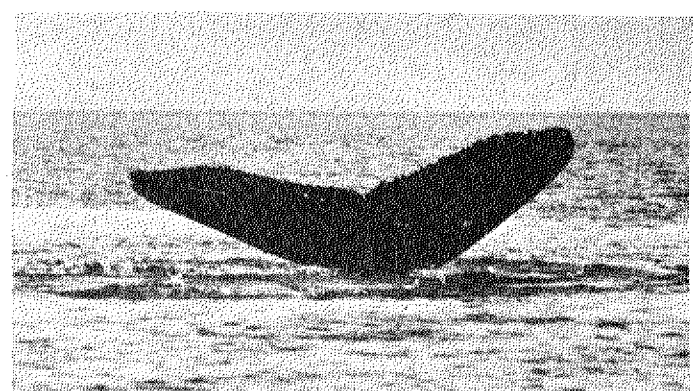
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69



3843

467



1387

206



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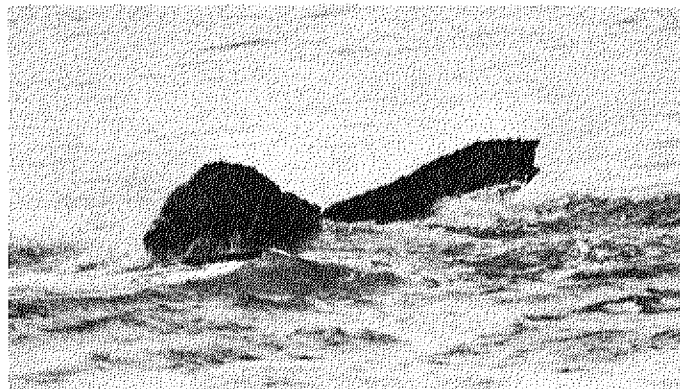
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1306

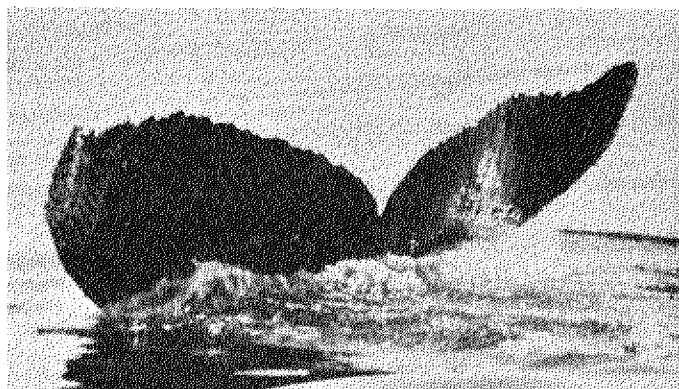
189

# SOUTHEASTERN ALASKA



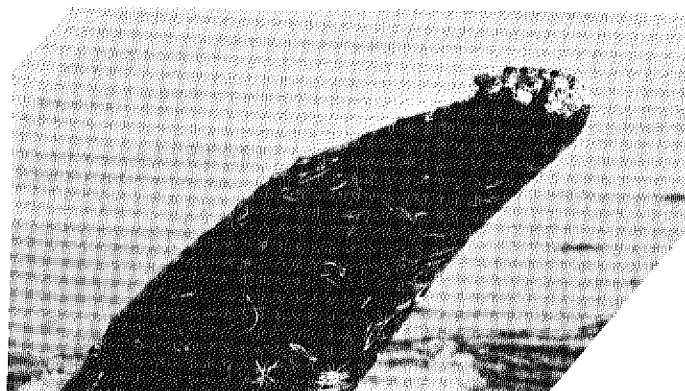
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486



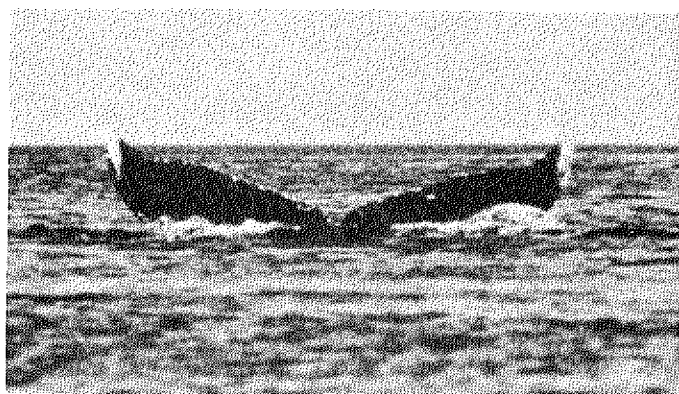
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465



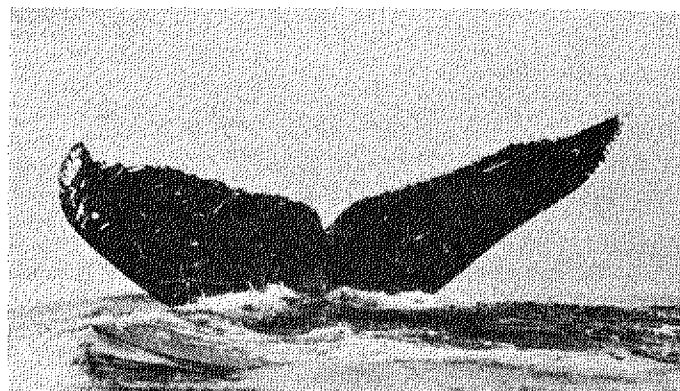
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583



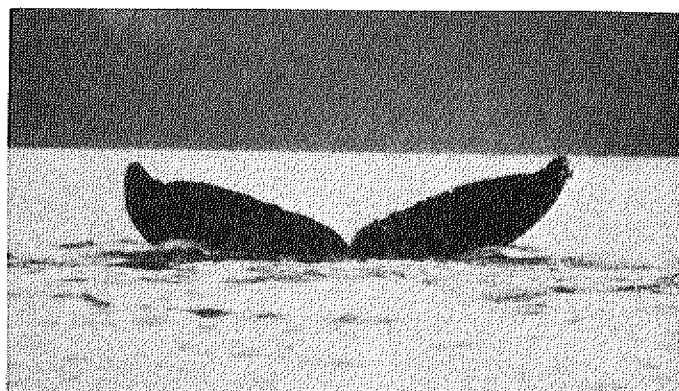
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273



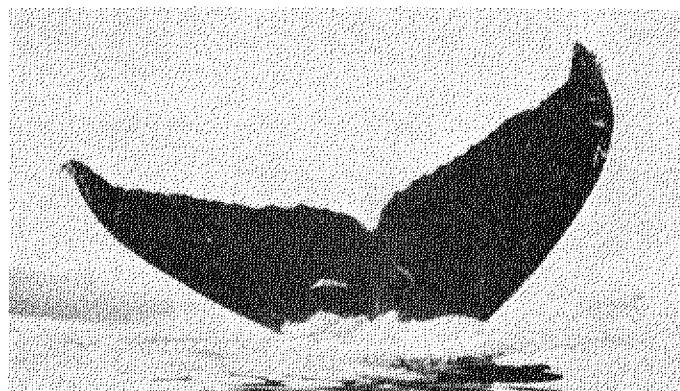
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469



3455

597



3706

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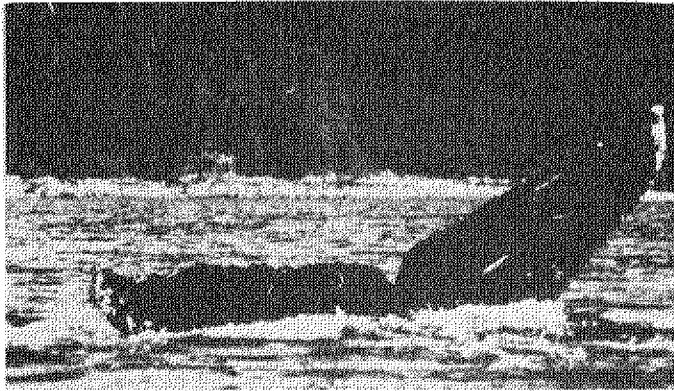


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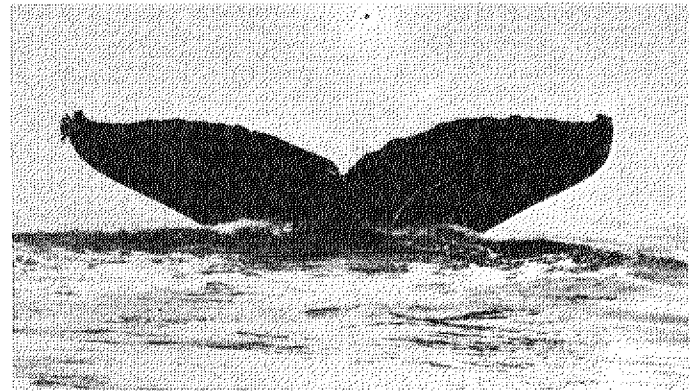


# SOUTHEASTERN ALASKA



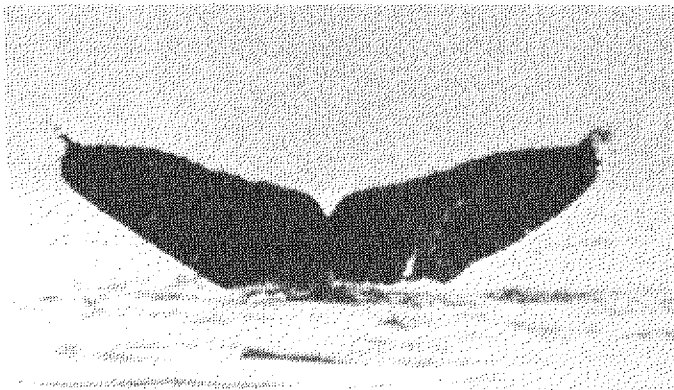
1784

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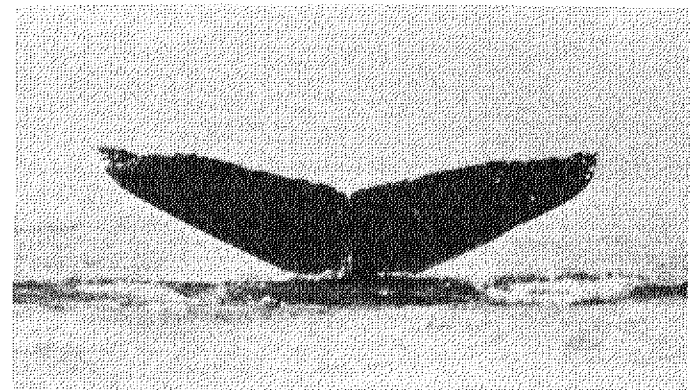
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262



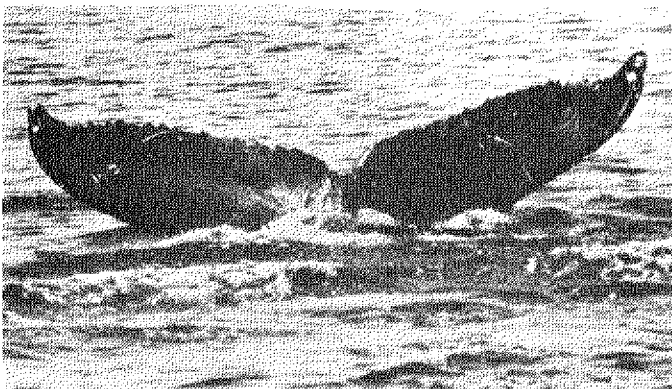
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451



1788

295



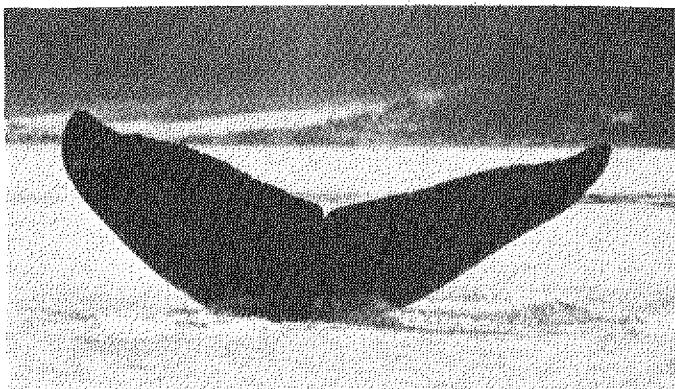
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4170

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1431

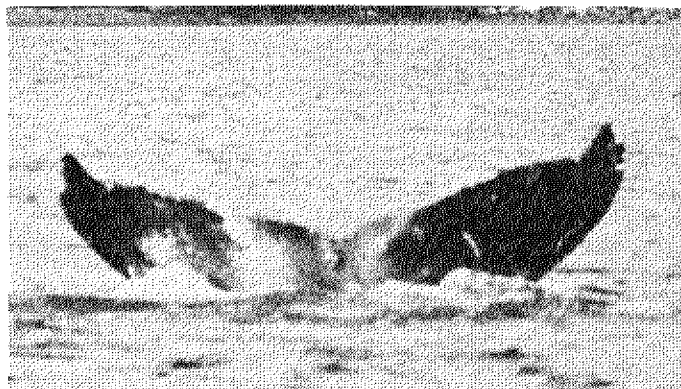
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1467

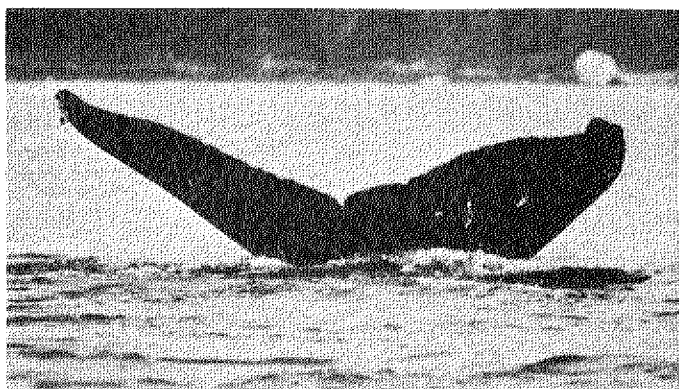
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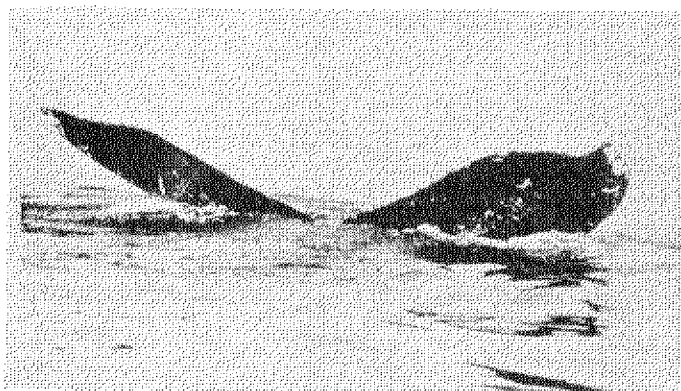
3623

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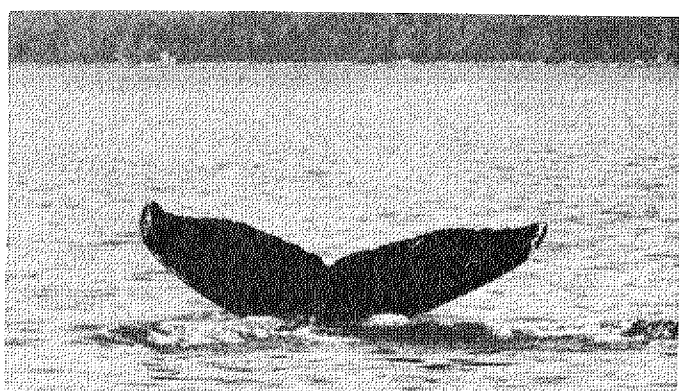
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580



1787

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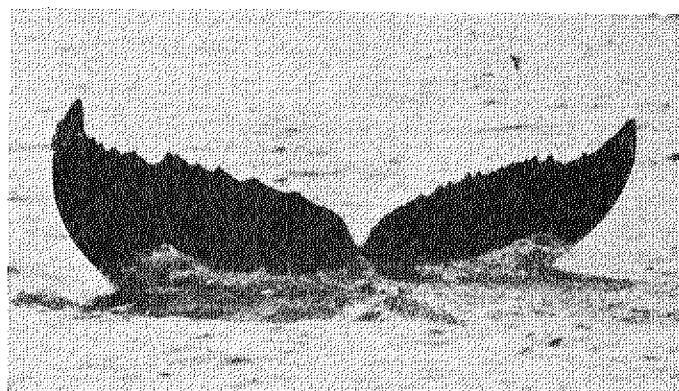
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214



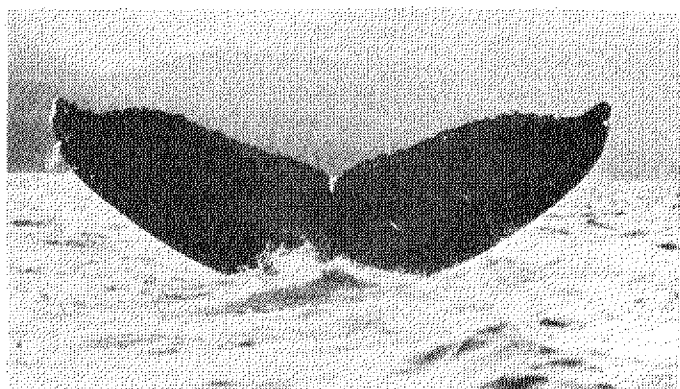
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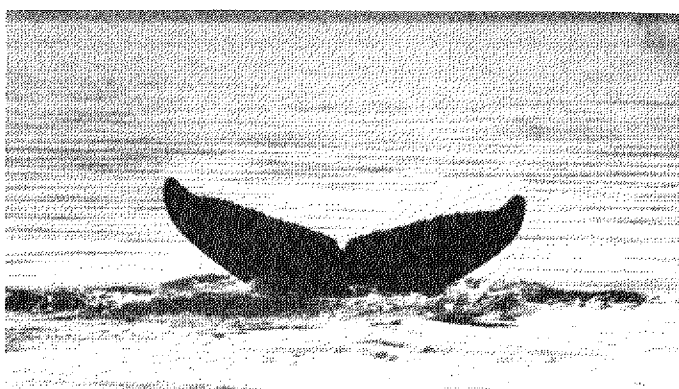
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488



4199

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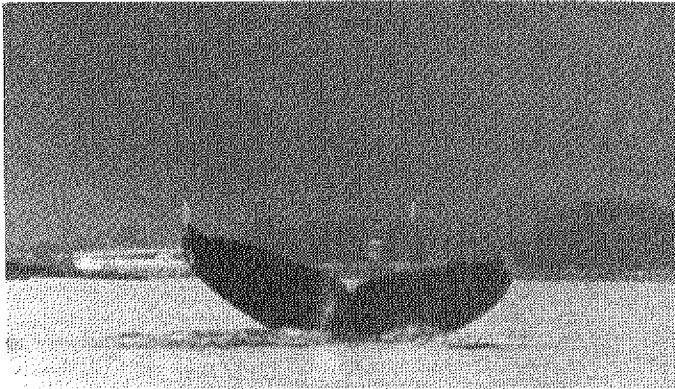


3203

468

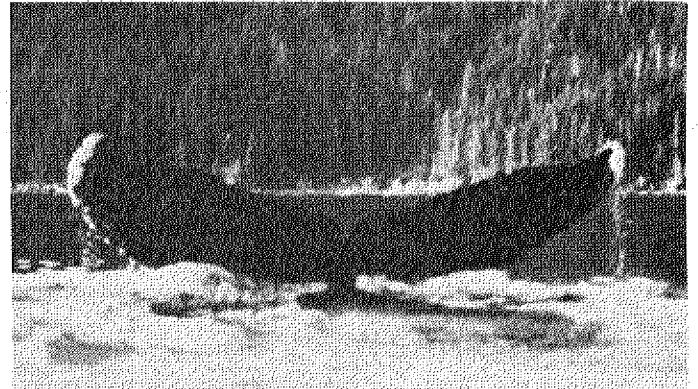


# SOUTHEASTERN ALASKA



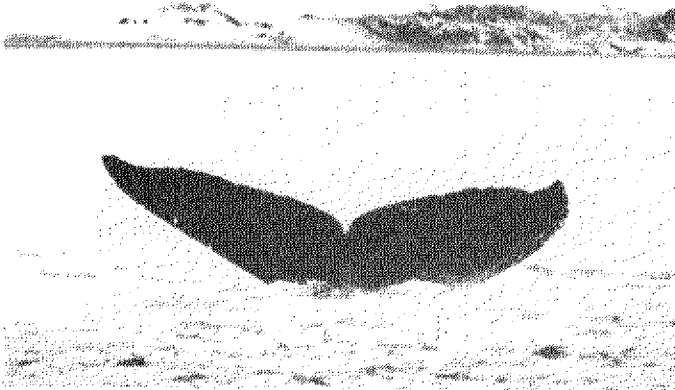
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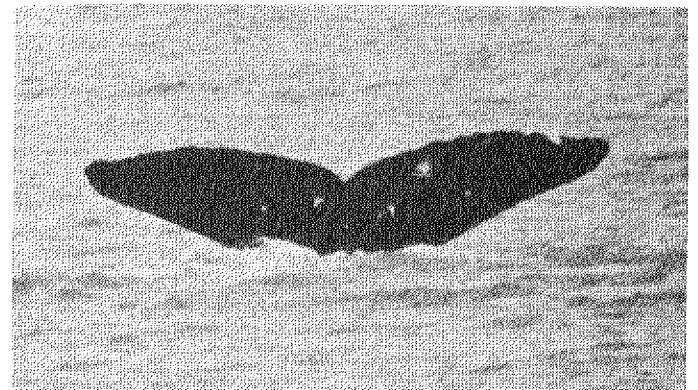
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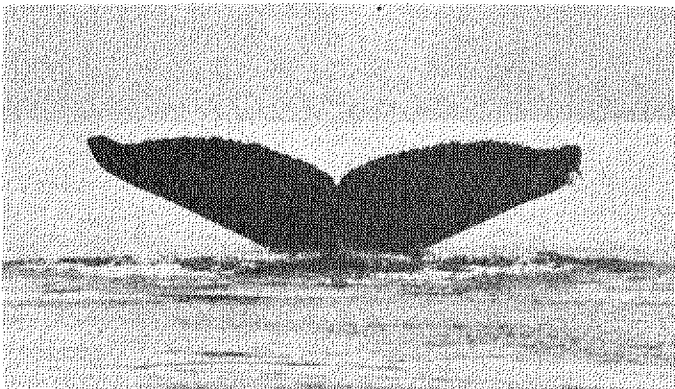
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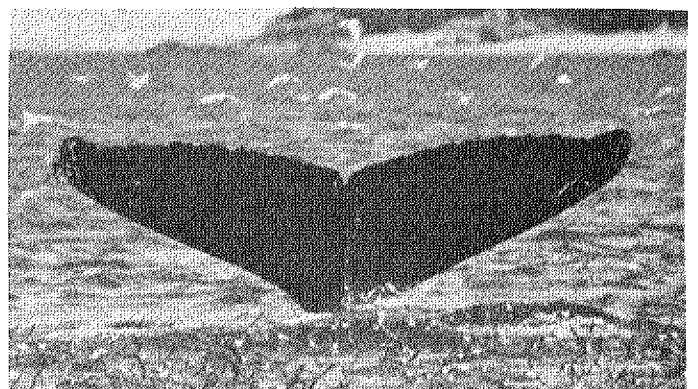
1736

302



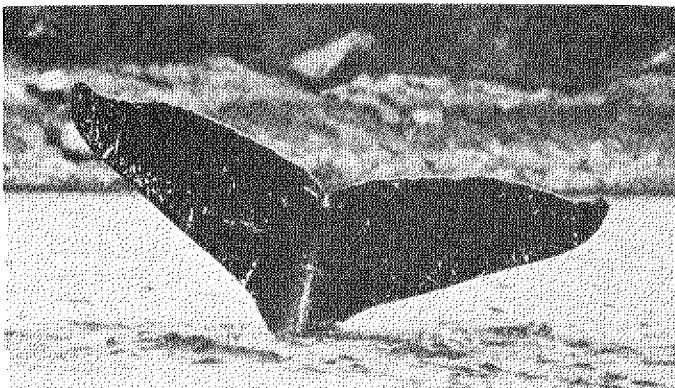
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557



1422

581



1485

584

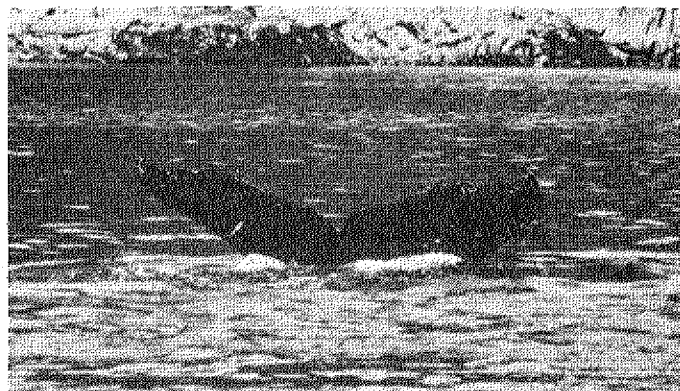


4173

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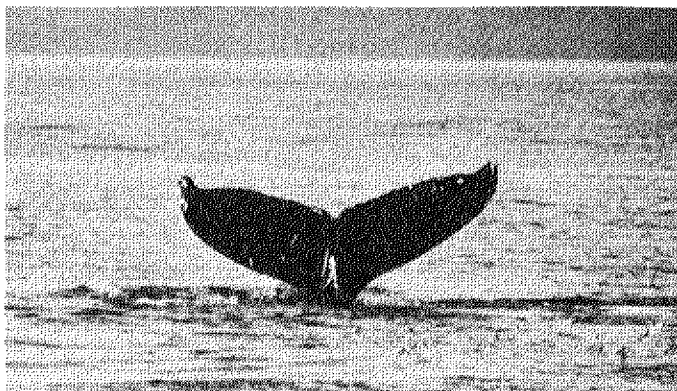


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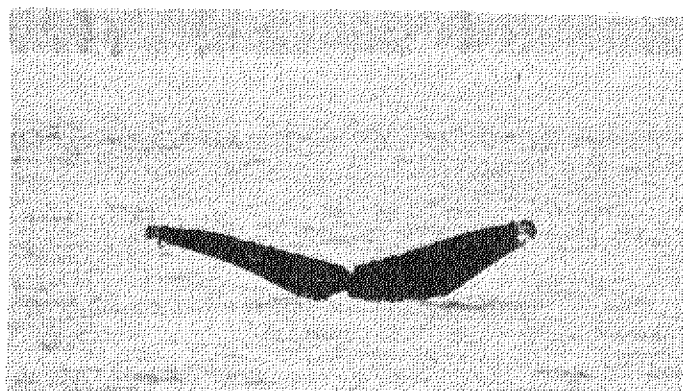
3318

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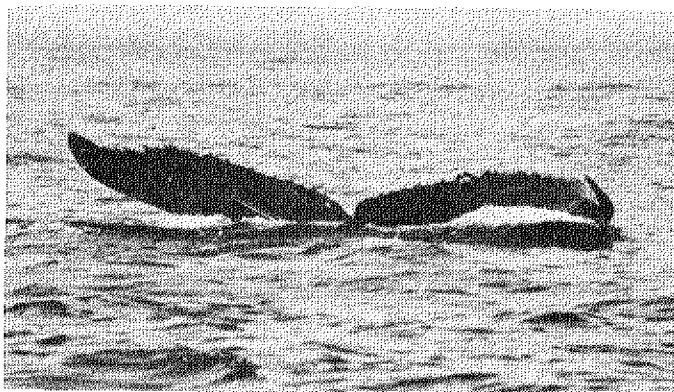
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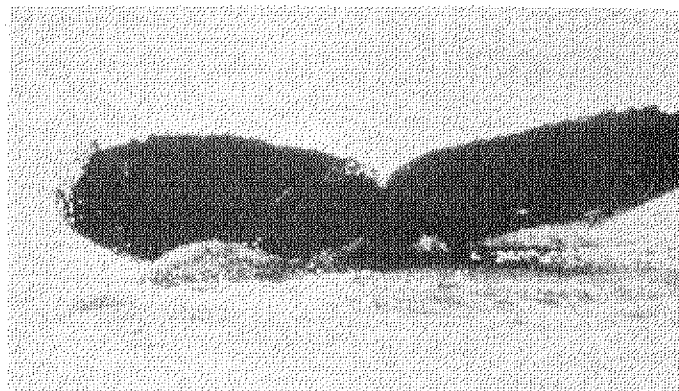
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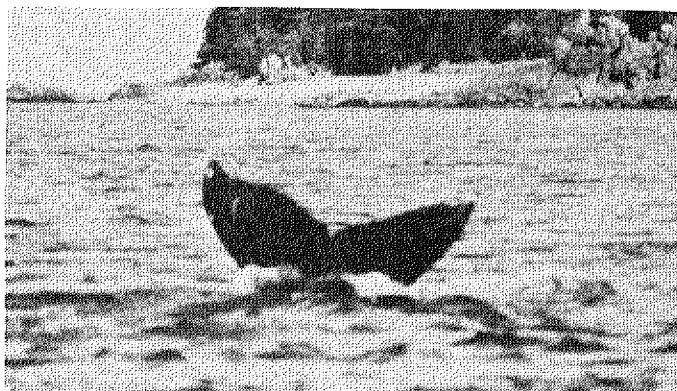
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1796

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2938

353



2573

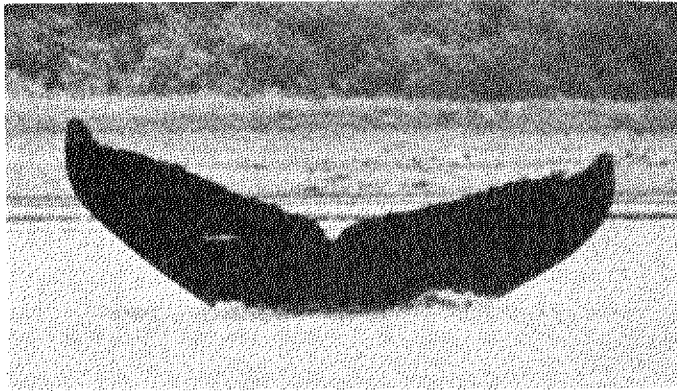
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3175

