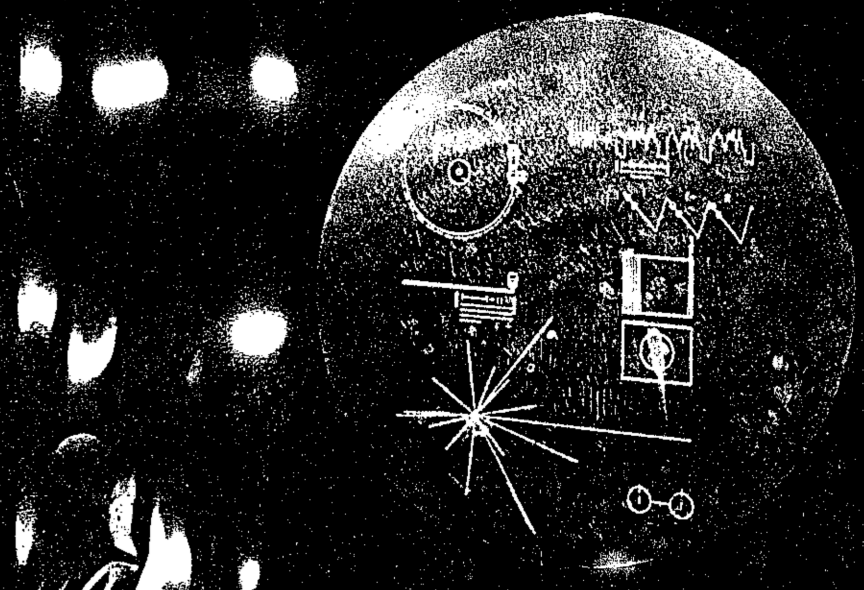
MURMURS OF EARTH

THE VOYAGER INTERSTELLAR RECORD

CARL SAGAN
F.D. DRAKE, ANN DRUYAN, TIMOTHY FERRIS, JON LOMBERG,
LINDA SALZMAN SAGAN



MURMURS OF EARTH

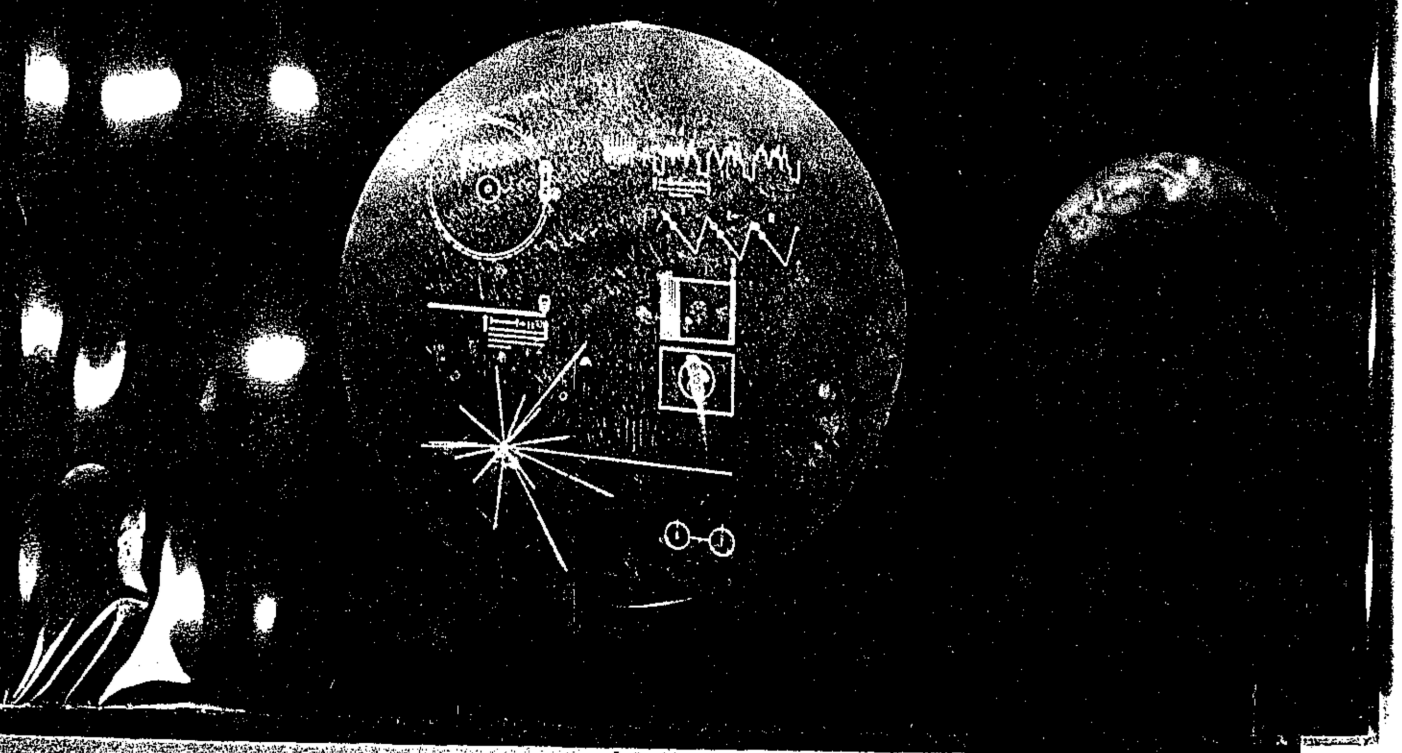
CARL SAGAN
F.D. DRAKE
ANN DRUYAN
TIMOTHY FERRIS
JON LOMBERG
LINDA SALZMAN SAGAN

RANDOM HOUSE

MURMURS OF EARTH

THE VOYAGER INTERSTELLAR RECORD

CARL SAGAN
F.D. DRAKE, ANN DRUYAN, TIMOTHY FERRIS, JON LOMBERG,
LINDA SALZMAN SAGAN



MURMURS OF EARTH

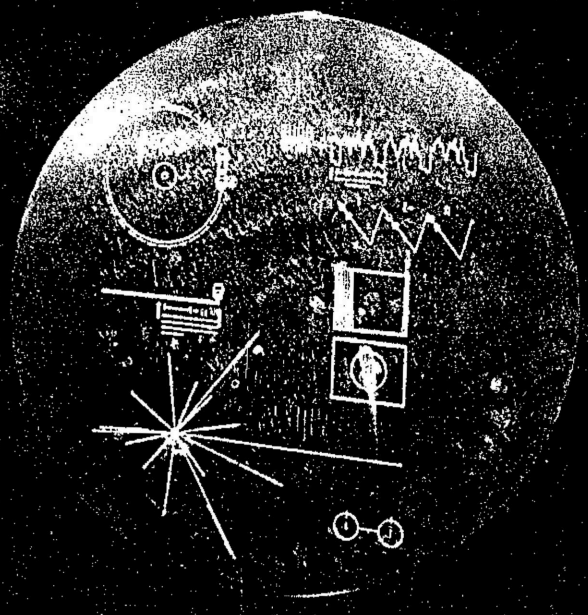
CARL SAGAN
F.D. DRAKE
ANN DRUYAN
TIMOTHY FERRIS
JON LOMBERG
LINDA SALZMAN SAGAN

RANDOM HOUSE

MURMURS OF EARTH

THE VOYAGER INTERSTELLAR RECORD

CARL SAGAN
F.D. DRAKE, ANN DRUYAN, TIMOTHY FERRIS, JON LOMBERG,
LINDA SALZMAN SAGAN



MURMURS OF EARTH

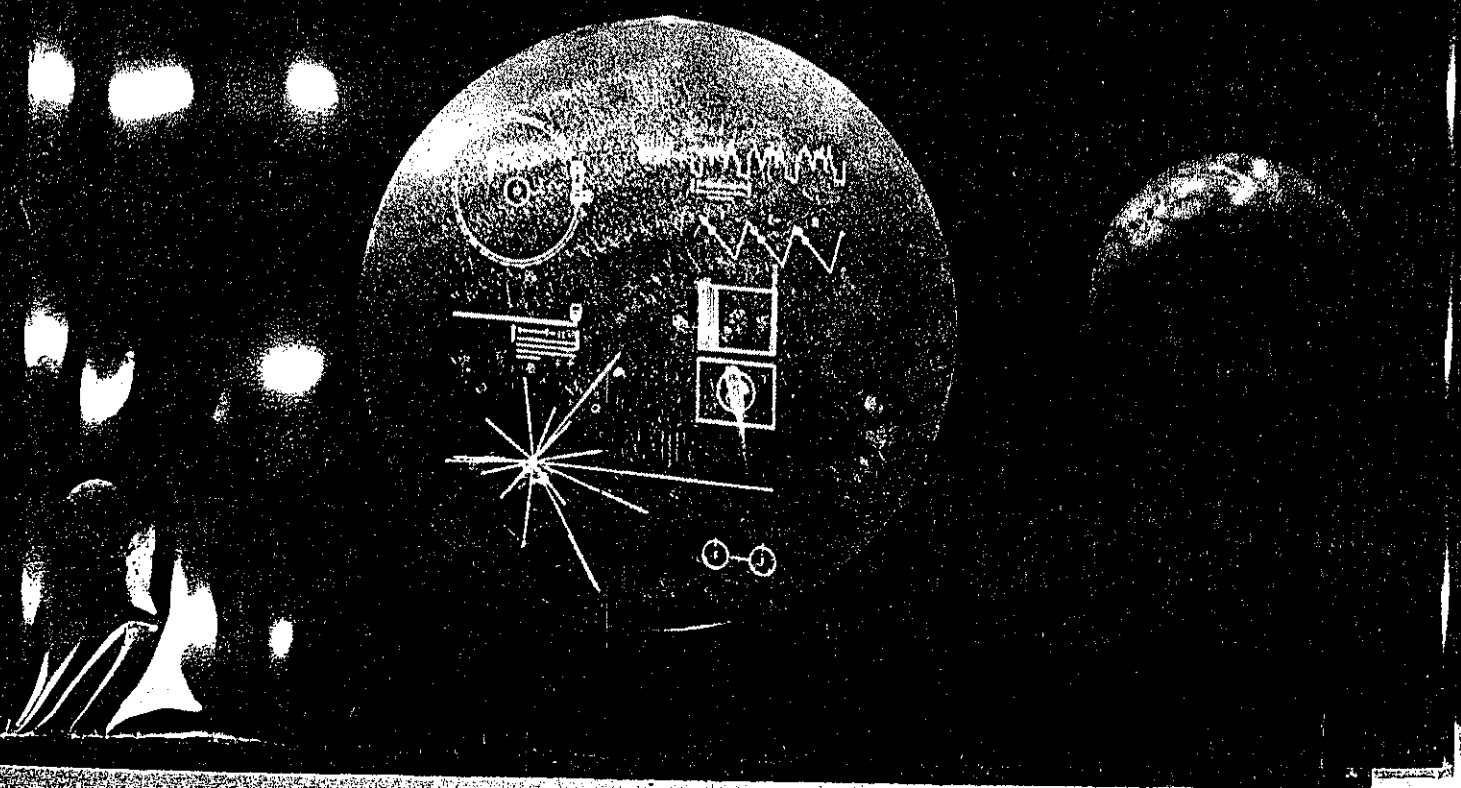
CARL SAGAN
F.D. DRAKE
ANN DRUYAN
TIMOTHY FERRIS
JON LOMBERG
LINDA SALZMAN SAGAN

RANDOM HOUSE

MURMURS OF EARTH

THE VOYAGER INTERSTELLAR RECORD

CARL SAGAN
F.D. DRAKE, ANN DRUYAN, TIMOTHY FERRIS, JON LOMBERG,
LINDA SALZMAN SAGAN



MURMURS OF EARTH
CARL SAGAN
F.D. DRAKE
ANN DRUYAN
IMOTHY FERRIS
JON OMBERG
LINDA ALZMAN SAGAN

NDOM OUSE

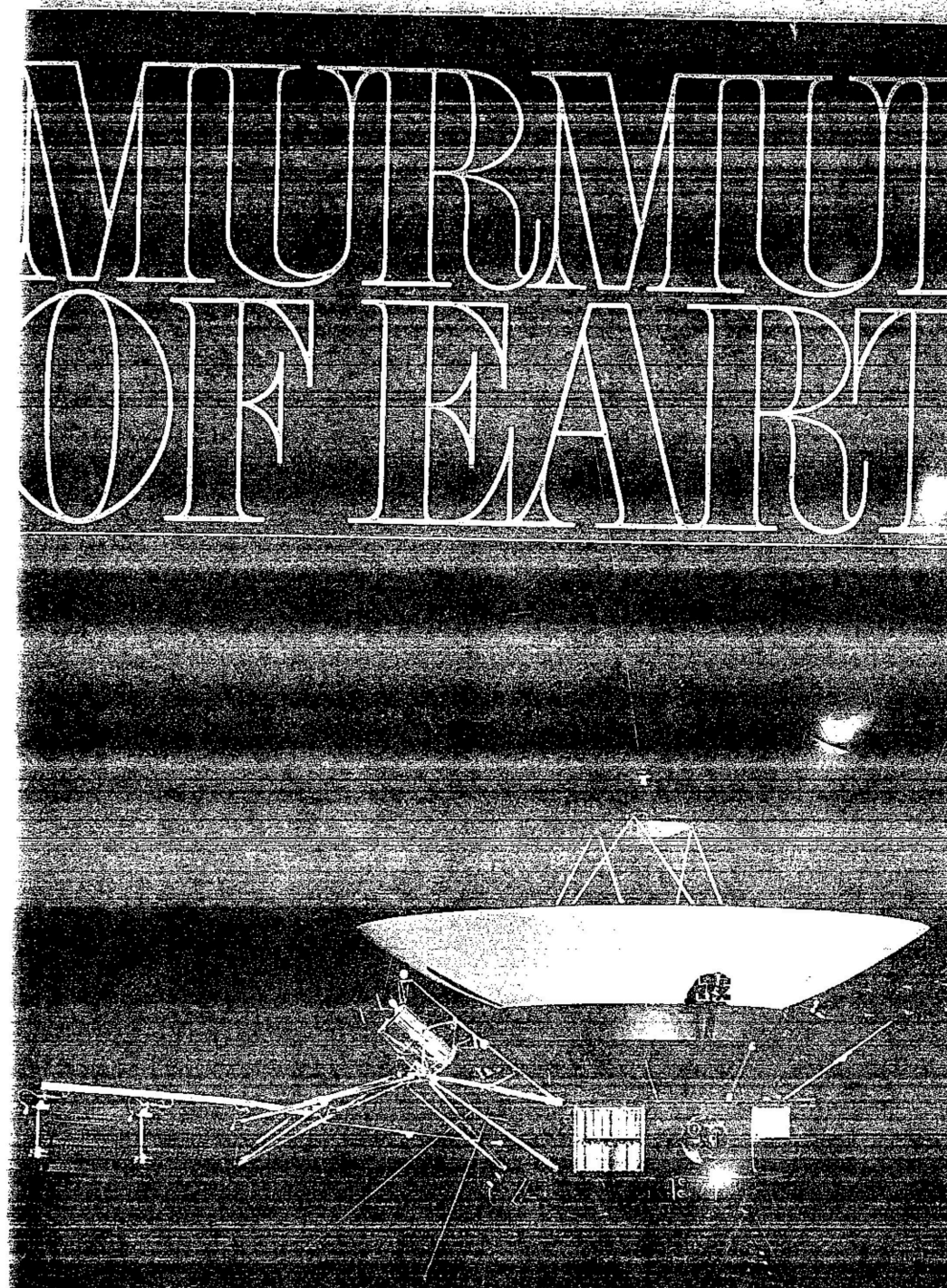
MURMURS OF EARTH

THE VOYAGER INTERSTELLAR RECORD

CARL SAGAN

