

John R. Boyd

A Register of His Papers



Marine Corps History Division

Quantico, VA

2020

Introduction

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Collection Summary

Title: John R. Boyd Collection

Collection Number: COLL/2062

Physical Characteristics: 36 standard legal size document boxes; 1 custom book box; 1 oversize box; 15 linear feet

Span Dates: 1943-1999

Languages: English

Creator: John R. Boyd

Administrative Information

Restrictions: Collection is open to all researchers

Preferred citation: Researchers wishing to cite this collection should include the following information:

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Provenance: The papers of John R. Boyd were acquired through the efforts of Commandant Charles C. Krulak.

Biographical Sketch

John Richard Boyd (1927-1997) was an Air Force fighter pilot, whose discovery that quicker is better than faster became the basis of a far-reaching theory that revolutionized military strategy. Boyd's approach plotted the ability to change altitude (potential energy), airspeed (kinetic energy) and direction (turn rate, radius or "g") in any combination for each airplane in the US fighter inventory. More importantly, he devised a way to compare them with each other and with any Soviet aircraft or other plane one wished to compare. He named this theory "energy maneuverability" (also known as "maneuver warfare"). Maneuverability allows precise comparisons between aircraft of when, in its performance envelope, one plane can out maneuver another. This theory has been widely applied in fields as diverse as weapons procurement, battlefield strategy, and business competition.

John Richard Boyd was born in 1927 in Erie, PA. He began his military career as a 19-year old draftee with the US Army forces occupying Japan during the winter of 1945-1946. After his stint in the Army, Boyd enrolled in the University of Iowa on the GI Bill, majoring in economics and entering the Air Force ROTC program. Upon graduation, Boyd entered the Air Force and became a fighter pilot. He was ordered to Korea in 1953 as the war was drawing to its close, where he flew 20 combat missions in F-86s.

Boyd was selected to become an instructor in the fledgling Fighter Weapons School at Nellis Air Force Base in Nevada, where he began his studies on aerial combat. During this time he taught himself calculus in order to work out the complex formulas that produced his repertoire of aerial maneuvers and led to his "Aerial Attack Study."

The Air Force sent Boyd to Georgia Tech in Atlanta for an undergraduate degree in industrial engineering. Among the core requirements for the degree was course work in thermodynamics, the science of heat and energy. Boyd realized that the laws of thermodynamics, particularly those governing the conservation and dissipation of energy, were similar to the tactical give-and-take of an air-to-air duel. This insight was characteristic of his ability to use analogies to see the connections between seemingly unrelated bits and pieces of information and synthesize them into a cohesive, cogent whole.

Boyd's next assignment was Eglin Air Force Base in Florida. In his studies of aerial combat, Boyd sought to understand why the comparatively slow and ponderous American F-86 achieved near total domination of the MiG-15. He realized that the F-86 had two crucial advantages: better visibility and a faster roll rate. This, in turn, led Boyd to develop what he termed the "OODA Loop:" the repeated cycle of Observation, Orientation, Decision and Action that characterized every encounter. The key to victory was an airplane that could begin climbing or change course faster than its opponent. In other words, the pilot who can react faster and maneuver from one position to another quicker than his opponent will be successful. The central core of his ideas is the way humankind has adapted to a complex, unstable, and changing environment. The fast-cycle combat theory eventually expanded into a lecture, which Boyd would deliver hundreds of times during his career.

Boyd was transferred to the Pentagon in 1966 to aid in the development of the F-15, at the time called the FX. Boyd had a direct impact on the redesign of the aircraft. The final version of the F-15 was smaller, lighter, less expensive, and more maneuverable.

Boyd continued to refine his theories of aerial combat and aeronautic design. He read voraciously in a variety of disciplines: books on physics, mathematics, logic, information theory, evolution, biology, cognitive psychology, genetics, cultural anthropology, Eastern philosophy, sociology, political science, economics and business.

Between 1973 and 1976, he wrote down his theory in a sixteen page paper entitled "Destruction and Creation." This treatise describes how a dialectical interplay of analysis and synthesis destroys and creates our mental images of the external world. The document describes what pressures drive this mental process, and how internal phenomena naturally regulate it in a never-ending cycle that takes on the outward manifestations of disorder turning into order and order into disorder. His theory combined certain aspects of mathematician Kurt Godel's Incompleteness Theorem, physicist Werner Heisenberg's Uncertainty Principle, and the second law of thermodynamics. "Destruction and Creation" became the foundation of his study on competition and conflict.

