

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

Institut International pour l'Amélioration et la Mise en valeur des Terres

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The aims of the Institute can be summarized as follows:

- ☆ *to collect information from all over the world with regard to land reclamation and improvement and to exchange this with interested parties working in the same field;*
- ☆ *to disseminate knowledge of these subjects by means of publications and other methods of enlightenment;*
- ☆ *to contribute – by supplementary research work – towards a more accurate appreciation of the problems of land reclamation and improvement.*

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.

Land Consolidation

333.013.6

HAHN, TH. *Die Flurbereinigung von Waldflächen. Grundsätze und Verfahren.*

Schriftenreihe für Flurbereinigung Heft 30. Eugen Ulmer Verlag, Stuttgart 1960; 96 pp., tables, bibliography, 43 refs.

Land consolidation of small forest areas, which are private property of farmers. Principles and methods.

KERSTING, R., *Die Anwendung der Luftbildmessung in der Flurbereinigung.*

Schriftenreihe für Flurbereinigung, Heft 26. Kleins Druck- und Verlagsanstalt, Lengerich (Westfalen) 1959; 93 pp., 14 figs. and maps, bibliography 43 refs.

Use of aerial survey in land consolidation.

OLSCHOWY, G. (editor). *Landschaftspflege und Flurbereinigung.*

Ein Bericht über die Arbeitstagung in Münster vom 5. bis 7. Oktober 1955. Schriftenreihe für Flurbereinigung, Heft 22, Verlag Eugen Ulmer, Stuttgart 1959; 132 pp., 33 illustr., bibliographies.

Landscape management and land consolidation. Report of a conference in Münster 5-7 October 1955. 12 papers by different authors.

OPPERMANN, E. a.o. *Weitere Untersuchungen über wirtschaftliche Auswirkungen von Masznahmen zur Verbesserung der Agrarstruktur im Rahmen der Flurbereinigung.*

Schriftenreihe für Flurbereinigung, Heft 29. Verlag Eugen Ulmer, Stuttgart 1960; 72 pp., 18 figs., 47 tables.

Further investigations into economic results of measures for improvement of rural structure in the scope of land consolidation. Supplement on a previously (in 1957) issued publication on this subject, viz. Heft 15 of the same series.

RÖHM, H. *Agrarplanung als Grundlage der Flurbereinigung und anderer landwirtschaftlicher Strukturverbesserungen in städtisch-industriellen Ballungsräumen. Der Stuttgarter Raum als Beispiel.* Schriftenreihe für Flurbereinigung, Heft 28, Verlag Eugen Ulmer, Stuttgart 1960; 208 pp., 68 figs. and maps, 28 tables, bibliography 91 refs.

Rural planning as basis for land consolidation and other structure improvements in urban industrial conglomerations. The conglomeration of Stuttgart as an example.

Land Ownership

333.5

GIESEKE, P. *Eigentum und Grundwasser.*

Arbeitsgemeinschaft für Forschung des Landes Nordrhein-Westfalen. Geisteswissenschaften, Heft 79. Westdeutscher Verlag, Köln und Opladen 1959; 31 pp., English and French summaries.

Report on a lecture about landownership and groundwater, with discussion.

ZUCKERMAN S. a.o. *Land ownership and resources.*

Dept. of Estate Management University of Cambridge 1960; 136 pp., 8 figs., 3 tables. Report of a conference held at the University of Cambridge in June 1958, regarding rural economy, sound management of agricultural exploitations and rational use of the soil.

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.

MACHATSCHKEK, 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.

Part 2 analyzes some technical events and techniques significant to water development.

Part 3 considers some of the emerging technology offering potential impact on water use. Atomic energy, use of saline water, weather modification, exploration for and development of ground water, and water conservation in industry and agriculture are discussed.

Part 4 discusses the administrative problems associated with water developments.

BAUER, H. *Gezähmte Fluten – Wasser im Dienste des Menschen.*

VEB F.A. Brockhaus Verlag, Leipzig 1959; 224 pp., 32 figs.

Elementary introduction into hydrology and water management. Future prospects.

BLANEY, H. F. and D. C. MUCKEL. *Evaporation from water surface in California.*

State of California, Dept. of Water Resources, Division of Resources Planning, 1959. Bulletin no. 73, 92 pp.

BOGOMOLOV, G. W. *Grundlagen der Hydrogeologie.*

VEB Deutscher Verlag der Wissenschaften, Berlin 1958; 178 pp., 104 figs. Translated from Russian.