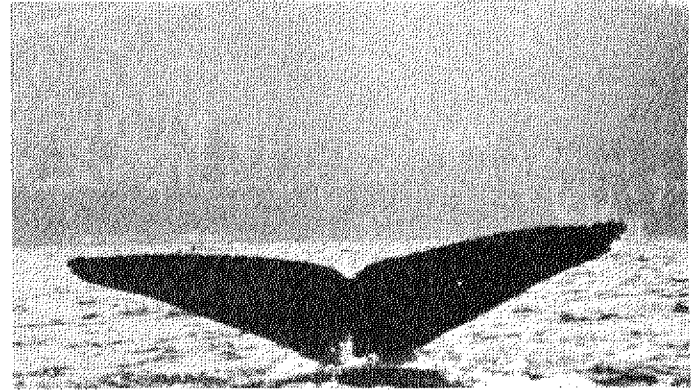
491

SOUTHEASTERN ALASKA



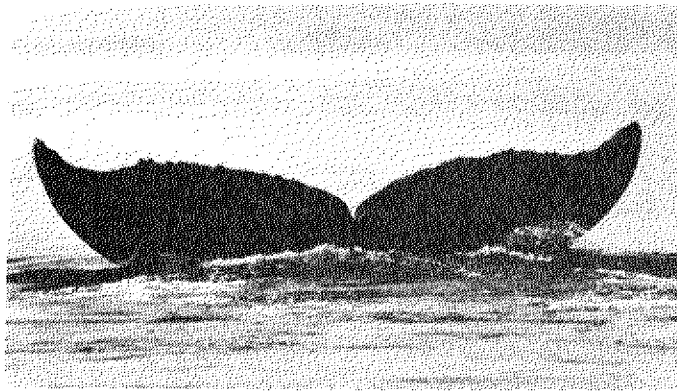
2843

351



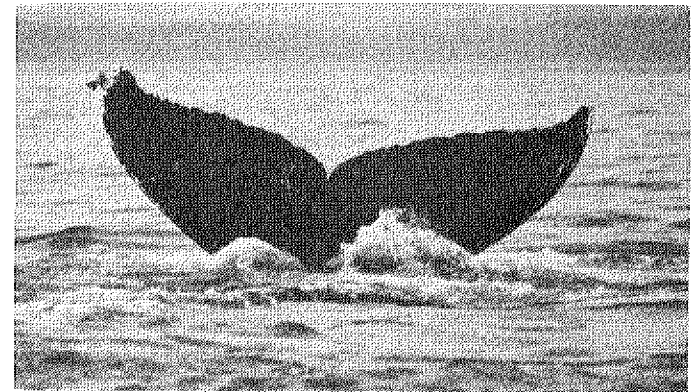
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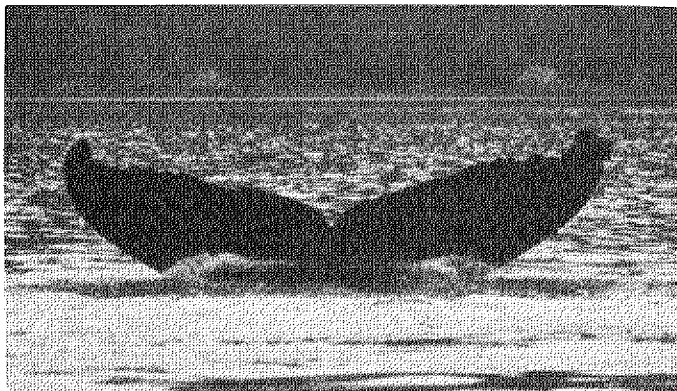
1487

217



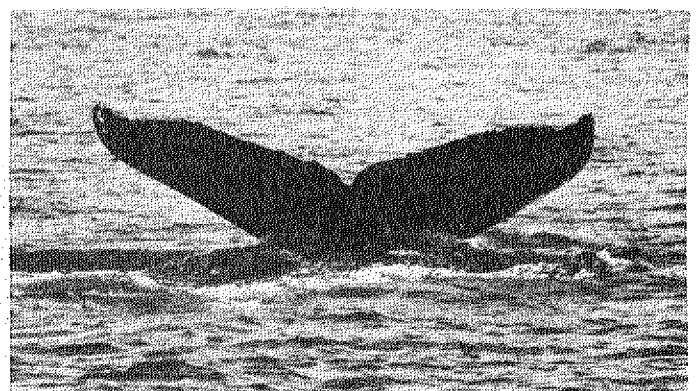
947

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735

590



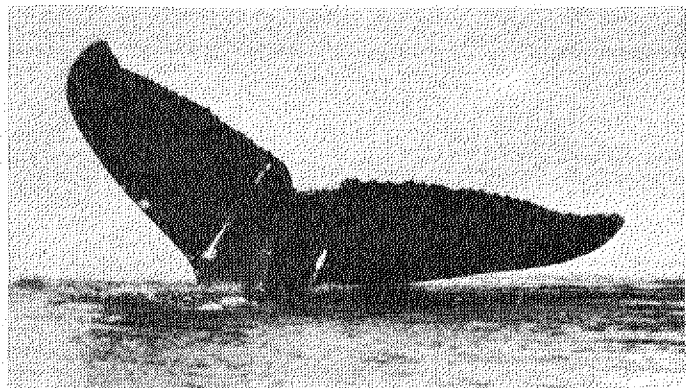
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406



901

104

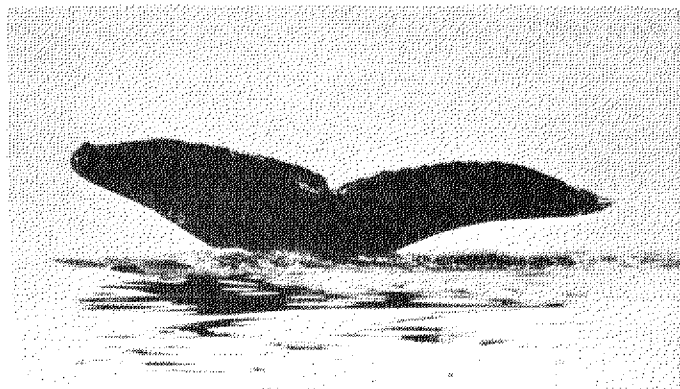


1419

196



# SOUTHEASTERN ALASKA



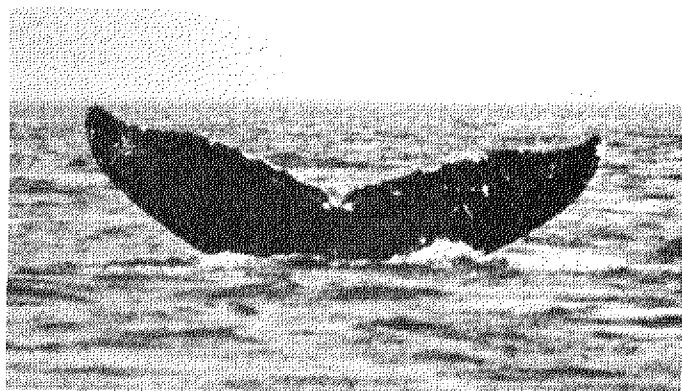
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224



948

578



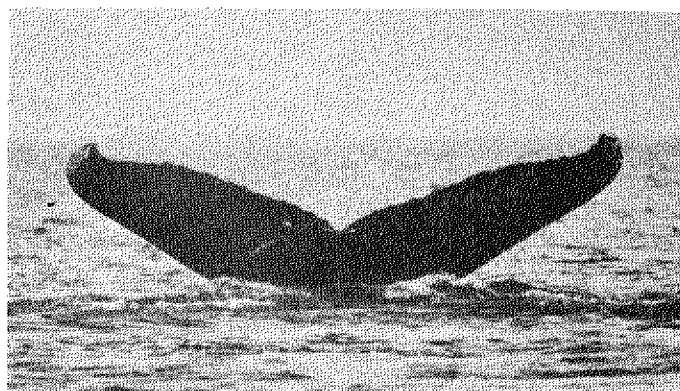
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166



3595

470



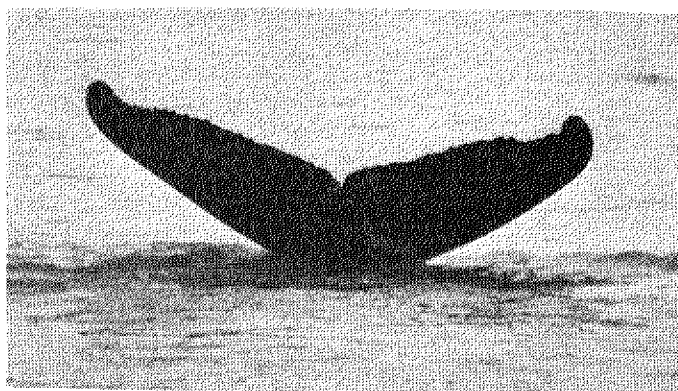
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560



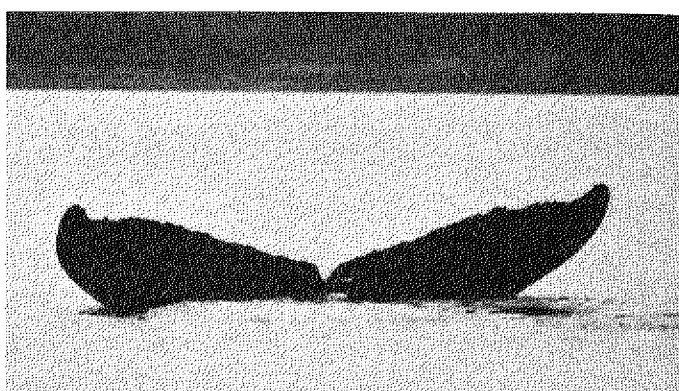
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576



3171

232

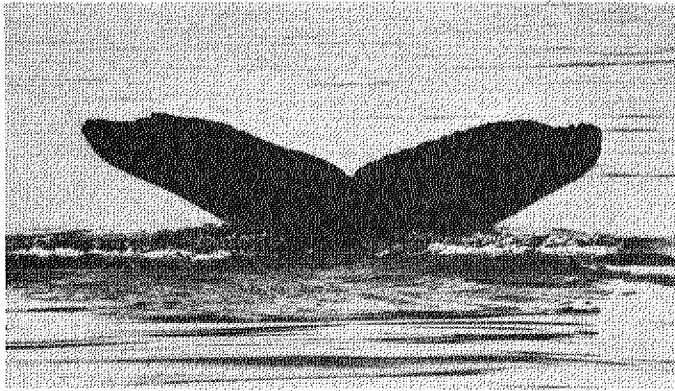


1433

0



SOUTHEASTERN ALASKA



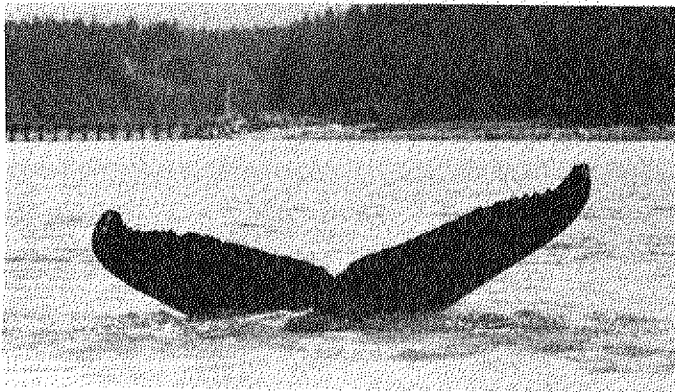
3199

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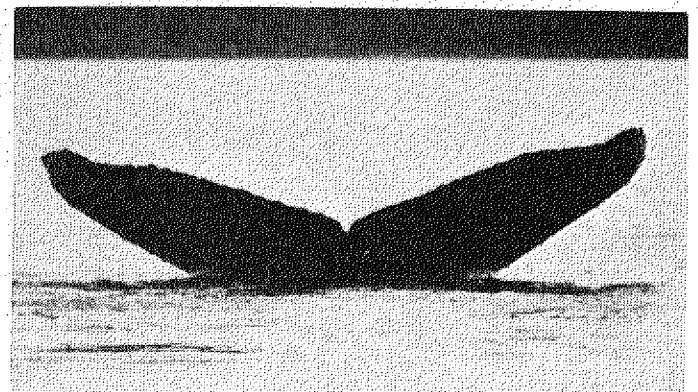
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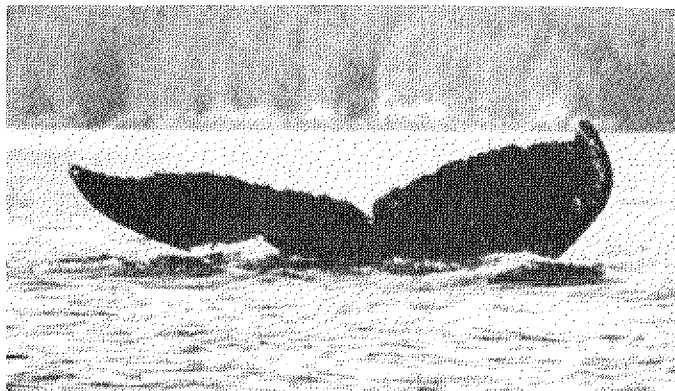
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219



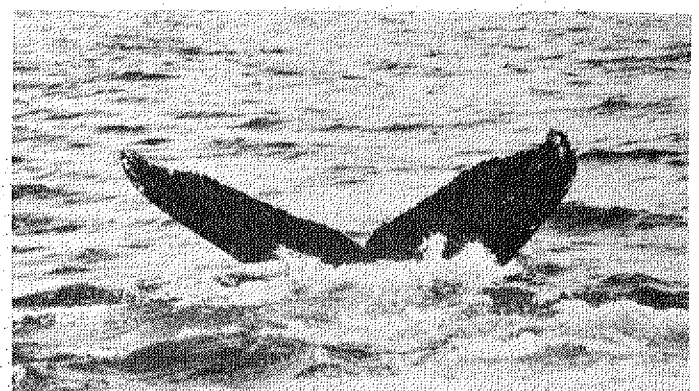
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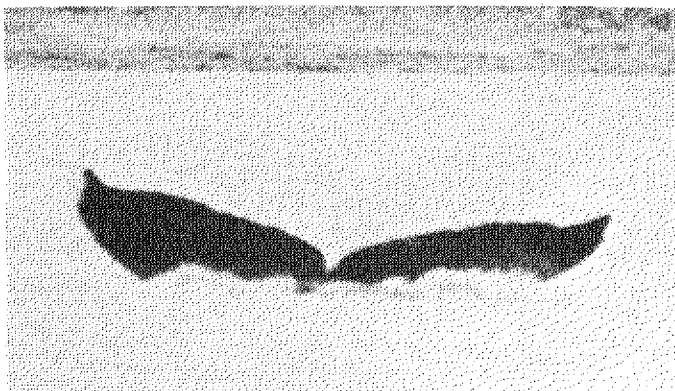
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593



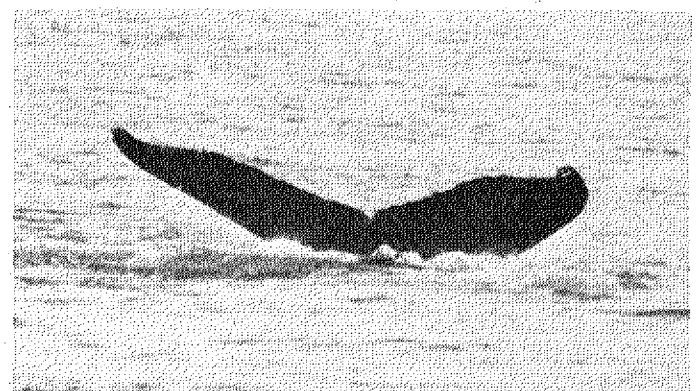
1762

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3634

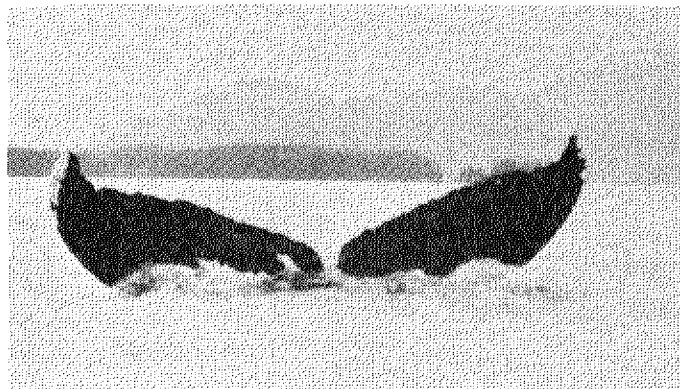
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3174

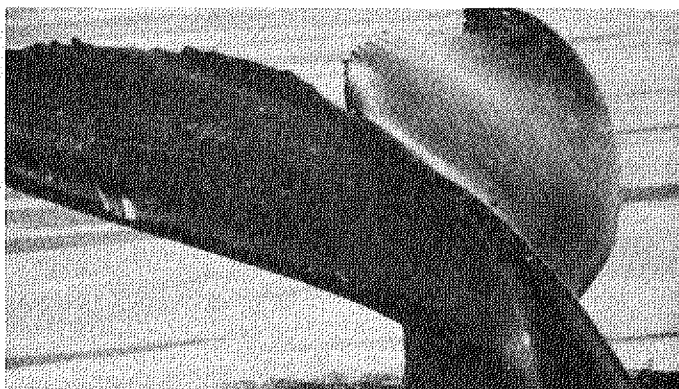
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# SOUTHEASTERN ALASKA



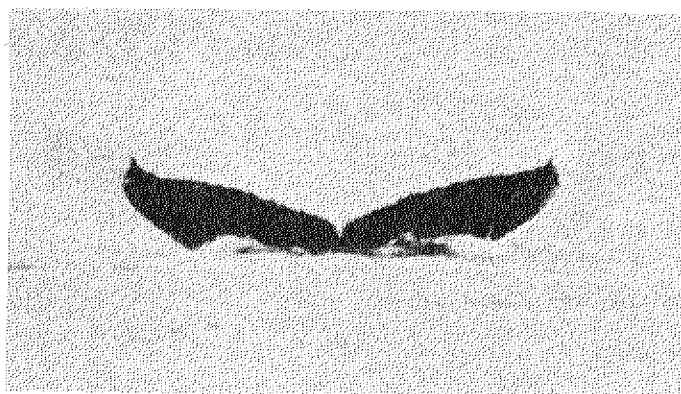
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4163

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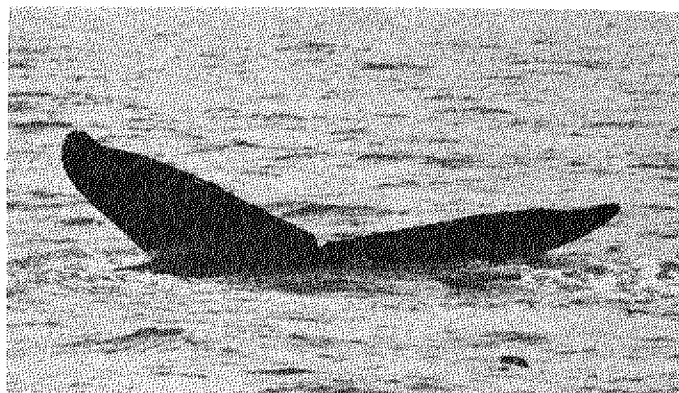
3937

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3246

384



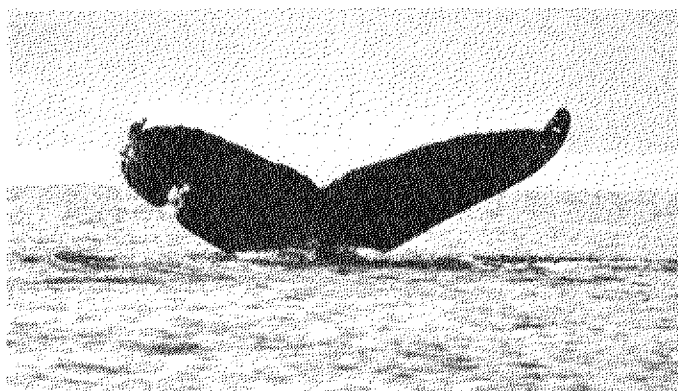
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283



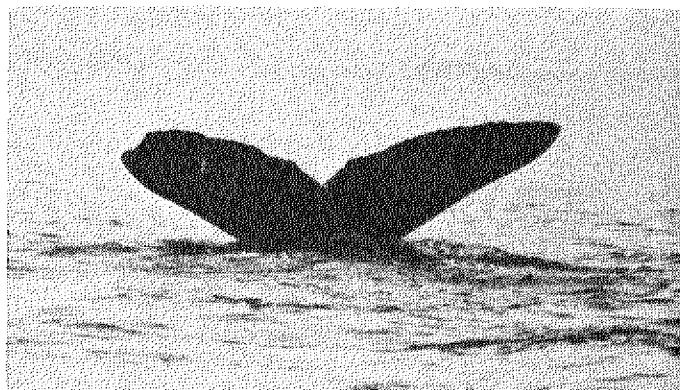
2535

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786

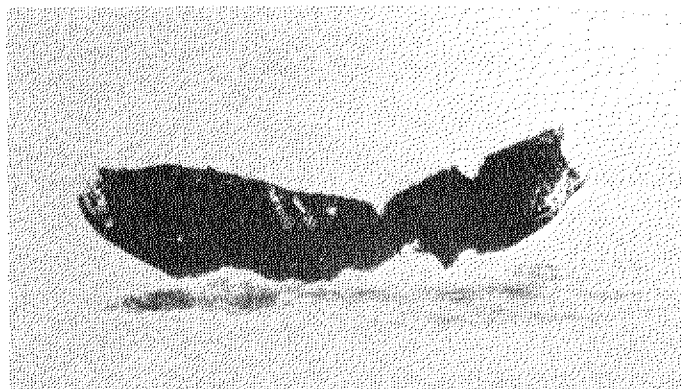
582



925

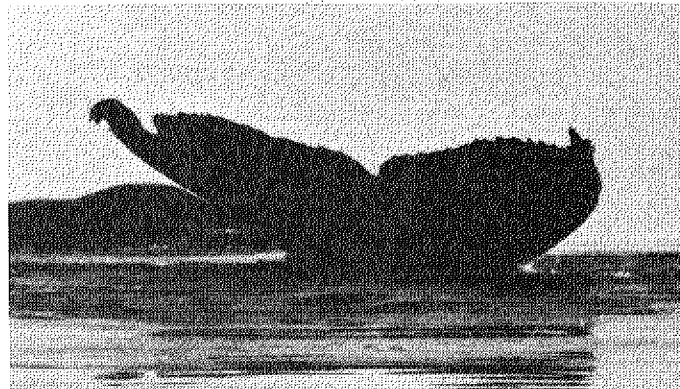
565





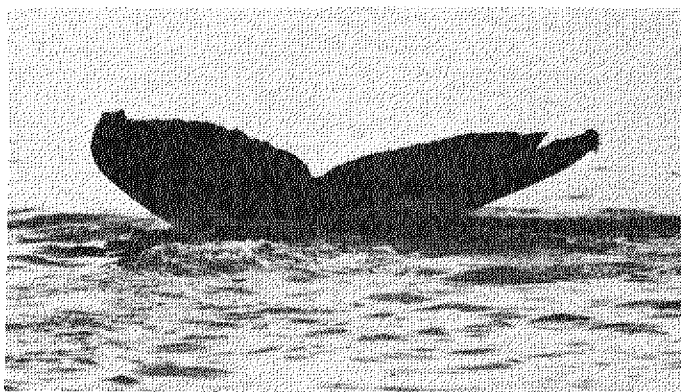
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114



815

563



3367

562



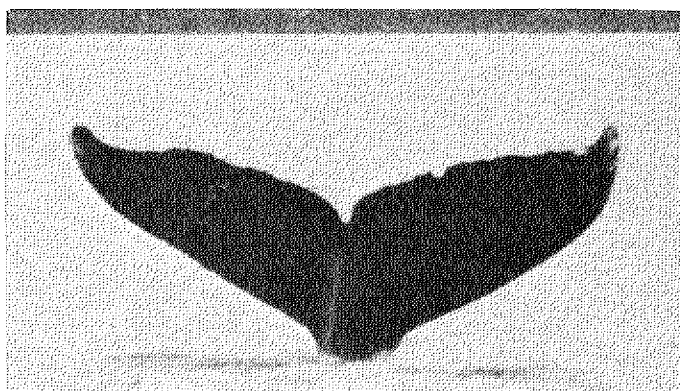
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561



734

564



3622

817



2847

118



797

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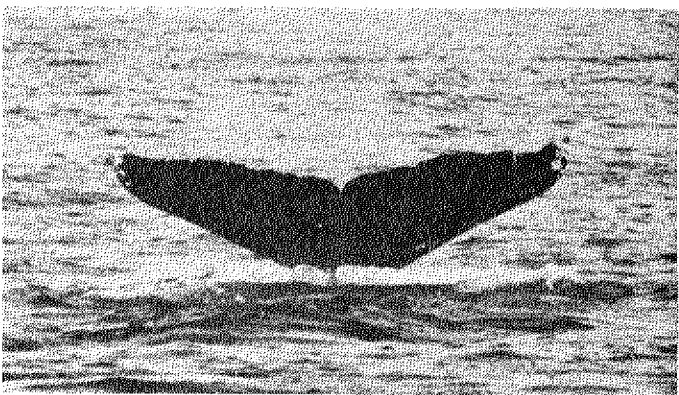


SOUTHEASTERN ALASKA



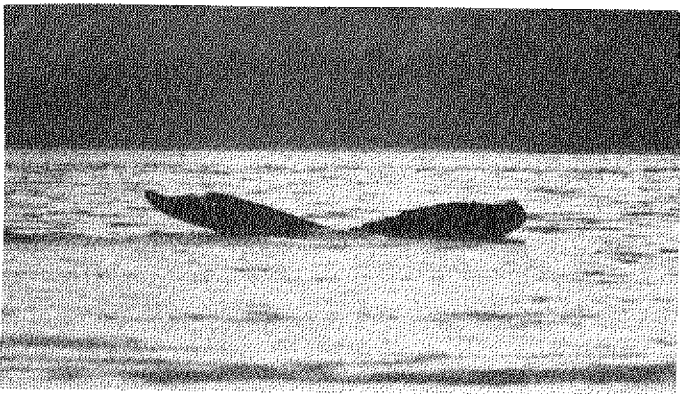
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229



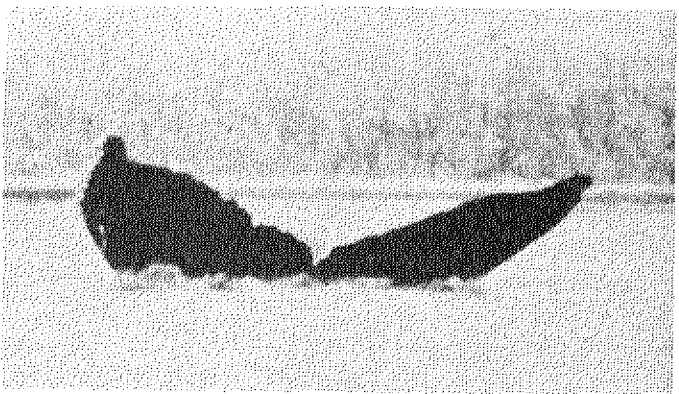
3224

408



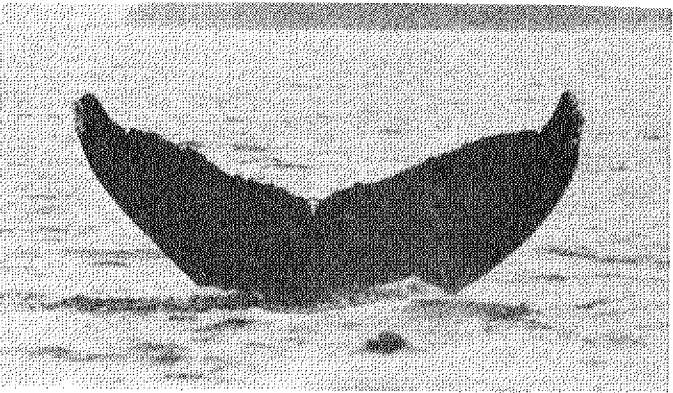
2846

350



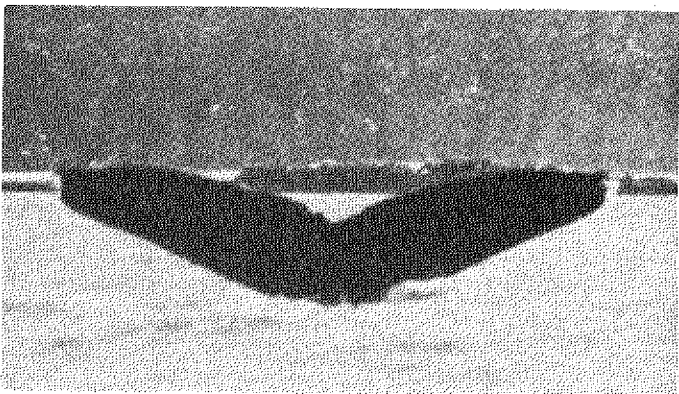
1984

494



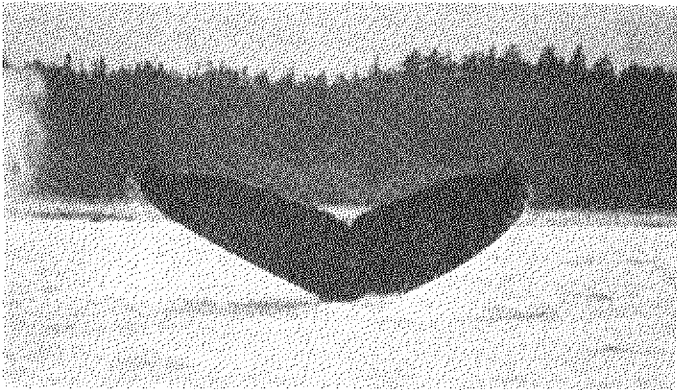
3684

285



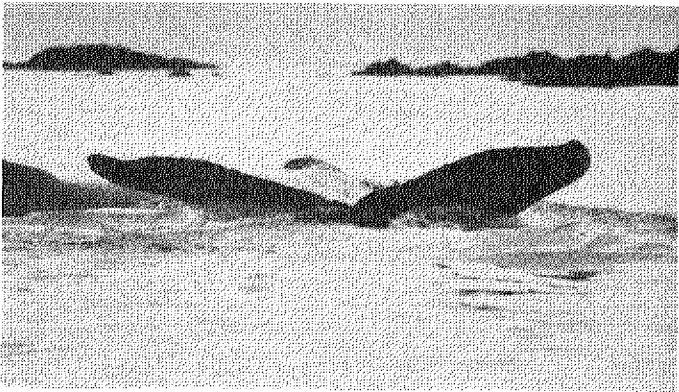
3572

415



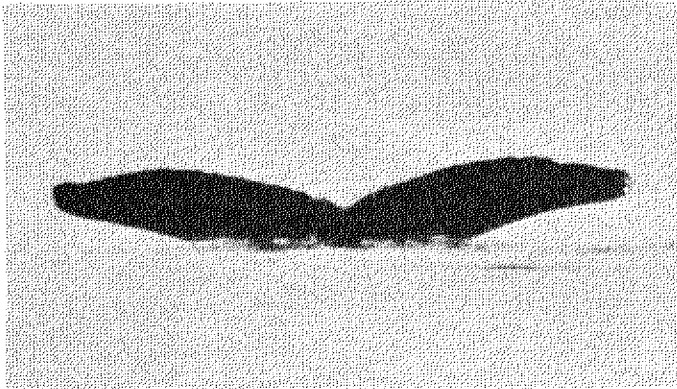
2972

387



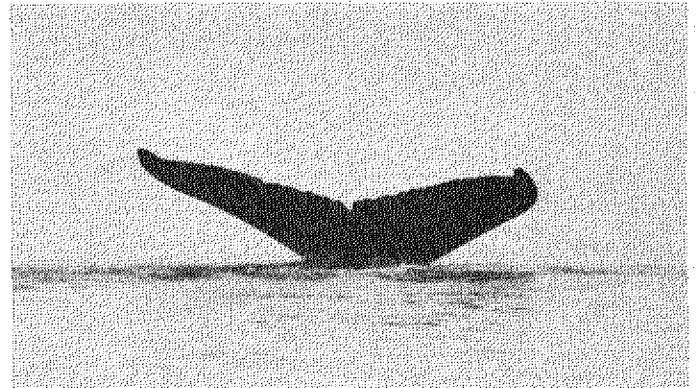
1448

252



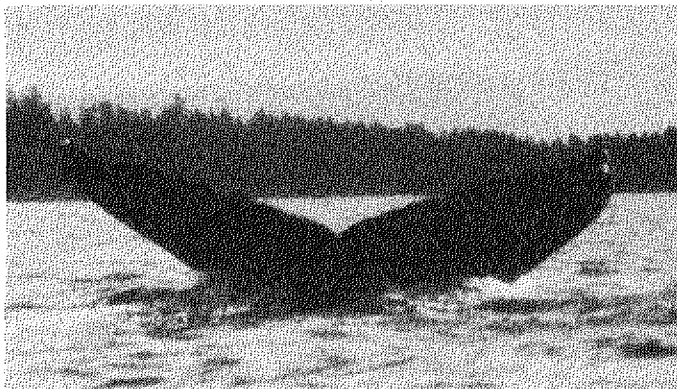
3616

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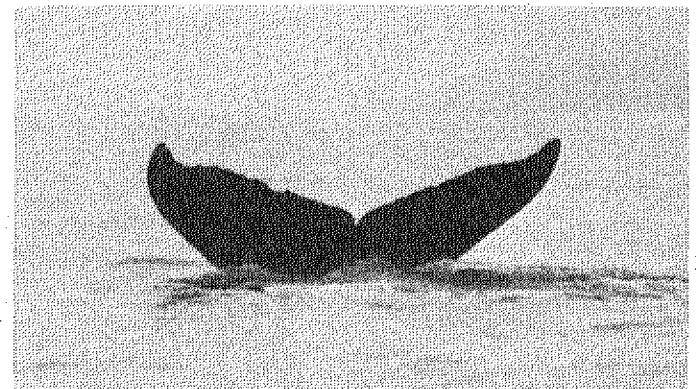
1506

