AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523

BIBLIOGRAPHIC INPUT SHEET

FOR AID USE ONLY
Batch 37

1. SUBJECT CLASSIFICATION

A. PRIMARY: Bibliography — Z-AP00-0000-GG30

B. SECONDARY: Agriculture--Natural resources--Near East

2. TITLE AND SUBTITLE
Desertification,a world bibliography: the Middle East

3. AUTHOR(S)
Paylore,Patricia

4. DOCUMENT DATE: 1976

5. NUMBER OF PAGES: 111p.

6. ARC NUMBER: ARC

7. REFERENCE ORGANIZATION NAME AND ADDRESS
Ariz.

8. SUPPLEMENTARY NOTES *(Sponsoring Organization, Publishers, Availability)*
(Pt.of a world survey,input in sections: PN-AAC-380 through PN-AAC-387,incl.)

9. ABSTRACT

10. CONTROL NUMBER
PN-AAC-382

11. PRICE OF DOCUMENT

12. DESCRIPTORS
Arid land
Desertification
Near East

13. PROJECT NUMBER

14. CONTRACT NUMBER
AID/ta-G-1111 211(d)

15. TYPE OF DOCUMENT

AID 590-1 (4-74)

AID/ta-G-1111 211(d)
PN-AAC-382

DESERTIFICATION :
A World Bibliography
THE MIDDLE EAST

Compiled and Edited by

Patricia Paylore
Assistant Director
Office of Arid Lands Studies
University of Arizona

for

23rd International Geographical Congress, Moscow, 1976
Pre-Conference Meeting of the IGU Working Group on Desertification
Desert Research Institute, Ashkhabad, Turkmen SSR

July 20-26, 1976

University of Arizona
OFFICE OF ARID LANDS STUDIES
Tucson, Arizona 85719, USA

Copyright © 1976
ARIZONA BOARD OF REGENTS
All rights reserved

CONTENTS

		page
Acknowledgments		i
Editor's Preface		ii
Bibliography		
[Regional Introductions precede and Indexes follow each section]		
Worldwide		1
Africa :		45
General	45	
Sahara and Sahelian Region	56	
English Language	59	
French Language	111	
German Language	174	
East Africa and Sudan	192	
Southern Africa	227	
Middle East		273
USSR :		376
Sand Control	378	
Afforestation	381	
Saxaul	384	
Phytoreclamation	386	
Range Improvement	388	
Soils	391	
Wind Action	392	
Environmental Impacts	393	
Desert Development	395	
Bibliographies	397	
Pakistan		398
India		419
China		451
Australia		466
South America :		506
Argentina	509	
Brazil	527	
Chile	535	
Peru	561	
Venezuela	583	
North America		589

ACKNOWLEDGMENTS

As Editor, my greatest obligation in the preparation of this bibliography for publication is to Mrs. Jean Mills, Research Assistant, Office of Arid Lands Studies, who virtually lived for five months in the University of Arizona Libraries verifying information submitted by the several regional contributors, and then barricaded herself in her office while she reconciled a variety of styles to the format of our computer program that stores and retrieves from the data base comprising the Arid Lands Information System (ALIS).

The technical staff — Lynn Lybeck, Systems Analyst, Julie V. Garrettson in charge of terminal operations, and Eleanor Smith who assisted her with data entry — produced the document you hold in your hands, all of them sharing the often tedious work of modifying the computer program where necessary, entering the information on the terminal, reading proof three times, and doing the preliminary preparation of printouts for the photoreduction and photoreproduction that enabled us to compress these hundreds of citations into manageable size. My deepest thanks to all, not least for the interest they took in the project and in the subject as well. I hope each thinks of himself as a minor authority on desertification.

The backup support of the University of Arizona, and particularly that of the Office of Arid Lands Studies, is greatly appreciated. Our Director, Dr. Jack D. Johnson, stabilized the disruptions to the Office, inevitable in a project of this magnitude, by his enthusiastic cooperation. Mary Michael, Information Specialist, and Helen Kassander, Research Assistant, helped us meet our deadline by relinquishing their share of the technical staff's time over a period of months.

I am grateful to my colleague, Dr. Andrew W. Wilson, University of Arizona Department of Geography, Regional Development, and Urban Planning, and Vice-Chairman of the IGU Working Group on Desertification, for his counsel and advice during the year we worked on the bibliography, and to Professor Jack W. Mabbutt, Chairman, Department of Geography, University of New South Wales, Kensington, and Chairman of the IGU Working Group, for his willingness to allow me to go forward on the project in my own way. His keen eye and impeccable judgment sharpened my own approach to the undertaking.

To the collaborators throughout the arid world, as noted elsewhere herein, those recognized authorities on the regions represented by their citation contributions, who responded bravely to all my anguished cables to hurry, hurry, my very best thanks. The bibliography is really theirs, expressing as it does their understanding of particular environments and the impact of desertification thereon.

-Patricia Paylore

Tucson

July 4, 1976

EDITOR'S PREFACE

This bibliography is a selection of largely recent information on worldwide desertification, a greatly expanded listing from that which accompanied a paper on the subject first published by the University of Arizona's Office of Arid Lands Studies in 1973*. It has been compiled and edited for the 23rd International Geographical Congress, Moscow, 1976, more particularly for the Pre-Conference Meeting of the IGU Working Group on Desertification in Ashkhabad, July 1976, since it was under its aegis that the task was undertaken in the summer of 1975.

The Working Group came into being at the IGU's Montreal Congress, 1972, as a successor to the former Commission on the Geography of Arid Lands. Its stated aim was "to collect evidence on the nature and causes of environmental changes constituting an extension of deserts into marginal areas or an intensification of desert conditions within arid regions." Two subsequent field meetings of the Working Group were held: in Alice Springs in the early winter of 1974; and in Cambridge, England, in the early fall of 1975. When the Editor was co-opted to the Working Group, it was agreed that she would depend to a large degree on contributions from various regional collaborators for coverage of specific areas. Those persons are listed here, many of whom are also authors of the brief introductory remarks which precede most sections of the bibliography itself:

Worldwide:	Ronald F. Peel, University of Bristol
Saharan Region and Sahel:	A. T. Grove, Cambridge University (English)
	Monique Mainguet, Reims University (French)
	Horst Mensching, University of Hamburg)
	F. N. Ibrahim, University of Hamburg) (German)
	Wolfgang Meckelein, University of Stuttgart)
East Africa:	Leonard Berry, Clark University, Worcester
Southern Africa:	Peter D. Tyson, University of Witwatersrand
Middle East:	Peter Beaumont, University of Durham
USSR:	Michael Petrov, Leningrad University
Pakistan:	Mushtaqur Rahman, Iowa State University
India:	H. S. Mann, Central Arid Zone Research Institute, Jodhpur
Australia:	J. A. Mabbutt, University of New South Wales
South America:	Hans J. Schneider, University of New South Wales
North America:	Andrew W. Wilson, University of Arizona

Many of the Regional Organizers have been assisted by local correspondents, who are in effect Corresponding Members of the Working Group.

---

* Sherbrooke, W. C. / Paylore, P. (1973) World Desertification: Cause and Effect. A Literature Review and Annotated Bibliography. University of Arizona, Office of Arid Lands Studies, Arid Lands Resource Information Paper 3. 168 p.

The following framework was suggested to the regional contributors early in the project, as a guide to selection of references. While not all items are represented in each gathering, the presence of citations dealing with any of these concepts can be determined from the index for each region.

A. Natural Trends:

1. Climatic changes in the historical period
2. Hydrologic changes
3. Changes in landforms due to the action of water
4. Changes in landforms due to the action of wind
5. Changes in soils
6. Changes in natural vegetation

B. Man's Influence on the Processes of Desertification:

1. Agriculture, dryland or irrigated
2. Pastoralism, rural settlement, and nomadism
3. Forestry, with emphasis on collection of fuel
4. Urbanization
5. Population changes
6. Mining (including oil and gas) and pipeline construction
7. Transportation, including construction of roads, railways, airfields
8. Tourism and recreation

C. Preservational Measures:

1. Studies of status and trend of the environment
2. Regional assessments of natural resources
3. Studies of natural hazards
4. Establishment of natural parks and reserves
5. Other controls of land use

D. Preventive and Remedial Measures:

1. Climate: climatic stress, rainmaking, evaporation suppression, shelterbelts
2. Water supplies: inventories of water resources, water balance or hydrologic cycle, improvement of supplies for drinking, stock or irrigation; water harvesting schemes
3. Erosion control: stabilization of dunes and drift sands, monitoring of processes, measures against water and wind erosion
4. Improvement of desert vegetative cover: surveys of the extent of degradation, range and grazing studies, revegetation of bare areas, pasture improvement, afforestation
5. Control of land use: pastoral, dryland / irrigated agriculture
6. Control of population and settlement: nomads, rural settlement, urban planning, communications
7. Development of alternative resources: regional development, mining, industry tourism, recreation, health care

It was also suggested that we attempt to keep within a timeframe of the past decade. This was done to a large extent, but earlier papers of a classic nature are still included where it is generally agreed that their presentation has not been improved upon.

Because of the massive infusion of bibliographic information, which (even with what, at times, must have appeared to be brutal editorial cuts) still far exceeds the total number of references envisaged when we began, we have had to be arbitrary in the manner in which we have handled some of the information. Where we have departed radically from the format employed to display the greatest percentage of information, such as the USSR, we have appended an explanation following the regional contributor's Introduction. We have included several hundred documents from our own Arid Lands Information System (ALIS) to enhance the coverage submitted by our regional colleagues.

Much work was done at Arizona to bring these hundreds of references into the format required by our computer program. Many references were dropped because of lack of adequate information to identify and locate copies should users so require. For those without the services of skilled documentalists and/or bibliographers to call upon, it has always seemed to us that our meticulous and sometimes fussy insistence on full bibliographical information is the sine qua non of good bibliography. In this respect, while much of the documentation in this bibliography was very difficult indeed, we believe that the smallest percentage humanly possible is included that has not been verified by our staff. We trust, therefore, that because of this care, users will find the full documentation more readily accessible than they would otherwise.

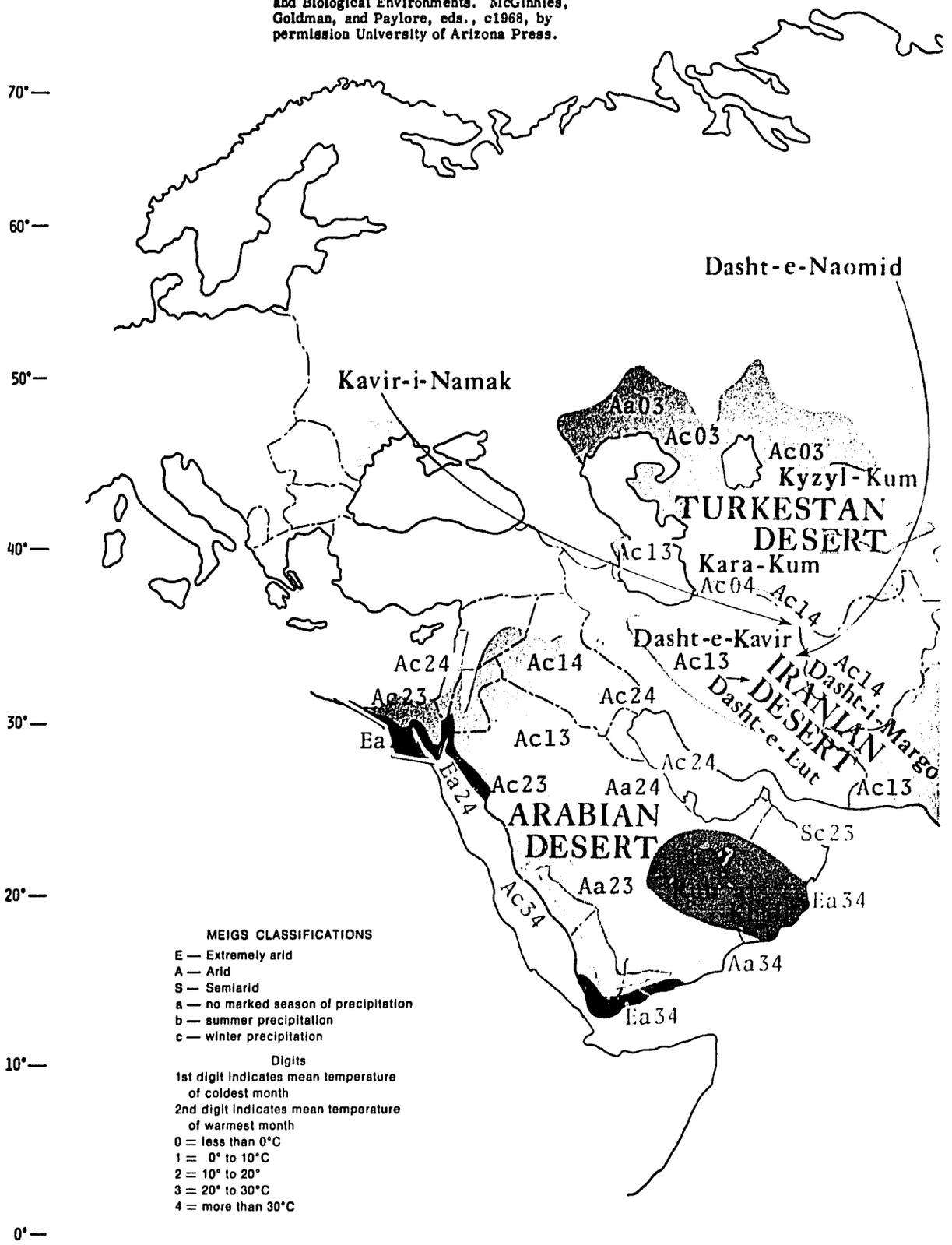
Indexing (except for the USSR) was done from the Thesaurus of Arid Lands Terminology (c1974), developed and used by the Office of Arid Lands Studies for its computerized data bank; and to make the use of the bibliography less cumbersome, subject keywords and authors appear as computerized lists following each section. The documentation from the USSR was sorted out into ten overall categories, and no indexing of individual citations was undertaken.

An effort was made to eliminate all references that did not contribute to an understanding of the phenomenon of desertification itself, rather than to permit the bibliography to become a general arid lands compilation. That we did not always succeed must be attributed not only to our inability to distinguish at times, but also to the disagreements and confusion existing among desert experts as to exactly what constitutes desertification. For those users who miss their favorite citations - their own or others - we ask you to take this constraint into account.

The Editor takes full responsibility for the choice of references carried, and for all shortcomings of coverage or format. I hope the latter will be outweighed by the work's overall usefulness at this critical time in the world's understanding of a biological and physical process that is affecting the lives of millions.

THE MIDDLE EAST

Reprinted from DESERTS OF THE WORLD: An Appraisal of Research into Their Physical and Biological Environments. McGinnies, Goldman, and Paylore, eds., c1968, by permission University of Arizona Press.



Arid Lands of Asia: Western Portion (after Meigs)

Peter Beaumont*
Department of Geography
University of Durham
Durham, DH1 3LE
England

THE MIDDLE EAST

The arid zones of southwest Asia can be divided broadly into two distinct types. The northern basins, of varying sizes and ringed by wetter upland areas, produce considerable environmental variation. In contrast, further south in Arabia, conditions of extreme aridity prevail almost everywhere, irrespective of topography.

The diverse environments of the northern regions are undoubtedly one of the factors accounting for the long history of human habitation. At Jericho, a settlement was first established about 10,000 years ago, and its occupation has been almost continuous ever since. This long history of human settlement, characteristic of southwest Asia, has played an important role in the desertification of the region. As empires have waxed and waned there have been a series of pulses of activity when pressures on the environment have been particularly severe.

One of the greatest needs of the hydraulic civilizations of the Nile valley and the Tigris-Euphrates lowlands has been for timber, as few trees grow naturally in these extremely arid environments. As a consequence, the limited forest resources of the Middle East, continuously exploited over the centuries, are now only a fraction of what they formerly were. Associated with deforestation has been soil erosion on a massive scale, which in parts of southern Turkey and the Levant has completely removed the topsoil from large areas. The grazing of sheep and goats has also hindered natural regeneration of the forest vegetation. Elsewhere throughout the region the cultivation of cereals, which leaves the ground devoid of vegetation cover during the winter rainy season, has greatly contributed to soil erosion.

During the twentieth century the population of the region has increased at least threefold to a current figure of over 120 million people, placing even greater strains on an environment which was in places already severely degraded. In many regions cultivation has spread into marginal areas unsuited for such activity, and as a consequence soil erosion has been accelerated.

The available literature on desertification in the Middle East is surprisingly limited. Many papers mention the problem while dealing with other topics, but in-depth studies of desertification are rare. Part of the problem is that environmental degradation has been occurring for such a long period that it is often impossible to distinguish natural trends from man-induced changes.

Conservation measures attempting to combat soil erosion and regenerate the vegetative cover have been undertaken in a number of countries in the region. Unfortunately, the results of such work do not often appear in the scientific literature, but instead are confined to limited circulation reports of international agencies and governments.

---

*Dr. Beaumont wishes to acknowledge the very great help provided by the publication GEO ABSTRACTS, as well as the assistance of Professor J. Dresch and Dr. D. J. Burdon, in supplying citations for this section on the Middle East.

1

ABERBACH, S.H./SELLINGER, A.

1967

REVIEW OF ARTIFICIAL GROUNDWATER RECHARGE IN THE COASTAL PLAIN OF ISRAEL.

INTERNATIONAL ASSOCIATION OF SCIENTIFIC HYDROLOGY, BULLETIN 12(1):65-77. SWRA(1)R203132 67A.

HYDROLOGICAL ASPECTS OF RECHARGE OPERATIONS ON THE COASTAL PLAIN AQUIFER OF ISRAEL FROM 1959 ON ARE REPORTED, AND METHODS, PROBLEMS, AND SOLUTIONS INVOLVED IN THIS OPERATION ARE DISCUSSED. ALLOWED WITHDRAWAL IS ESTIMATED AT 200 MILLION CU. M. ANNUALLY. DURING THE LAST DECADE 426 MILLION CU. M. PER YEAR HAVE BEEN WITHDRAWN CAUSING SEA WATER INTRUSION TO ENDANGER WATER SUPPLY WELLS IN TEL AVIV AND EMEK HEFER. AS A COUNTER MEASURE RECHARGE WAS PRACTICED, THE WATER COMING FROM CRETACEOUS LIMESTONE AQUIFERS. IN TEL AVIV A FRESH WATER BARRIER WAS ESTABLISHED BY INJECTING LAKE WATER INTO WELLS DURING WINTER. EXISTING PUMPING WELLS WERE USED FOR RECHARGE OPERATIONS. SPECIFIC RATE OF RECHARGE WAS ABOUT TWO THIRDS THE SPECIFIC CAPACITY DURING PUMPING.

SALINE WATER-FRESHWATER INTERFACES/SALINE WATER INTRUSION/ GROUNDWATER RECHARGE/AQUIFERS/RECHARGE WELLS/DRAWDOWN/WATER YIELD IMPROVEMENT/GROUNDWATER MINING/PUMPING/WELLS/COASTAL PLAINS/WATER SUPPLY/BARRIERS/ISRAEL/OALS

2

ABOU ZEID, A.M.

1967

SEDENTARIZATION AND LAND PROBLEMS. IN M.R. EL-GHONEMY, ED., LAND POLICY IN THE NEAR EAST, P. 53-65.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, ROME. WAERSA (10)810.

SEDENTARIZATION IS SOMETIMES REGARDED AS A PURELY TECHNICAL OPERATION WHICH ENVISAGES SETTLING CERTAIN GROUPS OF PEOPLE IN CERTAIN AREAS OF LAND WHERE THEY CAN TAKE TO AGRICULTURAL AND OTHER RURAL ACTIVITIES. BUT HOWEVER IMPORTANT THIS SIDE OF THE PROBLEM MAY BE, SEDENTARIZATION IS ESSENTIALLY A COMPLICATED SOCIAL PROCESS WHICH LEADS IN THE END TO THE EMERGENCE OF A NEW SOCIETY WITH NEW INSTITUTIONS, NEW VALUES AND NEW PATTERNS OF BEHAVIOR. MAJOR SOCIAL DIFFICULTIES ARISE BECAUSE MOST DESERT INHABITANTS REGARD NOMADIC LIVESTOCK REARING AS THE MOST HONOURABLE JOB A MAN CAN PRACTICE, AND LIVESTOCK AS THE MAJOR ITEM OF WEALTH. NOMADS ARE NOT READY TO SACRIFICE THIS FOR AGRICULTURE, AND FOR MANY NOMADIC GROUPS AGRICULTURE IS A NEW ACTIVITY OF WHICH THEY HAVE LITTLE EXPERIENCE. IF THE NOMADS SHOW MUCH RESISTANCE TO SEDENTARIZATION, IT IS NOT MERELY BECAUSE THEY ARE CONSERVATIVE AND UNWILLING TO ACCEPT CHANGES, BUT ALSO BECAUSE OF THE LOSSES WHICH THEY THINK, RIGHTLY OR WRONGLY, THAT THEY WILL SUFFER, ESPECIALLY WITH REGARD TO LAND. BUT WHATEVER THE POLICY ADOPTED BY THE DIFFERENT GOVERNMENTS, THE PRIMARY OBJECTIVE AGAINST WHICH SUCCESS SHOULD BE MEASURED MUST SURELY BE THE NARROWING OF THE ECONOMIC, SOCIAL AND CULTURAL GAP BETWEEN THE NOMADIC AND THE SEMINOMADIC INHABITANTS OF THE DESERT AND THE REST OF THE POPULATION IN EACH COUNTRY.

OALS/SETTLEMENTS/NOMADS/SOCIAL ASPECTS/HUMAN BEHAVIOR/LAND RESOURCES/ POLITICAL ASPECTS/LIVESTOCK/MIDDLE EAST/ECONOMIC DEVELOPMENT

3

ADAMS, R.M.

1958

SURVEY OF ANCIENT WATER COURSES AND SETTLEMENTS IN CENTRAL IRAQ.

SUMER 14:101-103.

IRAQ/WATER SOURCES/SETTLEMENTS/HISTORY

4

ADAMS, R.M.

1962

AGRICULTURE AND URBAN LIFE IN EARLY SOUTH-WESTERN IRAN.

SCIENCE 136:109-122.

IRAN/AGRICULTURE/URBAN AREAS/HISTORY/SOCIAL ORGANIZATION

5

ADAMS, R.M.

1965

LAND BEHIND BAGHDAD.

UNIVERSITY OF CHICAGO PRESS, CHICAGO. 187 P.

BAGHDAD/IRAQ/ARABIAN DESERT

6

AELION, E.

1958

A REPORT ON WEATHER TYPES CAUSING MARKED STORMS IN ISRAEL DURING THE COLD SEASON.

ISRAEL METEOROLOGICAL SERVICE, SER. C, MISCELLANEOUS PAPERS 10. 7 P.

ISRAEL/METEOROLOGY/STORMS/WEATHER DATA/WINTER STORMS

7

AGHASSY, J.

1973

MAN-INDUCED BADLANDS TOPOGRAPHY. IN D.R. COATES, ED., ENVIRONMENTAL GEOMORPHOLOGY AND LANDSCAPE CONSERVATION. 3: NON-URBAN REGIONS, P. 124-136.

DOWDEN, HUTCHINSON AND ROSS, LONDON/WILEY, N.Y. GA 71A-1165.

THIS PAPER DESCRIBES THE MAN-INDUCED EVOLUTION OF BADLAND TOPOGRAPHY IN A SEMIARID ENVIRONMENT. TWO SITUATIONS ARE CONSIDERED: ONE RESULTING FROM BEDOUIN PLOUGHING TECHNIQUES IN THE SOUTHERN COASTAL PLAIN OF ISRAEL DURING THE FIRST HALF OF THIS CENTURY, AND THE SECOND FOLLOWING THE CONSTRUCTION OF A NARROW-GAUGE RAILROAD WITHIN THE SAME AREA. IN BOTH INSTANCES, RILL EROSION ACTIVATED THE DEVELOPMENT OF FINE-TEXTURED DRAINAGE SYSTEMS WHICH DISSECTED BELTS OF LAND ADJACENT TO MAJOR WADI COURSES IN LOESS AND LOESS-LIKE SOILS, LEADING TO TYPICAL BADLANDS DEVELOPMENT.

BADLANDS/TOPOGRAPHY/GEOMORPHOLOGY/COASTAL PLAINS/ISRAEL/EROSION/NOMADS/CULTIVATION/WADIS/LAND USE/DRAINAGE PATTERNS

8

AKALAN, I.

1965

RUZGAR EROZYONU VE KORUNMA CARELERI (WIND EROSION AND ITS CONTROL).

ANKARA UNIVERSITESI ZIRAAT FAKULTESI YILLIGI 15(4):174-213.

A GENERAL OUTLINE OF WIND EROSION, ITS CAUSES AND CONTROL METHODS ARE SUMMARIZED AND WIND EROSION IN CENTRAL ANATOLIA IS DISCUSSED.

TURKEY/WIND EROSION/EROSION CONTROL

9

AKALAN, I.

1967

TOPRAK FIZIKSEL OZELLIKLERI VE EROZYON (SOIL PHYSICAL PROPERTIES AND EROSION).

ANKARA UNIVERSITESI, ZIRAAT FAKULTESI YILLIGI 17(3-4):490-503. GA 71B-0885.

EROSION RATIOS OF SOILS TAKEN FROM ANKARA AND SURROUNDINGS WERE DETERMINED BY MEANS OF MODIFIED MIDDLETON FORMULA. DATA WERE COMPARED WITH THE SOIL LOSSES MEASURED FROM UNDISTURBED SOIL SAMPLES UNDER ARTIFICIAL RAINFALL AT THE LABORATORY. IT IS CONCLUDED THAT THE ERODIBILITY OF THE SOILS OF ANKARA AND ITS VICINITY CAN BE CALCULATED AND COMPARED WITH EACH OTHER BY USING MODIFIED EROSION RATIO FORMULA.

TURKEY/SOIL PHYSICAL PROPERTIES/SOIL EROSION/EROSION

10

ALLAN, W.

1972

ECOLOGY, TECHNIQUES AND SETTLEMENT PATTERNS. IN P.J. UCKO, R. TRINGHAM, AND G.W. DIMBLEBY, EDS., MAN, SETTLEMENT AND URBANISM, P. 211-226.

DUCKWORTH, LONDON.

ECOLOGY/AGRICULTURE/SETTLEMENTS/HISTORY/MIDDLE EAST/DENSITY/POPULATIONS/TURKEY/URBAN AREAS

11

ALPEROVITCH, N./DAN, J.

1972

SODIUM-AFFECTED SOILS IN THE JORDAN VALLEY.

GEODERMA 8(1):37-57. GA 73A-0361.

SEVERAL KINDS OF SODIUM-AFFECTED SOILS, MAINLY SOLONETZIC GRUMUSOLS ARE EXTENSIVE IN THE JORDAN VALLEY. FOR MOST, SALINITY AND HIGH LEVELS OF EXCHANGEABLE SODIUM ARE DUE TO HIGH WATER TABLES. HOWEVER, SOME OLDER SOILS ARE BELIEVED TO HAVE BEEN SUBJECT TO PROLONGED DEPOSITION OF AIRBORNE SALTS. IN THE SOUTHERN PART OF THE VALLEY MOST OF THE SOILS ARE HIGHLY SALINE AND THE LOW RAINFALL PRECLUDES NATURAL LEACHING. MAJOR CHARACTERISTICS OF THE SOILS ARE RELATED TO HIGH SALINITY AND HIGH LEVELS OF EXCHANGEABLE SODIUM. TYPICAL SOLONETZ PROFILES ARE RESTRICTED TO SOILS WITH MODERATELY LOW CLAY CONTENT. AT HIGHER CLAY CONTENTS SOIL TURBATION PROCESSES MAY PRECLUDE FORMATION OF A TEXTURAL B-HORIZON. (AFTER AUTHOR)

JORDAN VALLEY/SOIL TYPES/SOLONETZ/SALINITY/GROUNDWATER/WATER TABLE/SALINE SOILS/SODIUM-AFFECTED SOILS

12

AMIRAN, D.H.K.

1965

ARID ZONE DEVELOPMENT: A REAPPRAISAL UNDER MODERN TECHNOLOGICAL CONDITIONS.

ECONOMIC GEOGRAPHY 41(3):189-210.

ARID LANDS/LAND USE/LAND MANAGEMENT/ISRAEL

13

AMIRAN, D.H.K./GILEAD, M.

1954

EARLY EXCESSIVE RAINFALL AND SOIL EROSION IN ISRAEL.

ISRAEL EXPLORATION JOURNAL 4:286-295.

ISRAEL/EROSION/RAINFALL INTENSITY/PRECIPITATION(ATMOSPHERIC)/WEATHER PATTERNS/SOIL EROSION

14

ARAD, A.

1966

HYDROCHEMISTRY OF GROUND-WATER IN CENTRAL ISRAEL.

INTERNATIONAL ASSOCIATION OF HYDROLOGIC SCIENCES, BULLETIN 11:122-146.

ISRAEL/GROUNDWATER/HYDROLOGY/WATER CHEMISTRY

15

ARAD, A./MICHAELI, A.

1967

HYDROLOGICAL INVESTIGATIONS IN THE WESTERN CATCHMENT OF THE DEAD SEA.

ISRAEL JOURNAL OF EARTH SCIENCES 16:131-136.

DEAD SEA/ISRAEL/HYDROLOGY

16

ATALAY, I.

1972

DEVREZ CAYI HAVZASINDA TOPRAK EROZYONU PROBLEMLERI (SOIL EROSION PROBLEMS IN THE DEVRES CAYI BASIN, TURKEY).

JEOMORFOLOJI DERGISI 4:105-120. GA 74A-0683.

THE ILGAZ MOUNTAINS (2000 M) ARE TO THE SOUTH OF THE STUDY AREA OF 42,943 HA. THE FACTORS CAUSING SOIL EROSION IN THE AREA ARE THE DESTRUCTION OF NATURAL VEGETATION, HEAVY GRAZING, MIS-USE OF THE LAND. THE SOIL TYPES, TOPOGRAPHY AND GEOLOGICAL FACTORS ARE ALSO IMPORTANT. GULLY EROSION IN THE NEOGENE CLASTICS SHOW THE IMPORTANCE OF GEOLOGY. SHEET EROSION IS ACTIVE IN ABOUT 41 PERCENT OF THE AREA AND GULLY EROSION IN NEARLY 10 PERCENT.

DEGENERATION/TURKEY/SOIL EROSION/LAND USE/SHEET EROSION/OVERGRAZING/GEOLOGY/ TOPOGRAPHY/GULLY EROSION

17

ATKINSON, K./BEAUMONT, P.

1967

WATERSHED MANAGEMENT IN NORTHERN JORDAN.

WORLD CROPS 19:62-65.

JORDAN/WATERSHED MANAGEMENT

18

ATKINSON, K./BEAUMONT, P.

1971

THE FORESTS OF JORDAN.

ECONOMIC BOTANY 25(3):305-311. SWRA W72-06723.

THE CEDAR STANDS OF LEBANON ARE, HISTORICALLY, THE MOST FAMOUS OF THE FORESTED AREAS OF THE LEVANT, BUT OTHER FORESTED AREAS OF THE REGION, THOUGH LESS FAMOUS, STILL REMAIN OF VITAL IMPORTANCE. DISCONTINUOUS AREAS OF NATURAL FOREST ARE LOCATED IN THE CATCHMENTS OF THE WADIS FLOWING INTO THE MAIN RIFT VALLEY OF THE RIVER JORDAN. THE FORESTS OF THE NORTHERN HIGHLANDS ARE OF A GREATER EXTENT THAN THOSE OF THE SOUTHERN HIGHLANDS. IN THE NORTH THE CRITICAL LIMIT FOR TREE GROWTH APPROXIMATES THE 400 MILLIMETER MEAN ANNUAL ISOHYET. THE SOUTHERN FOREST OCCURS UNDER CONDITIONS OF CONSIDERABLY LOWER RAINFALL AND GREATER MARGINALITY. FIVE ASSOCIATIONS OF TREES MAY BE DISTINGUISHED IN THE NORTHERN FOREST AND 2 ASSOCIATIONS IN THE SOUTH. IN BOTH THE NORTH AND SOUTH THE FORESTS HAVE CONTRACTED GREATLY FROM WHAT WERE MUCH VASTER WOODED AREAS AND CONSIDERABLE AREAS OF THE PRESENT-DAY FORESTED REGIONS ARE TREELESS AND DEGRADED. GOAT OVERGRAZING HAS BEEN CUMULATIVE AND IS PROBABLY ONE OF THE MAJOR REASONS FOR THE DECLINE OF THE FORESTS. CULTIVATION OF VINES, WHEAT AND OLIVES HAS REMOVED THE CONTINUOUS CANOPY AND EXPOSED LARGE AREAS TO SOIL DEGRADATION TO THE POINT THAT THE FOREST CANNOT EVER BE REFURBISHED. FOREST ECOSYSTEMS IN SUCH ARID AREAS ARE BRITTLE AND EASILY DISRUPTED. OTHER REASONS FOR THEIR DECLINE INCLUDE INDISCRIMINATE LOGGING, THE BARKING OF OAK ROOTS FOR TANNIN, WOOD COLLECTION FOR FUEL AND POSSIBLE GREATER CLIMATIC ARIDITY. (OALS)

OALS/FORESTS/SEMIARID CLIMATE/BROWSE/SOIL EROSION/ PRECIPITATION(ATMOSPHERIC)/TREES/MOUNTAINS/NATURAL RESOURCES/LAND USE/ ECOSYSTEMS/MIDDLE EAST/JORDAN/GRAZING/PERTURBATION/LOGGING(TIMBER)

19

AVNIMELECH, M.

1952

LATER QUATERNARY SEDIMENTS OF THE COASTAL PLAIN OF ISRAEL.

RESEARCH COUNCIL OF ISRAEL, BULLETIN 2:51-57.

ISRAEL/QUATERNARY PERIOD/SEDIMENTS/COASTAL PLAINS

20

AWAD, M.

1959

SETTLEMENT OF NOMADIC AND SEMI-NOMADIC TRIBAL GROUPS IN THE MIDDLE EAST.

INTERNATIONAL LABOUR REVIEW 79:25-56.

MIDDLE EAST/NOMADS/SETTLEMENTS/AGRICULTURE/SOCIAL ORGANIZATION/EGYPT/SUDAN/IRAQ/SYRIA/SAUDI ARABIA

21

AYAZI, M.

1961

DRAINAGE AND RECLAMATION PROBLEMS IN THE GARMSAR AREA.

UNESCO, PARIS. ARID ZONE RESEARCH 14:285-290.

IRAN/GARMSAR/DRAINAGE/RECLAMATION/SOIL ANALYSIS/QANATS

22

BAKER, C.W.

1954

REPORT ON PASTURE IMPROVEMENT AND LAND RECLAMATION IN EASTERN SAUDI ARABIA.

DHAHRAN. 18 P. (MIMEO)

ARABIAN PENINSULA/PASTURES/SAUDI ARABIA/LAND RECLAMATION

23

BALY, D.

1957

THE GEOGRAPHY OF THE BIBLE: A STUDY IN HISTORICAL GEOGRAPHY.

LUTTERWORTH, LONDON. 303 P.

MIDDLE EAST/GEOGRAPHY/PALESTINE/JORDAN/ISRAEL/HISTORY/ARCHAEOLOGY

24

BEALS, E.W.

1965

THE REMNANT CEDAR FORESTS OF LEBANON.

JOURNAL OF ECOLOGY 53(3):679-694. GA 67B-299.

CEDAR FORESTS OF CEDRUS LIBANI FORMERLY PROBABLY COVERED LARGE AREAS IN THE MOUNTAINS OF THE LEVANT AND WERE AN IMPORTANT TIMBER RESOURCE FOR EARLY CIVILIZATIONS. MOST REMAINING STANDS WERE DESTROYED FOR RAILWAY FUEL DURING THE 1914-1918 WAR. THE SURVIVAL OF THE PRESENT REMNANTS IS DUE TO THEIR INACCESSIBILITY AND LOCAL SANCTITY. FIVE PURE AND MIXED TRACTS ARE DESCRIBED FROM THE LEBANON RANGE, TOTALLING ABOUT 340 HA OF CLOSED FOREST. OTHER SMALL, DEGRADED REMNANTS EXIST IN LEBANON, TOGETHER WITH STANDS IN N.W. SYRIA AND E. TURKEY.

LEBANON/FORESTS/TIMBER/CLIMAX/SUCCESSION/RELICT VEGETATION/OVERSTORY/ DEGRADATION(DECOMPOSITION)

25

BEAUMONT, P.

1968

QANATS ON THE VARAMIN PLAIN, IRAN.

INSTITUTE OF BRITISH GEOGRAPHERS, TRANSACTIONS 45:169-179. GA 69C-341.

GROUNDWATER IS OBTAINED IN THE VARAMIN PLAIN REGION OF IRAN FROM A COMPLEX SYSTEM OF UNDERGROUND WATER PASSAGES KNOWN AS QANATS. MORE THAN 250 QANATS ON THE PLAIN SUPPLYING IRRIGATION WATER TO VILLAGES, AND AS PART OF THE TRADITIONAL PATTERN OF WATER CONSUMPTION FOR IRRIGATION PURPOSES, QANATS APPEAR TO HAVE SUPPLIED BETWEEN 20 AND 40 PERCENT OF THE TOTAL WATER NEEDS. IN RECENT YEARS THE INTRODUCTION OF THE PUMPED WELL HAS CAUSED THE WATER TABLE TO DROP MARKEDLY IN MANY AREAS AND, AS A RESULT, MORE QANATS ARE DRYING UP AND THE YIELDS OF OTHERS ARE BEING STEADILY REDUCED. AT PRESENT IT APPEARS THAT THE RATE OF GROUNDWATER EXTRACTION IS CONSIDERABLY IN EXCESS OF GROUNDWATER REPLENISHMENT. IF THIS CONTINUES, THE QANATS WILL EVENTUALLY RUN DRY, AND A MODERN SYSTEM OF WATER USE WILL REPLACE TRADITIONS. STEPS ARE BEING TAKEN BY THE IRANIAN GOVERNMENT TO ENSURE A MORE RATIONAL APPROACH TO GROUNDWATER UTILIZATION.

QANATS/WATER CONVEYANCE/IRRIGATION/WATER MANAGEMENT/PUMPING/WATER UTILIZATION/ GROUNDWATER BASINS/WATER TABLE/RECHARGE/WITHDRAWAL/IRAN/GROUNDWATER MINING/ WATER SUPPLY

26

BEAUMONT, P.

1971

QANAT SYSTEMS IN IRAN.

INTERNATIONAL ASSOCIATION OF SCIENTIFIC HYDROLOGY, BULLETIN 16:39-50.

IRAN/QANATS/GROUNDWATER

27

BEAUMONT, P.

1972

ALLUVIAL FANS ALONG THE FOOTHILLS OF THE ELBURZ MOUNTAINS, IRAN.

PALAEOGEOGRAPHY, PALAEOCLIMATOLOGY, PALAEOECOLOGY 12:251-273.

