

LAND RECLAMATION AND IMPROVEMENT
A READING LIST

(SUPPLEMENT TO THE 1960 ANNUAL REPORT)

Compiled by

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INTERNATIONAL INSTITUTE
FOR LAND RECLAMATION AND IMPROVEMENT
WAGENINGEN / THE NETHERLANDS

Supplement to the 1960 Annual Report

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INTRODUCTION

A list for further reading was added to our 1959 Annual Report. It included a number of references mainly covering the period 1950–1959. A list of reference journals and bibliographies in the field of land reclamation and improvement was appended to the 1960 Annual Report. As the size of both Reports had to be kept within fairly strict limits it was inevitable that the reading lists should also be short. No reference was made either to articles in periodicals or to separate conference papers.

However, encouraged by the response to the earlier lists, we felt we should continue to issue literature surveys. The present list may be considered as a supplement to our Annual Report for 1960.

It should be noted that it was not our intention to publish an exhaustive bibliography. This would be an impossible task, having regard to the vast number of publications that come out every year. All we have attempted to do is to assemble and classify the relevant literature that came to our notice. The list mainly consists of the titles of books entered at our Institute library, which is run in close co-operation with the Institute for Land and Water Management Research, Wageningen. This library not only has a large collection of books, but also about 300 periodicals.

The supplementary reading list covers the literature published during the period 1958–1960. Books only are recorded, references to periodicals being omitted.

For practical reasons the list has had to be limited to literature written in English, French, German (occasionally in Spanish). All abstracts are in English.

To avoid misunderstanding we must point out that the Institute cannot supply any publications referred to in the reading list. We only sell our own series of Publications, Bulletins and Bibliographies (see list inside the back cover of our 1960 Annual Report). If you wish to order any of the books mentioned you should apply to your own bookseller or else to the publishers.

Wageningen (the Netherlands), October, 1961.

The Director of the International Institute for
Land Reclamation and Improvement.

Land Settlement and Rural Planning

325+711

ARDENER, E., S. ARDENER and W. A. WARMINGTON. *Plantation and village in the Cameroons*. Some economic and social studies, with a contribution by M. J. RUEL. Oxford University Press, London 1960; XXXVI and 435 pp., plates, maps, tables.

BENDERMACHER, J. *Das Dorf und sein Raum. Feststellungen und Betrachtungen zur Planung auf dem Lande*.

Arbeitsgemeinschaft Landwirtschaftliches Bauwesen, Frankfurt/Main. Verlag Hellmut Neureuter, Wolfratshausen bei München, 1960; 64 pp., 49 figs. and maps.

Analysis of the significance and the character of the village in its historical development, as a foundation for "village planning" in Germany. Special attention is given to psychological aspects of village planning.

BOYENS, W. F. *Die Geschichte der ländlichen Siedlung*.

Band I: Das Erbe Max Serings.

Band II: Das wirtschaftliche und politische Ringen um die ländliche Siedlung. Landschriften-Verlag, Berlin-Bonn 1960; 799 pp., illustr., figs.

Historical review of land settlement in Germany, mainly during the period 1918-1933, with political aspects.

CONSTANDSE, A. K. *Het dorp in de IJsselmeerpolders*. Sociologische beschouwingen over de nieuwe plattelandscultuur en haar implicaties voor de planologie van de droog te leggen IJsselmeerpolders (The village in the IJsselmeerpolders, a sociological study on changing rural culture and its implications for planning of future IJsselmeerpolders in the Netherlands).

Tjeenk Willink, Zwolle 1960; 296 pp., graphs, maps, tables, bibliography, English summary.

Land and Water Use

333

CHRISTODOULOU, D. *The Evolution of the Rural Land Use Pattern in Cyprus*.

Geographical Publications Ltd, Bude, Cornwall, England, 1959; 230 pp. 117 figs, graphs and maps, 1 separate coloured map, bibliography. The World Land Use Survey, Regional Monograph no. 2.

Geology and landforms of Cyprus. Climate and water resources. Soils and vegetation. People and their habitations, settlements. Land tenure and water rights. Finance. Rural Services. Land use. Woodland and arable land. Types of farming. Industrial crops. Market gardening and other intensive cultivations. Viticulture and fruit trees. Animal husbandry. Present-day land use regions.

