CONTENTS

1.	Ancient Warfare
	TACTICS 2 Hand-to-Hand Combat on Foot 2 Combat on Foot with Missiles 6 Mounted Combat 8 Fortification and Siegecraft 10 Greek Heavy Infantry against Persian Light Infantry and Cavalry 14 Greek Light Infantry in Combat with Greek Heavy Infantry 19 Alexander's Conquests with a Complete Combined-Arms Army 21 The Roman Art of War 26
	The Romans in Confrontation with the Alexandrian System of Pyrrhus and Hannibal 28 The Roman Victories with the Alexandrian System 32 The Roman Legion Perfected 34 The Romans against the Mounted Parthians 35 Summary of the Capabilities of the Four Weapon Systems 39
	LOGISTICS 45 The Provision of Soldiers and Supplies 45 Logistics Illustrated by Alexander's Persian Campaign 49
	Persisting and Raiding Strategies Distinguished 54 Alexander's Campaign: An Exemplification of Combat, Logistic, and Persisting Strategies 57 Alexander's Encounter with a Raiding Strategy 62 Military Victories without Political Support: Hannibal's Experience with the Fabian Strategy 65 A Rare Instance of the Use of Interior Lines of Operations in Ancient Times 70 Caesar's Strategy in the Conquest of Gaul 72 Caesar's Ilerda Campaign: An Unusual Occurrence of the Turning Movement 75

Caesar's Campaign against Pompey 80 SUMMARY OF WARFARE ON LAND 81 NAVAL WARFARE 86

2. THE DIVERSITY OF THE MEDIEVAL WAYS OF WAR, 200-1200

92

The Dissolution of the Roman Empire 92
Changes in Military Organization and Tactical Emphasis 93
Least Effort Exemplified: Byzantine Tactics and Strategy 95
The Stirrup's Enhancement of the Effectiveness of Cavalry 102
Western Europe's Struggle against Raiders 104
William's Combined-Arms Army in the Conquest of England 109
Attack and Defense of Fortifications 114
Medieval Tactics 118
Medieval Strategy: The Evesham and Bouvines Campaigns 123
Examples of an Offensive Persisting Strategy against Raiders 127
Combined-Arms Combat in the Crusades 134
Jenghiz Khan and Mongol Warfare 142
Summary of Medieval Tactics and Strategy 144

3. THE EMERGENCE OF A NEW COMBINED-ARMS TACTICAL SYNTHESIS, 1200–1600

Revolution in Naval Tactics and Logistics 209

148

The French Version of Medieval Warfare 148 Changes in Logistics 150 Changes in Weapons 151 Persisting Strategy and the Completion of the English Conquest of Wales 154 The English Combined-Arms Tactical System in Scotland 156 The Beginning of the Hundred Years' War and the Crécy Campaign The Hundred Years' War: English Raids and French Persisting Strategy 165 English Persisting Strategy in the Last Phase of the Hundred Years' War 169 The Experience of the English Tactical System in Spain 173 The Wagenburg 174 The Swiss Heavy Infantry 175 The Least Effort Warfare of the Italian Condottieri 178 Regional Tactical Systems in Conflict: The French Invasion of Italy 182 The Search for a Combined-Arms Synthesis: Italian Battles, 1512-25 186 The Spanish Combined-Arms Tactics 190 The New Fortifications 194 Another Influence of Technology on Tactics 195 The Manpower System in 1600 199 Sixteenth-Century Battles, Campaigns, and Strategy 202

THE NEW TACTICAL SYNTHESIS IN TRANSITION, 1600-1700 214 The Logistics of the Thirty Years' War 214 Gustavus Adolphus's Development of the Dutch Tactical System 221 Gustavus's Persisting Strategy and Employment of Distraction 223 Gustavus's Exploitation of the Triumph of His Linear System at Breitenfeld 232 Gustavus against Wallenstein: Logistic and Combat Strategies 237 The Impact of Gustavus's Tactics 243 The Logistics of the Late Seventeenth Century 252 Representative Late Seventeenth-Century Campaigns and Battles 256 The Development of Missile Warfare at Sea 263 THE PRIMACY OF THE LINE OF BAYONETED MUSKETS, 1700-1791 267 The Bayonet, the Flintlock, and Further Changes in Tactics 267 Eighteenth-Century Logistics 272 The Strategy and Tactics of Marlborough's Campaigns 274 Persisting Strategy in North Italy 283 The Evolution of the Linear System 289 Tactics and Strategy as Exemplified in the Silesian Wars of Frederick the Great 294 The Seven Years' War: Tactics and Strategy in Defense against the Logistic Effects of a Persisting Strategy 297 Changes in Attrition in Relation to the Composition of Armies 308 Significant Developments in French Military Thought 309 Warfare in the Western Hemisphere 317 Warfare at Sea 318 TACTICAL AND STRATEGIC TRANSFORMATION IN THE ERA OF THE FRENCH REVOLUTION AND NAPOLEON, 1791-1815 320 The Tactics and Strategy of the Opening Campaigns in the North 320 The Advent of General Bonaparte 330 The Strategic Turning Movement of the Marengo Campaign 337 Napoleonic Operations on a Larger Scale: The Strategic Turning Movement of Ulm and Distraction and Concentration at Austerlitz 342 Some Characteristics of Napoleon's Campaigns 347 The Augmented Significance of Numerical Superiority 351 Some Later Napoleonic Campaigns 353 Operations in Spain: The French Encounter the Raiding Strategy of