After he retired from the Air Force in 1975, Boyd continued to refine and expand his theories to encompass the total battle, not just aerial encounters. "Discourse on Winning and Losing," his four (later expanded into thirteen) hour briefing was the result. Boyd presented this briefing to the Army and to the Marines to illustrate how his concepts could be adapted to land battle. Commandant Charles C. Krulak, awed by Boyd's intellect, attributed the US success in the Persian Gulf War in 1991 to the application of Boyd's theories on military strategy. While the Marine Corps embraced Boyd's energy maneuverability military strategy, it was largely ignored by the Air Force during his life time.

John Boyd died on 9 March 1997 and is buried at Arlington National Cemetery.

Scope and Content

John R. Boyd's papers are divided into fourteen (14) records series.

The first series is composed of books, the majority of which were heavily annotated by Boyd. The degree of importance Boyd placed on the information is witnessed by how heavily he marked the pages. Pages heavily underlined with stars across the top and bottom were of the greatest interest. He occasionally wrote comments in the margins. He often bought two copies of the same title and edition at a time. One copy was the clean reference copy, the other the working copy with his annotations. In several instances, Boyd collected different editions and/or translations of works by authors whom he admired. For example, he had various editions of Sun Tzu's military classic, *The Art of War*. An annotated book is indicated by a bullet in front of the author's name. Books are arranged alphabetically by author's last name.

The second series is excerpts or photocopies of books, arranged alphabetically by author. Annotations are also marked by bullets in front of the author's name.

The third series is Magazines. These are arranged is arranged chronologically by magazine.

The fourth is Articles, arranged alphabetically.

The fifth is Miscellaneous Newspaper Clippings.

The sixth series is Briefings, and is subdivided into two parts. The first sub-series is John Boyd's own briefings, arranged by briefing, there under chronologically by version. The second sub-series is briefings done by others, arranged alphabetically.

Next is the Reports and Concept Papers series. This is arranged alphabetically.

Notes and Notebook series is composed of John Boyd's handwritten notes and drafts. Items that were together in an envelope were kept together. He frequently abbreviated terms. T-T-D scrawled across the top of a page means "things to do". "POC" is "Patterns of Conflict".

The Course Syllabi and Seminars series, number nine, reflects John Boyd's work developing course curricula in professional military education.

The Technical Material series, number ten, reflects his studies of business management.

The eleventh series is Correspondence and Memoranda, arranged chronologically.

The twelfth series, Yearbooks and Daily Diaries, is arranged chronologically.

The General series, number thirteen, is composed of miscellaneous documents.

The Photographs and Audiovisual series, number fourteen, consists of still photographs of Colonel Boyd and his family, and one of his briefings.

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- Folder 11. Articles and Notes

Box 25

- Folder 1. Articles, Notes, and Engineering Drawings
- Folder 2. Colonel James G. Burton's Statement to Congress, 28 January 1985
- Folder 3. Congressional Testimony, Acquisition Reform
- Folder 4. Congressional Reform, 1991
- Folder 5. Testimony Before Aspen Committee, April 1991
- Folder 6. Federal Legislation, 1981-1986
- Folder 7. USAF Flight Crew Check Lists

- Folder 8. Flight Records (1 of 2)
- Folder 9. Flight Records (2 of 2)
- Folder 10. William Lind, Victoria
- Folder 11. Membership, US Naval Institute
- Folder 12. Naval Doctrine Publication 1: Naval Warfare
- Folder 13. Genesis, Ismond Rosen
- Folder 14. Naval War College Review, Radar: Shield or Target, Correspondence
- Folder 15. Notes, Correspondence, Evaluations, etc.

Box 26

- Folder 1. Oral History Transcripts
- Folder 2. Quotes from the movie "Dune" (1984)
- Folder 3. Resume
- Folder 4. "In the Shadow of Doom: Social Disintegration in America"; and "A Framework"
- Folder 5. Senator Barry Goldwater, Statement on Tactical Warfare, 3 March 1983
- Folder 6. Orders, TB-218, 23 January 1994
- Folder 7. Travel, 1986
- Folder 8. US Air Force Oral History Interview with Colonel John R. Boyd, 28 January 1977
- Folder 9. US Goal and B. H. Liddell Hart, Strategy, 1967
- Folder 10. Barry Watts: Articles & Correspondence Re: AFM 1-1 and Air Force Doctrine
- Folder 11. Destruction and Creation by John Boyd, 3 September 1976
- Folder 12. An Evaluation of LtCol John R. Boyd's Creative, Professional Contributions to the USAF
- Folder 13. Richard Szafranski
- Folder 14. Warfighting (Fleet Marine Force Manual 1)
- Folder 15. Miscellaneous
- Folder 16. Miscellaneous
- Folder 17. Obituaries and Congressional Record
- Folder 18. Boyd Hall Dedication, Invitation and Program, 17 September 1999
- Folder 19. Remarks by Robert Gates, Maxwell-Gunter Air Force Base, 21 April 2008
- Folder 20. Photographs
 - Polaroid snapshot of Colonel and Mrs. Boyd's living room showing bookcases and Colonel Boyd's favorite chair before shipping material to Quantico
 - 3 in. x 5 in. color photograph showing Boyd with Morley Safer of "60 Minutes" and Colonel James G. Burton, USAF
 - Photocopy of the photograph from The New York Times showing Boyd holding a model of the F-16
 - Boyd's college freshman photograph
 - Boyd's college graduation portrait
 - Boyd as an enlisted man, US Army
 - Boyd about to dive into swimming pool
 - College yearbook photograph of Mary E. Bruce (the future Mrs. John Boyd)