IN THIS WORK, 26 ALLUVIAL FANS SITUATED TO THE SOUTHEAST OF TEHRAN ARE EXAMINED. THE FAN OF THE RIVER JAJ IS EXTREMELY LARGE AND COVERS, WITH ITS DRAINAGE BASIN, AN AREA OF MORE THAN 2,500 SQUARE KILOMETERS. THE OTHER 25 FANS AND THEIR RELATED DRAINAGE BASIN SYSTEMS COMPRISE ALL TOGETHER AN AREA OF ONLY 130 SQUARE KILOMETERS. THE FAN AND DRAINAGE BASIN SYSTEMS SHOW A DIRECT RELATIONSHIP BETWEEN THE FAN AREA AND THE DRAINAGE BASIN AREA AND AN INVERSE RELATIONSHIP BETWEEN FAN AREA AND THE MEAN SLOPE OF THE FAN. HYDROMETEOROLOGICAL STUDIES SUGGEST THAT THE SEVEREST STORMS UNDER PRESENT ENVIRONMENTAL CONDITIONS ARE POSSIBLY CAPABLE OF MOVING MANY OF THE LARGER STONES OBSERVED ON ONE OF THE SMALLER FANS. THE POORLY SORTED SEDIMENTS COMPOSING THE FANS SUGGEST, HOWEVER, THAT DEPOSITION OCCURRED UNDER DEBRIS-FLOW CONDITIONS. FANHEAD TRENCHING, OCCURRENCE OF DESERT VARNISH ON STONES OVER LARGE AREAS OF THE FANS, AND GULLY EROSION OF THE LOWER PORTIONS OF THE FANS INDICATE THAT ALLUVIATION IS NOT OF GREAT IMPORTANCE AT THE PRESENT DAY. ARCHAEOLOGICAL EVIDENCE ALSO SUGGESTS THAT SEDIMENT DEPOSITION ON THE FANS HAS BEEN OF ONLY MINOR IMPORTANCE DURING THE LAST 750 YEARS. OPTIMUM CONDITIONS FOR FAN FORMATION ARE BELIEVED TO HAVE OCCURRED DURING THE GLACIAL PERIODS OF THE QUATERNARY ERA. (AUTHOR)

KWIC IR 5/OALS/IRAN/GEOMORPHOLOGY/PALEOCLIMATOLOGY/PALEOGEOGRAPHY/PALEONTOLOGY/ALLUVIAL FANS/DEPOSITION(SEDIMENTS)/AGGRADATION/ARCHAEOLOGY/DRAINAGE PATTERNS/DESERT PAVEMENT

28

BEAUMONT, P.

1973

RIVER REGIMES IN IRAN.

UNIVERSITY OF DURHAM, DEPARTMENT OF GEOGRAPHY, OCCASIONAL PUBLICATIONS, N.S. 1. 29 P. GA 74B-1537.

THE DRAINAGE SYSTEMS OF IRAN CAN BE DIVIDED INTO CASPIAN SEA DRAINAGE, PERSIAN GULF DRAINAGE AND DRAINAGE INTO THE CENTRAL PART OF THE COUNTRY. THE FIRST AND LAST REGIONS ARE AREAS OF INTERIOR DRAINAGE. WINTER IS THE RAINY SEASON IN IRAN, DURING WHICH PERIOD AT LEAST TWO-THIRDS OF THE COUNTRY RECEIVES MORE THAN HALF ITS ANNUAL PRECIPITATION TOTAL. THE REGIME HYDROGRAPHS OF 45 RIVERS REVEAL MARKED SIMILARITIES, WITH PEAK DISCHARGES OCCURRING MAINLY IN THE PERIOD ESFAND THROUGH ORDIBEHESHT (MARCH THROUGH MAY), OWING LARGELY TO THE EFFECT OF SNOWMELT. ANALYSIS OF THE RIVER REGIMES REVEALS BROAD HYDROGRAPHIC REGIONS WHICH DIFFER FROM THE THREE MAJOR GROUPINGS BASED ON DIRECTION OF DRAINAGE. THE LARGEST RUNOFF VALUES PER UNIT AREA ARE FOUND TO OCCUR IN THE NORTHERN AND CENTRAL PARTS OF THE ZAGROS MOUNTAINS, AND IN THE ELBURZ MOUNTAINS. THE LOWEST RUNOFF VALUES ARE FOUND IN A BELT AROUND THE DESERT REGIONS OF CENTRAL IRAN. (AUTHOR)

IRAN/RIVERS/CASPIAN SEA/PERSIAN GULF/DRAINAGE/WINTER PRECIPITATION/SNOWMELT/ DISCHARGE(WATER)/HYDROGRAPHY/RUNOFF/MOUNTAINS/IRANIAN DESERT

29

BEAUMONT, P.

1974

WATER RESOURCE DEVELOPMENT IN IRAN.

GEOGRAPHICAL JOURNAL 140(3):418-431.

WATER SURPLUSES EXIST IN SMALL AREAS OF NORTHERN AND WESTERN IRAN. TRADITIONAL IRRIGATION SYSTEMS HAVE BEEN USED FOR AGRICULTURAL PRODUCTION UNTIL RECENTLY. QANATS, SLOPING TUNNELS FOR EXTRACTING GROUNDWATER, ARE COMMON. FOUR DEVELOPMENT PLANS HAVE BEEN CARRIED OUT SINCE WORLD WAR II. EARLY PLANS EMPHASIZED WATER FOR AGRICULTURAL USE AND CURRENT PLANS FOCUS ON PROVISION OF WATER SUPPLIES TO MEET INCREASING INDUSTRIAL AND DOMESTIC DEMANDS.

OALS/AID/IRAN/IRRIGATION PROGRAMS/SURFACE WATERS/GROUNDWATER/QANATS/ WATER CONVEYANCE/AGRICULTURE/WATER RESOURCES DEVELOPMENT/URBAN AREAS/ WATER CONSUMPTION(EXCEPT CONSUMPTIVE USE)/COMPETING USES/WATER ALLOCATION(POLICY)/WATER UTILIZATION

30

BEAUMONT, P./ATKINSON, K.

1969

SOIL EROSION AND CONSERVATION IN NORTHERN JORDAN.

JOURNAL OF SOIL AND WATER CONSERVATION 24(4):144-147.

HUMAN POPULATION AND PRESSURES ON LAND IN THE WADI ZIQLAB HAVE INTENSIFIED SOIL EROSION. DELETERIOUS LAND USE PRACTICES, SUCH AS THE MONOCULTURE OF CEREALS AND OVERSTOCKING OF PASTURES WITH SHEEP AND GOATS MUST BE REFORMED. MEASUREMENT OF RAINFALL INTENSITIES IS MORE SIGNIFICANT THAN ANNUAL PRECIPITATION TOTALS AS THE SERIOUS SOIL EROSION OCCURS ON AN AVERAGE OF LESS THAN 15 DAYS EACH YEAR. THE AMOUNT OF EROSION THAT ACTUALLY OCCURS IN THIS SHORT PERIOD IS COMPLETELY CUT OF PROPORTION WITH THE TIME ELEMENT AND MUST BE CONSIDERED IN PLANNING ADEQUATE CONSERVATION MEASURE. RECENT CONSERVATION PRACTICES REDUCED THE RATE OF SOIL REMOVAL BY INTRODUCING PHYSICAL BARRIERS TO DOWNSLOPE SOIL MOVEMENT. IT IS HOPED THAT THESE CONSERVATION MEASURES WILL BE EXTENDED TO IMPROVED AGRICULTURAL PRACTICES.

OALS/SOIL EROSION/SOIL CONSERVATION/JORDAN/HUMAN BEHAVIOR/SETTLEMENTS/ LAND MANAGEMENT/EROSION CONTROL/LAND USE/AGRICULTURE/GRAZING/RAINFALL INTENSITY/DESERTIFICATION/RAINFALL-RUNOFF RELATIONSHIPS

31

BEAUMONT, P./BLAKE, G.H./WAGSTAFF, J.M.

1976

THE MIDDLE EAST: A GEOGRAPHICAL STUDY.

JOHN WILEY, LONDON. 572 P.

MIDDLE EAST/REGIONAL GEOGRAPHY/GEOGRAPHY

32

BECKETT, P.H.T./GORDON, E.D.

1966

LAND USE AND SETTLEMENT ROUND KERMAN IN SOUTHERN IRAN.

GEOGRAPHICAL JOURNAL 132(4):476-490. WAERSA (10)1498.

THE KERMAN BASIN, A HIGH ISOLATED PLAIN AREA IN S. IRAN ILLUSTRATES HOW LAND USE AND SETTLEMENT IN A MARGINAL AREA IS CONTROLLED BY CRITICAL ENVIRONMENTAL FACTORS, IN THIS CASE AVAILABILITY OF WATER AND CULTIVABLE SOIL. THERE IS A LIMITED AMOUNT OF GOOD SOIL ROUND THE EDGE OF THE BASIN AND A LIMITED AMOUNT OF WATER IN SHALLOW AQUIFERS WHICH ARE TAPPED BY AN EXPENSIVE TUNNELLING SYSTEM OF QANATS OFTEN SEVERAL MILES LONG, WHICH LEAD WATER UNDER GRAVITY TO SETTLEMENTS. FOUR TYPES OF SETTLEMENT (SHEPARD VILLAGES, MOUNTAIN, FOOTHILL AND PLAIN VILLAGES) ARE DESCRIBED, WITH EXAMPLES OF LAND USE AND CROPS GROWN. THE HIGH COST OF WATER LEADS LANDLORDS TO CLAIM A VERY HIGH PROPORTION OF CROPS AND DISCOURAGES CULTIVATORS FROM INCREASING PRODUCTION. IMPROVEMENT IN COMMUNICATIONS AND TRADE IN CHEAPER FOODSTUFFS WILL TEND TO UPSET THE LOCAL EQUILIBRIUM BETWEEN PRICES AND WAGES, AND CHEAPER METHODS OF WINNING WATER AND ADVANCES IN FARMING TECHNIQUES ARE NECESSARY IF VILLAGES ARE TO ADAPT TO MODERN CONDITIONS.

MEIGS AC13/LAND TENURE/OALS/IRAN/SETTLEMENTS/LAND USE/BASINS/QANATS/ SOCIAL ASPECTS/WATER RESOURCES DEVELOPMENT

33

BEN-ARIEH, Y.

1968

THE CHANGING LANDSCAPE OF THE CENTRAL JORDAN VALLEY.

SCRIPTA HIEROSOLYMITANA 15(3):1-131.

JORDAN VALLEY/ISRAEL

34

BEN-ZVI, M./BEN-ZVI, A.

1971

PROBABILITY DISTRIBUTION OF FLOW EVENTS IN THE NEGEV AREA OF ISRAEL.

JOURNAL OF HYDROLOGY 14(3/4):348-353.

ISRAEL/NEGEV/FLOW/PROBABILITY/RUNOFF

35

BERRY, R.W./BROPHY, G.P./NAQASH, A.

1970

MINERALOGY OF THE SUSPENDED SEDIMENT IN THE TIGRIS, EUPHRATES, AND SHATT-AL-ARAB RIVERS OF IRAQ, AND THE RECENT HISTORY OF THE MESOPOTAMIAN PLAIN.

JOURNAL OF SEDIMENTARY PETROLOGY 40(1):131-139. GA 70A-1481

CLAY MINERAL FRACTIONS OF THE EUPHRATES AND TIGRIS RIVERS SHOW MARKED DIFFERENCES RELATED TO THE NATURE OF THE PROVENANCE AREA. THE EUPHRATES IS RICHER IN BOTH CHLORITE AND EXPANDABLE LATTICE CLAYS. ALL THE SUSPENSION LOAD OF THE TWO RIVERS IS DEPOSITED PRIOR TO ENTERING THE PERSIAN GULF. MINIMUM SEDIMENT ACCUMULATION IN THE LOWER MESOPOTAMIAN PLAIN IS 0.1 CENTIMETER PER YEAR, BUT IF RESTRICTED TO THE MARSH AREAS IS 1.0 CENTIMETER PER YEAR. DOWNWARP TO FORM THE PRESENT PLAIN BEGAN IN UPPER MIOCENE AND IS PRESENTLY CONTINUING. MARGINAL UPWARPING HAS OCCURRED SINCE HUMAN HABITATION OF THE REGION. (AUTHORS)

MESOPOTAMIAN PLAIN/OALS/MINERALOGY/SEDIMENTS/TIGRIS RIVER/EUPHRATES RIVER/SHATT AL-ARAB/IRAQ/CLAYS/CLAY MINERALS/DEPOSITION(SEDIMENTS)/ MIOCENE EPOCH/PLAINS/MIDDLE EAST

36

BIRAND, H.

1970

DIE VERWUSTUNG DER ARTEMISIA-STEPPE BEI KARAPINAR IN ZENTRAL ANATOLIEN (THE DESTRUCTION OF ARTEMISIA STEPPE NEAR KARAPINAR IN CENTRAL ANATOLIA).

VEGETATIO 20(1-4):21-47. GA 70B-1416.

CENTRAL ANATOLIA HAS BEEN GRAZED OR CULTIVATED FOR SEVERAL THOUSAND YEARS AND IS IN NO SENSE A NATURAL LANDSCAPE. THE ORIGINAL SETTLERS, SEEKING RICHER GRAZING IN THE LEE OF MOUNTAINS, LIVED ALONG THE WOODLAND BOUNDARY WHICH THEY SUBSEQUENTLY PUSHED BACK. THE PILLOW-FORM COMMUNITIES FOUND THERE TODAY ARE DEGRADED REMNANTS, DUE TO OVERGRAZING. EVIDENCE FOR THE FORMER POSITION OF THE WOODLAND BOUNDARY IS DISCUSSED, PARTICULARLY THE PRESENCE OF BERBERIS, NOT USED FOR FODDER OR FUEL. SAND WASTE AND ARTEMISIA STEPPE COMMUNITIES ARE DESCRIBED, WITH NOTES ON THE SOIL AND CLIMATE. THE SAND WASTE COMMUNITY IS SALVIA CRYPTANTHA-PHLOMIS ARMENIACA. THE DESTRUCTION OF THE STEPPE BY OVERGRAZING IS DISCUSSED, THE DESTRUCTION LEADING TO A DESERT WASTE.

OALS/ARID LANDS/TURKEY/GRAZING/DESERTIFICATION/PERTURBATION/SETTLEMENTS/ARTEMISIA/SHEEP(DOMESTIC)/VEGETATION CHANGE/RELICT VEGETATION

37

BIRCH, B.P.

1973

RECENT DEVELOPMENTS IN AGRICULTURE: LAND AND WATER USE IN JORDAN.

WORLD CROPS 25(2):66-76. GA 74C-2317.

THIS ARTICLE DISCUSSES ENVIRONMENTAL AND ECONOMIC PROBLEMS ASSOCIATED WITH FARMING IN ARID AREAS. RAPID POPULATION GROWTH AND LACK OF ALTERNATIVE RESOURCES MAKES JORDAN DEPENDENT ON LIMITED WATER AND LAND. THE DIFFICULTIES ARE EXACERBATED BY TRADITIONAL PEASANT FARMING METHODS AND POLITICAL HOSTILITIES IN THE AREA. THE EAST GHOR IRRIGATION SCHEME AND SEVERAL SMALLER SCHEMES ARE DESCRIBED.

JORDAN/LAND USE/AGRICULTURE/ARABIAN DESERT/IRRIGATION PROGRAMS/WATER UTILIZATION

38

BIRCH, B.P.

1974

DESERTIFICATION IN EASTERN JORDAN.

UNIVERSITY OF SOUTHAMPTON, DEPARTMENT OF GEOGRAPHY. 20 P. (MIMEO)

ALTHOUGH DETAILED STUDIES ARE FEW, THERE IS VISIBLE EVIDENCE IN GREAT AREAS OF JORDAN OF LAND DETERIORATION AND THE ADVANCE OF DESERT CONDITIONS SINCE NABATAEAN AND ROMAN TIMES. THEORIES OF CLIMATIC DETERIORATION ARE, HOWEVER, SUPPORTED BY LITTLE RELIABLE EVIDENCE; THE AUTHOR FAVORS, RATHER, NEGLECT OF EARLIER IRRIGATION AND WATER-FARMING WORKS, CARELESS AND EXCESSIVE GRAZING BY NOMADS, TREE-CUTTING AND SHRUB DESTRUCTION. MODERN EXTENSIONS OF PLOWING (TOO DEEP, AND OFTEN WITH THE SLOPE), TOGETHER WITH DAMAGE TO SOIL BY WHEELED VEHICLES ARE FACTORS CONTRIBUTING TO CONTINUED LAND DETERIORATION ON A WIDE SCALE.

JORDAN/DESERTIFICATION/OVERGRAZING/IRRIGATION PRACTICES/CULTIVATION/ARABIAN DESERT/DEGENERATION/HISTORY

39

BIRMAN, J.H.

1968

GLACIAL RECONNAISSANCE IN TURKEY.

GEOLOGICAL SOCIETY OF AMERICA, BULLETIN 79(8):1009-1026. GA 70A-202.

A RECONNAISSANCE GLACIAL GEOLOGICAL STUDY WAS MADE IN TURKEY IN 1963. ABUNDANT EVIDENCE WAS FOUND, IN ALL LOCALITIES VISITED, FOR GLACIATION RESEMBLING THE WISCONSIN OF NORTH AMERICA, AND MOST LOCALITIES SHOW SOME EVIDENCE OF POST-WISCONSIN ACTIVITY. THE BEST EXPRESSION OF POSSIBLY PRE-WISCONSIN GLACIATION WAS FOUND IN THE TAURUS RANGE. THE CORRELATION WITH RESPECT TO THE WISCONSIN IS EXREMELY TENTATIVE. IT IS BASED ON GEOMORPHIC CRITERIA, SUCH AS EXTENT OF WEATHERING AND EROSION, AND ON GEOGRAPHIC CRITERIA, SUCH AS LATITUDE OF GLACIATED AREAS, LOWEST ALTITUDES REACHED BY THE GLACIERS, AND CLIMATIC SETTING OF TURKEY. (AFTER AUTHOR)

TURKEY/GLACIAL GEOLOGY

40

BLAKE, I.

1969

CLIMATE, SURVIVAL AND THE SECOND-CLASS SOCIETIES IN PALESTINE BEFORE 3000 B.C.

ADVANCEMENT OF SCIENCE 25(126):409-421. GA 72D-0473.

SHOWS THAT THERE ARE AREAS PECULIARLY SUSCEPTIBLE TO SMALL CLIMATIC CHANGES; THAT THESE AREAS WERE IMPORTANT IN HUMAN TERMS BETWEEN 7000 AND 3000 B.C.; THAT THERE IS A DEGREE OF CORRELATION BETWEEN CERTAIN ARCHAEOLOGICAL EVIDENCE AND CLIMATIC HYPOTHESES. BEGINS WITH A REGIONALIZATION OF PALESTINE BASED ON CLIMATIC CONSIDERATIONS. DISCUSSES SETTLEMENT PATTERNS AND THE CLIMATIC FLUCTUATIONS, AND CORRELATES SOME OF THE EVIDENCE. CONCLUDES THAT IT IS NOT THE CENTERS OF CIVILIZATION RESPONSIBLE FOR PROGRESS BUT THE GEOGRAPHIC FRINGES SUCCOURING SECOND CLASS SOCIETIES. THE EFFECT OF SMALL CLIMATIC FLUCTUATIONS IN THE MARGINAL REGION OF PREHISTORIC PALESTINE WAS SIGNIFICANT ENOUGH TO PRECIPITATE A STRUGGLE FOR SURVIVAL WHICH INDIRECTLY DETERMINED THE FUTURE OF THE ENTIRE SETTLED POPULATION.

ARID CLIMATE/CLIMATOLOGY/AGRICULTURE/HISTORY/SOCIAL ASPECTS/ PALESTINE/SETTLEMENTS/SURVIVAL/CLIMATIC CHANGE/ISRAEL/MIDDLE EAST/ OALS

41

BOBEK, H.

1959

FEATURES AND FORMATION OF THE GREAT KAVIR AND MASILEH.

UNIVERSITY OF TEHRAN, ARID ZONE RESEARCH CENTRE, PUBLICATION 2. 63 P.

IRAN/SALT DESERTS/DASHT-E-KAVIR/IRANIAN DESERT

42

BOBEK, H.

1963

NATURE AND IMPLICATIONS OF QUATERNARY CLIMATIC CHANGES IN IRAN.

UNESCO, PARIS. ARID ZONE RESEARCH 20:403-413.

IRAN/QUATERNARY PERIOD/CLIMATIC CHANGE/GEOMORPHOLOGY/SALT DESERTS

43

BRAIDWOOD, R.J./REED, C.A.

1957

THE ACHIEVEMENT AND EARLY CONSEQUENCES OF FOOD PRODUCTION: A CONSIDERATION OF THE ARCHAEOLOGICAL AND NATURAL-HISTORICAL EVIDENCE.

COLD SPRING HARBOR SYMPOSIUM ON QUANTITATIVE BIOLOGY 22:19-31.

ARCHAEOLOGY/AGRICULTURE/CROP PRODUCTION/HISTORY/IRAQ/HUMAN BEHAVIOR/NOMADS/SETTLEMENTS/POPULATIONS/ENVIRONMENT/DOMESTIC ANIMALS

44

BRICE, W.C./BALCI, A.N.

1955

THE HISTORY OF FORESTRY IN TURKEY.

ISTANBUL UNIVERSITESI, ORMAN FAKULTESI, DERGISI 5:19-42.

TURKEY/FORESTRY/HISTORY

45

BURDON, D.J./OTKUN, G.

1968

HYDROGEOLOGICAL CONTROL OF DEVELOPMENT IN SAUDI ARABIA.

INTERNATIONAL GEOLOGICAL CONGRESS, 23RD, PRAGUE, PROCEEDINGS, 12:145-153. GA 70B-1228.

IN ARID SAUDI ARABIA, WATER IS SO SCARCE AS VIRTUALLY TO CONTROL ALMOST ALL FORMS OF DEVELOPMENT. SURFACE WATER IS RARE, UNRELIABLE OR NONEXISTENT, AND ONLY FROM UNDERGROUND CAN DEPENDABLE SUPPLIES OF GROUNDWATER BE OBTAINED FROM SPRINGS, INFILTRATION GALLERIES, WELLS AND BOREHOLES. HYDROGEOLOGICAL INVESTIGATIONS SHOW THAT THERE ARE LARGE GROUNDWATER RESOURCES IN THE GREAT THICKNESS OF SEDIMENTARY FORMATIONS WHICH UNDERLIE 70 PERCENT OF THE 2.2 MILLION SQUARE KILOMETERS OF SAUDI ARABIA. THE REMAINING 660,000 SQUARE KILOMETERS OF CRYSTALLINE BASEMENT CONTAIN LIMITED SHALLOW GROUNDWATER ONLY IN THEIR VALLEY ALLUVIA AND OUTWASH FANS AND PLAINS. THE AVERAGE ANNUAL GROUNDWATER REPLENISHMENT, THE VOLUME OF GROUNDWATER IN STORAGE, THE PROBLEMS OF SALINITY, OF 'FOSSIL' GROUNDWATER AND OF AGE OF GROUNDWATER AS WELL AS DEVELOPMENT METHODS AND CONSERVATION CONTROL ARE BEING STUDIED AND DETERMINED. (AFTER AUTHORS)

WATER CONSERVATION/HYDROGEOLOGY/WATER STORAGE/SAUDI ARABIA/HYDROLOGIC DATA/ GROUNDWATER/SALINE WATER/WATER UTILIZATION/WATER RESOURCES DEVELOPMENT/WELLS/ RECHARGE/SPRINGS/BOREHOLES/AGRICULTURE/ECONOMIC DEVELOPMENT/SOCIAL ASPECTS

46

BURINGH, P.

1957

LIVING CONDITIONS IN THE LOWER MESOPOTAMIAN PLAIN IN ANCIENT TIMES.

SUMER 13:30-57.

MESOPOTAMIAN PLAIN/HISTORY/SOCIAL ASPECTS

47

BURINGH, P.

1960

SOILS AND SOIL CONDITIONS IN IRAQ.

IRAQ MINISTRY OF AGRICULTURE, BAGHDAD. 322 P.

MAP SCALE: 1/1,000,000. BOOK HAS DETAILED DESCRIPTIONS OF SOILS AND PHYSICAL AND CHEMICAL ANALYSIS. COMPREHENSIVE COVERAGE. GREATEST DETAIL ON MESOPOTAMIAN PLAIN.

IRAQ/SOIL TYPES/MESOPOTAMIAN PLAIN/SOIL ANALYSIS/SOIL CHEMICAL PROPERTIES/ SOIL PHYSICAL PROPERTIES

48

BUTZER, K.W.

1958

QUATERNARY STRATIGRAPHY AND CLIMATE IN THE NEAR EAST.

BONNER GEOGRAPHISCHE ABHANDLUNGEN, HEFT 24. 157 P.

QUATERNARY PERIOD/STRATIGRAPHY/MIDDLE EAST/CLIMATE/EGYPT/JORDAN/ARCHAEOLOGY

49

BUTZER, K.W.

1967

LATE GLACIAL AND POST GLACIAL CLIMATIC VARIATION IN THE NEAR EAST.

ERKUNDE 11:21-35.

MIDDLE EAST/CLIMATIC CHANGE/PALEOCLIMATOLOGY/GLACIERS

50

BUTZER, K.W.

1970

PHYSICAL CONDITIONS IN EASTERN EUROPE, WESTERN ASIA AND EGYPT BEFORE THE PERIOD OF AGRICULTURAL AND URBAN SETTLEMENT. IN CAMBRIDGE ANCIENT HISTORY, 3D ED., VOL. I, P. 35-69.

CAMBRIDGE UNIVERSITY PRESS, CAMBRIDGE.

EGYPT/HISTORY/ENVIRONMENT

51

BUTZER, K.W.

1972

ENVIRONMENT AND ARCHEOLOGY: AN ECOLOGICAL APPROACH TO PREHISTORY. 2D ED.

METHUEN, LONDON. 703 P. GA 72A-2379.

SURVEYS DATING TECHNIQUES, GEOMORPHOLOGICAL THEORY AND REGIONAL STRATIGRAPHY IN A SYSTEMATIC WAY BEFORE GOING TO REGIONAL CONSTRUCTION OF LATE PLEISTOCENE ENVIRONMENTS. EARLY CHAPTERS COVER SUCH TOPICS AS STRATIGRAPHY, GEOMORPHOLOGY, PLEISTOCENE SEDIMENTS, SEA-LEVEL FLUCTUATIONS AND PALYNOLOGY. CHAPTERS ON LATE PLEISTOCENE ENVIRONMENTS COVER MID-LATITUDE EUROPE, THE MEDITERRANEAN REGION, PARTS OF AFRICA, AND NORTH AMERICA, AND A CHAPTER ON CLIMATIC CHANGE. THE LAST THIRD OF THE BOOK DESCRIBES MAN-LAND RELATIONSHIPS IN PREHISTORY IN A NUMBER OF AREAS, INCLUDING AUSTRALIA, AND WITH SEVERAL CHAPTERS ON THE NEAR EAST.

ARCHAEOLOGY/ENVIRONMENT/QUATERNARY PERIOD/PLEISTOCENE EPOCH/HUMANS/HISTORY/LAND USE/WATER LEVELS/CLIMATIC CHANGE/AUSTRALIA/MIDDLE EAST/ECOLOGY/AFRICA/GEOMORPHOLOGY/STRATIGRAPHY/SEDIMENTS/PALYNOLOGY

52

CATON-THOMPSON, G./GARDNER, E.W.

1939

CLIMATE, IRRIGATION AND EARLY MAN IN THE HADHRAMAUT.

GEOGRAPHICAL JOURNAL 93:18-38.

ARABIAN PENINSULA/IRRIGATION/CLIMATE/HUMANS/HISTORY

53

CEDERSTROM, D.J.

1971

GROUNDWATER IN THE ADEN SECTOR OF SOUTHERN ARABIA.

GROUND WATER 9(2):29-34.

SAUDI ARABIA/ADEN/GROUNDWATER

54

CHAPMAN, R.W.

1971

CLIMATIC CHANGES AND THE EVOLUTION OF LANDFORMS IN THE EASTERN PROVINCE OF SAUDI ARABIA.

GEOLOGICAL SOCIETY OF AMERICA, BULLETIN 82(10):2713-2727. GA 72A-1751.

LANDFORMS IN THE EASTERN PROVINCE OF SAUDI ARABIA ARE FEATURES OF A RELICT TOPOGRAPHY DEVELOPED DURING LATE PLIOCENE, PLEISTOCENE, AND HOLOCENE TIME UNDER A VARIETY OF CLIMATES. THE FORMS DESCRIBED IN THIS REPORT OCCUR IN THE DAMMAM DOME, A GENTLE STRUCTURAL TOPOGRAPHIC RISE COMPOSED OF EOCENE LIMESTONES, AND IN THE SHEDGUM AREA, A PLATEAU UNDERLAIN BY LATE MIOCENE OR PLIOCENE CALCAREOUS ROCKS. IN THE WETTER CLIMATIC STAGES, STREAM EROSION WAS THE PRINCIPAL DEGRADATIONAL PROCESS, WHEREAS IN THE DRYER STAGES PEDIMENTATION AND RELATED PROCESSES DOMINATED. LANDFORM DEVELOPMENT WAS ALSO INFLUENCED BY THE STRUCTURE AND COMPOSITION OF THE BEDROCK AND BY TECTONIC AND POSSIBLY EUSTATIC MOVEMENTS. DURING THE LATE PLIOCENE AND PLEISTOCENE, A CALCAREOUS DURICRUST DEVELOPED PROGRESSIVELY ON THE TOPOGRAPHY, AND IN THE LATE PLEISTOCENE OR MID-HOLOCENE THIS CRUST WAS DEEPLY WEATHERED. MORE RECENTLY, DESERTIC GRADATIONAL PROCESSES HAVE PREVAILED. (AUTHOR)

SAUDI ARABIA/CLIMATIC CHANGE/RELICT LANDFORMS/DESERTIFICATION/GEOMORPHOLOGY/DOMES(GEOLOGY)/PLATEAUS/STREAM EROSION/TECTONICS/LIMESTONE/CALCAREOUS SOILS/DURICRUST/ARABIAN DESERT/HOLOCENE EPOCH/PLEISTOCENE EPOCH/PLIOCENE EPOCH

55

CHAPMAN, R.W.

1974

CALCAREOUS DURICRUST IN AL-HASA, SAUDI ARABIA.

GEOLOGICAL SOCIETY OF AMERICA, BULLETIN 85(1):119-130. GA 74A-1626.

THE CALCAREOUS DURICRUST IN AL-HASA, SAUDI ARABIA, COVERS A RUGGED TOPOGRAPHY DEVELOPED ON SANDY LIMESTONES OF MIOCENE AND PLIOCENE AGE. THE VERY IMMATURE CRUST RESTS ON THE YOUNGEST TOPOGRAPHIC SURFACES AND IS THE YOUNGEST, THINNEST, AND LEAST THOROUGHLY DEVELOPED. THE IMMATURE CRUST RESTS ON SOMEWHAT OLDER SURFACES, AND IS OLDER, THICKER, AND MORE THOROUGHLY DEVELOPED. THE CRUSTING PROCESS INVOLVED: 1) THE RECRYSTALLIZATION OF ORIGINAL CALCITE IN THE PARENT SANDY LIMESTONE, 2) THE INTRODUCTION OF ADDITIONAL CALCITE EITHER FROM ABOVE OR BELOW, AND 3) THE REPLACEMENT OF QUARTZ AND FELDSPAR BY CALCITE. THE CACO3 CONTENT OF THE THREE CRUST TYPES VARIES DIRECTLY WITH THEIR AGE. THE DURICRUST APPEARS TO HAVE EVOLVED PROGRESSIVELY, THOUGH INTERMITTENTLY, DURING THE VERY LATE PLIOCENE, PLEISTOCENE, AND EARLY HOLOCENE. DIFFERENCES IN THE THICKNESS OF THE THREE CRUST TYPES ARE ATTRIBUTED TO DIFFERENCES IN THE CLIMATE UNDER WHICH THEY FORMED, AND DIFFERENCES IN THEIR DEGREE OF DEVELOPMENT ARE ATTRIBUTED TO DIFFERENCES IN THEIR AGE. (AUTHOR)

SAUDI ARABIA/GEOLOGY/DURICRUST/SOIL TYPES/PALEOCLIMATOLOGY/TOPOGRAPHY/PLEISTOCENE EPOCH/PLIOCENE EPOCH/HOLOCENE EPOCH/CALCAREOUS SOILS/LIMESTONE/CALCITE

56

CLAPP, G.R.

1957

IRAN, A T.V.A. FOR THE KHUZESTAN REGION.

MIDDLE EAST JOURNAL 11:1-11.

IRAN/KHUZESTAN/WATER MANAGEMENT/DAMS

57

CLAWSON, H./LANDSBERG, H.H./ALEXANDER, L.T.

1971 .

THE AGRICULTURAL POTENTIAL OF THE MIDDLE EAST.

ELSEVIER, NEW YORK. 312 P.

MIDDLE EAST/AGRICULTURE/EGYPT/ISRAEL/JORDAN/LEBANON/SYRIA/IRAQ/LAND USE/
WATER RESOURCES/SOIL TYPES/HUMAN RESOURCES

58

COHEN, H.R./EROL, O.

1969

ASPECTS OF THE PALEOGEOGRAPHY OF CENTRAL ANATOLIA.

GEOGRAPHICAL JOURNAL 135(3):388-398. GA 70A-529.

ARCHAEOLOGICAL EVIDENCE SUGGESTS A WIDESPREAD CLIMATIC CHANGE IN THE NEAR EAST RESULTING IN THE RECESSION OF WATERS IN BASINS WITH INTERNAL DRAINAGE AND LEADING TO AN EXTENSION OF HUMAN SETTLEMENT ON TO THE RICH NEAR EAST RESULTING IN THE RECESSION OF WATERS IN BASINS WITH INTERNAL DRAINAGE AND LEADING TO AN EXTENSION OF HUMAN SETTLEMENT ON TO THE RICH ALLUVIUM THUS EXPOSED FROM THE END OF THE EIGHTH MILLENIUM. ANOTHER PART OF THIS ARTICLE DEALS WITH GEOMORPHOLOGICAL EVIDENCE FOR THE RECESSIONAL PHASES.

TURKEY/LAKES/BASINS/PALEOGEOGRAPHY/ARCHAEOLOGY/CLIMATIC CHANGE/GEOMORPHOLOGY/
PLEISTOCENE EPOCH/HOLOCENE EPOCH/TERRACES(GEOMORPHOLOGY)/COASTAL TOPOGRAPHIC
FEATURES/SETTLEMENTS/MIDDLE EAST/SHORES

59

CROWN, A.D.

1972

TOWARDS A RECONSTRUCTION OF THE CLIMATE OF PALESTINE 8000 B.C. - 0 B.C.

JOURNAL OF NEAR EASTERN STUDIES 31(4):312-330.

PALESTINE/CLIMATE/HISTORY

60

DAN, J./KOYUMDJISKY, H.

1963

THE SOILS OF ISRAEL AND THEIR DISTRIBUTION.

JOURNAL OF SOIL SCIENCE 14:12-20.

MAPS SHOW THE GEOGRAPHIC AND PHYSIOGRAPHIC REGIONS, THE CLIMATE AND THE SOILS OF ISRAEL ON A SCALE OF 1:2,000, AND A TABLE SHOWS THE SOIL TYPE OF COASTAL AREAS, MOUNTAIN AND HILL REGIONS, VALLEYS, PLAINS AND PLATEAUX IN HUMID, SEMI-ARID AND ARID AREAS.

ISRAEL/SOIL TYPES/SOIL MAPS/GEOMORPHOLOGY/COASTAL PLAINS/MOUNTAINS/PLATEAUS/SANDS/B HORIZON/CALCAREOUS SOILS/C HORIZON/LIMESTONE/DOLOMITES/RENDZINA SOILS/CLAYS/SILTS/DESERT PAVEMENT/HAMADAS/ALLUVIUM/DUNES/SLOPES

61

DAN, J./YAALON, D.H.

1971

ON THE ORIGIN AND NATURE OF THE PALEOPEDOLOGICAL FORMATIONS IN THE COASTAL DESERT FRINGE AREAS OF ISRAEL. IN D.H. YAALON, ED., PALEOPEDOLOGY: ORIGIN, NATURE AND DATING OF PALEOSOLS, P. 245-260.

INTERNATIONAL SOCIETY OF SOIL SCIENCE/ISRAEL UNIVERSITIES PRESS, JERUSALEM. GA 73A-0744.

TWO KINDS OF PALAEOSOL COMPLEXES MERGE IN THE COASTAL SEMIARID DESERT FRINGE AREA OF ISRAEL, ASSOCIATED WITH THE TWO MAJOR LITHOSTRATIGRAPHIC UNITS. IN THE NORTHERN PART OF THE REGION THE HAMRA-NAZAZ PALAEOSOL ASSOCIATION, INDICATING THAT THE MEDITERRANEAN CLIMATE EXTENDED SOMEWHAT FURTHER TO THE SOUTH DURING PARTS OF THE LOWER PLEISTOCENE. THE SUBSEQUENT PEDOGENIC DEVELOPMENT INDICATES A MODERATE AMPLITUDE IN THE FLUCTUATIONS OF THE CLIMATE AND PEDOGENESIS. THESE ARE ESSENTIALLY CONFINED TO PERIODIC N AND S SHIFTS OF THE SEMIARID CLIMATIC BELT, APPROXIMATELY IN THE RANGE OF THE PRESENT INTER-ANNUAL VARIABILITY OF THE PRECIPITATION. (AFTER AUTHOR)

PALEOSOLS/SEMIARID CLIMATE/MEDITERRANEAN CLIMATE/PALEOGEOGRAPHY/STRATIGRAPHY/SOIL FORMATION/PLEISTOCENE EPOCH/CLIMATIC CHANGE/ISRAEL

62

DAN, J./YAALON, D.H./KOYUMDJISKY, H.

1972

CATENARY SOIL RELATIONSHIPS IN ISRAEL. 2: THE BET GUVRIN CATENA ON CHALK AND NARI LIMESTONE CRUST IN THE SHEFELA.

ISRAEL JOURNAL OF EARTH SCIENCES 21(2)99-118. GA 73A-0362.

TWO TYPICAL SOIL CATENAS ON CHALK AND NARI LIMESTONE CRUSTS (CALCRETE) IN THE SHEFELA (HARE YEHUDA) WERE INVESTIGATED. THE CATENA ON THE NARI-COVERED NORTHERN SLOPE CONSISTS OF GRUMUSOLIC DARK BROWN SOIL (HAPLARGIDS) ON THE FLAT HILLTOPS, THICK NON-CALCAREOUS BROWN RENDZINA SOIL (RENDOLLS) ON THE MODERATE SLOPING UPLANDS, TYPICAL BROWN RENDZINA ON THE STEEP SLOPES AND BROWN RENDZINIC COLLUVIAL-ALLUVIAL SOILS (HAPLOXEROLLS) IN NARROW GULLIES. ON SOFT CHALK ROCK (SOUTHERN SLOPE) BROWN RENDZINA IS REPLACED BY PALE RENDZINA AND BROWN RENDZINIC COLLUVIAL-ALLUVIAL SOILS BY HIGHLY CALCAREOUS COLLUVIAL-ALLUVIAL SOIL (HAPLORTHENTS). THE ORIGIN OF BROWN SOILS (BROWN RENDZINA AND GRUMUSOLIC DARK BROWN SOILS) IS ATTRIBUTED MAINLY TO ACCUMULATION OF AEOLIAN DUST, WHILE THE PALE RENDZINA SOILS FORMED FROM THE WEATHERING OF THE UNDERLYING SOFT ROCKS. THE LEACHING AND DECALCIFICATION STAGE DEPENDS MAINLY ON SOIL DEPTH, EXPOSURE AND AGE. (AFTER AUTHORS)

SOIL ANALYSIS/SOIL FORMATION/SOIL CLASSIFICATIONS/SOIL EROSION/CATENAS/SOIL SURVEYS/SHEFELA REGION/ISRAEL/RENDZINA SOILS/CALCAREOUS SOILS/LIMESTONE/SOIL PROFILES

63

DAYTON, J.