WIBBERLEY, G. P. *Agriculture and Urban Growth. A study of the competition for rural land*.

Michael Joseph, London, 1959; 240 pp., 5 diagrams, 10 illustr., 24 tables, bibliography.

An account of recent research into how the land of Britain is being used and the nature of the competition between farms and the growing towns and cities.

Geology and Geomorphology

551

DERRUAU, M. *Précis de Geomorphologie.*

Masson et Cie, Paris 1958, 2nd edition; 395 pp., 164 figs, 50 plates.

FURON, R. *Géologie de l'Afrique.*

Payot, Paris 1960, 2nd edition; 400 pp., maps.

GOGUEL, J. A. *Application de la géologie aux travaux de l'ingénieur.*

Masson et Cie, Paris 1959; 358 pp.

LOUIS, H. *Allgemeine Geomorphologie.*

Lehrbuch der Allgemeinen Geographie, Band I. Verlag Walter de Gruyter, Berlin 1960; XVIII and 354 pp., 100 figs., 98 photographs, 2 maps.

MACHATSCHKE, F. *Geomorphologie.*

Verlag B. G. Teubner, Stuttgart 1959, 7th revised edition, 219 pp., 89 figs.

MAULL, O. *Handbuch der Geomorphologie.*

Verlag Franz Deuticke, Wien 1958; 2nd edition; 600 pp., 44 plates, 53 figs., 16 tables, 81 photogr., bibliography of 74 pp.

SPARKS, B. W. *Geomorphology.* Geographies for advanced study.

Longmans, London 1960; XX and 371 pp., graphs, figs.

An outline of the Davisian cycle is used to discuss weathering and slope development, the effects of rocks on relief, coastal features and the effects of movements of base level. The effects of glacial and arid climates are treated, and a series of landscapes are analysed in terms of development by a series of cycles rather than as stages in a Davisian cycle.

WEBER, H. *Die Oberflächenformen des festen Landes.*

Verlag B. G. Teubner, Leipzig 1958; 350 pp., 245 figs. and 103 photogr. on 34 plates.

WOOLDRIDGE, S. W. and R. S. MORGAN. *An outline of Geomorphology.* The physical basis of geography.

The University Geographical Series. Longmans, Green and Co, London 1959, 2nd edition; 409 pp., 271 figs.

Hydrology

551.49

ARCHAMBAULT, J. *Les eaux souterraines de l'Afrique occidentale.* (Subterranean water in West-Africa).

C.I.E.H., Paris 1960; 137 pp. photogr., tables, graphs, 2 separate maps.

ACKERMAN, E. A. and G.O.G. LÖF. *Technology in American Water Development.*

John Hopkins University Press, Baltimore 1959; XV and 709 pp., 27 plates, glossary, separate map, bibliography.

Part 1 of the text describes the physical and economic environment of water development. Discussion of the occurrence and uses of water in the United States. Summary of the technical problems which challenge water-resource developers.

Evaporation Symposium and Report on the Lysimeters in the Netherlands (II)
Committee for Hydrological Research T.N.O. Proceedings and Informations no. 4.
Netherlands Central National Council for Applied Scientific Research, 's-Gravenhage
1959; 263 pp., tables, figs.

14 papers by different authors, with literature references, in Dutch language and with summaries in English.

General consideration on the problem of evaporation. Aids to the calculation of evaporation from a free water surface. Uncertainty in the evaporation of free water surface computed according to the method of Penman as a consequence of inaccuracies in the basic data. Considerations about the validity of the formula of Penman for the evaporation from the open water surface. Relation between the amounts of evaporation computed following the method of Penman and those measured with Piche-evaporimeters. Investigation about the accuracy of different methods for the calculation of the potential evapotranspiration. Evaporation from vegetations in relation with the formula of Penman. Transpiration and crop yields. Determination of the evaporation by means of the waterbalance. Application of data concerning evapotranspiration. Calculation of the need of water supply for grassland. Investigation into the differences between precipitation and evaporation. Investigations concerning water requirements as a function of precipitation and evaporation as well as of the consumption and use of water stored in the soil root zone.

FRIEDRICH, W. (editor). *Wald und Wasser*.