0



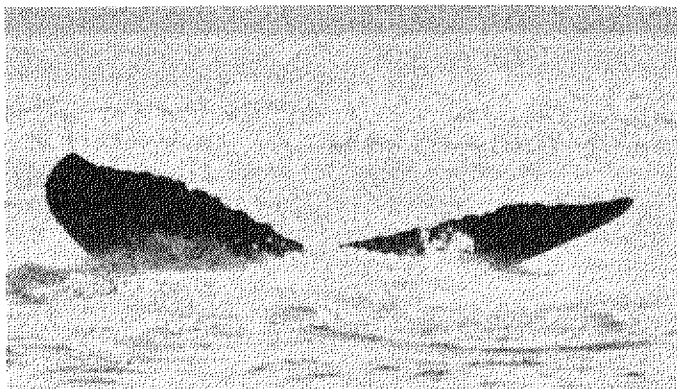
4189

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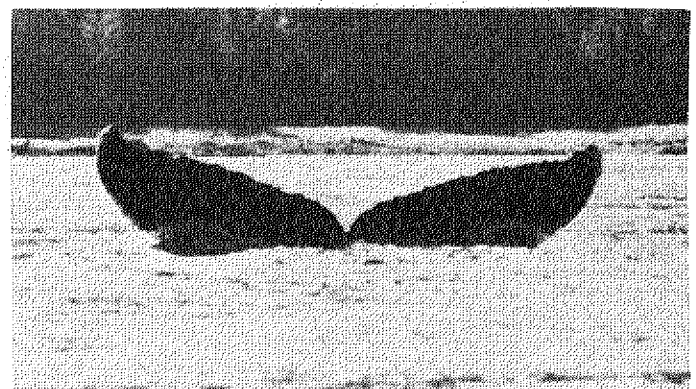
926

570



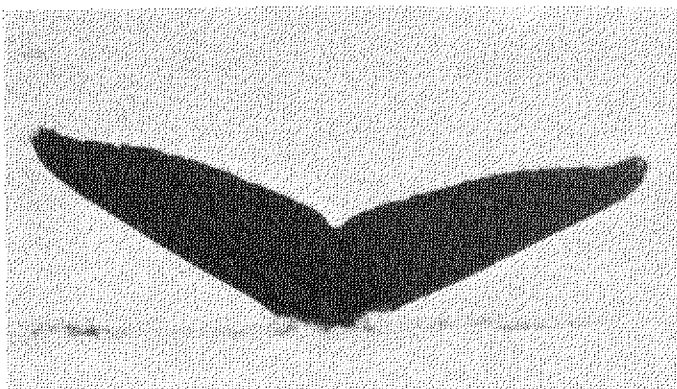
4148

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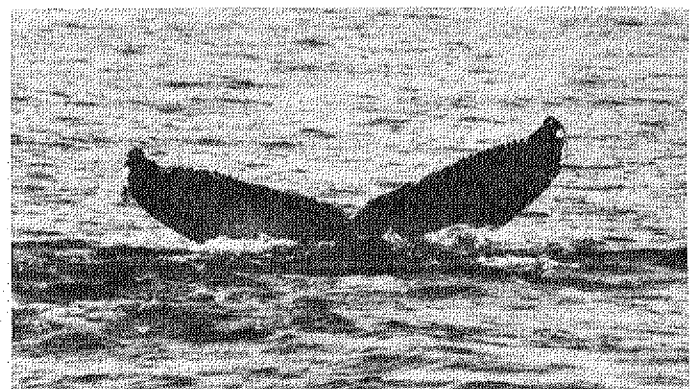
289

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2530

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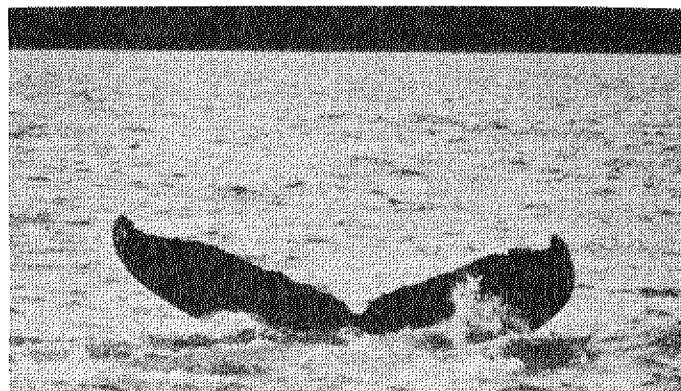


3242

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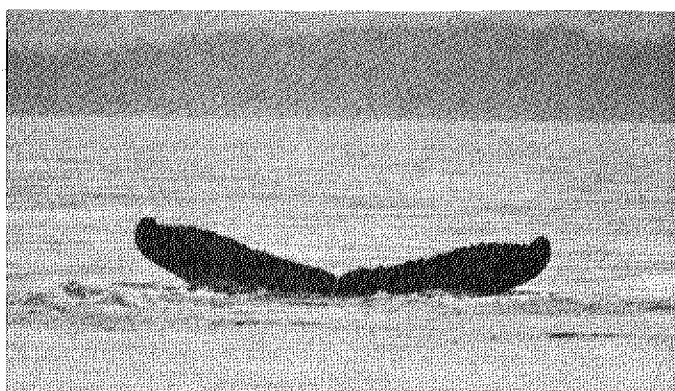


# SOUTHEASTERN ALASKA



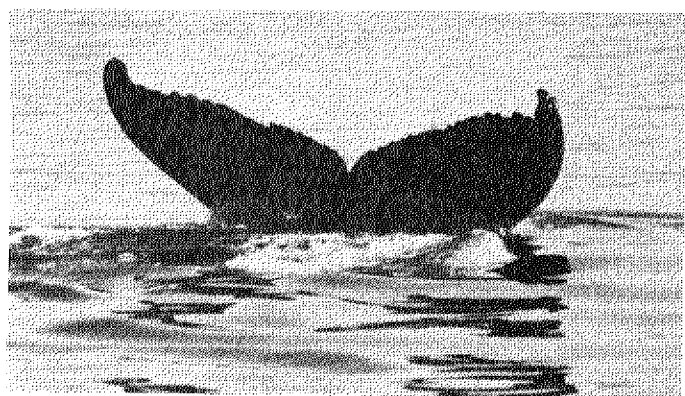
1489

231



928

658



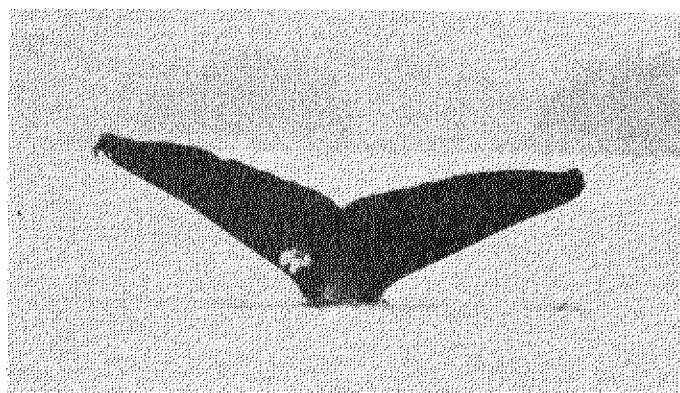
3187

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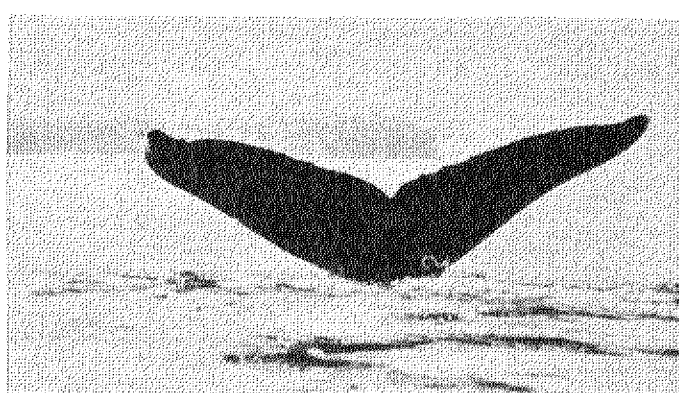
840

648



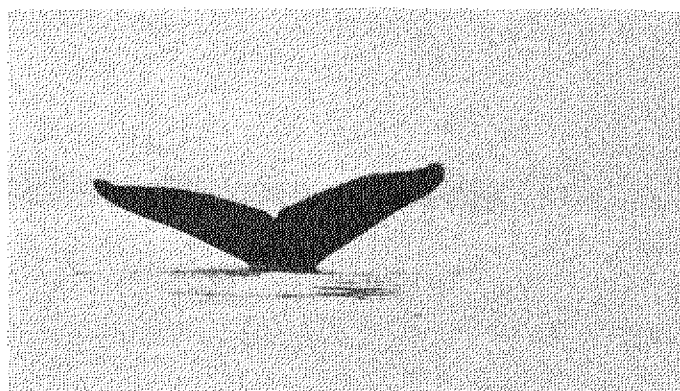
1442

204



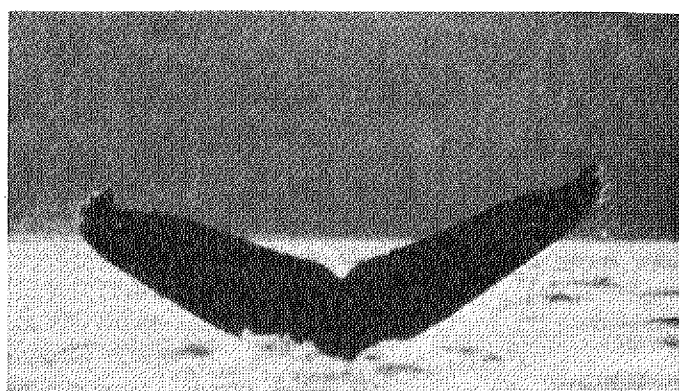
1786

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3842

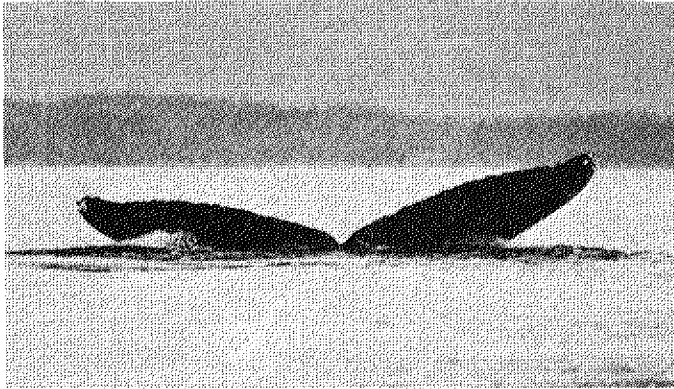
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1985

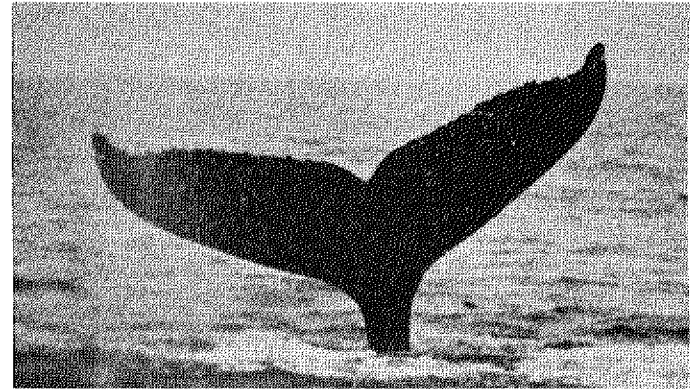
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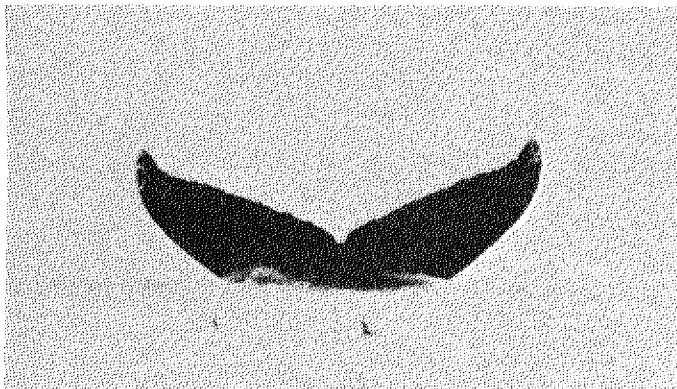
1451

599



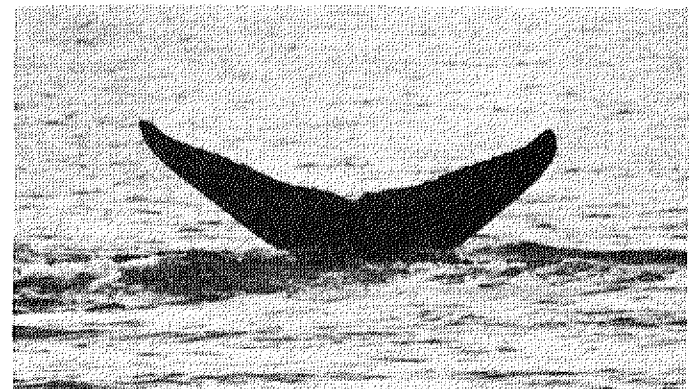
4266

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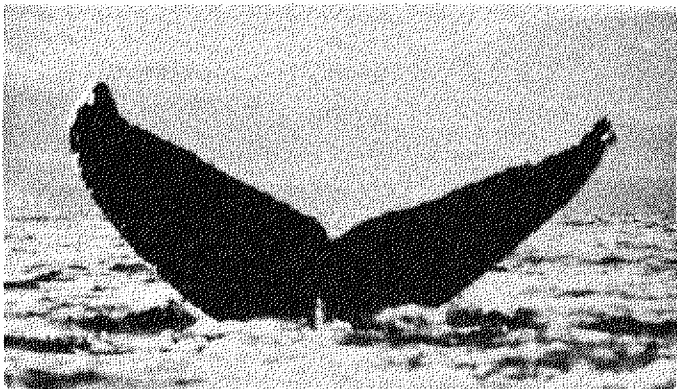
1707

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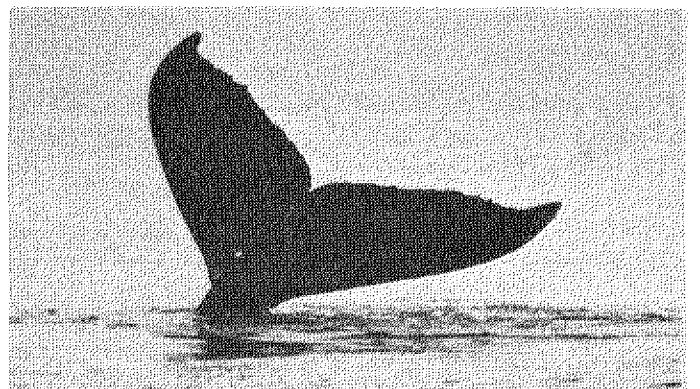
3364

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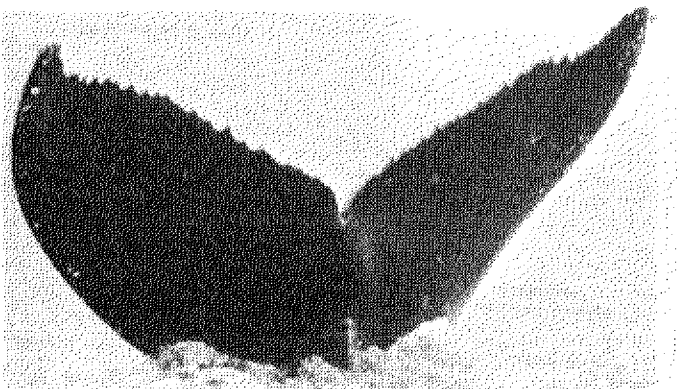
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2571

412



784

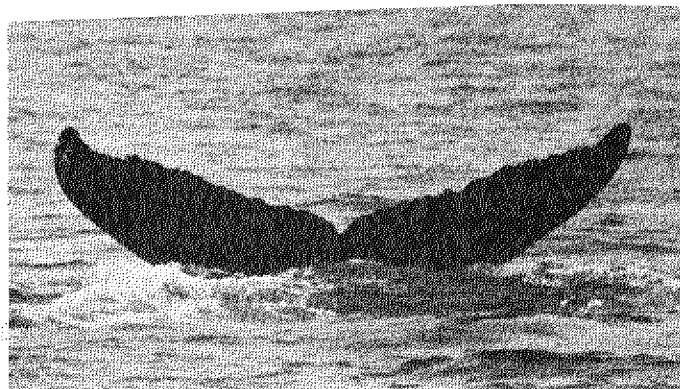
150



4208

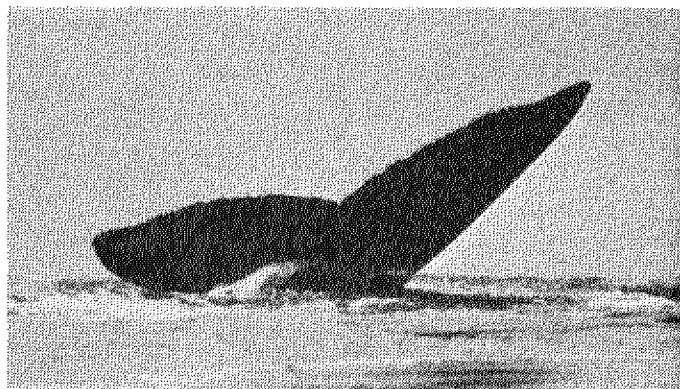
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# SOUTHEASTERN ALASKA



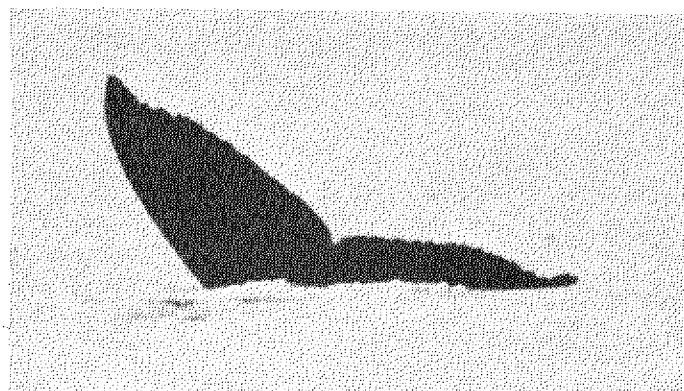
3914

492



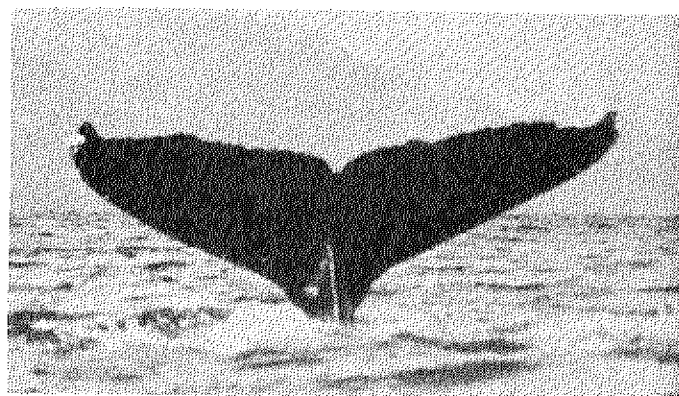
1513

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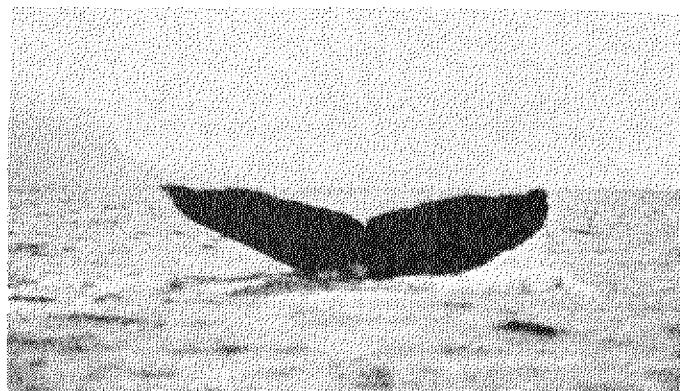
2989

383



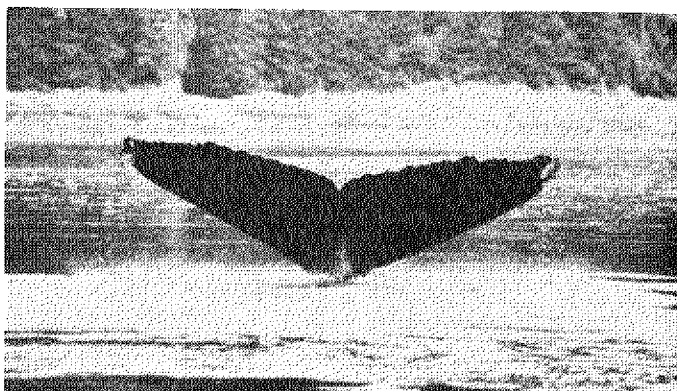
4207

452



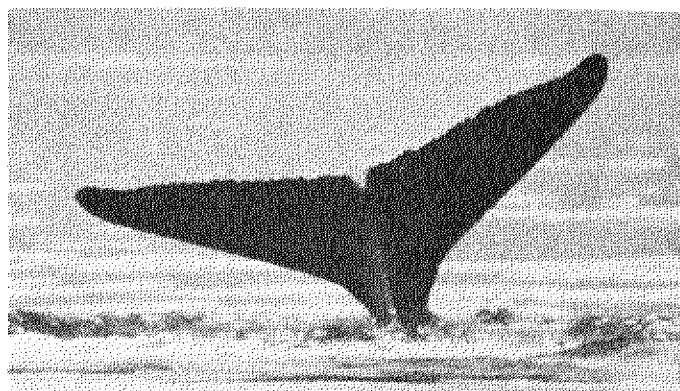
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341



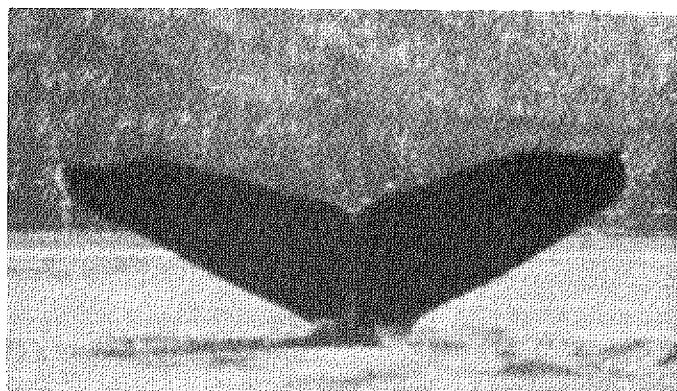
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594



1505

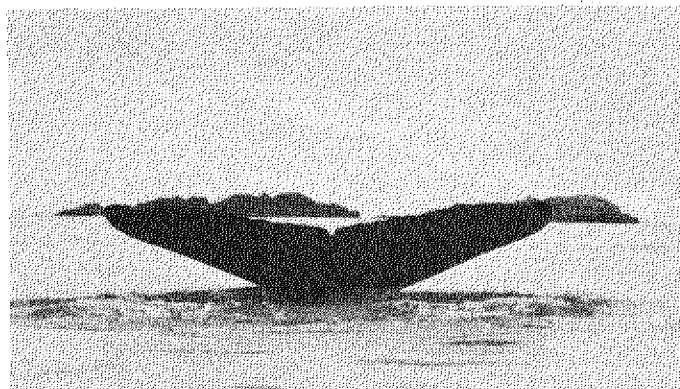
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3858

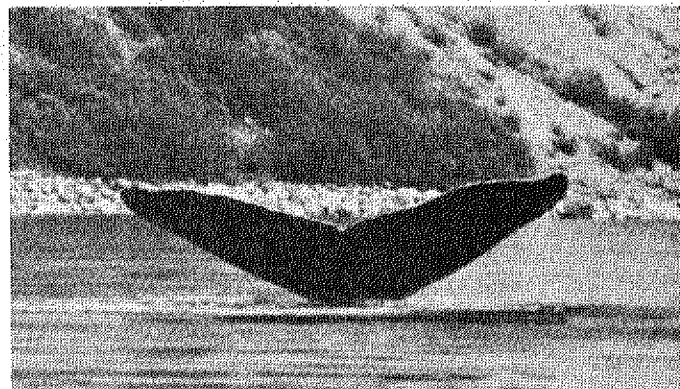
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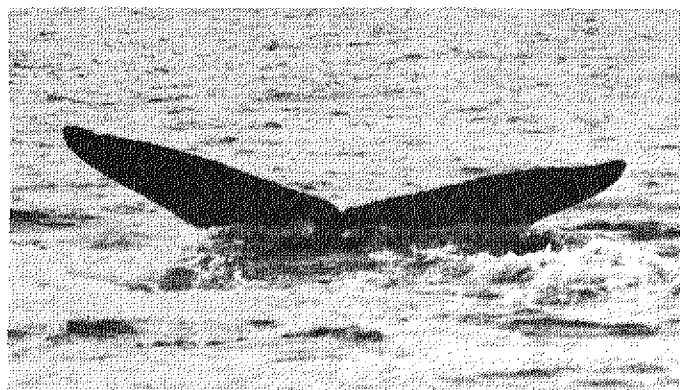
3840

0



3475

441



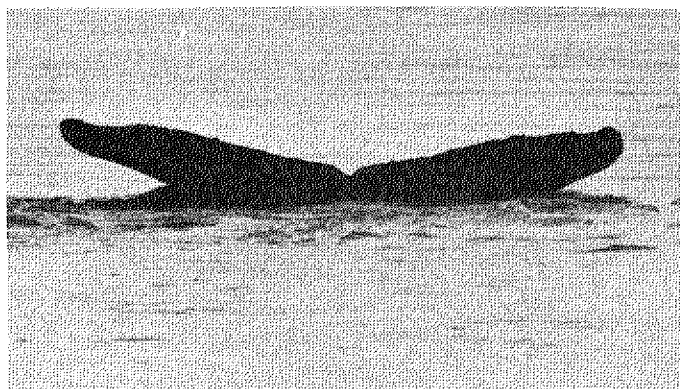
3624

0



1504

0



3607

446



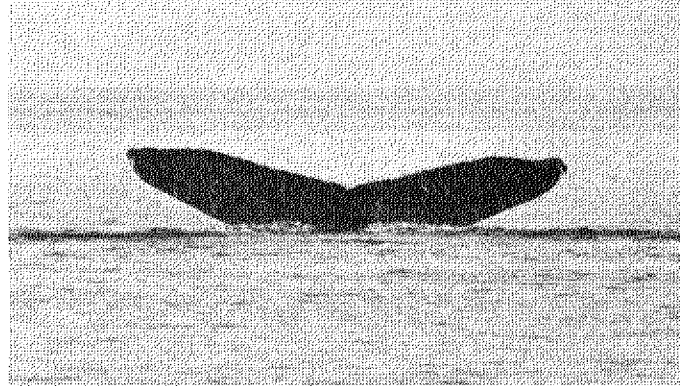
3696

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1795

0

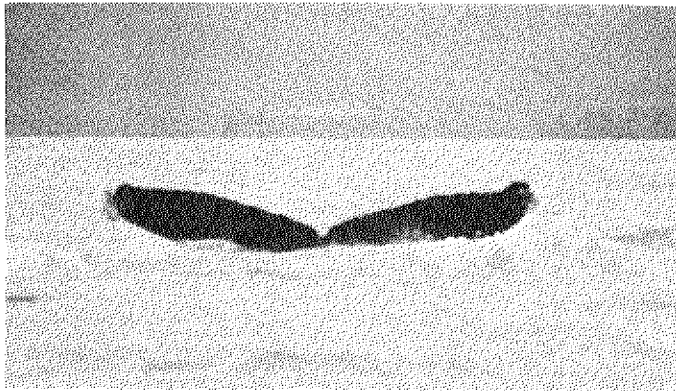


788

595

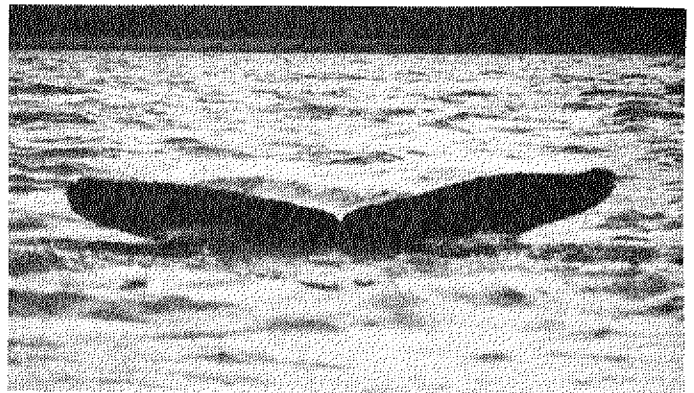


# SOUTHEASTERN ALASKA



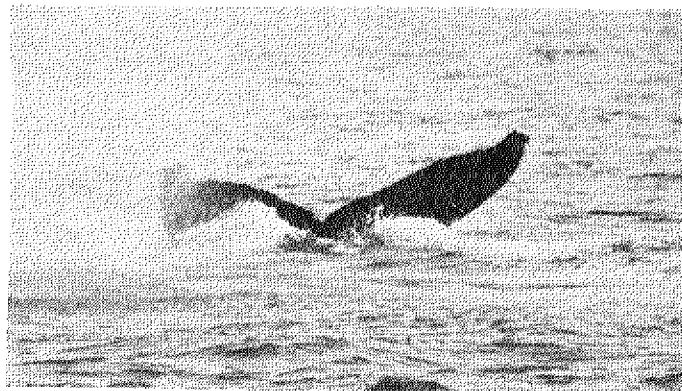
3834

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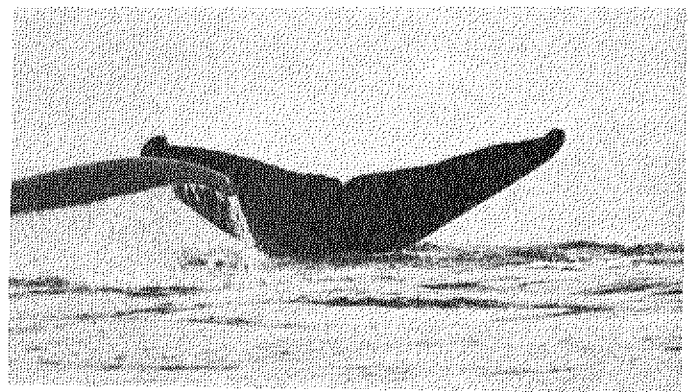
3981