F.D. DRAKE, ANN DRUYAN, TIMOTHY FERRIS, JON LOMBERG

LINDA SALZMAN SAGAN



MURMURS OF EARTH

THE VOYAGER INTERSTELLAR RECORD

CARL SAGAN

ED. DRAKE

ANN DRUYAN

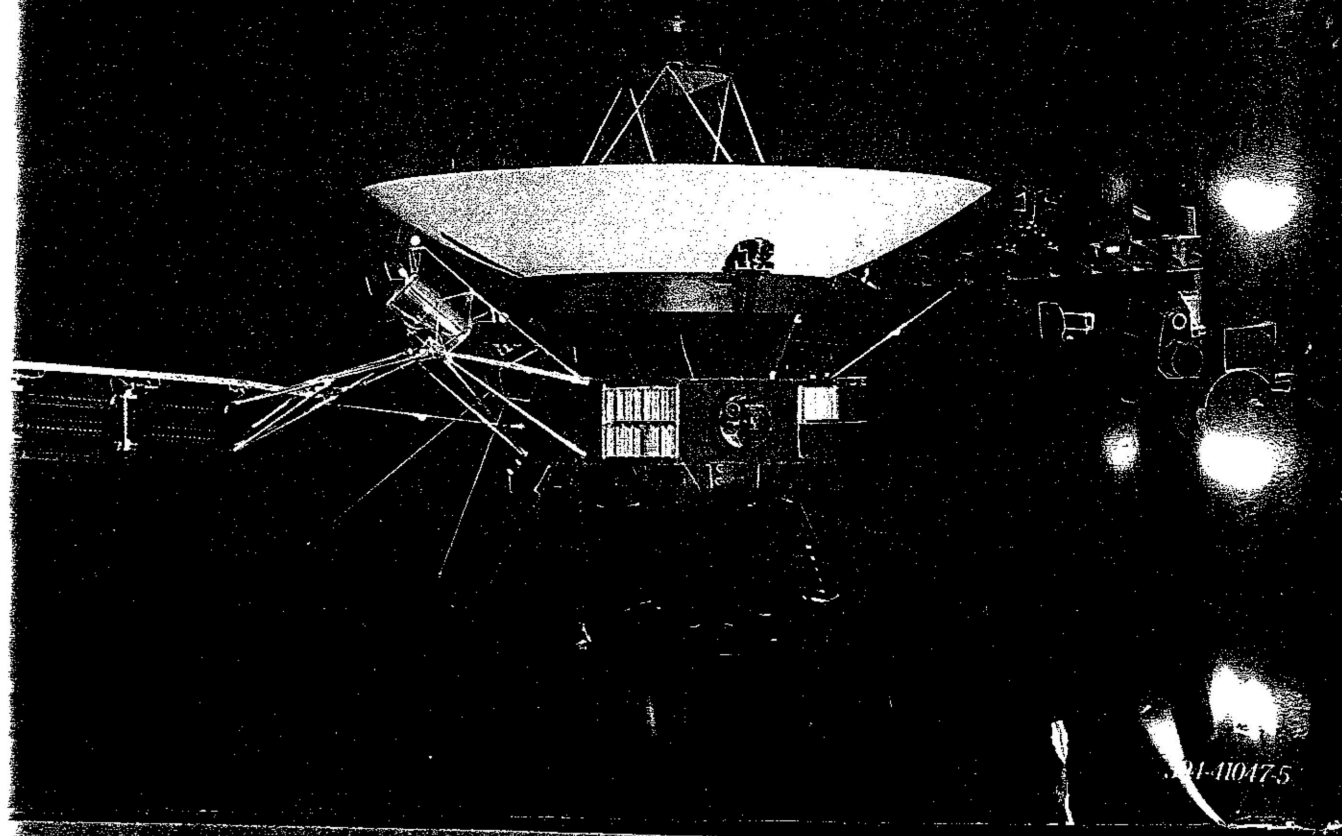
TIMOTHY FERRIS

JON LOMBERG

LINDA SALZMAN SAGAN

RANDOM HOUSE

MURMURS OF EARTH



MURMURS OF EARTH

CARL SAGAN

F.D. DRAKE

ANN DRUYAN

TIMOTHY FERRIS

JON LOMBERG

LINDA SALZMAN SAGAN

RANDOM HOUSE

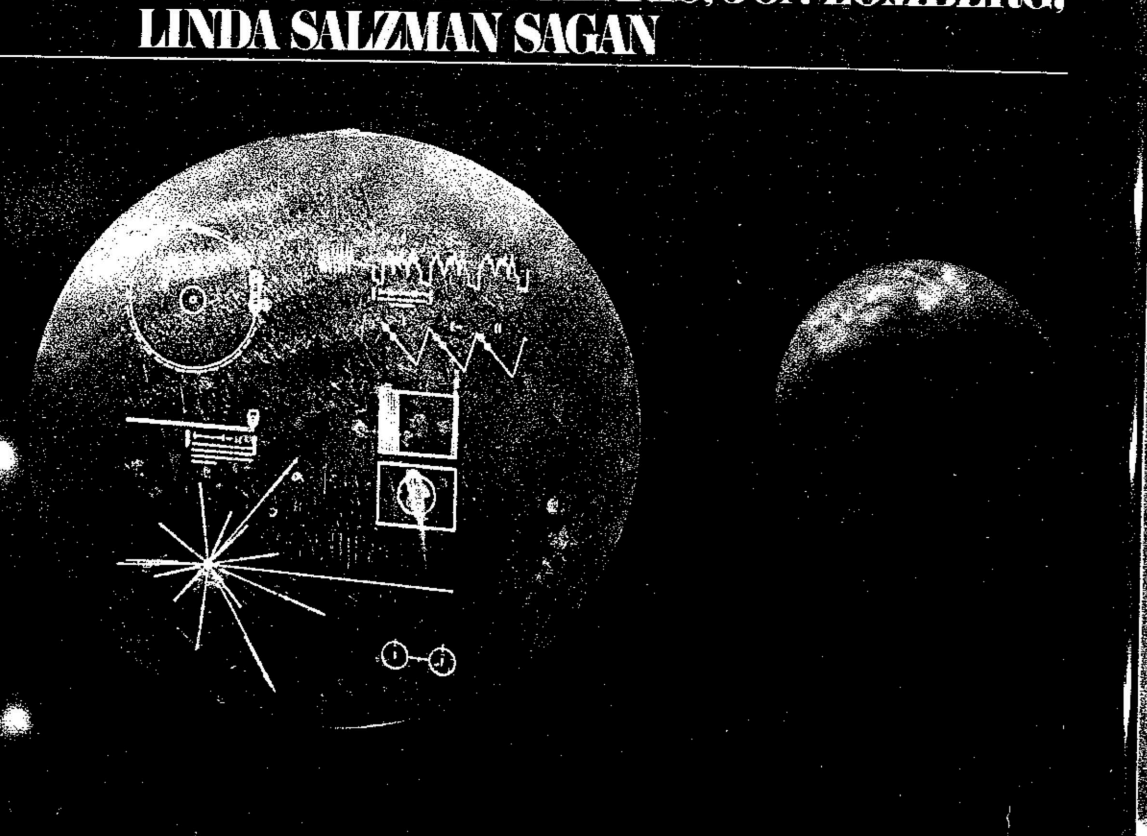
0-394-41047-5

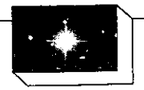
MURMURS OF EARTH

THE VOYAGER INTERSTELLAR RECORD

CARL SAGAN

F.D. DRAKE, ANN DRUYAN, TIMOTHY FERRIS, JON LOMBERG, LINDA SALZMAN SAGAN





Copyright © 1978 by Carl Sagan
All rights reserved under International and Pan-American Copyright Conventions.
Published in the United States by Random House, Inc., New York, and simultaneously
in Canada by Random House of Canada Limited, Toronto.

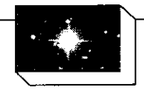
Library of Congress Cataloging in Publication Data
Main entry under title:

Murmurs of Earth.

Includes index.
CONTENTS: Sagan, C. For future times and beings.—
Drake, F. D. The foundations of the Voyager record.—
Lomberg, J. Pictures of Earth. [etc.]
1. Project Voyager—Addresses, essays, lectures.
I. Sagan, Carl, 1934—
TL789.8.U6V685 001.55'0999 77-5991
