

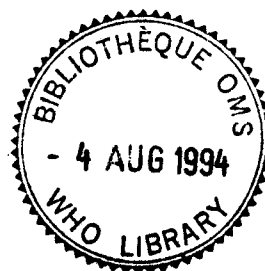


VECTOR BIONOMICS
IN
THE EPIDEMIOLOGY AND CONTROL
OF MALARIA

PART III
THE SOUTHEAST ASIA REGION
AND
THE WESTERN PACIFIC REGION

VOLUME I
CLASSIFIED BIBLIOGRAPHY
1970 - 1991*

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* SYSTEMATIC LITERATURE SEARCH CEASED AT THE END OF DECEMBER 1991

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FOREWORD

The series of VECTOR BIONOMICS IN THE EPIDEMIOLOGY AND CONTROL OF MALARIA (PARTS I & II) has been received with great interest by individuals and training and research institutions in different parts of the world. This encouraging response led us to proceed with PART III covering the WHO Southeast Asia and Western Pacific Regions.

Part III assembles the widely distributed published and unpublished literature in a Classified Bibliography as Volume I covering the period 1970-1991 arranged by subject and by country. In addition, some of the earlier books of malariology and entomology and WHO publications dealing with malaria and its control prior to 1970 have been included as they have provided basic learning for generations of malariologists and entomologists.

Based on this bibliography, a comprehensive review will be prepared as Volume II to form a background of vector studies and experiences in malaria epidemiology and control that have accumulated over the past 20 years. This background will be compiled country by country of the geographical areas of the two regions shown in Fig. 1. As in the previous series, the background will assist epidemiologists and entomologists in planning or modifying malaria control activities building on past experiences and avoiding repetition of unsuccessful attempts. The background will also assist central planners and consultants to pursue their activities without spending much time on tracing previous reports.

It is hoped that the whole series together will serve as a valuable asset for research and training in malaria epidemiology and control at national and international level.

We are grateful for the cooperation of certain authors and institutions who have provided copies of publications that could not be obtained at our end.

Dr P. de Raadt
Director of the Division of
Control of Tropical Diseases (CTD)

INTRODUCTION

The previous series of "VECTOR BIONOMICS IN THE EPIDEMIOLOGY AND CONTROL OF MALARIA" that have been issued covered three of the WHO Regions:

PART I dealt with the WHO African Region & the Southern WHO Eastern Mediterranean Region (Afrotropical Region).

PART II dealt with the WHO European Region and the WHO Eastern Mediterranean Region (the Palearctic and Oriental Region).

The details of the documents of those parts are listed in pp. vi, vii.

For PART III covering the WHO South-East Asia Region and the WHO Western Pacific Region, it has been decided to first collect the large amount of literature involved in a bibliography as Volume I, classified by subject and by country in order to facilitate literature search. This will be followed by Volume II to be prepared on the basis of this bibliography compiling information on vector aspects and experiences in malaria epidemiology and control from selected published and unpublished literature covering the past 20 years or more in the same way as the previous series were produced.

Certain principles have been set for the preparation of the present bibliography:

1. Format: As shown in the Table of Contents of the Bibliography (page xvi), references are grouped under two main headings:

(i) Leading literature covering references of general interest to malariology including books, WHO documents and other publications. Under this heading too, there is an item covering literature of direct relevance to South East Asia Region (SEAR) and Western Pacific Region (WPR) including references dealing with recognition of Anopheles species complexes.

(ii) Vector bionomics, malaria epidemiology and control by geographical areas: Country literature. Under this heading references are listed country by country in five arbitrarily divided geographical areas as shown in Fig. 1 (SECTIONS I-V).

References under each group of subjects or each country are arranged by alphabetical order of authors. Since India gave the largest number of publications, it was found more convenient to group the references into four 5-year periods, in each of which references are arranged alphabetically.

The extent of the area regarded as originally non-malarious (SECTION V A) could not be shown in Fig. 1 except for New Zealand. For details of this area the map shown as Fig. 160 in the book of Russell et al (1963)(1) should be consulted.

(1) Russell, P.F., West, L.S., Manwell, R.D. & Macdonald, G. Practical Malariology, London, New York, Toronto: Oxford University Press. 1963.

