THE LESSONS OF MODERN WAR:
VOLUME II

THE IRAN-IRAQ WAR

By Anthony H. Cordesman
and
Abraham R. Wagner
To David Boulton and Fred Praeger for their patient efforts and support.
TABLE OF CONTENTS

I. INTRODUCTION

1.1 The Cost and Intensity of the Conflict I-1
1.2 The Strategic Implications of the Conflict I-6
1.3 The Internationalization of the Conflict I-6

II. THE CONDITIONS THAT SHAPED THE IRAN-IRAQ WAR II-1

2.0 The Conditions That Shaped the Conflict II-1
2.1 The Prelude to Iraq's Invasion of Iran II-1
2.2 The Clashes That Led to War II-20
2.3 The Causes of Iraq's Decision to Invade II-30

III. THE STRENGTHS AND WEAKNESSES, ECONOMICS, FORCE STRENGTHS, AND OTHER FACTORS THAT SHAPED THE COURSE OF THE WAR III-1

3.0 The Strengths and Weaknesses of Each Side III-1
3.1 The Impact of Economics III-8
3.2 The Impact of Arms Imports and Technology Transfer III-13
3.3 The Impact of Manpower and Demographics III-22
3.4 Shifts in the Structure and Capability of Iranian and Iraqi Forces III-28
3.5 The Terrain III-46

IV. PHASE ONE: IRAQ'S INVASION OF IRAN IV-1

4.1 The Major Phases of the Conflict IV-2
4.2 Phase One: The Iraqi Invasion IV-2
4.3 Iraq's Failure to Exploit Its Initial Success IV-20
4.4 The Oil War Begins IV-21
4.5 The Battle of Khorramshahr: Iraq's Invasion Slows to A Crawl IV-23
4.6 The Air Fighting During the Rest of 1980 IV-31
4.7 The Naval Fighting During 1980 IV-35
4.8 The Role of External Powers IV-37

V. PHASE TWO: IRAN LIBERATES ITS TERRITORY: 1981-1982 V-1

5.0 The Situation at the Beginning of 1981 V-1
5.1 Iran's First Counter-Offensives Fail V-5
5.2 The Land Battle During February to September 1981 V-11
5.3 The Limited Impact of Air Power in 1981 V-15
5.4 The Conditions That Led To New Iranian Counteroffensives V-16
5.5 Iran's Counteroffensives Began to Succeed V-20
5.6 Other Developments During 1981 V-26
5.7 Iraqi Counterattacks Fail and New Iranian Offensives Liberate Khuzistan and Khorramshahr V-28
VI. PHASE THREE: IRAN ATTEMPTS TO CONQUER IRAQ: JUNE, 1982 - MARCH, 1984 VI-1

6.0 Iran's First Major Offensives Against Iraq VI-1
6.1 The State of Iranian and Iraqi Forces at the Beginning of Iran's Invasion of Iraq VI-2
6.2 Iran's Operation Ramadan Against Basra VI-6
6.3 Iran's Fall Offensives of 1982 VI-10
6.4 The Impact of Arms Sales and New Developments in Iraq's Air Power VI-14
6.5 Continuing Iranian Attempts to Invade Iraq Early in 1983 VI-20
6.6 Further Iranian Attacks on the Kurds and the Wal Fajr 2 Offensive VI-26
6.7 The Wal-Fajr 3 Offensive Near Mehran VI-28
6.8 The War in the Gulf Resumes VI-32
6.9 The Wal-Fajr 4 Offensive Takes Place Near Panjwin VI-39
6.10 The Wal-Fajr 5, Wal-Fajr 6, and Operation Kheiber Offensives of 1984 VI-44
6.11 Iran's Leaders and the Impact of the Fighting In Operation Kheiber VI-50
6.12 Chemical and Economic Warfare VI-52


7.0 The Beginning of the War of Attrition VII-1
7.1 The Air War and the Tanker War VII-5
7.2 Iran's Shift Towards Initiating a War of Attrition VII-13
7.3 Iraq's Over-Confidence VII-14
7.4 Iran's More Controlled Offensives in 1985 VII-17
7.5 The Air and Tanker Wars in 1985 VII-23
7.6 The Fighting on the Ground During the Rest of 1985 VII-26
7.7 Iraq Again Escalates the Air War VII-29

VIII. PHASE FIVE: NEW IRANIAN EFFORTS AT "FINAL OFFENSIVES: 1986-1987 VIII-1

8.0 Iran Prepares for New "Final Offensives" VIII-1
8.1 Wal Fajr 8: Iran Takes Faw VIII-4
8.2 Wal Fajr 9: The Continuing Struggle in the Kurdish North VIII-12
8.3 A Stalemate in the South and New Air Strikes VIII-14
8.4 The Battle for Mehran and Karbala 1 VIII-17
8.5 Iraq Shifts Back to the Air and Tanker Wars VIII-20
8.6 Shifts in Iranian Forces and Arms Imports VIII-23
IX. PHASE SIX: EXPANSION OF THE TANKER WAR IN THE GULF TO INCLUDE WESTERN NAVIES, WHILE THE LAND AND AIR WAR OF ATTRITION CONTINUES: MARCH 1987 TO DECEMBER 1987 IX-1

