

CHOLERA

A MANUAL FOR THE MEDICAL
PROFESSION IN CHINA

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PREFACE

This book is issued as the English Supplement¹ to the current Series (Series IV—1933) of the National Quarantine Service *Reports*, and is intended to be the first of a collection of practical manuals on the commoner epidemic diseases occurring in China to be issued by this Service.

It lays claim neither to scholarship nor to an exhaustive study into the vast problems of cholera. In so far as the subject has been treated in a novel manner and greater significance attached to certain aspects, the authors may perhaps justifiably press for a sympathetic hearing from medical and health workers in this country.

Throughout the work the authors have consistently avoided the inclusion of matter of a purely academic nature, although the scientific and laboratory foundation upon which our closer knowledge of cholera should rest has received ample attention. They have, on the other hand, dealt in some detail with certain subjects that find either no place or at best merely passing reference in standard textbooks on tropical diseases.

For instance, in Part One (and also in Part Three) considerable delving into ancient Chinese writings was involved in dealing with the history, nature and treatment of cholera (or rather, of the syndrome known as *Huo Luan* 霍亂) from the earliest times.² A considerable

(1) The Chinese Edition of the book is published separately.

(2) For a fuller description of this syndrome, the reader is referred to the article on "Huo Luan" in the National Quarantine Service Reports, Series IV.

amount of controversy has of late in this country raged round the respective merits of old-style and modern scientific methods of treatment. The authors have taken great pains to present both sides of the question, leaving to the intelligent reader the choice of methods. There can, however, be no doubt whatsoever as to the verdict, for figures (especially mortality figures) speak for themselves.

Again, Part Four, on Education and Propaganda, is an entirely new departure in a book of this kind. To extramural readers the theme may perhaps have been unduly laboured, but workers in this country (both Chinese and foreign) will appreciate the motives underlying its systematic treatment. Public health progress in China is in the main dependent upon the awakening of sanitary consciousness among the masses. Legislation has its merits but, acting alone, is worth as much (or as little) as the paper on which it is recorded. Laws (flawless as such) have been enacted time and again before the people for whom they were meant have been mentally, politically or economically prepared for them. They are just *paper tigers* (紙老虎) incapable of producing more than a ripple in the tide of the nation's destiny. China, in matters of public sanitation, is still far behind the West. It is only through systematic early training and education and the application of intensive scientific methods of propaganda that our law-makers and our public health workers can count on the intelligent participation of the common man, without which their labours would be but a delusion and a snare.

This book, in a word, is intended primarily for use in China, and it is hoped will serve as a reliable guide to

the medical practitioner and health worker both in town and rural districts. It is at once something less than a treatise and something more than a "popular" book. It is, in fact, a handbook on cholera for the use of rational practitioners of medicine in China, although much is included that may be of interest to workers in foreign fields.

No effort has been spared in order to avoid leaving out any information that may be of practical value. History, geographical distribution and epidemiology are considered in Part One, with special emphasis on their bearing in this country. Laboratory aspects of the disease, including some account of the latest researches in this and other countries, are embodied in Part Two which also contains a list of references for those who would go deeper into the subject. The clinical side is treated fully in Part Three: an attempt has been made here to include everything that may be of service to the clinician and hospital assistant. The last Part deals with what may be termed the public health and sociological aspect. Its attempted function is to stimulate public interest by indicating to what extent a carefully conducted propaganda campaign can contribute towards the ultimate eradication of disastrous epidemics in this country. The Appendix is devoted to a brief consideration of the modes of spread of cholera by maritime traffic and of the most modern measures adopted by quarantine authorities for its control.

In the preparation of this work the authors have drawn freely from their field and laboratory experience of cholera epidemics in China, but have not hesitated to consult, wherever possible, published books, articles, papers,

etc. by authorities in other countries. Due acknowledgment will be found in the text and references, but special mention must be made of the following:—Allbutt's System of Medicine; Byam and Archibald's Practice of Medicine in the Tropics; Kolle and Prigge's contribution to the "Handbuch der Pathogenen Mikroorganismen"; the cholera section in "A System of Bacteriology" by Mackie, Harvey and Greig; Stitt's Tropical Diseases; Rogers' Recent Advances in Tropical Diseases; Manson's Tropical Medicine; Castellani and Chalmers' Manual of Tropical Diseases; and Patel's Infectious Diseases and Other Fevers in India.

