The Failure of Third World Air Power

Iraq and the War with Iran

by

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Abstract

The Iraqi Air Force failed to live up to its prewar billing during Operation Desert Storm. Touted by many sources as an experienced, aggressive power before the war, Saddam's air force turned out to be quite the opposite. This paper explains why the Iraqi performance in Desert Storm was predictable: Nonindustrialized, third world nations are incapable of fielding a decisive, conventional air force. To illustrate the point, this essay studies Iraq's performance in the war against Iran. During the conflict, the Iraqi air force obtained all the equipment and training money could buy, but after eight years of combat experience it still made only minor contributions in a war effort against an equal foe. Each country is unique, but the same vulnerabilities that restrained Iraq's forces affect every other nonindustrialized nation. The inability of third world nations to independently organize, train, and equip air forces to decisive levels is inevitable. Avoiding large, wasted sums of money fielding a force of questionable value should lead these countries to alternative forms of aerial warfare.

Iran-Iraq War:
Chronology of the Air War

1980:

September 22: -The war begins with Iraqi air strikes on Iranian airfields.
-Iraqi land forces invade Iran.

December: -Iraq loses 60 aircraft by the end of the year.

1981:

April: -Iranian fighters destroy 46 Iraqi aircraft at Al-Walid Airfield.

June: -Israeli fighters destroy the Osirak nuclear facility outside Baghdad.

1982:

Spring: -Series of purges by Hussein repeatedly ground the IQAF.

May: -Khorramshahr Battle. The IQAF's first major support of land forces.
-Iraq driven out of Iran.

June: -Iran invades Iraq.

October: -Iraq receives first French-built Mirage F-1 fighters.
-Iraq received first Exocet missiles from: France.

November-December: -Iraqi planes fly 74 missions against Kharg Island.

1983:

January: -Major air strikes by both combatants. Iraq loses 80 aircraft.
-Iraq's total aircraft losses to date are approx. 200

February: -F-ls operational.

April: -Iraq fires its first surface-to-surface missile at Iran.

August: -Iraq declares an exclusion zone in the Gulf by warning all international shipping.

October: -France leases five Exocet capable Super Etendard fighters to Iraq.
-Iraq receives additional Mirage F-ls.

1984:

February: -Heavy attacks against Iranian cities lead to UN negotiated cease fire.

March: -Iraq employs the Etendard-Exocet combination against Gulf tankers for the first time.

April: -Iraqi fighters blunt Iranian spring offensive.

August: -Iran initiates tanker shuttle to Sirri and Larak Oil Terminals from Kharg Island.

1985:

March: -Iraq resumes attacks on Iranian population centers dubbed the "War of the Cities"

April: -New cease-fire in War of the Cities.

May: - Iraq resumes the War of the Cities.

June: -Iraq unilaterally halts city attacks.

August-December: -Series of attacks on Kharg Island using the AS-30 laser guided bomb for the first time.

1986:

February: -Iran invades the Fao Peninsula
-Iraqi fighters fly 355 sorties in support of land forces (strategic bombing halted).

April: -The Iran-Contra scandal breaks.

May: -Iraq resumes city bombing.

August: -Iraq attacks Sirri Island using aerial refueling.
-Kharg Island attacks intensify.

November: -Iraq attacks Larak Island using aerial refueling. -Iraqi attacks on Tabriz and Teheran destroy 25% of Iranian domestic oil. Rationing instituted in Iran.
-Iraq makes 250th attack on Kharg Island.

1987:

January: -IQAF sustains a 10% attrition in operations against Iranian ground offensive.
-Iraq steps up the War of the Cities in retaliation for the offensive (Iran forced back into fuel rationing).

February: -Soviets sponsor another cease fire in the war of the cities.

March: -Kuwaiti tankers reflagged under U.S. escort.

May: -USS Stark hit by two Iraqi Exocet missiles killing 37 crewmen.

1988:

January-February: -Iran stages a series of small ground offensives.
-Iraq renews the War of the Cities with400 aircraft sorties and 200 Scud missile launches.

April: -Iraq recaptures Fao Peninsula in a combined arms offensive.

May-June: -Iraq recaptures most of its territory in a series of Blitzkrieg style offensives.

July: -USS Vincennes shoots down an Iranian Airbus.

August: -Both adversaries accept a cease fire on August 20.

About the Author

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Introduction

On the evening of 16 January 1991, Americans held their breath as the first broadcasts of air attacks against Iraq reached the news services. Up until that moment, the information available to the public regarding Iraqi air force (IQAF) capabilities centered on a comparison of numbers tending to ignore other factors influencing combat capability. Consisting of nearly 1,000 combat aircraft, Saddam Hussein's air force might significantly raise the stakes of the war.

Instead, Iraq's performance in the air might best be described as a no-show. No air defense, no strike missions, and no support of the army all combined to reduce the fifth largest air power in the world into a footnote in the history books. The key issues focus on whether the performance of Hussein's air force was a surprise and, if so, why?