General introduction into hydrogeology.

BROADFOOT, W. M. and H. D. BURKE. *Soil-moisture constants and their variation.*

Southern Forest Experiment Station, Forest Service, U.S. Dept. of Agriculture, Vicksburg 1958. Occasional paper 166; 27 pp., 7 figs., 16 tables, bibliography.

Explanation of terms and symbols. Soil-moisture constants and textural relationships. Soil-moisture constants as related to land use and aeration. Estimation of bulk density from soil properties. Estimation of "wet" moisture constants. Estimation of 15-atmosphere constant. Estimation of available water capacity.

CARTER, R. W. and R. G. GODFREY. *Storage and Flood Routing.*

Water-Supply Paper 1543-B. U.S. Geological Survey, Washington 1960. Manual of Hydrology, Part 3, Flood-Flow Techniques; pp. 81–104, figs. 31–41.

Basic equations used in flood routing are developed from the law of continuity. The methods of flood routing are the stage-storage method which relates mean gage height with storage, the discharge-storage method which utilizes the difference in weighted inflow and outflow discharge, and the reservoir-storage method where storage is solely a function of outflow discharge.

DALRYMPLE, T. *Flood-Frequency Analyses.*

Water-Supply Paper 1543-A. U.S. Geological Survey, Washington 1960. Manual of Hydrology, Part 3. Flood-Flow Techniques. V and 80 pp., 30 figs., bibliography.

This report describes the method used by the U.S. Geological Survey to determine the magnitude and frequency of momentary peak discharges at any place on a stream, whether a gaging-station record is available or not. It discusses the theory underlying the Survey method of computing recurrence interval, and compares the method with other existing methods. Also, it describes a study in which a theoretical 1000-year streamflow record was analyzed statistically to test the reliability of the methods in their application to available streamflow records.

ENGELHARDT, W. VON. *Der Porenraum der Sedimente.*

Mineralogie und Petrographie in Einzeldarstellungen, Band II. Springer Verlag, Berlin, Göttingen, Heidelberg 1960; VII and 207 pp., 83 figs., 39 tables, bibliography.

Part B (pp 58–135) deals with water flow in the porous space of sediments. Darcy-equation for homogeneous flow in linear systems. Heterogeneous flow processes and equilibria. Permeability of stone.

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 Zwiesel (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 Zwiesel (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.

HOCKENSMITH, R. D. (editor). *Water and Agriculture*.

A symposium presented at the Washington meeting of the A.A.A.S., December 29–30, 1958. American Association for the Advancement of Science, Washington 1960; 206 pp., 21 ill.

Opportunities to extend existing water supplies and to develop additional water sources to meet the demands for a rapidly increasing population are explained in this symposium. Opportunities for improving water management by more equitable distribution, making it available at the time most needed, controlling quality, reducing losses of water through more efficient use and through control of phreatophytes and aquatic weeds are highlighted. Methods of increasing the soil moisture reservoir by application of soil conservation practices and improving water yield, retarding storm runoff and retaining water for sustained flow by good forest management practices are explained.

L'Hydraulique Souterraine.

Compte rendu des Sixièmes Journées de l'Hydraulique, Nancy, 28–30 Juin 1960. Société Hydrotechnique de France, Paris; 2 volumes, XLII and 663 pp., figs., graphs, photographs, maps, English summaries, bibliographies.

79 papers by different authors on the following subjects:

1. General theory of underground fluid flow.
2. Ground water and agriculture.
3. Underground water and urban hydraulics. The estimation of ground water resources.
4. Ground water in mines.
5. Mineral waters.
6. Hydraulics of oil and underground gas deposits.
7. Radioactivity applied to ground water hydraulics.

Hydrologic Networks and Methods. United Nations, E.C.A.F.E., Flood Control Series no. 15; Bangkok, 1960; 180 pp.

This report covers the activities of the Inter-Regional Seminar on Hydrologic Networks and Methods jointly organized by the United Nations and the World Meteorological Organization at Bangkok in July 1959. An edition in French language is scheduled for publication.

HUGUES, L. *Hydraulique.*

Ecole Nationale d'Agriculture de Rennes, 1959, 7 volumes (mimeographed), total 408 pp., figs., graphs, tables, maps.