2. Period covered: The bibliography starts from 1970 with the exception of some earlier literature. This date has been found convenient as it follows the decision of the Twenty-second World Health Assembly of 1969 which endorsed the revised global malaria eradication strategy. Although systematic literature search was terminated at the end of 1991, some publications were added as they became available in 1992 and 1993 during the preparation of the bibliography.

3. Scope: A fairly thorough literature search has been made for aspects of vector bionomics and malaria epidemiology and control on the basis of which the bibliography has been constructed. On the other hand, no systematic search has been made for certain subjects which have only been partly covered as shown in the following:

(a) Antimalarial drug trials: This subject was considered to deserve a thorough literature search to develop a special bibliography. Nevertheless, several fairly recent books and WHO publications dealing with chemotherapy of malaria including various experiences with antimalarial drugs have been included in the present bibliography.

(b) Drug resistance: No systematic literature search has been made for this aspect because it has been well covered by special literature. The WHO "Global Monitoring of the Susceptibility of Malaria Parasites to Drugs" has issued periodical reports screening and analyzing the results of in vitro and in vivo tests reported by various countries since 1982 as shown under 2.1.2. Moreover, records of drug resistance are projected on a world map in progressive reports issued by WHO on the "World Malaria situation" as shown under 2.1.6. Additionally some excellent reviews dealing with the problem of drug resistance, its evolution and geographical extent have been included in the present bibliography as shown under 6.3 and 7.2. Besides which papers of individual countries reporting drug resistance in the course of epidemiological studies are incorporated and identified by the appropriate descriptor. Included also, are papers proposing the presence of Plasmodium vivax resistance to chloroquine in the Western Pacific Region.

(c) Immunology: No attempt has been made to trace literature on this subject, but general reviews on malaria and proceedings of meetings incorporating immunological aspects are included. Also papers reporting on serological tests as part of epidemiological studies are listed. Selected reviews and proceedings of meetings discussing malaria vaccines have been included and labelled with the appropriate descriptor.

4. Descriptors: Initially, an attempt was made to use the "Permuted Medical Subject Headings (MESH)"(1), but these were found not to cover specifically the essential terms of malariology with its entomological component. Therefore, it was decided to develop specific descriptors to be used with this bibliography. However, some MESH descriptors were used with or without modifications. In designing specific descriptors, the following aims were observed:

(1) Permuted Medical Subject Headings. U.S. Department of Health and Human Services. Public Health Service. National Institute of Health. Bethesda, MD: National Library of Medicine, Library Operations, 1991. 481 pp.

(a) to use a set of principal descriptors that would assist the user to retrieve broad aspects.

(b) to use concurrently a set of secondary descriptors that would reflect the important contents of the paper, and assist in retrieval of specific topics.

Some published papers could not be obtained from the WHO Library or its sources. For unknown reasons, no response was obtained when written requests were sent to the authors. In such cases, descriptors had to be deduced from the titles of those papers.

To avoid repetition of descriptors, books and WHO reports and documents have been grouped under convenient subject headings that reflect their contents. Similarly, publications dwelling heavily upon mathematical models have been listed under Malaria Quantitative Epidemiology without defining individual descriptors for each.

Under SECTION II which principally deals with China, there are several unpublished WHO documents of the WHO/MAL series that were issued during 1980-1990 to present "Abstracts of Recent Chinese Publications on Malaria". These are labelled Anonymous in the bibliography. Suitable descriptors have been designated to reflect the main subjects covered by each of those WHO/MAL series as a whole and not the individual abstracts contained therein.

For LEUCOSPHERUS GROUP, the appropriate descriptors denoting species names follow the recent classification of the group by Peyton (1989).⁽¹⁾ Wherever a definite identification has been made recently, a descriptor designating the new species name is used irrespective of the old species name used by the author. For example Anopheles dirus is used to replace Anopheles balabacensis in old publications dealing with this taxon in Thailand.

5. Languages: The language of the bibliography is English. Titles of papers in other languages are translated into English with an indication of the availability of a summary in English or any other language.