The authors also desire to express their thanks to: The Public Health Commissioner with the Government of India, the Director of the National Health Administration, Nanking, the Commissioner of Public Health, Greater Shanghai, and the Commissioner of Public Health, Shanghai Municipal Council, for the use of posters, handbills and pamphlets issued by them for distribution in their respective areas in the campaign against cholera; and to the Director of the Lester Institute of Medical Research for kindly placing the library of the Institute at their disposal and permitting one of them to carry out research work in Dr. R. C. Robertson's laboratory.

Thanks are further due to Drs. Edgar T. H. Tsen (National Epidemic Prevention Bureau, Peiping), M. Y. Dzen (Greater Shanghai Public Health Laboratory), J. H. Blakelock (Shanghai Municipal Council, Public Health Department), and P. Z. King (Central Field Health Station, Nanking), for kindly

supplying figures relating to output of cholera vaccine from their respective laboratories.

In conclusion, the authors wish to state that, although each is separately responsible for the writing of his Part, the whole book in typescript was read and re-read by all of them, so that the completed work represents the result of their joint labours and an example of the team-spirit.

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Shanghai, March 15, 1934.

INTRODUCTION

The problem of cholera is a live one in China to-day. It is startlingly modern in its impact on the everyday existence of a quarter of the human race. There is nothing obsolete (unfortunately) in the cycle of disease and death that overtakes the country once every few summers. The cholera situation, in short, is due for a final clean-up. Experience has proved that the disease can be made to disappear from a district, a country or a continent. Europe, America, even certain Asiatic territories like Java, are now free. India and China are still hotbeds of infection. Whether cholera is now endemic in this country, or whether it has continued to be imported from its original home in the valley of the Ganges, is neither here nor there.

The question at issue is this: What are the basic measures required to stamp out this dread scourge? The present book is an attempt, not to answer this question, but to provide some sort of foundation for a concerted movement by central, provincial, district, municipal and local authorities to eradicate from this section of the Asiatic continent a disease that has wrought untold havoc on a long-suffering population.

It is a fascinating study—this pressing problem of scientific cholera control standing out in bold relief against a background of millenium-old concepts of the

syndrome *Huo luan* (霍亂), as cholera and cholera-like affections were known among the ancients. The old and the new! And yet there is something strangely familiar in the classical descriptions of symptoms and treatment when viewed in the light of modern knowledge.

There are rash people who still think of China as a backward nation—backward in many respects, not least of all in matters of sanitation and disease prevention. Perhaps they are right, but things progress slowly in this country and in the campaign against cholera, at any rate, heroic efforts are not wanting to make use of recognised and scientific methods. Even as far back as 1821, when cholera appeared at Kashing on the borders of Chekiang and Kiangsu, the old-time physicians tried to adopt rational therapy. Macgowan says of Hsü Tzu-mo and his followers that

despite their fanciful theories.....they pursued the same therapeutic course which in the West has been found most efficacious.

Contrast this statement with the treatment adopted by foreign doctors during the epidemic of 1865 in Shanghai when

large doses of chlorodyne, with champagne and brandy, were principally trusted to.....

and it is easy to see how careful one has to be in condemning a thing merely because it is Chinese and ancient.

The history of cholera in China, and the efforts made by successive generations of pioneers to introduce a rational basis into its treatment, make attractive reading. Even as early as 1841 some attempt was made to arouse public interest in cholera prevention, for in that year, Dr. Charles Legge addressed a letter to the Chinese in Malacca in which he gave quite good advice and tried to

stimulate the public conscience. In 1851 when an outbreak occurred at Ningpo, the gentry attempted with their usual benevolence to help the afflicted. Placards were posted in every quarter giving directions for treatment.

The first reference to cholera in Shanghai was made by William Lockhart in 1847, and since then a series of articles have appeared in the Customs Medical Reports by Lockhart (1862) who carried his interest in the disease to Peking, Dudgeon (1872), Wong Fun (1873) and Simmons (1879).

A year after Koch discovered the *V. cholerae* the organism was found in Shanghai in smears taken from stools of a patient who subsequently died. The comma bacillus was present in great numbers in the bowel discharges during life but had evidently disappeared on examination of the intestinal walls and bowel contents after death. In 1885, Macleod and Milles reported positive cultural findings, thus confirming Koch's results and the presence of Asiatic cholera in Shanghai.

It would appear from the records that intravenous saline infusion for the treatment of cholera was first used in Shanghai in 1875, but it was not until 1897 that the method was described in detail by Cox. He wrote a long illustrated article in the Customs Medical Reports (1897-8) in which his infusion apparatus was depicted. The first part of this article, however, was originally published in June 1897 in the China Medical Missionary Journal. Since then, the treatment of cholera by means of the injection of normal salt solution into the veins (with the addition of an alkaline solution in cases of threatened acidosis) has been successfully practised in

Shanghai, especially during the epidemics of the past few years. The mortality was as low as 7 per cent in 1932 among patients admitted into the Chinese Infectious Diseases Hospital.