Vol. I: Généralités, pp. 1–59

Vol. II: Généralités, pp. 60–131

Vol. III: Généralités, pp. 132–187

Vol. IV: Assainissements des terres, pp. 188–254

Vol. V: Irrigations. Généralités, pp. 255–297

Vol. VI: Irrigations. Les systèmes d'irrigation; pp. 298–361

Vol. VII: Adductions d'eau (par S. PICKER); pp. 362–408.

LANGBEIN, W. B. and K. T. ISERI. *General Introduction and Hydrologic Definitions.*

Water-Supply Paper 1541-A U.S. Geological Survey, Washington 1960. Manual of Hydrology: Part I. General Surface-Water Techniques. 29 pp., figs., bibliography.

A compilation of definitions to explain the terminology of hydrologic practices as they relate to the entire field of surface-water hydrology. Many of the definitions listed were selected from technical literature. Where acceptable definitions could not be found in existing literature, substitutes were written especially for this compilation.

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

as much as 70 feet below sea level, and saline encroachment has developed extensively along the coast. Maintenance of fresh-water head above sea level near the saline front is suggested as an economic possibility for control of saline water.

RAINWATER, F. H. and THATCHER, L. L. *Methods for collection and analysis of water samples.*

Water Supply Paper 1454. U.S. Geological Survey, Washington 1960; IX and 301 pp., 17 figs., 3 tables, bibliographies.

This manual contains methods used by the U.S. Geological Survey to collect, preserve and analyze water samples. Throughout the emphasis is on obtaining analytical results that accurately describe the chemical composition of the water in situ. Among the topics discussed are selection of sampling sites, frequency of sampling, field equipment, preservative and fixatives, analytical techniques of water analysis, and instruments. 77 laboratory and field procedures are given for determining 53 water properties.

Richtlinien für grundwasserkundliche Beobachtungen und ihre Auswertung.

Published by Forschungsanstalt für Gewässerkunde, Bielefeld. Franckh Verlag, Stuttgart; 56 pp., 26 figs., 7 tables.

Except proposals for the choice of measuring sites and measuring-instruments, also the working-out of measuring-results of groundwater investigation, collecting the facts in appropriate tables, the formation of medium values and drawing contourlines of groundwaterflow are dealt with in this book. Furthermore indications for observation of artesian and other wells are given.

REMENIERAS, G. *L'hydrologie de l'ingénieur.*

Collection du Laboratoire National d'Hydraulique. Eyrolles, Paris 1960; 413 pp., figs., graphs, maps, tables, bibliographies.

Atmosphere and hydro-meteorology. Precipitation. Topographical and glaciological characteristics of a watershed. Thermic characteristics of a watershed. Evaporation, transpiration and evapotranspiration. Gauging-stations in watercourses. Study of regime of discharges. Analysis and predetermination of hydrograms in relation with a given rainshower. Study of floods and predetermination of their maximum probable discharge.

REMENIERAS, G. *Eléments d'hydrologie appliquée.*

Collection Armand Colin nr. 343, Paris 1960; 208 pp., 48 figs.

Deals only with applied hydrology. Factors influencing runoff and statistical analysis of runoff. Investigation of floods.

SCHÄFFERNAK, F. *Hydrographie.*

Akademische Druck- und Verlagsanstalt, Graz (Austria) 1960, 2nd printing; 448 pp., 410 figs., 46 tables.

Rainfall, water levels, runoff, temperature, atmospheric pressure, air moisture, wind, sediments, ice, etc. as hydrographical, meteorological and morphological data are dealt with. Regulation of these data by analytical and graphical statistics.

SCHOELLER, H. *Arid zone hydrology. Recent developments.*

Arid Zone Research Series no. XII. UNESCO, Paris 1959, 125 pp., 29 figs., maps and graphs, bibliography 222 refs.

Chapter I deals with the circumstances determining the formation of bodies of groundwater, their replenishment and the water resources they represent.

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 1. 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 1. 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.

Verlag Wasser und Boden, Axel Lindow & Co, Hamburg-Blankenese, 2nd edition 1956; 570 pp.

Reference book of more than 8000 addresses in the field of hydrology and water management in West-Germany. A new edition is in preparation.

Agro-Meteorology and Climatology

551.5:63

CRITCHFIELD, H. J. *General climatology.*

Prentice-Hall Inc., Englewood Cliffs, N.J. (U.S.A.) 1960; XIII and 465 pp., figs., tables, maps, bibliography.