Bericht über die Aussprachetagungen des Arbeitskreises "Wald und Wasser" in Hilchenbach (1955) und in Zwiessel (1958). Mitteilungen des Arbeitskreises "Wald und Wasser" no. 3, Koblenz 1959; 76 pp., figs., photographs, bibliographies.

8 papers by different authors on hydrology of forest regions. Report on two conferences on this subject in Hilchenbach (1955) and in Zwiessel (1958).

GARSTKA, W. U., L. D. LOVE, B. C. GOODELL and F. A. BERTLE. *Factors affecting Snowmelt and Streamflow*.

A report on the 1946-53 Cooperative Snow Investigations at the Fraser Experimental Forest, Fraser, Colorado. U.S. Dept. of the Interior, Bureau of Reclamation, Denver; U.S. Dept. of Agriculture, Forest Service, Fort Collins; 1958; 189 pp., 58 tables, 136 figs., bibliography.

GEREB, E. *Locating feeding veins in waterlogged areas*.

Tahal Water Planning for Israel Ltd., Tel Aviv 1960, 2nd printing, 20 pp., 8 figs.

This publication deals with a method of investigating the causes of soil waterlogging, which has been developed in recent years by the Drainage Department of Water Planning for Israel Ltd. The object of this method of investigation is to locate the feeding veins and strata, and having established their positions and dimensions, to determine the most effective location of the proposed drainage works.

HARDER, J. A., L. MOCKROS and R. NISHIZAKI. *Flood control analogs*.

Hydraulic Laboratory, University of California, Berkeley 1960. Water Resources Center, Contribution no. 24; V, 9 and 40 pp., 26 figs., 1 table, bibliography.

This report is concerned with the development of methods and of equipment that can be used for the analysis of flood control systems. Part I describes the hydraulic system; Part II the application of electronic circuits to the solution of open channel flow problems.

Large-scale Groundwater Development

United Nations; Water Resources Development Centre, New York 1960; VII and 84 pp.; glossary of technical terms.

This study deals with basic considerations relating to groundwater utilization, stages of groundwater development, economic and financial aspects, organization and administration, and groundwater legislation. It is addressed primarily to high-level administrators responsible for comprehensive water development, rather than to technicians. Editions in French and Spanish are scheduled for publication.

Los Recursos Hidráulicos y su Aprovechamiento en América Latina. Vol. I: Chile
United Nations, 1960; 280 pp.

An appraisal of water resources in Chile and their utilization within the framework of over-all economic development in this country. The main areas of economic development by river basins are identified and available data on resources are given. Utilization is studied by separate functions (domestic supplies, hydro-electricity, irrigation) and by geographic areas. The elements of an integrated water development policy are outlined. Only in Spanish language.

MINDERHOUD, J. W. *Grasgroei en grondwaterstand. Onderzoekingen over de betekenis van de grondwaterstand voor komkleigrasland*, with English summary: *Growth of grass and ground-water level. Investigations into the importance of the groundwater level for basin-clay grassland*.

Publikatie no. 15, Proefstation voor de Akker- en Weidebouw, Wageningen 1960; 199 pp., 50 tables, 13 figs., 14 appendixes, bibliography.

Multiple-purpose River Basin Development. Part 2C. Water Resources Development in British Borneo, Federation of Malaya, Indonesia and Thailand.

United Nations. E.C.A.F.E., Flood Control Series no. 14; Bangkok 1959; XII and 135 pp., 50 tables, 51 figs., maps.

A study of physical and economic characteristics of each country, their water resources and stage of development with respect to flood control, irrigation and drainage, hydro-electric power, navigation, water supply, watershed management and multiple-purpose projects. Future prospects and plans are examined.

Plant-water relationships in arid and semi-arid conditions. Reviews of Research. Arid Zone Research Series no. XV. UNESCO, Paris 1960; 225 pp., figs., graphs, bibliographies.

9 papers by different authors on following subjects: Income and loss of water in arid and semi-arid zones. Soil water relations in arid and semi-arid conditions. Physiological and morphological changes in plants due to water deficiency. Adaptation to drought: scerophytism. Methods of research on water relations. Management of native vegetation in arid and semi-arid regions. Principles of dry land crop management. Significance of fallow as a management technique in continental and winter-rainfall climates. Principles of irrigated cropping.

POLAND, J. F., A. A. GARRETT and A. SINNOTT. *Geology, hydrology, and chemical character of ground waters in the Torrance-Santa Monica area, California*.