Knowledge of the enemy is a sound tenet in the conduct of any military operation. Unfortunately, the new world order which faces the US military today is a far cry from the days of bipolarity. Instead of simply concentrating on a single enemy-the Soviet Union-and extending that knowledge into its long list of client states, we now must understand a myriad of potential enemies in the hot spots around the world. Missing from this picture is a standardized framework for comparing air forces without relying exclusively on numbers.

The purpose of this essay is to show that lack of industrialization in most third world nations prevents them from ever fielding an air force capable of decisive action in conventional warfare. In fact, the resources these nations use to build up their aviation programs could be better spent on other, less sophisticated forms of military hardware. This statement is not intended to discount the need for air power in nonindustrialized countries, since counterinsurgency and transportation aircraft can enhance internal stability and a small attack force offers a deterring capability against belligerent neighbors. However, most third world nations seem drawn by the great destructive

capacity that modern fighter and bomber aircraft appear to offer them. For a variety of reasons, they are far from actually realizing the full capacity of these weapons.

The air forces of Iraq serve as an example of the failure of nonindustrialized air power. Outclassed in all aspects of the war, the Iraqis clearly stepped out of their league militarily when they tried to face down the rest of the world in Operation Desert Storm. The history leading up to the invasion of Kuwait offers considerable insight into the growth of a major third world air power. Against a more equally matched enemy-Iran-the IQAF was still unable to make a significant mark on the outcome of the war. The following five points show that the air war between Iraq and Iran is a good representation of the performance of third world air power.

First, the Iran-Iraq War was the longest war of the twentieth century, providing the Iraqi air force ample opportunity to grow and improve. Second, Iraq had considerable sources of funding, both internally with its oil exports and externally through support of the Gulf Cooperation Council (GCC) states. Third, Iraq had nearly uninterrupted sources of military hardware and training. Fourth, because of these nearly unlimited resources, IQAF: eventually developed one of the numerically largest air forces in the world. Fifth, the geographic and meteorological effects of the war zone had limited impact on an air campaign. In short, the IQAF had every opportunity to make a major impact on the outcome of the war, yet did not.

The framework for studying Saddam's air force is available in Air Force Manual (AFM) 1-1, Basic Aerospace Doctrine of the United States Air Force. Designed with an American military audience in mind, this manual advocates what the collective US Air Force believes to be the best means of preparing and employing aerial forces in combat. Although it may not directly apply to foreign nations' doctrines, it can serve as a common reference for studying and comparing other forces.

According to the manual, preparation directs the air arm to "organize, train and equip aerospace forces," and employment is the actual participation of forces in combat. Further explanation shows how these terms apply when one studies another country. Organization refers to the basic composition of an air force--its command and control and any individual leadership considerations that influence its performance. Training not only centers on specific military instruction received by forces, but can encompass the basic education of a nation's population as well. Equipment provides a numerical count of a country's hardware and includes an assessment of its ability to produce or import replacements. Finally, employment accounts for an air force's accomplishments in actual combat conditions. Each of these factors, when applied to Iraq in the years preceding and during its war with Iran, offers insight into the true capability of the IQAF in familiar terms.

Like any theory, this one is not immune to limitations. The most obvious one here is having only a single item in one's sample. To minimize this seemingly lopsided approach, the author presents conclusions (in each chapter) which offer lessons relevant to other nations as well. Another serious obstacle is the lack of primary references, which is aggravated by the Iraqi closed society. Iraq is a regime that considers outside interest in its military a threat to national security. [1] This xenophobia effectively eliminates access to primary sources in all but the rarest instances. Wherever possible, corroboration between multiple sources is used to minimize the intense propaganda and emotional influence of the war. Still, a number of important factors come out in this study of the IQAF that offer insight into the performance of other third world air forces.

Notes

1. Committee against Repression and for Democratic Rights in Iraq (CARDRI), Saddam’s Iraq: Revolution or Reaction? (London: Zed Books, Ltd., 1986), 203.

Chapter 1

Organization

Hussein:	"Two divisional commanders and the commander of the mechanized unit were executed. This is something very normal in all wars."
Interviewer:	"For what reason?"
Hussein:	"They did not undertake their responsibilities in the Battle of Muhammara."

-Stern magazine, 1982

The organization of a country's air force relies on three parts: leadership, command and control (C^2), and force structure. A nation's leadership by itself can have a significant effect on the military, either positive or negative. For example, the US military certainly experienced change in the form of growth under the presidency of Ronald Reagan. Likewise, Egypt's forces showed considerable modernization when their leadership switched from Gamal Abdel Nasser to Anwar Sadat. Leadership often drives the other two segments of organization-C^2 and force structure-and bears close examination.

In the case of Iraq, the leadership of the military was in the hands of one man. Iraqi history shows a continual struggle between military and political authority which was not subdued until Saddam Hussein seized control. After his rise to power, he continually reasserted his dominance over the military, serving as the commander of all forces during the war with Iran. From the top down, the influence of Hussein and his Ba'ath party is prevalent in the day-to-day operations of the Iraqi air force.