1975

THE PROBLEM OF CLIMATIC CHANGE IN THE ARABIAN PENINSULA. IN SEMINAR FOR ARABIAN STUDIES, PROCEEDINGS, 5:33-60.

INSTITUTE OF ARCHAEOLOGY, LONDON.

CLIMATIC CHANGE/ARABIAN PENINSULA

64

DEBUCHY, V.

1972

L'AMENAGEMENT D'UNE REGION DESERTIQUE: L'EXEMPLE DU NEGUEV (DEVELOPMENT OF A DESERT REGION: THE EXAMPLE OF THE NEGEV).

REVUE EUROPEENNE DES SCIENCES SOCIALES 10(26):151-192. GA 74C-0430.

THE DEVELOPMENT OF THE NEGEV DESERT IS EXAMINED FROM THE POINT OF VIEW OF WHETHER: 1) IT IS JUSTIFIABLE IN DEMOGRAPHIC, ECONOMIC AND SPATIAL TERMS, 2) IT IS PROFITABLE, IN TERMS OF THE RETURNS ON AGRICULTURAL, MINING AND INDUSTRIAL INVESTMENTS, AND 3) THE ACHIEVEMENTS IN THE NEGEV CAN BE REGARDED AS EXAMPLES FOR OTHER COUNTRIES WITH ARID ZONES. THE NEGEV HAD ONE IMMENSE ADVANTAGE: NO ESTABLISHED TRADITIONAL AGRICULTURAL POPULATION, SINCE MAKING A DESERT FERTILE IS AS MUCH A SOCIOLOGICAL AS A TECHNOLOGICAL PROBLEM.

NEGEV/ISRAEL/LAND USE/LAND RECLAMATION/SOCIAL ORGANIZATION/PRODUCTIVITY/ DEMOGRAPHY/ECONOMIC DEVELOPMENT/SOCIAL ASPECTS

65

DEHSARA, M.

1973

AN AGRO-CLIMATOLOGICAL MAP OF IRAN.

ARCHIV FUER METEOROLOGIE, GEOPHYSIK, UND BIOKLIMATOLOGIE, SER. B., 21(4):393-402.

IRAN/AGRICULTURAL CLIMATOLOGY/MAPS

66

DERIDDER, N.A.

1965

SEDIMENTS OF THE KONYA BASIN, CENTRAL ANATOLIA, TURKEY.

PALAEOGRAPHY, PALAEOCLIMATOLOGY, PALAEOECOLOGY 1:225-254.

TURKEY/SEDIMENTS/BASINS

67

DEWAN, M.L./FAMOURI, J.

1964

THE SOILS OF IRAN.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, ROME. 319 P.

MAP SCALE: 1/2,500,000. HAS DETAILED PROFILE DESCRIPTIONS AND PHYSICAL AND CHEMICAL ANALYSES.

IRAN/SOIL TYPES/SOIL PROFILES/SOIL CHEMICAL PROPERTIES/SOIL ANALYSIS/SOIL PHYSICAL PROPERTIES

68

DICKER, T.

1969

GEO-CHEMICAL CLASSIFICATION OF GROUNDWATER IN THE CARMEL REGION.

ISRAEL JOURNAL OF EARTH SCIENCES 18(2):71-81.

ISRAEL/GROUNDWATER/GEOCHEMISTRY

69

DINCER, T./PAYNE, B.R.

1971

AN ENVIRONMENTAL ISOTOPE STUDY OF THE SOUTH WESTERN KARST REGION OF TURKEY.

JOURNAL OF HYDROLOGY 14(3/4):233-258. GA 72A-1571.

SEVERAL LAKES, RIVERS AND KARST SPRINGS IN SW TURKEY HAVE BEEN STUDIED IN DETAIL USING THE NATURAL TRITIUM, DEUTERIUM AND OXYGEN-18 CONTENTS OF THE WATERS. STABLE ISOTOPES HAVE SHOWN THE RELATION BETWEEN INLAND LAKES AND COASTAL SPRINGS. THE TRITIUM CONTENT OF SPRINGS GIVES VALUABLE INFORMATION ON THE TRANSIT TIME OF WATER BETWEEN TIME OF RECHARGE AND SAMPLING, AND THE TIME STRUCTURE OF WATER IN THE KARST RESERVOIR. ENVIRONMENTAL ISOTOPES ALSO SHOW THE MAJOR COMPONENTS OF FLOW IN THE KARST WHICH CONSIST OF A SEASONAL FLOW THROUGH SOLUTION CHANNELS AND A MUCH SLOWER MOVEMENT THROUGH THE BASE KARST RESERVOIR. (AUTHORS)

TURKEY/KARST/ISOTOPES/WATER SOURCES/LAKES/RIVERS/SPRINGS/FLOW/GROUNDWATER MOVEMENT/RECHARGE

70

DRESCH, J.

1963

OBSERVATIONS SUR LA REGION DE PALMYRE EN SYRIE.

ASSOCIATION DE GEOGRAPHES FRANCAIS, BULLETIN 318-319:2-18.

SYRIA/SYRIAN DESERT/REGIONAL GEOGRAPHY

71

DRESCH, J.

1967

QUESTIONS DE GEOMORPHOLOGIE EN ISRAEL.

ASSOCIATION DE GEOGRAPHES FRANCAIS, BULLETIN 350-351:2-14.

PRESENT DAY ISRAEL PRESENTS TWO CONTRASTING GEOMORPHOLOGICAL FEATURES. IN THE GALILEE HIGHLAND WITH AN ELEVATION OF 1000 M OR MORE AND A HUMID CLIMATE WITH A RAINFALL OF 600-700 MM A YEAR, THERE HAS BEEN SLOPE EROSION OF MARLS AND LIMESTONES WHICH OVERLIE LIMESTONES. THE ARID NEGEV WITH A PRECIPITATION OF LESS THAN 200 MM AT BEER SHEVA AND 30 MM AT EILAT IS CHARACTERIZED BY PLATEAUS WITH FAULTING AND ASYMMETRICAL FOLDING OF PALEOZOIC ROCKS. ABRUPT TRANSITIONS IN CLIMATE ARE EVIDENT BETWEEN THE HUMID MEDITERRANEAN SLOPE AREA AND THAT OF THE ARID JORDAN GRABEN.

ISRAEL/GEOMORPHOLOGY/NEGEV/SLOPES/BANK EROSION/LIMESTONE/PLATEAUS/CLIMATIC ZONES/GRABEN(GEOLOGY)/MEDITERRANEAN BASIN

72

DRESCH, J.

1968

QUESTIONS DE GEOMORPHOLOGIE EN ISRAEL (GEOMORPHOLOGICAL PROBLEMS IN ISRAEL).

ASSOCIATION DE GEOGRAPHES FRANCAIS, BULLETIN 362-363:167-180. GA 69A-401.

A REPLY TO A CRITICAL ANALYSIS OF DRESCH'S INTERPRETATION OF GEOMORPHOLOGICAL PHENOMENA IN ISRAEL (ABSTRACT 68A-46); PHENOMENA SUPPOSEDLY DEVELOPED DURING COLDER PERIODS IN THE EASTERN MEDITERRANEAN; THE ROCK CONES; AND THE GENETIC SEQUENCES OF GEOMORPHOLOGICAL FEATURES IN THE REGION. THE FINDINGS OF ISRAELI AND ESPECIALLY FRENCH GEOMORPHOLOGISTS ARE QUOTED IN DETAIL TO ELABORATE AND, IN SOME CASES TO MODIFY DRESCH'S INTERPRETATION.

ISRAEL/GEOMORPHOLOGY

73

DRESCH, J.

1968

RECONNAISSANCE DANS LE LUT (IRAN) (RECONNAISSANCE STUDIES IN THE LUT AREA OF IRAN).

ASSOCIATION DE GEOGRAPHES FRANCAIS, BULLETIN 362-363:143-153. GA 69A-402.

LUT, 'THE EMPTY COUNTRY', IS FORMED BY A NUMBER OF ENCLOSED BASINS IN SE IRAN. FRENCH AND IRANIAN RESEARCHERS ARE CO-OPERATING IN THIS ARID REGION. A BRIEF GEOMORPHOLOGICAL REPORT DISTINGUISHES: COALESCING PIEDMONT DEBRIS CONES, SAND RIDGES (KALUT), YARDANGS AND FRAGMENTED PLAINS. VARIATIONS IN THE KALUT FORM ARE DESCRIBED IN DETAIL AND ARE MAPPED FROM AIR PHOTOGRAPHS AT A REGIONAL SCALE. THE ROLES OF TECTONIC AND CLIMATIC CHANGES ARE DISCUSSED IN ATTEMPTING THEIR INTERPRETATION.

IRAN/GEOMORPHOLOGY/BASINS/SALT DESERTS/CLIMATIC CHANGE/TECTONICS/TOPOGRAPHIC FEATURES/DASHT-E-LUT

74

DRIESSEN, P.M.

1970

SOIL SALINITY AND ALKALINITY IN THE GREAT KONYA BASIN, TURKEY.

AGRICULTURAL RESEARCH REPORTS 743. WAGENINGEN, THE NETHERLANDS. 50 P. GA 71B-1304.

THE GREAT KONYA BASIN (ABOUT 300 KILOMETERS SOUTH OF ANKARA, 10,000 SQUARE KILOMETERS IN AREA, ALTITUDE OF 1000 METERS) IS SURROUNDED BY MOUNTAINS, WITH NO DRAINAGE OUTLET. CLIMATE IS SEMIARID (DRY SUMMER, COOL WET WINTER), AND ANNUAL EVAPORATION EXCEEDS PRECIPITATION. THE RESULT OF CLIMATE AND INTERIOR DRAINAGE IS INCREASING SALINITY, HARMFUL FOR AGRICULTURE. THROUGH FIELD WORK AND USING LABORATORY TECHNIQUES, SOME OF THEM NEW, SALINITY TYPES AND DISTRIBUTION WERE DETERMINED. CONSEQUENCES FOR AGRICULTURE ARE DISCUSSED, WITH RECOMMENDATIONS FOR FUTURE DEVELOPMENT.

OALS/TURKEY/MIDDLE EAST/BASINS/TOPOGRAPHIC FEATURES/DRAINAGE PATTERNS/ SEMIARID CLIMATE/WINTER PRECIPITATION/EVAPORATION/PRECIPITATION DEFICIT/ WATER BALANCE/SALINE SOILS/SALINITY/ALKALINITY/SOIL CHEMICAL PROPERTIES/ DISTRIBUTION/ON-SITE INVESTIGATIONS/ANALYTICAL TECHNIQUES/AGRICULTURE/ LAND USE/ECONOMIC DEVELOPMENT

75

DUCLOS, P.

1968

L'ORIGINE DES ANIMAUX DOMESTIQUES EN PALESTINE (THE ORIGIN OF DOMESTIC ANIMALS IN PALESTINE).

UNIVERSITE DE BORDEAUX, INSTITUT DE PREHISTOIRE, MEMOIRE 6. 192 P. GA 71B-0045.

A STATISTICAL METHOD IS EMPLOYED IN RELATION TO THE DIMENSIONS OF BONES RECOVERED FROM VARIOUS DOMESTIC SITES TO DISTINGUISH DOMESTICATED ANIMALS FROM NON-DOMESTICATED, THE NORMS BEING DEDUCED FROM THE CURRENT PRACTICES OF REARING EMPLOYED BY VARIOUS AFRICAN PEOPLES. EXPLOITATION OF A HERD PRODUCED A HIGHER INCIDENCE OF BONES OF YOUNG ANIMALS AND A CORRESPONDING DECLINE IN THOSE OF OLDER BEASTS COMPARED WITH A NATURAL POPULATION. DOMESTICATED CATTLE APPEAR IN THE 5TH MILLENIUM B.C. IN THE MEDITERRANEAN CLIMATIC REGION OF PALESTINE, PROBABLY ASSOCIATED WITH GROUPS LIVING IN VILLAGES. PRECEDING CULTURES, INCLUDING THE NATOUFIAN, SHOW SOME SELECTION OF OLDER BEASTS IN THE CHASE, CONSERVATION OF YOUNG ANIMALS, AND THEREFORE AN INTIMATE RELATIONSHIP WITH WILD HERDS DESCRIBED AS PROTO-REARING. DOMESTICATION TOOK PLACE DURING FAVORABLE CLIMATIC CIRCUMSTANCES AND THE OASIS THEORY OF DOMESTICATION CANNOT BE SUSTAINED.

PALESTINE/DOMESTIC ANIMALS/HISTORY/ARCHAEOLOGY/ANALYTICAL TECHNIQUES/CATTLE/ HUMAN BEHAVIOR/SETTLEMENTS

76

EBERT, C.H.V.

1965

WATER RESOURCES AND LAND USE IN THE QATIF OASIS OF SAUDI ARABIA.

GEOGRAPHICAL REVIEW 55(4):496-509.

THE QATIF OASIS COVERS ABOUT 20 SQUARE MILES. ABOUT 10,000 ACRES (90 PERCENT DATES AND 9 PERCENT LUCERNE) ARE IRRIGATED FROM OVER 100 WELLS. RECOMMENDATIONS INCLUDE: CASING, CAPPING AND EVEN SEALING-OFF OF CERTAIN WELLS TO REDUCE THE ESTIMATED 75 PERCENT WASTAGE BY SEEPAGE, EVAPORATION AND NEEDLESS USE, AND THE INSTALLATION OF EFFICIENT SUBSOIL DRAINAGE TO PREVENT LOSS OF AGRICULTURAL LAND BY SALINIZATION.

SAUDI ARABIA/WATER RESOURCES/LAND USE/WELLS/SALINITY/IRRIGATION/EVAPORATION/ WATER CONSERVATION/SEEPAGE/DRAINAGE

77

EHLERS, E.

1971

SUEDKASPISCHES TIEFLAND (NORDIRAN) UND KASPISCHES MEER: BEITRAGE ZU IHREN ENTWICKLUNGSGESCHICHTE IM JUNG- UND POSTPLEISTOZAN (THE LOWLAND SOUTH OF THE CASPIAN SEA IN NORTH IRAN AND THE CASPIAN SEA: STUDIES IN THEIR DEVELOPMENT HISTORY DURING THE LATE AND POST PLEISTOCENE).

TUEBINGER GEOGRAPHISCHE STUDIEN 44. 184 P. GA 72A-2583.

A MAP SHOWS AREAS OF STUDY AND DESCRIBES PHYSICAL CONDITIONS. CORRELATING LATE PLEISTOCENE LAKE TERRACES, RIVER TERRACES OF RIVERS FLOWING FROM THE NORTH ELBURZ. CONSIDERS CLIMATE AND LANDSCAPE OF THE POST-PLEISTOCENE, WITH EMPHASIS ON SOIL STUDIES. SUGGESTS THERE ARE THREE COLD PERIODS RATHER THAN TWO FAVORED BY OTHERS. FAVORS A PLUVIAL EFFECT RATHER THAN PERIOD, CAUSED BY COLD RATHER THAN BY A RAINFALL CHANGE IN CENTRAL IRAN IN THE EARLY WURM.

PLUVIAL PROCESSES/SETTLEMENTS/IRAN/CASPIAN SEA/GLACIERS/PALEOCLIMATOLOGY/PLEISTOCENE EPOCH/GEOMORPHOLOGY/TERRACES(GEOMORPHOLOGY)/ARCHAEOLOGY/WATER LEVELS/MIDDLE EAST/USSR/SOIL TESTS

78

ELBASHAN (EARLIER, PRUSCHANSKY), D.

1966

MONTHLY RAINFALL ISOMERS IN ISRAEL, 1931-1960.

ISRAEL JOURNAL OF EARTH-SCIENCES 15(1):1-7. GA 67B-461.

ON THE BASIS OF 55 STATIONS IN ISRAEL AND WESTERN PALESTINE, NINE MAPS OF ISOPLETHS OF AVERAGE ISOMERIC VALUES FOR NINE MONTHS OF THE RAINY SEASON FOR THE INTERNATIONAL STANDARD PERIOD (1931-1960) WERE PREPARED. THE ISOMERIC VALUE IS THE RATIO OF THE MONTHLY RAINFALL TO THE ANNUAL FALL. IN THE SOUTH WHERE THE RAINFALL IS LESS THAN 200 MM THE PICTURE IS ERRATIC. TO THE NORTH TWO PATTERNS OF RAINFALL ARE SEEN; A COASTAL PLAIN PATTERN WITH THE WETTEST MONTH DECEMBER, AND A MOUNTAIN PATTERN WITH JANUARY THE WETTEST MONTH.

ISRAEL/RAINFALL/WET SEASONS/RAINFALL STATIONS/WEATHER PATTERNS/MAPS/WEATHER DATA/COASTAL PLAINS/MOUNTAINS

79

ENGLISH, P.W.

1968

THE ORIGIN AND SPREAD OF QANATS IN THE OLD WORLD.

AMERICAN PHILOSOPHICAL SOCIETY, PROCEEDINGS 112(3):170-181.

HORIZONTAL WELLS OR QANATS WERE DISCOVERED IN THE VICINITY OF ARMENIA MORE THAN 2,500 YEARS AGO AND SPREAD RAPIDLY TO BECOME ONE OF THE MOST IMPORTANT METHODS OF DRY-LAND IRRIGATION IN THE OLD WORLD. IN PARTS OF IRAN, AFGHANISTAN, ALGERIA AND MOROCCO, THIS INGENIOUS DEVICE HAS MADE HUMAN SETTLEMENT POSSIBLE IN DISTINCTLY MARGINAL AREAS. MODERN TECHNOLOGY THREATENS TO REPLACE THE QANAT WITH MORE EFFICIENT DEEP WELLS, BUT THE EXTENT TO WHICH SOCIAL AND ECONOMIC PATTERNS HAVE BECOME ENMESHED WITH THIS WATER-SUPPLY SYSTEM WILL MAKE THE TRANSITION DIFFICULT.

WELLS/IRAN/AFGHANISTAN/ALGERIA/MOROCCO/QANATS/WATER SUPPLY/WATER CONVEYANCE/OALS

80

ENGLISH, P.W.

1973

GEOGRAPHICAL PERSPECTIVES ON THE MIDDLE EAST: THE PASSING OF THE ECOLOGICAL TRILOGY. IN M.W. MIKESELL, ED., GEOGRAPHERS ABROAD, P. 134-164.

UNIVERSITY OF CHICAGO, DEPARTMENT OF GEOGRAPHY, RESEARCH PAPER 152.

MIDDLE EAST/GEOGRAPHY/ECOLOGY/NOMADS/SETTLEMENTS/AGRICULTURE/NORTH AFRICA/ URBAN AREAS/SOCIAL ORGANIZATION/IRAQ/IRAN/TURKEY/LEBANON/ARABIAN PENINSULA/ EGYPT/LIBYA/MOROCCO/TUNISIA/ALGERIA

81

EROL, O.

1968

ANADOLU KIYILARININ HOLOSENDEKI DEGISMERLERI HAKKINDA GOZLEMLER (OBSERVATIONS ON ANATOLIAN COASTLINE CHANGES DURING THE HOLOCENE).

COGRAFYA ARASTIRMALARI DERGISI 2:89-102. GA 71A-0920.

DUE TO ALLUVIATION, COASTLINE CHANGES IN THE MAIN DELTAIC AREAS OF ANATOLIA ARE VERY OBVIOUS DURING THE HOLOCENE, ESPECIALLY IN HISTORIC TIMES. SOME OBSERVATIONS ARE ALSO MADE ON SUBSIDENCES ESPECIALLY IN THE WESTERN AND SOUTHERN DELTAS. THERE ARE DROWNED VALLEYS WHICH ARE ALSO THE RESULT OF POSITIVE SEA-LEVEL CHANGES IN OTHER PLACES. ON THE OTHER HAND, AS A CERTAIN EVIDENCE OF A NEGATIVE MOVEMENT OF THE SEA AFTER THE FLANDRIAN TRANSGRESSION, SOLUTIONAL NOTCHES AT +250, +140 AND +80 CM IN THE LIMESTONES TO THE NORTH OF THE ORONTES DELTA ARE OBSERVED. THIS NEGATIVE SEA-LEVEL CHANGE, SUPPORTING THE ALLUVIATION, MUST BE ONE OF THE MAIN CAUSES FOR THE DRYING-UP OF THE ANCIENT HARBOR OF SELEUKEIA PIERIA. (AUTHOR)

TURKEY/GEOMORPHOLOGY/COASTS/LIMESTONE/HOLOCENE EPOCH/WATER LEVELS/DELTAS/ SUBSIDENCE

82

EROL, O.

1972

TROYA CEVRESININ FOTO-JEOMORFOLOJIK HARITASI (PHOTO-GEOMORPHOLOGICAL MAP OF THE AREA SURROUNDING TROY).

JEOMORFOLOJI DERGISI 4:9-20. GA 74A-0388.

IN THE SOUTHERN END OF THE DARDANELLES A PLATEAU SURFACE AT 50-60 M, AND PARTS OF AN EROSIONAL SURFACE OF OLDER PLEISTOCENE AGE, CUT ACROSS THE TOPS OF A SERIES OF CUESTAS. THE COASTLINE OF THIS PLAIN COULD HAVE EXTENDED TO NORTH OF YENIKOY AND TROY. AFTER THIS STAGE THE SEA FRONT OF THIS DELTAIC PLAIN ADVANCED MORE QUICKLY TOWARDS THE NORTH. IN AERIAL PHOTOGRAPHS SOME OLD COASTLINE TRACES, PARALLEL TO THE RECENT ONE, CAN BE SEEN ON THE NORTHERN PARTS OF THE DELTAIC PLAIN.

TURKEY/GEOMORPHOLOGY/PLEISTOCENE EPOCH/COASTAL PLAINS/CUESTAS/PLAINS/DELTAS/ LAGOONS(LANDFORMS)/FLUVIAL PROCESSES/SLOPES/AERIAL PHOTOGRAPHY

83

EVENARI, M./KOLLER, D.

1956

ANCIENT MASTERS OF THE DESERT.

SCIENTIFIC AMERICAN 194:39-45.

DESERTS/HUMANS/ADAPTATION/ENVIRONMENT/ISRAEL/NEGEV/RUNOFF FARMING/HISTORY/
WADIS/IRRIGATION PRACTICES

84

EVENARI, M./KOLLER, D.

1956

DESERT AGRICULTURE: PROBLEMS AND RESULTS IN ISRAEL. IN G.F. WHITE,
ED., THE FUTURE OF ARID LANDS.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, WASHINGTON, D.C.,
PUBLICATION 43:390-413.

ISRAEL/AGRICULTURE/DESERTS/LAND USE

85

EVENARI, M./SHANAN, L./TADMOR, N.H.

1971

THE NEGEV, THE CHALLENGE OF A DESERT.

HARVARD UNIVERSITY PRESS, CAMBRIDGE, MASSACHUSETTS. 345 P.

SUMMARIZES TWO DECADES OF SCIENTIFIC STUDY IN THE NEGEV, DURING WHICH
THE INVESTIGATORS SOUGHT TO ANSWER THE QUESTIONS OF HOW ANCIENT PEOPLE
SURVIVED THERE, HOW THEY FOUND WATER FOR FARMING, WHAT POLITICAL
FORCES DROVE THOSE CIVILIZATIONS TO DESERT SETTLEMENT, AND WHAT
CHANGES IN THE ENVIRONMENT HAVE BEEN BROUGHT ABOUT DURING THE
INTERVENING CENTURIES. ACTUAL LIVING IN THE NEGEV AND REALISTIC
EFFORTS TO USE OLD MECHANISMS AND RECONSTRUCT ANCIENT WAYS OF LIFE
WERE SUCCESSFULLY NEGOTIATED, THE AUTHORS BELIEVE, AND THE KNOWLEDGE
APPLIED TO MODERN NEEDS AND CIRCUMSTANCES. (OALS)

KWIC IS 5B/OALS/NEGEV/ISRAEL/ADAPTATION/RUNOFF FARMING/
MICROENVIRONMENT/DESERT PLANTS/HISTORY/RAINFALL-RUNOFF RELATIONSHIPS/
DESERTS/CROP PRODUCTION/LAND USE

86

EVENARI, M. ET AL

1958

THE ANCIENT DESERT AGRICULTURE OF THE NEGEV. III: EARLY BEGINNINGS.

ISRAEL EXPLORATION JOURNAL 8:231-269.

ISRAEL/NEGEV/AGRICULTURE/HISTORY

87

EVENARI, M. ET AL

1968

RUNOFF FARMING IN THE DESERT. III: EXPERIMENTAL LAYOUT.

AGRONOMY JOURNAL 60:29-32.

DESERTS/RUNOFF FARMING/CROP PRODUCTION/ISRAEL

88

FARRAND, W.R.

1971

LATE QUATERNARY PALEOCLIMATES OF THE EASTERN MEDITERRANEAN AREA. IN K.K. TUREKIAN, ED., LATE CENOZOIC GLACIAL AGES, P. 529-564.

YALE UNIVERSITY PRESS, NEW HAVEN. GA 72A-1634.

DATA PERTINENT TO CLIMATIC CHANGE - TAKEN FROM DEEP MEDITERRANEAN AND RED SEA CORES, POLLEN STUDIES IN GREECE AND ISRAEL, PLUVIAL LAKES IN THE JORDAN GRABEN AND IN JORDAN, DETERMINATIONS OF SNOWLINE LOWERING, AND PREHISTORIC CAVE HABITATIONS - ALL LEAD TO THE CONCLUSION THAT THE CLIMATE OF THE EASTERN MEDITERRANEAN DURING THE LAST CONTINENTAL GLACIATION WAS BOTH COOLER AND MORE HUMID THAN AT PRESENT. THE MEAN TEMPERATURE WAS LOWERED BY SOME 5 TO 7 DEGREES C., AND THERE WAS A DEFINITE INCREASE IN EFFECTIVE MOISTURE. THE ABSOLUTE AMOUNT OF ATMOSPHERIC PRECIPITATION MAY ALSO HAVE BEEN INCREASED. SEVERAL LINES OF EVIDENCE LEAD TO THE IDENTIFICATION OF AT LEAST ONE HUMID-DRY-HUMID CYCLE WITHIN THE LAST GLACIATION; OTHER EVIDENCE POINTS TO PROGRESSIVELY DRIER CONDITIONS THROUGHOUT THIS PERIOD OF TIME. TECTONIC ACTIVITY IN THE JORDAN GRABEN MAY HAVE INFLUENCED THE LOCAL CLIMATE MORE STRONGLY THAN DID THE DISTANT GLACIATIONS. (AUTHOR)

ISRAEL/JORDAN/RED SEA/PALEOCLIMATOLOGY/QUATERNARY PERIOD/CLIMATIC CHANGE/ CLIMATIC DATA/TECTONICS/PALYNOLOGY/MEDITERRANEAN CLIMATE/ARCHAEOLOGY/GLACIERS/ GRABEN(GEOLOGY)

89

FARRAND, W.R.

1972

GEOLOGICAL CORRELATION OF PREHISTORIC SITES IN THE LEVANT. IN F. BORDES, ED., THE ORIGIN OF HOMO SAPIENS.

UNESCO, PARIS. ECOLOGY AND CONSERVATION 3:227-235.

ISRAEL/GEOLOGY/SITES/LEBANON/ARCHAEOLOGY

90

FERNEA, R.A.

1969

LAND REFORM AND ECOLOGY IN POST-REVOLUTIONARY IRAQ.

ECONOMIC DEVELOPMENT AND CULTURAL CHANGE 17:356-381.

IRAQ/ECOLOGY/LAND MANAGEMENT/LAND USE/LAND REFORM

91

FETERIS, P.J.

1973

THE ROLE OF DEEP CONVECTION AND STRONG WINDS ALOFT IN TRIGGERING GALES OVER THE PERSIAN GULF: COMPARATIVE CASE STUDIES.

MONTHLY WEATHER REVIEW 101(5):455-460.

PERSIAN GULF/WIND(METEOROLOGY)/WIND VELOCITY/STORMS/WIND ACTION/METEOROLOGY

92

FIELD, M.

1972

AGRO-BUSINESS AND AGRICULTURAL PLANNING IN IRAN.

WORLD CROPS 24:68-72.

IRAN/AGRICULTURE/PRODUCTIVITY/PLANTING MANAGEMENT/CROP PRODUCTION/PLANNING

93

FILALI, M., EL-

1967

THE ECONOMIC AND SOCIAL DEVELOPMENT OF NOMADIC POPULATIONS BEFORE AND AFTER THEY HAVE BECOME SETTLED. IN M.R. EL-GHONEMY, ED., LAND POLICY IN THE NEAR EAST, P. 38-52.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, ROME.
NAERSA (10)811.

A BRIEF EXAMINATION IS MADE OF THE MAIN CHANGES AFFECTING THE STRUCTURE OF NOMADISM IN N. AFRICA AND THE NEAR EAST. NOMADISM SEEMS ANACHRONISTIC TODAY, THE REMNANT OF A MARGINAL SOCIAL SYSTEM IN A STATE OF UPHEAVAL, AND A TYPE OF ECONOMY LESS AND LESS IN TUNE WITH THE EVER-GROWING NEEDS OF MANKIND. THIS ANACHRONISM ONLY AGGRAVATES THE ECONOMIC BACKWARDNESS OF EMERGING COUNTRIES AND EVERYWHERE REQUIRES THE ENERGETIC INTERVENTION OF GOVERNMENTS AND PARTICULARLY OF DEVELOPMENT AUTHORITIES. PART 1 LISTS THE MEASURES REQUIRED FOR RAISING, ON A CONTINUING BASIS, THE STANDARD OF LIVING OF THE NOMADS AND PREPARING THEM FOR SETTLED FARMING. THIS CHANGEOVER TO A SEDENTARY ECONOMY, WHEREVER THE PROCESS HAS BEGUN MORE OR LESS SPONTANEOUSLY, POINTS NOT SO MUCH TO A GOAL PER SE AS TO THAT WILL TO CHANGE WITH WHICH THE MAJORITY OF NOMADIC PEOPLES ARE NOW IMBUED. THESE MEASURES RELATE TO ECONOMIC, SOCIAL, SETTLEMENT, AND ADMINISTRATIVE ASPECTS OF THE SITUATION. PART II EXAMINES SPECIFIC MEASURES OF ACCELERATING THE PROCESS OF, AND ADAPTATION TO, CHANGE.

OALS/NOMADS/MIDDLE EAST/LAND RESOURCES/SETTLEMENTS/HUMAN BEHAVIOR/ POLITICAL ASPECTS/SOCIAL ASPECTS/ECONOMIC DEVELOPMENT

94

FLANNERY, K.V.

1969

ORIGINS AND ECOLOGICAL EFFECTS OF EARLY DOMESTICATION IN IRAN AND THE NEAR EAST. IN P.J. UCKO AND G.W. DIMBLEBY, EDS., THE DOMESTICATION AND EXPLOITATION OF PLANTS AND ANIMALS, P. 73-100.

DUCKWORTH, LONDON.

IRAN/MIDDLE EAST/ECOLOGY/DRY FARMING/HISTORY/DOMESTIC ANIMALS/LIVESTOCK/ CULTIVATION/IRRIGATION PRACTICES/ECOLOGY/ARCHAEOLOGY

95

FLOWER, D.J.

1968

WATER USE IN NORTH-EAST IRAN. IN W.B. FISHER, ED., CAMBRIDGE HISTORY OF IRAN, 1:599-610.

CAMBRIDGE UNIVERSITY PRESS, CAMBRIDGE.

IRAN/WATER UTILIZATION/WATER RESOURCES/WATER MANAGEMENT/IRANIAN DESERT

96

FONTES, H.R.

1973

CONTROLLED ENVIRONMENT HORTICULTURE IN THE ARABIAN DESERT AT ABU DHABI.

HORTISCIENCE 8(1):13-16.

ARABIAN DESERT/AGRICULTURE/HORTICULTURAL CROPS/AGRONOMY/GREENHOUSES/ABU DHABI/ CONTROLLED ENVIRONMENT

97

GABRIEL, K.R.

1967

ISRAELI ARTIFICIAL RAINFALL STIMULATION EXPERIMENT: STATISTICAL EVALUATION FOR THE PERIOD 1961-1965.

SYMPOSIUM ON MATHEMATICAL STATISTICS AND PROBABILITY, 5TH, BERKELEY, CALIFORNIA, 1965-1966, PROCEEDINGS 5:91-113. MGA 19.6-190. SWRA W70-01821.

A RAINFALL STIMULATION EXPERIMENT IS BEING CARRIED OUT IN ISRAEL BY SEEDING SILVER IODIDE FROM AN AIRCRAFT IN A RANDOMIZED CROSS-OVER DESIGN. RESULTS OF 4 1/2 SEASONS SHOW 15 PERCENT MORE RAINFALL WITH SEEDING THAN WITH OUT, A RESULT WHICH IS 5 PERCENT SIGNIFICANT. IT IS SUSPECTED THAT THE EXCESS PRECIPITATION HAS OCCURRED MAINLY ON A SMALL NUMBER OF DAYS ON WHICH SEEDING APPARENTLY WAS VERY EFFECTIVE. IT HAS NOT BEEN POSSIBLE TO IDENTIFY METEOROLOGICAL CONDITIONS PARTICULARLY FAVORABLE TO SEEDING EFFECTIVENESS. NO EVIDENCE HAS BEEN FOUND THAT SEEDING EFFECTS PERSIST BEYOND THE DAY OF SEEDING.

ISRAEL/WEATHER MODIFICATION/ARTIFICIAL PRECIPITATION/CLOUD SEEDING/ RAINFALL/OALS

98

GARBELL, M.A.

1965

THE JORDAN VALLEY PLAN.

SCIENTIFIC AMERICAN 212(3):23-31.

JORDAN VALLEY/ISRAEL/JORDAN/WATER RESOURCES DEVELOPMENT/LAKE TIBERIAS

99

GERSON, R.

1974

KARST PROCESSES OF THE EASTERN UPPER GALILEE, NORTHERN ISRAEL.

JOURNAL OF HYDROLOGY 21(2):131-152. GA 74A-1329.

KARST PROCESSES DOMINATE MOST OF THE GEOMORPHIC ACTIVITY IN THE UPPER GALILEE, CONSISTING MAINLY OF DOLOMITES AND LIMESTONES. STUDY OF THE CHEMICAL EVOLUTION OF WATER PASSING THROUGH THE KARST HYDROLOGIC CYCLE CLEARLY SHOWS THAT THE MAJOR PORTION OF ITS CARBONATE SOLUTE IS GAINED SUBAERIALLY AND IN THE UPPER PART OF THE VADOSE ZONE. (AFTER AUTHOR)

SEDIMENT TRANSPORT/FAULTS(GEOLOGIC)/DISCHARGE(WATER)/GROUNDWATER MOVEMENT/ ISRAEL/KARST/LIMESTONE/DOLOMITES/GEOMORPHOLOGY/EROSION/GROUNDWATER/RUNOFF/ DENUDATION/SPRINGS/CALCITE/CARBONATES/RAINFALL/WATER CHEMISTRY

100

GLEESON, T.A.

1956

A COMPARISON OF CYCLONE FREQUENCIES IN THE NORTH ATLANTIC AND MEDITERRANEAN REGIONS.

ARCHIV FUER METEOROLOGIE, GEOPHYSIK, UND BICKLIMATOLCGIE, SER. A, 9:185-190.

WEATHER PATTERNS/CYCLONES/STORMS/MEDITERRANEAN BASIN

101

GOBLOT, H.

1962

LE PROBLEME DE L'EAU EN IRAN.

ORIENT 23:43-60.

IRAN/WATER RESOURCES

102

GORDON, A.H./LOCKWOOD, J.G.

1970

MAXIMUM ONE DAY FALLS OF PRECIPITATION IN TEHRAN.

WEATHER 25:2-8.

IRAN/PRECIPITATION(ATMOSPHERIC)/RAINFALL INTENSITY/WEATHER DATA

103

GRUELL, J.

1973

SYRIEN: TABKA STAUDAMM AM EUPHRAT (SYRIA: THE TABKA DAM ON THE EUPHRATES).

OSTERREICHISCHE GEOGRAPHISCHE GESELLSCHAFT, MITTEILUNGEN 115(1-3):272-273. GA 74C-2327.

WE CAN EASILY EXAGGERATE THE EARLY USE OF THE EUPHRATES VALLEY, AS ONE CANNOT SAY ALL FINDS WERE CONTEMPORARY. IT HAS BEEN HARD TO GET TURKISH, SYRIAN AND IRAQI AGREEMENT. RUSSIAN HELP GOES TO THE SYRIAN TABKA DAM AND THE IRAQI HADITA PROPOSAL; AND FRENCH AND IRANIAN HELP TO THE TURKISH PROJECT AT KHEBAN. THE TABKA PROJECT WOULD HAVE A HIGH DAM, AND CONTAIN 4.7 MILLIARD CUBIC METERS. RUSSIA REPLACED GERMANY AS THE BUILDER. A ROAD WAS BUILT TO ALEPPO. THE WATER WILL YIELD POWER (800 MW) AND IRRIGATE 200,000 HA (SUGAR, COTTON, FRUIT, FODDERS), I.E. AN INCREASE OF ONE-THIRD.

SYRIA/EUPHRATES RIVER/DAMS/TURKEY/WATER MANAGEMENT/IRAQ/POWERPLANTS/IRRIGATION WATER

104

HACHICHO, M.A.

1964

ENGLISH TRAVEL BOOKS ABOUT THE ARAB NEAR EAST IN THE EIGHTEENTH CENTURY.

WELT DES ISLAMS 9. 206 P.

MIDDLE EAST/TOURISM/HISTORY

105

HARDAN, A.

1971

ARCHAEOLOGICAL METHODS FOR DATING OF SOIL SALINITY IN THE MESOPOTAMIAN PLAIN. IN D.H. YAALON, ED., PALEOPEDOLOGY: ORIGIN, NATURE AND DATING OF PALEOSOLS, P. 181-187.

INTERNATIONAL SOCIETY OF SOIL SCIENCE/ISRAEL UNIVERSITIES PRESS, JERUSALEM. GA 73A-0730.

A NEW METHOD, UTILIZING SUN-DRIED MUD BRICKS OF ANCIENT WALLS, IS INTRODUCED FOR OBTAINING SOIL SAMPLES REPRESENTING IRRIGATED SOILS OF THE MESOPOTAMIAN PLAIN AT DIFFERENT PERIODS IN THE HISTORY OF AGRICULTURE IN IRAQ. ASSUMING THAT SOIL MATERIAL FOR MUD BRICKS AND PLASTER WAS OBTAINED FROM SOILS NEAR THE BUILDING SITE AND AT SELECTED HIGH SITES, BRICKS AND PLASTER WERE NOT SUBJECTED TO INFLUENCE OF FLOODS, CAPILLARY ACTION, RAIN OR WEATHERING, THESE SAMPLES REPRESENT THE PROPERTIES OF THE ORIGINAL SOILS. FOUR ARCHAEOLOGICAL SITES ALONG THE EUPHRATES AND FOUR ALONG THE TIGRIS RIVER WERE SAMPLES, INDICATING SOIL SALINITY WAS ALREADY PRESENT PRIOR TO OR AT THE INCEPTION OF IRRIGATION IN THE MESOPOTAMIAN PLAIN SOME 6-7 THOUSAND YEARS AGO, AND THAT THE DEGREE AND TYPE OF SALINITY ARE RELATED TO TIME AND LOCATION RELATIVE TO THE TWIN RIVERS. (AUTHOR)

OALS/IRAQ/MESOPOTAMIAN PLAIN/EUPHRATES RIVER/TIGRIS RIVER/ARCHAEOLOGY/ SALINITY/SOIL ANALYSIS/SALINE SOILS/IRRIGATION WATER/SALINE WATER/ IRRIGATION EFFECTS

106

HARDAN, A./ABBAS, A.K.