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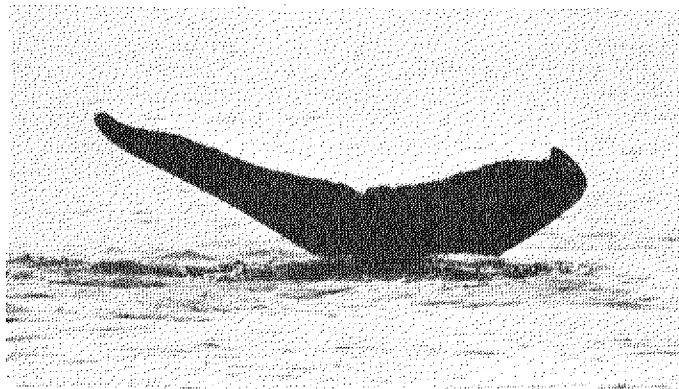
3404

413



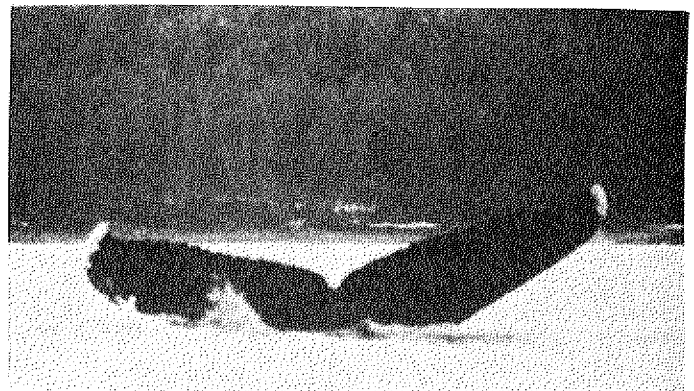
3442

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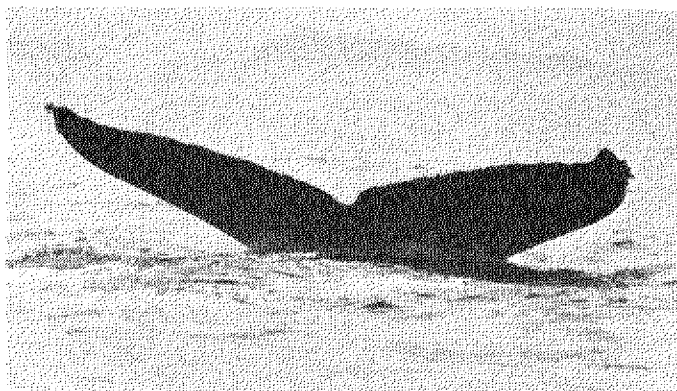
3362

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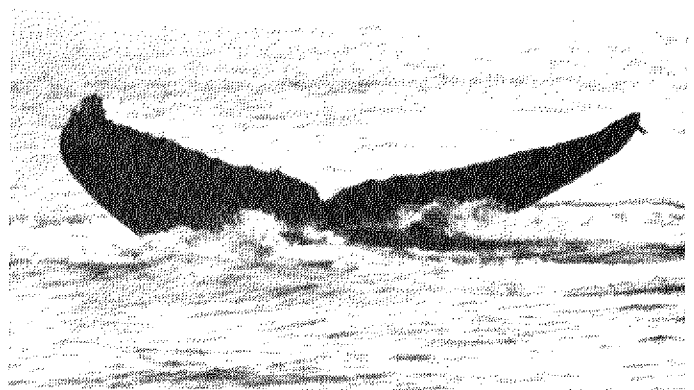
1990

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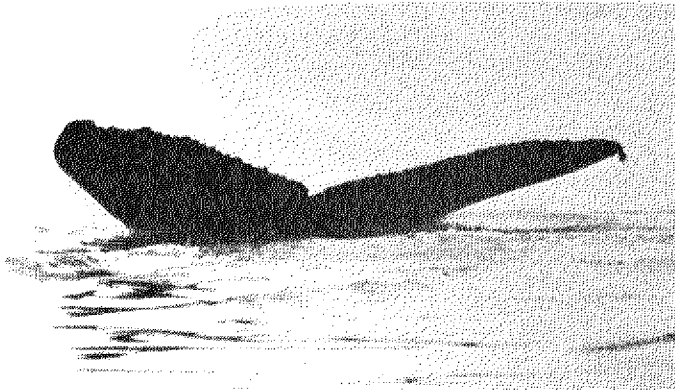
810

600



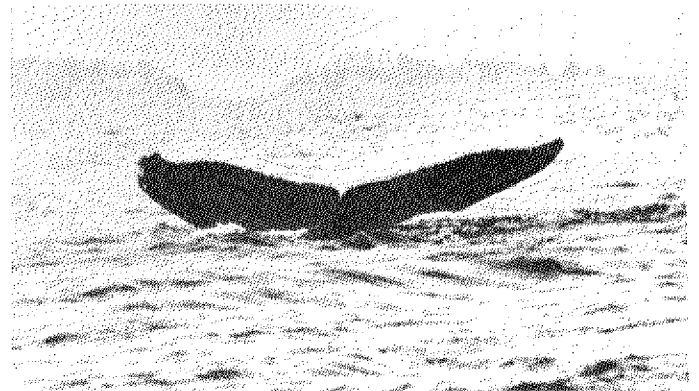
3757

493



3586

0



1654

272



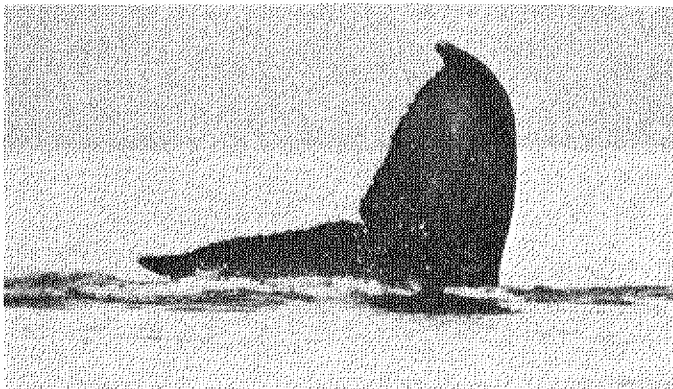
1463

205



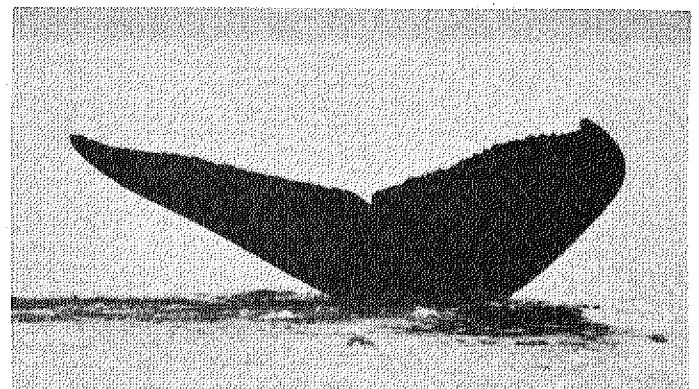
798

605



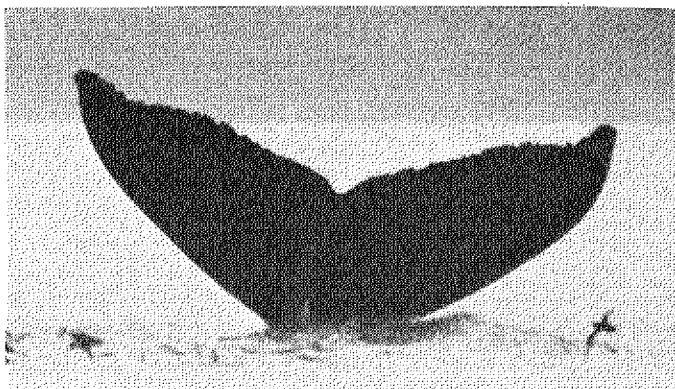
1246

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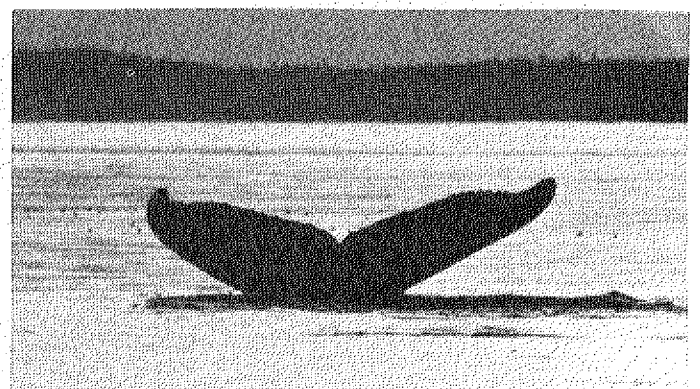
1495

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1515

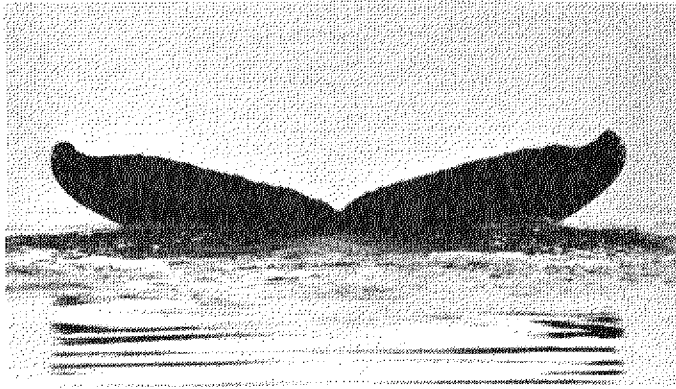
233



2568

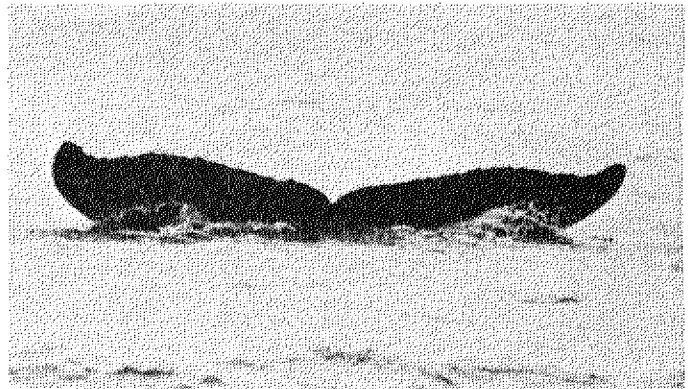
410

# SOUTHEASTERN ALASKA



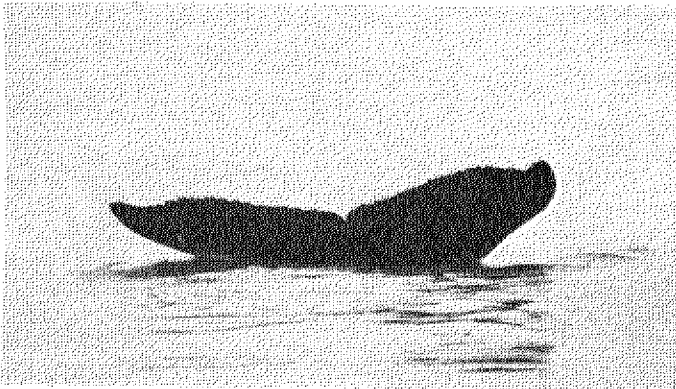
3601

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3664

461



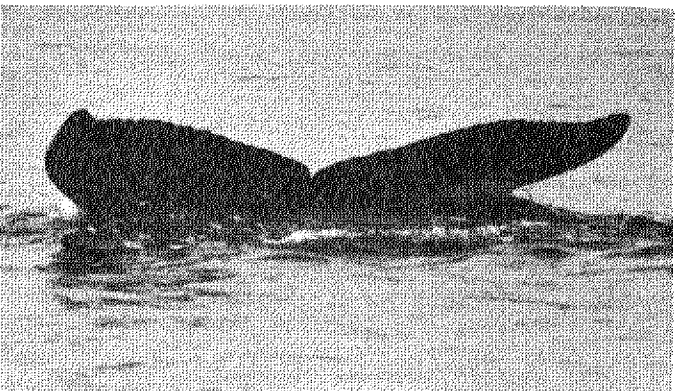
3257

382



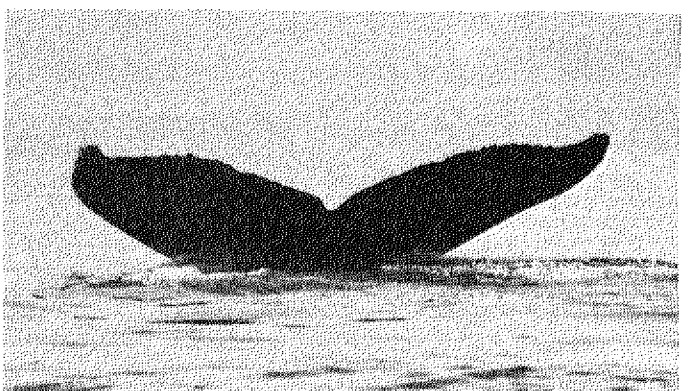
3657

0



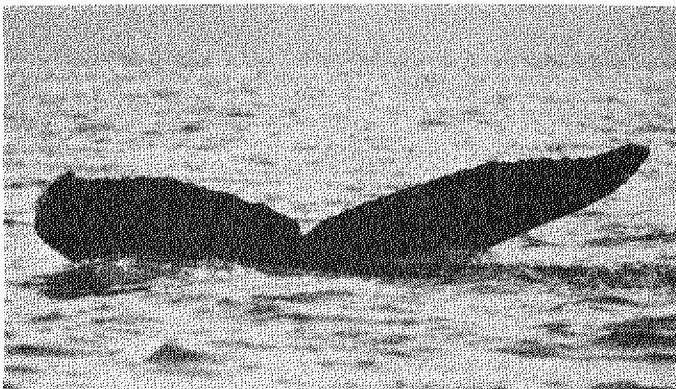
841

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1440

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1516

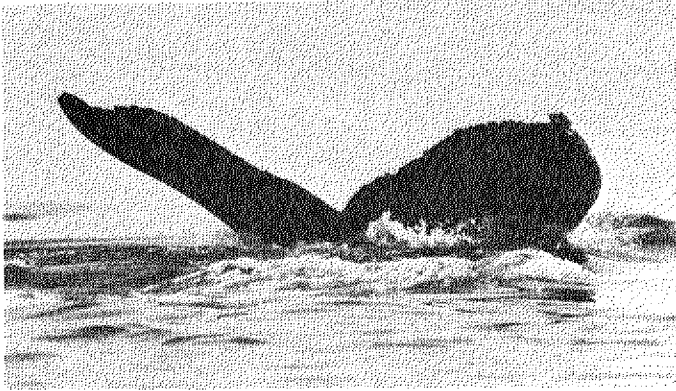
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1517

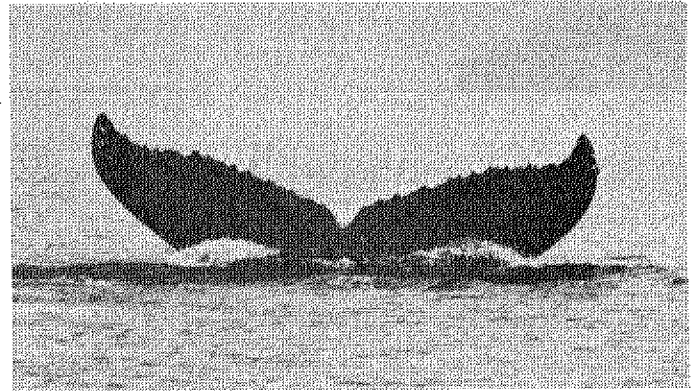
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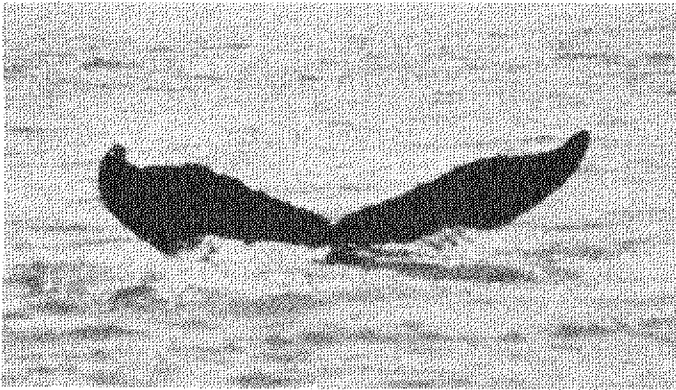
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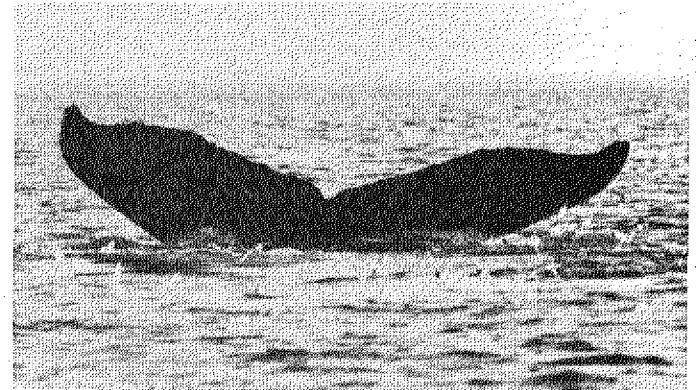
899

592



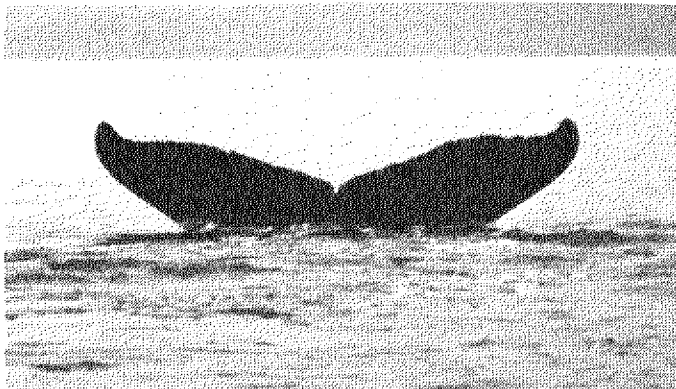
3173

405



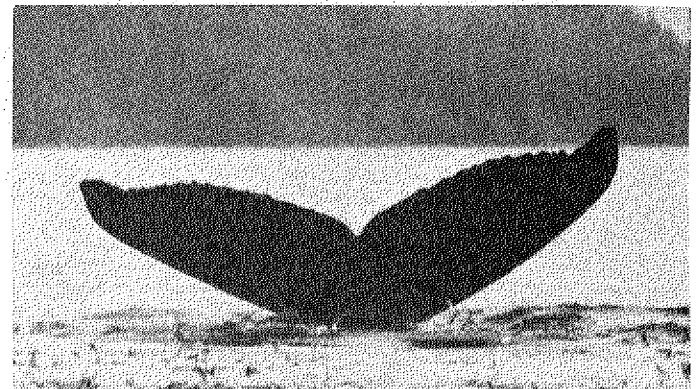
1491

348



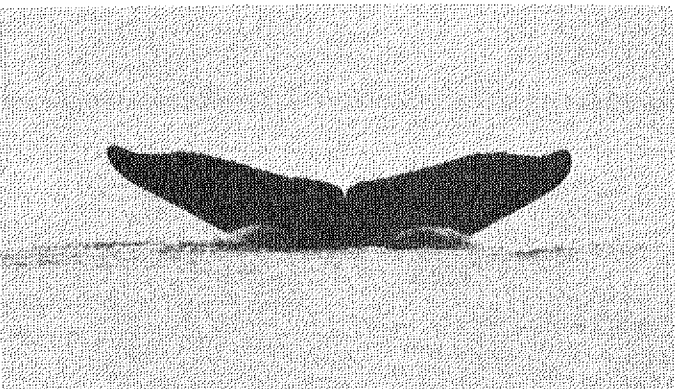
103

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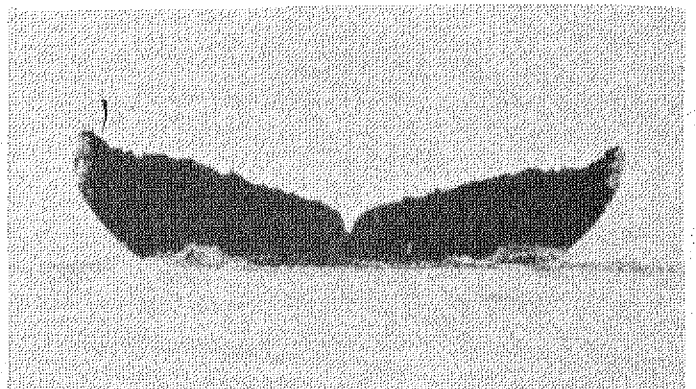
1435

181



1461

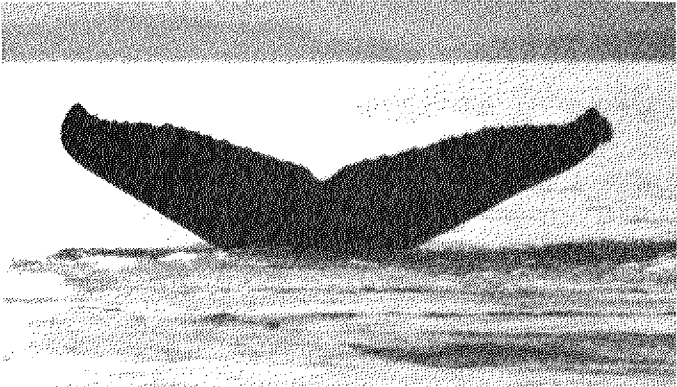
163



3900

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SOUTHEASTERN ALASKA



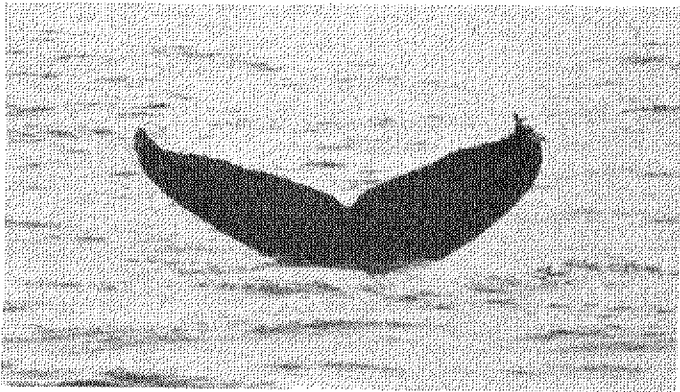
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234



1794

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3232

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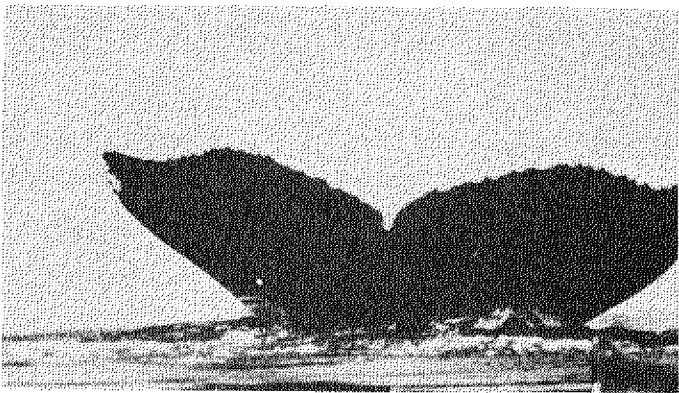
3230

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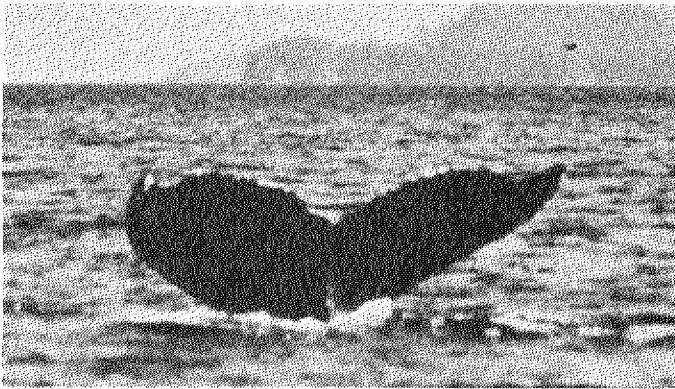
1464

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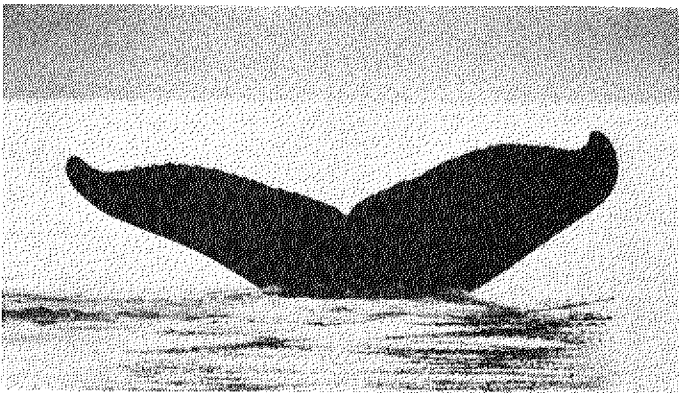
1781

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4264

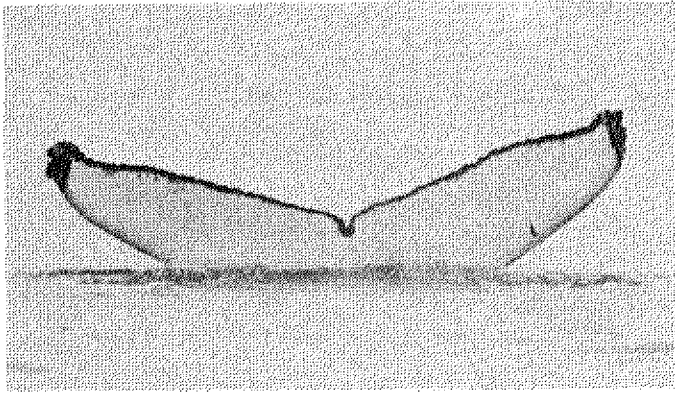
407



1514

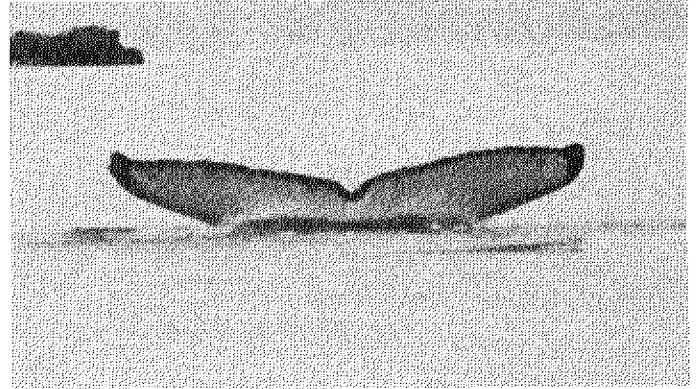
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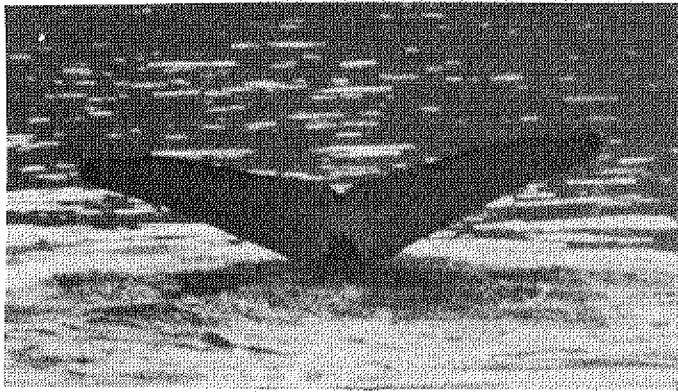
4225

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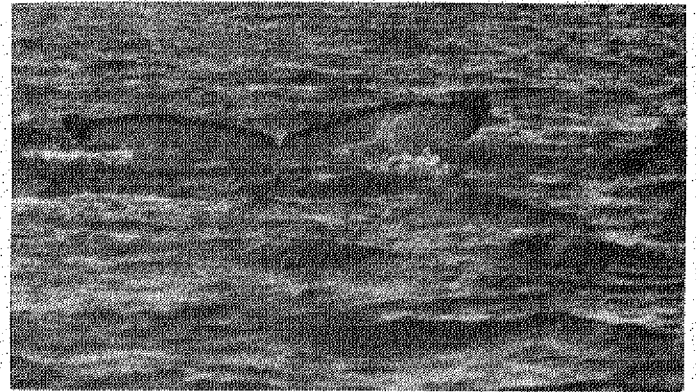
4228

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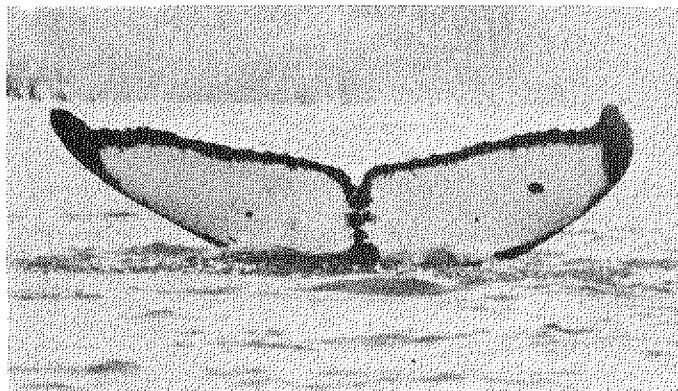
695

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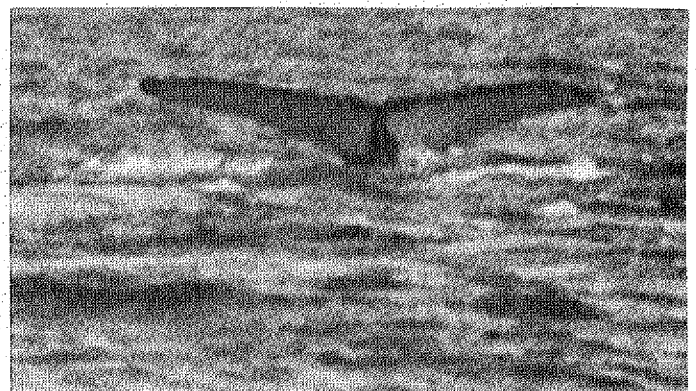
694

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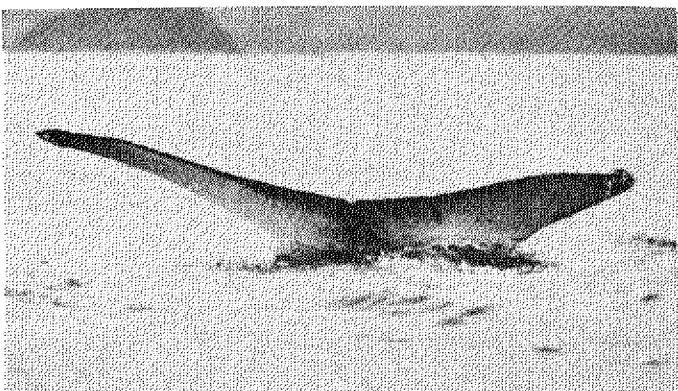
2605