Water Supply Paper 1461. U.S. Geological Survey, Washington 1959; 425 pp., 20 plates, 34 figs.

The west basin of the Los Angeles coastal plain, including about 180 square miles, is an area of intensive groundwater withdrawal, chiefly from deposits of Pleistocene age. Water levels have been drawn down

Chapter II covers groundwater prospecting and development in arid zones.

Chapter III discusses certain new methods for determining the transmissibility of aquifers.

Chapter IV gives a general outline of the geochemistry of groundwater.

Chapter V deals with the utilization of tracers and particularly radioactive tracers to determine the direction and velocity of groundwater flow.

SEARCY, J. K. *Graphical Correlation of Gaging-Station Records.*

Water Supply Paper 1541-C. U.S. Geological Survey, Washington 1960. Manual of Hydrology: Part I. General Surface-Water Techniques, pp. 67-100, figs. 9-14, 13 tables, 1 separate graph.

The reliability of using a short-term record to estimate future flow characteristics can be improved through correlation with a long-term record. Graphical methods for simple and multiple correlation of gaging-station records are explained step by step, with illustrative problems of one case of simple correlation, and three cases of multiple correlation.

SEARCY, J. K. and C. H. HARDISON. *Double-Mass Curves.* With a section: "Fitting curves to cyclic data" by W. B. LANGBEIN.

Water-Supply Paper 1541-B. U.S. Geological Survey, Washington 1960. Manual of Hydrology: Part I. General Surface-Water Techniques, pp. 31-66, 8 figs., 12 tables, bibliography, summaries.

Explanation of the double-mass curve. Application to hydrologic data: precipitation records, stream-flow records, sediment records, precipitation-runoff relations, residual-mass curve. Statistical test for significance.

SEARCY, J. K. *Flow-duration curves.* Manual of hydrology, part 2, Low-flow techniques. Water Supply-Paper 1542-A. U.S. Geological Survey, Washington 1959; 33 pp., 13 figs.

The flow-duration curve shows flow characteristics of a stream throughout the range of discharge. Preparation of the curve and some of its uses are described. Methods are given for adjusting the flow-duration curve of a short-term record to represent long-term conditions, thus improving the reliability of the curve for predicting future flow patterns. Estimation of flow-duration curves from base flow measurements is also described.

TODD, D. K. and J. BEAR. *River seepage investigation.*

Water Resources Center, Contribution no. 20. Hydraulic Laboratory, University of California, Berkeley 1959; VII and 163 pp., 23 figs., 56 plates, 7 tables, bibliography, 32 refs.

This report summarizes an investigation of seepage from leveed rivers into low-lying adjoining agricultural lands. Only the hydraulics of seepage - the flow rate and distribution, as a function of the surface and sub-surface boundary conditions - were considered. Conditions studied are representative of those along channels in the lower Sacramento Valley, California, where seepage is a serious recurring problem.

TSCHAPEK, M. W. *El agua en el suelo.*

Instituto Nacional de Tecnología Agropecuaria, Buenos Aires, 1959; XIII and 402 pp., figs., graphs, tables, bibliography, Colección Científica, vol. I.

Comprehensive book on hydrology in the Spanish language.

Wasserwirtschaft - A B C.

Handbuch und Bezugsquellennachweis für die gesamte Wasserwirtschaft. Herausgegeben im Auftrag des Bundes der Wasser- und Kulturbauingenieure.

WANG, J. Y. *An evaluation of some techniques in agrometeorology.* (Methods relating to problems in cultivated plants).

Thesis University of Wisconsin, Madison 1958; 172 pp.

WARTENA, L. *Het klimaat en de verdamping van een meer in Centraal Irak.* (The climate and evaporation from a lake in Central Iraq).

Thesis Agricultural University of Wageningen. H. Veenman & Zonen, Wageningen 1959; 90 pp., 58 figs., 23 tables, bibliography 52 refs., English summary.

Climate of Central Iraq. Observations and instruments. Shortwave radiation. Measuring of evaporation. Calculation of evaporation of the future Tharthar lake. Calculation of different terms of the energy-balance of the evaporation pan.

WIT, C. T. DE. *Transpiration and crop yields.*

Institute of Biological and Chemical Research on Field Crops and Herbage, Wageningen 1958. Mededeling No. 59; 88 pp., 47 figs., 14 tables, bibliography.