ISBN 0-394-41047-5

Manufactured in the United States of America
2 4 6 8 9 7 5 3
First Edition

Design: Robert Aulicino

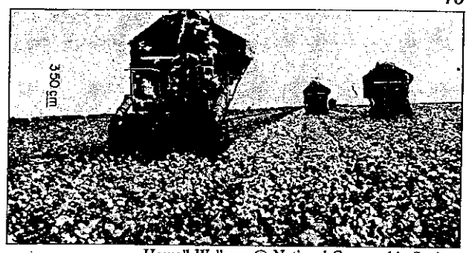


To the makers of music—all worlds, all times

75

75. Cotton Harvest

We felt we had to have a picture of mechanized agriculture, and these cotton pickers were chosen because the white cotton shows up the swath of the harvester clearly. In fact the cotton can be seen, tossed into the air above the machine. There is enough similarity in appearance between the field of cotton and the field of daffodils (picture 50) to make it obvious that something growing is being picked. The following pictures show how we obtain and eat our food, and this picture serves as an introduction, even though cotton is not normally thought of as a food (unless you are Milo Minderbinder in *Catch-22*).



Howell Walker, © National Geographic Society

76

76. Man with Grapes

Originally selected as a close-up of hands and a face, this plainly shows a human being stuffing his mouth. Functional anatomists may note that three very different functions of the hand are also shown. The things he is eating look as if they may be of natural origin, suggesting that we don't yet produce food in factories. (Photograph by David Moore: *Grape Picker*).



77. Supermarket

Here is another person eating grapes, but this time in a location that adds more information—namely, that we don't all get grapes from the fields; some of us buy them in markets. There are a variety of other foodstuffs in bins in the background, some marked numerically with prices. A recipient society with an economy that involves money, buying, and selling might even deduce that these are in fact prices. Frank Drake had decided that we had to have a picture of a market or food store, and it was easier to take our own picture than to spend days looking for one. Five of us, including Herman Eckelmann, the NAIC staff photographer, trooped off to the local supermarket. With Frank in the lead, we began loading up carts with foods. Eckelmann ran around taking photographs. The other shoppers soon gave us a wide berth. Predictably, the manager came over and politely asked what the hell we were doing. Frank did the talking, and while the rest of us tried to look appropriately serious, one of the world's great astronomers explained to a suspicious store manager that we wanted to send his supermarket to the stars. We put most of the food back on the shelves (causing more bewilderment), paid for the grapes, and left.