Dividing his analysis into three principal sections (physical, regional and applied), the author begins the survey with a study of the physical elements involved, the fundamental atmospheric processes, insolation, temperature, pressure, winds, moisture, air masses, storms and a brief discussion of weather forecasting. He continues with a detailed classification of climatic types and their geographic distribution. In his conclusion, the author relates the climatic elements to the biotic environment and everyday living, and carefully reviews current knowledge about climatic change and cycles.

CRUSE, R. R. and G. E. HARBECK, Jr. *Evaporation control research, 1955-1958.*

Water-Supply Paper 1480. U.S. Geological Survey, Washington 1960; 45 pp., 1 plate, 14 figs.

This report contains a list of chemicals tested as possible evaporation retardants, describes methods and equipment for applying the chemicals, and gives results of tests in metal tanks and ranch ponds in Texas, during the period 1955-1958.

EUVERTE, G. *Les climats et l'agriculture.*

P.U.F., Paris 1960. Série "Que sais-je?" No. 824; 124 pp., maps, bibliography.

GEIGER, R. *Das Klima der bodennahen Luftschicht. Ein Lehrbuch der Mikroklimatologie.*

Verlag Friedr. Vieweg & Sohn, Braunschweig 1961; 4th improved edition; XII and 646 pp., 281 figs., bibliography 1218 refs.

Revised edition of a well known standardwork on this subject, first published in 1927. Heat transfer of the earth's surface as principle for micro-climatology. The air layer close to the surface on flat and not overgrown soil. Influence of the soil on the air layer close to the surface. Calculations of heat transfer. The close to the surface air layer on overgrown soil. Forest-meteorological climatological problems. Influence of configuration of the landscape on micro-climate. Relations of man and animal to micro-climate. Manual of measure techniques for micro-climatological and micro-meteorological research by G. HOFMANN.

GENTILLI, J. *A geography of climate. The synoptic world pattern.*

University of Western Australia Press, Perth 1958; 2nd revised edition; 172 pp., 28 figs. and maps, 30 tables, bibliography.

Solar radiation in space. Effect of the atmosphere. Temperature. Land and sea breezes. Atmospheric circulation. The first (tropical-equatorial) cycle. The second (surface westerly) cycle. The third (polar) cycle and the polar front. The monsoons. Tropical cyclones (hurricanes). Evaporation. Water vapour in the air. Precipitation. Thunderstorms and hail. The water balance. The seasons. Classification of climates.

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.

Problems of Humid Tropical Regions. Problèmes des régions tropicales humides.

UNESCO. Paris 1958; 102 pp., 9 figs., and maps, 1 separate map, bibliographies.

Six reports (by different authors) in English and French. General reports on the Amazon region, on the Caribbean region and on the humid regions of South Asia. Special reports on biological problems in the Congo, entomological problems in South Asia and problems related to the development of water resources in the Philippines.

PURI, G. S. *Indian Forest Ecology.*

A comprehensive survey of vegetation and its environment in the Indian Subcontinent. 1960; 2 volumes.

Vol. I: XXXV and 1–318 pp., 50 figs. and maps, 238 photogr.

Vol. II: XIV and pp. 319–710, 95 figs. and maps, 92 photogr.

Summarizing the most important botanical and ecological literature so far published on Indian vegetation, this book is intended to serve as a reference book on ecological research.

RATTRAY, J. M., *The grass cover of Africa.*

F.A.O. Agricultural Studies No. 49, Rome 1960; V and 168 pp., 1 separate coloured map, bibliography.

As part of a project of mapping the grazing resources of the under-developed countries of the world. FAO published the first of a series which is devoted to Africa. Other parts of the world will follow.

Ecological relationships of the grass cover. Method of presentation of map. Types of vegetation with which the grass cover is associated. Successional changes. The type genera. Types of grass cover.

SCHMITHÜSEN, J. *Allgemeine Vegetationsgeographie.*

Lehrbuch der Allgemeinen Geographie, Band IV. Verlag Walter de Gruyter, Berlin 1959; 261 pp., 114 figs., 1 coloured table.

SHANTZ, H. L. and B. L. TURNER. *Photographic documentation of vegetational changes in Africa over a third of a century.*

University of Arizona, College of Agriculture, 1958. Report 169. VI and 158 pp., 78 photographs, graphs, 1 map.