0



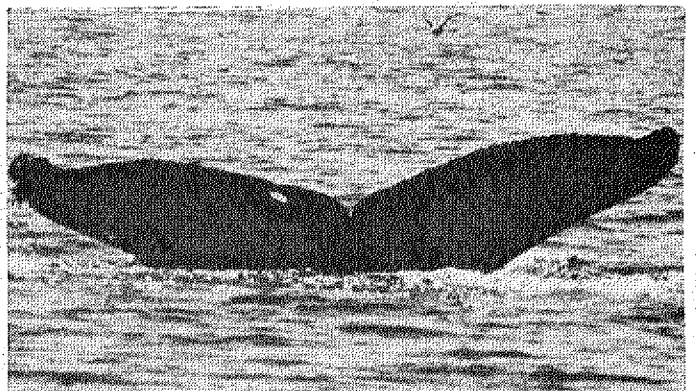
164

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2603

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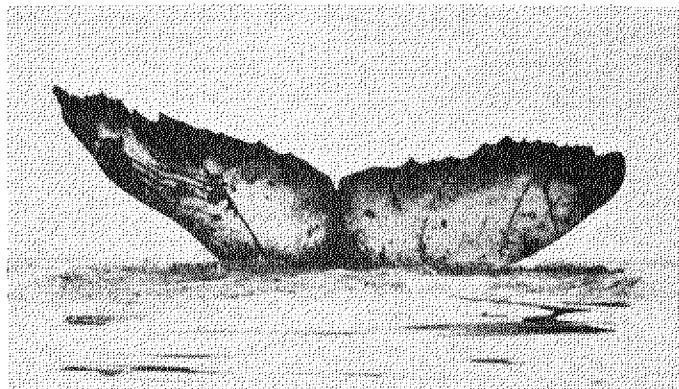


4222

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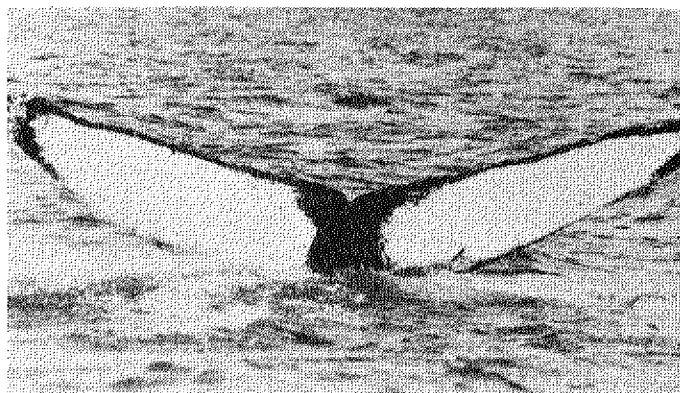


# WESTERN GULF OF ALASKA



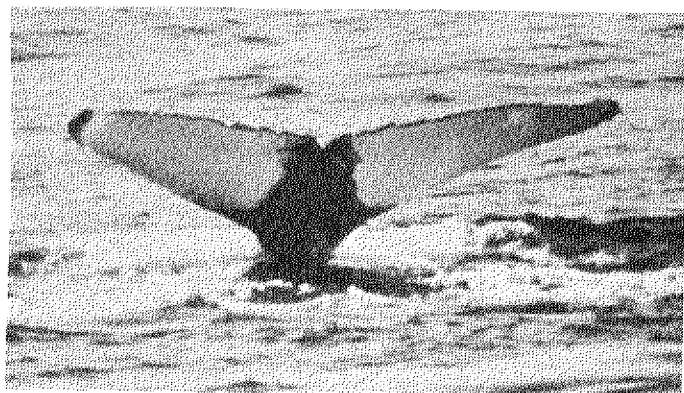
2584

363



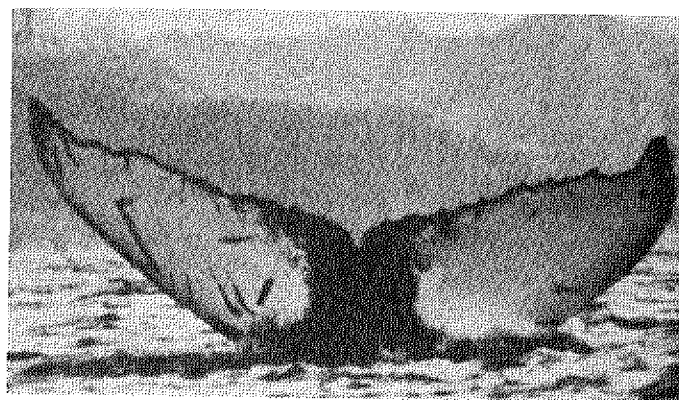
4238

0



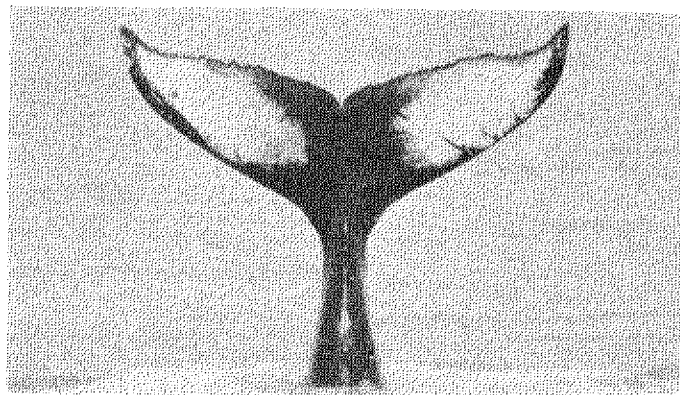
1730

0



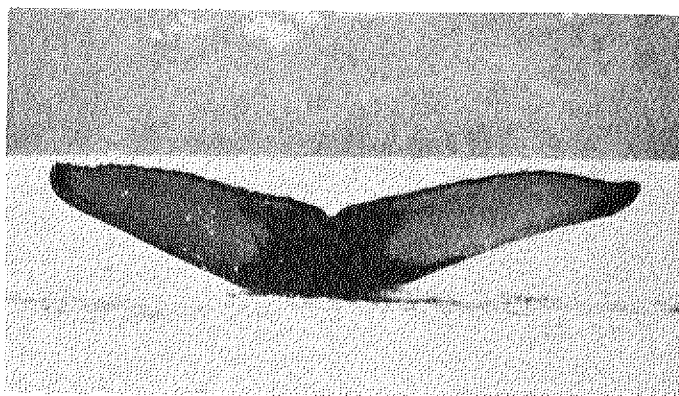
2607

124



693

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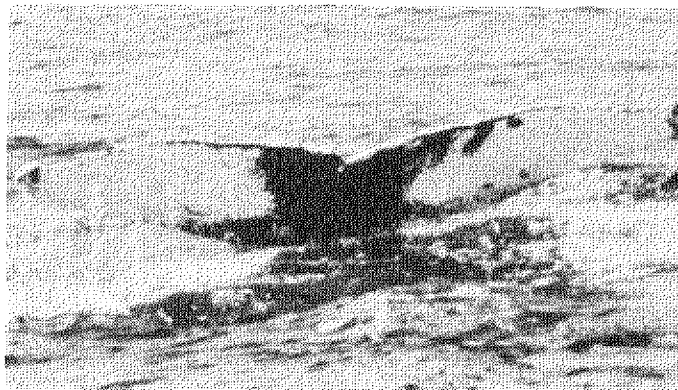
2614

338



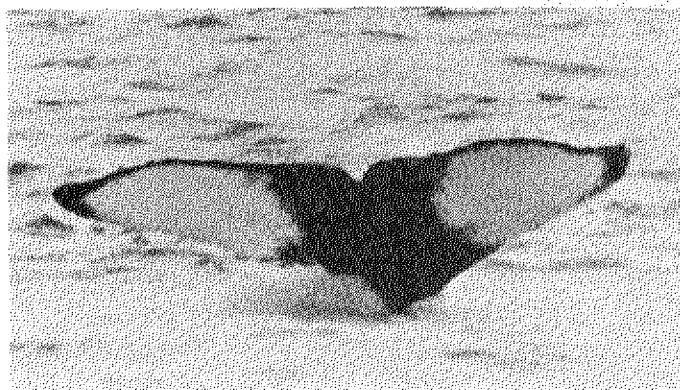
1728

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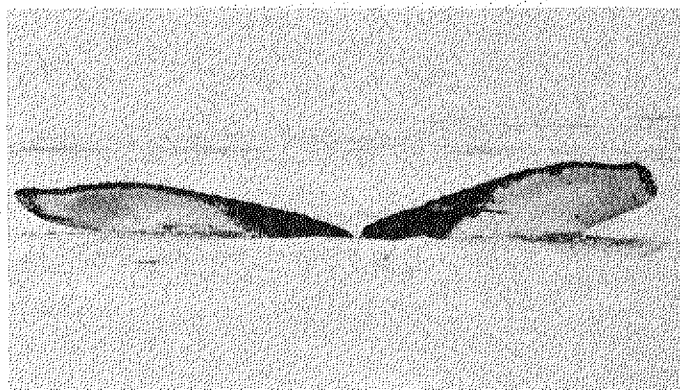
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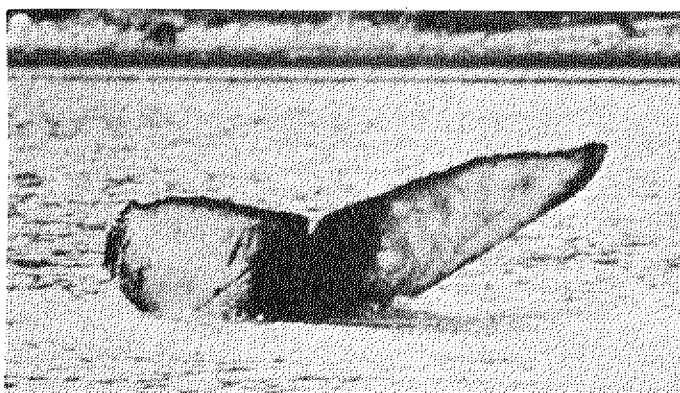
1729

253



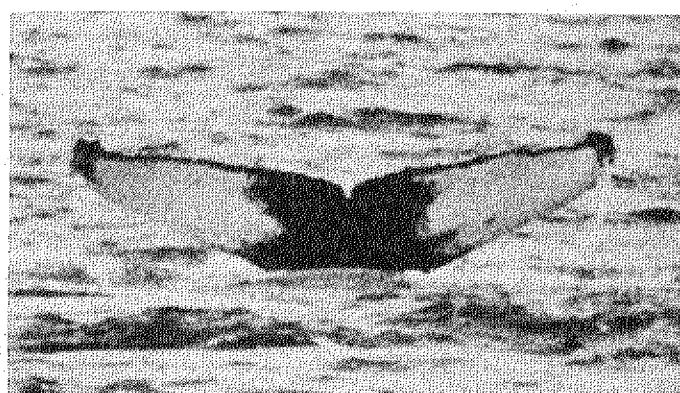
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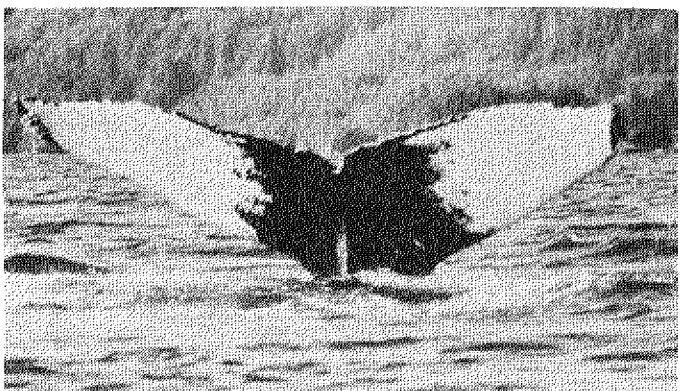
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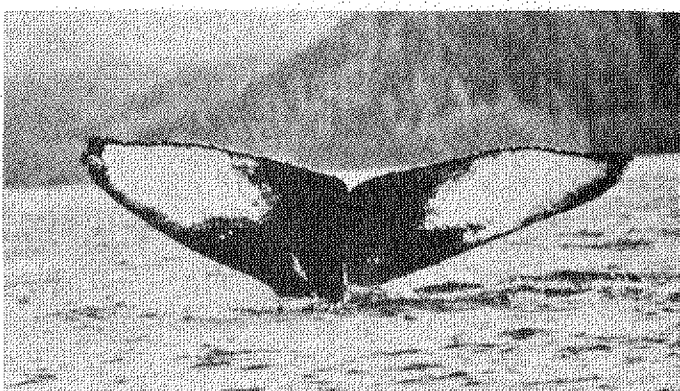
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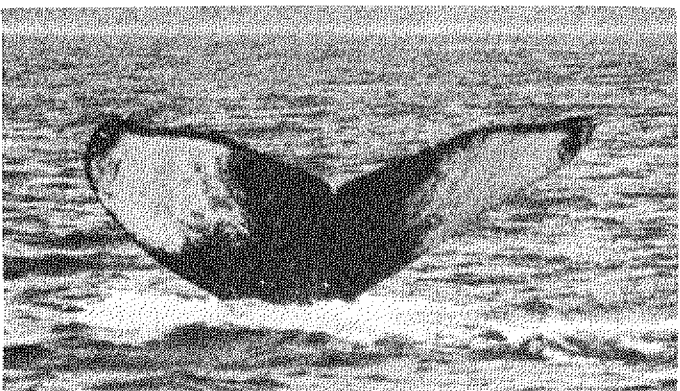
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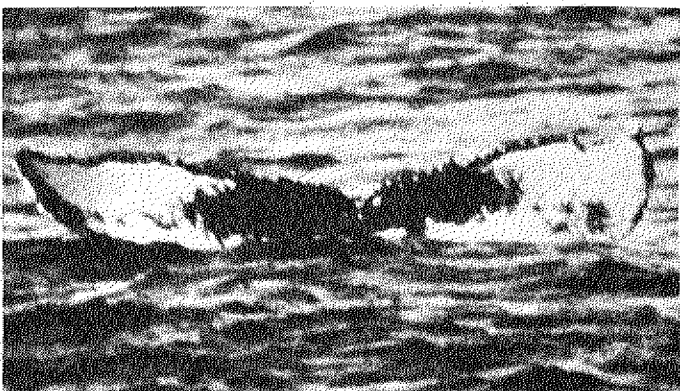
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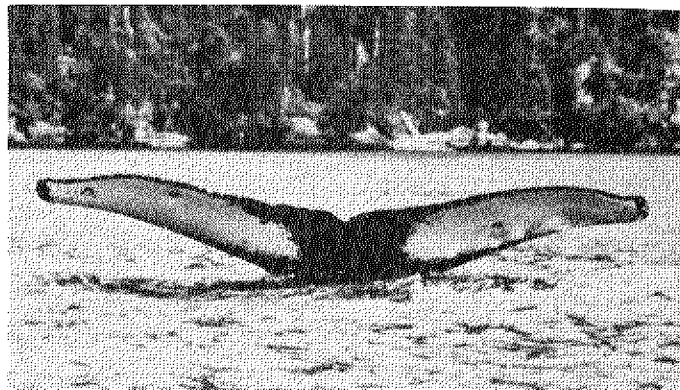


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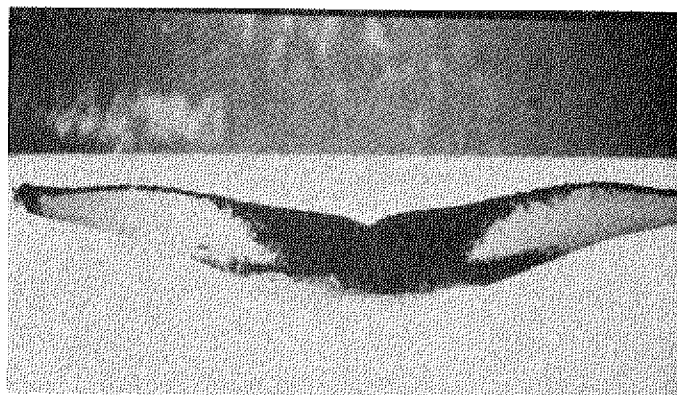


# WESTERN GULF OF ALASKA



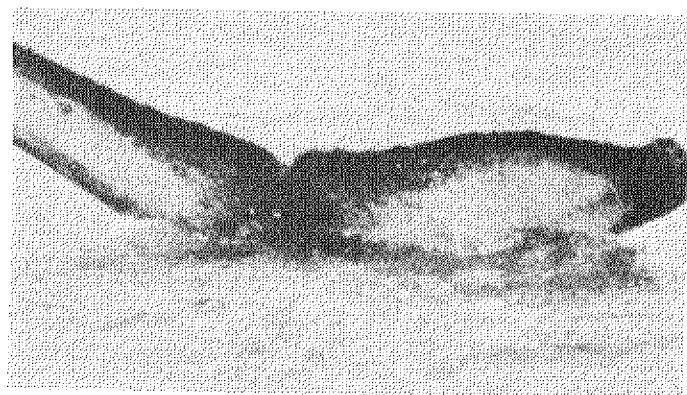
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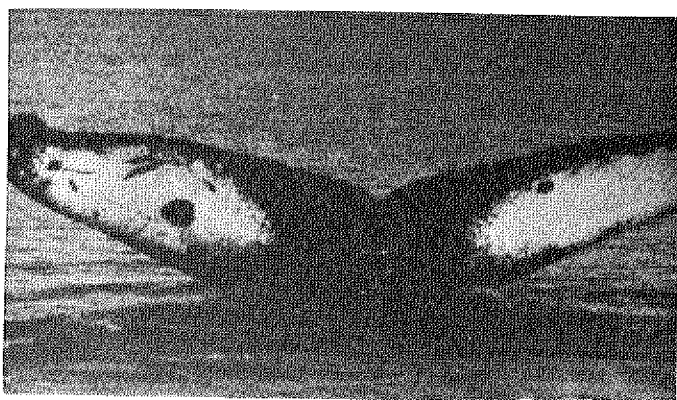
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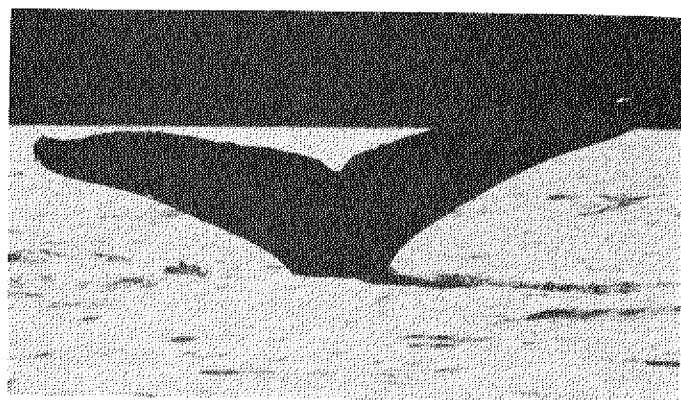
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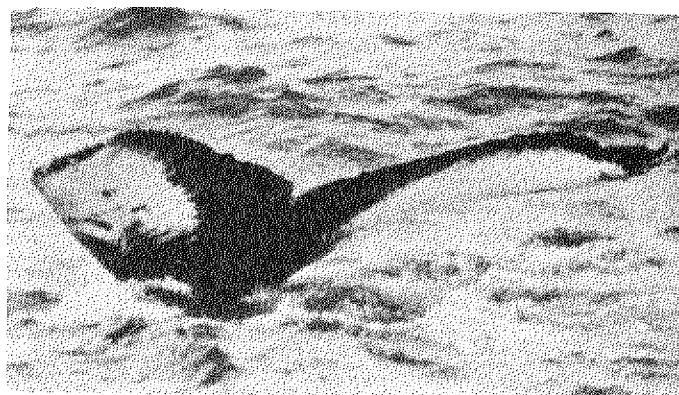
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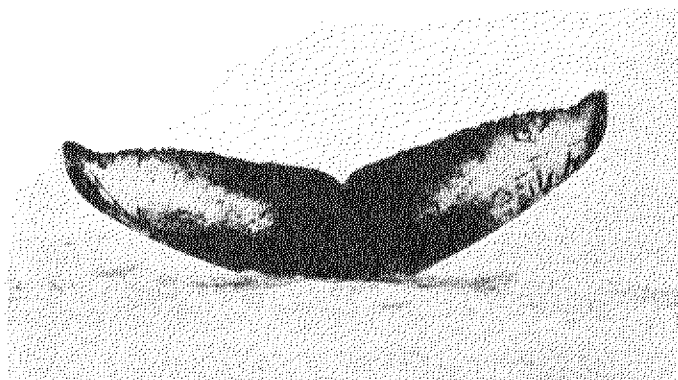
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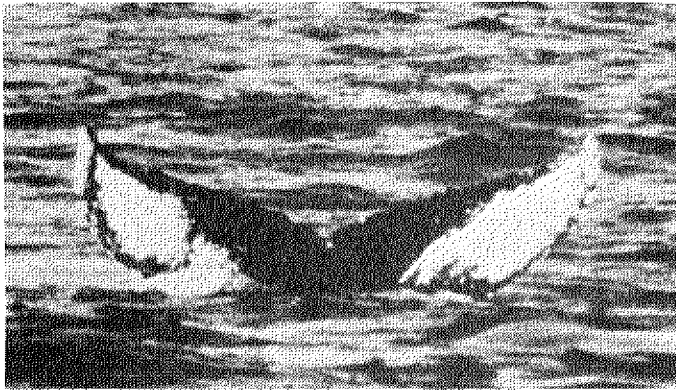
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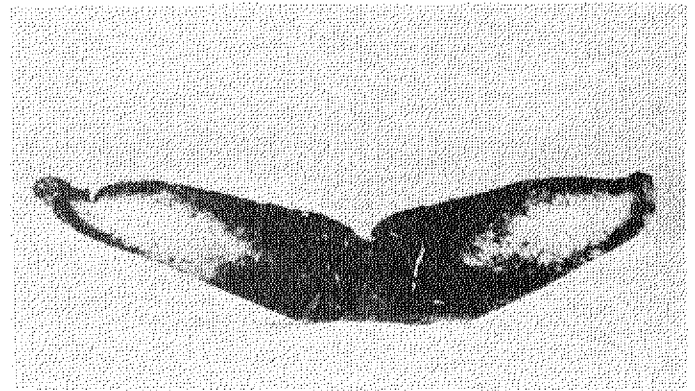
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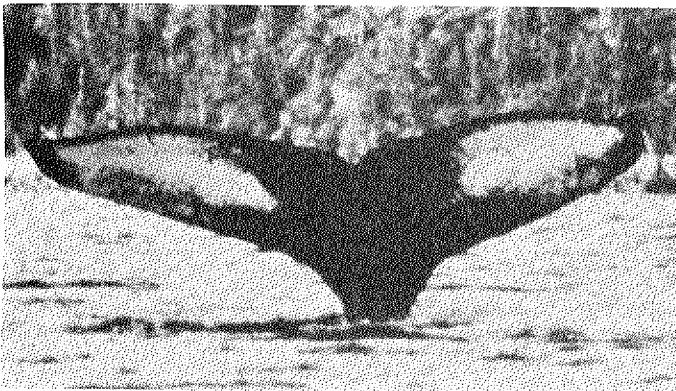
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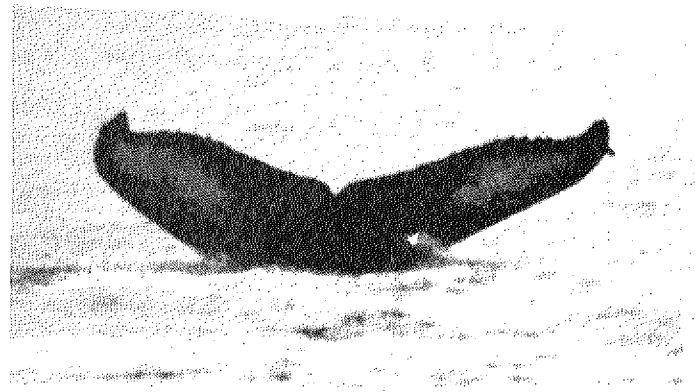
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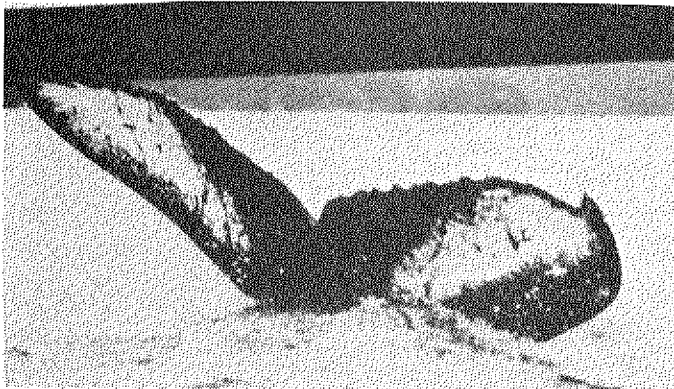
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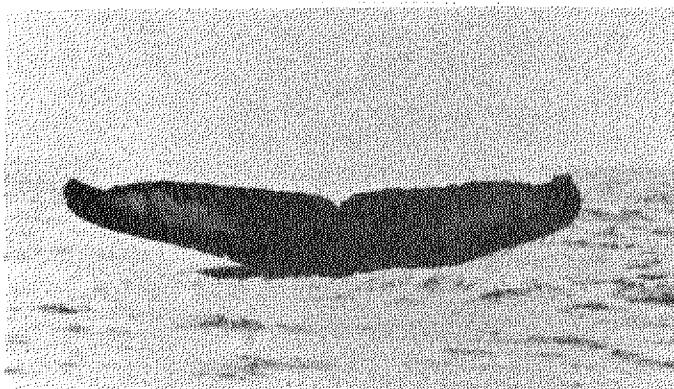
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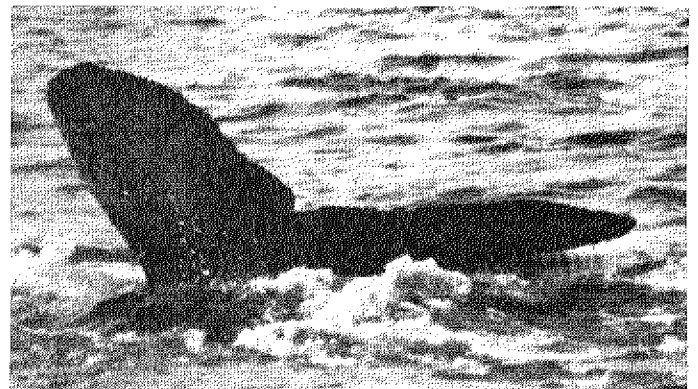
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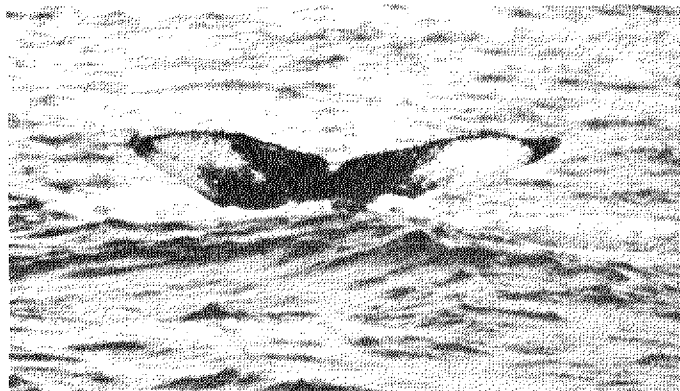
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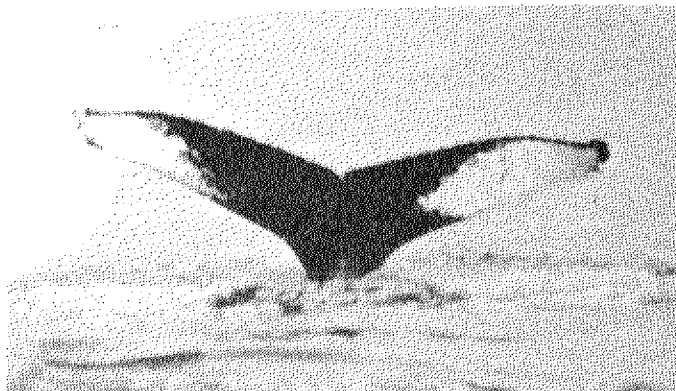
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# WESTERN GULF OF ALASKA



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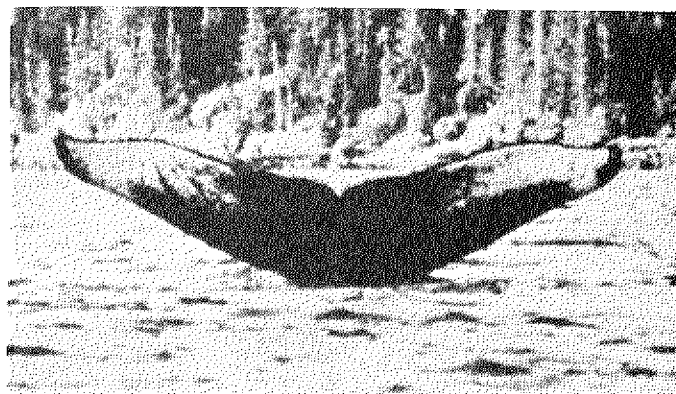
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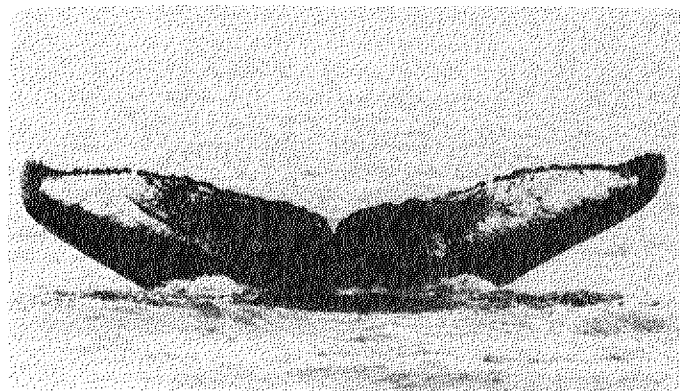
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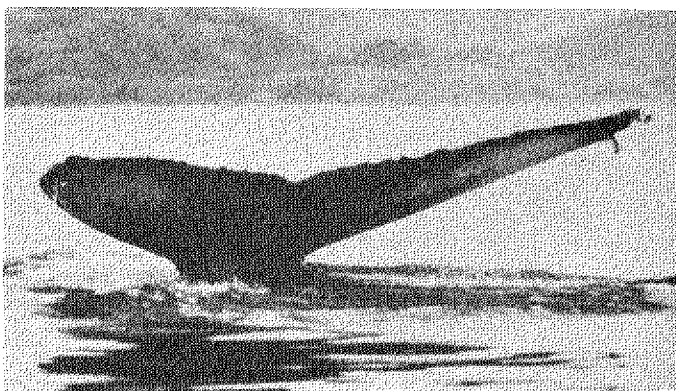
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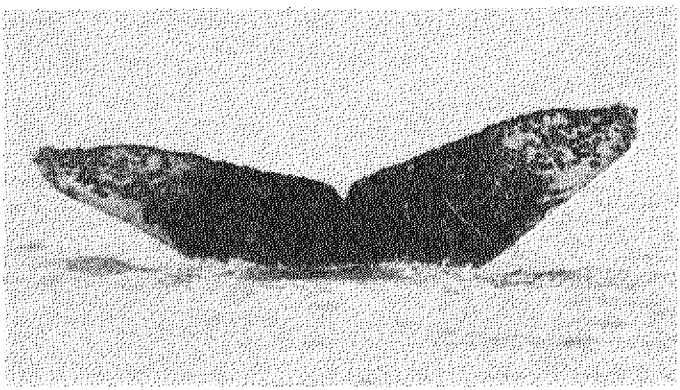
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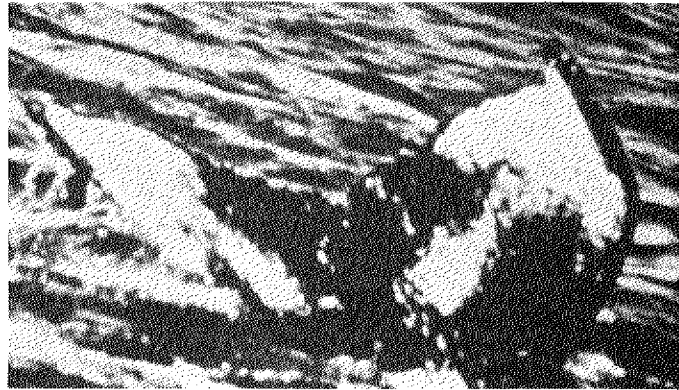
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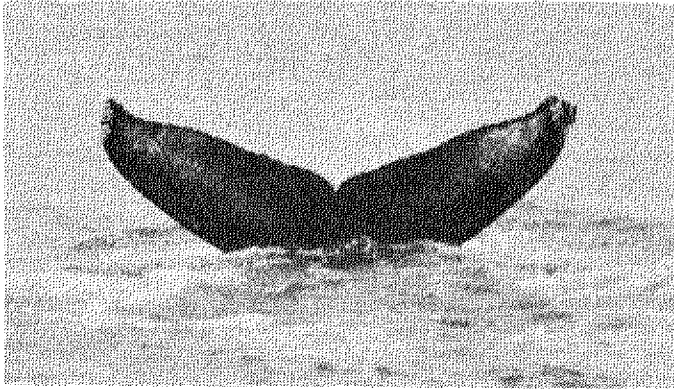
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1731