Transpiration and assimilation of leaves, plants and crops. Ratio between transpiration and assimilation. Transpiration and production of plants in containers, in arid and temperate climates. Transpiration and production in the field.

Ecology and Vegetation

581.5

BROWN, D. *Methods of surveying and measuring vegetation.*

Bulletin 42. Commonwealth Bureau of Pasture and Field Crops, Hurley, Berkshire, (England) 1954.

Comprehensive treatment of methods primarily for range and pasture studies.

KEAST, A., R. L. CROCKER and C. S. CHRISTIAN (editors). *Biogeography and Ecology in Australia.*

Uitgeverij Dr. W. Junk, The Hague 1959; 640 pp.

LEGRIS, P. *Contributions à l'étude écologique des types de végétation du sud de l'Inde.* Pondichérij 1960, 3 volumes. Thesis Toulouse Faculty of Science.

Examination and interpretation of the ecological conditions and types of vegetation of this extremely mixed region of Southern India. Description of geographical features and discussion of the ecological conditions (Part I). Part II deals with the main types of vegetation, Part III contains the conclusions of the first two parts, and main climaxes and plesio-climaxes of the region.

PHILLIPS, J. *Agriculture and Ecology in Africa. A study of actual and potential development South of the Sahara.*

Faber and Faber, London 1959; 424 pp., 27 tables, 1 coloured map, bibliography.

A synopsis of the hazards and potentialities in agricultural and related development inherent in the climate, soils, vegetation, certain animal life, and human responses and relations, of Africa south of the Sahara.

Premier Colloque de la Société Botanique de France, Paris, 13 Juin 1959. Rapports du sol et de la végétation. (Editor G. VIENNOT BOURGIN).

Masson, Paris 1960; 183 pp., tables, figs., bibliography.

First symposium of the Botanical Society of France. The relationship between soil and vegetation.

Hydraulics and Hydromechanics

626/627

HAPKE, F. *Der Ingenieur im Wasserbau*. Ein Ausbildungs- und Fortbildungsbuch in Frage, Antwort und Bild.

Werner Verlag, Düsseldorf 1960; 4th printing; 272 pp., 180 figs.

Questions and answers regarding A. Hydraulic engineering, B. Technical management and C. General legal and managerial science.

KEIL, K. F. G. *Geotechnik*.

VEB Wilhelm-Knapp-Verlag, Halle (Saale) 1959, 3rd edition, previously published under the title "Ingenieurgeologie und Geotechnik"; 1411 pp., 1650 figs., 1250 literature references in the text.

Geological, hydrological and soil physical principles. Field and laboratory investigations. Hydraulic engineering.

LELIAVSKY, S. *An introduction to fluvial hydraulics*.

Constable and Co., London 1959, 2nd improved printing; XII and 257 pp., 88 figs., list of symbols.

This book is an attempt at a short but comprehensive survey of the various theories, methods and facts bearing upon the flow of water in erodible channels, which are themselves the natural creations of this flow. The ten chapters deal with the following subjects:

1. theoretical versus empirical approach; 2. difference between traction and suspension; 3. correlation between surface slope and particle size; 4. dunes and ripples; 5. pick-up velocity drag and lift, as criteria of scour; 6. bed-load in the light of the drag theory; 7. side-slope stability in the light of the drag theory; 8. the non-parallelism principle in the interpretation of three-dimensional water flow in rivers; 9. sediment, suspension explained mechanically, and 10. the empirical approach to the sediment transportation problem.

SAMARIN, E. A., K. W. POPOV and W. W. FANDEJEW. *Wasserbau*.

VEB Verlag für Bauwesen, Berlin 1960; 492 pp., 488 figs., 59 tables.

Translated from the Russian by K. D. NEHLS.

Divided into six parts: 1. principles of hydraulic designs, hydraulic calculations, use of nomograms, and seepage processes in the soil; 2. works for distribution and transport of water; 3. types of locks and sluices; 4. dams and barrages; 5. and 6. watersheds and catchments.

SCHÄFER, A. *Hydraulik und Wasserbau auf neuen Grundlagen*.

Franckh Verlag, Stuttgart; 187 pp., 400 drawings and tables.