Literature search was made through screening the abstracts published during 1970-1971 in the Tropical Disease Bulletin of the Bureau of Hygiene and Tropical Medicine, London, U.K., and the Review of Applied Entomology, Series B / Review of Medical and Veterinary Entomology of the Commonwealth Institute of Entomology, London, U.K. The efforts made by these institutions are fully acknowledged and greatly appreciated.

Despite repeated revisions, some mistakes may still be found. I am responsible for any errors that may have been overlooked. I hope that these will be brought to our attention so that we can issue a corrigendum.

A.R. Zahar

(1) Peyton, E.L. A new classification for the LEUCOSPHERUS GROUP of Anopheles (Cellia). Mosquito Systematics, 1989; 21:197-205.

List of Documents issued on:

VECTOR BIONOMICS
IN
THE EPIDEMIOLOGY AND CONTROL OF MALARIA
PART I
THE WHO AFRICAN REGION
& THE SOUTHERN WHO EASTERN MEDITERRANEAN REGION
PREPARED BY A.R. ZAHAR

VBC/84.6-MAP/84.3 (109 pp.) covering the following:

PREFACE

INTRODUCTION

SECTION I: MALARIA VECTORS OF THE AFROTROPICAL REGION - GENERAL INFORMATION

SECTION II: AN OVERVIEW OF MALARIA CONTROL PROBLEMS & THE RECENT MALARIA SITUATION

VBC/85.1-MAP/85.1 (225 pp.) covering the following:

SECTION III: VECTOR BIONOMICS, MALARIA EPIDEMIOLOGY AND CONTROL BY GEOGRAPHICAL AREAS

(A) WEST AFRICA

VBC/85.2-MAP/85.2 (136 pp.) covering the following:

(B) EQUATORIAL AFRICA

(C) SOUTHERN AFRICA

VBC/85.3-MAP/85.3 (244 pp.) covering the following:

(D) EAST AFRICA

(E) EASTERN OUTER ISLANDS

(F) SOUTHWESTERN ARABIA

VECTOR BIONOMICS
IN
THE EPIDEMIOLOGY AND CONTROL OF MALARIA
PART II
THE WHO EUROPEAN REGION
AND
THE WHO EASTERN MEDITERRANEAN REGION

PREPARED BY A.R. ZAHAR

Document VBC/88.5-MAP/88.2 (228 pp.) covering the following:

FOREWORD
PREFACE
INTRODUCTION

VOLUME I: VECTOR LABORATORY STUDIES

Document VBC/90.2-MAL/90.2 (226 pp.) covering the following:

VOLUME II: APPLIED FIELD STUDIES

SECTION III: VECTOR BIONOMICS, MALARIA EPIDEMIOLOGY AND CONTROL BY
GEOGRAPHICAL AREAS

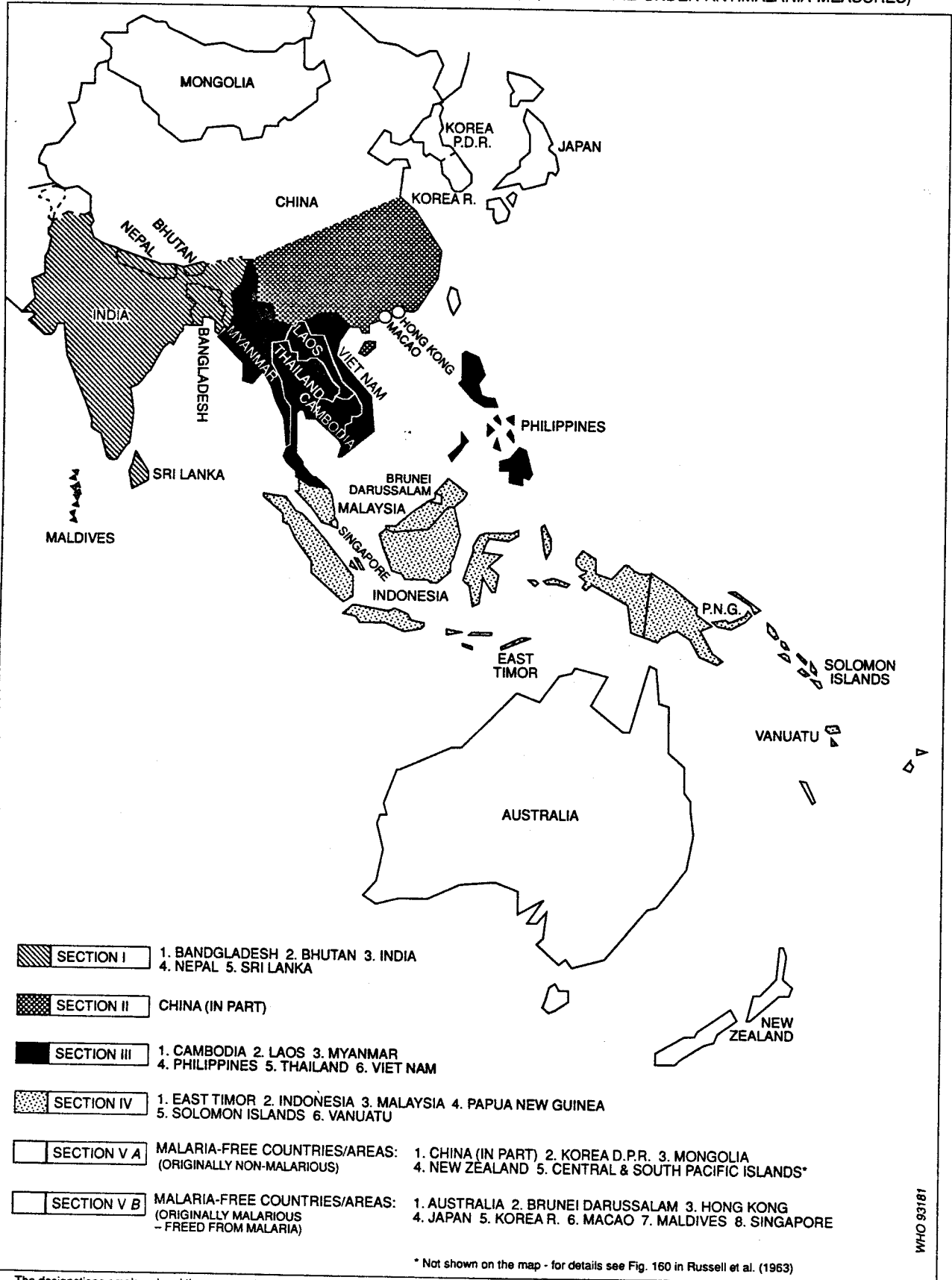
(A) THE MEDITERRANEAN BASIN

Document VBC/90.3-MAL/90.3 (352 pp.) covering the following:

SECTION III: VECTOR BIONOMICS, MALARIA EPIDEMIOLOGY AND CONTROL BY
GEOGRAPHICAL AREAS

(B) ASIA WEST OF INDIA

FIG. 1 COUNTRIES/AREAS OF THE SOUTHEAST ASIA AND WESTERN PACIFIC REGIONS GROUPED INTO CONVENIENT GEOGRAPHICAL AREAS (SECTIONS I, II, III & IV ARE UNDER ANTIMALARIA MEASURES)



The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines represent approximative border lines for which there may not yet be full agreement.

RESERVATIONS

The designations employed and the presentation of material on the map and the bibliography do not imply the expression of any opinion on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Demarcated lines on the map represent approximative border lines for which there may not be full agreement.

ABBREVIATIONS

<u>An.</u>	=	<u>Anopheles</u>
<u>B.</u>	=	<u>Bacillus</u>
ed	=	editor
eds	=	editors
IRG	=	Insect growth regulators
OP	=	Organophosphates
<u>P.</u>	=	<u>Plasmodium</u>
PNG	=	Papua New Guinea
SEAR	=	Southeast Asia Region
WPRO	=	Western Pacific Region
WHO	=	World Health Organization
WHO SEARO	=	World Health Organization Regional Office for Southeast Asia
WHO WPRO	=	World Health Organization Regional Office for Western Pacific
WHO/MAL-WHO/VBC	=	A WHO unpublished document in the series of Malaria & Vector Biology and Control. The abbreviation is followed by two numbers: the first indicates the year, and the second shows the serial numbers of the document