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# WESTERN GULF OF ALASKA



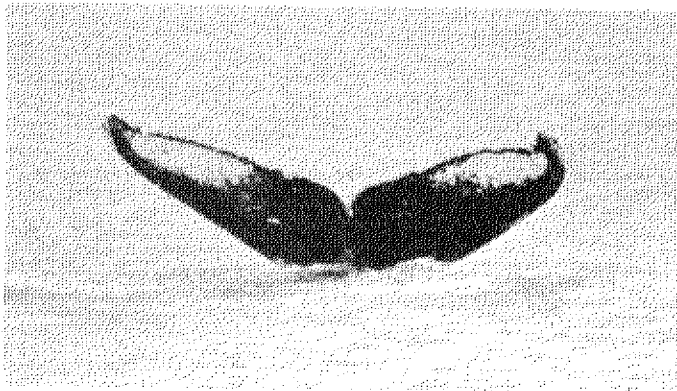
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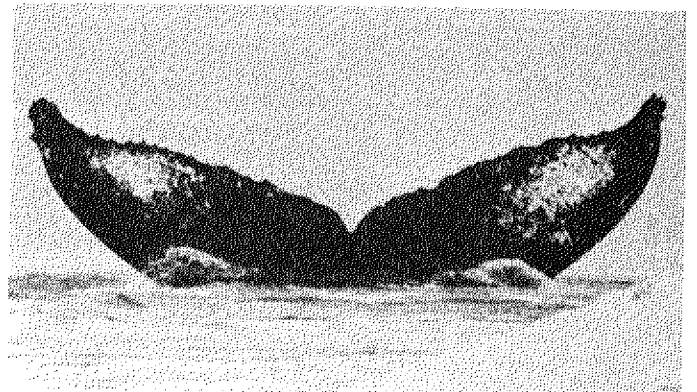
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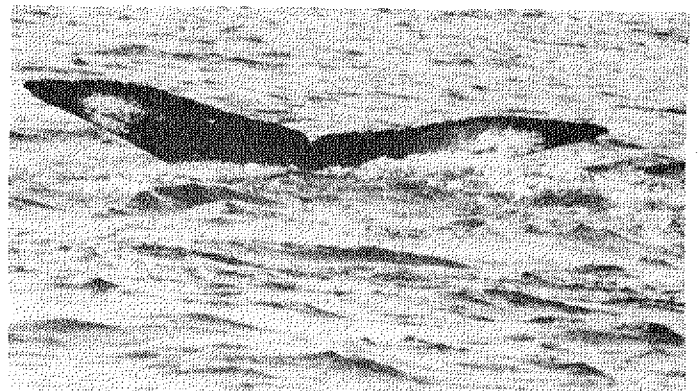
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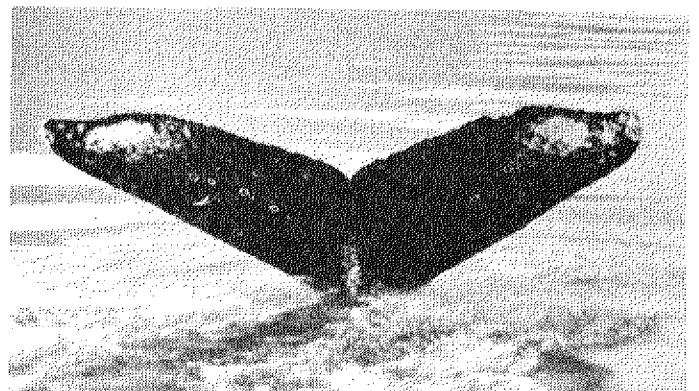
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4258

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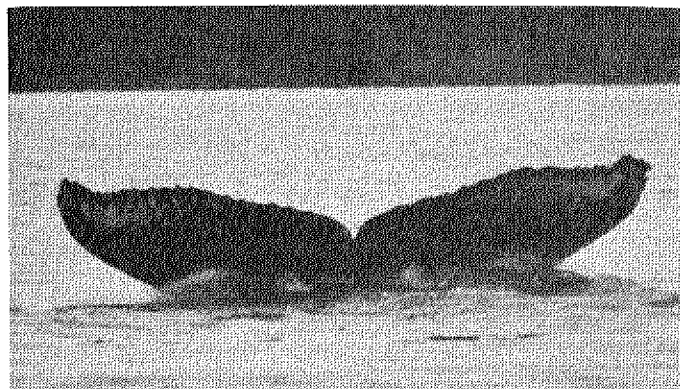


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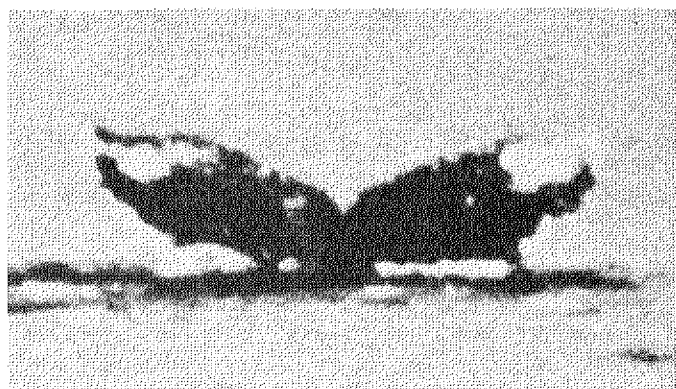


# WESTERN GULF OF ALASKA



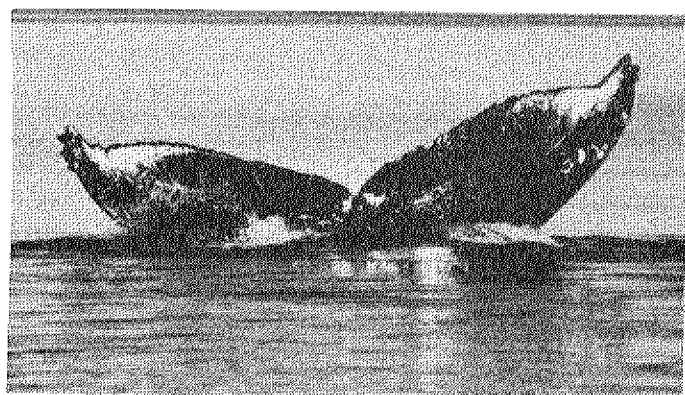
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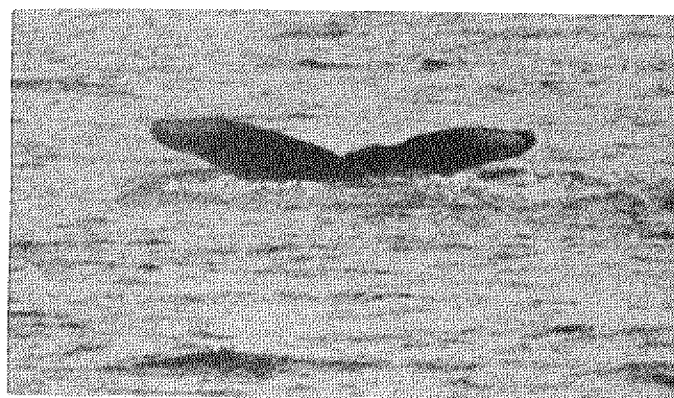
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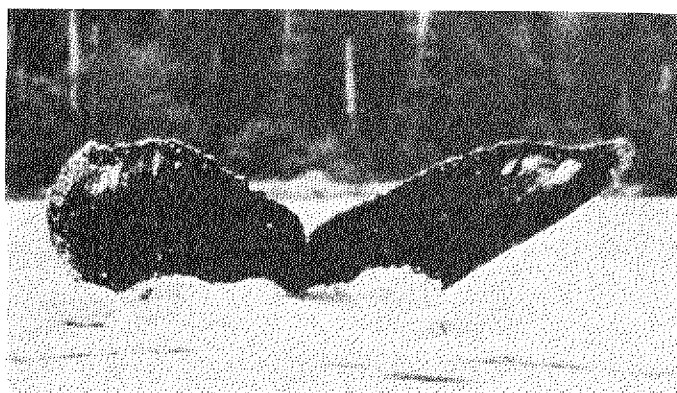
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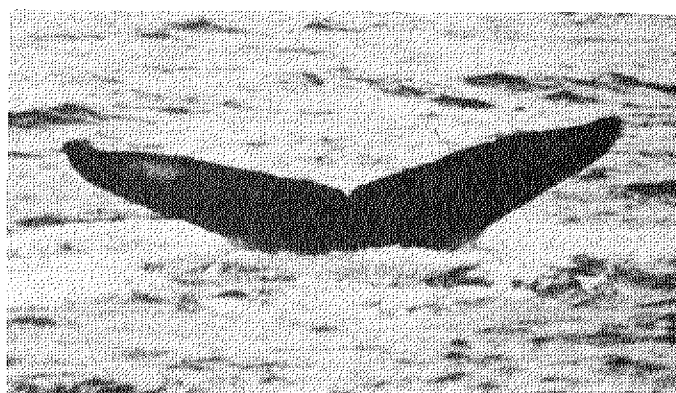
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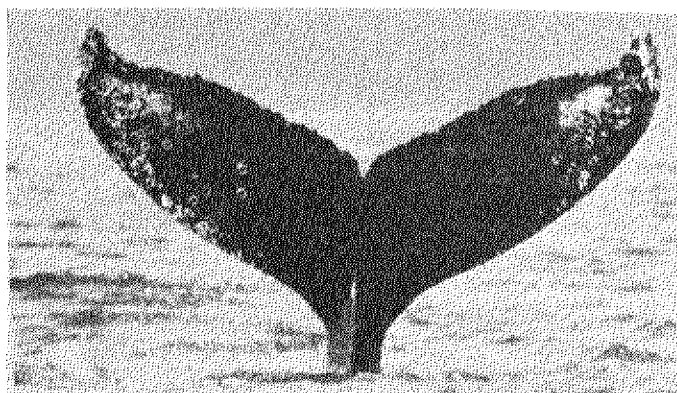
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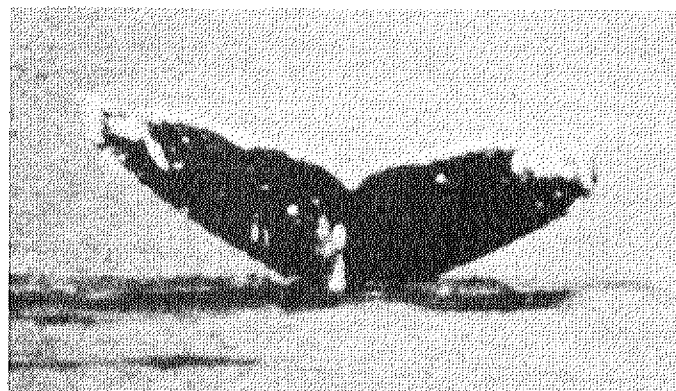
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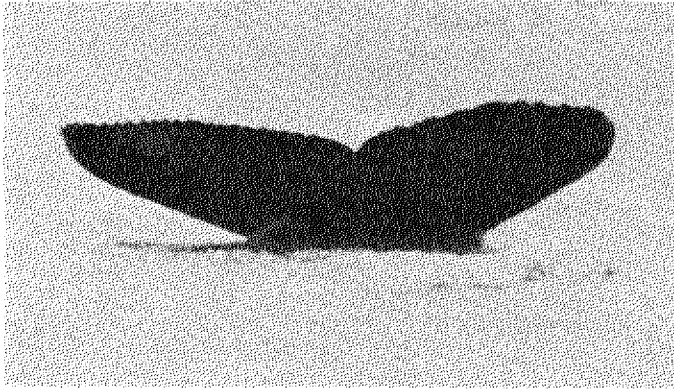
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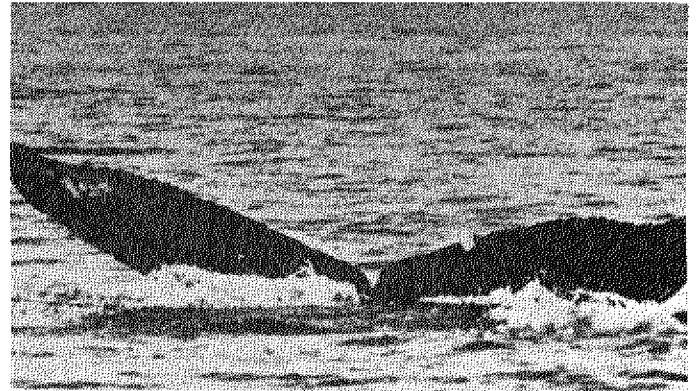
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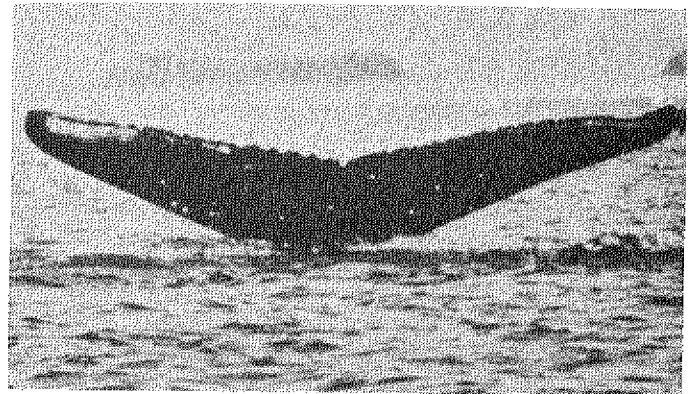
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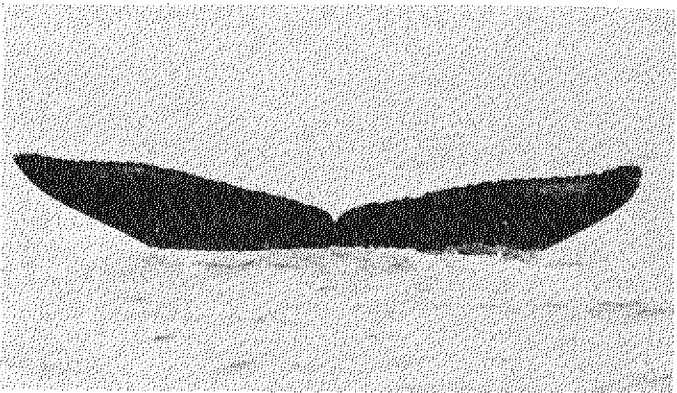
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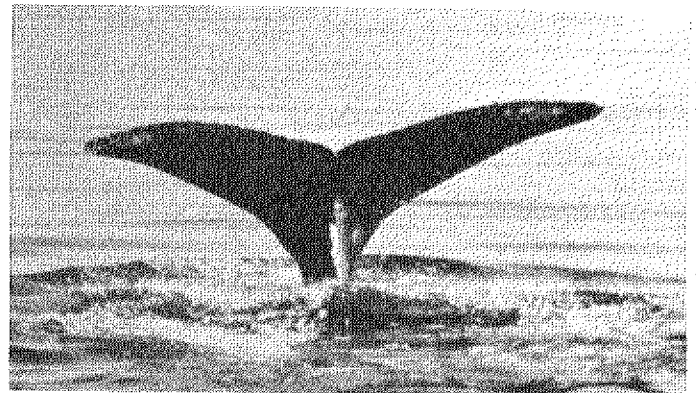
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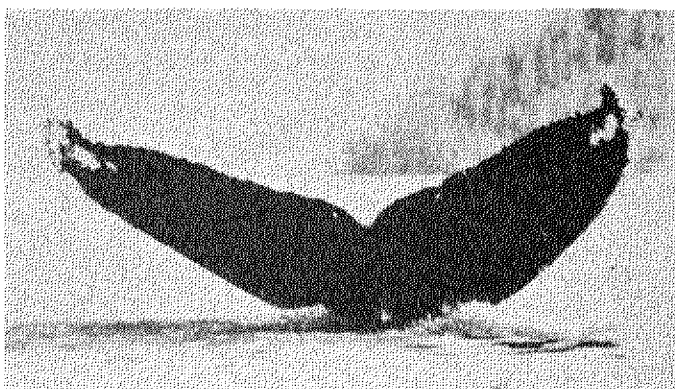


# WESTERN GULF OF ALASKA



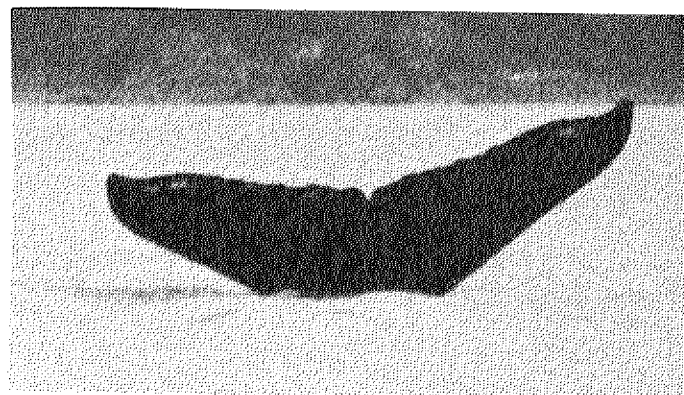
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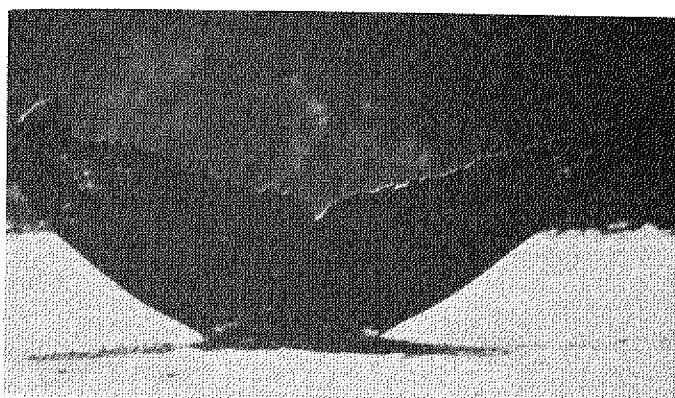
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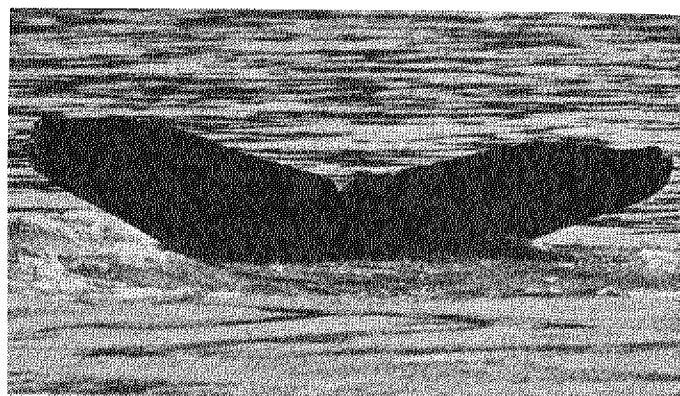
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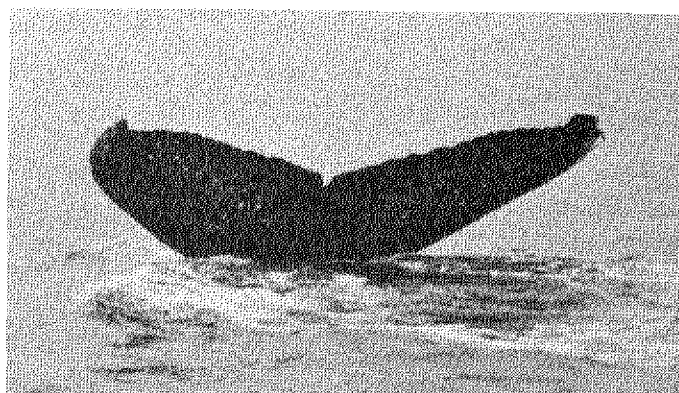
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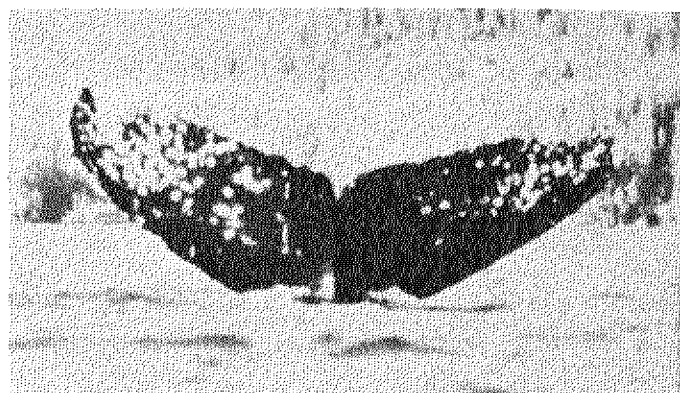
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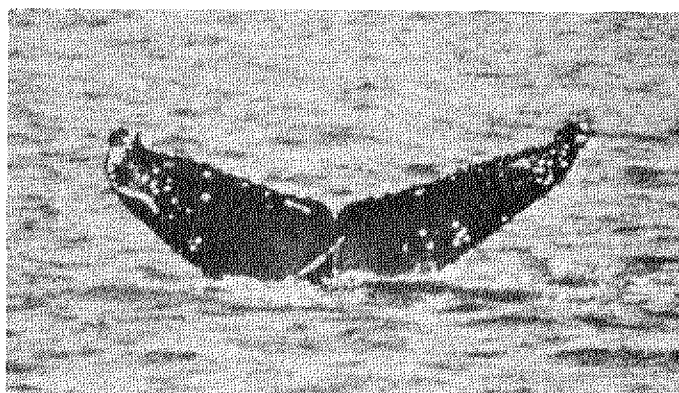
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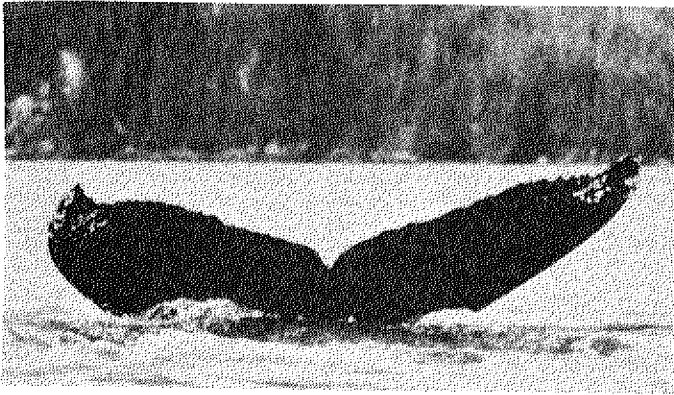
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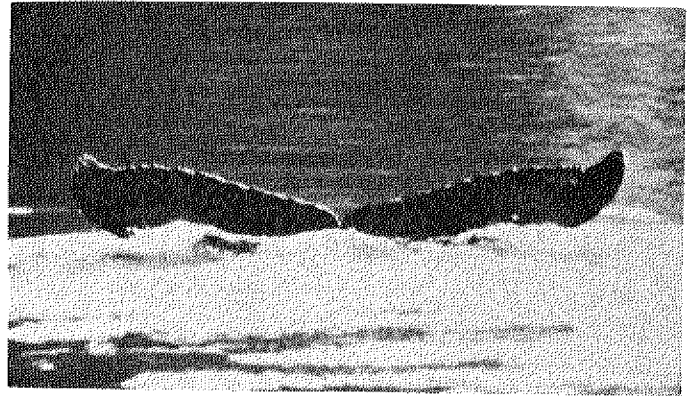
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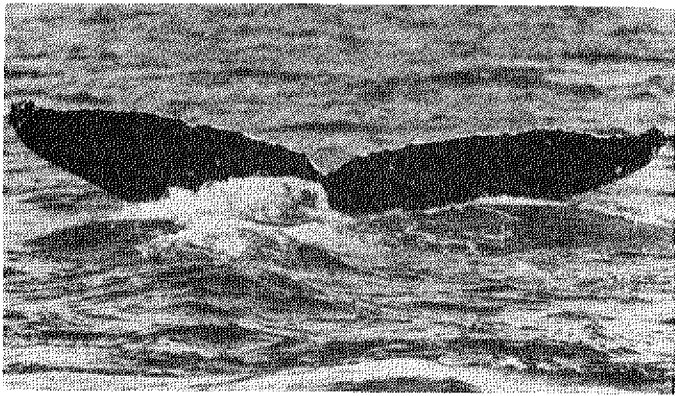
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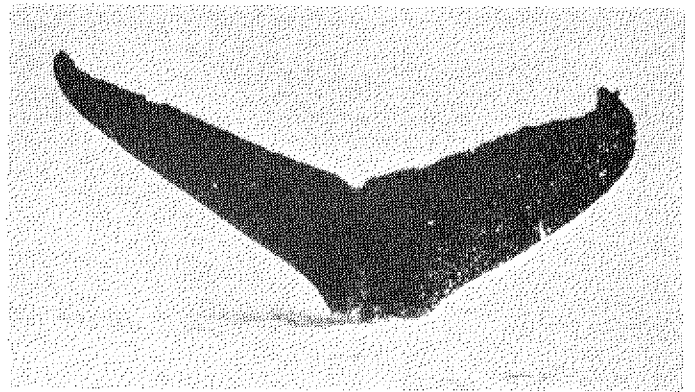
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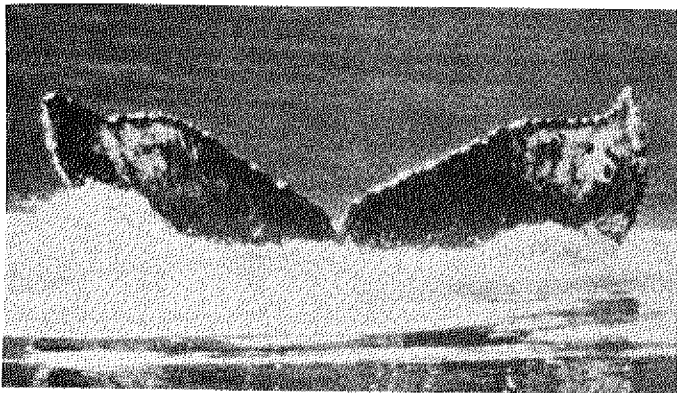
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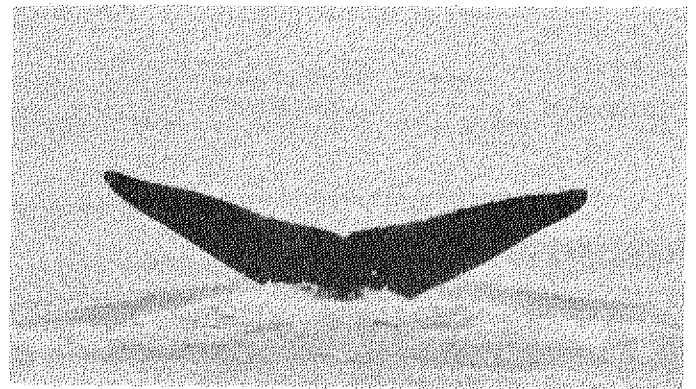
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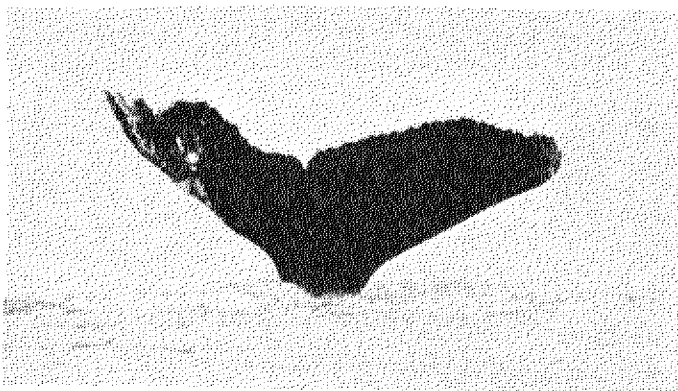
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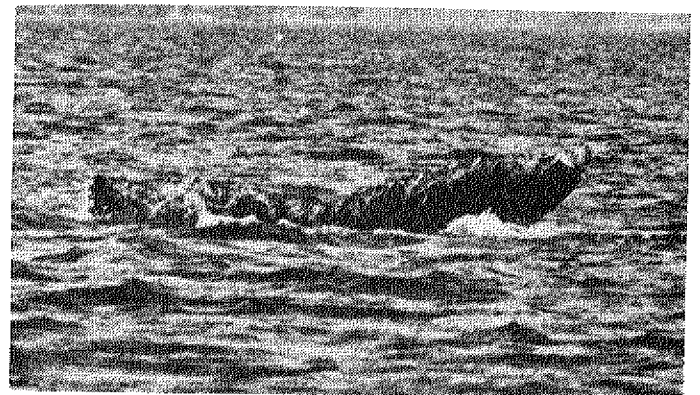
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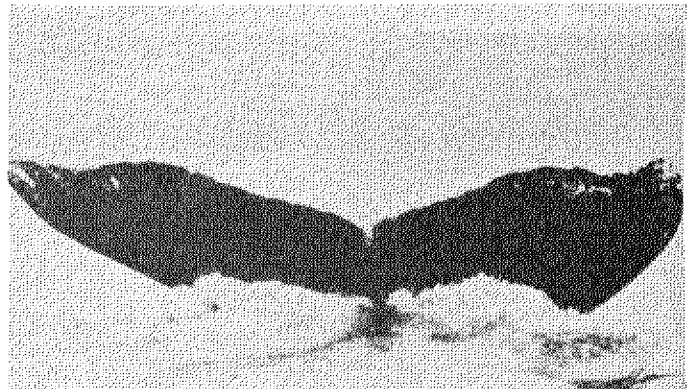
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WESTERN GULF OF ALASKA