9.0 The Increasing Importance of the War at Sea IX-1
9.1 Iran Seeks New Ways to Fight the Tanker War IX-3
9.2 Iran Deploys the Silkworm IX-6
9.3 Kuwait Seeks to Reflag Its Tankers IX-12
9.4 The Battle For Influence in the Gulf IX-18
9.5 Low Level Land Warfare in Mid-1987 IX-19
9.6 The Attack on the USS Stark IX-21
9.7 The U.S. Convoy Effort and the Bridgeton Incident IX-33
9.8 More Low-Level Attacks in the North IX-35
9.9 The Impact of New UN Peace Efforts IX-37
9.10 The U.S. Reflagging Effort Begins to Operate IX-40
9.11 Iran Expands Its Mining Effort and European Forces Join the U.S. IX-52
9.12 The Iran Ajar Incident IX-75
9.13 Iran's Silkworm Attacks On Kuwait IX-92

X. THE COMBINATION OF IRAQI OFFENSIVES AND WESTERN INTERVENTION FORCES IRAN TO ACCEPT A CEASEFIRE: SEPTEMBER 1987 TO MARCH 1989

10.0 The War Enters Its Final Phase X-1
10.1 Iraq Prepares for Offensive Operations X-1
10.2 Iran's Political and Strategic Mistakes X-7
10.3 New Iranian Mobilization and Arms Procurement Efforts, and an Emphasis on Campaigns in the North X-8
10.4 The Fighting in the North in Late 1987 X-13
10.5 The Fighting in 1988 Begins X-14
10.6 The War of the Cities Turns into a Missile War X-15
10.7 New Land Battles in the North Begin in March X-24
10.8 The Use of Chemical Weapons Escalates to The Level of Atrocity X-25
10.9 New Developments in the War of the Cities X-28
10.10 Iraq Retakes Faw X-30
10.11 New Naval Conflicts Between the U.S. and Iran X-33
10.12 Iran Retakes Salamcheh and the Area Around Basra X-43
10.13 The Uncertain Situation in June, 1988 X-47
10.14 Iraq's Offensives At Mehran and Majnoon X-51
10.15 A New Clash Between the U.S. and Iran and the Shooting Down of Iran Air Flight 655 X-57
10.16 Iraq's Offensives on the Central Front Force Iran to Accept a Ceasefire X-63
10.17 "Cold Peace": The Aftermath to the Ceasefire X-69

XI. COMMAND, CONTROL, COMMUNICATIONS, INTELLIGENCE, AND BATTLE MANAGEMENT XI-1

11.0 The Problems of High Command XI-1
11.1 Threat Assessment Technologies and Warning and Surveillance Systems XI-3

II.2 Effective and Secure C3I XI-9

XII. COMBINED ARMS AND THE LAND WAR XII-1

12.0 The Land War XII-1
12.1 Combined Arms XII-2
12.2 Infantry in the Iran-Iraq War XII-3
12.3 Tanks, Armored Vehicles and Helicopters XII-17
12.4 Precision Guided Weapons and Specialized Land Munitions XII-26
12.5 Tube Artillery and Multiple Rocket Launchers XII-29
12.6 Mines and Barriers XII-34
12.7 All-Weather and Night Target Acquisition Systems XII-37
12.8 Logistics and Logistic Systems XII-39

XIII. THE AIR AND MISSILE WARS AND WEAPONS OF MASS DESTRUCTION XIII-1

13.0 The Air and Missile Wars XIII-1
13.1 Command, Control, and Communications; Battle Management, and Air Control and Warning XIII-3
13.2 Surface-to-Air Missiles XIII-5
13.3 Anti-Aircraft Artillery XIII-9
13.4 Air Strength and Capabilities XIII-13
13.5 Air-to-Air Combat XIII-28
13.6 Close Air Support XIII-33
13.7 Interdiction and Air Suppression Campaign XIII-37
13.8 Strategic Operations XIII-39
13.9 Air Reconnaissance and Identification of Friend or Foe XIII-48
13.10 Helicopters XIII-49
13.11 Combined Operations XIII-50
13.12 Surface-to-Surface Rockets and Missiles XIII-53
XIV. THE TANKER WAR AND THE LESSONS OF NAVAL COMBAT XIV-1

14.0 The Tanker and Naval Wars XIV-1
14.1 Naval Operations and the "Tanker War" XIV-2
14.2 The Attack on the USS Stark and Lessons for Surface Warfare XIV-26
14.3 The Bridgeton and the Mine War XIV-41
14.4 The Lessons of the Convoy Effort XIV-55
14.5 The USS Vincennes and the Destruction of Iran Air Flight 655

XV. CONCLUSION XV-1

15.0 The Major Lessons of the Iran-Iraq War XV-1
15.1 The Future of Iran and Iraq XV-5
15.2 Key Military and Strategic Uncertainties XV-8
15.3 Iraqi and Iranian Progress in Creating Weapons of Mass Destruction XV-11