Relation between rainfall and vegetation in Africa south of the Sahara. The Mediterranean type in South Africa. Desert shrub and desert grass. Acacia-savannas. Dry forest. Mountain grassland. Temperate rain forest. Plant citations. Weather records.

Tropical soils and vegetation. Sols et végétation des régions tropicales.

Proceedings of the Abidjan Symposium, jointly organized by UNESCO and the Commission for Technical Co-operation in Africa South of the Sahara 20–24 October 1959. UNESCO, Humid Tropics Research, Paris 1961; 115 pp., figs., maps, tables, bibliographies, photographs.

12 papers by different authors in English and French. General reports on: Types of vegetation of humid tropics in relation to the soil. Effect of soil characteristics on localization of vegetation in equatorial and humid tropical regions. Influence of various types of vegetation on the characteristics and evolution of soils in equatorial, sub-equatorial and adjacent semihumid tropical regions. Influence of cultivation on the evolution of soils in dense forests in low and intermediate altitudes. Pedological aspects of reclamation of tropical, and particularly volcanic soils in humid regions. Regional reports on vegetation of West-Africa, Transcaucasia, Ghana, Ceylon, India and Brazil. Recommendations of the symposium.

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. POPOW 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*.

California Institute of Technology, Pasadena 1960. Report KHWR-1; 131 pp.

VANONI, V. A. and R. E. POLLAK. *Experimental design of low rectangular drops for alluvial flood channels.*

Sedimentation Laboratory, California Institute of Technology, Pasadena, California, U.S.A. 1959. Report No. E-82; 122 pp., 81 figs., tables, 3 appendixes.

Runs were made in two flumes: one with a fixed bed and clear water, the other with an erodible bed and sediment-carrying water. Two cases were investigated in each flume: drops on mild slopes and drops on steep slopes. The dimensions of the drops were varied to establish the combinations which give the best performance. Design curves and sample calculations are presented. The complete tabulated data are presented in the appendix.

Coastal Engineering and Geography

627

ABENDARRON, E. C. *The problem of the tides* (viewed by a geologist)

C. Blommendaal, The Hague 1960; 137 pp., bibliography.

BISHOP, M. S. *Subsurface mapping.*

Wiley, New York 1960; 198 pp., figs., bibliography.

BRUUN, P. and F. GERRITSEN. *Stability of Coastal Inlets.*

North Holland Publishing Company, Amsterdam 1960; XVII and 123 pp., 19 figs., 15 tables, bibliography, 4 appendixes.

Natural inlet regimen. Considerations on tidal hydraulics and stability of channels and inlets. Pertinent factors involved in inlet stability. Analysis of actual inlet data. Design of tidal inlets.

DRONKERS, J. J. and J. C. SCHÖNVELD. *Tidal computations in shallow water.*

Rijkswaterstaat Communications Nr. 1, The Hague 1959; pp. 1-60, 11 figs., bibliography 35 refs., English and French summary.

A survey is given of the established practice of tidal computations in the Netherlands. Integration by harmonic components. Direct integration. Integration along characteristics. The employment of large computers, either analogue or digital, is here mentioned only briefly, since more detailed information on the development is being prepared.

GUILCHER, A., *Coastal and submarine morphology.*

Translated from the French. Methuen and Co., London 1958; 274 pp.

KING, C. A. M. *Beaches and Coasts*

Edward Arnold Ltd, London 1959; XII and 403 pp., 149 figs., 5 tables, maps, graphs, bibliographies, 353 refs.

The main factors on which the character of the beach depends: beach material, waves, tides, winds. Methods of research; theoretical, experimental and field observations. Waves in deep water, wave generation, wave refraction diagrams and waves in shallow water. Movement of material on the beach. Beach profiles, experimental results and surveying techniques. Effect of wind. Classification of beaches and coasts. Constructive wave action and coastal accretion. Destructive wave action and coastal erosion. Beach gradient and beach profiles. Historical data on coastal change. Coastal types and their development, the marine cycle.

MORGAN, J. P. *Activities and research results of the Coastal Studies Institute including*

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.

SIERP, F. *Amerikanische Rückschau auf die Abwasserliteratur des Jahres 1958.*
Vom Wasser, Band XXVI (1959), Verlag Chemie, Weinheim/Bergstr. 1960, pp. 273-414.

Comprehensive survey of American literature on waste water during 1958, with a great number of references.

Vom Wasser. Ein Jahrbuch für Wasserchemie und Wasserreinigungstechnik.