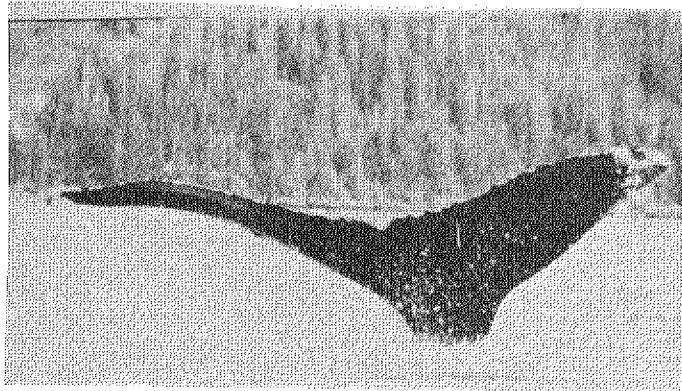
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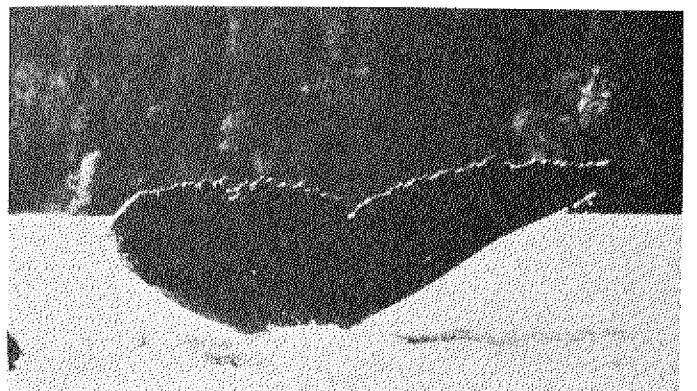
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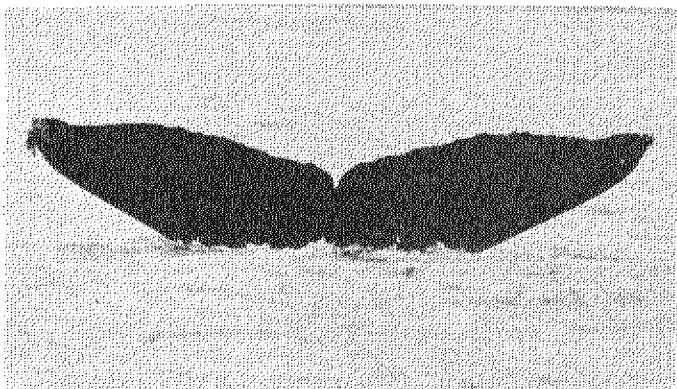
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809



4231

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4227

807

# INDEX I: OBSERVATIONS OF WHALES IN EACH REGION

Observ. No.	Resight No.	Year	Photogr.	Additional Contributors	First Year	Page
HAWAII						
20	91	1979	KBL	PWF	1979	C-59
26	49	1979	KBL		1976	C-34
29	46	1979	KBL		1979	C-24
37	102	1980	KBL		1980	C-49
39	0	1980	KBL			C-1
40	0	1980	KBL			C-14
47	0	1980	KBL			C-8
49	36	1980	KBL		1980	C-39
52	479	1980	KBL		1980	C-4
53	0	1980	KBL			C-74
54	31	1980	KBL		1980	C-68
59	0	1980	KBL			C-3
60	0	1980	KBL			C-57
61	0	1980	KBL			C-38
62	119	1980	KBL	PWF	1980	C-58
69	0	1980	KBL			C-22
72	0	1980	KBL			C-12
73	0	1980	KBL			C-19
74	33	1980	KBL		1980	C-51
75	25	1980	KBL		1980	C-62
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78	606	1980	KBL		1980	C-63
79	21	1980	KBL		1980	C-67
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93	0	1977	KBL			C-11
96	0	1980	KBL			C-27
100	251	1980	KBL		1980	C-71
102	0	1980	KBL			C-9
105	0	1977	KBL			C-52
117	38	1980	KBL	PWF	1980	C-7
118	0	1980	KBL			C-36
121	124	1980	KBL	PWF	1980	C-11



Observ. No.	Resight No.	Year	Photogr.	Additional Contributors	First Year	Page
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127	0	1980	KBL			C-42
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130	0	1980	KBL			C-42
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145	408	1980	KBL		1980	C-72
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208	305	1983	KBL		1981	C-68
211	0	1980	KBL			C-15
212	538	1980	KBL	PWF	1980	C-34
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Observ. No.	Resight No.	Year	Photogr.	Additional Contributors	First Year	Page
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338	260	1978	KBL		1978	C-18
340	0	1981	KBL			C-75
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367	67	1981	KBL		1981	C-6
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Observ. No.	Resight No.	Year	Photogr.	Additional Contributors	First Year	Page
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439	0	1979	KBL			C-65
441	0	1981	KBL			C-27
442	0	1981	KBL			C-9
443	168	1981	KBL		1981	C-34
452	94	1981	KBL		1980	C-5
458	89	1981	KBL	PWF	1981	C-34
459	812	1981	KBL		1981	C-33
461	0	1981	PWF			C-18
462	76	1981	PWF		1981	C-26
463	92	1981	PWF	KBL	1980	C-65
464	0	1981	PWF			C-61
469	96	1981	KBL		1980	C-40
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515	114	1979	KBL		1979	C-65
517	440	1981	PWF		1981	C-73



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519	0	1981	KBL			C-36
520	0	1981	KBL			C-66
523	117	1981	KBL		1981	C-43
524	0	1981	KBL			C-6
526	74	1981	KBL	PWF	1981	C-20
530	0	1981	KBL			C-12
531	0	1981	KBL			C-78
532	0	1981	KBL			C-54
533	0	1981	KBL			C-35
534	0	1981	KBL			C-65
536	0	1981	KBL			C-44
537	0	1981	KBL			C-52
538	99	1981	KBL		1981	C-56
540	93	1981	KBL		1978	C-14
541	169	1981	KBL		1981	C-9
543	82	1981	KBL		1981	C-16
545	429	1981	PWF	KBL	1977	C-42
547	0	1981	PWF			C-60
549	422	1981	KBL		1980	C-29
553	248	1981	PWF		1981	C-70
559	0	1981	KBL			C-40
561	0	1981	PWF			C-8
564	323	1981	PWF		1981	C-16
567	433	1981	PWF	KBL	1981	C-42
573	0	1981	KBL			C-16
574	0	1981	KBL			C-29
575	0	1981	KBL			C-54
576	0	1981	KBL			C-10
580	0	1981	KBL			C-76
581	68	1981	KBL	PWF	1981	C-38
582	0	1981	KBL			C-31
585	0	1981	PWF			C-70
587	41	1979	KBL		1977	C-26
620	0	1979	KBL			C-20
641	0	1979	KBL			C-58
652	0	1980	KBL			C-49
657	0	1979	KBL			C-1
660	6	1979	KBL		1979	C-12
669	0	1980	KBL			C-66
670	0	1980	KBL			C-76

Observ. No.	Resight No.	Year	Photogr.	Additional Contributors	First Year	Page
671	0	1980	KBL			C-76
673	0	1980	KBL			C-35
674	0	1980	KBL			C-12
676	0	1980	KBL			C-27
680	0	1980	KBL			C-4
768	43	1981	KBL		1978	C-18
811	572	1981	KBL		1980	C-62
850	591	1981	KBL	PWF	1982	C-63
901	104	1981	KBL		1980	C-66
916	0	1982	KBL			C-34
939	254	1982	PWF		1982	C-45
968	0	1982	PWF			C-22
970	0	1982	PWF			C-26
971	0	1982	PWF			C-33
972	137	1982	PWF		1982	C-41
974	0	1982	PWF			C-76
981	0	1982	PWF			C-48
987	239	1982	PWF		1981	C-8
988	256	1982	PWF		1981	C-11
989	257	1982	PWF		1982	C-77
990	0	1982	PWF			C-42
991	103	1982	PWF	KBL	1981	C-53
994	0	1982	PWF			C-28
1000	255	1982	PWF		1982	C-39
1004	0	1982	PWF			C-13
1007	0	1982	PWF			C-60
1009	0	1982	PWF			C-41
1010	427	1982	PWF	KBL	1982	C-33
1018	0	1982	PWF			C-20
1019	127	1982	PWF	KBL	1980	C-51
1022	129	1982	PWF		1982	C-47
1024	0	1982	PWF			C-15
1027	0	1982	PWF			C-30
1028	432	1982	PWF	KBL	1982	C-49
1029	0	1982	PWF			C-50
1030	0	1982	PWF			C-49
1032	0	1982	PWF			C-33
1034	407	1982	PWF		1982	C-74
1035	0	1982	PWF			C-16
1036	39	1982	PWF	KBL	1980	C-25

Observ. No.	Resight No.	Year	Photogr.	Additional Contributors	First Year	Page
1044	136	1982	PWF		1982	C-42
1045	0	1982	PWF			C-40
1046	439	1982	PWF		1982	C-72
1057	130	1982	KBL		1982	C-36
1058	364	1982	KBL		1982	C-10
1059	0	1982	KBL			C-67
1061	0	1982	KBL			C-58
1063	809	1982	KBL		1982	C-71
1064	424	1982	PWF	KBL	1978	C-19
1067	0	1982	KBL			C-21
1068	0	1982	KBL			C-70
1070	0	1982	KBL			C-31
1071	22	1982	KBL	PWF	1979	C-20
1072	0	1982	KBL			C-12
1073	245	1982	KBL	PWF	1981	C-36
1077	0	1982	KBL			C-55
1080	811	1982	KBL		1982	C-31
1082	0	1982	KBL			C-24
1083	133	1982	KBL		1979	C-52
1084	152	1982	KBL	PWF	1981	C-50
1085	0	1982	KBL			C-68
1091	542	1982	KBL		1982	C-56
1092	131	1982	KBL		1982	C-69
1093	0	1982	KBL			C-76
1094	0	1982	KBL			C-56
1097	143	1982	PWF		1982	C-3
1099	132	1982	KBL	PWF	1982	C-5
1101	443	1982	KBL		1982	C-52
1103	821	1982	KBL		1980	C-10
1104	0	1982	KBL			C-51
1111	200	1982	KBL		1982	C-27
1112	0	1982	KBL			C-73
1117	0	1982	KBL			C-9
1122	338	1982	KBL		1982	C-13
1124	105	1982	KBL		1981	C-15
1126	247	1982	PWF	KBL	1981	C-45
1127	0	1982	PWF			C-51
1129	0	1982	PWF			C-30
1130	0	1982	PWF			C-54
1132	0	1982	PWF			C-60



Observ. No.	Resight No.	Year	Photogr.	Additional Contributors	First Year	Page
1134	428	1982	PWF	KBL	1979	C-22
1135	0	1982	KBL			C-77
1136	0	1982	KBL			C-77
1137	316	1982	KBL		1982	C-26
1150	75	1981	PWF	KBL	1979	C-73
1163	84	1981	KBL		1981	C-55
1180	503	1982	KBL		1981	C-2
1191	183	1982	KBL	PWF	1980	C-1
1197	178	1982	KBL	PWF	1981	C-5
1213	241	1982	KBL	PWF	1982	C-14
1262	170	1982	KBL	PWF	1981	C-32
1303	547	1982	KBL		1981	C-55
1314	190	1982	KBL	PWF	1982	C-37
1317	191	1982	KBL		1980	C-48
1448	252	1982	KBL	PWF	1979	C-66
1469	224	1982	KBL	PWF	1982	C-66
1487	217	1982	KBL		1980	C-71
1748	541	1981	KBL		1984	C-50
1768	505	1983	KBL		1983	C-40
2027	203	1983	KBL		1983	C-40
2028	0	1983	KBL			C-73
2029	0	1983	KBL			C-62
2031	0	1983	KBL			C-11
2032	438	1983	KBL	PWF	1982	C-64
2033	0	1983	KBL			C-59
2034	344	1983	KBL		1983	C-17
2035	0	1983	KBL			C-69
2037	0	1983	KBL			C-55
2038	355	1983	KBL		1983	C-54
2039	804	1983	KBL		1983	C-64
2041	499	1983	KBL		1983	C-29
2042	327	1983	KBL		1983	C-31
2043	0	1983	KBL			C-48
2044	824	1983	KBL		1983	C-24
2046	0	1983	KBL			C-47
2047	0	1983	KBL			C-33
2049	0	1983	KBL			C-22
2050	78	1983	KBL	PWF	1981	C-7
2051	0	1983	KBL			C-59
2052	0	1983	KBL			C-58

Observ. No.	Resight No.	Year	Photogr.	Additional Contributors	First Year	Page
2053	311	1983	KBL		1983	C-58
2055	375	1983	KBL		1980	C-50
2056	0	1983	KBL			C-72
2058	0	1983	KBL			C-28
2060	0	1983	KBL			C-38
2061	820	1983	KBL		1983	C-50
2062	328	1983	KBL		1983	C-6
2066	0	1983	KBL			C-26
2070	335	1983	KBL		1983	C-1
2071	0	1983	KBL			C-37
2072	0	1983	KBL			C-63
2074	11	1983	KBL		1980	C-49
2075	302	1983	KBL		1983	C-61
2076	0	1983	KBL			C-65
2077	342	1983	KBL		1980	C-28
2078	0	1983	KBL			C-28
2080	0	1983	KBL			C-57
2082	0	1983	KBL			C-76
2087	0	1983	KBL			C-35
2088	0	1983	KBL			C-29
2089	0	1983	KBL			C-23
2090	331	1983	KBL	PWF	1982	C-32
2091	0	1983	KBL			C-70
2093	337	1983	KBL		1983	C-12
2094	0	1983	KBL			C-57
2096	0	1983	KBL			C-65
2098	0	1983	KBL			C-19
2100	0	1983	KBL			C-21
2103	0	1983	KBL			C-75
2105	815	1983	KBL		1983	C-53
2106	0	1983	KBL			C-34
2108	0	1983	KBL			C-47
2110	0	1983	KBL			C-1
2111	0	1983	KBL			C-68
2113	0	1983	KBL			C-28
2115	308	1983	KBL		1983	C-73
2116	343	1983	KBL	PWF	1982	C-27
2117	0	1983	KBL			C-1
2118	0	1983	KBL			C-28
2120	86	1983	KBL	PWF	1981	C-19

Observ. No.	Resight No.	Year	Photogr.	Additional Contributors	First Year	Page
2123	0	1983	KBL			C-64
2125	580	1983	KBL		1983	C-69
2129	0	1983	KBL			C-66
2131	0	1983	KBL			C-46
2132	301	1983	KBL		1983	C-40
2135	0	1983	KBL			C-10
2136	0	1983	KBL			C-14
2141	126	1983	KBL	PWF	1979	C-30
2142	184	1983	KBL		1983	C-36
2144	0	1983	KBL			C-23
2145	0	1983	KBL			C-8
2146	0	1983	KBL			C-69
2148	123	1983	KBL	PWF	1981	C-3
2150	367	1983	KBL		1983	C-2
2151	0	1983	KBL			C-78
2155	0	1983	KBL			C-67
2156	51	1983	KBL	PWF	1979	C-6
2158	0	1983	KBL			C-37
2159	0	1983	KBL			C-25
2160	0	1983	KBL			C-17
2161	334	1983	KBL		1983	C-4
2163	0	1983	KBL			C-73
2164	0	1983	KBL			C-45
2167	322	1983	KBL		1983	C-24
2170	330	1983	KBL		1981	C-9
2171	536	1983	KBL		1983	C-37
2173	0	1983	KBL			C-79
2175	329	1983	KBL		1983	C-16
2176	259	1983	KBL		1983	C-50
2178	0	1983	KBL			C-56
2179	120	1983	KBL	PWF	1979	C-7
2183	553	1983	KBL		1979	C-52
2186	0	1983	KBL			C-34
2187	0	1983	KBL			C-13
2188	0	1983	KBL			C-70
2189	0	1983	KBL			C-63
2191	326	1983	KBL		1983	C-33
2194	371	1983	KBL		1983	C-60
2195	228	1983	KBL	PWF	1981	C-7
2196	70	1983	KBL	PWF	1981	C-5



Observ. No.	Resight No.	Year	Photogr.	Additional Contributors	First Year	Page
2197	826	1983	KBL		1983	C-53
2198	0	1983	KBL			C-77
2200	852	1983	KBL			C-77
2201	0	1983	KBL			C-43
2207	0	1983	KBL			C-38
2209	0	1983	KBL			C-53
2210	0	1983	KBL			C-2
2211	852	1982	KBL		1983	C-64
2212	0	1983	KBL			C-35
2213	45	1983	KBL	PWF	1978	C-44
2215	232	1983	KBL		1983	C-67
2218	431	1983	KBL		1983	C-48
2219	0	1983	KBL			C-43
2220	0	1983	KBL			C-32
2223	0	1983	KBL			C-9
2229	0	1983	KBL			C-69
2233	159	1983	KBL		1983	C-59
2235	813	1981	KBL		1981	C-43
2236	309	1983	KBL		1983	C-46
2237	0	1983	KBL			C-27
2240	100	1983	KBL		1980	C-55
2241	0	1983	KBL			C-62
2243	0	1983	KBL			C-30
2245	0	1983	KBL			C-62
2246	0	1983	KBL			C-21
2247	0	1983	KBL			C-45
2248	0	1983	KBL			C-31
2249	0	1983	KBL			C-3
2253	345	1983	KBL	PWF	1981	C-9
2254	0	1983	KBL			C-78
2257	336	1983	KBL		1983	C-4
2258	346	1983	KBL	PWF	1982	C-23
2261	317	1983	KBL		1981	C-22
2262	825	1983	KBL		1983	C-53
2263	134	1983	KBL		1982	C-54
2264	0	1983	KBL			C-8
2265	0	1983	KBL			C-49
2267	0	1983	KBL			C-69
2270	313	1983	KBL		1981	C-39
2272	0	1983	KBL			C-8

Observ. No.	Resight No.	Year	Photogr.	Additional Contributors	First Year	Page
2273	0	1983	KBL			C-71
2275	0	1983	KBL			C-44
2277	0	1983	KBL			C-72
2281	320	1983	KBL		1981	C-44
2282	299	1983	KBL		1983	C-19
2283	0	1983	KBL			C-76
2284	0	1983	KBL			C-63
2288	0	1983	KBL			C-40
2289	307	1983	KBL		1983	C-71
2293	0	1983	KBL			C-37
2294	125	1983	KBL		1980	C-11
2295	304	1983	KBL	PWF	1981	C-68
2297	378	1983	KBL		1981	C-17
2299	321	1983	KBL		1983	C-42
2300	0	1983	KBL			C-29
2301	0	1983	KBL			C-68
2302	0	1983	KBL			C-65
2303	47	1983	KBL		1979	C-29
2306	324	1983	KBL		1982	C-17
2311	0	1983	KBL			C-50
2313	347	1983	KBL		1983	C-49
2319	376	1984	KBL		1984	C-39
2321	0	1984	KBL			C-14
2322	0	1984	KBL			C-63
2323	827	1983	KBL		1983	C-46
2324	0	1984	KBL			C-29
2325	0	1984	KBL			C-51
2327	0	1984	KBL			C-25
2330	373	1984	KBL		1984	C-53
2335	362	1984	KBL		1984	C-13
2336	442	1984	KBL		1983	C-71
2342	436	1984	KBL	PWF	1981	C-63
2344	358	1984	KBL		1984	C-8
2345	0	1984	KBL			C-75
2346	0	1984	KBL			C-24
2348	0	1984	KBL			C-79
2349	0	1984	KBL			C-38
2350	0	1984	KBL			C-63
2351	0	1984	KBL			C-56
2353	421	1984	KBL		1984	C-15

Observ. No.	Resight No.	Year	Photogr.	Additional Contributors	First Year	Page
2358	0	1984	KBL			C-4
2360	540	1984	KBL		1983	C-50
2361	359	1984	KBL		1984	C-3
2363	0	1984	KBL			C-45
2364	437	1984	KBL		1984	C-74
2366	416	1984	KBL		1984	C-9
2371	0	1984	KBL			C-23
2373	0	1984	KBL			C-1
2374	354	1984	KBL		1982	C-6
2376	435	1984	KBL		1984	C-36
2377	13	1984	KBL	PWF	1978	C-16
2379	372	1984	KBL		1984	C-74
2380	20	1984	KBL		1979	C-43
2381	0	1984	KBL			C-75
2382	0	1984	KBL			C-39
2383	377	1984	KBL		1984	C-47
2384	0	1984	KBL			C-58
2386	0	1984	KBL			C-46
2389	0	1984	KBL			C-16
2390	0	1984	KBL			C-46
2391	360	1984	KBL		1984	C-13
2395	0	1984	KBL			C-48
2396	0	1984	KBL			C-23
2398	366	1984	KBL		1984	C-43
2402	0	1984	KBL			C-25
2403	441	1984	KBL		1984	C-80
2406	0	1984	KBL			C-25
2407	0	1984	KBL			C-56
2408	0	1984	KBL			C-5
2411	0	1984	KBL			C-57
2412	0	1984	KBL			C-66
2414	0	1984	KBL			C-48
2415	0	1984	KBL			C-47
2416	498	1984	KBL		1984	C-75
2417	0	1984	KBL			C-78
2420	417	1984	KBL	PWF	1982	C-6
2421	0	1984	KBL			C-15
2422	0	1984	KBL			C-45
2425	0	1984	KBL			C-70
2426	0	1984	KBL			C-61



Observ. No.	Resight No.	Year	Photogr.	Additional Contributors	First Year	Page
2427	18	1984	KBL		1980	C-30
2431	50	1984	KBL		1977	C-12
2434	0	1984	KBL			C-43
2435	419	1984	KBL		1980	C-1
2436	0	1984	KBL			C-74
2437	0	1984	KBL			C-22
2438	370	1984	KBL		1979	C-7
2439	0	1984	KBL			C-14
2441	368	1984	KBL		1984	C-18
2444	0	1984	KBL			C-41
2445	2	1984	KBL		1978	C-20
2446	369	1984	KBL		1984	C-3
2448	0	1984	KBL			C-78
2452	497	1984	KBL		1981	C-20
2453	361	1984	KBL		1983	C-17
2454	0	1984	KBL			C-79
2457	0	1984	KBL			C-52
2458	418	1984	KBL		1984	C-14
2459	0	1984	KBL			C-79
2460	332	1984	KBL	PWF	1981	C-56
2461	0	1984	KBL			C-55
2462	0	1984	KBL			C-21
2464	237	1984	KBL	PWF	1982	C-54
2467	4	1980	KBL		1980	C-6
2468	356	1984	KBL	PWF	1982	C-10
2469	0	1984	KBL			C-3
2470	0	1984	KBL			C-53
2471	814	1983	KBL		1983	C-78
2472	0	1984	KBL			C-41
2473	0	1984	KBL			C-67
2474	0	1984	KBL			C-52
2475	0	1984	KBL			C-35
2476	0	1984	KBL			C-79
2478	0	1984	KBL			C-61
2479	0	1984	KBL			C-18
2480	0	1984	KBL			C-15
2485	0	1984	KBL			C-74
2486	0	1984	KBL			C-67
2487	379	1984	KBL		1984	C-15
2489	0	1984	KBL			C-74

Observ. No.	Resight No.	Year	Photogr.	Additional Contributors	First Year	Page
2490	0	1984	KBL			C-53
2494	0	1984	KBL			C-11
2496	0	1984	KBL			C-67
2497	0	1984	KBL			C-19
2498	0	1984	KBL			C-80
2584	363	1980	JMR	KBL	1984	C-7
2657	0	1983	KBL			C-24
2658	819	1983	KBL		1983	C-35
2659	0	1983	KBL			C-38
2666	0	1983	KBL			C-61
2667	0	1983	KBL			C-17
2685	447	1983	KBL		1983	C-45
2686	157	1983	KBL		1983	C-51
2700	0	1984	KBL			C-77
2702	0	1984	KBL			C-31
2705	0	1984	KBL			C-62
2709	0	1984	KBL			C-54
2712	0	1984	KBL			C-23
2716	415	1984	KBL		1984	C-64
2718	0	1984	KBL			C-79
2719	357	1984	KBL	PWF	1982	C-2
2720	95	1984	KBL		1980	C-19
2721	0	1984	KBL			C-52
2725	0	1984	KBL			C-44
2728	425	1984	KBL		1976	C-28
2730	0	1984	KBL			C-56
2733	420	1984	KBL		1984	C-21
2734	0	1984	KBL			C-21
2738	0	1984	KBL			C-34
2789	0	1984	KBL			C-5
2790	0	1984	KBL			C-78
2791	0	1984	KBL			C-62
2792	0	1984	KBL			C-45
2793	0	1984	KBL			C-67
2796	0	1984	KBL			C-18
2798	0	1984	KBL			C-68
2800	177	1984	KBL		1981	C-4
2802	0	1984	KBL			C-57
2803	0	1984	KBL			C-59
2804	0	1984	KBL			C-17

Observ. No.	Resight No.	Year	Photogr.	Additional Contributors	First Year	Page
2807	0	1984	KBL			C-71
2808	0	1984	KBL			C-42
2809	0	1984	KBL			C-79
2816	0	1984	KBL			C-73
2817	0	1984	KBL			C-32
2820	0	1984	KBL			C-48
2847	118	1984	KBL	PWF	1981	C-62
2995	386	1983	KBL		1983	C-55
3192	318	1984	CSB	KBL	1980	C-32
3339	262	1984	CSB	PWF	1982	C-72
3390	52	1984	CSB	KBL	1977	C-36
3394	389	1984	CSB	KBL	1982	C-5
3422	40	1984	CSB	KBL	1980	C-2
3446	535	1984	CSB	PWF	1981	C-36
3471	0	1983	KBL			C-64
3476	0	1983	KBL			C-43
3609	554	1985	CSB	KBL	1983	C-55
3684	285	1985	CSB	KBL	1979	C-72
3779	476	1985	KBL		1985	C-54
3782	0	1985	KBL			C-3
3785	0	1985	KBL			C-75
3786	0	1985	KBL			C-57
3791	0	1985	KBL			C-64
3794	0	1985	KBL			C-61
3795	0	1985	KBL			C-24
3796	0	1985	KBL			C-41
3797	0	1985	KBL			C-41
3799	0	1985	KBL			C-2
3800	0	1985	KBL			C-22
3801	0	1985	KBL			C-21
3802	0	1985	KBL			C-49
3803	0	1985	KBL			C-20
3808	0	1985	KBL			C-44
3809	0	1985	KBL			C-64
3812	0	1985	KBL			C-57
3814	829	1985	KBL		1984	C-60
3815	0	1985	KBL			C-30
3816	0	1985	KBL			C-2
3817	0	1985	KBL			C-13
3818	0	1985	KBL			C-23



Observ. No.	Resight No.	Year	Photogr.	Additional Contributors	First Year	Page
3820	0	1985	KBL			C-60
3825	0	1985	KBL			C-15

## MEXICO

2538	303	1980	WSL		1980	C-84
2539	0	1980	WSL			C-85
2540	0	1980	WSL			C-83
2541	0	1980	WSL			C-82
2542	0	1980	WSL			C-83
2543	0	1980	WSL			C-83
2544	0	1980	WSL			C-82
2547	0	1980	WSL			C-83
2549	0	1980	WSL			C-81
2551	616	1980	WSL		1980	C-81
2552	0	1980	WSL			C-81
2621	0	1978	HEW			C-83
2622	0	1978	HEW			C-82
2623	0	1978	HEW			C-82
2624	0	1978	HEW			C-82
2625	0	1978	HEW			C-81
2626	0	1978	HEW			C-82
2627	0	1978	HEW			C-81
2628	0	1978	HEW			C-81
2630	0	1978	HEW			C-83
2631	0	1978	HEW			C-85
2632	0	1978	HEW			C-84
2633	0	1978	HEW			C-84
2635	0	1978	HEW			C-84
2637	0	1978	HEW			C-85
2640	0	1978	HEW			C-85
2642	0	1978	HEW			C-84
2643	0	1978	HEW			C-84
2644	0	1978	HEW			C-84
2645	0	1978	HEW			C-84
2647	298	1978	HEW		1978	C-83
2648	339	1978	HEW		1978	C-82

Observ. No.	Resight No.	Year	Photogr.	Additional Contributors	First Year	Page
2649	0	1978	HEW			C-81
2650	0	1978	HEW			C-83
2651	0	1978	HEW			C-81
4273	6	1984	IDS		1984	C-82

### CENTRAL CALIFORNIA

2555	0	1983	JO			C-86
2556	303	1983	JO		1983	C-87
2558	0	1983	JO			C-87
2559	0	1983	JO			C-87
2561	0	1983	JO			C-87
2564	0	1983	JO			C-88
3527	0	1985	JS			C-86
3528	0	1985	JS			C-86
3529	0	1985	CSB			C-86
4260	0	1980	RLP			C-88
4261	0	1979	RLP			C-87
4270	821	1981	MAW		1981	C-86
4271	0	1981	MAW			C-87
4275	0	1985	CE			C-87
4276	0	1981	MAW			C-86
4277	0	1983	IDS			C-86
4278	0	1981	MAW			C-87
4279	0	1983	MAW			C-86

### SOUTHEASTERN ALASKA

42	4	1980	KBL	WSL	JMS	1980	C-92
103	0	1981	KBL				C-145
289	0	1980	KBL				C-137
296	78	1980	KBL			1980	C-92
297	44	1980	KBL			1980	C-99
702	0	1981	JMS				C-117

Observ. No.	Resight No.	Year	Photogr.	Additional Contributors				First Year	Page
730	506	1981	KBL	WSL				1979	C-89
734	564	1981	KBL	JMR	WSL	CSB	CMJ	1979	C-135
735	590	1981	KBL	WSL	JMS	CSB		1980	C-131
742	509	1981	KBL	WSL	PD	BT		1980	C-93
744	598	1981	KBL	CSB				1980	C-123
753	503	1981	KBL	WSL	CSB			1979	C-90
755	508	1981	KBL	WSL	PD	BT		1979	C-93
757	567	1981	KBL	JMR	WSL	CSB		1979	C-120
763	593	1981	KBL	CSB				1981	C-133
765	540	1981	KBL	WSL	CSB			1980	C-113
768	43	1981	KBL	WSL	JMS	CSB		1979	C-98
784	150	1980	MD					1980	C-139
786	582	1981	KBL	CSB				1981	C-134
787	502	1981	KBL	WSL	PD	BT	CSB	1980	C-90
788	595	1981	KBL	PD	BT			1981	C-141
794	510	1981	KBL	WSL	PD	BT		1980	C-92
797	0	1981	KBL						C-135
798	605	1981	KBL	JMR	WSL	JMS	CSB	1979	C-143
803	523	1981	KBL	CSB				1981	C-101
804	594	1981	KBL	JMS				1981	C-140
810	600	1981	KBL	WSL	CSB	JMS		1979	C-142
811	572	1981	KBL	JMR	WSL			1979	C-124
812	504	1981	KBL	JMR	WSL			1979	C-89
814	555	1981	KBL	CMJ				1978	C-112
815	563	1981	KBL					1980	C-135
821	568	1981	KBL	CSB				1981	C-125
829	518	1981	KBL	WSL	JMS	CSB		1980	C-95
830	507	1981	KBL	JMS	PD	BT		1981	C-92
832	0	1981	KBL						C-130
840	648	1981	KBL	CSB	JMS	WSL		1979	C-138
841	0	1981	KBL						C-144
847	505	1981	KBL	WSL	PD	BT		1979	C-90
849	541	1981	KBL	JMS				1981	C-113
850	591	1981	KBL	WSL	CSB			1979	C-125
852	583	1981	KBL					1981	C-126
853	282	1981	JMS					1981	C-111
862	531	1981	KBL	JMS				1980	C-108
866	576	1981	KBL	JMS	CSB			1980	C-132
877	526	1981	KBL	WSL	JMS			1980	C-105
896	544	1981	KBL	WSL	JMS	CSB		1979	C-120



