

PETROLEUM PROVINCES
OF THE
TWENTY-FIRST CENTURY

Edited by
Marlan W. Downey
Jack C. Threet
William A. Morgan

AAPG MEMOIR 74

Published by
The American Association of Petroleum Geologists
Tulsa, Oklahoma, U.S.A.
Printed in the U.S.A.



Table of Contents

DEDICATION AND ACKNOWLEDGMENTS	iv
ABOUT THE EDITORS	v
PREFACE	vi
PETROLEUM RESOURCES OF THE TWENTY-FIRST CENTURY	
CHAPTER 1	
EXPLORATION INTO THE NEW MILLENNIUM	11
<i>Michel T. Halbouty</i>	
CHAPTER 2	
TWENTY-FIRST-CENTURY ENERGY: DECLINE OF FOSSIL FUEL, INCREASE OF RENEWABLE NONPOLLUTING ENERGY SOURCES	21
<i>John D. Edwards</i>	
CHAPTER 3	
DISCOVERIES OF THE 1990S: WERE THEY SIGNIFICANT?	35
<i>Robert Esser</i>	
CHAPTER 4	
OIL: ARE WE RUNNING OUT?	45
<i>David Deming</i>	
CHAPTER 5	
EXPLORATION: TOMORROW'S CHARGE, TOMORROW'S CHALLENGE	57
<i>Peter D. Gaffney</i>	
NORTH AMERICA AND THE UNITED KINGDOM	
CHAPTER 6	
NEW OIL IN OLD PLACES: THE VALUE OF MATURE-FIELD REDEVELOPMENT	63
<i>Robert M. Sneider and John S. Sneider</i>	
CHAPTER 7	
NATURAL-GAS HYDRATES: RESOURCE OF THE TWENTY-FIRST CENTURY?	85
<i>Timothy S. Collett</i>	
CHAPTER 8	
PETROLEUM RESOURCES OF CANADA IN THE TWENTY-FIRST CENTURY	109
<i>Keith Skipper</i>	
CHAPTER 9	
ALASKA: A TWENTY-FIRST-CENTURY PETROLEUM PROVINCE	137
<i>Kenneth J. Bird</i>	
CHAPTER 10	
HYDROCARBON EXPLORATION OPPORTUNITIES IN THE TWENTY-FIRST CENTURY IN THE UNITED KINGDOM	167
<i>J. R. V. Brooks, S. J. Stoker, and T. D. J. Cameron</i>	
CHAPTER 11	
EXPLORATION OPPORTUNITIES IN THE GREATER ROCKY MOUNTAIN REGION, U.S.A.	201
<i>Fred F. Meissner and M. Ray Thomasson</i>	
ASIA	
CHAPTER 12	
FUTURE HYDROCARBON POTENTIAL OF KAZAKHSTAN	243
<i>Igor Effimoff</i>	

CHAPTER 13	
NEW FRONTIERS FOR HYDROCARBON PRODUCTION IN THE TIMAN-PECHORA BASIN, RUSSIA	259
<i>Bret J. Fossom, William J. Schmidt, David A. Jenkins, Vladimir I. Bogatsky, and Boris I. Rappoport</i>	
CHAPTER 14	
FUTURE PETROLEUM PRODUCTION FROM INDONESIA AND PAPUA NEW GUINEA	281
<i>J. V. C. Howes</i>	
CHAPTER 15	
AUSTRALIAN PETROLEUM PROVINCES OF THE TWENTY-FIRST CENTURY	287
<i>Ian M. Longley, Marita T. Bradshaw, and John Heberger</i>	
CHAPTER 16	
GEOLOGIC CHALLENGES OF EXPLORATION: ONSHORE CHINA, WITH SPECIAL FOCUS ON THE TARIM AND JUNGGAR BASINS	319
<i>Barry J. Katz</i>	
CENTRAL AND SOUTH AMERICA	
CHAPTER 17	
THE GULF OF MEXICO BASIN SOUTH OF THE BORDER: THE PETROLEUM PROVINCE OF THE TWENTY-FIRST CENTURY	337
<i>Alfredo E. Guzmán and Benjamín Márquez-Domínguez</i>	
CHAPTER 18	
FUTURE PETROLIFEROUS PROVINCES OF VENEZUELA	353
<i>F. E. Audemard and I. C. Serrano</i>	
CHAPTER 19	
PRESENT AND FUTURE PETROLEUM PROVINCES OF SOUTHERN SOUTH AMERICA	373
<i>Carlos M. Urien</i>	
CHAPTER 20	
FOZ DO AMAZONAS AREA: THE LAST FRONTIER FOR ELEPHANT HYDROCARBON ACCUMULATIONS IN THE SOUTH ATLANTIC REALM	403
<i>M. R. Mello, R. Mosmann, S. R. P. Silva, R. R. Maciel, and F. P. Miranda</i>	
THE MIDDLE EAST AND AFRICA	
CHAPTER 21	
MAJOR HYDROCARBON POTENTIAL IN IRAN	417
<i>Porter L. Versfelt Jr.</i>	
CHAPTER 22	
LIBYA: PETROLEUM POTENTIAL OF THE UNDEREXPLORED BASIN CENTERS— A TWENTY-FIRST-CENTURY CHALLENGE	429
<i>Donald C. Rusk</i>	
CHAPTER 23	
THE PETROLEUM POTENTIAL OF EGYPT	453
<i>John C. Dolson, Mark V. Shann, Sayed Matbouly, Colin Harwood, Rashed Rashed, and Hussein Hammouda</i>	
CHAPTER 24	
PALEOZOIC STRATIGRAPHY AND HYDROCARBON HABITAT OF THE ARABIAN PLATE	483
<i>G. Konert, A. M. Afifi, S. A. Al-Hajri, K. de Groot, A. A. Al Naim, and H. J. Droste</i>	
CHAPTER 25	
LOWER CONGO BASIN, DEEP-WATER EXPLORATION PROVINCE, OFFSHORE WEST AFRICA	517
<i>J. Leite Da Costa, T. W. Schirmer, and B. R. Laws</i>	
CHAPTER 26	
HYDROCARBON EXPLORATION IN THE BERKINE BASIN, GRAND ERG ORIENTAL, ALGERIA	531
<i>Michael D. Cochran and Lee E. Petersen</i>	
INDEX	561



**PETROLEUM RESOURCES
OF THE
TWENTY-FIRST CENTURY**