77



Photo: Herman Eckelmann, NAIC staff photographer

78. Diver and Fish

[Unfortunately we were unable to reach a satisfactory arrangement with the photographer to include this picture in this book. It was chosen to add more information on the undersea environment.]

79. Fishing Boats

It may be deduced that the nets these Greek fishermen are pulling in are for catching the fish, since the next picture shows fish being cooked. The boat is primitive in relation to the technology in some other pictures, showing various stages in our technological development.

80. Cooking Fish

The fish are being broiled on an open grill in Portugal. On one side of the grill the fish are raw and wet (looking very much like the fish in picture 78). They become progressively more cooked (and carbonized) along the grill. The message is that we catch animals and then cook them. (From *The Cooking of Spain and Portugal,* a title in the Foods of the World series. Photograph by Brian Seed. Courtesy Time-Life Books, Inc.)

81. Chinese Dinner Party

We wanted to show a group of people eating together. The fact that this party is sitting in a circle around a table echoes the circles of pictures 36 and 74. Several of the people are holding utensils; some are dipping into their bowls, and some are raising their spoons to their mouths. Plates of food and a bottle of liquid appear on the table. This is also one of the few pictures that show people in typical modern dress. Westerners may find the man's gesture puzzling. He is playing a table game common in the Orient, in which players have to guess how many fingers a person will hold out. The women are evidently amused. (From *Chinese Cooking,* a title in the Foods of the World series. Photograph by Michael Rougier. Courtesy of Time-Life Books, Inc.)

79



United Nations

80



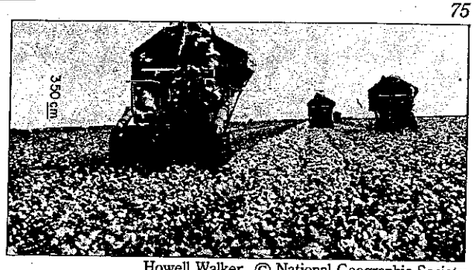
81



75. Cotton Harvest

We felt we had to have a picture of mechanized agriculture, and these cotton pickers were chosen because the white cotton shows up the swath of the harvester clearly. In fact the cotton can be seen, tossed into the air above the machine. There is enough similarity in appearance between the field of cotton and the field of daffodils (picture 50) to make it obvious that something growing is being picked. The following pictures show how we obtain and eat our food, and this picture serves as an introduction, even though cotton is not normally thought of as a food (unless you are Milo Minderbinder in *Catch-22*).

75



Howell Walker, © National Geographic Society

76. Man with Grapes

Originally selected as a close-up of hands and a face, this plainly shows a human being stuffing his mouth. Functional anatomists may note that three very different functions of the hand are also shown. The things he is eating look as if they may be of natural origin, suggesting that we don't yet produce food in factories. (Photograph by David Moore: *Grape Picker*).

76



77. Supermarket

Here is another person eating grapes, but this time in a location that adds more information—namely, that we don't all get grapes from the fields; some of us buy them in markets. There are a variety of other foodstuffs in bins in the background, some marked numerically with prices. A recipient society with an economy that involves money, buying, and selling might even deduce that these are in fact prices. Frank Drake had decided that we had to have a picture of a market or food store, and it was easier to take our own picture than to spend days looking for one. Five of us, including Herman Eckelmann, the NAIC staff photographer, trooped off to the local supermarket. With Frank in the lead, we began loading up carts with foods. Eckelmann ran around taking photographs. The other shoppers soon gave us a wide berth. Predictably, the manager came over and politely asked what the hell we were doing. Frank did the talking, and while the rest of us tried to look appropriately serious, one of the world's great astronomers explained to a suspicious store manager that we wanted to send his supermarket to the stars. We put most of the food back on the shelves (causing more bewilderment), paid for the grapes, and left.

77



Photo: Herman Eckelmann, NAIC staff photographer

78. Diver and Fish

[Unfortunately we were unable to reach a satisfactory arrangement with the photographer to include this picture in this book. It was chosen to add more information on the undersea environment.]

79. Fishing Boats

It may be deduced that the nets these Greek fishermen are pulling in are for catching the fish, since the next picture shows fish being cooked. The boat is primitive in relation to the technology in some other pictures, showing various stages in our technological development.

80. Cooking Fish

The fish are being broiled on an open grill in Portugal. On one side of the grill the fish are raw and wet (looking very much like the fish in picture 78). They become progressively more cooked (and carbonized) along the grill. The message is that we catch animals and then cook them. (From *The Cooking of Spain and Portugal,* a title in the Foods of the World series. Photograph by Brian Seed. Courtesy Time-Life Books, Inc.)

81. Chinese Dinner Party

We wanted to show a group of people eating together. The fact that this party is sitting in a circle around a table echoes the circles of pictures 36 and 74. Several of the people are holding utensils; some are dipping into their bowls, and some are raising their spoons to their mouths. Plates of food and a bottle of liquid appear on the table. This is also one of the few pictures that show people in typical modern dress. Westerners may find the man's gesture puzzling. He is playing a table game common in the Orient, in which players have to guess how many fingers a person will hold out. The women are evidently amused. (From *Chinese Cooking,* a title in the Foods of the World series. Photograph by Michael Rougier. Courtesy of Time-Life Books, Inc.)

79



United Nations

80



81



75. Cotton Harvest

We felt we had to have a picture of mechanized agriculture, and these cotton pickers were chosen because the white cotton shows up the swath of the harvester clearly. In fact the cotton can be seen, tossed into the air above the machine. There is enough similarity in appearance between the field of cotton and the field of daffodils (picture 50) to make it obvious that something growing is being picked. The following pictures show how we obtain and eat our food, and this picture serves as an introduction, even though cotton is not normally thought of as a food (unless you are Milo Minderbinder in *Catch-22*).

76. Man with Grapes

Originally selected as a close-up of hands and a face, this plainly shows a human being stuffing his mouth. Functional anatomists may note that three very different functions of the hand are also shown. The things he is eating look as if they may be of natural origin, suggesting that we don't yet produce food in factories. (Photograph by David Moore: *Grape Picker*)

77. Supermarket

Here is another person eating grapes, but this time in a location that adds more information—namely, that we don't all get grapes from the fields; some of us buy them in markets. There are a variety of other foodstuffs in bins in the background, some marked numerically with prices. A recipient society with an economy that involves money, buying, and selling might even deduce that these are in fact prices. Frank Drake had decided that we had to have a picture of a market or food store, and it was easier to take our own picture than to spend days looking for one. Five of us, including Herman Eckelmann, the NAIC staff photographer, trooped off to the local supermarket. With Frank in the lead, we began loading up carts with foods. Eckelmann ran around taking photographs. The other shoppers soon gave us a wide berth. Predictably, the manager came over and politely asked what the hell we were doing. Frank did the talking, and while the rest of us tried to look appropriately serious, one of the world's great astronomers explained to a suspicious store manager that we wanted to send his supermarket to the stars. We put most of the food back on the shelves (causing more bewilderment), paid for the grapes, and left.