- Boyd and Mary Bruce at a college prom
- Boyd's wedding photograph
- John and Mary Boyd cutting the wedding cake
- Boyd climbing out of F-86 cockpit
- Official USAF portrait of Boyd
- Retirement photograph of Colonel Boyd, with Secretary of the Air Force John McLucas
- Boyd in retirement
- John Boyd and Pierre Sprey
- F-16 in flight

Folder 21. Slides

Box 27

Clippings and magazine articles

Series . Books

Box 28

1. Lincoln Barnett, "The Universe and Dr. Einstein, 1948
2. David Bohm and F. David Peat, "Science, Order, and Creativity," 1987
3. J. Bronowski & Bruce Mazlish, "The Western Intellectual Tradition, From Leonardo to Hegel," 1960
4. Fritjof Capra, "The Tao of Physics," 1973
5. James Bryant Conant, "Two Modes of Thought, My Encounters with Science and Education," 1964
6. Edward De Bono, "New Think, the Use of Lateral Thinking in the Generation of New Ideas," 1967
7. Erich Fromm, "The Crisis of Psychoanalysis," 1970
8. John W. Gardner, "Self-Renewal, The Individual and Innovative Society," 1963
9. F. H. George, "Cybernetics," 1971
10. B. H. Liddell Hart, "Strategy," 1954
11. John Keegan, "The Face of Battle," 1976
12. B. H. Liddell Hart, "History of the Second World War, Volume I," 1970

Box 29

1. Dr. Michio Kaku & Jennifer Trainer, "Beyond Einstein, The Cosmic Quest for the Theory of the Universe," 1987
2. Morris Kline, "Mathematics, The Loss of Certainty," 1980
3. Harold Lamb, "Genghis Kahn," 1927
4. Walter Laquer, "The Guerrilla Reader, A Historical Anthology," 1977

5. Maxwell Maltz, M.D., "Psycho-Cybernetics, a New Way to Get More Living Out of Life," 1960
6. Gunnar Myrdal, "Challenge to Affluence," 1962
7. Ernest Nagle & James R. Newman, "Gödel's Proof," 1958
8. Jean Piaget, "Structuralism," 1968
9. Mao Tse-Tung, "Four Essays on China & World Communism," 1972
10. Alan Watts, "The Book, On the Taboo Against Knowing Who You Are," 1966
11. Edward Luttwak, "Coup d'Etat, A Practical Handbook" 1968
12. Harry Levinson, "The Exceptional Executive, A Psychological Conception," 1968
13. Major General F. W. von Mellenthin, "Panzer Battles, A Study of Employment of Armor in the Second World War," 1956
14. William Irwin Thompson, "At the Edge of History" 1972

Box 30

1. Charles W. Thayer, "Guerrilla," 1963
2. B.F. Skinner, "Beyond Freedom and Dignity," 1971
3. Joseph Chilton Pearce, "Exploring the Crack in the Cosmic Egg," 1974
4. Joseph Chilton Pearce, "The Crack in the Cosmic Egg, Challenging Constraints of Mind and Reality," 1973
5. Adolf Galland, "The First and the Last, The Rise and Fall of the German Fighter Forces, 1938-1945," 1954
6. Michael Polanyi, "Knowing and Being, Essays," 1969
7. F. O. Miksche, "Blitzkrieg," 1941
8. Patrick Beesly, "Room 40, British Naval Intelligence 1914-18," 1982
9. Baijit Singh & Ko-Wang Mei, "Theory and Practice of Modern Guerrilla Warfare," 1971
10. Fred Hoyle, "Encounter With The Future," 1965
11. Nick Herbert, "Quantum Reality, Beyond the New Physics," 1985