Guerrilla Warfare 358
The Foundations of the French Conquests 367
The Military Legacy of the Napoleonic Era 372
The Tactics of Warfare at Sea 377
The Strategy of Warfare at Sea 381

7.	TECHNOLOGICAL CHANGE AND DOCTRINAL STABILITY, 1815-
	1914 387
	The Continuation of the Napoleonic Tradition in Radetzky's Victories 387
	The Midcentury's New Infantry Weapons 390
	The Prussian Staff and Manpower System 392 The New Prussian Army in Action against Austria 396 Decisive Turning Movements in the Franco-Prussian War 398
	A Summary of the Tactics, Logistics, and Strategy of the Franco-Prussian War 407
	The Strategy of the American Civil War 409
	Two Instances of Combating the Raiding Strategy of Guerrilla Warfare 418
	European Weapons, Armies, and Doctrine on the Eve of World War I 419
	The Revolution in Naval Materiel and its Use in the Russo-Japanese War 423
	wai 423
8.	THE APOGEE OF THE DEFENSE: WORLD WAR I, 1914-18 434
	The German Concentration on Interior Lines and Effort to Turn the French 434
	The Tactical, Logistical, and Strategic Conditions of the War 439 The German Exploitation of Interior Lines and a Turning Movement to
	Defeat the Russians 441
	The Opening Naval Campaigns 443
	Allied Naval Predominance Confirmed: The Battle of Jutland 446
	The Submarine as a Commerce Raider 447 The Dominance of Artillery in the Siege Warfare on Land 449
	The Dominance of Artificity in the Siege warrance on Land 449 The Development and Utility of Air Forces 450
	The Tactics of Trench Warfare 456
	The War in 1915 and 1916 459
	The Search for a Technological Solution to the Tactical Deadlock 463 The German Quest for Victory through a Logistic Strategy Using
	Submarines 467 The New German Method of Defense 467
	The New German Doctrine for Attack 472
	The Campaigns of 1918 on the Western Front 475
	A Turning Movement through Superior Mobility: The Megiddo Campaign 480
	Summary of the Changes in Weapons, Tactics, and Logistics 483
9.	PRELUDE TO RENEWED CONFLICT, 1919-39 489
	The Full Development of Four New Weapon Systems 489
	The French in Morocco: New Weapons and Old Strategy 497
	Tactical and Strategic Use of Aircraft 501
	A Russian Cannae 501

Contents xi

The	Navies'	Respons	e to	the	New	Weapons	502
Doc	trinal Di	iversity	504				

10. THE CLIMAX OF MODERN WARFARE: WORLD WAR II, 1939-45 508

The German Victory over Poland 508

The French and German Armies 510

French and German Plans 518

The New German Offensive Plan 520

The German Breakthrough in May 1940 523

The Causes of the German Breakthrough 534

The German Turning Movement 535

The German Victory: Napoleonic Warfare with Four Weapon Systems 539

Air Power in a Decisive Role: The Battle of Britain 544

The Strategic and Tactical Conditions of the Russo-German War 548

The Strategic Envelopments of the 1941 Campaign in Russia 552

The Debacle of the German Logistic Strategy of 1942 and the Conclusion of the Russo-German War 557

Distraction, Concentration, and Turning Movement Again: The Landing and Campaign in Normandy 559

The British Inauguration of Mounted Warfare in North Africa and the Defeat of the Italians 563

The Warfare of the Mounted British and German Armies 565

New and Improved Weapons 569

The Interaction of Technology with Strategy 576

Strategic Bombing 578

Combat at Sea with Two Types of Capital Ships 583

The German Submarine Campaign 589

11. AFTER THE WORLD WARS: CONSOLIDATION AND TECHNOLOGICAL CHANGE, 1945-85

596

Changes in Weapons 596
The All-Mounted Army 601
The Israeli-Egyptian War of 1973 602
The Tactical Mixture of Old and New 609

12. CONTINUITY AND CHANGE

613

SEA AND AIR WARFARE 613
Chronological Survey 613
Recapitulation of the Characteristics of Naval Warfare 616
Summary of the Attributes of Aircraft in Warfare 619