1973

MECHANISMS OF ACCUMULATION AND DISTRIBUTION OF CALCIUM CARBONATE IN MARSH SOILS OF THE LOWER MESOPOTAMIAN PLAIN. IN E. SCHLICHTING AND U. SCHWERTMANN, EDS., PSEUDOGLEY AND GLEY: GENESIS AND USE OF HYDROMORPHIC SOILS. INTERNATIONAL SOCIETY OF SOIL SCIENCE, COMMISSIONS 5 AND 6, TRANSACTIONS, P. 123-130.

VERLAG CHEMIE, WEINHEIM. 771 P. GA 74A-0269.

THE ACCUMULATION AND DISTRIBUTION OF CACO3 BY PEDOGENETICAL PROCESSES WHICH ARE ASSOCIATED WITH PREVIOUSLY OR PRESENTLY WATERLOGGED DEPRESSIONS IN THE LOWER MESOPOTAMIAN PLAIN WERE STUDIED. CALCULATIONS OF THE 'SATURATION INDEX' FOR VARIOUS WATERS OF TIGRIS, EUPHRATES, DIYALLA, SHATT-EL-ARAB, MARSHES AND MOURS INDICATE THE TENDENCY FOR CACO3 TO PRECIPITATE FROM ALL OF THESE WATERS. THE ROLE OF SHALLOW SALINE GROUNDWATER, VEGETATION, AND BIOLOGICAL SO4 REDUCTION IN THE ACCUMULATION AND DISTRIBUTION OF LIME IN RELATION TO SOIL DEPTH WAS ALSO STUDIED.

MESOPOTAMIAN PLAIN/SOIL CHEMICAL PROPERTIES/CALCIUM CARBONATES/TIGRIS RIVER/ EUPHRATES RIVER/LIME/SALINE WATER/DEPRESSIONS(GEOMORPHIC)/GROUNDWATER/SOIL FORMATION/VEGETATION EFFECTS/BIOLOGICAL CONTROLS

107

HARE, V.C.

1954

THE JORDAN, VALLEY OF THE FUTURE: DESERT OR GARDEN?

NEAR EAST 7:8-15.

JORDAN VALLEY/LAND USE

108

HAUPERT, J.S.

1966

RECENT PROGRESS ON JORDAN'S EAST GHOR CANAL.

PROFESSIONAL GEOGRAPHER 18:9-13.

JORDAN/CANALS/WATER MANAGEMENT

109

HEADY, H.F.

1972

ECOLOGICAL CONSEQUENCES OF BEDOUIN SETTLEMENT IN SAUDI ARABIA. IN H.T. FARVAR AND J. P. MILTON, EDS., THE CARELESS TECHNOLOGY: ECOLOGY AND INTERNATIONAL DEVELOPMENT, P. 683-693.

NATURAL HISTORY PRESS, N.Y. 1030 P.

ONE UNPLANNED AND UNFORESEEN SIDE EFFECT OF THE OIL INDUSTRY IN SAUDI ARABIA HAS BEEN SETTLEMENT OF MANY BEDOUINS. THIS PAPER TRACES THE RECENT DEVELOPMENT OF WATER AND GRAZING FOR DOMESTIC ANIMALS. BASIC GEOGRAPHIC CONSIDERATIONS ARE OUTLINED. THE GRAZING HISTORY IS REVIEWED, INCLUDING THE EFFECT ON WATER DEVELOPMENT BY OIL INTERESTS AND THE DROUGHT OF 1955-63 ON INTENSIFICATION OF SETTLEMENT. THE AUTHOR REPORTS ON NUMBERS OF GRAZING ANIMALS AND CONDITIONS OF THE RANGE. HYDROLOGICAL DEVELOPMENT OF WELLS WAS OFTEN POORLY CARRIED OUT, RESULTING IN EXCESS WATER, HIGH SALINITY AND POOR DRAINAGE. RECENTLY WATER MANAGEMENT PRACTICES HAVE BEEN IMPROVED. THE AUTHOR QUESTIONS THE USEFULNESS OF WATER-SPREADING SYSTEMS IN WADIS. DEPLETION OF WILDLIFE IS RELATED TO THE INTRODUCTION OF FOUR-WHEEL DRIVE VEHICLES. THE AUTHOR FEELS THAT MANY BEDOUINS CAN EASILY MOVE INTO MODERN SOCIETY, BUT THAT THEIR WAY OF LIFE IS THE BEST FOR EXPLOITATION OF THE RANGE RESOURCES. FOR THOSE THAT RETAIN THEIR NOMADIC EXISTENCE, HE SUGGESTS THAT MODERNIZATION OF BEDOUIN LIFE IN SITU WITH ALL THE SERVICES AVAILABLE FROM TECHNOLOGICAL AGRICULTURE AND OTHER ASPECTS OF MODERN SOCIETY SHOULD BE BROUGHT TO BEAR ON THE PROBLEMS OF LIVESTOCK PRODUCTION IN ARID REGIONS.

OALS/SAUDI ARABIA/ARABIAN DESERT/NOMADS/ENVIRONMENTAL EFFECTS/SOCIAL ASPECTS/ECONOMIC DEVELOPMENT/OIL FIELDS/WATER RESOURCES DEVELOPMENT/ WATER SPREADING/SALINITY/DROUGHTS/LIVESTOCK/GRAZING/REGIONAL GEOGRAPHY/

110

HEINZELIN, J.

1965

OBSERVATIONS SUR LES TERRACES DU MOYEN-EUPHRATE (OBSERVATIONS ON THE TERRACES OF THE MIDDLE EUPHRATES).

SOCIETE GEOLOGIQUE DE FRANCE, BULLETIN 7(7):37-44. GA 67A-82.

TERTIARY DEPOSITS AT THE SITE OF THE NEW RESERVOIR OF TAQBA ON THE RIVER EUPHRATES INCLUDE: 1) THE DIBSI FORMATION: 70-90 METERS OF FLOOD PLAIN MATERIAL CONTAINING HORN FLINT PEBBLES, PREFERABLE TO SEDIMENTATION IN THE JABBUL BASIN BEFORE THE LINKING OF THE UPPER AND MIDDLE EUPHRATES INDUCED BY RECENT TECTONIC DEFORMATION; 2) THE SHAJARA FORMATION: FLUVIATILE TERRACE DEPOSITS 20-30 METERS ABOVE THE PRESENT CHANNEL, AND CONTAINING LOWER PALEOLITHIC ARTIFACTS; 3) THE MUREIBAT FORMATION: FLUVIATILE TERRACE DEPOSITS 1-10 METERS ABOVE THE PRESENT CHANNEL AND CONTAINING MESOLITHIC ARTIFACTS. THE MUREIBAT FORMATION GRADES INTO THE SHAJARA FORMATION IN PLACES; 4) THE FLOOD PLAIN REFERABLE TO THE PRESENT CHANNEL, DEVELOPED UNINTERRUPTEDLY SINCE NEOLITHIC TIMES.

EUPHRATES RIVER/RESERVOIRS/GEOMORPHOLOGY/ALLUVIUM/ARCHAEOLOGY/FLUVIAL PROCESSES/TERTIARY PERIOD/TERRACES(GEOMORPHOLOGY)/FLOOD PLAINS

111

HOROWITZ, A.

1971

CLIMATE AND VEGETATIONAL DEVELOPMENTS IN NORTHEASTERN ISRAEL DURING UPPER PLEISTOCENE - HOLOCENE TIMES.

POLLEN ET SPORES 13:255-278.

POLLEN DIAGRAMS FROM THE HULA AND KINNERET BASINS, IN THE NORTHERN JORDAN VALLEY (ISRAEL), ARE PRESENTED AND DISCUSSED. IT IS SUGGESTED THAT THE DIAGRAMS COVER THE LAST 80,000 YEARS, REPRESENTING THE UPPER PLEISTOCENE AND HOLOCENE. THE MOUNTAIN VEGETATION CHANGED FROM FOUR STANDS OF MIXED MAQUIS, DURING THE RISS WUERM INTERPLUVIAL, 80,000-60,000 YEARS B.P., TO A WELL DEVELOPED OAK FOREST OF THE WUERM PLUVIAL, 60,000-11,500 YEARS B.P. THE VEGETATION CHANGED IN THE HOLOCENE ONCE MORE INTO A MIXED MAQUIS, TYPICAL FOR INTERPLUVIAL CLIMATE. IT WAS FOUND THAT THE PLUVIALS IN ISRAEL CORRESPOND IN AGE TO THE EUROPEAN GLACIALS, AND THE INTERPLUVIAL TO THE INTERGLACIAL. THE INTERSTADIALS ARE ALSO SYNCHRONOUS ON THE WHOLE, AND EVEN THE MINOR CLIMATIC CHANGES WITHIN THE HOLOCENE BEAR THE SAME AFFINITY AS THOSE KNOWN FROM EUROPE.

BASINS/MOUNTAINS/ISRAEL/JORDAN VALLEY/VEGETATION/PALEOCLIMATOLOGY/GLACIAL GEOLOGY/PLEISTOCENE EPOCH/HOLOCENE EPOCH/PALYNOLOGY/VEGETATION CHANGE/FORESTS/ CLIMATIC CHANGE

112

HOROWITZ, A.

1973

DEVELOPMENT OF THE HULA BASIN, ISRAEL.

ISRAEL JOURNAL OF EARTH SCIENCES 22(2):107-139. GA 74A-0556.

PALYNOLOGICAL, GEOMORPHOLOGICAL AND GEOLOGICAL DATA INDICATE THAT THE HULA AREA HAS EXISTED AS A TAPHROGENIC UNIT SINCE PLIOCENE TIMES. THE HULA BASIN IS FILLED WITH A SERIES OF LACUSTRINE, PALUDAL AND FLUVIATILE SEDIMENTS, SOMETIMES WITH BASALTIC INTERCALATIONS. EARLY PLEISTOCENE SEDIMENTS ARE MISSING WITHIN THE BASIN, AND MIDDLE PLEISTOCENE THROUGH RECENT IS REPRESENTED BY A SEQUENCE OF FORMATIONS. CORRELATIONS OF THESE FORMATIONS WITH OTHER ROCK UNITS IN THE JORDAN VALLEY ARE SUGGESTED. CLIMATIC CHANGES, THAT ARE REFLECTED IN THE POLLEN SPECTRA, INFLUENCED THE PATTERN OF LAKE AND MARSHES IN THE BASIN. (AFTER AUTHOR)

ISRAEL/CLIMATIC CHANGE/GEOMORPHOLOGY/PLEISTOCENE EPOCH/PLIOCENE EPOCH/GEOLOGY/ PALYNOLOGY/BASALT/SEDIMENTS/JORDAN VALLEY/BASINS/LAKES

113

HOURANI, A.

1957

THE CHANGING FACE OF THE FERTILE CRESCENT IN THE EIGHTEENTH CENTURY.

STUDIA ISLAMICA 8:89-122.

MESOPOTAMIAN PLAIN/TIGRIS RIVER/EUPHRATES RIVER/HISTORY

114

HUDSON, J.

1968

THE ROLE OF IRRIGATION (IN SYRIA).

FOCUS 18(8):8-11.

SYRIA/IRRIGATION

115

HUTCHINSON, G.E./COWGILL, U.M.

1963

CHEMICAL EXAMINATION OF A CORE FROM LAKE ZERIBAR, IRAN.

SCIENCE 140(3562):67-69.

IRAN/LAKES/CHEMICAL ANALYSIS

116

HUZAYYIN, S.

1935

CHANGEMENT HISTORIQUE DU CLIMAT ET DU PAYSAGE DE L'ARABIE DU SUD (HISTORICAL CHANGES IN THE CLIMATE AND LANDSCAPE OF SOUTHERN ARABIA).

CAIRO UNIVERSITY, FACULTY OF ARTS, BULLETIN 3(2):19-23.

ARABIAN DESERT/HISTORY/CLIMATIC CHANGE/TOPOGRAPHY/SOUTH ARABIA

117

IBRAHIM, K.M.

1967

SUMMARY REPORT AND BIBLIOGRAPHY [ON] THE PASTURE, RANGE AND FODDER CROP SITUATION IN THE NEAR EAST.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, ROME. 159 P. WAERSA (10) 3047.

THIS COMPILATION OF DATA COVERS LIBYA, EGYPT, THE SUDAN REPUBLIC, SOMALIA, ETHIOPIA, SAUDI ARABIA, YEMEN, KUWAIT, JORDAN, LEBANON, SYRIA, CYPRUS, TURKEY, IRAQ, IRAN, PAKISTAN AND AFGHANISTAN. FOR EACH OF THESE 17 COUNTRIES, A CHAPTER PRESENTS BRIEF INFORMATION ON NATURAL GRASSLANDS, PASTURES AND FODDER CROPS, PROBLEMS CONNECTED WITH GRAZING AND ADEQUATE FEEDING OF ANIMALS, AND WORK DONE TO IMPROVE THE SITUATION, FOLLOWED BY A LIST OF PUBLICATIONS. THE SUMMARY HAS BEEN ISSUED TO PROMOTE CO-ORDINATION OF REGIONAL RESEARCH PROGRAMMES. A COMMON PROBLEM IS THE DETERIORATION OF THE NATURAL VEGETATION IN GRAZING AREAS THROUGH OVERSTOCKING, ACCELERATED BY THE CONSTRUCTION OF WELLS AND RECLAMATION OF LAND FOR AGRICULTURAL CROPS.

BIBLIOGRAPHIES/OALS/MIDDLE EAST/PASTURES/GRAZING/LIVESTOCK/RANGES/ PERTURBATION/CROP PRODUCTION/FORAGE SUPPLY

118

ISRAEL NATIONAL COUNCIL FOR RESEARCH AND DEVELOPMENT, JERUSALEM

1971

SYMPOSIUM ON ARTIFICIAL RAIN, SHORESH, 1970, PROCEEDINGS.

SAME AS AUTHOR. 92 P. MGA 23.4-10.

THESE PROCEEDINGS CONTAIN THE RESULTS OF RESEARCH PROJECTS AIMED AT THE ARTIFICIAL INCREASE OF RAINFALL, ESPECIALLY AS THE PREVAILING CONDITIONS IN ISRAEL DEMAND NEW AND BETTER SOURCES OF WATER. BACKGROUND PAPERS MAKE A LIMITED SURVEY OF THE VARIOUS ASPECTS OF RAIN FORMATION (ICE CRYSTALIZATION AND COLLISION-COALESCENCE PROCESSES IN PARTICULAR); OTHERS PRESENT EXPERIMENTAL RESULTS, AND GIVE POSSIBLE EXTENSIONS TO DROPLET FORMATION THEORY AND TO POTENTIAL RAIN MAKING APPLICATIONS. ATTENTION IS ALSO GIVEN TO REDUCTION OF EVAPORATION LOSSES BY SURFACTANTS AND THE PHENOMENON OF VIRGAE.

OALS/ARTIFICIAL PRECIPITATION/ISRAEL/CLOUD SEEDING/WEATHER MODIFICATION/WATER YIELD IMPROVEMENT/EVAPORATION CONTROL

119

ISSAR, A.

1968

GEOLOGY OF THE CENTRAL COASTAL PLAIN OF ISRAEL.

ISRAEL JOURNAL OF EARTH-SCIENCES 17(1):16-29 GA 69A-817.

SUBSURFACE GEOLOGICAL INVESTIGATIONS IN THE CENTRAL COASTAL PLAIN OF ISRAEL REVEALED THE EXISTENCE OF FOUR MAIN INGRESSIONS DURING THE PLEISTOCENE PERIOD, TO WHICH WERE ATTRIBUTED THE AGES OF SICILIAN, TYRRHENIAN I, TYRRHENIAN II AND POST TYRRHENIAN (FLANDRIAN). THE AGE DETERMINATIONS WERE BASED MAINLY ON THE PRESENCE OF THE FORAMINIFER HYALINEA BALTICA IN LAYERS OF THE FIRST REGRESSION WHICH WAS CORRELATED WITH THE CALABRIAN, AND THE EXISTENCE OF THE WARM WATER FORAMINIFER MARGINOPORA SP. WHICH WAS FOUND EXCLUSIVELY IN THE SEDIMENTS OF THE SECOND AND THIRD INGRESSIONS AND, THUS CORRELATED WITH THE TYRRHENIAN I AND II. A CORRELATION WITH OTHER STRATIGRAPHIC DIVISIONS AND PREHISTORIC CULTURES OF THE PLEISTOCENE PERIOD IN THE WESTERN MEDITERRANEAN COAST IS SUGGESTED. (AUTHOR)

ISRAEL/COASTAL PLAINS/GEOLOGY/PLEISTOCENE EPOCH/SEDIMENTS/STRATIGRAPHY/ ARCHAEOLOGY

120

ISSAR, A.

1969

GROUNDWATER PROVINCES OF IRAN.

INTERNATIONAL ASSOCIATION OF SCIENTIFIC HYDROLOGY, BULLETIN 14(1):87-99. HGA 21.1-799. SWRA(2)W69-06772.

THE HYDROGEOLOGICAL CHARACTER OF VARIOUS PROVINCES OF IRAN IS OUTLINED. EMPHASIZED ARE COMBINED INFLUENCES OF CLIMATE, LITHOLOGY AND GEOLOGICAL STRUCTURE ON OCCURRENCE, FLOW AND QUALITY OF GROUNDWATER IN THE CENTRAL PLATEAU, ZAGROS MOUNTAINS, CASPIAN COASTAL PLAIN, AND ALBORZ MOUNTAINS. (OALS)

HYDROGEOLOGY/GROUNDWATER BASINS/IRAN/ZAGROS MOUNTAINS/OALS

121

JACOBSEN, T./ADAMS, R.M.

1958

SALT AND SILT IN ANCIENT MESOPOTAMIAN AGRICULTURE.

SCIENCE 128(3334):1251-1258.

MESOPOTAMIAN PLAIN/AGRICULTURE/SALTS/SILTS

122

JOHNSON, D.L.

1969

THE NATURE OF NOMADISM: A COMPARATIVE STUDY OF PASTORAL MIGRATIONS IN SOUTHWESTERN ASIA AND NORTHERN AFRICA.

UNIVERSITY OF CHICAGO, DEPARTMENT OF GEOGRAPHY, RESEARCH PAPER 118. 200 P. GA 71D-1711.

IN ADDITION TO REVIEWING A PORTION OF THE VAST LITERATURE DEALING WITH NOMADS, THE PAPER ATTEMPTS TO CLASSIFY NOMADIC GROUPS ON THE BASIS OF THE CARTOGRAPHIC APPEARANCE OF THEIR MIGRATION PATTERN. CASE STUDIES OF TRIBES REPRESENTING ECOLOGICAL AND ENVIRONMENTAL FACTORS ARE UTILIZED AS THE MAJOR RESEARCH TOOL. EMPHASIS HAS BEEN PLACED ON THE TRADITIONAL MIGRATORY REGIME RATHER THAN THE CURRENT TREND TOWARD SEDENTARIZATION. A CLASSIFICATION OF PASTORAL MIGRATION IS PROVIDED INCLUDING FACTORS SUCH AS DOMICILE, POLITICAL AND SOCIAL ORGANIZATION, LENGTH OF DISPLACEMENT, ANIMALS HERDED, SEASONAL LOCATION, ROLE OF AGRICULTURE, AND TRADING MECHANISMS.

OALS/NOMADS/BIBLIOGRAPHIES/CAMELS/MIGRATION/GEOGRAPHICAL ORIGIN/ VARIABILITY(ENVIRONMENTAL)/LAND RESOURCES /TURKEY/ARABIAN DESERT/IRAN/ AFGHANISTAN/NORTH AFRICA/MAURITANIA/SAHARA/TRANSHUMANCE/GRAZING

123

KAISER, K. ET AL

1973

QUARTAERSTRATIGRAPHISCHE UNTERSUCHUNGEN AUS DEM DAMASKUS-BECKEN UND SEINER UMGEBUNG (QUATERNARY STRATIGRAPHIC RESEARCH ON THE DAMASCUS BASIN AND ITS SURROUNDINGS).

ZEITSCHRIFT FUER GEOMORPHOLOGIE 17(3):263-353. GA 74A-0557.

THE BASIN INCLUDES BOTH ALLUVIAL AND LACUSTRINE SEDIMENTS. MOST OF THE DISCUSSION CONCERNS WUERM AND HOLOCENE DEPOSITS. DEPOSITIONAL HISTORY, SOIL DEVELOPMENT, PALYNOLOGY AND MOLLUSCS ARE ALL DISCUSSED. A CLIMATIC/ ENVIRONMENTAL SEQUENCE IS ESTABLISHED. PLUVIALS WERE COOL AND COINCIDED WITH NORTHERN GLACIAL PERIODS. THERE WAS A SHORT NEOLITHIC PLUVIAL IN THE MIDDLE OF THE HOLOCENE. LAKE LEVELS ROSE TO 100-140 M ABOVE THE BASIN FLOOR AT THE END OF THE RISS AND 10-30 M ABOVE IN THE WUERM.

SYRIA/QUATERNARY PERIOD/STRATIGRAPHY/PALEOCLIMATOLOGY/HOLOCENE EPOCH/SOIL FORMATION/PALYNOLOGY/LAKES/WATER LEVELS/GLACIERS/DEPOSITION(SEDIMENTS)/BASINS/ ALLUVIUM

124

KARMELI, D./YAALON, D.H./RAVINA, I.

1968

DUNE SAND AND SOIL STRATA IN QUATERNARY SEDIMENTARY CYCLES OF THE SHARON COASTAL PLAIN.

ISRAEL JOURNAL OF EARTH-SCIENCES 17(2):45-53. GA 69A-1155.

QUANTITATIVE DATA OF SEDIMENT CHARACTERISTICS WERE OBTAINED FROM CORES ON QUATERNARY SANDY RIDGES IN THE PARDES HANNA AND GIVAT HAYYIM AREAS. CONSTRUCTIONAL CYCLES OF DUNE SAND ACCUMULATION AND SOIL DEVELOPMENT WERE IDENTIFIED. THE UNIFORM DISTRIBUTION OF FINES IN THE TOTAL THICKNESS OF THE SOIL STRATUM IRRESPECTIVE OF ITS POSITION ON THE RIDGE INDICATES AN AEOLIAN ORIGIN OF THE CLAY AND ITS IMBEDDING INTO THE SOILS BY LEACHING. TOPOGRAPHIC DIFFERENCES ARE THE MAIN FACTOR CAUSING THE DEVELOPMENT OF THE DIFFERENT SOILS. THE TOTAL AMOUNT OF FINES IN A SOIL STRATUM MAY BE A USEFUL PARAMETER FOR SUBSURFACE CORRELATIONS AND FOR ESTIMATING THE RATE OF AEOLIAN DEPOSITION. (AUTHORS)

ISRAEL/COASTAL PLAINS/QUATERNARY PERIOD/LEACHING/SEDIMENTS/SOIL FORMATION/ SAND DUNES/SOIL HORIZONS/TOPOGRAPHY/EOLIAN SOILS/FINE-TEXTURED SOILS

125

KARSCHON, R.

1964

AFFORESTATION AND TREE PLANTING IN THE ARID AREAS OF THE NEGEV OF ISRAEL.

ANNALS OF ARID ZONE 3:13-24.

ISRAEL/NEGEV/AFFORESTATION/TREES

126

KATSNELSON, J.

1964

THE VARIABILITY OF ANNUAL PRECIPITATION IN PALESTINE.

ARCHIV FUER METEOROLOGIE, GEOPHYSIK, UND BIOKLIMATOLOGIE, SER. B, 13:163-172.

PALESTINE/PRECIPI' (ATMOSPHERIC)/VARIABILITY(ENVIRONMENTAL)

127

KATSNELSON, J.

1970

FREQUENCY OF DUSTSTORMS AT BEER SHEVA.

ISRAEL JOURNAL OF EARTH SCIENCES 19(2):69-76. GA 71B-1986. SNBA W71-12096.

A SAND OR DUST STORM OCCURS IF THE VISIBILITY IS REDUCED TO LESS THAN 1 KM WHILE THE PARTICLES ARE BEING RAISED TO GREAT HEIGHTS BY STRONG AND TURBULENT WINDS. SUCH STORMS OCCUR MAINLY IN DESERT REGIONS AND THE NECESSARY CONDITIONS FOR THEIR OCCURRENCE ARE EXISTING AREAS OF LOOSE SAND, DUST OR LOESS, RELATIVELY STRONG WINDS, A STEEP TEMPERATURE LAPSE RATE IN THE LOWER ATMOSPHERE LAYERS, AND A PRECEDING DRY SPELL. RAINFALL USUALLY CAUSES THEIR CESSATION. ALL DUST STORMS RECORDED AT THE METEOROLOGICAL STATION AT BEERSEEVA OVER A 12-YEAR PERIOD (1958-1969) WERE ANALYZED IN TERMS OF WIND DIRECTION, WIND VELOCITY AND TIME OF YEAR. THERE WERE 88 STORMS IN WHICH VISIBILITY WAS 5 KM OR LESS (RECORDED FOR AVIATION PURPOSES) AND 39 STORMS OF 1 KM OR LESS VISIBILITY. CONTRARY TO PREVIOUS OPINION, IT WAS FOUND THAT 60 PERCENT OF ALL STORMS HAVING EITHER KIND OF VISIBILITY COME FROM SW-NW. APPARENTLY AFTER THE PASSAGE OF A COLD, DRY FRONT, THE WIND VEERS AND BECOMES W-NW WITH DECREASING VELOCITY, BUT IS STILL STRONG ENOUGH TO TRANSPORT TO BEERSHEVA PART OF THE DUST FROM SW TO NW OF THE AREA AND TO RETURN PART OF THE DUST IN THE AIR OF W-NW SECTOR. (OALS)

DUST STORMS/ARID LANDS/CLIMATIC DATA/SANDS/LOESS/WIND VELOCITY/ ENVIRONMENTAL EFFECTS/ISRAEL/NEGEV/WIND(METEOROLOGY)/EOLIAN SOILS/ FRONTS(METEOROLOGY)/WEATHER PATTERNS/OALS

128

KAUL, R.N./THALEN, D.C.P.

1971

RANGE RESOURCES OF IRAQ, A PROBLEM ANALYSIS.

INSTITUTE FOR APPLIED RESEARCH ON NATURAL RESOURCES, ABU GHRAIB, IRAQ, TECHNICAL REPORT 20. 31 P.

THE AUTHORS REVIEW THE RANGE RESOURCES OF IRAQ; PAST, PRESENT AND FUTURE. THE DEMAND FOR LIVESTOCK PRODUCTS HAS RISEN SHARPLY DURING THE PAST DECADE AND IS EXPECTED TO CONTINUE TO RISE. A REVIEW OF PAST WORK ON CLIMATOLOGY, SOILS, HYDROLOGY AND VEGETATION PRECEDES A DISCUSSION OF RANGE UTILIZATION AND LIVESTOCK PRODUCTION. THE NEED FOR INCREASED STRESS ON THE DEVELOPMENT OF CULTIVATED FODDER AND PASTURES IS OUTLINED AS WELL AS THE NEED FOR ACCURATE CENSUS OF LIVESTOCK. THE PRESENT SITUATION CONCERNING RANGE AND CULTIVATED FODDER RESOURCES IS DESCRIBED FOR 5 AGRO-CLIMATIC REGIONS. SOME RANGE LAND HAS BEEN TURNED TO PRODUCTION OF WHEAT, BARLEY AND DATES; PRODUCTION AND YIELDS ARE LOW. THE USE OF NATIVE RANGELANDS BY VARIOUS TRIBES OF PASTORAL NOMADS AND THEIR INFLUENCE ON RANGE CONDITIONS IS CONSIDERED. PRESENT PROBLEMS ARE OUTLINED AND A SERIES OF POSSIBLE REMEDIES ARE PROPOSED INCLUDING; FORMATION OF AN AGENCY TO ORGANIZE ACTIVITIES IN RANGE MANAGEMENT, ESTABLISHMENT OF HOLDING CENTERS RESEEDING, WATER MANAGEMENT AND RESEARCH PROGRAMS.

LAND TENURE/OALS/IRAQ/RANGE MANAGEMENT/FORAGE PRODUCTION/LAND USE/NOMADS/SOCIAL ASPECTS/LIVESTOCK/ARABIAN DESERT/WADIS/WATER CONSERVATION/RANGES/FORAGE PLANTS/PASTURES/FORAGE SUPPLY/GRAZING/CARRYING CAPACITY

129

KAYAN, I.

1971

GOKOVA VE CEVRESINDE FIZIKI COGRAFYA ARASTIRMALARI (RESEARCH ON THE PHYSICAL GEOGRAPHY OF THE GOKOVA PLAIN AND ITS SURROUNDINGS).

COGRAFYA ARASTIMALARI DERGISI 3-4:295-336.

TURKEY/PHYSICAL GEOGRAPHY/PLAINS

130

KENYON, K.M.

1969

THE ORIGINS OF THE NEOLITHIC.

ADVANCEMENT OF SCIENCE 26:144-160.

ARCHAEOLOGY/MIDDLE EAST/JORDAN/PALESTINE/IRAQ/TURKEY/PLANTS/ANIMALS/HISTORY

131

KERNAN, H.S.

1957

FOREST MANAGEMENT IN IRAN.

MIDDLE EAST JOURNAL 11:199-202.

IRAN/FOREST MANAGEMENT

132

KHALILI, I., AL-

1973

PRECIPITATION PROBLEMS OF CENTRAL ELBURZ.

ARCHIV FUER METEOROLOGIE, GEOPHYSIK UND BICKLIMATOLOGIE, SER. B, 21(2-3):215-232.

IRAN/PRECIPITATION(ATMOSPHERIC)

133

KHASHAB, W.H., AL-

1958

THE WATER BUDGET OF THE TIGRIS - EUPHRATES BASIN.

UNIVERSITY OF CHICAGO, DEPARTMENT OF GEOGRAPHY, RESEARCH PAPER 54. 105 P.

RIVER BASINS/TIGRIS RIVER/EUPHRATES RIVER/HYDROLOGIC BUDGET

134

KIBARDIN, R.E.

1969

PREDICTING THE HARVEST OF WINTER WHEAT (TRANSLATED TITLE).

METEOROLOGIYA I GIDROLOGIYA 2:111-112. GA 72B-0336.

IN THE WESTERN PART OF JORDAN THE HIGHEST GRAIN HARVEST IS ACHIEVED WITH PRECIPITATION OF THE ORDER OF 900 MM FOR THE SEASON, AMOUNTING TO 113 G PER 1 MM OF PRECIPITATION. IN THE WEST, THE MORE ARID PART OF JORDAN, THE HIGHEST HARVEST, FOUND FOR 1 MM OF PRECIPITATION IS 244 G. THIS IS BECAUSE IN THE WINTER SEASON THE SOIL ACCUMULATES A LARGER AMOUNT OF WATER. A PREDICTION IS GIVEN FOR THE 1967 MEAN WHEAT HARVEST. IN THE PROVINCE OF AMMAN HARVEST (Y) WAS EXPECTED TO BE EQUAL TO 9.5 CENTNERS PER HECTARE, AND IN THE JERUSALEM PROVINCE 8.9 CENTNERS PER HECTARE. THE PREDICTION PROVED CORRECT. (IN RUSSIAN)

JORDAN/DRY FARMING/PRECIPITATION(ATMOSPHERIC)/TRITICUM/CROP RESPONSE/WEATHER DATA/CROP PRODUCTION/FORECASTING

135

KLEIN, C.

1961

ON THE FLUCTUATIONS OF THE LEVEL OF THE DEAD SEA SINCE THE BEGINNING OF THE 19TH CENTURY.

ISRAEL HYDROLOGICAL SERVICE, JERUSALEM, PAPER 7.

DEAD SEA/HISTORY/WATER LEVELS

136

KNILL, J.L./JONES, K.S.

1968

GROUND WATER CONDITIONS IN GREATER TEHRAN.

QUARTERLY JOURNAL OF ENGINEERING GEOLOGY 1(3):181-194.

IRAN/GROUNDWATER

137

KOLARS, J.

1966

LOCATIONAL ASPECTS OF CULTURAL ECOLOGY: THE CASE OF THE GOAT IN NON-WESTERN AGRICULTURE.

GEOGRAPHICAL REVIEW 56:577-584.

GOATS/AGRICULTURE/TURKEY/ANIMAL DAMAGE/SOCIAL ASPECTS/FORESTS/FERTILIZERS

138

KRAMER, H.P.

1951

CLIMATOLOGY OF THE MIDDLE EAST AND CENTRAL ASIA. A SELECTED, ANNOTATED BIBLIOGRAPHY.

METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY 2(6):453-480.

A CHRONOLOGICAL (1861-1951) BIBLIOGRAPHY COVERING THE CLIMATOLOGY OF THE GENERAL GEOGRAPHICAL REGION, SPECIFIC GEOGRAPHICAL AREAS, AND THE SEA AND OCEAN REGIONS BORDERING THESE PARTICULAR LANDS. AN OUTLINE OF CONTENTS PLUS AUTHOR AND SUBJECT INDEXES SERVE TO IDENTIFY CITATIONS.

TURKESTAN DESERT/WEATHER DATA/OALS/CLIMATOLOGY/GEOGRAPHY/DESERTS/ PERSIAN GULF/ARABIAN PENINSULA/MIDDLE EAST/MIDDLE ASIA/CASPIAN SEA/ AFGHANISTAN/BALUCHISTAN/IRAN/IRAQ/USSR/MESOPOTAMIAN PLAIN/EUPHRATES RIVER/SYRIA/BIBLIOGRAPHIES/AGRICULTURAL CLIMATOLOGY/CLIMATIC CHANGE/ ATMOSPHERIC CIRCULATION/RAINFALL/ANTICYCLONES/BIOCLIMATOLOGY/ RADIATION/SOLAR RADIATION/TEMPERATURE RANGES/WIND(METEOROLOGY)

139

KRINSLEY, D.B.

1968

GEOMORPHOLOGY OF THREE KAVIRS IN NORTHERN IRAN. IN J.T. NEAL, ED., PLAYA SURFACE MORPHOLOGY: MISCELLANEOUS INVESTIGATIONS.

U.S. AIR FORCE CAMBRIDGE RESEARCH LABORATORIES, MASSACHUSETTS, ENVIRONMENTAL RESEARCH PAPERS 283:105-130. GA 69A-1065.

THE DISTRIBUTION OF THREE KAVIRS IN NORTHERN IRAN AS WELL AS THE PRESENCE OR ABSENCE OF PERIPHERAL LACUSTRINE DEPOSITS SUGGEST THAT THE PLEISTOCENE CLIMATE OF NORTHERN IRAN WAS SIMILAR TO THE PRESENT CLIMATE, EXCEPT THAT THE PRECIPITATION/EVAPORATION RATIO WAS HIGHER DUE TO DECREASED SUMMER TEMPERATURE. THIS PLEISTOCENE CLIMATIC REGIME RESULTED IN EXTENSIVE LACUSTRINE EXPANSION AT DARYACHEH REZAIYEH (LAKE URMIA), AND PROBABLE EXPANSION AT SABZEVAR KAVIR. AT THE GREAT KAVIR, WHERE IT WAS COOLER AND WINDIER BUTNOT WETTER THAN AT PRESENT, THERE IS NO EVIDENCE THAT A LAKE EVER EXISTED. (AUTHOR)

IRAN/IRANIAN DESERT/GEOMORPHOLOGY/PLEISTOCENE EPOCH/PALEOCLIMATOLOGY/ DASHT-E-KAVIR/SALT DESERTS/DEPOSITION(SEDIMENTS)/PLAYAS

140

KRINSLEY, D.B.

1970

A GEOMORPHOLOGICAL AND PALEOCLIMATOLOGICAL STUDY OF THE PLAYAS OF IRAN. FINAL REPORT, 1965-1970. 2 PTS.

U.S. AIR FORCE CAMBRIDGE RESEARCH LABORATORIES, AFCRL-70-0503:1-2. AVAILABLE NTIS AS AD-721 843/849. GA 71A-2110.

THE MORPHOLOGY OF THE SURFICIAL FEATURES OF 60 PLAYAS WITHIN THE INTERIOR OF IRAN IS STUDIED IN ORDER TO DETERMINE THEIR CHARACTERISTICS, DISTRIBUTION, AND DEVELOPMENT. SURFICIAL TYPES DELINEATED WITHIN THE PLAYA AREAS CONSIST OF CLAY FLATS, SALT CRUSTS, WET ZONES, INTERMITTENT AND PERENNIAL LAKES, FAN DELTAS, AND SWAMPS. THESE UNITS ALONE OR IN COMBINATION CONSTITUTE THE PLAYA TYPE. THE TYPE OF PLAYA THAT FORMS IN AN AREA IS DETERMINED BY THE COMPOSITION OF ITS SEDIMENTS AND THE POSITION OF THE WATER TABLE. BECAUSE THE SOURCE OF THE SEDIMENTS REMAINS ESSENTIALLY STABLE, THE PLAYA IS MODIFIED THROUGH TIME MAINLY AS A RESULT OF CHANGES IN THE HYDROLOGY OF ITS BASIN. THE HYDROLOGY IS CONTROLLED BY THE FORM OF THE BASIN, THE PERMEABILITY OF ITS BEDROCK AND ITS CLIMATE. BECAUSE THE FORM AND BEDROCK PERMEABILITY OF MOST OF THE IRANIAN BASINS HAVE REMAINED ESSENTIALLY STABLE SINCE THE LATE PLEISTOCENE (WURM), SUBSEQUENT HYDROLOGIC CHANGES MAY BE ATTRIBUTED TO CLIMATIC CHANGES. PART 2 CONTAINS THE FIGURES AND THE APPENDICES. (AUTHOR)

KWIC MF 7394/OALS/IRAN/PLAYAS/GEOMORPHOLOGY/PALEOCLIMATOLOGY/ SEDIMENTATION/TERRAIN ANALYSIS/SURFACE PROPERTIES/CLAYS/SALTS/CRUSTS/ BASINS

141

KRINSLEY, D.B.

1972

THE PALAEOCLIMATIC SIGNIFICANCE OF THE IRANIAN PLAYAS.

PALAEOECOLOGY OF AFRICA 6:114-120. GA 73A-1745.

A STUDY OF 60 PLAYAS WITHIN THE INTERIOR OF IRAN, DISCUSSING THE VARIOUS SURFACE FEATURES (DELTAS, WET ZONES, CLAY FLATS, SALT CRUSTS, INTERMITTENT LAKES, PERENNIAL LAKES AND SWAMPS). CONSIDERATION IS MADE OF THE PALAEOCLIMATIC INTERPRETATION OF THE PLAYAS, WITH PARTICULAR REFERENCE TO LATE PLEISTOCENE AND HOLOCENE. PLEISTOCENE WAS COLDER AND SOMEWHAT MOISTER, BUT ESSENTIALLY SEMI-ARID. INCREASED TEMPERATURE HAS BEEN THE DOMINANT CLIMATIC DETERMINANT OF THE HOLOCENE AND PEAK ARIDITY WAS REACHED ABOUT 6000 BEFORE PRESENT (BP). SINCE 5500 BP MANY LAKES HAVE STARTED TO RISE AND AT 53 OUT OF THE 60 PLAYAS THE CLIMATE APPEARS TO BE MOISTER AT PRESENT THAN IN THE RECENT PAST.

OALS/PALEOCLIMATOLOGY/IRAN/PLAYAS/LAKES/LAKE BASINS/DELTAS/CRUSTS/SALTS/LANDFORMS/PLEISTOCENE EPOCH/HOLOCENE EPOCH/CLIMATIC GEOMORPHOLOGY/GEOLOGIC TIME/PALEOCLIMATOLOGY

142

KROWN, L.

1966

AN APPROACH TO FORECASTING SEASONAL RAINFALL IN ISRAEL.

JOURNAL OF APPLIED METEOROLOGY 5(5):590-594. GA 67B-481.