Box 31

1. S.L.A. Marshall, "Men Against Fire, The Problem of Battle Command in Future War," 1947
2. Jeremy Campbell, "Grammatical Man, Information, Entropy, Language, and Life," 1982
3. Hideki Yukawa, "Creativity and Intuition, A Physicist Looks at East and West," 1973
4. Richard Tanner Pascale & Anthony G. Athos, "The Art of Japanese Management, Applications for American Executives," 1981
5. Richard Humble, "Hitler's Generals," 1973
6. Martin Van Creveld, "Supplying War, Logistics from Wallenstein to Patton," 1977
7. Samuel B. Griffith, "Sun Tzu, The Art of War," 1963
8. Werner Heisenberg, "Physics & Philosophy, The Revolution in Modern Science," 1958
9. James P. Womack, Daniel T. Jones, Daniel Roos, "The Machine that Changed the World," 1990
10. Thomas J. Peters & Robert H. Waterman, Jr., "In Search of Excellence, Lessons from America's Best-Run Companies," 1982

Box 32

1. William J. Miller, "The Peninsula Campaign of 1862, Yorktown to the Seven Days, Volume I," 1995
2. Anthony Cave Brown, "Bodyguard of Lies," 1975
3. Ilya Prigogine & Isabelle Stengers, "Order Out of Chaos, Man's New Dialogue With Nature," 1984
4. David Foster, "The Intelligent Universe," 1975
5. Robert L. Heilbroner, "Marxism: For and Against," 1980
6. Gary Zukav, "The Dancing Wu Li Masters, An Overview of the New Physics," 1979
7. J. Bronowski, "The Ascent of Man," 1973
8. John Briggs & F. David Peat, "Turbulent Mirror, An Illustrated Guide to Chaos Theory and the Science of Wholeness," 1971
9. Alan Watts, "TAO: The Watercourse Way," 1975

Box 33

1. Paddy Griffith, "Forward into Battle, Fighting Tactics from Waterloo to Vietnam," 1981
2. Marilyn Fergusson, "The Aquarian Conspiracy, Personal and Social Transformation in the 1980s," 1980
3. David Irving, "The Trail of the Fox," 1977
4. Robert L. Heilbroner, "An Inquiry Into The Human Prospect," 1974
5. Rafael Aguayo, "Dr. Deming, The American Who Taught the Japanese About Quality," 1990
6. Frank Kitson, "Low Intensity Operations, Subversion, Insurgency, Peace-keeping," 1971
7. William Irwin Thompson, "Evil and World Order," 1976
8. Charles Messenger, "The Blitzkrieg Story," 1976

Box 34

1. David Downing, "The Devil's Virtuosos: German Generals at War 1940-5," 1977
2. F. W. von Mellenthin, "German Generals of World War II, As I Saw Them," 1977
3. P. H. Vigor, "Soviet Blitzkrieg Theory," 1983
4. Will and Ariel Durant, "The Lessons of History," 1968
5. Harry G. Summers, Jr., "On Strategy: The Vietnam War in Context," Forward 1981
6. Lynn Montross, "War Through the Ages," 1944
7. J. Bronowski, "A Sense of the Future, Essays in Natural Philosophy," 1977
8. G. Spencer Brown, "Laws of Form," 1972

Box 35

1. Ian Stewart, "Does God Play Dice? The Mathematics of Chaos," 1989
2. Thomas S. Kuhn, "The Structure of Scientific Revolutions," 1962
3. Peter Pareto, "Clausewitz and the State," 1976

4. James Gleick, "Chaos," 1987
5. Peter Coveney & Roger Highfield, "The Arrow of Time, A Voyage Through Science to Solve Time's Greatest Mystery," 1990
6. Kenneth Macksey, "Guderian, Creator of the Blitzkrieg," 1976
7. William G. Ouchi, "Theory Z, How American Business Can Meet the Japanese Challenge," 1981
8. Colonel T. N. Dupuy, USA, Ret., "A Genius for War, The German Army and General Staff, 1807-1945," 1977

Box 36

1. Daniel Goleman, Ph.D., "Vital Lies, Simple Truths, The Psychology of Self-Deception," 1985
2. Brian Goodwin, "How The Leopard Changed Its Spots, The Evolution of Complexity," 1994
3. George Stalk, Jr. & Thomas M. Hout, "Competing Against Time, How Time-based Competition Is Reshaping Global Markets," 1990
4. Masaaki Imai, "Kaizen, The Key to Japan's Competitive Success," 1986
5. General Tao Hanzhang, "Sun Tzu's Art of War, The Modern Chinese Interpretation," 1987
6. Corelli Barnett, "Bonaparte," 1978
7. Marvin Minsky, "The Society of Mind," 1985

Box 37

Clausewitz, "On War" (annotated copy)

Box 38

Floppy Disks, CD-ROM, Hi8, VHS, and Betamax Tapes