NOTES

Burma : Now Myanmar

GLOSSARY FOR SOME DESCRIPTORS

- Insecticide susceptibility tests : indicates that tests were made with the insecticide(s) stated and the species concerned was found susceptible.
- Spatial distribution : concerns the distribution of a vector species within the country reviewed.
- Seasonal distribution : concerns the seasonal abundance of a vector species within the country reviewed.
- Geographical distribution : concerns vector or parasite distribution over a large area of several countries or parasite distribution within one country.
- Anopheles : abbreviated as An. in order to accommodate all descriptors within the computer screen.
- Plasmodium : abbreviated as P. in order to accommodate all descriptors within the computer screen.
- Host feeding patterns : Derived from bloodmeal identification and includes human blood index.

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The cooperation of colleagues in various institutions and WHO is fully appreciated and acknowledged as follows:

National institutions: Grateful thanks are expressed to all who provided copies or reprints of publications as follows:

Dr M.H. Birley, Department of Medical Entomology, Liverpool School of Tropical Medicine, Pembroke Place, Liverpool L3 5QA, U.K.

Dr Carolyn A. Brown, Editor/Assistant Director, Bureau of Hygiene and Tropical Diseases, Keppel Street, London WC1E 7HT.

Professor D.F. Clyde, Center for Vaccine Development, 10 South Pine Street, Baltimore, Maryland 21201, USA.

Professor Emeritus G. Davidson, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT.

Professor Doutor A.F.de Santos Gracio, Instituto de Higiene e Medicina Tropical, Rua da Junqueira 96, Lisbon, Portugal.

Dr B.A. Harrison, Board on Science and Technology for International Development, National Research Council, FO-2060, 2101 Constitution Ave, N.W., Washington, D.C. 20418.

Dr J.L.K. Hii, Papua New Guinea Institute of Medical Research, P.O. Box 378, Madang, Papua New Guinea.

Professor Emeritus A.T.A. Learmonth, Bryn Rhwydd, Penmachno, Betws-y-cred, Gwynedd, LL240AJ, Wales, U.K.

Dr J.F. Pan, Shanghai Institute of Entomology, Academia Sinica, Chungkin Road (S) 225, Shanghai, China.

Dr T. Ponnudurai, Institute of Medical Parasitology, University of Nijmegen, The Netherlands.

Professor M.W. Service, Department of Medical Entomology, Liverpool School of Tropical Medicine, Pembroke Place, Liverpool L3 5QA, U.K.

Dr S.G. Suguna, Vector Control Centre, Indira Nagar, Pondicherry-605006, India.

Dr W. Takken, Department of Entomology, Agricultural University, P.O. Box 8031/6707 EH, Wageningen, The Netherlands.

Professor G.A.T. Targett, Department of Medical Parasitology, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT.

Dr Wang, Xingzhen, Department of Parasitology, West China University of Medical Sciences, Chengdu 610044, Sichuan, China.

Dr Zhang Pei-xuan, Guizhou Provincial Institute of Parasitic Diseases, 62 Ba Jiao Yan Road, Guiyang, Guizhou, China.

For providing copies of publications and/or explanations

Professor V. Baimai, Department of Biology, Faculty of Science, Mahidol University, Rama VI Road, Bangkok 10400, Thailand, for providing a complete list of his publications and copies needed, and for clarifying the distribution of the *Dirus Species Complex* and its accurate methods of identification.

Dr Joan H. Bryan, Tropical Health Program, the University of Queensland Medical School, Herston Road, Herston, Brisbane, Queensland, 4006, Australia, for providing copies of some papers published in Australia by other authors, and for clarifying her recent findings on the *Anopheles punctulatus* complex.

Dr Chen Ming Gang, Chief Department of Scientific Information, Institute of Parasitic Diseases, Chinese Academy of Preventive Medicine, 207 Rui Jin Er Lu, Shanghai 200025, China, for providing reprints of several papers by Chinese authors published in China that could not be obtained through the WHO Library sources.