THE RAINY SEASON OF ISRAEL LASTS OCTOBER THROUGH APRIL OR MAY. THE ANALYSIS OF 41 YEARS OF RAINFALL RECORDS SHOWS THAT MODERATE OCTOBER RAINFALL IS FOLLOWED BY BELOW-NORMAL PRECIPITATION (A KNOWN BEDUIN ADAGE) AND LOW RAINFALL IN THIS MONTH IS FOLLOWED BY ABOVE-NORMAL RAINS. FOR THE LAST 15 YEARS (1950-1964), MEAN MONTHLY 500-MB CHARTS FOR OCTOBER HAVE SHOWN THAT WHEN THE MEAN TROUGH LINE IS OVER THE WESTERN MEDITERRANEAN SEA THE SUBSEQUENT RAINFALL IS ABOVE NORMAL AND WHEN IT IS OVER THE EASTERN MEDITERRANEAN, RAINFALL IN THE FOLLOWING MONTHS IS BELOW NORMAL. THE INTENSITY OF THE TROUGH AND ITS WAVELENGTH IN THE DIRECTION TO THE ATLANTIC ARE ALSO STRONGLY ASSOCIATED WITH THE RAINFALL REGIME IN ISRAEL.

ISRAEL/RAINFALL/WET SEASONS/WEATHER FORECASTING/WEATHER DATA/WEATHER PATTERNS

143

LAMB, H.H.

1968

CLIMATIC BACKGROUND TO THE BIRTH OF CIVILISATION.

ADVANCEMENT OF SCIENCE 25:103-120.

CLIMATE/ARCHAEOLOGY/HISTORY/SAHARA/JORDAN/MESOPOTAMIAN PLAIN/INDUS BASIN/NORTH AFRICA/CLIMATIC CHANGE/ANIMAL DISTRIBUTION/LAKE CHAD

144

LEBON, J.H.G.

1955

THE NEW IRRIGATION ERA IN IRAQ.

ECONOMIC GEOGRAPHY 31:47-59.

IRAQ/IRRIGATION

145

LEROI-GOURHAN, A.

1971

POLLENS ET TERRASSES MARINES AU LIBAN (POLLENS AND MARINE TERRACES IN THE LEBANON).

QUATERNARIA 15:249-260.

LEBANON/POLLEN/TERRACES(GEOMORPHOLOGY)/MARINE GEOLOGY

146

LEVI, W.M.

1963

THE DRY WINTER OF 1962-63: A SYNOPTIC ANALYSIS.

ISRAEL EXPLORATION JOURNAL 13(3):229-241.

PRECIPITATION DEFICIT/WINTER/MEDITERRANEAN BASIN/RAINFALL/METEOROLOGICAL DATA/ ISRAEL/LIBYA/USSR/TURKEY/LEBANON/EGYPT/JORDAN/STORMS/ANTICYCLONES/DROUGHTS/ ATMOSPHERIC CIRCULATION/SOLAR RADIATION

147

LEWIS, N.E.

1949

MALARIA, IRRIGATION AND SOIL EROSION IN CENTRAL SYRIA.

GEOGRAPHICAL REVIEW 39:278-290.

SYRIA/MALARIA/IRRIGATION/SOIL EROSION/HUMAN DISEASES

148

LEWIS, N.E.

1953

LEBANON: THE MOUNTAIN AND ITS TERRACES.

GEOGRAPHICAL REVIEW 43:1-14.

LEBANON/MOUNTAINS/SLOPES/TERRACES(GEOMORPHOLOGY)

149

LEWIS, N.E.

1955

THE FRONTIER OF SETTLEMENT IN SYRIA, 1800-1950.

INTERNAIONAL AFFAIRS 31:48-60.

SYRIA/SETTLEMENTS/HISTORY

150

LLOYD, J.W.

1965

THE HYDROCHEMISTRY OF THE AQUIFERS OF NORTH-EASTERN JORDAN.

JOURNAL OF HYDROLOGY 3:319-330.

JORDAN/WATER CHEMISTRY/AQUIFERS/GROUNDWATER

151

LOEFFLER, E.

1970

UNTERSUCHUNG ZUM EISZEITLICHEN UND REZENTEN KLIMAGENETISCHEN FORMENSCHATZ IN DEN GEBIRGEN NORDOSTANATOLIENS (RESEARCH ON THE ICE AGES AND RECENT CLIMATO-GENETIC LANDFORMS IN THE MOUNTAINS OF N.E. ANATOLIA).

HEIDELBERGER GEOGRAPHISCHE ARBEITEN 27. 162 P. GA 72A-0188.

THE PLEISTOCENE SNOW-LINE IS RECONSTRUCTED USING EVIDENCE FROM TERMINAL MORAINES AND RIDGE CRESTS. EVEN TODAY THE SNOW-LINE ON THE WET NORTH OF THE MOUNTAINS APPEARS RELATIVELY HIGH BECAUSE OF THE INFLUENCE OF CONTINENTAL CLIMATE. IN THE PLEISTOCENE IT IS ASSUMED THE SAME CLIMATIC SITUATION EXISTED. MANY RECESSIONAL MORAINES ARE FOUND IN THE MOUNTAINS BUT IT IS NOT KNOWN IF READVANCES CAN BE CORRELATED WITH THOSE IN THE ALPS. ONLY IN THE HIGHEST AREAS DO LARGE GLACIERS STILL OCCUR, UNWEATHERED MORAINES SEEM TO HAVE BEEN DEPOSITED DURING A MAJOR ADVANCE LAST CENTURY. ROCK GLACIERS ARE STATIC AT PRESENT, LICHENS WERE USED FOR A RELATIVE CHRONOLOGY. THE PERIGLACIAL ZONE WAS DELINEATED USING SOLIFLUCTIONAL FEATURES. BESIDES SOLIFLUCTIONAL PROCESSES, MECHANICAL MASS MOVEMENTS AND EROSION PARTICULARLY CAUSED BY ANIMALS ARE VERY IMPORTANT LANDFORMING FACTORS. ASYMMETRICAL RIDGE CRESTS ARE A RESULT OF DIFFERENT MORPHOCLIMATIC PROCESSES ON NORTH ANDSOUTH FACING SLOPES. YOUNG COASTAL TERRACES WERE EXAMINED TO SHOW THERE IS NO INDICATION OF A STRONG POST-GLACIAL UPLIFT.

TURKEY/PLEISTOCENE EPOCH/PALEOCLIMATOLOGY/SNOW COVER/CLIMATIC ZONES/CLIMATE/MOUNTAINS/GEOMORPHOLOGY/GLACIERS/LICHENS/SOIL STABILITY/LANDFORMS/SLOPES/SOIL EROSION/ANIMAL DAMAGE/CLIMATIC GEOMORPHOLOGY/TERRACES(GEOMORPHOLOGY)

152

LOMAS, J.

1972

FORECASTING WHEAT YIELDS FROM RAINFALL DATA IN IRAN.

WORLD METEOROLOGICAL ORGANIZATION, BULLETIN 21:9-14.

IRAN/RAINFALL/WEATHER DATA/CROP RESPONSE/CROP PRODUCTION/TRITICUM/FORECASTING

153

LOWDERMILK, W.C.

1946

PALESTINE: LAND OF PROMISE.

VICTOR GOLLANCZ, LONDON. 167 P.

PALESTINE/HISTORY/ECONOMIC DEVELOPMENT/LAND RECLAMATION/JORDAN VALLEY/SOCIAL ASPECTS/POWERPLANTS/AGRICULTURE/CLIMATE/REGIONAL GEOGRAPHY/POPULATIONS/DRY FARMING/IRRIGATION PROGRAMS/EROSION/NEGEV

154

LOWDERMILK, W.C.

1960

THE RECLAMATION OF A MAN-MADE DESERT. IN MAN AND THE ECOSPHERE (READINGS FROM SCIENTIFIC AMERICAN), P. 219-227.

W.H. FREEMAN AND COMPANY, SAN FRANCISCO.

IN THE 1950'S, ISRAEL UNDERTOOK TO CREATE A NEW AGRICULTURE IN AN OLD AND DAMAGED LAND. TEN YEARS LATER IT SUCCEEDED IN BEING AN EXPORTER OF AGRICULTURAL PRODUCE AND NEARLY ACHIEVED THE GOAL OF AGRICULTURAL SELF-SUFFICIENCY. POLITICAL BOUNDARIES AND CONFLICTS HAVE FRUSTRATED PROGRAMS TO REALIZE THE FULL BENEFITS OF THE WATER SUPPLY TO ALL CONCERNED IN A REGION WHERE WATER IS SCARCE. VARIATIONS IN RAINFALL AS WELL AS EXTREME TEMPERATURE RANGES AFFECT VEGETATION AS DOES THE KHAMSIN WHICH MAY BLOW FOR DAYS TO THE EAST AFFECTING UNPROTECTED CROPS. HOWEVER, THE AUTHOR SAYS THERE HAS BEEN NO SIGNIFICANT DETERIORATION IN CLIMATE SINCE ROMAN TIMES. THE DESERT THAT ENCROACHED THE ONCE-FLOURISHING LAND WAS THE WORK OF MAN, NOT OF NATURE. THE AUTHOR OUTLINES STEPS THAT HAVE BEEN TAKEN TO RECLAIM ERODED LAND BY IMPLEMENTING TECHNIQUES SUCH AS CONTOUR FARMING, IRRIGATION PRACTICES, AND SOIL CONSERVATION METHODS.

OALS/ISRAEL/RECLAMATION/DESERTIFICATION/SOIL CONSERVATION/LAND RECLAMATION/IRRIGATION PRACTICES/VEGETATION ESTABLISHMENT/WIND ACTION/ TEMPERATURE RANGES

155

MAHHOUK, A.

1956

RECENT AGRICULTURAL DEVELOPMENT AND BEDOUIN SETTLEMENT IN SYRIA.

MIDDLE EAST JOURNAL 10:167-176.

SYRIA/NOMADS/SETTLEMENTS/AGRICULTURE/SOCIAL ORGANIZATION

156

MALLOWAN, M.E.L.

1964

NOAH'S FLOOD RECONSIDERED.

IRAQ 26(2):62-82.

IRAQ/ARCHAEOLOGY/HISTORY/MESOPOTAMIAN PLAIN/EUPHRATES RIVER

157

MANNERS, I.R.

1970

THE EAST GHOR IRRIGATION PROJECT.

FOCUS 20(8):8-11.

JORDAN VALLEY/LEBANON/ISRAEL/JORDAN/SYRIA/TRITICUM/LAND REFORM/WATER RESOURCES DEVELOPMENT/POLITICAL ASPECTS/IRRIGATION PRACTICES

158

MANNERS, I.R.

1971

THE DESERT AND THE SOWN: AN ECOLOGICAL APPRAISAL OF THE MIDDLE EAST.

FOCUS 22(2). 8 P.

MIDDLE EAST/ECOLOGY/NOMADS/RAINFALL/JORDAN/ISRAEL/EGYPT/TURKEY/SYRIA/IRAQ/SAUDI ARABIA/IRAN/CLIMATE/AGRICULTURE/HISTORY/DEGENERATION/HUMAN BEHAVIOR/QANATS/IRRIGATION PRACTICES/JORDAN VALLEY/SALINITY/PLANNING/HUMAN ASPECTS/WATER RESOURCES DEVELOPMENT/POPULATIONS

159

MANNERS, I.R.

1974

PROBLEMS OF WATER RESOURCE MANAGEMENT IN SEMI-ARID ENVIRONMENT: THE CASE FOR IRRIGATION AGRICULTURE IN THE CENTRAL JORDAN RIFT VALLEY. IN B.S. HOYLE, ED., SPATIAL ASPECTS OF DEVELOPMENT, P. 95-115.

WILEY, NEW YORK. GA 74C-2300.

OUTLINES THE MAIN PROBLEMS WHICH CONFRONT DEVELOPMENT PLANNERS AND IRRIGATION WATER USERS IN A MARGINAL CLIMATIC REGIME SUCH AS THAT IN THE RIFT VALLEY OF THE JORDAN, FOLLOWED BY AN ILLUSTRATION OF THE VALUE OF A GEOGRAPHICAL CONTRIBUTION ALONG BOTH MAN/ENVIRONMENT AND SPATIAL ORGANIZATION LINES, IN EVALUATING AVAILABLE WATER RESOURCES AS WELL AS THE DISTRIBUTION OF ATTITUDES, KNOWLEDGE AND SKILLS TO BE APPLIED TO THE DEVELOPMENT OF THESE RESOURCES. THE EXTRA DIMENSION OF AN INTER-STATE CONFLICT FOR SCARCE WATER RESOURCES BETWEEN ISRAEL AND JORDAN IS ALSO DEALT WITH IN THE ANALYSIS.

JORDAN VALLEY/WATER MANAGEMENT/WATER RESOURCES DEVELOPMENT/IRRIGATION/WATER CONSERVATION/SEMIARID CLIMATE/HUMAN BEHAVIOR/SOCIAL ORGANIZATION/COMPETING USES

160

MANSOUR, A.H.

1967

LES PROBLEMES PASTORAUX ET HUMAINS DANS LES ZONES ARIDES DU MOYEN-ORIENT (PASTORAL AND HUMAN PROBLEMS IN ARID ZONES OF THE MIDDLE EAST).

JOURNAL D AGRICULTURE TROPICALE ET DE BOTANIQUE APPLIQUEE 14(10-11):454-493. WAERSA (10)3048.

THE TRADITIONAL ANIMAL HUSBANDRY SYSTEM OF THE NOMADIC AND SEMI-NOMADIC HERDSMEN TRIBES IN THE ARID ZONES OF SAUDI ARABIA, YEMEN, EGYPT, JORDAN, SYRIA, IRAQ AND IRAN IS DESCRIBED. SUBJECTS DISCUSSED INCLUDE THE WAY OF LIFE OF THE BEDOUIN, HIS RELATIONS TO THE URBAN OWNERS OF HIS ANIMALS, TRANSHUMANCE FOR WINTER GRAZING IN THE PLAINS, PLANT SPECIES GRAZED OR BROWSED, NUMBERS AND BREEDS OF SHEEP, GOATS, CAMELS, HORSES AND DONKEYS, AND VARIOUS KINDS OF MILK PRODUCTS PREPARED IN THE AREA. IN THE LAST 15 YEARS AGRICULTURAL DEVELOPMENT HAS INCREASINGLY RESTRICTED THE GRAZING AREAS, RESULTING IN SERIOUS OVER-GRAZING AND DEPLETION OF THE VEGETATION. MEASURES TO BE TAKEN BY GOVERNMENTS TO COUNTERACT THIS ARE PROPOSED.

YEMEN/OALS/MIDDLE EAST/NOMADS/GRAZING/PERTURBATION/LIVESTOCK/SOCIAL ASPECTS/SAUDI ARABIA/EGYPT/JORDAN/SYRIA/IRAQ/IRAN

161

MARGALIT, H.

1964

SOME ASPECTS OF THE CULTURAL LANDSCAPE OF PALESTINE DURING THE FIRST HALF OF THE NINETEENTH CENTURY.

ISRAEL EXPLORATION JOURNAL 13:208-223.

PALESTINE/HISTORY/HUMANS

162

MEGARD, R.O.

1967

LATE QUATERNARY CLADOCERA OF LAKE ZERIBAR, WESTERN IRAN.

ECOLOGY 48:179-189.

IN LEBANON WHERE 54 PERCENT OF THE TERRAIN IS KARSTIC, THE FIRST TRACES OF KARST EROSION OCCUR IN LATE JURASSIC DEPOSITS AND COINCIDE WITH EMERGENCE OF THE LEBANESE MOUNTAINS. KARSTIFICATION ALSO CCCURRED DURING THE CRETACEOUS AND TERTIARY, AND REACHED ITS MAXIMUM EXTENT IN THE QUATERNARY AS A RESULT OF TECTONIC ACTIVITY AND EUSTATISM IN THE MEDITERRANEAN DURING THE COURSE OF GLACIAL AND INTER-GLACIAL PERIODS. THE GEOHYDROLCGY AND RATES OF RECHARGE AND DRAINAGE OF THESE FORMATIONS, WHICH ARE THE MAJOR WATER RESERVOIRS IN THE COUNTRY, ARE DISCUSSED.

LEBANON/KARST/HYDROLOGY/CRETACEOUS PERIOD/TERTIARY PERIOD/QUATERNARY PERIOD/ TECTONICS/RESERVOIRS/MOUNTAINS/EROSION/WATER LEVELS

164

MIKESELL, M.W.

1969

THE DEFORESTATION OF MOUNT LEBANON.

GEOGRAPHICAL REVIEW 59(1):1-28. GA 70C-376.

AS A RESULT OF SEVERAL MILLENNIA OF CLEARING, PASTORAL DISTURBANCE, AND EXPLOITATION FOR BUILDING MATERIAL, THE FOREST COVER OF LEBANON HAS BEEN ALMOST ENTIRELY DESTROYED. ONLY SCATTERED REMNANTS OF THE ONCE EXTENSIVE STANDS OF CEDAR, FIR, AND JUNIPER SURVIVE, AND MOST OF THE OAK FORESTS HAVE BEEN DEGRADED TO SCRUB. IT IS POSSIBLE, NEVERTHELESS, TO RECONSTRUCT THE MAIN FEATURES OF LEBANON'S ORIGINAL ARBORESCENT VEGETATION AND TO IDENTIFY THE MOST IMPORTANT AGENTS OF DEFORESTATION. THE MAGNITUDE OF THE ANCIENT LUMBERTRADE BETWEEN PHOENICIA AND THE WOOD-DEFICIENT AREAS OF EGYPT, MESOPOTAMIA, AND PALESTINE IS DIFFICULT TO ASSESS IN QUANTITATIVE TERMS, BUT THERE IS ABUNDANT EVIDENCE OF COMMERCIAL TRANSACTIONS CENTERED ON BYBLOS, SIDON, AND TYRE, AND OF LOGGING EXPEDITIONS UNDERTAKEN BY EGYPTIAN AND ASSYRIAN ARMIES. DURING THE PERIOD OF ROMAN RULE EMPEROR HADRIAN, PROBABLY IN AN ATTEMPT TO PRESERVE TIMBER FOR HIS FLEETS, CLAIMED PERSONAL OWNERSHIP OF THE SURVIVING FORESTS OF MOUNT LEBANON. IN LATER CENTURIES THE AGRICULTURAL AND PASTORAL ACTIVITIES ASSOCIATED WITH HIGHLAND SETTLEMENTS LED TO THE DESTRUCTION OF ALL BUT A FEW PROTECTED OR INACCESSIBLE PATCHES OF THE ANCIENT WOODLAND. (AUTHOR)

LEBANON/FORESTS/TIMBER/ANIMAL DAMAGE/PERTURBATION/DEFORESTATION/SETTLEMENTS/ HUMAN BEHAVIOR/LOGGING(TIMBER)/CULTIVATION

165

MIRZAYEV, K.M./KOZLOV, V.V.

1966

NOVEYSHIYE TEKTONICHESKIYE DVIZHENIYA I RAZVITIYE DOLINY R. YEVFRAT (RECENT TECTONIC MOVEMENTS AND THE DEVELOPMENT OF THE EUPHRATES RIVER VALLEY).

AKADEMIIA NAUK SSSR, IZVESTIYA, SERIYA GEOGRAFICHESKAYA 5:80-85. BIGZNA 32(4)E68-04266.

FOUR SERIES OF RIVER TERRACES CAN BE DISTINGUISHED ALONG THE SYRIAN SECTION OF THE EUPHRATES RIVER. THE ARRANGEMENT OF THE TERRACES SUGGESTS THAT THE VALLEY HAS REMAINED IN ITS PRESENT LOCATION DURING THE QUATERNARY, BUT HAS BEEN STEADILY REDUCED IN WIDTH. THE PRESENT VALLEY IS A FEW KILOMETRES IN WIDTH, COMPARED WITH SOME PARTS OF THE LOWER QUATERNARY VALLEY THAT ARE MORE THAN 50 KM WIDE. THE ARRANGEMENT OF THE TERRACES HAS BEEN DISTURBED BY CRUSTAL MOVEMENTS SO THAT IN SOME AREAS THE LEFT-BANK TERRACES ARE SUBSTANTIALLY LOWER THAN THE RIGHT-BANK TERRACES.

OALS/TERRACING/RIVERS/EUPHRATES RIVER/SYRIA/QUATERNARY PERIOD/ TECTONICS

166

MITCHELL, C.W.

1959

INVESTIGATIONS INTO THE SOILS AND AGRICULTURE OF THE LOWER DIJALA AREA OF EASTERN IRAQ.

GEOGRAPHICAL JOURNAL 125:390-397.

IRAQ/SOIL TYPES/AGRICULTURE

167

MITCHELL, C.W./MAYLOR, P.E.

1960

INVESTIGATIONS INTO THE SOILS AND AGRICULTURE OF THE MIDDLE DIYALA REGION OF EASTERN IRAQ.

GEOGRAPHICAL JOURNAL 126:469-475.

IRAQ/SOIL TYPES/AGRICULTURE

168

MOORMANN, F.

1959

THE SOILS OF EAST JORDAN. REPORT TO THE GOVERNMENT.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, RCME, EPTA REPORT 1132. 73 P.

PROJECT REPORT ON SOILS IN EAST JORDAN, WITH MAPS, DATA ON PHYSICAL GEOGRAPHY, SOIL GENESIS, CLIMATE, SOIL CLASSIFICATIONS, PROFILES, PARENT MATERIALS, AND GEOGRAPHIC DISTRIBUTION. AGRICULTURE IN RELATION TO SOIL CONDITIONS AND THE POSSIBILITIES OF AGRICULTURAL DEVELOPMENT ARE DISCUSSED, WITH RECOMMENDATIONS ON FERTILIZING, IRRIGATION SYSTEMS, PASTURE MANAGEMENT, AND AFFORESTATION.

JORDAN/SOIL TYPES/PHYSICAL GEOGRAPHY/SOIL MAPS/SOIL CLASSIFICATIONS/SOIL FORMATION/CLIMATE/SOIL PROFILES/SOIL SURVEYS/AGRICULTURE/FERTILIZERS/PASTURES/ AFFORESTATION/IRRIGATION

169

MORITANI, T.

1966

THE GHANADS (QANATS) IN WEST ASIA (TRANSLATED TITLE).

GEOGRAPHICAL REVIEW OF JAPAN 39(7):499-503. GA 678-914.

THE QAZVIN BASIN, SURROUNDED BY ELBURZ MOUNTAINS, IS FILLED UP WITH THICK FLOOD PLAIN DEPOSITS. IT HAS A TRIANGULAR SHAPE, AT THE NORTHERN APEX OF WHICH THE CITY OF QAZVIN IS SITUATED, AND IS ROUGHLY DIVIDED INTO TWO GEOMORPHOLOGICAL UNITS: FANS AND FLOOD PLAINS. THE LAND NEIGHBORING THE CITY OF QAZVIN WITH A GRADIENT OF APPROXIMATELY 1:200 IS CHARACTERIZED BY THE DENSELY DEVELOPED QANATS, AVERAGING UNDER 3 KM, THE LONGEST BEING 8.8 KM. THE AMOUNT OF WATER OF THE QANATS IS DECREASING YEAR BY YEAR, DUE TO THE DEPRESSION OF GROUNDWATER TABLE. DEVELOPMENTS OF DEEP WELLS TO PUMP UP WATER BY MOTORS IS NOW RAPIDLY PROGRESSING AT MANY PLACES IN THE QAZVIN. SUCH DEVELOPMENT COMBINED WITH WATER RESERVOIRS BY DAM SYSTEM WILL BE RECOMMENDABLE FOR SUCH ARID REGIONS IN FUTURE. (IN JAPANESE) (AFTER AUTHOR)

IRAN/QANATS/MOUNTAINS/WATER LOSS/WATER TABLE/WELLS/GEOMORPHOLOGY/PUMPING/WATER RESOURCES DEVELOPMENT/WATER SUPPLY/DAMS/RESERVOIRS

170

HOSELEY, F.

1966

EXPLORATION FOR WATER IN THE ADEN PROTECTORATE.

ROYAL ENGINEERS JOURNAL 80:124-142.

ADEN/WATER SOURCES/EXPLORATION/ARABIAN PENINSULA

171

MOUNTFORT, G.

1965

PORTRAIT OF A DESERT: THE STORY OF AN EXPEDITION TO JORDAN.

COLLINS, LONDON. 192 P.

JORDAN/DESERT PLANTS/DESERT ANIMALS/INSECTS/BIRDS

172

MUIR, A.

1951

NOTES ON THE SOILS OF SYRIA.

JOURNAL OF SOIL SCIENCE 2:163-183.

AN ACCOUNT OF THE MAIN SOIL GROUPS OCCURRING IN SYRIA, TOGETHER WITH CHEMICAL AND CLAY MINERAL DATA. THE MAIN SOILS RECOGNIZED ARE, IN THE DESERT, DESERT SOILS AND SOLONCHAKOUS SOILS, WITH UNDERDEVELOPED SOILS ON ALLUVIUM; IN THE STEPPE AND DESERTIC STEPPE, GREYED AND RED-BROWN SOILS CORRESPONDING IN SOME FEATURES TO THE RUSSIAN SIEROZEM AND POSSIBLY TO REDDISH CHESTNUT SOILS; IN THE MEDITERRANEAN ZONE, TERRA ROSSA AND BROWN SOILS ON BASALT WITH GLEY SOILS OR ALLUVIAL FLATS. THE OCCURRENCE OF ATTAPULGITE IN SOME OF THE DESERT AND STEPPE SOILS IS REPORTED.

SYRIA/SOIL TYPES/SOIL CHEMICAL PROPERTIES/CLAY MINERALS/DESERT SOILS/DESERTS/ SOLONCHAKS/STEPPE

173

NAVEH, Z.

1971

THE CONSERVATION OF ECOLOGICAL DIVERSITY OF MEDITERRANEAN ECOSYSTEMS THROUGH ECOLOGICAL MANAGEMENT. IN E. DUFFEY AND A.S. WATT, EDS., THE SCIENTIFIC MANAGEMENT OF ANIMAL AND PLANT COMMUNITIES FOR CONSERVATION, P. 605-622.

BLACKWELL SCIENTIFIC PUBLICATIONS, LONDON. GA 72B-2429.

ONE OF THE CHIEF AIMS OF CONSERVATION OF UNTILLABLE MEDITERRANEAN UPLAND ECOSYSTEMS WHICH HAVE BEEN INFLUENCED FOR LONG PERIODS BY ANTHROPOGENIC PRESSURE, IS THE PRESERVATION OF THEIR STRIKING STRUCTURAL, FUNCTIONAL AND BIOLOGICAL DIVERSITY. THESE ARE THREATENED AT PRESENT BY URBAN INDUSTRIAL AND AGRICULTURAL EXPANSION ON ONE HAND, AND BY CREATION OF DENSE AND MONOTONOUS ALLEPO PINE 'PRODUCTION' OR INACCESSIBLE MAQUIS 'PROTECTION' FORESTS ON THE OTHER. BOTH IN OAK SAVANNAHS AND IN OPEN MAQUIS AND GARRIGUE, THE DYNAMIC EQUILIBRIUM BETWEEN PHANEROPHYTES, CHAMAEPHYTES, HEMICRYPHOPHYTES AND THE GEOPHYTE AND THEROPHYTE UNDERSTORY, CONTAINING MANY FLOWERING PLANTS AND FAVORABLE NICHES AND EDGE HABITATS FOR ANIMALS, CAN BE MAINTAINED ONLY BY ACTIVE HUMAN INTERVENTION. (AFTER AUTHOR)

ISRAEL/ECOLOGY/CONSERVATION/ECOSYSTEMS/URBAN AREAS/HUMAN BEHAVIOR/FORESTS/ ENVIRONMENTAL IMPACT/ECONOMIC DEVELOPMENT/MEDITERRANEAN BASIN

174

NEEV, D./EMERY, K.O.

1968

GEOLOGISCHE UNTERSUCHUNGEN IM BEREICH DES TOTEN MEERES (GEOLOGIC INVESTIGATIONS IN THE DEAD SEA AREA).

UMSCHAU IN WISSENSCHAFT UND TECHNIK 68(9):282-283. GA 69A-958.

THE HISTORY OF EVAPORITE SEDIMENTATION IN THE DEAD SEA GRABEN DISTINGUISHES THREE MAIN PERIODS OF EVAPORITE FORMATION: THE FIRST ONE BEGAN WITH THE FORMATION OF THE GRABEN AND ENDED 70,000 YEARS AGO, WHEN THE CLIMATE BECAME MORE HUMID; THE SECOND TOOK PLACE BETWEEN 15,000 AND 6,000 YEARS AGO; THE THIRD PERIOD BEGAN 2,000 YEARS AGO AND ENDED 400 YEARS AGO. RECENT LOWERING OF THE LEVEL OF THE DEAD SEA IS PROBABLY DUE TO INCREASE IN THE CARBON DIOXIDE CONTENT OF THE ATMOSPHERE.

DEAD SEA/SEDIMENTATION/EVAPORITES/GRABEN(GEOLOGY)/GEOLOGY/WATER LOSS/WATER LEVELS/CLIMATIC GEOMORPHOLOGY

175

NEUMANN, J.

1960

NOTES ON RAINFALL FLUCTUATIONS IN PALESTINE AND CLIMATIC INFLUENCES IN THE NORTHERN HEMISPHERE.

RESEARCH COUNCIL OF ISRAEL, BULLETIN 9(4):185-191.

PALESTINE/RAINFALL/RAINFALL INTENSITY/WEATHER PATTERNS/CLIMATIC ZONES

176

NIKNAM, F./AHRANJANI, B.

1975

DUNES AND DEVELOPMENT IN IRAN.

IRAN, MINISTRY OF AGRICULTURE AND NATURAL RESOURCES, TEHRAN, FORESTRY AND RANGE ORGANIZATION. 21 P.

THIS PUBLICATION RECOGNIZES THE CYCLE OF SETTLEMENT, DEVELOPMENT, OVER UTILIZATION, DUNE FORMATION, AND ABANDONMENT THAT CHARACTERIZED ANCIENT CIVILIZATION, AND SEEKS TO FOCUS ON WAYS OF ALLEVIATING SUCH CONDITIONS PREVAILING IN THE KHUZESTAN AND SOUTHERN COASTAL PLAINS PROVINCE, AND THE CENTRAL PLATEAU PROVINCE OF IRAN. TWO RECENT FACTORS CAUSING DETERIORATION OF LAND RESOURCES ARE POPULATION INCREASES DEMANDING MORE LAND FOR CULTIVATION AND GRAZING, AND SOIL LOSSES TO WATER AND WIND EROSION AS A RESULT OF TILLAGE AS AN EASY WAY TO ESTABLISH LAND OWNERSHIP. THE OFFICIAL SAND DUNE STABILIZATION PROJECT INITIATED IN 1966 IS DESCRIBED, SHOWING SIGNIFICANT INCREASES IN GOVERNMENTAL SUPPORT TO THE PRESENT TIME AS INDICATIVE OF A NATIONAL COMMITMENT TO SEEK NEW WAYS OF REVERSING THE DETERIORATION OF WILDLAND RESOURCES AND RESTORING THE PRODUCTIVITY OF THE COUNTRY'S LAND BASE. (OALS)

OALS/AID/KWIC IR 4/IRAN/KHUZESTAN/DUNES/SAND CONTROL/SOIL STABILIZATION/MULCHING/LAND USE/LAND RESOURCES/DESERTIFICATION/ DEGENERATION/HALOXYLON/TAMARIX/PANICUM/ARISTIDA/PENNISETUM

177

NIR, D.

1967

REMARQUES SUR LE QUATERNAIRE DE LA PLAINE COTIERE DU NEGUEV SEPTENTRIONAL, ISRAEL (REMARKS ON THE QUATERNARY FEATURES OF THE COASTAL PLAIN OF THE NORTHERN NEGEV, ISRAEL).

ASSOCIATION DE GEOGRAPHES FRANCAISE, BULLETIN 352:2-10. GA 68A-107.

THE PRE-QUATERNARY SEASHORE OF THE COASTAL PLAIN OF THE NEGEV MAY BE ESTABLISHED BY THE CONTACT BETWEEN FLUVIAL AND COASTAL DEPOSITS. DEPOSITS OF THE 'ANCIENT SICILIAN' TRANSGRESSION ARE FOUND AT AN ALTITUDE OF 70-80 METERS NEAR TEL SHERUHAN. THE BEACH-ROCK OF EN BESOR (56-58 METERS) IS ATTRIBUTED TO THE 'NEOSICILIAN' TRANSGRESSION. THE SAND SHEETS OF LOWER QUATERNARY AGE TO THE WEST OF N. BESOR HAVE NOT BEEN ALTERED TO THE 'RED SANDS' OF THE MEDITERRANEAN AREA AND THUS INDICATE THE PERSISTENCE OF ARID CONDITIONS. BY CONTRAST, THE PLAIN OF BESOR HAS NOT BEEN DISSECTED AND SEEMS TO HAVE BEEN COVERED BY PROTECTIVE VEGETATION UNTIL THE HOLOCENE. THE DEPOSITION OF LOESS DIVERTED THE COURSE OF THE PRE-QUATERNARY NAHAL BEER SHEVA TO ITS PRESENT POSITION. THE LIMIT OF AIR CONDITIONS IN THE QUATERNARY MUST HAVE BEEN BETWEEN THE PLAIN OF BESOR AND THE ANCIENT SANDS.

ISRAEL/NEGEV/COASTAL PLAINS/PALEOCLIMATOLOGY/GEOMORPHOLOGY/QUATERNARY PERIOD/ HOLOCENE EPOCH/SHORES/SANDS/VEGETATION EFFECTS/DIVERSION/LOESS/CLIMATIC ZONES

178

OAKES, H.

1957

THE SOILS OF TURKEY.

TURKEY MINISTRY OF AGRICULTURE, ANKARA, SOIL CONSERVATION AND FARM IRRIGATION DIVISION, PUBLICATION 1. 180 P.

TURKEY/SOIL TYPES

179

ORNI, E.

1974

ESHKOLBEZIRK UND ARAVATAL: ZWEI BEISPIELE LANDWIRTSCHAFTLICHER INTENSIV-BETRIEBE IN WUESTENGEBIETEN ISRAELS (THE ESHKOL DISTRICT AND THE ARAVA VALLEY: TWO EXAMPLES OF INTENSIVE CULTIVATION IN DESERT AREAS OF ISRAEL).

GEOGRAPHISCHE RUNDSCHAU 4:125-131. GA 74C-3C64.

DESCRIBES THE ESHKOL AREA (NORTH WEST NEGEV ALONG THE GAZA STRIP, AN EXTENSION OF AGRICULTURE) AND THE ARAVA VALLEY, WEST SIDE NEXT TO JORDAN, AN OASIS, WHERE PRECIPITATION IS LESS THAN 300 MM.

ISRAEL/NEGEV/AGRICULTURE/CULTIVATION

180

PEARSE, C.K.

1970

RANGE DETERIORATION IN THE MIDDLE EAST.

INTERNATIONAL GRASSLAND CONGRESS, 11TH, SURFERS PARADISE, 1970, PROCEEDINGS, P. 26-30.

SEVERE RANGE DETERIORATION IN THE MIDDLE EAST BEGAN ABOUT THE TURN OF THE CENTURY. FACTORS INCREASING THE DEPLETION INCLUDE INCREASED LIVESTOCK NUMBERS, PLOUGHING OF RANGELAND, FUEL PLANT REMOVAL, CHANGE FROM NOMADIC TO SEDENTARY GRAZING, DEVELOPMENT OF LIVESTOCK WATERING, IMPROVED VETERINARY SERVICE AND SUPPLEMENTAL FEEDING. WIDESPREAD WIND AND WATER EROSION OF DENUDED RANGELAND THREATENS THE FUTURE DEVELOPMENT OF THE AREA. (AUTHOR)

DESERTS/OALS/MIDDLE EAST/DENUDATION/EROSION/WEATHERING/ANIMAL DAMAGE/ LIVESTOCK/POLLUTION/DESICCATION/LAND RECLAMATION/DESERTIFICATION/ RANGE MANAGEMENT

181

PEDGLEY, D.E.

1970

THE CLIMATE OF INTERIOR OMAN.

METEOROLOGICAL MAGAZINE 99(1171):29-37.

MUSCAT AND OMAN/ARABIAN PENINSULA/CLIMATE

182

PEPPELENBOSCH, P.G.N.

1968

NOMADISM IN THE ARABIAN PENINSULA: A GENERAL APPRAISAL.

TIJDSCHRIFT VOOR ECONOMISCH EN SOCIALE GEOGRAFIE 59:335-346.

ARABIAN PENINSULA/NOMADS

183

PERETZ, D.

1964

RIVER SCHEMES AND THEIR EFFECT ON ECONOMIC DEVELOPMENT IN JORDAN, SYRIA, AND LEBANON.

MIDDLE EAST JOURNAL 18:293-305.

JORDAN/SYRIA/LEBANON/RIVERS/ECONOMIC DEVELOPMENT

184

PERRIN DE BRICHAMBAUT, G./WALLEN, C.C.

1963

A STUDY OF AGROCLIMATOLOGY IN SEMI-ARID AND ARID ZONES OF THE NEAR EAST.

WORLD METEOROLOGICAL ORGANIZATION, GENEVA, TECHNICAL NOTE 56. 64 P.

ALTHOUGH THE EMPHASIS OF THIS REPORT IS ON AGROCLIMATOLOGY, IT CAN BE CONSIDERED A MAJOR CONTRIBUTION TO THE UNDERSTANDING OF THE METEOROLOGY OF THE MEDITERRANEAN REGION WITH AN EMPHASIS ON THE EASTERN PORTION. A GENERAL PICTURE OF THE CLIMATIC CONDITIONS IN THE REGION IS GIVEN. THE REPORT DEALS WITH THE GENERAL CIRCULATION AND DISCUSSES VARIOUS CAUSES OF RAINFALL DURING THE WINTER AND SPRING SEASONS. OF SPECIAL INTEREST IS A STUDY OF THE LENGTH OF THE RELIABLE RAINFALL SEASON.

MIDDLE EAST/AGRICULTURAL CLIMATOLOGY/ARID CLIMATE/SEMIARID CLIMATE/RAINFALL/ MEDITERRANEAN BASIN/MEDITERRANEAN CLIMATE/RAINFALL RELIABILITY/ATMOSPHERIC CIRCULATION/WET SEASONS/WEATHER PATTERNS/METEOROLOGY

185

PETROV, M.P.

1966

ONCE AGAIN ABOUT THE DESICCATION OF ASIA.

SOVIET GEOGRAPHY 7(10):15-24. GA 67B-484.

THERE IS MUCH EVIDENCE THAT CENTRAL ASIA IS DRIER IN APPEARANCE THAN IT WAS IN THE PAST. BUT MAN CAN CAUSE DETERIORATION BY OVERGRAZING OR CARELESS CULTIVATION AND IT IS NOT ALWAYS SAFE TO ARGUE THAT THIS IS ITSELF EVIDENCE OF A DRIER CLIMATE. INSTRUMENTAL OBSERVATIONS COVER FAR TOO SHORT A PERIOD TO BE USEFUL. HOWEVER, DESPITE HIS VIEW THAT MANY ARGUMENTS USED HITHERTO ARE UNCONVINCING, THE AUTHOR DOES FIND SOME LINES OF EVIDENCE THAT SUGGEST A REAL INCREASE IN ARIDITY IN HISTORICAL TIMES. THE REDUCTION IN GLACIER AREAS IS THOUGHT TO BE A CRITICAL LINE OF EVIDENCE.

CENTRAL ASIA/DESICCATION/DEGENERATION/HUMAN BEHAVIOR/OVERGRAZING/ARID CLIMATE/GLACIERS

186

PHILIP, G.