75



Howell Walker, © National Geographic Society

76



77



Photo: Herman Eckelmann, NAIC staff photographer

78. Diver and Fish

[Unfortunately we were unable to reach a satisfactory arrangement with the photographer to include this picture in this book. It was chosen to add more information on the undersea environment.]

79. Fishing Boats

It may be deduced that the nets these Greek fishermen are pulling in are for catching the fish, since the next picture shows fish being cooked. The boat is primitive in relation to the technology in some other pictures, showing various stages in our technological development.

80. Cooking Fish

The fish are being broiled on an open grill in Portugal. On one side of the grill the fish are raw and wet (looking very much like the fish in picture 78). They become progressively more cooked (and carbonized) along the grill. The message is that we catch animals and then cook them. (From *The Cooking of Spain and Portugal*, a title in the Foods of the World series. Photograph by Brian Seed. Courtesy Time-Life Books, Inc.)

81. Chinese Dinner Party

We wanted to show a group of people eating together. The fact that this party is sitting in a circle around a table echoes the circles of pictures 36 and 74. Several of the people are holding utensils; some are dipping into their bowls, and some are raising their spoons to their mouths. Plates of food and a bottle of liquid appear on the table. This is also one of the few pictures that show people in typical modern dress. Westerners may find the man's gesture puzzling. He is playing a table game common in the Orient, in which players have to guess how many fingers a person will hold out. The women are evidently amused. (From *Chinese Cooking*, a title in the Foods of the World series. Photograph by Michael Rougier. Courtesy of Time-Life Books, Inc.)

79



United Nations

80



81

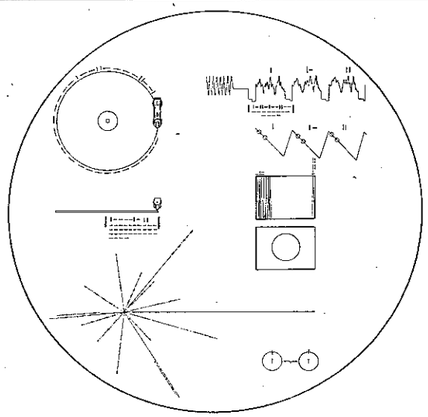


MURMURS OF EARTH

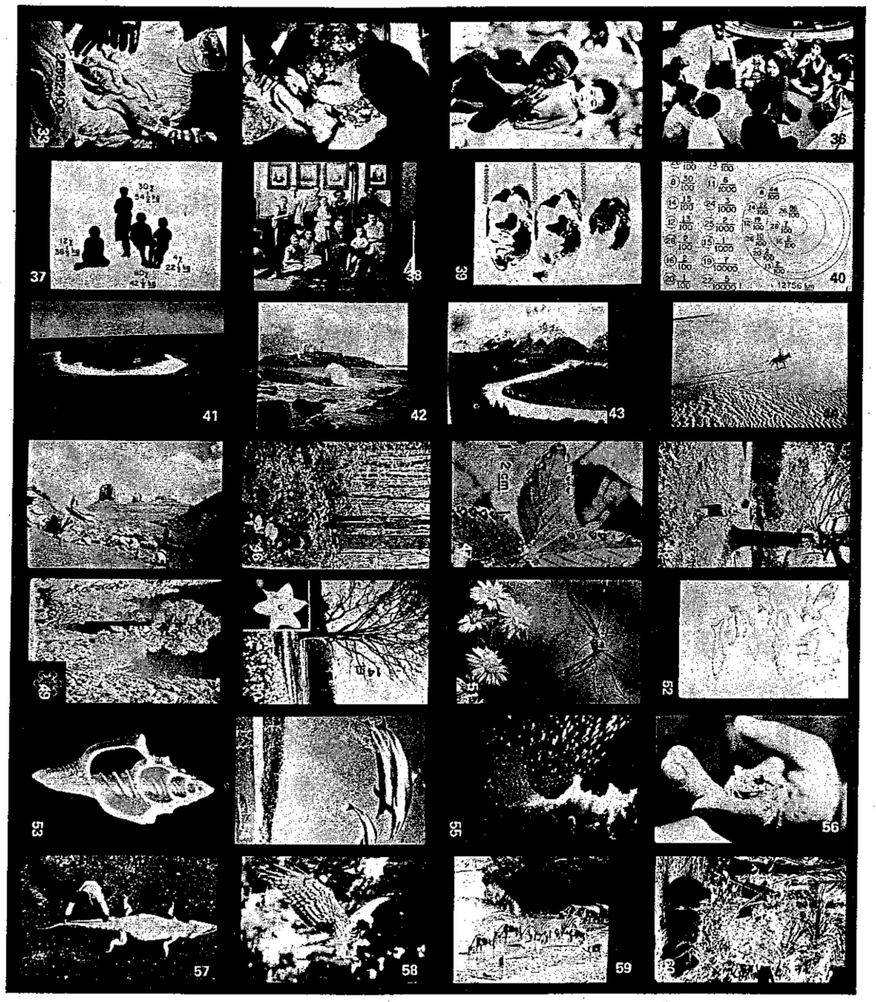
THE VOYAGER INTERSTELLAR RECORD

CARL SAGAN

F.D. DRAKE, ANN DRUYAN, TIMOTHY FERRIS, JON LOMBERG, LINDA SALZMAN SAGAN



RANDOM HOUSE NEW YORK


33
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60


61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88

78. Diver and Fish

[Unfortunately we were unable to reach a satisfactory arrangement with the photographer to include this picture in this book. It was chosen to add more information on the undersea environment.]

79. Fishing Boats

It may be deduced that the nets these Greek fishermen are pulling in are for catching the fish, since the next picture shows fish being cooked. The boat is primitive in relation to the technology in some other pictures, showing various stages in our technological development.

80. Cooking Fish

The fish are being broiled on an open grill in Portugal. On one side of the grill the fish are raw and wet (looking very much like the fish in picture 78). They become progressively more cooked (and carbonized) along the grill. The message is that we catch animals and then cook them. (From *The Cooking of Spain and Portugal,* a title in the Foods of the World series. Photograph by Brian Seed. Courtesy Time-Life Books, Inc.)