Professor M. Elias, Professor of Medical Entomology, National Institute of Preventive and Social Medicine, Mohakhali, Dhaka 1212, Bangladesh, for providing a complete list and reprints of his papers published in Bangladesh which could not be obtained from the WHO Library and its outside sources.

Dr M. Maffi for providing a complete list of his publications which much helped in obtaining copies of his studies in Southeast Asia and Western Pacific Regions.

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Through the cooperation of Dr S. Sucharit and Dr A. Asavanick copies could be obtained of the series of Annotated Bibliography on Mosquito-borne Diseases in Southeast Asia, 1984-1991, issued by the Museum and Reference Centre (MRC), SEAMEO-TROPMED National Centre of Thailand, Faculty of Tropical Medicine, Mahidol University, Bangkok 10400, Thailand.

To Dr Ronald A. Ward, Editor, Journal of the American Mosquito Control Association, P.O. Box 12279, Silver Spring, MD 20908, U.S.A., the writer is indebted for his continued cooperation and valuable assistance during the preparation of the bibliography. In addition to making available reprints of his recent publications, Dr Ward provided copies of publications of other authors that could not be obtained from the WHO Library and its outside sources including some Chinese papers, with an English translation of a paper dealing with the taxonomy and bionomics of members of the *Anopheles sinensis* group in China. Based on Dr Ward's advice, the map of Fig. 1 was modified by dividing SECTION V Malaria-free Areas into two subsections, V A & V B.

Moreover, Dr Ward has made useful comments on a provisional list of descriptors which much helped in the final checking of certain topics. Dr Ward's contribution is gratefully acknowledged and much appreciated.

Former WHO Staff Members. Sincere thanks are expressed to the following colleagues:

Dr J. Akiyama, former WHO Regional Entomologist, WHO Regional Office for Southeast Asia, Delhi, India for expediting the dispatch of copies of literature requested from the library of the Regional Office and from outside sources in India.

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WORLD HEALTH ORGANIZATION

WHO, GENEVA, SWITZERLAND

DIVISION OF CONTROL OF TROPICAL DISEASES (CTD)

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Mrs P.M. den Herder, Assistant (Library), Technical Documentation, CTD, for providing country files on malaria, copies of WHO mimeographed series, and for arranging the reproduction and dispatch of copies of the previous series, and for making the final preparations of this document for reproduction.

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WHO LIBRARY (HLT)

Thanks are extended to the library staff of WHO, notably Mr B. Bionda for securing copies of publications and books on loan which are not available in the WHO Library, Miss E. Certain for making available computer printouts of all WHO publications on malaria epidemiology and vector control, and Miss R. Agoncillo for expediting the despatch of copies of publications requested from the library of WHO WPRO.

GRAPHICS

Thanks are also expressed to this unit for the excellent preparation of the map of Fig. 1.

DUPLICATING & BINDING

Thanks are also extended to this service for expeditiously processing the Bibliography for distribution.

WHO SEARO, DELHI & WHO, WPRO, MANILA

Thanks are expressed to the librarians of the two Regional Offices for providing copies of publications that could not be found in the WHO Library in Geneva.

CORRIGENDUM

While the Bibliography was in its final stages for reproduction two errors were discovered. This corrigendum is made with a view to avoiding changing the serial numbering of the references and making a further printout of the whole document which takes a long time. These errors are:

<u>Page No.</u>	<u>Ref. No.</u>	<u>Correction</u>
13	148	<p>This reference is misplaced. It should be placed under item 3.2: <u>Proceedings and reports of meetings</u> (p. 12). It should be corrected to read as follows:</p> <p>Anonymous. Vector-borne disease control in humans through rice agroecosystem management.</p> <p>Proceedings of the Workshop on Research and Training Needs in the Field of Integrated Vector-borne Disease Control in Riceland Agrosystems of Developing Countries held in Los Banos, Philippines 9-14 March 1987. Los Banos, Philippines: International Rice Research Institute, in collaboration with the WHO/FAO/UNEP Panel of Experts on Environmental Management for Vector Control, 1988. 237 p. (Edited by W.H. Smith, assisted by E.P. Cervantes, with technical advice from R. Boss, PEEM.)</p>
14	159	<p>This reference should be deleted as it is a duplication of the above.</p>

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