XVI. SOURCES AND METHODS

16.1 Sources XVI-1
16.2 Methods XVI-2

XVII. RESEARCH BIBLIOGRAPHY XVII-1
LIST OF FIGURES

1.1 Estimates of the Cost of the Iran-Iraq War I-4
1.2 World Oil Reserves I-9

3.1 Iranian and Iraqi Military Efforts: 1979-1986 III-11
3.2 Iranian and Iraqi Access to Foreign Supplies of Arms: 1980-1987 III-17
3.3 Iranian and Iraqi Access to Foreign Supplies of Arms: 1982-1986 III-21
3.4 Iranian and Iraqi Military Manpower III-25
3.5 The Trends in Iranian and Iraqi Military Forces: 1975-1980 III-44
3.6 Map of Iraq-Iran III-54

4.1 Iranian-Iraqi Deployments During the Iraqi Invasion IV-19

5.1 Maximum Iraqi Gains During the Iran-Iraq War V-12
5.2 Iraq Recovers Khuzistan V-36
5.3 Iraq's Vulnerable Oil Routes V-37

6.1 Iran's Offensives of 1982 VI-16
6.2 The First Iranian Offensive of 1982 VI-23
6.3 Major Arms Sales to the Gulf States VI-24
6.4 The Impact of Arms Imports on the Iran-Iraq War VI-25
6.5 Iran's Vulnerable Loading Points in the Oil War VI-35

7.2 Iranian and Iraqi Oil Production in Average Daily Production in Millions of Barrels Per Day VII-10

9.1 Patterns in Iraqi and Iranian Attacks on Gulf Shipping: 1984 to June 30, 1987 IX-2
9.2 Chinese Missile Systems Affecting the Iran-Iraq War IX-8
9.3 The Location of the Exclusion Zones and Strikes on the USS Stark IX-32
9.4 Naval Forces in the Persian Gulf and Gulf of Oman: July, 1987 IX-41
9.5 Western Ships in the Gulf and Gulf of Oman on August 15, 1987 IX-56
9.6 Western Ships in the Gulf and Gulf of Oman on September 20, 1987 IX-73
9.7 Iranian and Iraqi Oil Production: October 1986 - January 1988 IX-83
9.8 Targets in the Tanker War IX-89

10.1 Strikes Reported by Iraq and Iraq Affecting The Tanker War and War of the Cities in 1987 and 1988 X-20

12.1 The Iran-Iraq War: 1980 XII-7
12.2 The Iran-Iraq War: 1985 XII-10
12.3 Armed Forces Personnel Strengths XII-11
12.3 The Thermometer of Death in 1984 XII-16

13.1 The Shift in Iranian and Iraqi Air Strength: 1980-1985 XIII-18
13.2 Comparative Combat Radius of Aircraft XIII-19
13.3 Main Iranian Air Bases and Air Defense Centers XIII-32
13.4 Relative Oil Production of Iran and Iraq from 1980-1988, and Expansion of Iraqi Pipeline Capacity XIII-46
13.5 Impact of Iraqi Strikes on Iranian Oil Production XIII-47
13.6 Strikes Reported by Iran and Iraq Affecting the War of the Cities in 1986 and 1987 XIII-62
13.7 Comparative Range and Lethality of Surface-to-Surface Missiles XIII-68
13.8 Claims of Uses of Chemical warfare XIII-81
13.9 Major Chemical Agents That May Have Been Used in the Iran-Iraq War XIII-93

14.1 The Tanker War: A Partial Chronology XIV-5
14.2 Air-to-Ship Missiles Affecting A Gulf Conflict XIV-16
14.3 Patterns in the Tanker War: 1980-1988 XIV-20
14.4 Changes in the U.S. Forces Committed to Operation Ernest Will XIV-64

15.1 Iranian and Iraqi Progress in Creating Weapons of Mass Destruction XV-13
This is the second volume in a series of three volumes that the authors have written with the assistance of Raymond J. Picquet, W. Andrew Terril, and Carol K. Wagner, and the support of the Royal United Services Institute. These three volumes cover five major wars: the Arab-Israeli conflict of October 1973, the Israeli invasion of Lebanon in 1982, the Iran Iraq War, the Soviet Invasion of Afghanistan, and the Falklands conflict with Argentina.


Each of the three volumes is written as an independent work, but the analysis of the wars in question is standardized as much as possible. The analysis of major conflicts is divided into sections that analyze the forces involved, the history of the conflict, key aspects of the operational art of war, and the impact of major types of forces and weapons.

The analysis in each volume focuses on military events and lessons, and only treats the politics of each conflict to the extent it is necessary to understand the grand strategy, strategy, and tactics of the conflict. Where possible, key events and data are described in a way that will allow the reader to draw his or her own conclusions. A deliberate effort has been made to avoid oversimplifying the complex nature of modern war.

The sources and methods used in each volume are described at its end, and a research bibliography is provided for each conflict. Frequent use is made of tables and charts to allow comparisons of forces, portray force shifts over time, and show the key performance features of major weapons. In most cases, the data shown are shown as provided in the original source, rather than standardized or altered to eliminate minor conflicts. This is done to allow the reader to see the original data on which the analysis is based.