1966

MINERALOGY OF RECENT SEDIMENTS OF TIGRIS AND EUPHRATES RIVERS AND SOME OF THE OLDER DETRITAL DEPOSITS.

BAGHDAD UNIVERSITY, COLLEGE OF SCIENCE, BULLETIN 9:159-173. GA 68A-698.

MINERALOGICAL STUDY OF THE LIGHT AND HEAVY FRACTIONS OF THE RECENT SEDIMENTS OF THE EUPHRATES AND TIGRIS RIVERS AND SOME OF THE OLDER DEPOSITS REVEALED THE PRESENCE OF SEVEN MINERALS IN THE LIGHT FRACTION AND 32 MINERAL SPECIES REPRESENTED BY 41 VARIETIES IN THE HEAVY FRACTION. THE RECENT SEDIMENTS OF THE EUPHRATES AND TIGRIS RIVERS AS WELL AS THE PLEISTOCENE TERRACES OF THE EUPHRATES AND THE UPPER FARS DEPOSITS (LATE MIOCENE) CONTAINED THE SAME MINERAL SPECIES IN ABOUT THE SAME RELATIVE FREQUENCIES, CHARACTERIZED BY AN ABUNDANCE OF IRON ORES, EPIDOTES, AMPHIBOLES AND PYROXENES THAT MAKE MORE THAN 80 PERCENT OF THE HEAVY FRACTION. SHATT-EL-ARAB SEDIMENTS ALSO CONTAINED A SIMILAR ASSEMBLAGE DERIVED MAINLY FROM THE DISINTEGRATION OF METAMORPHIC AND BASIC IGNEOUS ROCKS. THE AQSU AND ADHAIM RIVERS SHOWED AN ASSEMBLAGE CHARACTERIZED BY AN INCREASE IN THE RELATIVE FREQUENCIES OF EPIDOTES. (AUTHOR)

TIGRIS RIVER/EUPHRATES RIVER/MINERALOGY/SEDIMENTS/PLEISTOCENE EPOCH/MIOCENE EPOCH/METAMORPHIC ROCKS/IGNEOUS ROCKS/DETRITUS

187

PIKE, J.G.

1970

EVAPORATION OF GROUNDWATER FROM COASTAL PLAYAS (SABKHAH) IN THE ARABIAN GULF.

JOURNAL OF HYDROLOGY 11:79-88.

GROUNDWATER/EVAPORATION/PLAYAS/PERSIAN GULF/COASTS

188

PLANHOL, X., DE

1966

ASPECTS OF MOUNTAIN LIFE IN ANATOLIA AND IRAN. IN S.R. EYRE AND G.R.J. JONES, EDS., GEOGRAPHY AS HUMAN ECOLOGY, P. 291-308.

ARNOLD, LONDON.

TURKEY/IRAN/MOUNTAINS/ETHNOLOGY

189

PLATTNER, F.

1970

MEHRJAEHRIGE BEOBACHTUNGEN UEBER DIE SPIEGEL UND SALZGEHALTSCHWANKUNGEN DES URMIASEES (LONG-PERIOD OBSERVATIONS OF WATER-LEVEL AND SALT-CONTENT VARIATIONS IN LAKE URMIA).

ERDKUNDE 24(2):134-139. GA 72B-1112.

THE WATER LEVEL VARIATIONS IN LAKE URMIA WERE RECORDED BETWEEN 1951 AND 1965. FIRST ORDER ANNUAL CHANGES IN SURFACE LEVEL ARE SUPERIMPOSED OVER LONG PERIODS ON SECOND ORDER VARIATIONS OF CHANGING, ALTHOUGH IMPORTANT, EXTENT. THERE ARE NO GROUNDS FOR SUPPORTING THE OPINION, WIDESPREAD IN PERSIA, THAT LAKE URMIA IS BEING SUBJECTED TO A STEADILY PROGRESSIVE DRYING OUT. CHANGES IN LEVEL ARE ACCOMPANIED BY RECIPROCAL VARIATIONS IN THE (SIGNIFICANT) SALT CONCENTRATION. THE RESULTS OF THIS FOR THE ENVIRONMENTAL CONDITIONS OF PLANT AND ANIMAL LIFE (USUFRUCTUARIES) ARE DISCUSSED. (AUTHOR)

IRAN/SALINE LAKES/WATER LEVELS/ENVIRONMENT/ANIMAL ECOLOGY/PLANT ECOLOGY/BIOMES

190

POHORYLES, S./SZESKIN, A.

1973

STRATEGIC CONSIDERATIONS IN ISRAELI AGRICULTURAL DEVELOPMENT.

OXFORD AGRARIAN STUDIES 2(2):132-140. GA 74G-2473.

ASSESSING THE PRESENT STAGE OF AGRICULTURAL DEVELOPMENT, IT MAY BE SAID THAT ISRAEL ACHIEVED SELF-SUFFICIENCY IN AGRICULTURE. THE EFFORTS AT BOLSTERING AGRICULTURE, HOWEVER, INCREASED THE DEPENDENCE OF THE FARMERS ON EXOGENOUS FACTORS CREATING A SITUATION WHICH IS TYPICAL OF DEVELOPED COUNTRIES. THE DECLINING SHARE OF AGRICULTURE IN THE ECONOMY AND THE NATIONAL GOAL OF PRESERVING THE RURAL FRAMEWORK MAKE IT NECESSARY TO FIND ALTERNATIVES TO AGRICULTURAL EMPLOYMENT IN THE RURAL SETTLEMENTS. THE ENTIRE CONCEPT OF PLANNING MUST BE DRASTICALLY REVISED AS PURELY AGRICULTURAL PLANNING HAS RUN ITS COURSE. ONLY A NEW APPROACH ENCOMPASSING ALL ECONOMIC ACTIVITIES IN A REGION CAN SERVE AS A BASIS FOR FUTURE PLANNING. (AUTHORS)

ISRAEL/AGRICULTURE/PLANNING/ECONOMIC DEVELOPMENT/SOCIAL ASPECTS

191

POURTET, J.

1965

QUELQUES ASPECTS DE LA VEGETATION FORESTIERE EN TURQUIE OCCIDENTALE (ASPECTS OF THE FOREST VEGETATION IN W. TURKEY).

REVUE FORESTIERE FRANCAIS 6:417-426.

TURKEY/FORESTS/VEGETATION

192

PRAUSNITZ, M.W.

1959

THE FIRST AGRICULTURAL SETTLEMENTS IN GALILEE.

ISRAEL EXPLORATION JOURNAL 9:166-174.

ISRAEL/AGRICULTURE/SETTLEMENTS/HISTORY/LAKE TIBERIAS

193

QALYOUBI, T.A.

1967

JAFER PILOT PROJECT FOR THE SETTLEMENT OF BEDOUINS. IN M.R. EL-GHONEMY, ED., LAND POLICY IN THE NEAR EAST, P. 152-163.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, ROME. WAERSA (10)64.

THE PLAN INITIATED IN 1963 WITH THE AID OF THE WORLD FOOD PROGRAMME TO IMPROVE SHEEP FARMING IN S. JORDAN WAS BASED ON THE THEORY THAT MIGRATION IS NOT A WAY OF LIFE FOR BEDOUINS BUT A MEANS OF LIVELIHOOD, AND THAT THE NOMAD-MIGRATORY SHEPHERD SYSTEM CAN BE TRANSFORMED INTO SETTLED AGRICULTURAL PATTERNS THROUGH EDUCATION AND TRAINING. THIS TRANSFORMATION IS A COMPLICATED OPERATION INVOLVING AGRO-ECONOMIC AND SOCIAL PROBELMS. PROPER METHODS AND APPROPRIATE COLLECTION OF DATA AND OBSERVATIONS ARE EXTREMELY IMPORTANT FOR THE FINAL APPRAISAL OF THE RESULTS ACHIEVED. THE HUMAN ELEMENT, I.E., THE BEDOUINS AND THEIR PARTICIPATION IN THE ENDEAVOUR, IS VITAL TO ENSURE SUCCESS. ON-THE-JOB TRAINING THROUGH THE EMPLOYMENT OF NOMADS IN THE DEVELOPMENTAL STAGES OF SETTLEMENT IS ESSENTIAL TO ACQUIRE NEW SKILLS. THE FIXED INCOME THEY EARN IS NOT ONLY A STIMULANT FACTOR, BUT ALSO IS A VITAL REPLACEMENT OF THE MIGRATORY GRAZING SYSTEM FROM WHICH THEY TRADITIONALLY EARN THEIR LIVING. THE AGRICULTURAL PATTERNS TO BE EMPLOYED IN THE NEW SETTLEMENTS SHOULD TAKE INTO CONSIDERATION THE HABITS AND THE TRADITIONAL SKILLS OF THE BEDOUINS, I.E., LIVESTOCK RAISING WHICH HAS A VERY IMPORTANT ROLE TO PLAY BY PROVIDING THE BADLY NEEDED ANIMAL PROTEIN FOR THE PEOPLES OF THE REGION.

OAIS/JORDAN/NOMADS/LAND RESOURCES/GRAZING/LIVESTOCK/SOCIAL ASPECTS/HUMAN BEHAVIOR/LAND MANAGEMENT/MIDDLE EAST/SETTLEMENTS/ARABIAN DESERT/ECONOMIC DEVELOPMENT

194

RAIKES, R.L.

1966

THE PHYSICAL EVIDENCE FOR NOAH'S FLOOD.

IRAQ 28(1):52-63.

IRAQ/ARCHAEOLOGY/MESOPOTAMIAN PLAIN/EUPHRATES RIVER/FLOODS/SUBSIDENCE/GEOLOGY

195

RAPP, R.R.

1970

SOME ECONOMIC ASPECTS OF RAIN STIMULATION.

RAND CORPORATION, SANTA MONICA, CALIFORNIA, PAPER P-4524. 13 P. GA 73B-1464.

FEASIBILITY AND COSTS OF STIMULATING RAINFALL FROM NATURALLY FORMED CLOUDS BY SILVER IODIDE SEEDING, WITH ESTIMATES FOR A PROJECT IN THE WESTERN SLOPES OF THE JUDEAN HILLS. A SYSTEMATIC METHOD FOR CATCHING, CONSERVING, AND DISTRIBUTING THE WATER IS ESSENTIAL. ISRAEL ALREADY HAS SUCH A WATER CONTROL SYSTEM, DESIGNED FOR WATER FROM LAKE TIBERIAS AND THE JORDAN. LACKING A WATER CONTROL SYSTEM, RAIN STIMULATION IN THE TIGRIS-EUPHRATES BASIN, FOR EXAMPLE, WOULD BE USELESS. THE 20 PERCENT INCREASES IN ANNUAL RAINFALL IN THE ISRAEL EXPERIMENTS WOULD, IN THE LONG RUN, INCREASE THE PRODUCTIVE WATER SUPPLY BY 10 TO 15 PERCENT, AT A COST OF 40 CENTS PER ACRE/FOOT. EVEN IF COSTS WERE TWICE THE ESTIMATE AND RETAINED WATER AMOUNTED TO ONE-FOURTH THE ESTIMATE, COST WOULD BE ONLY 3 DOLLARS AND 20 CENTS PER ACRE/FOOT FOR AN AUSTERE PROGRAM. SUCCESS REQUIRES GOOD WEATHER OBSERVATION AND FORECASTING, KNOWING WHEN TO INTERVENE AND WHEN TO LEAVE NATURE TO HER OWN DEVICES.

ISRAEL/RAINFALL/CLOUD SEEDING/WEATHER MODIFICATION/RAINFALL-RUNOFF RELATIONSHIPS/WATER HARVESTING/WATER YIELD/WATER MANAGEMENT/WATER COSTS/ LAKE TIBERIAS/JORDAN VALLEY/WEATHER FORECASTING/WEATHER DATA

196

RAWITZ, E./HILLEL, D.

1971

A METHOD FOR CHARACTERIZING THE RUNOFF POTENTIAL OF RAINFALL IN WATER HARVESTING SCHEMES.

WATER RESOURCES RESEARCH 7(2):401-405. GA 71B-1519.

THE AUTHORS HAVE DEVELOPED A METHOD FOR EVALUATING THE RUNOFF PRODUCING POTENTIAL OF RAINFALL PATTERNS AND FOR ESTIMATING THE AMOUNT OF WATER HYPOTHETICALLY OBTAINABLE FROM WATER HARVESTING AREAS OF GIVEN AVERAGE INFILTRATION RATES. DATA OBTAINED FROM THE ARID ZONE OF ISRAEL INDICATE THAT THE DISTRIBUTION OF RAINFALL AMOUNTS IN RELATION TO RAINFALL INTENSITIES IS SKEWED TOWARD THE LOW INTENSITIES AND THAT A FEW LARGE STORMS GENERALLY ACCOUNT FOR MOST OF THE TOTAL RAINFALL AND RUNOFF PRODUCING POTENTIAL. A SCALING OF RAINFALL INTENSITY VERSUS RELATIVE RAINFALL AMOUNT (FRACTION OF EACH SEASON'S TOTAL) SHOWS THAT SEASONS WITH WIDELY DIFFERENT TOTAL RAINFALLS NEVERTHELESS HAVE SIMILAR RELATIVE DISTRIBUTION PATTERNS. THIS FACT SUGGESTS THE POSSIBILITY OF FINDING A FUNCTION THAT CAN ADEQUATELY CHARACTERIZE THE RELATIVE INTENSITY DISTRIBUTION PATTERN OF A REGION AND CAN BE USED TO PREDICT RUNOFF POTENTIAL IN RELATION TO SEASONAL RAINFALL PROBABILITIES. (AUTHORS)

ISRAEL/WATER HARVESTING/RAINFALL/RAINFALL-RUNOFF RELATIONSHIPS/RAINFALL INTENSITY/DEPTH-AREA-DURATION ANALYSIS/WEATHER PATTERNS/WET SEASONS/WEATHER DATA/EVALUATION

197

REGEL, C.

1966

DIE FLORENELEMENTE DER TUERKEI (THE FLORAL ELEMENTS OF TURKEY).

ANNALES BOTANICI FENNICI 3(3):343-348.

TURKEY/VEGETATION/FLORA

198

REIFENBERG, A.

1950

MAN-MADE DUNE ENCROACHMENT ON ISRAEL'S COAST.

INTERNATIONAL CONGRESS OF SOIL SCIENCE, 4TH, AMSTERDAM, 1950, 1:325-327.

DUNE ENCROACHMENT NEAR CAESAREA, COVERING 30 SQUARE KILOMETERS OF FERTILE SOIL, WAS CAUSED BY A MOLE OR MASONRY BREAKWATER ERECTED IN THE HARBOR IN ANTIQUITY.

OALS/ISRAEL/DUNES/DESERTIFICATION/COASTAL ENGINEERING

199

REIFENBERG, A.

1952

THE SOILS OF SYRIA AND THE LEBANON.

JOURNAL OF SOIL SCIENCE 3:68-88.

SYRIA/LEBANON/SOIL TYPES

200

REIFENBERG, A.

1953

THE STRUGGLE BETWEEN DESERT AND THE SOWN. IN DESERT RESEARCH, INTERNATIONAL SYMPOSIUM HELD MAY 7-14, JERUSALEM, PROCEEDINGS, P. 378-391.

RESEARCH COUNCIL OF ISRAEL, SPECIAL PUBLICATION 2.

DESERT CONDITIONS IN MANY PARTS OF ISRAEL ARE ATTRIBUTED TO ECOLOGICAL CAUSES AND HUMAN MISMANAGEMENT WHICH HAVE BROUGHT ABOUT A CONTINUING DETERIORATION OF NATURAL CONDITIONS. THERE HAS BEEN AN ETERNAL STRUGGLE BETWEEN THE NOMAD AND PEASANT, BETWEEN DESERT AND CIVILIZATION. THE AUTHOR BELIEVES THAT WHENEVER THERE IS A DETERIORATION OF POLITICAL CONDITIONS, THE DESERT ENCROACHES CIVILIZED AREAS. THE NOMAD IS NOT SO MUCH THE SON OF THE DESERT, BUT ITS FATHER. ANOTHER ESSENTIAL FACTOR THAT CREATED STRESS IN THE AGRICULTURAL LIFE OF ALL MIDDLE-EASTERN STATES WAS THE PERPETUAL STRUGGLE BETWEEN THE INDEBTED SMALL CULTIVATOR AND THE LANDLORDS WHO DID NOT REPLENISH THE LAND. THE HISTORICAL REVIEW OF POLITICAL LAND MANAGEMENT DURING DIFFERENT TIME PERIODS INDICATES THAT TAXATION AND LAND MISUSE CONTRIBUTED TO DESICCATION OF SOIL AND VEGETATION. HISTORICAL PERIODS COVERED INCLUDE CA. 6000 B.C.--1917 A.D.

OALS/ISRAEL/CROP PRODUCTION/PRODUCTIVITY/NOMADS/SETTLEMENTS/POLITICAL ASPECTS/HUMAN RESOURCES/HISTORY/AGRICULTURE/DESICCATION/ DESERTIFICATION/SOIL EROSION/MIDDLE EAST/CLIMATOLOGY/LAND MANAGEMENT

201

REISS, Z./HERLING-REISS, P./MOSHKOVITZ, S.

1971

QUATERNARY PLANKTONIC FORMINIFERIDA AND NANNOPLANKTON FROM THE MEDITERRANEAN CONTINENTAL SHELF AND SLOPE OF ISRAEL.

ISRAEL JOURNAL OF EARTH SCIENCES 20(4):141-177. GA 72A-1750.

THE QUALITATIVE AND QUANTITATIVE COMPOSITION OF THE PLANKTONIC FORAMINIFERID AND CALCAREOUS NANNOPLANKTON ASSEMELAGES FROM FOUR CORES TAKEN BETWEEN 100 AND 550 M WATER DEPTH ON THE SOUTHERN CONTINENTAL SHELF AND SLOPE OF ISRAEL INDICATES THAT THREE OF THE SEQUENCES PENETRATED REPRESENT HOLOCENE (POST GLACIAL) AND LATE PLEISTOCENE (GLACIAL) DEPOSITS, THE FOURTH CORE BEING COMPOSED ONLY OF HOLOCENE SEDIMENTS. (AFTER AUTHORS)

ISRAEL/CONTINENTAL SHELF/HOLOCENE EPOCH/PLEISTOCENE EPOCH/OCEANOGRAPHY/ MARINE GEOLOGY/SEDIMENTS/PALEOCLIMATOLOGY/GEOCHRONOLOGY/CLIMATIC CHANGE

202

RIEBEN, E.H.

1966

GEOLOGICAL OBSERVATIONS ON ALLUVIAL DEPOSITS IN NORTHERN IRAN.

GEOLOGICAL SURVEY OF IRAN, REPORT 6. 41 P.

IRAN/GEOLOGY/ALLUVIUM/SEDIMENTS

203

ROLLEY, J.

1948

FOREST CONDITIONS IN SYRIA AND LEBANON.

UNASYLVA 2:77-80.

SYRIA/LEBANON/FORESTS

204

RON, Z.

1969

AGRICULTURAL TERRACES IN THE JUDEAN MOUNTAINS.

ISRAEL EXPLORATION JOURNAL 16:33-49, 111-122.

ISRAEL/MOUNTAINS/AGRICULTURE/TERRACING

205

ROSENAN, N.

1951

LONG RANGE FORECASTS OF RAINFALL.

RESEARCH COUNCIL OF ISRAEL, BULLETIN 1(1/2):33-35.

RAINFALL/WEATHER FORECASTING/ISRAEL/ANTICYCLONES/WEATHER DATA

206

ROSENAN, N.

1963

CLIMATIC FLUCTUATIONS IN THE MIDDLE EAST DURING THE PERIOD OF INSTRUMENTAL RECORD.

UNESCO, PARIS. ARID ZONE RESEARCH 20:67-73.

MIDDLE EAST/METEOROLOGICAL DATA/ISRAEL/LEBANON/CLIMATIC DATA/TEMPERATURE/PRECIPITATION(ATMOSPHERIC)/EGYPT/SUDAN/RAINFALL/MEDITERRANEAN CLIMATE/DEAD SEA/WATER LEVELS

207

ROSENTHAL, S.L./GLEESON, T.A.

1959

SEA LEVEL ANTICYCLOGENESIS AFFECTING MEDITERRANEAN WEATHER.

ARCHIV FUER METEROLOGIE, GEOPHYSIK, UND BICKLIMATOLOGIE 9:185-190.

MEDITERRANEAN CLIMATE/ANTICYCLONES/ATMOSPHERIC DISTURBANCES

208

ROSSIGNOL, M.

1969

SEDIMENTATION PALYNOLOGIQUE RECENTE DANS LA MER MORTE (RECENT POLLEN SEDIMENTATION IN THE DEAD SEA).

POLLEN ET SPORES 11(1):17-38. GA 71B-1C04.

POLLEN ANALYSIS OF SUPERFICIAL MUDS FROM THE BOTTOM OF THE DEAD SEA REVEALS ELEMENTS OF THE PHYTO-GEOGRAPHICAL AREAS WHICH SURROUND CONCENTRICALLY THE DEAD SEA. THE IMMEDIATE VICINITY, WHICH IS SAHARO-ARABIC, IS REPRESENTED BY HALOPHYTES OR NON-HALOPHYTES. THE IRANO-TOURANIAN TERRITORY IS REFLECTED BY ARTEMISIA HERBA-ALBA, ABUNDANT, PTEROCEPHALUS, PISTACIA ATLANTICA; WHILE THE MEDITERRANEAN AREA OF THE MOUNTAINS AROUND THE VALLEY, BY PINUS HALEPENSIS, POTERIUM SPINOSUM, PISTACIA, QUERCUS, ETC. PROBABLY CARRIED MAINLY BY RUN-OFF AND RIVERS. PROPORTIONS AND NATURE OF POLLENS FROM DIFFERENT AREAS TODAY WILL LATER ALLOW INTERPRETATION OF POLLEN ANALYSIS OF PLEISTOCENE LIMNIC SEDIMENTS FROM THE SAME AREA.

ISRAEL/DEAD SEA/PALYNOLOGY/SEDIMENTS/LAKES/DEPOSITION(SEDIMENTS)/HALOPHYTES/PHYTOGEOGRAPHY/FLORA

209

ROSSIGNOL, M./PASTOURET, L.

1971

ANALYSE POLLINIQUE DE NIVEAUX SAPROPELIQUES POSTGLACIAIRES DANS UNE CARROTTE EN MEDITERRANEE ORIENTALE (POLLEN ANALYSIS OF POST-GLACIAL SAPROPEL MUDS IN AN EASTERN MEDITERRANEAN CORE).

REVIEW OF PALAEOBOTANY AND PALYNOLOGY 11(3/4):227-238. GA 72A-1107.

POST-GLACIAL SAPROPELIC MUDS IN A DEEP-SEA MEDITERRANEAN CORE, OFFSHORE CRETE, REVEAL AN ABUNDANT POLLEN CONTENT, SUPPOSEDLY COMING FROM THE NEARBY ISLAND. ABOVE A LITTORAL ZONE OF HERBACEOUS VEGETATION, THE POLLEN SPECTRUM SUGGESTS A DENSE MEDITERRANEAN FOREST COVER, (WHICH HAS NOW DISAPPEARED FROM THE ISLAND EXCEPT ZELKOVA AND CARPINUS) AND CEDRUS, NOW ALSO EXTINCT, WHOSE CLOSEST PRESENT-DAY OCCURRENCES ARE IN LEBANON, CYPRUS AND MOROCCO. THESE RICH FLORA AND DENSE VEGETAL COVER DO NOT NECESSARILY IMPLY A MORE HUMID CLIMATE THAN TODAY; THE PRESENT RAINFALL IS SUFFICIENT FOR THESE SPECIES IN CONVENIENT LOCATIONS; RATHER, IT POINTS TO THE DEVASTATION OF THE VEGETATION BY MAN AND GOAT IN THE MEDITERRANEAN AREA FOR 8,000 YEARS.

PALYNOLOGY/SEDIMENTS/VEGETATION/PALEOBOTANY/FORESTS/PINUS/QUERCUS/ANIMAL DAMAGE/PERTURBATION/HUMAN BEHAVIOR/MEDITERRANEAN BASIN

210

ROWTON, M.B.

1967

THE WOODLANDS OF ANCIENT WESTERN ASIA.

JOURNAL OF NEAR EASTERN STUDIES 26:261-277.

ISRAEL/SYRIA/IRAQ/FORESTS/HISTORY/TURKEY/PERTURBATION/EROSION/MOUNTAINS/PRECIPITATION(ATMOSPHERIC)/PHYTOGEOGRAPHY/NORTH AFRICA/JORDAN

211

SANLAVILLE, P.

1963

LES REGIONS AGRICOLES DU LIBAN.

REVUE DE GEOGRAPHIE DE LYON 38:47-90.

LEBANON/AGRICULTURE

212

SANLAVILLE, P.

1970

LES VARIATIONS HOLOCENES DU NIVEAU DE LA MER AU LIBAN (HOLOCENE VARIATIONS IN SEA LEVEL IN LEBANON).

REVUE DE GEOGRAPHIE DE LYON 45(3):279-304. GA 71A-1384.

THE COAST OF LEBANON FORMED AN IMPORTANT FOCUS OF HUMAN ACTIVITY EVEN DURING THE NEOLITHIC. SMALL DIFFERENCES IN SUBMARINE MORPHOLOGY WERE OF EXTREME IMPORTANCE FOR THE DEVELOPMENT OF PORTS AT THE MOUTHS OF SMALL CREEKS. VARIATIONS IN HOLOCENE SEA LEVELS WERE OF GREAT SIGNIFICANCE IN THE SURVIVAL OF SUCH PORTS. ABOUT 1200 B.C. ALL PHOENICIAN PORTS WHICH WERE NOT LOCATED ON ISLANDS WERE IN VARIOUS STAGES OF DECLINE.

LEBANON/HOLOCENE EPOCH/WATER LEVELS/COASTS/MORPHOLOGY/MARINE GEOLOGY/HISTORY/ SUBMARINE TOPOGRAPHIC FEATURES/HARBOR FACILITIES

213

SARAN, G.

1968

THE HYDROGEOLOGICAL CONDITION OF CUMRA PLAIN, TIMRAS SINKHOLE AND SURROUNDINGS.

TURKEY, DEVLET SU ISLERI GENEL MUDURLUGU, TEKNIK BULTEN 13/14:87-104.

TURKEY/PLAINS/HYDROLOGY

214

SCHEIN, Z./BURAS, N.

1973

RAINFALL INTENSITIES IN ISRAEL.

ISRAEL JOURNAL OF EARTH SCIENCES 22(1):15-30.

ISRAEL/RAINFALL INTENSITY/PRECIPITATION(ATMOSPHERIC)

215

SCHOLZ, F.

1972

DIE PHYSISCH- UND SOZIALGEOGRAPHISCHEN URSACHEN FUER DIE AUFGABE UND DEN ERHALT DER KAREZE IN BELUTSCHISTAN (THE GEOGRAPHY OF THE PHYSICAL AND SOCIAL CAUSES OF THE ABANDONMENT AND MAINTENANCE OF QUANATS IN BALUCHISTAN).

ERDE 103(3/4):302-315. GA 74G-0590.

SCHOLZ LISTS THE VARIOUS NAMES OF QANATS, AND THEIR PRESENT INSUFFICIENCY. IN BALUCHISTAN THEY RUN ALONG LONGITUDINAL VALLEYS (NORTHEAST TO SOUTHWEST), AND THE INTENSE AREAS ARE VERY LOCALIZED, AND INHABITED BY THE RELATIVELY SEDENTARY PATHANS. THEY IRRIGATE C 120,000 HA. THEY WERE EXTENDED UNDER THE BRITISH PEACE (END 19TH CENTURY); AND SINCE 1958 OTHERS HAVE BEEN MADE (MAPPED FOR QUETTA AREA). THEY HAVE MANY ADVANTAGES, BUT THE WATER TABLE MAY SINK BELOW THEM, AND THEIR FLOW IS IRREGULAR. GREAT EVAPORATION OCCURS AT THEIR MOUTHS: MUCH IS LOST BY PERCOLATION (UP TO 60 PERCENT). MANY PREFER PUMPS. THEY OFTEN FALL IN AND ARE COSTLY TO MAINTAIN. NOMADIC QANAT BUILDER ARE NOT ALLOWED TO MIGRATE NOW. TO MAINTAIN 2-4000 M REQUIRES TWO 4-MEN TEAM AND 2 OVERSEERS, ALL YEAR: HENCE THESE MUST WATER 100 HA TO PAY FOR THIS. THEIR OWNERSHIP IS IMPORTANT AS IS THE PROBLEM OF WATER OWNERSHIP AND DIVISION EACH AREA HAS A STANDARD TIME OF WATERING. THE QANAT CAN BELONG TO INDIVIDUALS, COMPANIES, THE VILLAGE OR THE STATE. THE OWNER MAY DEMAND HALF THE CROP: HE MAY SELL A YEAR'S RIGHTS TO WATER, AND THE PEASANT MAY FALL IN DEBT. THE SAME APPLIES TO COMPANY OWNERSHIP. A HAPPIER CONDITION IS VILLAGE OWNERSHIP WITH KNOWN RIGHTS AND RESPONSIBILITIES. SINCE 1947 MANY ARE STATE-OWNED AND VERY STABLE. THE MAKING OF SUBSIDIZED WELLS IS NOW FASHIONABLE. MANY QANATS THUS FALL OUT OF USE, BUT A WELL NEEDS 80 HA TO BE PROFITABLE. BUT WELLS NEED GOOD CHEAP PUMPS.

IRAN/PAKISTAN/BALUCHISTAN/QANATS/WATER TABLE/WATER LOSS/EVAPORATION/SEEPAGE/PUMPING/WELLS/WATER MANAGEMENT/WATER RESOURCES DEVELOPMENT/WATER RIGHTS/WATER ALLOCATION(POLICY)/SOCIAL ASPECTS

216

SEGINER, I.

1966

GULLY DEVELOPMENT AND SEDIMENT YIELD.

JOURNAL OF HYDROLOGY 4(3):236-253. GA 67A-864.

SEVERAL METHODS ARE PRESENTED WHICH MAY BE HELPFUL IN QUANTITATIVE GULLY EROSION STUDIES. AIR PHOTOGRAPHS FROM 1948, 1962, 1964 OF THE STUDY AREA IN SOUTHERN ISRAEL WERE USED FOR MAPPING, AND SOME FIELD OBSERVATIONS AND MEASUREMENTS WERE MADE TO MAP IN DETAIL THE BOUNDARIES OF THREE GULLIES AFTER EACH RUNOFF-PRODUCING STORM. INFORMATION ON TYPE OF SOIL IN THE WATERSHED WHICH DRAINED INTO THE GULLY HEAD, DRAINAGE AREA, DEPTH OF WATERFALL, AND CULTIVATION PRACTICE HISTORY WAS COLLECTED FOR ONE AREA. ADVANCEMENT RATE OF GULLY HEADS WAS RELATED TO WATERSHED AREA, AND THE SEDIMENT YIELD OF A GULLY SYSTEM WAS CALCULATED AND COMPARED WITH TRAPPED SEDIMENTS. A MODEL OF GULLY SYSTEM DEVELOPMENT IS SUGGESTED AND THE DISCREPANCIES BETWEEN VARIOUS RESULTS ARE DISCUSSED.

ISRAEL/GULLY EROSION/SEDIMENT YIELD/QUANTITATIVE GEOMORPHOLOGY/MAPPING/AERIAL PHOTOGRAPHY/WATERSHEDS(BASINS)/MEASUREMENT/ON-SITE INVESTIGATIONS/SOIL TYPES/RAINFALL-RUNOFF RELATIONSHIPS/CULTIVATION

217

SERJEANT, R.B.

1964

SOME IRRIGATION SYSTEMS IN HADRAMAUT.

UNIVERSITY OF LONDON, SCHOOL OF ORIENTAL AND AFRICAN STUDIES, BULLETIN 27:33-76.

ARABIAN PENINSULA/YEMEN/IRRIGATION

218

SHALEM, N.

1953

LA STABILITE DU CLIMAT EN PALESTINE. IN DESERT RESEARCH, INTERNATIONAL SYMPOSIUM HELD MAY 7-14, 1952, JERUSALEM, PROCEEDINGS, P. 153-175.

RESEARCH COUNCIL OF ISRAEL, SPECIAL PUBLICATION 2.

CLIMATE, HYDROLOGY, BIOLOGY AND HISTORIC SETTLEMENT PATTERNS AND CHANGES ARE TRACED. THE AUTHOR REJECTS THE THEORY THAT POPULATION CHANGES IN THE AREA WERE CAUSED BY CLIMATIC CHANGE, IN FAVOR OF ONE THAT ATTRIBUTES THESE CHANGES TO HUMAN INFLUENCES.

GAIS/ARID CLIMATE/REGIONAL ANALYSIS/HISTORY/SETTLEMENTS/MIDDLE EAST/HYDROLOGY/BIOGEOGRAPHY/CLIMATIC CHANGE/PALESTINE/DESERTIFICATION

219

SHANAN, L./EVENARI, M./TADMOR, N.H.

1967

RAINFALL PATTERNS IN THE CENTRAL NEGEV DESERT.

ISRAEL EXPLORATION JOURNAL 17:163-184.

ISRAEL/NEGEV/RAINFALL/WEATHER PATTERNS

220

SHANAN, L. ET AL

1970

RUNOFF FARMING IN THE DESERT. 3: MICROCATCHMENTS FOR IMPROVEMENT OF DESERT RANGE.

AGRONOMY JOURNAL 62:445-449.

ISRAEL/RUNOFF FARMING/CATCHMENTS/NEGEV/RAINFALL-RUNOFF RELATIONSHIPS/SALINE SOILS/ATRIPLEX

221

SINGER, A./SHACHNAI, E.

1972

THE MICROMORPHOLOGY AND CLAY MINERALOGY OF SANDY PALEOSOILS FROM THE COASTAL PLAIN OF ISRAEL. IN ETUDES SUR LE QUATERNAIRE DANS LE MONDE, 1:391-394.

INQUA CONGRESS, 8TH, PARIS, 1969. GA 73A-0745.

THE VARIABILITY OF THE QUATERNARY SEDIMENTS OF THE ISRAEL COASTAL PLAIN IS CONNECTED WITH FLUCTUATING SEA LEVEL. SEVERAL TRANSGRESSION/REGRESSION CYCLES ARE RECOGNIZED. SAMPLES OF REDDISH PALEOSOLS WERE EXAMINED FROM TERRESTRIAL PHASES IN DIFFERENT CYCLES, AND A PRESENT-DAY RED SANDY SOIL, BY ANALYZING THE MICROMORPHOLOGY AND CLAY MINERALOGY. THE PALEOSOLS DO NOT DIFFER SUFFICIENTLY TO BE OF GREAT VALUE AS STRATIGRAPHIC TRACERS AND IT SEEMS AS THOUGH PEDOGENETIC CONDITIONS, INCLUDING CLIMATE, THROUGHOUT THE PLEISTOCENE WERE NOT VERY DIFFERENT FROM THE PRESENT. THIS ASSUMPTION IS SUPPORTED BY SEDIMENTARY DATA FROM THE PLAIN OF HAIFA AND POLLEN ANALYSIS.

ISRAEL/COASTAL PLAINS/MORPHOLOGY/MINERALOGY/CLAYS/QUATERNARY PERIOD/SEDIMENTS/WATER LEVELS/PALEOSOLS/PLEISTOCENE EPOCH/PALYNOLOGY/SOIL FORMATION/SANDS

222

SMITH, C.G.

1970

WATER RESOURCES AND IRRIGATION DEVELOPMENT IN THE MIDDLE EAST.

GEOGRAPHY 55:407-425.

MIDDLE EAST/TURKEY/IRAN/SYRIA/IRAQ/LEBANON/JORDAN/ISRAEL/EGYPT/RAINFALL/WATER RESOURCES/IRRIGATION/CLIMATE

223

SMITH, R.A./BIRCH, B.P.

1963

THE EAST GHOR IRRIGATION PROJECT IN THE JORDAN VALLEY.

GEOGRAPHY 48:407-409.

JORDAN VALLEY/IRRIGATION PROGRAMS

224

SMITH, R.A./ROBERTSON, V.C.

1962

SOIL AND IRRIGATION CLASSIFICATION OF SHALLOW SOILS OVERLYING GYPSUM BEDS, NORTHERN IRAQ.

JOURNAL OF SOIL SCIENCE 13:106-115.

IRAQ/SOIL CLASSIFICATIONS/GYPSUM/IRRIGATED SOILS/SOIL TYPES

225

STANHILL, G.

1969

EVAPORATION FROM LAKE TIBERIAS: AN ESTIMATE BY THE COMBINED WATER BALANCE - MASS TRANSFER APPROACH.

ISRAEL JOURNAL OF EARTH SCIENCES 18(3-4):101-108.

LAKE TIBERIAS/ISRAEL/EVAPORATION/WATER BALANCE/WATER TRANSFER

226

STEVENS, J.H.

1968

THE SOILS OF THE TRUCIAL STATES: CLASSIFICATION AND CAPABILITY.

INTERNATIONAL CONGRESS OF SOIL SCIENCE, 9TH, ADELAIDE, AUSTRALIA, TRANSACTIONS 4:253-260. GA 70B-630. SWRA W70-02423.

THE TRUCIAL STATES, LOCATED ON THE ARID ARABIAN PENINSULA, ARE MADE UP OF FIVE MAJOR PHYSIOGRAPHIC REGIONS. THE SOUTHERN PART OF THE OMAN HILLS IS FORMED OF METAMORPHIC AND BASIC IGNEOUS ROCKS. TO THE WEST ARE THE CENTRAL GRAVEL PLAINS FORMED BY OUTWASH FROM THE HILLS. THE AUTHOR REPORTS THE RESULTS OF A SOIL SURVEY OF THE GRAVEL PLAINS CONDUCTED AS A PART OF A WATER RESOURCES SURVEY. THE SOILS RANGE FROM SALINE-ALKALI SOILS TO SIEROZEMS AND NONSALINE-ALKALI SOILS AND ARE SUBDIVIDED ON THE BASIS OF TEXTURE, CALCIUM CARBONATE CONTENT, AND DEPTH OF GRAVEL HORIZONS. THEIR PROPERTIES ARE DISCUSSED IN THIS CONTRIBUTION. THE AIM OF THE SURVEY WAS TO EVALUATE AREAS WHICH COULD PROFITABLY BE USED FOR IRRIGATED AGRICULTURE. ASSUMING AVAILABILITY OF ADEQUATE WATER, SOIL QUALITIES, PARTICULARLY THE PRESENCE OF GRAVEL HORIZONS, ARE THE LIMITING FACTORS. THE AREA IS DIVIDED INTO LAND CAPABILITY CLASSES. THE SOILS WITH GRAVEL PHASES ARE ASSIGNED TO THE LOWEST CAPABILITY CLASSES. THE HEAVY TEXTURED SIEROZEMS WITH A CARBONATE CONTENT OF 25-50 PERCENT ARE ALWAYS CLASSIFIED AS SUITABLE FOR ARABLE DEVELOPMENT. (OALS)

OALS/TRUCIAL STATES/ARABIAN PENINSULA/REGIONAL ANALYSIS/GRAVELS/SOIL CLASSIFICATIONS/SIEROZEMS/SOIL SURVEYS/SODIUM-AFFECTED SOILS/SALINE SOILS/SOIL HORIZONS

227

STEVENS, J.H.

1969

ARID ZONE AGRICULTURAL DEVELOPMENT IN THE TRUCIAL STATES.

JOURNAL OF SOIL AND WATER CONSERVATION 24:181-183.

TRUCIAL STATES/ARABIAN PENINSULA/ARID LANDS/AGRICULTURE

228

STEVENS, J.H.