Hypertonic saline treatment was introduced by Rogers into India in 1908 with remarkable results. He pointed out that between 1895 and 1905 when normal saline was used subcutaneously and per rectum the mortality was 59 per cent among 1,243 cases, while in 1906 when normal saline was injected intravenously 51.9 per cent among 112 cases died. In 1908 when hypertonic saline was used exclusively the mortality was 32.6, and between 1909 and 1914 when permanganates were added to the treatment, only 25.9 per cent succumbed out of 858 cases. With the introduction of alkalis (in combination with hypertonic saline and permanganates) in 1915-7, he managed to reduce the mortality even further (to 19.1 per cent). Among the earliest trials of Rogers' method in China was the treatment adopted by two of the authors in the 1919 Harbin epidemic, when the mortality among 1,962 admissions to the Chinese Anti-Plague Hospital was as low as 14.11 per cent, whereas the Russians who treated their patients with castor oil and normal saline subcutaneously had a mortality of 33.75 per cent (Russian Central Hospital) and 57.77 per cent (Russian Municipal Hospital). The good results obtained by the authors in 1919 were maintained in 1926 when another outbreak occurred in Harbin.

On this occasion 17.3 per cent of admissions died as compared with over 50 per cent among patients in the Russian Municipal Hospital.

The history of anti-cholera inoculation in China is a comparatively recent one. Ferrán had in 1884

attempted to produce a modified form of the disease by inoculation with an attenuated virus, while Haffkine in 1893 and Kolle in 1896 had already laid the foundations of scientific inoculation against cholera. Although no reliable data exist relating to the earliest application of this form of prophylaxis in this country, there can be no doubt that previous to 1919 inoculation with vaccine imported from abroad had been resorted to by medical practitioners and hospital authorities on a small scale. In that year cholera vaccine prepared from local strains was first manufactured in China by the Peiping National Epidemic Prevention Bureau (a Government organ). Since then, increasingly large quantities capable of supplying the requirements of the whole population have been turned out by this laboratory and by two other institutions in the country (the Public Health Laboratory attached to the Bureau of Public Health of the City Government of Greater Shanghai, and the Medical Laboratory of the Shanghai Municipal Council Public Health Department). In 1932, the Peiping Bureau issued a total of 6,401,922 c.c. of standardised vaccine, while the two Shanghai laboratories produced the same year 1,760,960 c.c. and 400,000 c.c. respectively. Vaccine was also prepared by the Manchurian Plague Prevention Service before the Japanese occupation in sufficient quantities to meet the needs of the population of Manchuria.

The significance of these figures (reproduced in full below) cannot be overestimated. Three facts stand out: first, a successful attempt has been made to meet the vaccine requirements of the public health authorities in their anti-cholera campaign. Second, no doubt exists as to the efficacy and potency of vaccine prepared from local

strains as compared with material imported at very high cost from abroad. (The local vaccine costs only Mex. \$1.20 per bottle of 40 c.c.). Third, the remarkable response of the population to the mass inoculation drive that began in 1930 and reached new levels in the three following years.

NATIONAL EPIDEMIC PREVENTION BUREAU, PEIPING

Year			Cholera vaccine cc.	T.A.B.C. vaccine cc.	Total cc.	
1922	(July)	—	1923	(June)	450	450
1923	"	—	1924	"	1,781	1,781
1924	"	—	1925	"	2,596	2,596
1925	"	—	1926	"	22,520	22,520
1926	"	—	1927	"	130,040	130,040
1927	"	—	1928	"	306,361	306,361
1928	"	—	1929	"	1,024,781	1,024,781
1929	"	—	1930	"	515,595	515,595
1930	"	—	1931	"	194,876	870,996
1931	"	—	1932	"	1,105,294	2,877,483
1932	"	—	1933	"	5,680,035	6,401,922
1933	(July to December)				378,449	473,372
						851,821

PUBLIC HEALTH LABORATORY, GREATER SHANGHAI

	Typhoid-cholera Vaccine	Cholera Vaccine	Total
1930	480,000 c.c.	618,360 c.c.	1,098,360
1931	413,480 c.c.	678,640 c.c.	1,092,120
1932	407,880 c.c.	1,353,080 c.c.	1,760,960
1933	431,120 c.c.	651,160 c.c.	1,082,280

PUBLIC HEALTH DEPARTMENT, SHANGHAI MUNICIPAL COUNCIL

Year	12,000 mill	6,000 mill	4,000 mill	2,000 mill
1925	1454 ccs			
1926		2545 ccs		
1927			49,740 ccs	
1928			34,956 ccs	
1929				
1930			7,000 ccs	
1931			4,000 ccs	203,750 ccs
1932			10,500 ccs	380,500 ccs
1933			10,000 ccs	217,000 ccs

CENTRAL FIELD HEALTH STATION, NANKING

1932:	130,000 doses;
1933:	80,000 doses.