81. Chinese Dinner Party

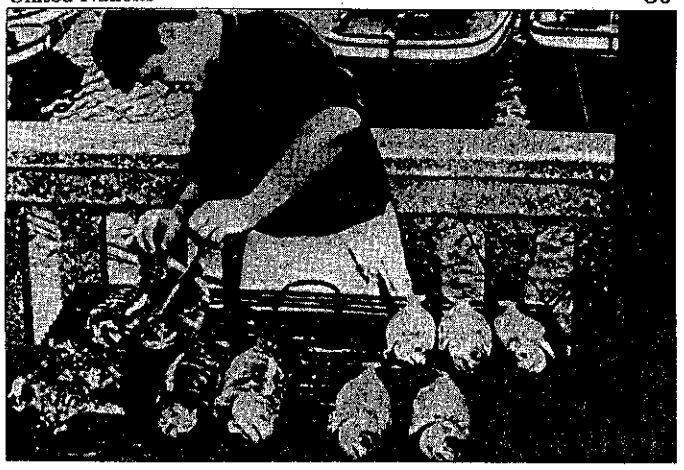
We wanted to show a group of people eating together. The fact that this party is sitting in a circle around a table echoes the circles of pictures 36 and 74. Several of the people are holding utensils; some are dipping into their bowls, and some are raising their spoons to their mouths. Plates of food and a bottle of liquid appear on the table. This is also one of the few pictures that show people in typical modern dress. Westerners may find the man's gesture puzzling. He is playing a table game common in the Orient, in which players have to guess how many fingers a person will hold out. The women are evidently amused. (From *Chinese Cooking,* a title in the Foods of the World series. Photograph by Michael Rougier. Courtesy of Time-Life Books, Inc.)

79



United Nations

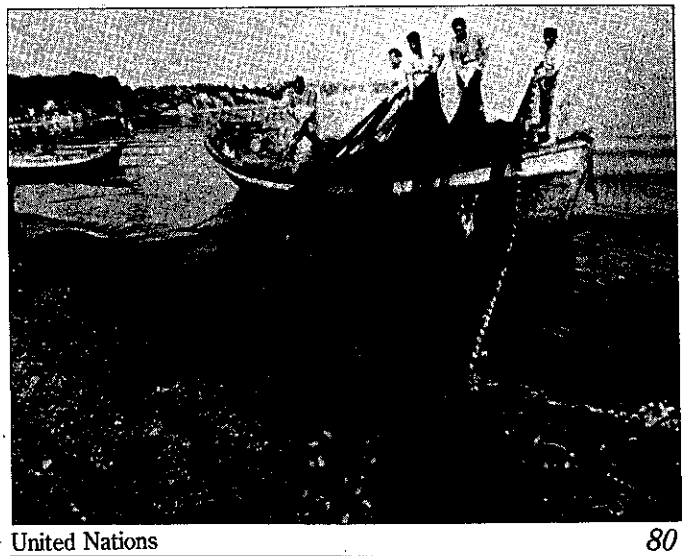
80



81



79



United Nations

80



81



78. Diver and Fish

[Unfortunately we were unable to reach a satisfactory arrangement with the photographer to include this picture in this book. It was chosen to add more information on the undersea environment.]

79. Fishing Boats

It may be deduced that the nets these Greek fishermen are pulling in are for catching the fish, since the next picture shows fish being cooked. The boat is primitive in relation to the technology in some other pictures, showing various stages in our technological development.

80. Cooking Fish

The fish are being broiled on an open grill in Portugal. On one side of the grill the fish are raw and wet (looking very much like the fish in picture 78). They become progressively more cooked (and carbonized) along the grill. The message is that we catch animals and then cook them. (From *The Cooking of Spain and Portugal,* a title in the Foods of the World series. Photograph by Brian Seed. Courtesy Time-Life Books, Inc.)

81. Chinese Dinner Party

We wanted to show a group of people eating together. The fact that this party is sitting in a circle around a table echoes the circles of pictures 36 and 74. Several of the people are holding utensils; some are dipping into their bowls, and some are raising their spoons to their mouths. Plates of food and a bottle of liquid appear on the table. This is also one of the few pictures that show people in typical modern dress. Westerners may find the man's gesture puzzling. He is playing a table game common in the Orient, in which players have to guess how many fingers a person will hold out. The women are evidently amused. (From *Chinese Cooking,* a title in the Foods of the World series. Photograph by Michael Rougier. Courtesy of Time-Life Books, Inc.)

78. Diver and Fish

[Unfortunately we were unable to reach a satisfactory arrangement with the photographer to include this picture in this book. It was chosen to add more information on the undersea environment.]

79. Fishing Boats

It may be deduced that the nets these Greek fishermen are pulling in are for catching the fish, since the next picture shows fish being cooked. The boat is primitive in relation to the technology in some other pictures, showing various stages in our technological development.

80. Cooking Fish

The fish are being broiled on an open grill in Portugal. On one side of the grill the fish are raw and wet (looking very much like the fish in picture 78). They become progressively more cooked (and carbonized) along the grill. The message is that we catch animals and then cook them. (From *The Cooking of Spain and Portugal,* a title in the Foods of the World series. Photograph by Brian Seed. Courtesy Time-Life Books, Inc.)

81. Chinese Dinner Party

We wanted to show a group of people eating together. The fact that this party is sitting in a circle around a table echoes the circles of pictures 36 and 74. Several of the people are holding utensils; some are dipping into their bowls, and some are raising their spoons to their mouths. Plates of food and a bottle of liquid appear on the table. This is also one of the few pictures that show people in typical modern dress. Westerners may find the man's gesture puzzling. He is playing a table game common in the Orient, in which players have to guess how many fingers a person will hold out. The women are evidently amused. (From *Chinese Cooking,* a title in the Foods of the World series. Photograph by Michael Rougier. Courtesy of Time-Life Books, Inc.)