1969

QUATERNARY EVENTS AND THEIR EFFECT ON SOIL DEVELOPMENT IN AN ARID ENVIRONMENT: THE TRUCIAL STATES.

QUATERNARIA 10:73-81.

QUATERNARY PERIOD/TRUCIAL STATES/ARABIAN PENINSULA/SOIL TYPES/SOIL FORMATION/ ARID LANDS

229

STEVENS, J.H.

1970

THE CHANGING AGRICULTURAL PRACTICE IN AN ARABIAN OASIS.

GEOGRAPHICAL JOURNAL 136:410-418.

ARABIAN DESERT/OASES/AGRICULTURE

230

STEVENS, J.H.

1972

OASIS AGRICULTURE IN THE CENTRAL AND EASTERN ARABIAN PENINSULA.

GEOGRAPHY 57:321-326.

ARABIAN PENINSULA/AGRICULTURE/OASES

231

STEVENS, J.H.

1974

STABILIZATION OF AEOLIAN SANDS IN SAUDI ARABIA'S AL HASA OASIS.

JOURNAL OF SOIL AND WATER CONSERVATION 29(3):129-132. GA 74A-2432.

AEOLIAN SANDS SEVERLY AFFECT THE ANCIENT OASIS OF AL-HASA. IMPROVEMENTS FOR AGRICULTURE INCLUDE THE ESTABLISHMENT OF A SAND STABILIZATION SCHEME USING FAST-GROWING TAMARIX APHYLLA. METHODS OF RECLAMATION ARE DESCRIBED, AND THE INITIAL STAGES IN THE EVOLUTION OF A SOIL ARE DISCUSSED. THESE INCLUDE SOME LESSIVAGE OF FINE MATERIAL, AN ACID HUMUS HORIZON LEADING TO DECALCIFICATION OF THE UNDERLYING SOIL, INCREASED AVAILABILITY OF PHOSPHATE, TRANSLOCATION OF IRON, AND REMOVAL OF SOLUBLE SALTS. THE TECHNIQUE APPEARS TO BE HIGHLY SUCCESSFUL AND INEXPENSIVE. (AUTHOR)

SAUDI ARABIA/OASES/EOLIAN SOILS/AGRICULTURE/SAND CONTROL/TAMARIX/LAND RECLAMATION/ARABIAN DESERT

232

STORKE, C.

1959

EVAPOTRANSPIRATION PROBLEMS IN IRAQ.

NETHERLANDS JOURNAL OF AGRICULTURAL SCIENCE 7:269-282.

IRAQ/EVAPOTRANSPIRATION

233

STRIEM, H.L.

1967

RAINFALL GROUPINGS IN THE MIDDLE EAST.

INTERNATIONAL ASSOCIATION OF SCIENTIFIC HYDROLOGY, BULLETIN 11:59-64.

MIDDLE EAST/RAINFALL/WEATHER PATTERNS

234

STRIEM, H.L./ROSENAN, N.

1973

RAINSPELLS, AS A CLIMATOLOGICAL PARAMETER USED IN THE ANALYSIS OF RAINFALL IN JERUSALEM.

ARCHIV FUER METEOROLOGIE, GEOPHYSIK, UND BIOKLCMATOLCGIE, SER. B., 21(1):25-42. GA 74B 0352.

RAINFALL OF JERUSALEM FOR THE LAST 20 YEARS WAS ANALYZED BY INTRODUCING THE CONCEPT OF RAINSPELLS, I.E. GROUPS OF SUCCESSIVE HOURS OR DAYS WITH PRECIPITATION WHICH TOGETHER CONSTITUTE A METEOROLOGICALLY SIGNIFICANT PERIOD. RAINSPELLS THUS DEFINED WERE FOUND TO BE CHARACTERIZED BY THEIR YIELD, DURATION AND 'INTENSITY', I.E. THE RATIO BETWEEN YIELD AND DURATION OF THE SPELL AS A WHOLE. IT WAS ALSO FOUND THAT THE RAINSPELLS OF LARGE YIELDS WERE MAINLY OF LONG DURATION, BUT ALSO OF HIGHER INTENSITY. RAIN-SPELLS WERE GROUPED INTO SIGNIFICANT TYPES BY THEIR CHARACTERISTICS. (AFTER AUTHOR)

ISRAEL/RAINFALL/DEPTH-AREA-DURATION ANALYSIS/WEATHER PATTERNS/RAINFALL INTENSITY/PRECIPITATION(ATMOSPHERIC)/METEOROLOGICAL DATA

235

TADMOR, N.H./EVENARI, M./SHANAN, L.

1970 - 1971

RUNOFF FARMING IN THE DESERT. 4: SURVIVAL YIELDS OF PERENNIAL RANGE PLANTS. 5: PERSISTENCE AND YIELDS OF ANNUAL RANGE SPECIES.

AGRONOMY JOURNAL 62:695-699; 63:91-95.

ISRAEL/RUNOFF FARMING/PLANTS/RANGES/WATER HARVESTING/NEGEV/SURFACE RUNOFF/SURVIVAL/DROUGHT TOLERANCE/SOIL MOISTURE/RAINFALL/HERBAGE PRODUCTION

236

TADMOR, N.H./SHANAN, L.

1969

RUNOFF INDUCEMENT IN AN ARID REGION BY REMOVAL OF VEGETATION.

SOIL SCIENCE SOCIETY OF AMERICA, PROCEEDINGS 33:790-794.

ERADICATION OF NATURAL VEGETATION FROM RUNOFF PLOTS IN A 250 MM ISOHET REGION INCREASED ANNUAL RUNOFF THREEFOLD FROM 7 PERCENT TO 21 PERCENT OF ANNUAL RAINFALL. THE VEGETATION COVER INCREASED THE INFILTRATION RATES OF THE LOESS SOIL BY 40 TO 50 PERCENT. A 'PRIMING' RAINFALL OF 2 TO 4 MM/DAY WAS REQUIRED TO CAUSE RUNOFF FROM BOTH BARE AND VEGETATION AREAS. INTERCEPTION STORAGE OF VEGETATION WAS 0.1 TO 0.4 MM. (AUTHOR)

ISRAEL/NEGEV/RUNOFF/WATER HARVESTING/RAINFALL-RUNOFF RELATIONSHIPS/PLANT COVER/INFILTRATION/LOESS/INTERCEPTION

237

TAMIMI, S.A./YOUNIS, M.A.

1972

EFFECT OF CCC AND IRRIGATION ON WHEAT YIELDS IN IRAQ.

WORLD CROPS 24(6):310-311.

CYCOCEL (2-CHLORO-ETHYL)-TRIMETHYLAMMONIUM CHLORIDE USED AS GROWTH-RETARDANT TO INCREASE RESISTANCE OF YOUNG WHEAT PLANTS TO SOIL SALINITY AND DROUGHT.

IRRIGATION/TRITICUM/SOIL SALINITY/PLANT GROWTH REGULATORS/DROUGHT TOLERANCE/IRAQ

238

TAN, K.

1970

AGRICULTURAL PROBLEMS IN SOUTHERN ARABIA.

WORLD CROPS 22:397-400.

SOUTH ARABIA/AGRICULTURE/ARABIAN DESERT

239

THATCHER, L./RUBIN, M./BROWN, G.

1961

DATING DESERT GROUNDWATER.

SCIENCE 134:105.

TRITIUM IN ARABIAN RAINFALL HAS FOLLOWED THE TREND OBSERVED IN NORTH AMERICA WITH PEAKS IN 1958 AND THE SPRING OF 1959. THESE MEASUREMENTS WILL BE USEFUL FOR FUTURE HYDROLOGIC STUDIES. WATER FROM WADI GRAVELS AVERAGES 10 YEARS OLD. CARBON-14 MEASUREMENTS OF DEEP WATERS INDICATE AGES OF SEVERAL THOUSAND YEARS.

ARABIAN DESERT/GROUNDWATER/RAINFALL/RADIOCARBON DATING/HYDROLOGY

240

THORNTHWAITE, C.W./MATHER, J.R./CARTER, D.B.

1958

THREE WATER BALANCE MAPS OF SOUTHWEST ASIA.

DREXEL INSTITUTE OF TECHNOLOGY, PHILADELPHIA, LABORATORY OF CLIMATOLOGY, PUBLICATIONS IN CLIMATOLOGY 11(1). 57 P.

MIDDLE EAST/WATER BALANCE/HYDROLOGIC MAPS

241

TURKOWSKI, L.

1969

PEASANT AGRICULTURE IN THE JUDEAN HILLS.

PALESTINE EXPLORATION QUARTERLY 101:21-33, 101-112.

ISRAEL/AGRICULTURE

242

UBELL, K.

1971

IRAQ'S WATER RESOURCES.

NATURE AND RESOURCES 7:3-9.

IRAQ/WATER RESOURCES

243

UNITED NATIONS DEVELOPMENT PROGRAMME, NEW YORK

1966

GENERAL REPORT ON THE GROUNDWATER INVESTIGATION OF THE AZRAQ BASIN.

SAME AS AUTHOR. 64 P. NGA 21.1-795. SWRA(2)W69-09200.

THIS PROJECT ASSESSES GROUND- AND SURFACE-WATER POTENTIAL OF THE AZRAQ AREA, JORDAN. RESULTS OF A COMPREHENSIVE STUDY INDICATE THAT SAFE PERENNIAL YIELD OF GROUNDWATER IN THE AZRAQ BASIN IS NOT ADEQUATE TO MEET REQUIREMENTS OF PROPOSED PLANS FOR IRRIGATION OF LARGE AREAS OF ADDITIONAL LANDS IN THE BASIN OR FOR EXPORTATION. FIELD DATA SHOW THAT IN ADDITION TO GROUNDWATER PERENNIALLY AVAILABLE IN THE BASIN, A LARGE VOLUME OF WATER IS CONTAINED IN STORAGE IN GEOLOGIC FORMATIONS. IT SEEMS UNWISE TO MINE THIS STORED WATER FOR IRRIGATION AGRICULTURE UNDER CURRENT CONDITIONS BECAUSE, AS THE QUANTITY IN STORAGE IS DEPLETED, THE GROUNDWATER TABLE DECLINES AND IRRIGATION COSTS STEADILY INCREASE. THE REPORT PROVIDES INFORMATION ON GEOLOGY, HYDROLOGY AND CHEMISTRY OF THE WATER. RECORDS AND LOGS OF SELECTED WELLS ARE INCLUDED.

WATER YIELD IMPROVEMENT/WATER RESOURCES/GROUNDWATER BASINS/SURVEYS/WELLS/DESERTS/WATER QUALITY/RECHARGE/DISCHARGE(WATER)/HYDROLOGIC DATA/WATER SOURCES/AQUIFERS/SPRINGS/JORDAN/AZRAQ/HYDROGEOLOGY/IRRIGATION PROGRAMS/WITHDRAWAL/SURFACE WATERS/GROUNDWATER MINING/WATER TABLE/OALS

244

VAN AART, R.

1972

ASPECTS OF DRAINAGE AND LAND RECLAMATION IN THE LOWER MESOPOTAMIAN PLAIN: A PROBLEM ANALYSIS.

INSTITUTE FOR APPLIED RESEARCH ON NATURAL RESOURCES, BAGHDAD, IRAQ, TECHNICAL BULLETIN 34. 23 P. SWRA W73-07135.

THE OLDEST FORM OF ANY PRIMITIVE RECLAMATION PRACTICE IN THE WORLD IS ASCRIBED TO THE SUMERIANS WHO RECLAIMED LAND AS EARLY AS 3000 B.C. BY BORDERING TRACTS IN THE MARSHES OF THE DELTA PLAIN WITH LOW EARTHEN DAMS AND DRAINING THEM. THE FIRST APPEARANCE OF SALINITY WAS ATTRIBUTED TO THE SAME ERA. A DECLINE IN THE AGRICULTURAL PROSPERITY WAS NOTED AND AN OVERALL SHIFT IN LAND USE TOOK PLACE CHANGING FROM ANNUAL WINTER CULTIVATION (MAINLY) TO A SYSTEM OF FALLOW LAND ROTATION. THE OBJECTIVE OF THIS STUDY IS TO CONTRIBUTE TO A BETTER UNDERSTANDING OF THE PROBLEMS OF WATERLOGGING AND SALINIZATION, TO DELINEATE WHY SO MANY FAILURES TOOK PLACE IN THE IMPLEMENTATION OF EARLIER LAND RECLAMATION SCHEMES, AND TO GIVE SOME BROAD LINES ALONG WHICH ANY FUTURE RECLAMATION ACTIVITY SHOULD PROCEED. A SUMMARY IS INCLUDED OF THE PHYSIOGRAPHY, SOIL, CLIMATE, VEGETATION, HYDROLOGY, AND SALINITY OF THE PLAINS. PROBLEMS OF WATERLOGGING AND SALINIZATION CAN BE SOLVED BEST BY CONTROL OF THE WATER TABLE (DRAINAGE), AND SUBSEQUENT DESALINIZATION, DEALKALINIZATION AND CROPPING (RECLAMATION). DRAINAGE CRITERIA ARE OUTLINED AND PERMEABILITY OF THE SOIL IS ANALYZED IN DETAIL. (OALS)

OALS/DRAINAGE/LAND RECLAMATION/LAND USE/REGIONAL ANALYSIS/SATURATED SOILS/DAMS/SALINE SOILS/SALINITY/AGRICULTURE/CULTIVATION/EVALUATION/ WATER RESOURCES DEVELOPMENT/GROUNDWATER/PERMEABILITY/SODIUM-AFFECTED SOILS/SOIL ANALYSIS/IRAQ/MESOPOTAMIAN PLAIN

245

VAN ZEIST, W.

1967

LATE QUATERNARY VEGETATION HISTORY OF WESTERN IRAN.

REVIEW OF PALAEOBOTANY AND PALYNOLOGY 2:301-311.

IRAN/VEGETATION CHANGE/PALYNOLOGY/QUATERNARY PERIOD/CLIMATIC CHANGE/TREES/ FORESTS

246

VAN ZEIST, W./WRIGHT, H.E., JR.

1963

PRELIMINARY POLLEN STUDIES AT LAKE ZERIBAR, ZAGROS MOUNTAINS, SOUTHWESTERN IRAN.

SCIENCE 140:65-69.

IRAN/LAKES/PALYNOLOGY

247

VITA-FINZI, C.

1966

THE HASA FORMATION: AN ALLUVIAL DEPOSITION IN JORDAN.

HAM 1(3):386-390. GA 67A-342.

THIS EPHEMERAL STREAM DRAINS WESTWARD FROM THE EASTERN PLATEAU OF JORDAN TO THE DEAD SEA. THE UPPER PART OF ITS COURSE IS VERY GENTLE AND DISSECTION SHOWS THAT IT IS UNDERLAIN BY ALLUVIAL FILL HERE NAMED THE HASA FORMATION. IT CONTAINS KEBARAN IMPLEMENTS. OTHER ALLUVIAL DEPOSITS FORM TERRACES AND ARTEFACTS SHOW THAT THEY ARE LOCAL REPRESENTATIVES OF FILLS FOUND IN OTHER PARTS OF JORDAN. THE HASA FORMATION WAS LAID DOWN BETWEEN 10,000 AND 4,000 YEARS AGO AND FROM ITS GENERAL SEDIMENTARY CHARACTERISTICS IS REGARDED AS A DEPOSIT OF A STREAM WITH LARGER AND BETTER-DISTRIBUTED DISCHARGE THAN TODAY. THE PERIODIC FLOODING OF BROAD ALLUVIAL VALLEY FLOODS WAS PROBABLY OF IMPORTANCE IN THE ESTABLISHMENT OF AGRICULTURE AT THIS TIME.

JORDAN/DEAD SEA/EPHEMERAL STREAMS/ALLUVIUM/DEPOSITION(SEDIMENTS)/FLOODS/TERRACES(GEOMORPHOLOGY)/ARCHAEOLOGY/AGRICULTURE/HISTORY

248

VITA-FINZI, C.

1969

LATE QUATERNARY CONTINENTAL DEPOSITS OF CENTRAL AND WESTERN TURKEY.

MAN 4(4):605-619. GA 71A-2109.

DEPOSITS DESCRIBED INCLUDE REMNANTS OF THE LAST INTERGLACIAL BEACH DESCRIBED FROM A NUMBER OF LOCALITIES ALONG THE TURKISH COAST. A TUFA DEPOSIT HERE CALLED THE ANTALYA TUFA IS ASSIGNED TO THE WURM REGRESSION. RED ALLUVIAL BEDS ARE CALLED THE SINOP ALLUVIUM. PREHISTORIC REMAINS ARE ASSOCIATED WITH THIS DEPOSIT. A MORE RECENT ALLUVIUM INCISED INTO THE SINOP ALLUVIUM IS GIVEN THE NAME MEANDER ALLUVIUM. THERE ARE BRIEF NOTES ON RATES OF CONTEMPORARY EROSION AND THE SEQUENCE OF DEPOSITS DESCRIBED IN THE ARTICLE IS SUMMARIZED IN A TABLE AND TENTATIVE CORRELATIONS ARE MADE WITH OTHER COUNTRIES OF THE MEDITERRANEAN AREA.

TURKEY/QUATERNARY PERIOD/ALLUVIUM/ARCHAEOLOGY/DEPOSITION(SEDIMENTS)/BEACHES/SEDIMENTS/EROSION/MEDITERRANEAN BASIN

249

VITA-FINZI, C.

1969

MEDITERRANEAN MONOGLACIALISM?

NATURE 224(5215):173. GA 71A-2254.

IN MANY PARTS OF THE MEDITERRANEAN BASIN AND WESTERN ASIA THERE IS FIRM SEDIMENTARY EVIDENCE FOR ONLY ONE 'GLACIAL' EPISODE WITHIN THE QUATERNARY. IT CONSISTS OF CALCAREOUS AND ALLUVIAL DEPOSITS LAID DOWN IN THE VALLEYS DURING THE LAST MARINE REGRESSION AND WHICH CONTAIN MIDDLE AND UPPER PALAEOLITHIC ARTEFACTS. WHILE THE MEDITERRANEAN MUST HAVE BEEN AFFECTED BY WORLD-WIDE EUSTATIC OSCILLATIONS OF SEA LEVEL, THERE IS NO CLEAR EVIDENCE THAT THIS WAS ACCOMPANIED BY CLIMATIC CHANGES UNTIL THE LAST GLACIATION.

QUATERNARY PERIOD/SEDIMENTS/MEDITERRANEAN CLIMATE/MEDITERRANEAN BASIN/WATER LEVELS/ALLUVIUM/CALCAREOUS SOILS/DEPOSITION(SEDIMENTS)/ARCHAEOLOGY/GLACIAL GEOLOGY

250

VITA-FINZI, C.

1969

THE MEDITERRANEAN VALLEYS: GEOLOGICAL CHANGES IN HISTORICAL TIMES.

CAMBRIDGE UNIVERSITY PRESS. 140 P. GA 69A-1371.

LYING BETWEEN THE 'EVERLASTING' HILLS, THE VALLEYS OF THE MEDITERRANEAN AREA HAVE SEEN PERIODS OF AGGRADATION AND INCISION WITHIN HISTORIC TIME. ROMAN POTSHERDS LIE DEEP IN TERRACE FILLS, NOW HIGH AND DRY ABOVE THE RIVER. THESE FEATURES ARE DESCRIBED FROM SOME DOZEN AREAS ALL AROUND THE MEDITERRANEAN. THIS UBIQUITOUS PATTERN OF PHYSIOGRAPHIC CHANGE HAS GREATLY MODIFIED THE ECONOMIC POTENTIAL OF THE AREA. IN THE SECOND PART OF THE BOOK AN ATTEMPT IS MADE TO UNRAVEL THE HUMAN AND PHYSICAL CONTROLS THAT HAVE AFFECTED EROSION AND SEDIMENTATION. A MAJOR PERIOD OF AGGRADATION OCCURRED 10-50,000 YEARS AGO, EROSION CONTINUED THROUGH TO ROMAN TIMES (CUTTING A HIGH TERRACE IN THIS OLDER FILL), AND SINCE THEN THERE HAS BEEN THE MEDIEVAL AGGRADATION AND, OVER THE LAST 500 YEARS OR SO, RENEWED EROSION, CUTTING INTO THE 'HISTORICAL TERRACE'. GEOLOGICAL CAUSES COULD BE REGIONAL AND AT TIMES (E.G. EARTH MOVEMENT) WOULD BE LOCAL. HUMAN HISTORY SEEMS LINKED WITH EROSIONAL HISTORY, BUT A DIRECT LINK CAN HARDLY BE TRACED THROUGH THE DESTRUCTION OF VEGETATION, FOR THIS STARTED LONG BEFORE THE MEDIEVAL AGGRADATION. A CLIMATIC INTERPRETATION IS PREFERRED, LINKING AGGRADATION WITH THE 'LITTLE ICE AGE' THROUGH THE SHIFTING OF DEPRESSION TRACKS AND A CHANGE IN THE SEASONAL RAINFALL PATTERN. IT IS UBIQUITOUS, AS ARE THE PHYSIOGRAPHIC CHANGES, WHILE ALL OTHER EXPLANATIONS SEEM INADEQUATE. ROMAN SUCCESSES IN CULTIVATION IN TRIPOLITANIA AND ELSEWHERE DEPENDED IN PART ON DAMS TRAPPING THE SOIL COMING OFF THE SLOPES.

AGGRADATION/ARCHAEOLOGY/GEOMORPHOLOGY/SOIL EROSION/SEDIMENTATION/HISTORY/TERRACES(GEOMORPHOLOGY)/GEOLOGY/WEATHER PATTERNS/CLIMATIC CHANGE/EROSION CONTROL/DEPRESSIONS(GEOMORPHIC)/PERTURBATION/GLACIAL GEOLOGY/MEDITERRANEAN BASIN

251

VITA-FINZI, C.

1973

THE MUSANDAM EXPEDITION 1971-72. SCIENTIFIC RESULTS 1(4): LATE QUATERNARY SUBSIDENCE.

GEOGRAPHICAL JOURNAL 139(3):414-421. GA 74A-0408.

IT IS GENERALLY ACCEPTED THAT SUBSIDENCE HAS COLLABORATED WITH THE FLANDRIAN TRANSGRESSION IN PRODUCING THE DROWNED COASTLINE OF NORTHERN OMAN. EVIDENCE OBTAINED IN 1971-1972 FROM OFFSHORE HYDROGRAPHIC AND GEOPHYSICAL WORK AND FROM ALLUVIAL STRATIGRAPHY INDICATES TILTING TOWARDS THE NORTHEAST DURING THE LATE QUATERNARY; THE VERTICAL DISPLACEMENT OF THE NORTH AND EAST COASTS APPEARS TO HAVE EXCEEDED 60 M DURING THE LAST 10,000 YEARS. THE HINGE LINE PASSES THROUGH RA'S AL-KHAYMAH AND DIBA. (AUTHOR)

MUSCAT AND OMAN/SOUTH ARABIA/MARINE GEOPHYSICS/COASTS/QUATERNARY PERIOD/SUBSIDENCE/ALLUVIUM/STRATIGRAPHY/GEOMORPHOLOGY/HYDROGRAPHY

252

VON WISSMANN, H. ET AL

1956

ON THE ROLE OF NATURE AND MAN IN CHANGING THE FACE OF THE DRY BELT OF ASIA. IN W.L. THOMAS, JR., ED., MAN'S ROLE IN CHANGING THE FACE OF THE EARTH, P. 278-303.

UNIVERSITY OF CHICAGO PRESS, CHICAGO.

SUMMARIZES THE GEOGRAPHICAL AND ANTHROPOLOGICAL HISTORY OF THE RISE, SPREAD AND DEVELOPMENT OF CULTURES, WITH EMPHASIS ON THE EFFECT OF CLIMATE AND ON THE DEVELOPMENT OF HERDING, AGRICULTURE AND NOMADISM. EARLY MIGRATION WAS FACILITATED BY THE STEPPE VEGETATION THAT COVERED MOST OF THE DRY BELT(DURING THE LAST ICE AGE) ALLOWING MORE MIGRATION THAN PRESENT-DAY VEGETATION. VEGETATION STUDIES OF THE DRY BELT (EXTENDING TO INNER ASIA, CENTRAL EUROPE AND CHINA) INDICATE THAT BECAUSE OF LOWER TEMPERATURES, THE BOUNDARIES OF THE THERMAL ZONES WERE EXTENDED OVER MUCH GREATER DISTANCES THAN BOUNDARIES OF HUMID ZONES-INCLUDING ARABLE STEPPE AND DESERT STEPPE. CIVILIZATION SPREAD THROUGHOUT ASIA WITH SETTLEMENTS DEVELOPING CEREAL FARMING, HERDING OF SHEEP AND GOATS, AS WELL AS ELEMENTARY TYPES OF IRRIGATION AND OASIS ECONOMY. FARMING AND HERDING SPREAD INTO 3 DISTINCT REGIONS: 1) THE MIDDLE BELT OF MOROCCO AND SPAIN TO NORTHERN CHINA, WHERE NATURAL OASES AND IRRIGATION ARE STILL OF GREATEST IMPORTANCE; 2) THE SOUTHERN BELT OF THE TROPICAL STEPPE OF THE SUDAN; 3) THE NORTHERN BELT FROM MANCHURIA AND NORTHERN MONGOLIA TO KAZAKHSTAN, SOUTHERN RUSSIA, AND RUMANIA.

KWIC DE 19/OALS/ARID LANDS/ARID CLIMATE/SEMIARID CLIMATE/SOCIAL ASPECTS/HISTORY/GRAZING/CLIMATOLOGY/AGRICULTURE/CLIMATIC-VEGETAL RELATIONSHIPS/VEGETATION CHANGE/MIGRATION/NOMADS/CENTRAL ASIA/MIDDLE ASIA/ARABIAN PENINSULA/AFRICA/CHINA/USSR

253

WALDEMAR, H.

1970

ÜBER DEN ABFLUSS IM EINZUGSBEREICH DES TOTEN MEERES WAHREND DER LETZTEN KALTZEIT UND HEUTE (RUNOFF IN THE CATCHMENT OF THE DEAD SEA DURING THE LAST ICE-AGE AND TODAY).

ARCHIV FUER METEOROLOGIE, GEOPHYSIK, UND BIOKLIMATOLOGIE, SER. B, 18(2):101-130. ENGLISH AND GERMAN SUMMARIES. MGA 22.12-424.

DURING COLD PERIODS OF THE PLEISTOCENE, POTENTIAL EVAPORATION WAS LESS THAN TODAY. THE WATER BALANCE, THEREFORE, WAS CHANGED EVERYWHERE. HOW FAR AT THAT TIME PRECIPITATION AMOUNT AND DISTRIBUTION DIFFERED IN JORDAN FROM TODAY IS NOT TO BE VERIFIED DIRECTLY. FOR THE PRESENT, IT SEEMS OBVIOUS TO TAKE THE PRECIPITATION OF THE LAST COLD PERIOD AS SIMILAR TO NOW AND TO INVESTIGATE THE CONSEQUENCES OF REDUCTIONS OF TEMPERATURE ON THE WATER BALANCE ONLY. THE RISING OF RUNOFF HEIGHT AND AMOUNT IS EVALUATED USING THE RESULTS OF CLIMATOLOGICAL MEASUREMENTS OF TEMPERATURE AND PRECIPITATION AT JERUSALEM FOR 93 YEARS AND AT AMMAN FOR 40 YEARS AND WITH A GENERAL DROP OF TEMPERATURE OF 5 AND 10 DEGREES ALSO. ACCORDING TO THESE RESULTS, ESTIMATIONS OF THE CHANGING AMOUNT OF RUNOFF FOR WEST AND EAST JORDAN ARE PERFORMED BY LOWERING THE TEMPERATURES BY 1 DEGREE TO 10 DEGREES, AND BY RISING THE PRECIPITATIONS TO 10 AND 20 PERCENT. THE RESULTS ARE CHECKED BY MEANS OF THE FLUCTUATIONS THE WATER BALANCE OF THE DEAD SEA CARRIED OUT FROM 23,000 YEARS AGO TO THE PRESENT. THE FIRST HALF OF A DROP IN TEMPERATURE OF THE DIMENSION OF SUCH A COLD PERIOD HAS A MUCH GREATER INFLUENCE THAN THE SECOND ONE ON THE REDUCTION OF EVAPORATION AND ON THE INCREASE OF RUNOFF, AND CONSEQUENTLY, ON THE WATER BALANCE. (AUTHOR)

OALS/PLEISTOCENE EPOCH/HYDROLOGY/WATER BALANCE/JORDAN/ PALEOCLIMATOLOGY/CLIMATIC CHANGE/CLIMATIC DATA/CATCHMENTS/DEAD SEA/ ISRAEL

254

WALKER, J.M.

1967

SOME IDEAS ON WINTER ATMOSPHERIC PROCESSES OVER S.W. ASIA.

METEOROLOGICAL MAGAZINE 96(1139):161-167. GA 67B-1547.

ATMOSPHERIC CIRCULATIONS OVER S.W. ASIA IN WINTER ARE RELATED TO PRECIPITATION AND CLOUD DISTRIBUTIONS. IT IS FOUND THAT THE POSITION OF THE SUB-TROPICAL JET STREAM HAS CONSIDERABLE EFFECT ON RAINFALL DISTRIBUTION, WHICH IS IN ACCORDANCE WITH REITER'S WORK ON JET STREAMS. A CASE STUDY IS DESCRIBED AND AN EXPLANATION OF THE CLOUD PATTERNS GIVEN.

ATMOSPHERIC CIRCULATION/MIDDLE EAST/WINTER PRECIPITATION/WEATHER PATTERNS/ JET STREAMS(METEOROLOGY)/RAINFALL/IRAQ/INDIA/PERSIAN GULF/IRAN/PAKISTAN/ SAUDI ARABIA

255

WASYLIKOWA, K.

1967

LATE QUATERNARY PLANT MACROFOSSILS FROM LAKE ZERIBAR, WESTERN IRAN.

REVIEW OF PALAEOBOTANY AND PALYNOLOGY 2:313-318.

IRAN/QUATERNARY PERIOD/LAKES/PALEOBOTANY/PLANTS

256

WEICKMANN, L.

1961

SOME CHARACTERISTICS OF THE SUB-TROPICAL JET STREAM IN THE MIDDLE EAST AND ADJACENT REGIONS.

IRAN METEOROLOGICAL DEPARTMENT, METEOROLOGICAL PUBLICATIONS 1, SER. A. 29 P.

SUMMARIZES THE AVAILABLE INFORMATION ON THE SUBTROPICAL JET STREAM IN THE MIDDLE EAST. THE SEASONAL SHIFTS AND THE JET CORE ARE DESCRIBED.

MIDDLE EAST/JET STREAMS(METEOROLOGY)/SEASONAL

257

WEICKMANN, L.

1963

METEOROLOGICAL AND HYDROLOGICAL RELATIONSHIPS IN THE DRAINAGE AREA OF THE TIGRIS RIVER NORTH OF BAGHDAD.

METEOROLOGISCHE RUNDSCHAU 16:33-38.

TIGRIS RIVER/IRAQ/METEOROLOGY/HYDROLOGY

258

WESTERN, A.C.

1971

THE ECOLOGICAL INTERPRETATION OF ANCIENT CHARCOALS FROM JERICHO.

LEVANT, LONDON (BRITISH SCHOOL OF ARCHAEOLOGY IN JERUSALEM) 3:31-40.

JORDAN/ECOLOGY/HISTORY

259

WHITE, L.P.

1969

VEGETATION ARCS IN JORDAN.

JOURNAL OF ECOLOGY 57(2):461-466. GI 71B-0304.

THE ARCS OCCUR IN THE HASA BASIN AND IN THE WADI BUWEIAJA, VERY LOW RAINFALL AREAS, ON HIGHLY SALINE AND ALKALINE ALLUVIAL FLATS LIABLE TO PERIODIC INUNDATION. THEY CONSIST OF LOW, GRAZED-DOWN XEROPHYTIC AND HALOPHYTIC SHRUBS, AND ARE 5 M ACROSS, UP TO 800 M LONG AND 25-100 M APART, SEPARATED BY BARE ALLUVIUM. SPECIES ARE ROOTED IN CONTIGUOUS WIND-ACCUMULATED HUMMOCKS (UP TO 500 CM HIGH) WHICH ACT AS CHECK-DAMS TO SHEET-WASH, CONCENTRATING THE LIMITED SUPPLIES OF WATER AND CAUSING MARKED LOCAL LEACHING OF SOLUBLE SALTS. THEY APPEAR TO REPRESENT PRIMARY COLONIZATION RATHER THAN REMNANTS OF MORE EXTENSIVE VEGETATION. THEY MAY HAVE FORMED BY LATERAL EXTENSION FROM MORE FAVORABLE SITES.

JORDAN/VEGETATION/PLANT DISTRIBUTION/XEROPHYTES/HALOPHYTES/TOPOGRAPHIC FEATURES/ENVIRONMENTAL EFFECTS/SOIL-WATER-PLANT RELATIONSHIPS

260

WHITE, L.P./LAW, R.

1969

CHANNELLING OF ALLUVIAL DEPRESSION SOILS IN IRAQ AND SUDAN.

JOURNAL OF SOIL SCIENCE 20(1):84-90.

IRAQ/ALLUVIUM/DEPRESSIONS(GEOMORPHIC)/SUDAN/CHANNEL MORPHOLOGY/COMPACTION/DISTRIBUTION PATTERNS/GEOMORPHOLOGY

261

WHYTE, R.O.

1961

EVOLUTION OF LAND USE IN SOUTH-WESTERN ASIA.

UNESCO, PARIS. ARID ZONE RESEARCH 17:57-118.

TOPICS TREATED: METHODOLOGY, INTERPRETATION OF INFORMATION AND OBJECTIVES IN RESEARCH; CLIMATE, GEOMORPHOLOGY, SOILS, AND HYDROLOGY; HISTORY OF THE VEGETATION; THE BEGINNINGS OF LAND USE; FIRE, FUEL, AND TIMBER; DOMESTICATION OF CROPS; NATURAL FAUNA AND DOMESTICATION OF ANIMALS; HISTORICAL SEQUENCES. THE RECENT HISTORY OF CLIMATIC CHANGE IN THE AREA IS STILL SUBJECT OF CONTROVERSEY. NATURAL VEGETATION HAS BEEN GREATLY MISUSED IN MAN'S ANXIETY TO PROVIDE FOR HIS NEEDS IN TERMS OF TIMBER, FUEL, LAND FOR CULTIVATION AND GRAZING RESOURCES FOR HIS LIVESTOCK. VEGETATIVE REGRESSION IS PROBABLY DUE ONLY SLIGHTLY, IF AT ALL, TO ANY MAJOR OR LOCAL CLIMATIC CHANGE, ALTHOUGH MICROCLIMATIC CHANGE HAS LED TO INCREASED DESICCATION. THE AUTHOR DOCUMENTS THE DESTRUCTION OF FOREST RESOURCES AND STATES THAT THERE IS STILL LITTLE SIGN THAT THE LESSONS OF HISTORY HAVE BEEN READ AND UNDERSTOOD. THIS AREA WAS VERY IMPORTANT IN THE DOMESTICATION OF CROPS AND ANIMALS. THE EVOLUTION OF THEIR INCORPORATION INTO CIVILIZATION AND ITS EFFECT ON LAND USE PATTERNS IS TRACED THROUGH PREHISTORIC AND HISTORIC TIMES. THE ABANDONMENT OF ONCE FERTILE LANDS RESULTED NOT ONLY FROM POOR TECHNOLOGICAL UNDERSTANDING, BUT FREQUENTLY FROM CHANGING SOCIAL AND POLITICAL ATMOSPHERES. 233 REFERENCES.

LAND TENURE/OALS/HISTORY/LAND USE/LAND RESOURCES/LAND RECLAMATION/ARID LANDS/GEOMORPHOLOGY/GEOLOGY/HYDROLOGY/WILDLIFE/SOCIAL ORGANIZATION/GRAZING/RANGE MANAGEMENT/VEGETATION/FORESTS/LAND MANAGEMENT/CULTIVATION /SALINITY/PERTURBATION/DEGENERATION/MIDDLE EAST/CLIMATIC CHANGE/EVOLUTION

262

WIENER, A.

1972

THE DEVELOPMENT OF ISRAELI WATER RESOURCES.

AMERICAN SCIENTIST 60:466-473.

ISRAEL/WATER RESOURCES DEVELOPMENT

263

WINSTANLEY, D.

1973

RAINFALL PATTERNS AND GENERAL ATMOSPHERIC CIRCULATION.

NATURE 245:190-194. GA 74B-1905. SWRA W75-04513.

RAINFALL RECORDS OF THE MEDITERRANEAN, THE MIDDLE EAST, THE SAHEL ZONE, AND NORTH-WEST INDIA FROM THE BEGINNING OF THIS CENTURY WERE ANALYZED. RAINFALL FLUCTUATIONS ARE RELATED TO CHANGES IN GENERAL CIRCULATION OF THE ATMOSPHERE. FROM THE ANALYSIS, AN IDEA OF LONG-TERM RAINFALL PROSPECTS AND FUTURE CLIMATIC PATTERNS CAN BE OBTAINED. IN ARID AREAS LIKE THE SAHARA, HUMAN RESPONSE TO LOW AND VARIABLE RAINFALL IS NOMADISM. CLIMATOLOGY WILL PLAY AN IMPORTANT ROLE IN LONG-TERM PLANNING IN ECONOMIC AND POLITICAL PROBLEMS OF THE AFFECTED COUNTRIES. (OALS)

OALS/AID/KWIC SS 68/RAINFALL/WEATHER PATTERNS/WEATHER DATA/MIDDLE EAST/INDIA/SAHELIAN ZONE/ATMOSPHERIC CIRCULATION/WEATHER FORECASTING/SAHARA/TRANSHUMANCE/ARID CLIMATE/CLIMATOLOGY/PLANNING/POLITICAL ASPECTS

264

WINSTANLEY, D.

1973

RECENT RAINFALL TRENDS IN AFRICA, THE MIDDLE EAST AND INDIA.

NATURE 243(5408):464-465. GA 74B-0353.

AFRICA/MIDDLE EAST/INDIA/WET SEASONS/WIND(METEOROLOGY)/MONSOONS/WEATHER PATTERNS/RAINFALL/DROUGHTS/WINTER PRECIPITATION

265

WITTFOGEL, K.A.

1956

THE HYDRAULIC CIVILIZATIONS. IN W.L. THOMAS, JR., ED., MAN'S ROLE IN CHANGING THE FACE OF THE EARTH, P. 152-164.

UNIVERSITY OF CHICAGO PRESS, CHICAGO.

INDIA/CHINA/HISTORY/SOCIAL ASPECTS/AGRICULTURE/IRRIGATION/MESOPOTAMIAN PLAIN/ PERU/MEXICO/NORTH AFRICA/MIDDLE EAST

266

WRIGHT, H.E., JR.

1966

STRATIGRAPHY OF LAKE SEDIMENTS AND THE PRECISION OF THE PALAEOCLIMATIC RECORD. IN WORLD CLIMATE FROM 8000 - 0 B.C., PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM, P. 157-173.

ROYAL METEOROLOGICAL SOCIETY, LONDON

PALEOCLIMATOLOGY/IRAN/QUATERNARY PERIOD/STRATIGRAPHY/PALYNOLOGY/SEDIMENTS/ LAKES

267

WRIGHT, H.E., JR.

1968

NATURAL ENVIRONMENT OF EARLY FOOD PRODUCTION NORTH OF MESOPOTAMIA.

SCIENCE 161:334-339.

MESOPOTAMIAN PLAIN/ENVIRONMENT/CROP PRODUCTION/HISTORY

268

WRIGHT, H.E., JR.

1970

ENVIRONMENTAL CHANGES AND THE ORIGIN OF AGRICULTURE IN THE NEAR EAST.