TACTICS 622

Chronological Summary 622

Technology and the Four Basic Weapon Systems 629

The Economics of Force Composition	630
The Role of Articulation and Offensive	Troops in Concentrating against
Weakness 634	
Battles and Casualties 638	

LOGISTICS 643	
Chronological Overview 643	
Alternative Manpower Systems	645

Continuity and Change 704

	Three many of the officers of
S	TRATEGY 648
	Chronological Summary 648
	The Classifications of Military Strategy 662
	The Influence of the Ratio of Force to Space 666
	The Supremacy of Retreat Over Pursuit 667
	Concentration against Weakness, Distraction, and the Principles of
	War 668
	Compelling the Enemy to Fight, Turning Movements, and Concentration
	in Space and Time 670
	The Nature and Objectives of a Raiding Strategy 675
	Guerrilla Warfare as an Application of Raiding Strategy 679
	Defense and Offense against Guerrilla Warfare 681
	Summary of Alternatives Confronting Commanders 690

Notes		717
INDEX		725

LIST OF SCHEMATICS

I.I	Spartans' Flanking Maneuver	5
1.2	Weapon Systems Matrix	39
1.3	Strategy Matrix	85
2.I	Tactical Capabilities of Weapon Systems	144
3.I	Tactical Capabilities of Weapon Systems without Reiters	197
3.2	Tactical Capabilities of Weapon Systems with Reiters	198
5.1	Musketeers with Bayonets versus Cavalry	269
5.2	Prussian Approach March	293
5.3	Processional March	293
6.1	Combat Relationship between Infantry and Cavalry	373
7.1	The Dominance of Light Infantry and the Defense	402
9.1	Substitution Relationship between Mobility and Power	493
9.2	Traditional Weapon Systems Matrix	494
9.3	1930s Weapon Systems Matrix	494
9.4	Traditional Weapon Systems Capabilities	494
9.5	1930s Weapon Systems Capabilities	495
II.I	1930s Weapon Systems Capabilities	611
11.2	1930s Weapon Systems Capabilities	611
11.3	Relation of World War I Infantry and Artillery to 1930s Weapon Systems	612
12.1	Marginal Rate of Substitution between Spearmen and Dismounted	
	Knights, Exhibiting a Curve of Equal Combat Effectiveness under Cer-	
	tain Conditions	632
12.2	The Role of Cost in Choosing the Optimum Combination of Spearmen	417
	and Dismounted Knights	632
12.3	Strategy Matrix	662
12.4	More General Strategy Matrix	663
12.5	The Influence of the Ratio of Force to Space	666
12.6	Comparison of the Strengths of Raiding and Persisting Strategies	686
12.7	Summary of Alternatives for Combatting a Raiding Strategy or Guerrilla	
	Warfare	689
12.8	Choice between Military Strategy and Military Means to Attain Non-	4.6
	military Results	692
12.9	Choice between the Two Most Basic Means of Attacking the Enemy	5-2
BE	Armed Forces	693
12.10	Alternatives in the Employment of a Logistic Strategy against Enemy	3.4
	Armed Forces	694
12.11	Alternatives for a Combat Defense against a Logistic Raiding Strategy	695
- 1		

xiv Contents

12.12	Alternative Means of Using a Logistic Strategy to Defend against a	
	Logistic Raiding Strategy	696
12.13	The Two Fundamental Offensive Possibilities in Combat Strategy	698
12.14	Alternatives in Pursuing an Offensive Combat Strategy	698
12.15	Defender's Alternatives for Resisting a Combat Persisting Strategy	700
12.16	Defender's Combat Persisting Alternatives against the Same Kind of	
	Attack	700
12.17	Alternatives for Attacking against a Guerrilla Resistance	702
12.18	Alternatives Available When Attacker and Defender Both Employ a	
	Combat Persisting Strategy	704
12.19	Strategic Alternatives: A Summary	705
	LIST OF TABLES	
5.1	Sources of Prussian Income in the Seven Years' War	306
7.1	The Initial Prussian Cadre, Reserve, and Militia Force	394
7.2	The Prussian Cadre and Reserve Force	395
7.3	The Strength of the German, French, and Russian Armies in 1914	422
8.1	Comparison of Ships at the Battle of the Falkland Islands	445
8.2	Some World War I Artillery	452
8.3	The Submarine War, 1917-18	468
10.1	Comparison of French and German Light Tanks	511
10.2	Comparison of French and German Medium Tanks	512
10.3	Comparison of Russian and German Light Tanks	550
10.4	Comparison of Russian and German Medium Tanks	550
119	Table And the second of the se	
	LIST OF DIAGRAMS	
	LIST OF DIAGRAMS	
I.I	Roman Interior Lines	7.1
1.2	T	71 78
3.1	D 1 C 1 .	193
4.1	Gustavus's First Distraction	227
4.2	Gustavus Exploits Interior Lines	228
4.3	Second Distraction Fails	229
4.4	Diagram of Positions and Movements at Breitenfeld	235
4.5	Diagram of Dispositions and Actions at Lützen	242
4.6	Action at Fleurus	261
5.1	Blenheim: Distraction and Concentration	278
5.2	Eugene Distracts Catinat	284
5.3	Eugene's Interior Lines	285
5.4	Frederick's Interior Lines	300
6.1	Coburg's Attempted Envelopment	327
6.2	Souham Acts on Interior Lines	328
660	AND ADDRESS OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PARTY OF THE PAR	3-0