General textbook with 100 solved problems and practical examples.

TROSKOLANSKI, A. T. *Hydrometry. Theory and practice of hydraulic measurements*.

Pergamon Press, Oxford, etc.; Państwowe Wydawnictwa Techniczne, Warszawa, 1960.

Translated and revised from the Polish. XIX and 684 pp., figs., graphs, tables, bibliography.

I. Principles and methods of measurement of hydromechanical quantities.

II. Measuring instruments and apparatus used in hydraulic measurement.

III. Hydrometric laboratories.

VANONI, V. A., N. H. BROOKS and J. F. KENNEDY. *Lecture notes on sediment transportation and channel stability*.

a bibliography of publications pertaining to the Mississippi River Delta and Coastal Louisiana.

Coastal Studies Institute, Louisiana State University, Baton Rouge (U.S.A.) 1959; pp. 425-472. Reprinted from the Proceedings of the Second Coastal Geography Conference, held on April 6-9, 1959.

SCHULEJKIN, W. W. *Theorie der Meereswellen*

Akademie Verlag, Berlin 1959; IX and 157 pp., 49 figs., 3 tables. Translated from the Russian.

Theory of sea waves in open ocean and shallow coastal waters. Energy from waves. Refraction of waves on the coast.

THORN, R. B. *The design of sea defense works.*

Butterworths Publications Ltd., London 1960; XI and 106 pp., 75 figs. refs.

Concise survey of defense works along the British coast and general technical-scientific principles. I. Tides and waves. II. Natural sea defences, a.o. breakwaters. III. Sea walls, estuary and counterwalls. IV. Hydraulic design of sea wall profiles and revetment details. V. Examples of sea, estuary and tidal river walls.

WAALEWIJN, A. *Report on hydrostatic levelling across the Westerschelde.*

Rijkswaterstaat. Communications Nr. 1, The Hague 1959; pp. 61-86, 13 figs., 3 tables, bibliography 7 refs., English and French summary.

WILLIAMS, W. W. *Coastal changes.*

Routledge and Kegan Paul, London 1960; XVIII and 220 pp., figs., 8 plates, 4 appendices, bibliography.

Wave behaviour and the action of currents and wind. Transport of coastal material; the formation of lagoons and different types of erosion and deposition. Broad configuration of the coastline, its physical substance and the major geological factors. Sea defences.

Waste Water

628.3

BAARS, C., A. W. DE GRAAF en J. A. KEUNING. *Landbouwkundige en technische aspecten van het verregenen van zuivelafvalwater op grasland.* (Agricultural and technical aspects for sprinkling of dairy waste water on grassland).

Publication No. 14. Proefstation voor Akker- en Weidebouw (P.A.W.), Wageningen 1960; 65 pp. English and German summaries.

SCHONNOPP, G. *Die Praxis der landwirtschaftlichen Abwasserwertung.*

Berichte über Landtechnik 56. Kuratorium für Technik in der Landwirtschaft, Frankfurt am Main 1959; 46 pp., 29 figs.

SCHWARZ, K. *Entwicklung, Stand und Verbesserungsmöglichkeiten der Abwasserlandbehandlung in Deutschland unter besonderer Berücksichtigung der weiträumigen Verwertungsanlagen.*

Akademie-Verlag, Berlin 1960; 157 pp., 13 figs., 41 tables.

Use of waste water in agriculture in Germany.

Comprehensive information on all aspects of cotton culture, marketing and technology, based on research work in India and other important cotton growing countries. Illustrated with many maps, charts and tables.

Vol. I: History; Climate and soils, Taxonomy; Morphology; Breeding and Cytology. Vol. II: Physiology; Agronomy; Seed diseases; Insect pests; Seed multiplication and distribution of cotton. Vol. III and IV will be published shortly.

TEMPANY, H. and D. H. GRIST. *An introduction to tropical agriculture.*

Longmans, Green and Co, London, 1958; XV and 347 pp., 17 photogr., bibliography.

Part I: The tropical background. Part II: Agricultural practice in the tropics. Part III: Economic considerations.

Soil Science

631.4

BURINGH, P. *Soil and soil conditions in Iraq.*

Ministry of Agriculture, Baghdad, 1960; 322 pp., 167 figs., 38 tables, 2 separate maps, bibliography.