BIOSCIENCE 20(1):210-212.

TURKEY/IRAQ/IRAN/AGRICULTURE/ENVIRONMENT/HISTORY/ARCHAEOLOGY/PALYNOLOGY/ PLEISTOCENE EPOCH/PALEOCLIMATOLOGY/CROP PRODUCTION/CLIMATIC CHANGE/SETTLEMENTS/ RADIOCARBON DATING/SOCIAL ASPECTS/DOMESTIC ANIMALS

269

WULFF, H.E.

1968

QANATS OF IRAN.

SCIENTIFIC AMERICAN 218(4):94-105.

IRAN/QANATS/GROUNDWATER

270

YAALON, D.H./DAN, J.

1967

FACTORS CONTROLLING SOIL FORMATION AND DISTRIBUTION IN THE MEDITERRANEAN COASTAL PLAIN OF ISRAEL DURING THE QUATERNARY. IN QUATERNARY SOILS, 9:322-338.

INQUA CONGRESS, 7TH, BOULDER-DENVER, 1965. GA 69A-1742.

ISRAEL/QUATERNARY PERIOD/COASTAL PLAINS/PALEOSOLS/SOIL FORMATION/EOLIAN SOILS/ SOIL EROSION/DUNES/VEGETATION EFFECTS/CALCAREOUS SOILS/SOIL FORMATION/ALLUVIUM/ SOIL TYPES/DEPOSITION(SEDIMENTS)/WATER LEVELS/HUMAN BEHAVIOR

271

YAALON, D.H./GANOR, E.

1966

THE CLIMATIC FACTOR OF WIND ERODIBILITY AND DUST BLOWING IN ISRAEL.

ISRAEL JOURNAL OF EARTH SCIENCES 15(1):27-32. GA 67A-501.

A CLIMATIC INDEX OF WIND ERODIBILITY BASED ON WIND VELOCITY AND ON EFFECTIVE PRECIPITATION WAS FOUND TO BE SUITABLE FOR THE DELIMITING OF RELATIVE WIND EROSION CONDITIONS IN VARIOUS REGIONS OF ISRAEL. A VERY HIGH INDEX OF WIND ERODIBILITY IS OBTAINED FOR THE NEGEV. SOME MOUNTAIN AREAS IN THE MEDITERRANEAN CLIMATIC REGION BELONG TO A HIGHER ERODIBILITY CLASS THAN THE VERY LOW RATED REST OF THE REGION. AN INTERMEDIATE TO HIGH INDEX IS OBTAINED FOR THE SEMI-ARID REGIONS.

ISRAEL/NEGEV/WIND EROSION/DUST STORMS/WIND VELOCITY/CLIMATIC DATA/ REGIONAL ANALYSIS/OALS

272

YAALON, D.H./GINZBOURG, D.

1966

SEDIMENTARY CHARACTERISTICS AND CLIMATIC ANALYSIS OF EASTERLY DUST STORMS IN THE NEGEV (ISRAEL).

SEDIMENTOLOGY 6(4):315-332. GA 67A-734.

SEDIMENTARY AND METEOROLOGICAL CHARACTERISTICS OF EASTERLY DUST STORMS CAUSING SEVERE DAMAGE IN THE NEGEV IN NOVEMBER 1958 ARE ANALYZED. THOUGH THE HEAVY STORM ORIGINATED IN WEATHER CONDITIONS OUTSIDE THE AFFECTED AREA, THE INTENSE DUSTINESS WAS OF A MORE LOCAL NATURE. THE SEDIMENTOLOGICAL CHARACTER OF THE DUST INDICATES THAT THE LARGEST PORTION WAS OF LOCAL ORIGIN, PICKED UP BY THE TURBULENT CURRENT IN THE LOESS AREA OF THE NORTHERN NEGEV IN ITS PASSAGE WESTWARD. TOTAL QUANTITY OF SEDIMENT TRANSPORTED IN THE BEERSHEBA BASIN IS ESTIMATED TO BE 10-20 MILLION TONS. THE ANALYSIS OF CLIMATIC DATA AND OF SEDIMENTARY CHARACTERISTICS OF SEVERAL OTHER DUST SAMPLES INDICATES THAT THOUGH SEVERE DUST STORMS CAN PRODUCE DRAMATIC EFFECTS IN TRANSPORTING AND DEPOSITION OF AEOLIAN DUST, THE RARE OCCURRENCE OF EASTERLY DUST STORMS DOES NOT MAKE IT LIKELY THAT THEY WERE RESPONSIBLE FOR THE IMPORT OF AEOLIAN SEDIMENTS FOUND IN THE NORTHERN NEGEV. (AUTHORS)

ISRAEL/NEGEV/DUST STORMS/SEDIMENTS/SEDIMENT TRANSPORT/METEOROLOGY/LOESS/ CLIMATIC DATA/EOLIAN SOILS/WIND ACTION

273

YAIR, A.

1971

GEOMORPHOLOGICAL PROCESSES ON MARL SLOPES.

JERUSALEM STUDIES IN GEOGRAPHY 2:156-190. GA 72A-2077.

THIS PAPER DISCUSSES PROCESSES OF FORMATION CHARACTERISTIC OF THE MARL SLOPES OF THE BIRA FORMATION EXPOSED WITHIN THE YISSAKHAR AND TAVOR WATERSHEDS IN EASTERN LOWER GALILEE, ISRAEL. THERE SLOPES ARE FORMED BY THE COMBINATION OF THREE FACTORS: 1) VARIOUS TYPES OF LANDSLIDE; 2) PROCESSES OF CREEP, MANIFESTED IN CREEP TERRACES ALONG THE VALLEY SIDES SLOPES; 3) VIGOROUS PROCESSES OF RUNOFF EROSION ACTIVE ALONG THE LONGITUDINAL SLOPE OF THE MARL RANGES WITHIN THE LOCAL DIVIDE BELTS. THE BASIC GEOMORPHOLOGICAL SIGNIFICANCE OF THE DIFFERENCE BETWEEN PROCESSES OF FORMATION OF VALLEY SIDES SLOPES AND THOSE OF INTERFLUVE SLOPES ARE DISCUSSED AT LENGTH.

ISRAEL/SLOPES/SLOPE STABILITY/RUNOFF/EROSION/GEOMORPHOLOGY/INTERFLUVES/LAKE TIBERIAS/TOPOGRAPHY/TERRACES(GEOMORPHOLOGY)

274

YAIR, A.

1972

OBSERVATIONS SUR LES EFFETS D'UN RUISSELLEMENT DIRIGE SELON LA PENTE DES INTERFLUVES DANS UNE REGION SEMI-ARIDE D'ISRAEL (OBSERVATIONS ON THE EFFECTS OF RUNOFF DIRECTED ALONG THE SLOPE OF INTERFLUVES IN A SEMI-ARID REGION OF ISRAEL).

REVUE DE GEOGRAPHIE PHYSIQUE ET DE GEOLOGIE DYNAMIQUE 14(5):537-548.
GA 73A-1955.

FIELD OBSERVATIONS IN ARID AND SEMIARID REGION, IN DIVERSE LITHOLOGICAL CONDITIONS LED TO THE HYPOTHESIS THAT OVERLAND FLOW DIRECTED ALONG THE LONGITUDINAL AXIS OF LOCAL DIVIDE BELTS SEPARATING ADJACENT DRAINAGE BASINS CONTRIBUTES TO EROSION OF THE AREA CALLED THE 'BELT OF NO EROSION' BY HORTON. IN ORDER TO CHECK THE HYPOTHESIS, OVERLAND FLOW COLLECTORS WERE INSTALLED AT THE BASE OF THE DIVIDE AND VALLEY SIDES SLOPES OF A SPUR. DURING THREE YEARS OF MEASUREMENTS, 520 SAMPLES OF RUNOFF WATER LOADED WITH SEDIMENT WERE COLLECTED. ANALYSIS OF DATA SHOWS CLEARLY THAT THE NUMBER OF FLOW EVENTS, THE VOLUME OF RUNOFF AND THE WEIGHT OF SEDIMENT LOAD COLLECTED BY TWO COLLECTORS DRAINING THE DIVIDE BELT ARE SIGNIFICANTLY HIGHER THAN THE VOLUMES RECORDED IN THE SIX COLLECTORS DRAINING THE VALLEY SIDES SLOPES. THE GEOMORPHIC SIGNIFICANCE OF THE RESULTS IS DISCUSSED.

ISRAEL/RUNOFF/INTERFLUVES/ARID LANDS/FLOW/FLOW MEASUREMENT/SEDIMENT TRANSPORT/SOIL EROSION/SLOPES/GEOMORPHOLOGY

AUTHOR INDEX

ABBAS, A.K. 106
ABERBACH, S.H. 1
ABOU ZEID, A.M. 2
ADAMS, R.M. 3 4 5 121
AELION, E. 6
AGHASSY, J. 7
AHRANJANI, B. 176
AKALAN, I. 8 9
ALEXANDER, L.T. 57
ALLAN, W. 10
ALPEROVITCH, N. 11
AMIRAN, D.H.K. 12 13
ARAD, A. 14 15
ATALAY, I. 16
ATKINSON, K. 17 18 30
AVNIMELECH, M. 19
AWAD, M. 20
AYAZI, M. 21

BAKER, C.W. 22
BAKIC, M. 163
BALCI, A.N. 44
BALY, D. 23
BEALS, E.W. 24
BEAUMONT, P. 17 18 25 26 27 28 29 30 31
BECKETT, P.H.T. 32
BEN-ARIEH, Y. 33
BEN-ZVI, A. 34
BEN-ZVI, M. 34
BERRY, R.W. 35
BIRAND, H. 36
BIRCH, B.P. 37 38 223
BIRMAN, J.H. 39
BLAKE, G.H. 31
BLAKE, I. 40
BOBEK, H. 41 42
BRAIDWOOD, R.J. 43
BRICE, W.C. 44
BROPHY, G.P. 35
BROWN, G. 239
BURAS, N. 214
BURDON, D.J. 45
BURINGH, P. 46 47
BUTZER, K.W. 48 49 50 51

CARTER, D.B. 240
CATON-THOMPSON, G. 52
CEDERSTROM, D.J. 53
CHAPMAN, R.W. 54 55
CLAPP, G.R. 56
CLAWSON, M. 57
COHEN, H.R. 58
COWGILL, U.M. 115
CROWN, A.D. 59

DAN, J. 11 60 61 62 270
DAYTON, J. 63
DEBUCHY, V. 64
DEHSARA, M. 65
DERIDDER, N.A. 66
DEWAN, M.L. 67
DICKER, T. 68
DINCER, T. 69
DRESCH, J. 70 71 72 73
DRIESSEN, P.M. 74
DUCLOS, P. 75

EBERT, C.H.V. 76
EHLERS, E. 77
ELBASHAN (EARLIER, PRUSCHANSKY), D. 78
EMERY, K.O. 174
ENGLISH, P.W. 79 80
EROL, O. 58 81 82
EVENARI, M. 83 84 85 86 87 219 235

FAMOURI, J. 67
FARRAND, W.R. 88 89
FERNEA, R.A. 90
FETERIS, P.J. 91
FIELD, M. 92
FILALI, M., EL- 93
FLANNERY, K.V. 94
FLOWER, D.J. 95
FONTES, M.R. 96

GABRIEL, K.R. 97
GANOR, E. 271
GARBELL, M.A. 98
GARDNER, E.W. 52
GERSON, R. 99
GILEAD, M. 13
GINZBOURG, D. 272
GLEESON, T.A. 100 207
GOBLOT, H. 101
GORDON, A.H. 102
GORDON, E.D. 32
GRUELL, J. 103

HACHICHO, M.A. 104
HARDAN, A. 105 106
HARE, V.C. 107

HAUPERT, J.S. 108
HEADY, H.F. 109
HEINZELIN, J. 110
HILLEL, D. 196
HOROWITZ, A. 111 112
HOURANI, A. 113
HUDSON, J. 114
HUTCHINSON, G.E. 115
HUZAYYIN, S. 116

IBRAHIM, K.M. 117
ISRAEL NATIONAL COUNCIL FOR RESEARCH AND DEVELOPMENT, JERUSALEM 118
ISSAR, A. 119 120

JACOBSEN, T. 121
JOHNSON, D.L. 122
JONES, K.S. 136

KAISER, K. 123
KARMELI, D. 124
KARSCHON, R. 125
KATSNELSON, J. 126 127
KAUL, R.N. 128
KAYAN, I. 129
KENYON, K.M. 130
KERNAN, H.S. 131
KHALILI, I., AL- 132
KHASHAB, W.H., AL- 133
KIBARDIN, R.E. 134
KLEIN, C. 135
KNILL, J.L. 136
KOLARS, J. 137
KOLLER, D. 83 84
KOYUMDJISKY, H. 60 62
KOZLOV, V.V. 165
KRAMER, H.P. 138
KRINSLEY, D.B. 139 140 141
KROWN, L. 142

LAMB, H.H. 143
LANDSBERG, H.H. 57
LAW, R. 260
LEBON, J.H.G. 144
LEROI-GOURHAN, A. 145
LEVI, W.M. 146
LEWIS, N.E. 147 148 149
LLOYD, J.W. 150
LOCKWOOD, J.G. 102
LOEFFLER, E. 151
LOMAS, J. 152
LOWDERMILK, W.C. 153 154

MAHHOUK, A. 155
MALLOWAN, M.E.L. 156
MANNERS, I.R. 157 158 159
MANSOUR, A.H. 160
MARGALIT, H. 161
MATHER, J.R. 240
MEGARD, R.O. 162
MERLING-REISS, P. 201
MICHAELI, A. 15
MIJATOVIC, B. 163
MIKESELL, M.W. 164
MIRZAYEV, K.M. 165
MITCHELL, C.W. 166 167
MOORMANN, F. 168
MORITANI, T. 169
MOSELEY, F. 170
MOSHKOVITZ, S. 201
MOUNTFORT, G. 171
MUIR, A. 172

NAQASH, A. 35
NAVEH, Z. 173
NAYLOR, P.E. 167
NEEV, D. 174
NEUMANN, J. 175
NIKNAM, F. 176
NIR, D. 177

OAKES, H. 178
ORNI, E. 179
OTKUN, G. 45

PASTOURET, L. 209
PAYNE, B.R. 69
PEARSE, C.K. 180
PEDGLEY, D.E. 181
PEPPELENBOSCH, P.G.N. 182
PERETZ, D. 183
PERRIN DE BRICHAMBAUT, G. 184
PETROV, M.P. 185
PHILIP, G. 186
PIKE, J.G. 187
PLANHOL, X., DE 188
PLATTNER, F. 189
POHORYLES, S. 190
POURTET, J. 191
PRAUSNITZ, M.W. 192

QALYOUBI, T.A. 193

RAIKES, R.L. 194
RAPP, R.R. 195
RAVINA, I. 124
RAWITZ, E. 196
REED, C.A. 43
REGEL, C. 197
REIFENBERG, A. 198 199 200
REISS, Z. 201
RIEBEN, E.H. 202
ROBERTSON, V.C. 224
ROLLEY, J. 203
RON, Z. 204
ROSENAN, N. 205 206 234
ROSENTHAL, S.L. 207
ROSSIGNOL, M. 208 209
ROWTON, M.B. 210
RUBIN, M. 239

SANLAVILLE, P. 211 212
SARAN, G. 213
SCHEIN, Z. 214
SCHOLZ, F. 215
SEGINER, I. 216
SELLINGER, A. 1
SERJEANT, R.B. 217
SHACHNAI, E. 221
SHALEM, N. 218
SHANAN, L. 85 219 220 235 236
SINGER, A. 221
SMITH, C.G. 222
SMITH, R.A. 223 224
STANHILL, G. 225
STEVENS, J.H. 226 227 228 229 230 231
STORKE, C. 232
STRIEM, H.L. 233 234
SZESKIN, A. 190

TADMOR, N.H. 85 219 235 236
TAMIMI, S.A. 237
TAN, K. 238
THALEN, D.C.P. 128
THATCHER, L. 239
THORNTHWAITE, C.W. 240
TURKOWSKI, L. 241

UBELL, K. 242
UNITED NATIONS DEVELOPMENT PROGRAMME, NEW YORK 243

VAN AART, R. 244
VAN ZEIST, W. 245 246
VITA-FINZI, C. 247 248 249 250 251
VON WISSMANN, H. 252

WAGSTAFF, J.M. 31
WALDEMAR, H. 253
WALKER, J.M. 254
WALLEN, C.C. 184
WASYLIKOWA, K. 255
WEICKMANN, L. 256 257
WESTERN, A.C. 258
WHITE, L.P. 259 260
WHYTE, R.O. 261
WIENER, A. 262
WINSTANLEY, D. 263 264
WITTFOGEL, K.A. 265
WRIGHT, H.E., JR. 246 266 267 268
WULFF, H.E. 269

YAALON, D.H. 61 62 124 270 271 272
YAIR, A. 273 274
YOUNIS, M.A. 237

KEYWORD INDEX

ABU DHABI 96
ADAPTATION 83 85
ADEN 53 170
AERIAL PHOTOGRAPHY 82 216
AFFORESTATION 125 168
AFGHANISTAN 79 122 138
AFRICA 51 252 264
AGGRADATION 27 250
AGRICULTURAL CLIMATOLOGY 65 138 184
AGRICULTURE 4 10 20 29 30 37 40 43 45 57 74 80 84 86 92 96 121 137 153 155 158 166 167 168 179 190 192 200 204 211 227 229 230 231 238 241 244 247 252 265 268
AGRONOMY 96
ALGERIA 79 80
ALKALINITY 74
ALLUVIAL FANS 27
ALLUVIUM 60 110 123 202 247 248 249 251 260 270
ANALYTICAL TECHNIQUES 74 75
ANIMAL DAMAGE 137 151 164 180 209
ANIMAL DISTRIBUTION 143
ANIMAL ECOLOGY 189
ANIMALS 130
ANTICYCLONES 138 146 205 207
AQUIFERS 1 150 243
ARABIAN DESERT 5 37 38 54 96 109 116 122 128 193 229 231 238 239
ARABIAN PENINSULA 22 52 63 80 138 170 181 182 217 226 227 228 230 252
ARCHAEOLOGY 23 27 43 48 51 58 75 77 88 89 94 105 110 119 130 143 156 194 247 248 249 250 268
ARID CLIMATE 40 184 185 218 252 263
ARID LANDS 12 36 127 227 228 252 261 274
ARISTIDA 176
ARTEMISIA 36
ARTIFICIAL PRECIPITATION 97 118
ATMOSPHERIC CIRCULATION 138 146 184 254 263
ATMOSPHERIC DISTURBANCES 207
ATRIPLEX 220
AUSTRALIA 51
AZRAQ 243

B HORIZON 60
BADLANDS 7
BAGHDAD 5
BALUCHISTAN 138 215
BANK EROSION 71
BARRIERS 1
BASALT 112
BASINS 32 58 66 73 74 111 112 123 140
BEACHES 248
BIBLIOGRAPHIES 117 122 138
BIOCLIMATOLOGY 138
BIOGEOGRAPHY 218
BIOLOGICAL CONTROLS 106
BIOMES 189
BIRDS 171
BOREHOLES 45
BROWSE 18

C HORIZON 60
CALCAREOUS SOILS 54 55 60 62 249 270
CALCITE 55 99
CALCIUM CARBONATES 106
CAMELS 122
CANALS 108
CARBONATES 99
CARRYING CAPACITY 128
CASPIAN SEA 28 77 138
CATCHMENTS 220 253
CATENAS 62
CATTLE 75
CENTRAL ASIA 185 252
CHANNEL MORPHOLOGY 260
CHEMICAL ANALYSIS 115
CHINA 252 265
CLAY MINERALS 35 172
CLAYS 35 60 140 221
CLIMATE 48 52 59 143 151 153 158 168 181 222
CLIMATIC CHANGE 40 42 49 51 54 58 61 63 73 88 111 112 116 138 143 201 218 245 250 253 261 268
CLIMATIC DATA 88 127 206 253 271 272
CLIMATIC GEOMORPHOLOGY 141 151 174
CLIMATIC ZONES 71 151 175 177
CLIMATIC-VEGETAL RELATIONSHIPS 252
CLIMATOLOGY 40 138 200 252 263

CLIMAX 24
CLOUD SEEDING 97 118 195
COASTAL ENGINEERING 198
COASTAL PLAINS 1 7 19
60 78 82 119 124 177
221 270
COASTAL TOPOGRAPHIC FEATURES
58
COASTS 81 187 212 251
COMPACTION 260
COMPETING USES 29 159
CONSERVATION 173
CONTINENTAL SHELF 201
CONTROLLED ENVIRONMENT 96
CRETACEOUS PERIOD 163
CROP PRODUCTION 43 85 87
92 117 134 152 200 267
268
CROP RESPONSE 134 152
CRUSTS 140 141
CUESTAS 82
CULTIVATION 7 38 94
164 179 216 244 261
CYCLONES 100

DAMS 56 103 169 244
DASHT-E-KAVIR 41 139
DASHT-E-LUT 73
DEAD SEA 15 135 174 206
208 247 253
DEFORESTATION 164
DEGENERATION 16 38 158
176 185 261
DEGRADATION (DECOMPOSITION)
24
DELTAS 81 82 141
DEMOGRAPHY 64
DENSITY 10
DENUDATION 99 180
DEPOSITION (SEDIMENTS) 27
35 123 139 208 247 248
249 270
DEPRESSIONS (GEOMORPHIC) 106
250 260
DEPTH-AREA-DURATION ANALYSIS
196 234
DESERT ANIMALS 171
DESERT PAVEMENT 27 60
DESERT PLANTS 85 171
DESERT SOILS 172
DESERTIFICATION 30 36 38
54 154 176 180 198 200
218
DESERTS 83 84 85 87
138 172 180 243
DESICCATION 180 185 200
DETRITUS 186
DISCHARGE (WATER) 28 99
243
DISTRIBUTION 74
DISTRIBUTION PATTERNS 260
DIVERSION 177
DOLOMITES 60 99
DOMES (GEOLOGY) 54
DOMESTIC ANIMALS 43 75
94 268
DRAINAGE 21 28 76 244
DRAINAGE PATTERNS 7 27
74

DRAWDOWN 1
DROUGHT TOLERANCE 235 237
DROUGHTS 109 146 264
DRY FARMING 94 134 153
DUNES 60 176 198 270
DURICRUST 54 55
DUST STORMS 127 271 272

ECOLOGY 10 51 80 90
94 98 158 173 258
ECONOMIC DEVELOPMENT 2 45
64 74 93 109 153 173
183 190 193
ECOSYSTEMS 18 173
EGYPT 20 48 50 57 80
146 158 160 206 222
ENVIRONMENT 43 50 51
83 189 267 268
ENVIRONMENTAL EFFECTS 109
127 259
ENVIRONMENTAL IMPACT 173
EOLIAN SOILS 124 127 231
270 272
EPHEMERAL STREAMS 247
EROSION 7 9 13 99
153 163 180 210 248 273
EROSION CONTROL 8 30 250
ETHNOLOGY 188
EUPHRATES RIVER 35 103 105
106 110 113 133 138 156
165 186 194
EVALUATION 196 244
EVAPORATION 74 76 187
215 225
EVAPORATION CONTROL 118
EVAPORITES 174
EVAPOTRANSPIRATION 232
EVOLUTION 261
EXPLORATION 17^

FAULTS (GEOLOGIC) 99
FERTILIZERS 137 168
FINE-TEXTURED SOILS 124
FLOOD PLAINS 110
FLOODS 194 247
FLORA 197 208
FLOW 34 69 274
FLOW MEASUREMENT 274
FLUVIAL PROCESSES 77 82
110
FORAGE PLANTS 128
FORAGE PRODUCTION 128
FORAGE SUPPLY 117 128
FORECASTING 134 152
FOREST MANAGEMENT 131
FORESTRY 44
FORESTS 18 24 111 137
164 173 191 203 209 210
245 261
FRONTS (METEOROLOGY) 127

GARMSAR 21
GEOCHEMISTRY 68
GEOCHRONOLOGY 201
GEOGRAPHICAL ORIGIN 122
GEOGRAPHY 23 31 80 138
GEOLOGIC TIME 141
GEOLOGY 16 55 89 112
119 174 194 202 250 261
GEOMORPHOLOGY 7 27 42
51 54 58 60 71 72
73 77 81 82 99 110
112 139 140 151 169 177
250 251 260 261 273 274
GLACIAL GEOLOGY 39 111 249
250
GLACIERS 49 77 88 123
151 185
GOATS 137
GRABEN(GEOLOGY) 71 88 174
GRAVELS 226
GRAZING 18 30 36 109
117 122 128 160 193 252
261
GREENHOUSES 96
GROUNDWATER 11 14 26
29 45 53 68 99 106
136 150 187 239 244 269
GROUNDWATER BASINS 25 120
243
GROUNDWATER MINING 1 25
243
GROUNDWATER MOVEMENT 69 99
GROUNDWATER RECHARGE 1
GULLY EROSION 16 216
GYPSUM 224

HALOPHYTES 208 259
HALOXYLON 176
HAMADAS 60
HARBOR FACILITIES 212
HERBAGE PRODUCTION 235
HISTORY 3 4 10 23
38 40 43 44 46 50
51 52 59 75 83 85
86 94 104 113 116 130
135 143 149 153 156 158
161 192 200 210 212 218
247 250 252 258 261 265
267 268
HOLOCENE EPOCH 54 55 58
81 111 123 141 177 201
212
HORTICULTURAL CROPS 96
HUMAN ASPECTS 158
HUMAN BEHAVIOR 2 30 43
75 93 158 159 164 173
185 193 209 270
HUMAN DISEASES 147
HUMAN RESOURCES 57 200
HUMANS 51 52 83 161
HYDROGEOLOGY 45 120 243
HYDROGRAPHY 28 251
HYDROLOGIC BUDGET 133
HYDROLOGIC DATA 45 243
HYDROLOGIC MAPS 240
HYDROLOGY 14 15 163 213
218 239 253 257 261

IGNEOUS ROCKS 186
INDIA 254 263 264 265
INDUS BASIN 143
INFILTRATION 236
INSECTS 171
INTERCEPTION 236
INTERFLUVES 273 274
IRAN 4 21 25 26 27
28 29 32 41 42 56
65 67 73 77 79 80
92 94 95 101 102 115
120 122 131 132 136 138
139 140 141 152 158 160
162 169 176 188 189 202
215 222 245 246 254 255
266 268 269
IRANIAN DESERT 28 41 95
139
IRAQ 3 5 20 35 43
47 57 80 90 103 105
128 130 138 144 156 158
160 166 167 194 210 222
224 232 237 242 244 254
257 260 268
IRRIGATED SOILS 224
IRRIGATION 25 52 76 114
144 147 159 168 217 222
237 265
IRRIGATION EFFECTS 105
IRRIGATION PRACTICES 38 83
94 154 157 158
IRRIGATION PROGRAMS 29 37
153 223 243
IRRIGATION WATER 103 105
ISOTOPES 69
ISRAEL 1 6 7 12
13 14 15 19 23 33
34 40 57 6061 62 64
68 71 72 78 83 84
85 86 87 88 89 97
98 99 111 112 118 119
124 125 127 142 146 154
157 158 173 177 179 190
192 195 196 198 200 201
204 205 206 208 210 214
216 219 220 221 222 225
234 235 236 241 253 262
270 271 272 273 274

JET STREAMS(METEOROLOGY) 254
256
JORDAN 17 18 23 30
37 38 48 57 88 98
108 130 134 143 146 150
157 158 160 168 171 183
193 210 222 243 247 253
258 259
JORDAN VALLEY 11 33 98
107 111 112 153 157 158
159 195 223

KARST 69 99 163
KHUZESTAN 56 176

LAGOONS (LANDFORMS) 82
LAKE BASINS 141
LAKE CHAD 143
LAKE TIBERIAS 98 192 195
225 273
LAKES 58 69 112 115 123
141 162 208 246 255 266
LAND MANAGEMENT 12 30 90
193 200 261
LAND RECLAMATION 22 64
153 154 180 231 244 261
LAND REFORM 90 157
LAND RESOURCES 2 93 122
176 193 261
LAND TENURE 32 128 261
LAND USE 7 12 16 18
30 32 37 51 57 64
74 76 84 85 90 107
128 176 244 261
LANDFORMS 141 151
LEACHING 124
LEBANON 24 57 80 89
145 146 148 157 163 164
183 199 203 206 211 212
222
LIBYA 80 146
LICHENS 151
LIME 106
LIMESTONE 54 55 60 62
71 81 99
LIVESTOCK 2 94 109 117
128 160 180 193
LOESS 127 177 236 272
LOGGING (TIMBER) 18 164

MALARIA 147
MAPPING 216
MAPS 65 78
MARINE GEOLOGY 145 201 212
MARINE GEOPHYSICS 251
MAURITANIA 122
MEASUREMENT 216
MEDITERRANEAN BASIN 71 100
146 173 184 209 248 249
250
MEDITERRANEAN CLIMATE 61
88 184 206 207 249
MESOPOTAMIAN PLAIN 35 46
47 105 106 113 121 138
143 156 194 244 265 267
METAMORPHIC ROCKS 186
METEOROLOGICAL DATA 146 206
234
METEOROLOGY 6 91 184
257 272
MEXICO 265
MICROENVIRONMENT 85
MIDDLE ASIA 138 252
MIDDLE EAST 2 10 18
20 23 31 35 40 48
49 51 57 58 74 77
80 93 94 104 117 130
136 158 160 180 184 193
200 206 218 222 233 240
254 256 261 263 264 265

MIGRATION 122 252
MINERALOGY 35 186 221
MIOCENE EPOCH 35 186
MONSOONS 264
MOROCCO 79 80
MORPHOLOGY 212 221
MOUNTAINS 18 28 60 78
111 148 151 163 169 188
204 210
MULCHING 176
MUSCAT AND OF N 181 251

NATURAL RESOURCES 18
NEGEV 34 64 71 83 85
86 125 127 153 177 179
219 220 235 236 271 272
NOMADS 2 7 20 43
80 93 109 122 128 155
158 160 182 193 200 252
NORTH AFRICA 80 122 143
210 265

OASES 229 230 231
OCEANOGRAPHY 201
OIL FIELDS 109
ON-SITE INVESTIGATIONS 74
216
OVERGRAZING 16 38 185
OVERSTORY 24

PAKISTAN 215 254
PALEOBOTANY 209 255
PALEOCLIMATOLOGY 27 49
55 77 88 111 123 139
140 141 141 151 177 201
253 266 268
PALEOGEOGRAPHY 27 58 61
PALEONTOLOGY 27
PALEOSOLS 61 221 270
PALESTINE 23 40 59 75
126 130 153 161 175 218
PALYNOLOGY 51 88 111 112
123 208 209 221 245 246
266 268
PANICUM 176
PASTURES 22 117 128 168
PENNISETUM 176
PERMEABILITY 244
PERSIAN GULF 28 91 138
187 254
PERTURBATION 18 36 117
160 164 209 210 250 261
PERU 265
PHYSICAL GEOGRAPHY 129 160
PHYTOGEOGRAPHY 208 210
PINUS 209
PLAINS 35 82 129 213
PLANNING 92 158 190 263
PLANT COVER 236

PLANT DISTRIBUTION 259
PLANT ECOLOGY 189
PLANT GROWTH REGULATORS 237
PLANTING MANAGEMENT 92
PLANTS 130 235 255
PLATEAUS 54 60 71
PLAYAS 139 140 141 187
PLEISTOCENE EPOCH 51 54
55 58 61 77 82 111
112 119 139 141 151 186
201 221 253 268
PLIOCENE EPOCH 54 55 112
POLITICAL ASPECTS 2 93
157 200 263
POLLEN 145
POLLUTION 180
POPULATIONS 10 43 153
158
POWERPLANTS 103 153
PRECIPITATION DEFICIT 74
146
PRECIPITATION (ATMOSPHERIC)
13 18 102 126 132 134
206 210 214 234
PROBABILITY 34
PRODUCTIVITY 64 92 200
PUMPING 1 25 169 215

QANATS 21 25 26 29
32 79 158 169 215 269
QUANTITATIVE GEOMORPHOLOGY
216
QUATERNARY PERIOD 19 42
48 51 88 123 124 162
163 165 177 221 228 245
248 249 251 255 266 270
QUERCUS 209

RADIATION 138
RADIOCARBON DATING 239 268
RAINFALL 78 97 99 138
142 146 152 158 175 184
195 196 205 206 219 222
233 234 235 239 254 263
264
RAINFALL INTENSITY 13 30
102 175 196 214 234
RAINFALL RELIABILITY 184
RAINFALL STATIONS 78
RAINFALL-RUNOFF RELATIONSHIPS
30 85 195 196 216 220
236
RANGE MANAGEMENT 128 180
261
RANGES 117 128 235
RECHARGE 25 45 69 243
RECHARGE WELLS 1
RECLAMATION 21 154
RED SEA 88
REGIONAL ANALYSIS 218 226
244 271
REGIONAL GEOGRAPHY 31 70
109 153
RELICT LANDFORMS 54
RELICT VEGETATION 24 36
RENDZINA SOILS 60 62
RESERVOIRS 110 163 169
RIVER BASINS 133
RIVERS 28 69 165 183
RUNOFF 28 34 99 236
273 274
RUNOFF FARMING 83 85 87
220 235

SAHARA 122 143 263
SAHELIAN ZONE 263
SALINE LAKES 189
SALINE SOILS 11 74 105
220 226 244
SALINE WATER 45 105 106
SALINE WATER INTRUSION 1
SALINE WATER-FRESHWATER INTERFACES
1
SALINITY 11 74 76 105
109 158 244 261
SALT DESERTS 41 42 73
139
SALTS 121 140 141
SAND CONTROL 176 231
SAND DUNES 124
SANDS 60 127 177 221
SATURATED SOILS 244
SAUDI ARABIA 20 22 45
53 54 55 76 109 158
160 231 254
SEASONAL 256
SEDIMENT TRANSPORT 99 272
274
SEDIMENT YIELD 216
SEDIMENTATION 140 174 250
SEDIMENTS 19 35 51 66
112 119 124 186 201 202
208 209 221 248 249 266
272
SEEPAGE 76 215
SEMIARID CLIMATE 18 61
74 159 184 252
SETTLEMENTS 2 3 10
20 30 32 36 40 43
58 75 77 80 93 149
155 164 192 193 200 218
268
SHATT AL-ARAB 35
SHEEP (DOMESTIC) 36
SHEET EROSION 16
SHEFELA REGION 62
SHORES 58 177
SIEROZEMS 226
SILTS 60 121
SITES 89
SLOPE STABILITY 273
SLOPES 60 71 82 148
151 273 274
SNOW COVER 151
SNOWMELT 28
SOCIAL ASPECTS 2 32 40
45 46 64 93 109 128
137 153 160 190 193 215
252 265 268

SOCIAL ORGANIZATION 4 20 64 80 155 159 261
SODIUM-AFFECTED SOILS 11 226 244
SOIL ANALYSIS 21 47 62 67 105 244
SOIL CHEMICAL PROPERTIES 47 67 74 106 172
SOIL CLASSIFICATIONS 62 168 224 226
SOIL CONSERVATION 30 154
SOIL EROSION 9 13 16 18 30 62 147 151 200 250 270 274
SOIL FORMATION 61 62 106 123 124 168 221 228 270 270
SOIL HORIZONS 124 226
SOIL MAPS 60 168
SOIL MOISTURE 235
SOIL PHYSICAL PROPERTIES 9 47 67
SOIL PROFILES 62 67 168
SOIL SALINITY 237
SOIL STABILITY 151
SOIL STABILIZATION 176
SOIL SURVEYS 62 168 226
SOIL TESTS 77
SOIL TYPES 11 47 55 57 60 67 166 167 168 172 178 199 216 224 228 270
SOIL-WATER-PLANT RELATIONSHIPS 259
SOLAR RADIATION 138 146
SOLONCHAKS 172
SOLONETZ 11
SOUTH ARABIA 116 238 251
SPRINGS 45 69 99 243
STEPPE 172
STORMS 6 91 100 146
STRATIGRAPHY 48 51 61 119 123 251 266
STREAM EROSION 54
SUBMARINE TOPOGRAPHIC FEATURES 212
SUBSIDENCE 81 194 251
SUCCESSION 24
SUDAN 20 206 260
SURFACE PROPERTIES 140
SURFACE RUNOFF 235
SURFACE WATERS 29 243
SURVEYS 243
SURVIVAL 40 235
SYRIA 20 57 70 103 114 123 138 147 149 155 157 158 160 165 172 183 199 203 210 222
SYRIAN DESERT 70

TAMARIX 176 231
TECTONICS 54 73 88 163 165
TEMPERATURE 206
TEMPERATURE RANGES 138 154
TERRACES(GEOMORPHOLOGY) 58 77 110 145 148 151 247 250 273
TERRACING 165 204
TERRAIN ANALYSIS 140
TERTIARY PERIOD 110 163
TIGRIS RIVER 35 105 106 113 133 186 257
TIMBER 24 164
TOPOGRAPHIC FEATURES 73 74 259
TOPOGRAPHY 7 16 55 116 124 273
TOURISM 104
TRANSHUMANCE 122 263
TREES 18 125 245
TRITICUM 134 152 157 237
TRUCIAL STATES 226 227 228
TUNISIA 80
TURKESTAN DESERT 138
TURKEY 8 9 10 16 36 39 44 58 66 69 74 80 81 82 103 122 129 130 137 146 151 158 178 188 191 197 210 213 222 248 268

URBAN AREAS 4 10 29 80 173
USSR 77 138 146 252

VARIABILITY(ENVIRONMENTAL) 122 126
VEGETATION 111 191 197 209 259 261
VEGETATION CHANGE 36 111 245 252
VEGETATION EFFECTS 106 177 270
VEGETATION ESTABLISHMENT 154

WADIS 7 83 128
WATER ALLOCATION(POLICY) 29 215
WATER BALANCE 74 225 240 253
WATER CHEMISTRY 14 99 150
WATER CONSERVATION 45 76 128 159
WATER CONSUMPTION(EXCEPT CONSUMPTIVE USE) 29
WATER CONVEYANCE 25 29 79
WATER COSTS 195
WATER HARVESTING 195 196 235 236
WATER LEVELS 51 77 81 123 135 163 174 189 206 212 221 249 270
WATER LOSS 169 174 215
WATER MANAGEMENT 25 56 95 103 108 159 195 215

WATER QUALITY 243
WATER RESOURCES 57 76 95
101 222 242 243
WATER RESOURCES DEVELOPMENT
29 32 45 98 109 157
158 159 169 215 244 262
WATER RIGHTS 215
WATER SOURCES 3 69 170
243
WATER SPREADING 109
WATER STORAGE 45
WATER SUPPLY 1 25 79
169
WATER TABLE 11 25 169
215 243
WATER TRANSFER 225
WATER UTILIZATION 25 29
37 45 95
WATER YIELD 195
WATER YIELD IMPROVEMENT
118 243
WATERSHED MANAGEMENT 17
WATERSHEDS(BASINS) 216
WEATHER DATA 6 78 102
134 138 142 152 195 196
205 263
WEATHER FORECASTING 142 195
205 263
WEATHER MODIFICATION 97 118
195
WEATHER PATTERNS 13 78
100 127 142 175 184 196
219 233 234 250 254 263
264
WEATHERING 180
WELLS 1 45 76 79 169
215 243
WET SEASONS 78 142 184
195 264
WILDLIFE 261
WIND ACTION 91 154 272
WIND EROSION 8 271
WIND VELOCITY 91 127 271
WIND(METEOROLOGY) 91 127
138 264
WINTER 146
WINTER PRECIPITATION 28 74
254 264
WINTER STORMS 6
WITHDRAWAL 25 243

XEROPHYTES 259

YEMEN 160 217

ZAGROS MOUNTAINS 120