No survey of the cholera situation in China is complete without a word about the activities of the Central Cholera Bureau, established in Shanghai by the Minister of Health (Dr. J. Heng Liu) in 1930 to co-ordinate the work of the various health bodies in the city. Systematic attack on the cholera problem may be said to have commenced from the day the first meeting of this Bureau was convened. Among the resolutions passed were:

1. The appointment of Dr. Wu Lien-teh, Director of the National Quarantine Service, as Chairman of the Bureau, who was to receive and distribute all necessary information.
2. Vaccine was to be standardised to contain 2,000 millions of killed organisms in 1 c.c.
3. An intensive epidemiological study of local cholera was to be undertaken, including examinations for carriers, possibilities of water infection, etc. (In this connection, much has been accomplished by members of the National Quarantine Service and other institutions towards better knowledge of the rôle of carriers, cholera-like vibrios and meteorological conditions).

The Central Cholera Bureau has continued to function every summer since 1930 and, through its publicity work, has contributed largely to the increasing interest displayed by all in the concerted efforts to remove the menace of cholera from this country. Without the public's co-operation the phenomenal success of the mass inoculation campaign, which achieved a total of 537,034 injections in 1930, 761,279 in 1931, 1,062,609 in 1932, and 947,083 in 1933, in Shanghai alone with its population of three millions, could not have been attained.

The response was not confined to Shanghai alone; it was nation-wide. Aeroplanes—in many cases specially chartered—conveyed millions of doses of vaccine in 1932 from the Peiping and Shanghai government laboratories to provinces as far away as Shensi, Shansi, Szechuen and Suiyuan.

CONTENTS

	PAGE
Preface	iii
Introduction	ix

PART ONE

HISTORICAL, GEOGRAPHICAL AND EPIDEMIOLOGICAL ASPECTS

	PAGE
Section I. Definition	1
II. History (General)	2
III. Geography (General)	4
IV. History and Geography in Relation to China	7
V. History in Shanghai	16
VI. Meteorological Aspects	21
VII. Discussion of the Cholera Problem in China	23
VIII. Chronological Record of Cholera Invasions in China from A.D. 1817	29

PART TWO

LABORATORY ASPECTS

	PAGE
Section I. Introduction	38
II. Morphology of the Cholera Vibrio	38
III. Cultural Properties of the Cholera Vibrio	42
IV. Biochemical Properties of the Cholera Vibrio	49

	PAGE
V. Serological Reactions of the Cholera Vibrio	57
VI. Toxins of the Cholera Vibrio	73
VII. Pathology of Cholera	74
VIII. Cholera in Animals	76
IX. Immunity in Cholera	78
X. The Bearing of Laboratory Findings upon the Epidemiology of Cholera	86
XI. Appendix (containing a short description of some laboratory methods)	93
XII. List of References	97

PART THREE

CLINICAL ASPECTS

Section		PAGE
I. Introduction		103
II. Differential Diagnosis		104
III. Prophylaxis		109
IV. Clinical History		113
V. Treatment		118
VI. Prognosis		136
VII. Illustrative Cases		138
VIII. Summary and Conclusion		141
IX. References		142

PART FOUR

EDUCATION AND PROPAGANDA

Section		PAGE
I. General Considerations		146
II. Planning an Anti-cholera Campaign		152
III. The Facts of Cholera		156
IV. Pamphlets		164
V. Posters		169

VI. Cholera and the Cinema	173
VII. Concluding Remarks	176

APPENDIX

THE SPREAD AND CONTROL OF SEA-BORNE
CHOLERA

	PAGE
Section I. Introduction	179
II. Spread by Maritime Traffic	180
III. Mode of Spread	180
IV. Incubation Period	180
V. Some Records of Shipboard In- fection	181
VI. The Inoculation Problem	182
VII. Quarantine Measures	183
VIII. Stool Examination of Ships' Per- sonnel	186
IX. Conclusion	187
Index	188