(Editor W. HUSMANN). Herausgegeben von der Fachgruppe Wasserchemie in der Gesellschaft Deutscher Chemiker, Verlag Chemie, Weinheim/Bergstr. (West-Germany) 1960. Band XXVI; 425 pp. text, 88 pp. advertisements with index, 132 figs., 60 tables.

18 papers on water management, chemical research of water, waste water.

Tropical Agriculture

63 (213)

ESDORN, I. *Die Nutzpflanzen der Tropen und Subtropen der Weltwirtschaft.*

Gustav Fischer Verlag, Stuttgart 1961; VIII and 159 pp., 34 figs., bibliography.

GHOSE, R. L. M., M. B. GHATGE and V. SUBRAMANYAM. *Rice in India.*

Indian Council of Agricultural Research, New-Delhi 1960; 482 pp. illustr. 2nd edition.

Part I: botany, climate, soils, irrigation, rice culture, diseases and pests. Part II: various problems of marketing. Part III: technology of rice processing, nutritive value of rice and rice diets.

GRIST, D. H. *Rice.*

Longmans, Green and Co, London, 3rd edition 1959; XXIII and 466 pp., 72 photogr., 7 appendices, 29 tables, 38 figs., bibliography.

Climate and Soils. Water supply and control. Varieties and their classification. Genetics of paddy. Selection and breeding. Methods of cultivation. Mechanized cultivation. Fertilizers and manures. Weeds. Pests and diseases. Milling. Nutritional value. Production, yields and consumption. Economic conditions.

MATSUO, T. *Rice culture in Japan.*

Yokendo Ltd., Ministry of Agriculture and Forestry, Japanese Government, Tokyo 1959; 128 pp., 22 tables, figs., photographs.

Origin and development of rice cultivation in Japan. Position of rice cultivation in the agriculture in Japan. Rice and food in Japan. Changes in rice production in Japan and the contributing factors therein. Ecological rice crop geography in Japan. Development of rice growing techniques. Development and dissemination of rice growing techniques. Method of paddy rice cultivation in Japan. Upland rice cultivation. Future problems of rice cultivation. Growth and development of rice plants.

OCHSE, J. J., M. J. SOULE Jr., M. J. DIJKMAN and C. WEHLBURG. *Tropical and Subtropical Agriculture.*

Macmillan, New York 1961; 2 volumes total LIV and 1446 pp., 285 figs., 103 tables, bibliographies at the end of each chapter, glossary.

Comprehensive standardwork on all aspects of tropical and subtropical crops.

SETHI, B. L. a.o. *Cotton in India - a monograph.*

Indian Council of Agricultural Research, New Delhi 1960; 4 volumes.

Vol. I: 479 pp; 34 illustr.

Vol. II: 339 pp; 64 illustr.

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.

KAROL, R. H. *Soils and soil engineering.*

Prentice-Hall Inc. Englewood Cliffs, New Jersey, U.S.A. 1960; XIII and 194 pp., figs., graphs, tables.

Soil formation and distribution. Physical properties of soils. Field investigations. Simple laboratory tests. Classification and identification. Permeability, capillarity and seepage. Consolidation, compression and settlement. Shear strength. Sub-soil stresses. Stability of slopes. Retaining structures. Bearing capacity. Piles and pile groups. Water content and density relationships. Soil stabilization. Chemical grouting.

NYE, P. H. and D. J. GREENLAND. *The soil under shifting cultivation.*

Commonwealth Agricultural Bureaux, Farnham Royal, Bucks. (England) 1960; 156 pp. photographs, tables, graphs, bibliography. Commonwealth Bureau of Soils. Technical Communication no. 51.

Soil Classification. A comprehensive system. 7th Approximation. Soil Survey Staff, Soil Conservation Service, U.S. Dept. of Agriculture, Washington 1960; V and 265 pp., 44 figs., tables, 101 profile descriptions, 2 appendixes.

The Soil Survey uses a classification to see relations among soils and between soils and their natural and cultural environment. Categories of the system: 10 orders viz. 1. entisols, 2. vertisols, 3. inceptisols, 4. aridisols, 5 mollisols, 6. spodosols, 7. alfisols, 8. ultisols, 9. oxisols, 10. histosols; each order subdivided into suborders, and these further into great soil groups, subgroups, families series and soil types. Appendixes I: Soil Survey Manual terminology for describing soils. II: Identification of soil profiles.