Contents	XV
Contents	>

6.3	Napoleon's Dispersion	334
6.4	Concentration on Interior Lines	335
6.5	Interior Lines Exploited	336
6.6	Napoleon's Strategic Turning Movement	340
6.7	Napoleon's Turning Movement at Ulm	343
6.8	Action at Austerlitz	346
7.I	Radetzky's Turning Movement	389
7.2	Moltke's Turning Movement	405
7.3	Interior Lines and Turning Movement	406
7.4	Napoleon's Situation before Würmser's First Relief of Mantua	411
7.5	Analogous Strategic Situation in March 1862	411
7.6	Napoleon's Concentration against Quasdonovich	412
7.7	Confederate Concentration against Grant	412
7.8	Napoleon Drives Back Quasdonovich and Turns against Würmser	412
7.9	Hypothetical Outcome if Confederates Had Defeated Grant before	DE DE DE
1-7	Buell Joined Him	412
7.10	Grant Turns Vicksburg	414
	Continuous Turning Movement	414
	Second Bull Run Turning Movement Forces Pope Back	415
	Gettysburg Turning Movement Forces Hooker Back	415
8.1	Opening Turning Movement of World War I	436
8.2	Joffre Exploits His Strategic Mobility	437
8.3	Battle of Marne and Aftermath	438
8.4	German Use of Interior Lines and Railway for Turning Movement	443
8.5	Allenby's Distraction, Breakthrough, and Turning Movement	482
0.1	German Strategic Envelopment with Simultaneous Advances	509
	First French and German Plans	518
0.3	Final French and German Plans	522
0.4	German Advance into Belgium	524
0.5	Panzer Divisions Reach the Meuse	526
-	French Fall Back from Dinant	528
0.7	Panzer Breakthrough at Sedan	530
,	German Breakthrough	533
0.9	Strategic Turning Movement	537
	Final German Offensive in France	541
	German Successes at Minsk, Smolensk, and Vyazma	555
	Montgomery's Distraction	561
	Breakout and Turning Movement	562
	British Turn Sidi Barrani	564
	Israeli Counterattack and Turning Movement	609

LIST OF ILLUSTRATIONS

1.1	Light Infantry	8
1.2	Siege Tower	I 2

Contents

1.3	Siege Artillery	13
1.4	Heavy Cavalryman	22
1.5	Heavy Cavalryman Defeats Light Infantryman	40
2.I	Catapult	116
2.2	Ram	117
3.1	Plate Armor	152
3.2	Matchlock	154
3.3	Heavy Infantryman	179
3.4	Cross-Section of New Fortifications	194
3.5	Flanking Fire in a Ditch	194
3.6	Outline of New Fortifications	194
3.7	Wheel Lock Handgun	196
5.1	Flintlock Mechanism	270
5.2	Light Cavalryman	291
5.3	Cannon Firing Twelve-pound Ball	311
7.1	Steam Railroad and Telegraph	396
7.2	Maxim's Gun	420
7.3	The Large Battle Cruiser H.M.S. Tiger	432
8.1	Paris Gun	451
8.2	Pusher Airplane	454
8.3	Sopwith Camel, Tractor with Synchronized Machine Guns	455
8.4	Prototype Landship	466
9.1	Small-Bore, High-Velocity German Antitank Gun	492
10.1	Char-B Tank	512
10.2	75-mm Recoilless Rifle	572
10.3	Rocket Launcher	573
10.4	Torpedo Plane	586
10.5	German Submarine	590
I.II	Jet Aircraft	597
11.2	Antiaircraft Rocket	598
11.3	Helicopter	601
	III OF MAPS	
	German Successes at Minsk, Smelensk, and Vyarma	
I.I	Greece	16
1.2	Persian Empire	50-51
1.3	Carthaginian Area of Influence	66
2.1	Evesham Area	124
2.2	Wales	128
4.1	Germany	225
7.1	Theater of Operations in the Russo-Japanese War	428
8.1	Central and Eastern Europe	460