79



United Nations

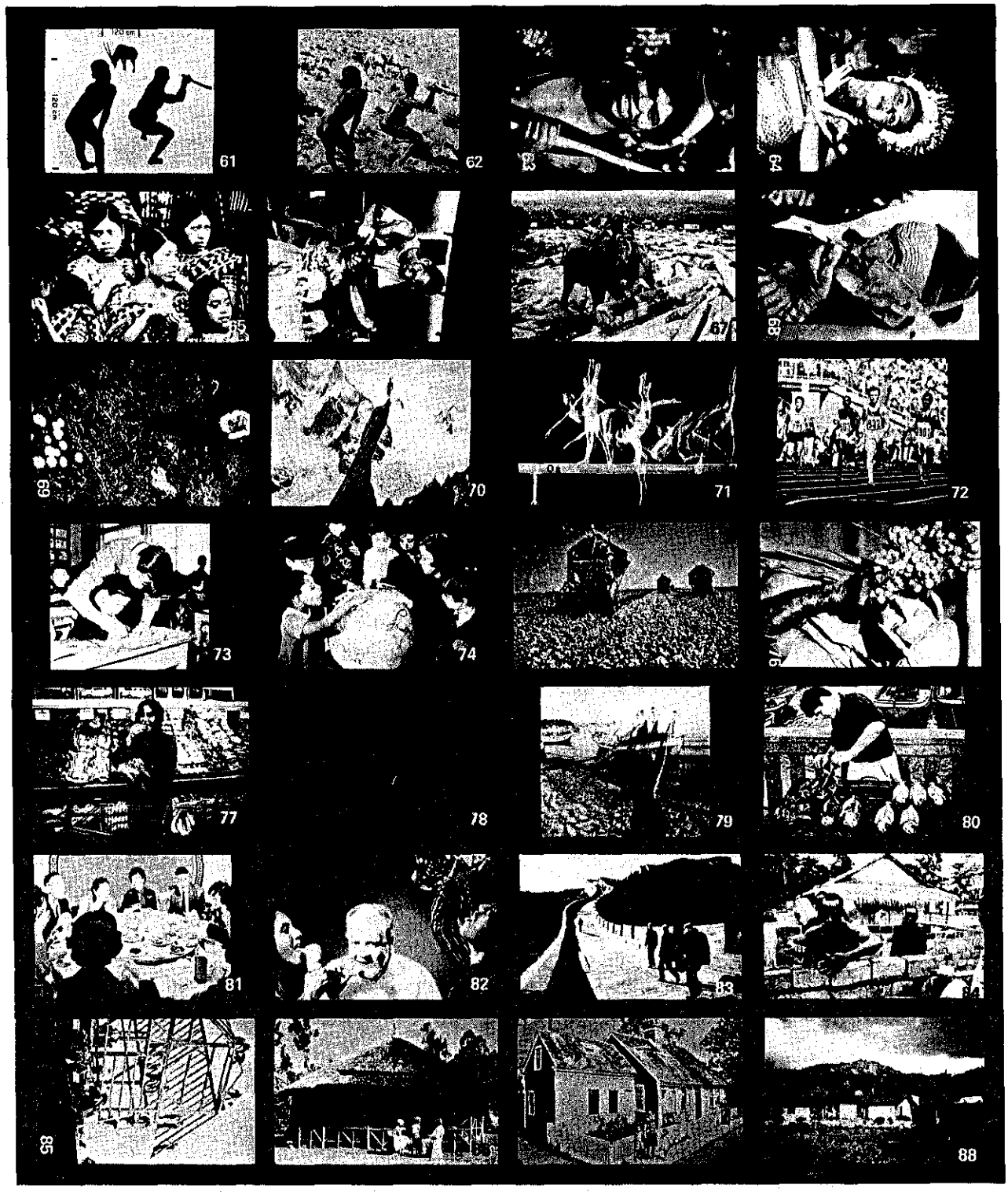
80



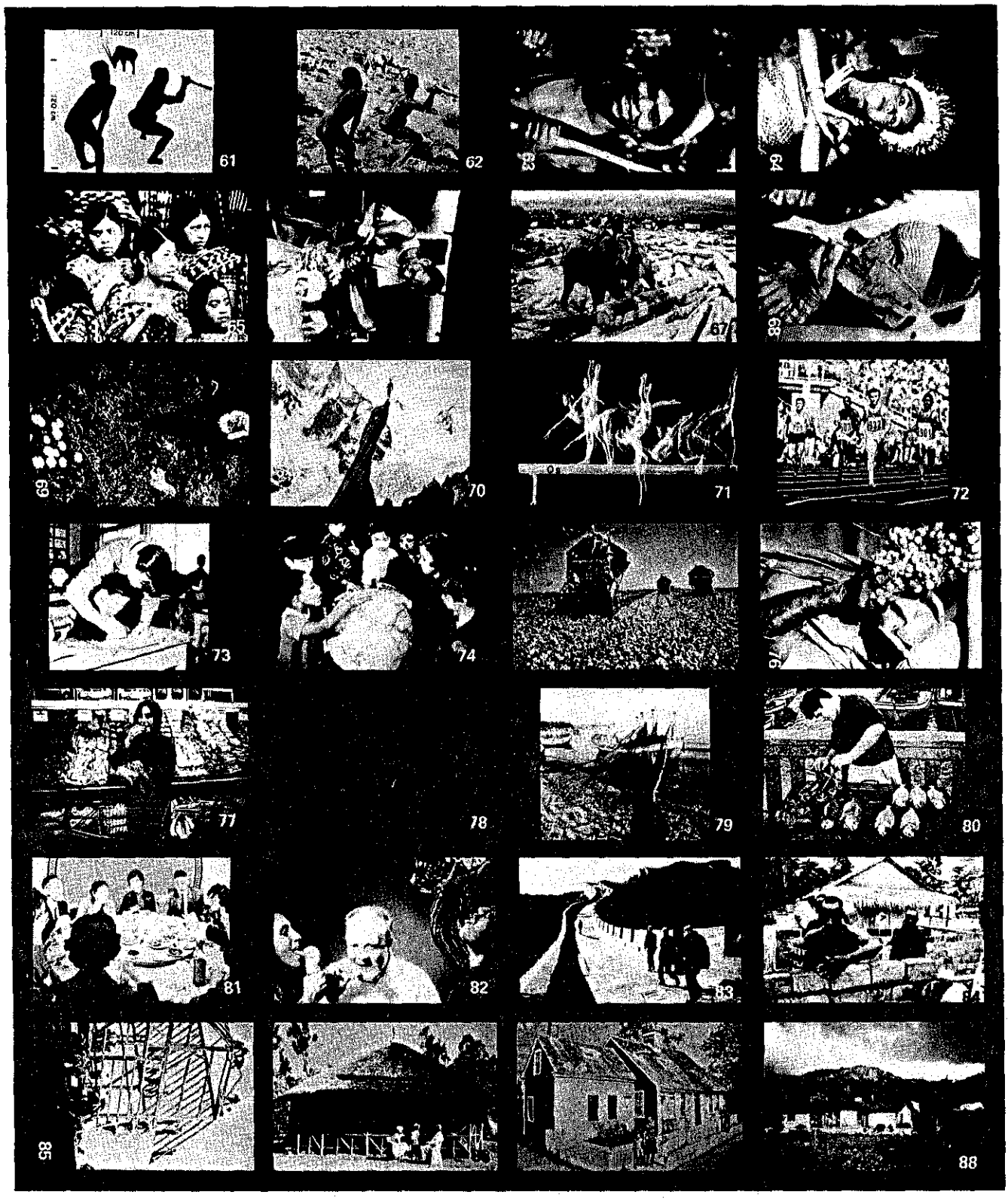
81






61
62
65
67
68
69
70
71
72
73
74
77
78
79
80
81
82
83
85
88




61
62
65
66
67
68
69
70
71
72
73
74
76
77
78
79
80
81
82
83
85
88


61
62
65
67
69
70
71
72
73
74
77
78
79
80
81
82
83
85
88