Observ. No.	Resight No.	Year	Photogr.	Additional Contributors			First Year	Page
898	558	1981	KBL	JMR	WSL		1979	C-112
899	592	1981	KBL				1981	C-145
901	104	1982	KBL	JMR	CSB		1979	C-131
902	557	1981	KBL	CSB			1981	C-129
910	501	1981	KBL	AAW	CSB		1976	C-89
915	616	1981	KBL	CMJ	JMS	CSB	1979	C-89
918	528	1981	KBL	CSB			1980	C-109
919	529	1981	KBL				1981	C-117
921	536	1981	KBL	PD	BT		1981	C-110
922	551	1981	KBL	JMS			1981	C-110
923	552	1981	KBL	JMR	CSB		1979	C-111
924	554	1981	KBL	WSL	CSB		1979	C-117
925	565	1981	KBL	CMJ	WSL	JMS	1978	C-134
926	570	1981	KBL				1980	C-137
927	575	1981	KBL	WSL	CSB		1980	C-119
928	658	1981	KBL				1981	C-138
929	0	1981	KBL					C-115
940	741	1981	KBL	WSL	JMS	CSB	1979	C-122
945	561	1981	KBL	WSL	JMS	CSB	1980	C-135
946	569	1981	KBL	WSL	JMS		1980	C-122
947	0	1981	KBL					C-131
948	578	1981	KBL	WSL	PD	BT	1980	C-132
951	556	1981	KBL	CSB			1981	C-119
1073	245	1982	KBL				1981	C-105
1176	156	1982	KBL	PD	BT		1982	C-90
1181	182	1982	KBL				1982	C-91
1191	183	1982	KBL	JMS			1982	C-90
1197	178	1982	KBL	PD	BT		1982	C-91
1199	177	1982	KBL	JMR	WSL	JMS	1979	C-91
1204	278	1982	JMS				1981	C-102
1205	519	1982	KBL	WSL	CSB		1980	C-95
1210	197	1982	KBL	CSB			1982	C-94
1212	169	1982	KBL	WSL			1979	C-95
1213	241	1982	KBL				1982	C-95
1217	22	1982	KBL	AAW	CMJ	WSL	1977	C-97
1224	221	1982	KBL	WSL	PD	BT	1980	C-96
1230	199	1982	KBL				1982	C-99
1231	267	1982	KBL	WSL			1979	C-97
1232	512	1982	KBL	WSL	JMS	CSB	1979	C-97
1234	293	1981	JMS	JMR			1979	C-106

Observ. No.	Resight No.	Year	Photogr.	Additional Contributors			First Year	Page
1242	95	1982	KBL	WSL	JMS		1980	C-102
1243	516	1982	KBL	CMJ	CSB		1977	C-96
1246	0	1982	KBL					C-143
1248	266	1982	KBL	JMR	JMS		1979	C-104
1251	525	1982	KBL	WSL	JMS	CSB	1979	C-106
1253	211	1982	KBL	CMJ			1980	C-101
1254	203	1982	KBL	WSL	PD	BT JMS	1980	C-107
1257	277	1982	KBL	JMR	JMS	CSB	1979	C-107
1260	533	1982	KBL	WSL	JMS	CSB	1980	C-107
1262	170	1982	KBL	WSL			1980	C-101
1265	185	1982	KBL	JMS			1980	C-107
1269	184	1982	KBL	JMR	CSB	JMS	1979	C-104
1276	577	1982	KBL	CMJ	CSB		1978	C-105
1285	117	1982	KBL	CMJ	WSL	CSB	1977	C-108
1289	186	1982	KBL	CSB			1982	C-118
1291	187	1982	KBL	PD	BT		1982	C-110
1297	68	1982	KBL	JMS			1979	C-108
1301	530	1982	KBL	CSB			1981	C-110
1304	474	1982	KBL				1982	C-116
1306	189	1982	KBL	CSB			1980	C-125
1310	159	1982	KBL	CSB			1982	C-120
1314	190	1982	KBL				1982	C-104
1317	191	1982	KBL	CSB			1982	C-111
1318	546	1982	KBL	PD	BT	JMS	1980	C-112
1320	192	1982	KBL	CSB			1982	C-112
1327	553	1982	KBL	JMR	JMS	CSB	1979	C-120
1350	527	1982	KBL	JMS			1981	C-109
1352	195	1982	KBL	JMS			1982	C-121
1353	545	1982	KBL	AAW	JMS	CSB	1976	C-121
1363	220	1982	KBL				1982	C-118
1367	216	1982	KBL	CSB	JMS		1981	C-115
1370	45	1982	KBL	WSL			1979	C-108
1375	559	1982	KBL	WSL	CSB	JMS	1979	C-114
1387	206	1982	KBL	JMS			1981	C-125
1389	208	1982	KBL	PD	BT	CSB	1980	C-111
1398	560	1982	KBL	JMR	JMS	CSB	1981	C-132
1399	237	1982	KBL	CSB			1982	C-115
1401	155	1982	KBL	CSB	JMS		1981	C-122
1404	586	1982	KBL	PD	BT	JMS WSL	1979	C-123
1405	154	1982	KBL					C-122

Observ. No.	Resight No.	Year	Photogr.	Additional Contributors				First Year	Page
1410	69	1982	KBL					1981	C-125
1418	225	1982	KBL	WSL	JMS			1979	C-122
1419	196	1982	KBL	CSB				1982	C-131
1422	581	1982	KBL	CSB				1981	C-129
1431	587	1982	KBL	CMJ	WSL	JMS	CSB	1977	C-127
1433	0	1982	KBL						C-132
1435	181	1982	KBL	PD	BT			1982	C-145
1436	230	1982	KBL					1981	C-133
1438	202	1982	KBL					1982	C-121
1440	0	1982	KBL						C-144
1442	204	1982	KBL	WSLJMR		JMS	CSB	1979	C-138
1448	252	1982	KBL	CSB				1981	C-136
1451	599	1982	KBL	WSL	CSB			1980	C-139
1453	580	1982	KBL	WSL	JMS	CSB		1979	C-128
1459	213	1982	KBL	JMS				1979	C-124
1461	163	1982	KBL	PD	BT			1982	C-145
1463	205	1982	KBL					1982	C-143
1464	0	1982	KBL						C-146
1467	740	1982	KBL					1981	C-127
1469	224	1982	KBL	WSL	PD	BT	JMS	1979	C-132
1477	166	1982	KBL	CMJ	CSB	JMS		1975	C-132
1484	160	1982	KBL	JMS	CSB			1979	C-117
1485	584	1982	KBL	CSB				1981	C-129
1487	217	1982	KBL	CSB				1982	C-131
1489	231	1982	KBL	WSL	JMS	CSB		1979	C-138
1491	348	1982	KBL	CSB				1981	C-145
1495	0	1982	KBL						C-143
1497	229	1982	KBL					1981	C-136
1502	0	1982	KBL						C-145
1504	0	1982	KBL						C-141
1505	0	1982	KBL						C-140
1506	0	1982	KBL						C-137
1513	0	1982	KBL						C-140
1514	0	1982	KBL						C-146
1515	233	1982	KBL					1982	C-143
1516	0	1982	KBL						C-144
1517	0	1982	KBL						C-144
1518	219	1982	KBL	CSB				1982	C-133
1557	0	1980	JMS						C-96
1593	0	1980	AAW						C-104



Observ. No.	Resight No.	Year	Photogr.	Additional Contributors			First Year	Page
1635	38	1982	PD BT				1982	C-96
1654	272	1981	KBL				1981	C-143
1656	234	1981	KBL				1981	C-146
1667	573	1983	KBL	WSL	CSB		1979	C-119
1707	0	1983	KBL					C-139
1721	0	1980	MT					C-100
1724	0	1980	MT					C-97
1736	302	1980	MT				1980	C-129
1749	416	1983	CSB	KBL			1983	C-94
1754	259	1983	KBL	JMS			1981	C-114
1756	258	1983	KBL	WSL	CSB		1979	C-99
1759	263	1983	KBL	WSL	CSB	JMS	1979	C-124
1762	0	1983	KBL					C-133
1781	0	1980	WSL					C-146
1784	0	1980	WSL					C-127
1786	0	1979	WSL					C-138
1787	0	1979	JMR					C-128
1788	295	1979	WSL	JMS			1979	C-127
1789	273	1980	WSL	JMS			1980	C-126
1791	0	1980	WSL					C-133
1794	0	1980	WSL					C-146
1795	0	1980	WSL					C-141
1796	0	1979	JMR					C-130
1834	0	1980	WSL					C-109
1837	287	1980	WSL	KBL	CSB		1980	C-111
1838	279	1980	WSL	JMS	KBL		1980	C-105
1840	215	1980	WSL	KBL	CSB		1982	C-120
1845	0	1979	JMR					C-111
1846	0	1980	WSL					C-113
1847	373	1980	WSL				1980	C-109
1849	0	1979	WSL					C-110
1850	0	1979	JMR					C-113
1853	730	1980	WSL	KBL	CSB		1980	C-114
1867	265	1980	WSL	KBL			1980	C-109
1868	264	1979	WSL	KBL			1979	C-112
1886	0	1979	JMR					C-106
1888	0	1980	WSL					C-106
1889	0	1980	WSL					C-106
1890	0	1980	WSL					C-108
1891	0	1980	WSL					C-99

Observ. No.	Resight No.	Year	Photogr.	Additional Contributors				First Year	Page
1892	0	1980	WSL						C-101
1893	0	1980	WSL						C-106
1897	0	1979	WSL						C-107
1900	0	1979	WSL						C-94
1901	0	1980	WSL						C-100
1903	0	1979	WSL						C-102
1905	276	1980	WSL	JMS				1979	C-95
1906	0	1979	WSL						C-100
1907	0	1979	JMR						C-98
1909	0	1980	WSL						C-102
1910	0	1980	WSL						C-103
1912	0	1979	WSL						C-100
1931	0	1979	WSL						C-89
1934	0	1980	WSL						C-93
1935	0	1979	WSL						C-92
1936	0	1980	WSL						C-92
1937	0	1980	WSL						C-94
1940	0	1980	JMS						C-91
1967	0	1979	WSL						C-91
1982	454	1981	JMS					1981	C-122
1984	494	1979	JMS	CSB				1979	C-136
1985	0	1981	JMS						C-138
1990	0	1979	JMS						C-142
2020	289	1981	JMS	WSL	KBL			1980	C-119
2053	311	1983	KBL	PD	BT	CSB	JMS	1982	C-116
2179	120	1983	KBL	JMR	WSL	CSB		1979	C-93
2205	320	1983	KBL	WSL				1979	C-110
2431	50	1984	KBL	JMS				1979	C-95
2515	0	1982	JMS						C-105
2517	0	1982	JMS						C-99
2519	0	1982	JMS						C-117
2523	341	1982	JMS					1981	C-140
2524	0	1982	JMS						C-124
2529	0	1982	JMS						C-117
2530	0	1982	JMS						C-137
2535	0	1982	JMS						C-134
2568	410	1981	KBL	CSB				1981	C-143
2571	412	1981	KBL	JMS				1981	C-139
2573	0	1981	KBL						C-130
2789	547	1982	KBL	JMS	CSB			1981	C-114

Observ. No.	Resight No.	Year	Photogr.	Additional Contributors			First Year	Page
2834	566	1984	KBL	CMJ	JMR	CSB	1978	C-121
2843	351	1984	KBL	CSB			1984	C-131
2846	350	1984	KBL	CSB			1982	C-136
2847	118	1984	KBL	CMJ	CSB		1978	C-135
2877	539	1984	KBL	CMJ	WSL	JMS CSB	1978	C-102
2938	353	1984	KBL	CSB			1984	C-130
2946	235	1984	KBL	CMJ	JMR	CSB	1977	C-125
2972	387	1984	KBL	CSB			1984	C-136
2989	383	1984	KBL	CSB			1984	C-140
3103	394	1984	CSB				1984	C-108
3104	114	1984	CSB	KBL			1980	C-135
3106	542	1984	CSB	CMJ	KBL	JMS WSL	1978	C-114
3116	0	1984	CSB					C-105
3122	274	1984	CSB	JMS	WSL		1980	C-97
3124	811	1984	CSB				1982	C-103
3125	0	1984	CSB					C-130
3171	232	1984	CSB	KBL	CMJ	MT	1975	C-132
3173	405	1984	KBL	CSB			1984	C-145
3174	0	1984	CSB					C-133
3175	491	1984	KBL	CSB			1984	C-130
3176	0	1984	CSB					C-98
3179	390	1984	CSB	JMS			1982	C-100
3181	480	1984	CSB				1984	C-120
3187	0	1984	CSB					C-138
3192	318	1984	CSB	JMS	WSL	PD BT	1980	C-103
3194	0	1984	CSB					C-103
3195	0	1984	CSB					C-93
3196	0	1984	CSB					C-93
3199	0	1984	CSB					C-133
3203	468	1984	CSB				1984	C-128
3205	397	1984	CSB	WSL			1979	C-113
3209	393	1984	CSB				1984	C-96
3210	392	1984	CSB				1984	C-101
3211	0	1984	CSB					C-124
3213	815	1984	CSB				1984	C-114
3216	0	1984	CSB					C-103
3218	0	1984	CSB					C-90
3220	0	1984	CSB					C-113
3223	301	1984	CSB				1984	C-114
3224	408	1984	CSB	WSL	JMS		1980	C-136



Observ. No.	Resight No.	Year	Photogr.	Additional Contributors				First Year	Page
3225	400	1984	CSB	KBL				1980	C-114
3226	198	1984	CSB	KBL	PD	BT	JMS	1982	C-102
3227	0	1984	CSB						C-123
3228	0	1984	CSB						C-102
3229	0	1984	CSB						C-103
3230	0	1984	CSB						C-146
3232	0	1984	CSB						C-146
3233	0	1984	CSB						C-118
3234	0	1984	CSB						C-96
3235	0	1984	CSB						C-121
3237	402	1984	CSB	JMS				1981	C-116
3241	0	1984	CSB						C-106
3242	0	1984	CSB						C-137
3243	391	1984	CSB					1984	C-103
3246	384	1984	CSB	KBL				1981	C-134
3247	549	1984	CSB	CMJ	KBL			1978	C-119
3248	0	1984	CSB						C-129
3251	385	1984	CSB					1984	C-92
3257	382	1984	CSB	KBL				1984	C-144
3274	157	1984	CSB	KBL				1982	C-119
3283	352	1984	CSB	KBL				1984	C-94
3301	513	1984	CSB	WSL	KBL	JMS		1980	C-99
3305	455	1984	CSB	JMS				1983	C-91
3313	0	1984	CSB						C-130
3317	0	1984	CSB						C-123
3318	0	1984	CSB						C-130
3321	214	1984	CSB	KBL				1982	C-128
3324	0	1984	CSB						C-95
3335	482	1984	CSB					1984	C-101
3337	332	1984	CSB	JMS				1980	C-119
3339	262	1984	CSB	KBL	WSL	JMS		1979	C-127
3347	486	1984	CSB					1984	C-126
3352	517	1984	CSB	WSL	JMS	KBL		1979	C-98
3353	538	1984	CSB	WSL	KBL	JMS		1979	C-108
3357	281	1984	CSB	JMS	KBL			1981	C-109
3362	0	1984	CSB						C-142
3364	0	1984	CSB						C-139
3367	562	1984	CSB	AAW	CMJ	WSL	KBL	1977	C-135
3369	268	1984	CSB	JMS	PD	BT		1980	C-89
3370	122	1984	CSB	WSL	KBL	JMS		1979	C-93

Observ. No.	Resight No.	Year	Photogr.	Additional Contributors			First Year	Page
3374	310	1984	CSB	KBL	PD	BT	1982	C-115
3379	0	1984	CSB					C-127
3380	0	1984	CSB					C-98
3381	406	1984	CSB				1984	C-131
3389	395	1984	CSB	JMS			1982	C-112
3390	52	1984	CSB	WSL	CP		1980	C-104
3391	161	1984	KBL	CMJ	WSL	JMS	CSB	1978 C-94
3404	413	1984	CSB	KBL				1983 C-142
3415	401	1984	CSB					1984 C-119
3416	236	1984	CSB	KBL				1983 C-124
3422	40	1984	CSB	KBL	PD	BT	JMS	1980 C-89
3423	0	1984	CSB					C-102
3427	481	1984	CSB					1984 C-118
3434	522	1984	CSB	WSL	PD	BT	KBL	1980 C-95
3442	0	1984	CSB					C-142
3444	125	1984	CSB	WSL				1980 C-98
3445	0	1984	CSB					C-107
3446	535	1984	CSB	JMR	KBL	WSL		1979 C-105
3447	349	1984	CSB	KBL				1984 C-94
3451	606	1984	CSB	KBL	WSL	JMS		1980 C-123
3455	597	1984	CSB	KBL				1981 C-126
3470	0	1981	JMS					C-100
3475	441	1981	KBL					1981 C-141
3545	200	1985	JMS	KBL	CSB			1982 C-99
3565	336	1984	JMS	WSL				1980 C-90
3572	415	1982	JMS					1982 C-136
3586	0	1985	CSB					C-143
3595	470	1985	CSB	KBL				1982 C-132
3601	0	1985	CSB					C-144
3602	0	1985	CSB					C-125
3607	446	1985	CSB	WSL				1979 C-141
3608	479	1985	CSB					1985 C-90
3613	484	1985	CSB					1985 C-107
3616	0	1985	CSB					C-137
3622	817	1985	CSB					1985 C-135
3623	0	1985	CSB					C-128
3624	0	1985	CSB					C-141
3634	0	1985	CSB					C-133
3643	478	1985	CSB				1985	C-118
3657	0	1985	CSB					C-144

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3662	0	1985	CSB					C-110
3664	461	1985	CSB	JMS			1984	C-144
3676	475	1985	CSB				1985	C-116
3679	472	1985	CSB				1985	C-123
3680	0	1985	CSB					C-113
3684	285	1985	CSB	WSL	KBL		1980	C-136
3685	496	1985	CSB	JMS			1984	C-113
3686	458	1985	CSB				1985	C-98
3687	0	1985	CSB					C-122
3688	250	1985	CSB	WSL	KBL		1980	C-121
3689	459	1985	CSB	JMS			1982	C-123
3692	0	1985	CSB					C-108
3695	469	1985	CSB				1985	C-126
3696	0	1985	CSB					C-141
3697	465	1985	CSB	JMS			1982	C-126
3698	487	1985	CSB				1985	C-122
3701	154	1985	CSB	JMS	KBL	WSL	1976	C-116
3702	477	1985	CSB				1985	C-120
3706	0	1985	CSB					C-126
3712	0	1985	CSB					C-97
3723	0	1985	CSB					C-94
3750	0	1985	CSB					C-112
3757	493	1985	CSB				1985	C-142
3764	0	1985	CSB					C-105
3765	515	1985	CSB	WSL	KBL		1980	C-100
3830	0	1982	JMS					C-109
3831	0	1982	JMS					C-116
3832	0	1982	JMS					C-121
3833	0	1983	JMS					C-100
3834	0	1982	JMS					C-142
3835	0	1982	JMS					C-104
3836	284	1981	JMS				1981	C-110
3837	0	1984	JMS					C-124
3838	0	1984	JMS					C-91
3839	0	1984	JMS					C-103
3840	0	1984	JMS					C-141
3841	130	1985	JMS				1985	C-111
3842	0	1984	JMS					C-138
3843	467	1984	JMS				1984	C-125
3845	0	1984	JMS					C-96



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3846	0	1984	JMS					C-118
3847	329	1984	JMS				1984	C-98
3848	0	1985	JMS					C-116
3849	0	1984	JMS					C-117
3850	0	1980	JMS					C-97
3853	0	1982	JMS					C-121
3855	0	1982	JMS					C-117
3856	0	1982	JMS					C-115
3858	0	1982	JMS					C-140
3900	0	1985	CSB					C-145
3901	0	1985	CSB					C-116
3902	271	1985	CSB	KBL			1982	C-101
3913	0	1985	CSB					C-123
3914	492	1985	CSB	KBL			1983	C-140
3921	488	1985	CSB				1985	C-128
3923	283	1985	CSB	JMS	KBL	JMR	1979	C-134
3932	476	1985	CSB	JMS			1982	C-115
3937	0	1985	CSB					C-134
3947	0	1985	CSB					C-97
3951	193	1985	CSB	JMR	KBL		1979	C-115
3981	0	1985	CSB					C-142
4060	801	1985	CSB				1985	C-109
4105	826	1985	CSB				1985	C-115
4138	800	1985	CSB				1985	C-118
4145	0	1985	CSB					C-128
4148	0	1985	CSB					C-137
4162	613	1985	CSB	WSL	KBL		1980	C-112
4163	0	1985	CSB					C-134
4165	0	1985	JMS					C-126
4166	0	1984	JMS					C-129
4167	451	1985	JMS	KBL			1980	C-127
4168	0	1985	JMS					C-124
4170	0	1985	JMS					C-127
4171	0	1985	JMS					C-120
4172	0	1985	JMS					C-101
4173	0	1985	JMS					C-129
4174	0	1985	JMS					C-99
4176	457	1985	JMS	CSB			1985	C-89
4177	0	1985	JMS					C-93
4180	449	1985	JMS	KBL			1982	C-111

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4181	0	1985	JMS			C-104
4182	0	1985	JMS			C-129
4189	0	1985	JMS			C-137
4192	389	1985	JMS	CSB	1984	C-91
4194	0	1985	JMS			C-96
4197	0	1985	JMS			C-134
4198	453	1985	JMS		1985	C-107
4199	0	1985	JMS			C-128
4202	0	1985	JMS			C-131
4205	0	1985	JMS			C-139
4206	0	1985	JMS			C-104
4207	452	1985	JMS	KBL	1982	C-140
4208	0	1985	JMS			C-139
4262	0	1984	JMS			C-118
4263	0	1985	JMS			C-92
4264	407	1985	JMS	CSB	1984	C-146
4265	0	1985	JMS			C-106
4266	0	1985	JMS			C-139

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82	0	1977	JDH			C-153
156	0	1982	JDH			C-153
164	0	1982	JDH			C-147
288	316	1977	JDH		1977	C-152
312	0	1977	JDH			C-153
330	0	1982	JDH			C-151
478	0	1977	JDH			C-158
487	804	1977	JDH		1977	C-157
506	0	1977	JDH			C-156
508	0	1982	JDH			C-155
509	0	1977	JDH			C-155
586	0	1977	JDH			C-153
597	0	1982	JDH			C-149
679	298	1977	JDH		1977	C-153
691	0	1977	JDH			C-150
693	0	1977	JDH			C-148

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694	0	1982	JDH			C-147
695	0	1977	JDH			C-147
721	149	1980	MT		1980	C-155
764	168	1980	MT		1980	C-149
1663	0	1980	MD			C-152
1720	0	1980	AAW			C-151
1722	0	1980	MT			C-148
1723	260	1980	AAW	JDH	1977	C-150
1726	420	1980	AAW		1980	C-149
1727	0	1980	MT			C-152
1728	0	1980	MT			C-148
1729	253	1980	AAW		1980	C-149
1730	0	1980	MT			C-148
1731	244	1980	AAW		1980	C-152
1732	0	1980	AAW			C-154
1733	300	1980	AAW	JDH	1977	C-154
1734	447	1980	MD		1980	C-154
1735	297	1980	MD	JDH JMR	1977	C-157
1738	0	1980	MD			C-156
1739	0	1980	MD			C-155
1740	0	1980	MT			C-154
2583	0	1980	JMR			C-158
2584	363	1980	JMR		1980	C-148
2586	0	1980	JMR			C-151
2587	0	1980	JMR			C-149
2588	409	1980	JMR	JDH	1977	C-154
2590	392	1980	JMR		1980	C-151
2591	448	1980	JMR	JDH	1977	C-157
2593	0	1980	JMR			C-156
2595	0	1980	JMR			C-156
2596	0	1980	JMR			C-156
2597	0	1980	JMR			C-158
2598	0	1980	JMR			C-157
2600	0	1980	JMR			C-155
2601	0	1980	JMR			C-152
2603	0	1980	JMR			C-147
2605	0	1980	JMR			C-147
2607	124	1980	JMR		1980	C-148
2608	83	1980	JMR	WAW OVS	1979	C-149
2610	299	1980	JMR	JDH AAW	1977	C-150



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2611	314	1980	JMR	JDH		1977	C-151
2612	315	1980	JMR	JDH		1977	C-152
2613	323	1980	JMR	JDH		1977	C-150
2614	338	1980	JMR			1980	C-148
2997	0	1983	JH				C-149
4213	816	1985	OVZ	BMK		1985	C-157
4214	0	1983	OVZ				C-151
4215	380	1985	OVZ	JMR	JDH	1980	C-155
4216	301	1984	CM	JDH		1977	C-154
4217	0	1984	CM				C-150
4218	0	1984	CM				C-155
4219	803	1985	KB	JMR		1980	C-150
4220	0	1985	JDH				C-158
4221	0	1985	OVZ				C-154
4222	0	1985	OVZ				C-147
4223	0	1985	OVZ				C-149
4224	0	1984	CM				C-153
4225	0	1984	CM				C-147
4226	809	1984	CM	JDH		1982	C-158
4227	807	1984	CM	JMR		1980	C-158
4228	0	1984	OVZ				C-147
4229	805	1984	CM	JMR		1980	C-151
4230	0	1984	CM				C-153
4231	0	1984	CM				C-158
4232	0	1984	CM				C-152
4233	0	1984	CM				C-156
4234	0	1984	JSL				C-150
4235	0	1984	CM				C-152
4236	0	1984	CM				C-157
4237	806	1984	CM	JMR		1980	C-154
4238	0	1984	CM				C-148
4239	808	1984	KE	JDH		1982	C-157
4240	0	1984	KE				C-156
4241	828	1980	RCM	JDH		1977	C-151
4242	0	1980	OVZ				C-150
4257	0	1985	OVZ				C-156
4258	0	1984	CM				C-153
4267	0	1985	BMK				C-157
4281	0	1983	JDH				C-155

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2	6	HI	660	C-12
	6	MEX	4273	C-82
3	22	HI	1071	C-20
	22	SEA	1217	C-97
4	38	HI	117	C-7
	38	SEA	1635	C-96
5	40	HI	3422	C-2
	40	SEA	3422	C-89
6	43	HI	768	C-18
	43	SEA	768	C-98
7	45	HI	2213	C-44
	45	SEA	1370	C-108
8	50	HI	2431	C-12
	50	SEA	2431	C-95
9	52	HI	3390	C-36
	52	SEA	3390	C-104
10	68	HI	581	C-38
	68	SEA	1297	C-108
11	69	HI	490	C-61
	69	SEA	1410	C-125
12	78	HI	2050	C-7
	78	SEA	296	C-92
13	83	HI	499	C-20
	83	WGA	2608	C-149
14	95	HI	2720	C-19
	95	SEA	1242	C-102
15	104	HI	901	C-66
	104	SEA	901	C-131
16	114	HI	515	C-65
	114	SEA	3104	C-135
17	117	HI	523	C-43
	117	SEA	1285	C-108
18	118	HI	2847	C-62
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20	124	HI	121	C-11
	124	WGA	2607	C-148
21	125	HI	2294	C-11
	125	SEA	3444	C-98
22	130	HI	1057	C-36
	130	SEA	3841	C-111
23	149	HI	411	C-46
	149	WGA	721	C-155
24	150	HI	438	C-78
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25	157	HI	2686	C-51
	157	SEA	3274	C-119
26	159	HI	2233	C-59
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27	168	HI	443	C-34
	168	WGA	764	C-149
28	169	HI	541	C-9
	169	SEA	1212	C-95
29	170	HI	1262	C-32
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30	177	HI	2800	C-4
	177	SEA	1199	C-91
31	178	HI	1197	C-5
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32	181	HI	360	C-79
	181	SEA	1435	C-145
33	183	HI	1191	C-1
	183	SEA	1191	C-90
34	184	HI	2142	C-36
	184	SEA	1269	C-104
35	190	HI	1314	C-37
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36	191	HI	1317	C-48
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37	200	HI	1111	C-27
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38	203	HI	2027	C-40
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40	224	HI	1469	C-66
	224	SEA	1469	C-132
41	232	HI	2215	C-67
	232	SEA	3171	C-132
42	237	HI	2464	C-54
	237	SEA	1399	C-115
43	241	HI	1213	C-14
	241	SEA	1213	C-95
44	244	HI	512	C-25
	244	WGA	1731	C-152
45	245	HI	1073	C-36
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46	250	HI	505	C-74
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47	252	HI	1448	C-66
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48	253	HI	169	C-12
	253	WGA	1729	C-149
49	259	HI	2176	C-50
	259	SEA	1754	C-114
50	260	HI	338	C-18
	260	WGA	1723	C-150
51	262	HI	3339	C-72
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52	285	HI	3684	C-72
	285	SEA	3684	C-136
53	298	MEX	2647	C-83
	298	WGA	679	C-153
54	299	HI	2282	C-19
	299	WGA	2610	C-150
55	301	HI	2132	C-40
	301	SEA	3223	C-114
	301	WGA	4216	C-154
56	302	HI	2075	C-61
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57	303	MEX	2538	C-84
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	311	SEA	2053	C-116
59	316	HI	1137	C-26
	316	WGA	288	C-152
60	318	HI	3192	C-32
	318	SEA	3192	C-103
61	320	HI	2281	C-44
	320	SEA	2205	C-110
62	323	HI	564	C-16
	323	WGA	2613	C-150
63	329	HI	2175	C-16
	329	SEA	3847	C-98
64	332	HI	2460	C-56
	332	SEA	3337	C-119
65	336	HI	2257	C-4
	336	SEA	3565	C-90
66	338	HI	1122	C-13
	338	WGA	2614	C-148
67	339	HI	393	C-14
	339	MEX	2648	C-82
68	363	HI	2584	C-7
	363	WGA	2584	C-148
69	373	HI	2330	C-53
	373	SEA	1847	C-109
70	389	HI	3394	C-5
	389	SEA	4192	C-91
71	392	SEA	3210	C-101
	392	WGA	2590	C-151
72	407	HI	1034	C-74
	407	SEA	4264	C-146
73	408	HI	145	C-72
	408	SEA	3224	C-136
74	415	HI	2716	C-64
	415	SEA	3572	C-136
75	416	HI	2366	C-9
	416	SEA	1749	C-94
76	420	HI	2733	C-21
	420	WGA	1726	C-149
77	441	HI	2403	C-80
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	447	WGA	1734	C-154
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	476	SEA	3932	C-115
80	479	HI	52	C-4
	479	SEA	3608	C-90
81	503	HI	1180	C-2
	503	SEA	753	C-90
82	505	HI	1768	C-40
	505	SEA	847	C-90
83	535	HI	3446	C-36
	535	SEA	3446	C-105
84	536	HI	2171	C-37
	536	SEA	921	C-110
85	538	HI	212	C-34
	538	SEA	3353	C-108
86	539	HI	383	C-33
	539	SEA	2877	C-102
87	540	HI	2360	C-50
	540	SEA	765	C-113
88	541	HI	1748	C-50
	541	SEA	849	C-113
89	542	HI	1091	C-56
	542	SEA	3106	C-114
90	547	HI	1303	C-55
	547	SEA	2789	C-114
91	552	HI	346	C-37
	552	SEA	923	C-111
92	553	HI	2183	C-52
	553	SEA	1327	C-120
93	554	HI	3609	C-55
	554	SEA	924	C-117
94	564	HI	480	C-66
	564	SEA	734	C-135
95	572	HI	811	C-62
	572	SEA	811	C-124
96	580	HI	2125	C-69
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97	591	HI	850	C-63
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	606	SEA	3451	C-123
99	616	MEX	2551	C-81
	616	SEA	915	C-89
100	804	HI	2039	C-64
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101	809	HI	1063	C-71
	809	WGA	4226	C-158
102	811	HI	1080	C-31
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103	815	HI	2105	C-53
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104	821	HI	1103	C-10
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105	826	HI	2197	C-53
	826	SEA	4105	C-115