Salinity and Alkalinity

631.416.5

The application of drainage in the reclamation of salinized soils.

Published for the National Science Foundation, Washington D.C. and the Department of Agriculture, U.S.A., by the Israel Program for Scientific Translations. Jerusalem 1960. Translated from the Russian original: *Primenenie drenazka pri osvvenii zasolennykh zemel.* Academy of Sciences of the U.S.S.R., Moscow 1958.

228 pp., figs., tables, graphs, maps, bibliographies.

11 papers by different authors delivered on a working conference held in January 1956 by the Soil Institute of the U.S.S.R. Academy of Sciences jointly with Glavvodkhoz (Central Water Administration), to examine the results of the application of drainage as a means of combating the salinization of irrigated soils in various regions of the U.S.S.R.

CHAPMAN, V. J. *Salt Marshes and Salt Deserts of the World.*

Leonard Hill, London; Interscience Publishers Inc., New York 1960; XVI and 392 pp., 102 figs., 45 plates, 52 tables, bibliography.

Distribution and vegetation of salt marshes, Physiography and development. Tides and water table. Soil factor. Survey of salt marshes in Great Britain, arctic and continental Europe. Mediterranean and Australasia, America. Salt marsh survey and marsh fucoids. Physiology of halophytes. Economic uses.

Saline Water Conversion Report for 1959

U.S. Department of the Interior, Office of Saline Water, Washington 1960; 108 pp., 42 figs.

1. Division of Research, a.o.: demineralization of sea water; membranes for water desalination; high-pressure-solvent desalination; use of algae in saline water conversion

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.

Introduction into development of arid lands. Hydrology, vegetation and soil. Climate and rainfall. Solar radiation. Animal life.

Soil Conservation and Erosion Control

631.459

FLEGEL, R. *Die Verbreitung der Bodenerosion in der Deutschen Demokratischen Republik.*

VEB Bibliographisches Institut, Leipzig 1958, 104 pp., 14 drawings, 36 figs., 1 table, 1 coloured map.

DOTAN, A. *Soil conservation in Israel.*

Ministry of Agriculture, Soil Conservation Division, Israel 1959; 40 pp., photographs, 3 maps.

Picture-booklet with captions in English and Hebrew.

Soil erosion by wind and measures for its control on agricultural lands.

F.A.O., Rome 1960; V and 85 pp. Informal Working Bulletin No. 6. 143 selected references.

Land Development Projects

631.6

A Case Study of the Damodar Valley Corporation.

United Nations, E.C.A.F.E., 1960. Flood Control Series No. 16; 80 pp.

Describes the operations during ten years. Power generating capacity, irrigation facilities including water supply for municipalities and industry, and the future power construction programme.

F.A.O. Mediterranean Development Project. The economy and agriculture of Israel.

Government of Israel, Jeruzalem 1959; V and 140 pp., statistics, tables.

F.A.O. Mediterranean Development Project. Greece. Country Report.

F.A.O., Rome 1959; 227 pp., tables.

F.A.O. Mediterranean Development Project. Turkey. Country Report.

F.A.O., Rome 1959; 211 pp., tables.

Projet F.A.O. de Développement méditerranéen. Maroc. Rapport national.

F.A.O., Rome 1959; 295 pp., tables, maps.

Projet F.A.O. de Développement méditerranéen. Tunisie. Rapport national.

F.A.O., Rome 1959; 237 pp., tables.

Projet F.A.O. de Développement méditerranéen. Yougoslavie. Rapport national.

F.A.O., Rome 1959; IV and 165 pp., 33 tables.

Future development of the San Francisco Bay area 1960-2020.

Prepared and published for U.S. Army Engineer District San Francisco Corps of Engineers by the Office of Area Development Business and Defense Services Administration, U.S. Dept. of Commerce, Washington 1959; 132 pp., illustr., graphs, tables, bibliography, 23 separate maps.

Economic aspects of comprehensive survey of San Francisco Bay and tributaries.

HAYES, P. *Measuring the results of development projects.*

A manual for the use of field workers. UNESCO, Paris 1959; 100 pp.

Major Development Projects Australia.

Department of National Development, Canberra, 1960; 104 pp., maps.

Survey of water projects in Australia, under construction and completed. Furthermore electricity, gas, railways, roads and bridges, ports, airports and telecommunications projects. Address index of authorities.

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