General development of Iraq and its soils. Physiography and agriculture. Soil formation and classification. Saline and alkali soils of the desert, the uplands and mountains. Agricultural development and soils. Soil erosion and mismanagement of land.

DAVIS, J. F. and R. E. LUCAS. *Organic soils, their formation, distribution, utilization and management.*

Dept. of Soil Sciences, Agr. Exp. Station, Michigan State University, East Lansing, Michigan, U.S.A. 1959. Special Bulletin 425; 156 pp., 73 figs., 24 tables, bibliography.

HÉNIN, S., A. FÉODOROFF, R. GRAS et G. MONNIER. *Le profil cultural. Principes de physique du sol.*

Société d'Éditions des Ingénieurs Agricoles, Paris 1960; 320 pp., 52 tables, 25 figs., photographs, bibliography.

The soil profile. Structural stability. Agricultural value of the soil profile. Improvement of the soil profile. Water control. Improvement of structural stability. Action of organic matter. Modification of the ion-complex in the soil. Problems of burning down the vegetation.

JACKS, G. V., R. TAVERNIER and D. H. BOALCH (editors). *Multilingual Vocabulary of Soil Science. Vocabulaire multilingue de la science du sol. Vocabulario multilingue de la ciencia del suelo.*

Land and Water Development Division, F.A.O. 1960, 2nd revised edition; XXIII and 430 pp.

Soil science terms, divided into 22 sections: Physics, general; Texture and structure; Soil water; Chemistry; Organic matter, humus; Biology, ecology; Cultivation, manuring, fertility; Soil formation, morphology; Profile characters, horizons; Geology, topography, climate; Mineralogy, clay minerals; Soil classification, general; Organic and peat soils; Podzolic soils; Gley and meadow soils; Arid and semi-arid soils; Saline and alkali soils; Tropical and sub-tropical soils; Intrazonal and azonal soils; Terracing, damming, drainage; Irrigation; Erosion; in 9 languages: English, French, Spanish, German, Portuguese, Italian, Dutch, Swedish and Russian.

2. Division of Processes Development a.o.: distillation processes, solar processes, membrane processes, freezing and other processes.
3. Division of Demonstration Plants, a.o.: processes and sites.

Salinity problems in the arid zones. Proceedings of the Teheran Symposium.

Arid Zone Research Series No. XIV. UNESCO, Paris, 1960; 395 pp.

Many papers delivered on the symposium in Teheran from 11 to 15 October 1958 by different authors, grouped in the following four sections: I. Hydrology with reference to salinity. II. Physiology of plants and animals in relation to consumption of saline water. III. Irrigation with brackish water and saline soils. IV. Demineralization of saline water.

Arid Zone Research

631.445.5

NAQVI, S. N. *Arid zone research. A report on the meteorological and geophysical researches for the development of arid areas in Pakistan.*

Pakistan Meteorological Service, Karachi 1960; 67 pp. (mimeogr.), 12 figs.

Since 1951, when Unesco first sent experts to set up the Geophysical Institute of the Pakistan Meteorological Service at Quetta, a programme of research in fields connected with arid zones has been developed there. The report describes the work done in cloud physics and artificial rain making, plant ecology, climatology, and micro-climatology, hydrology and other problems.

Symposium on Arid Zone Research in Pakistan. Quetta, November 1956.

Pakistan Meteorological Service, Karachi 1960. Arid zone series No. 1; 177 pp.

(mimeogr.).

The symposium was held at the Quetta Geophysical Institute with the participation of UNESCO and FAO experts. The programme was grouped into five sections: I. Surface water management and utilization II. Ground-water geology and geophysics. III. Weather modification and plant ecology. IV. Energy resources. V. Reports and recommendations submitted to the Government of Pakistan. The proceedings include 18 papers arranged under five sections and provide valuable information on the arid zone conditions and research in West Pakistan.

UNESCO's programme for arid lands.

UNESCO Information Manual 3, Paris 1958; 31 pp., 1 map, bibliography.

Short description of the UNESCO development programme for arid lands. List of international organizations and national institutes interested in this research. Attack on the desert. Future research and prospects. List of films and filmstrips on this subject.

WHITE, G. E. *Science and the future of arid lands.*

UNESCO, Paris 1960; 96 pp., maps, photogr., glossary.

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