Origins of the Ba'athist Movement

Ba'athism began shortly after World War II as an anticolonial movement. At a time when pan-Arabism, or the unity of Arab nations, was just beginning, the party offered a structured forum for Arab unity with the slogan Unity-Freedom-Socialism.[1] Initially prevalent throughout

the Middle East, Ba'athism eventually took its strongest hold in the countries of Syria and Iraq. In Iraq, the Ba'ath party rose to the leadership of the government in a 1968 coup after having failed in a 1963 attempt. The president of the new Iraqi Republic was Ahmad Hasan al-Bakr. His closest advisor was Saddam Hussein.

Hussein was a long-time member of the party and a key figure in the 1963 failed coup attempt. As al-Bakr's right-hand man, Hussein was the leading civilian leader of the government while al-Bakr controlled the military. However, by 1971 it was apparent that al-Bakr's position was simply a figurehead while Saddam represented the true power in the government. In 1979 Hussein consolidated his power by forcing al-Bakr to step down for "medical reasons" and purging the civil and military portions of the government in an Iraqi version of the night of the long knives.[2]

Hussein had no military training but was promoted to the rank of general in 1973 by al-Bakr to improve relations between the military and civilian branches of the Ba'ath party.[3] Meter seizing power in 1979, Saddam awarded himself an honorary degree from the Military College, Iraq's military academy, and appointed himself field marshal of the armed forces.[4] His heavy-handed attempts at fully controlling the Iraqi forces were understandable in light of the military's history of involvement in domestic politics.

Iraqi Military Political Involvement

The Iraqi army was formed as part of the British colonial forces following World War I. A highly professional force, it was embroiled in Iraqi politics beginning in early 1920s.[5] As a result of an otherwise unstable series of Iraqi governments, the armed forces repeatedly stepped in to enforce political order and eventually viewed itself as the guardian of the Iraqi nation.

The rise of the Ba'athist movement found a home in the military of Iraq. Always politically

astute, the army accepted the principles of Ba'athism as a means of removing the last vestiges of British colonialism-the installed royal family. The army participated in the abortive 1963 coup, and the successful 1968 takeover was led by the armed forces and al-Bakr, a member of the army.[6]

To protect himself from the military's involvement in politics, Hussein embarked on a program of Ba'athization in the armed forces. His campaign consisted of two parts. First, all officers of colonel rank or above received politically directed appointments. This ensured a loyal command structure within the military. Second, Hussein developed a corps of Ba'ath party organizers and assigned at least one to each unit. Their mission was to keep an eye out for hostile elements within the military and to teach party propaganda to the troops. In this manner Saddam exerted control over the

military.[7] The system was not foolproof. In the war with Iran, Saddam found himself alternating between military disasters caused by incompetent political appointees and threats to his regime led by officers assigned for battlefield competence. The result was a series of purges and reforms during the war. In the spring of 1982, the entire air force was grounded for "plots against the regime."[8] In September of 1983, the senior leadership of the air force was summarily shot for an attempted coup.[9] All told, Hussein had hundreds of officers executed during the war, either for their participation in activities against the state or for failure to successfully perform their military mission. [10]

Organization of the Air Force

One prominent feature of the IQAF organization was its resemblance to the Soviet air force. This should not be surprising, considering the close relationship between the two countries in the early 1970s and Iraq's reliance on the Soviet-client relationship. The division of the country into

military districts and the basic composition of individual units closely followed the model set forth by the sponsor country to its protégé.[11]

During the entire war, Iraq divided itself into four military districts: north, central, south, and Baghdad. Although the Baghdad district accounted for a large percentage of the C^2 facilities and internal security forces, the south district received the most emphasis in weapons and manpower since it was involved in the bulk of the fighting.[12]

Given the politically oriented leadership in Iraq, it comes as no surprise that C^2 was highly centralized. While some degree of consolidation is normal in a command structure, Iraq was limited by a combination of untrustworthy leadership and limited technical capacity. The leadership problem was caused by the political appointment of dependable commanders over officers with more expertise. Technologically, Iraqi command, control, and communications (C^3) equipment at the start of the conflict was archaic even by Soviet standards and only improved slightly during the war. The result was an overcentralized command structure that was unresponsive to the tactical situation.

The air force structure remained fairly constant throughout the war although there was considerable growth and modernization of the weaponry. Entering the war, the IQAF had approximately 38,000 personnel, over 10,000 of whom were dedicated to air defense operations. By the end of the war, this number had grown to only 40,000 personnel.[13] The increase in Iraqi combat aircraft numbers indicates a different story. In 1980 the IQAF possessed 332 combat aircraft, increasing to 580 by 1985 then leveling off at just over 500 by the end of the war in 1988.[14]

The aircraft were integrated into squadrons that increased in number with increases in hardware. At the beginning of the war, Iraq had 19 squadrons of combat aircraft, but by the end

of the war the number had grown to 32. The near constant number of personnel during this organizational surge indicates the problems Iraq faced in training new personnel.

Iraqi squadron organization was similar to that of its Soviet counterparts. A typical bomber squadron had 10 planes; a ground attack fighter squadron normally consisted of 15 to 20 aircraft; the air defense squadrons had as many as 25 interceptors. These numbers per squadron remained fairly constant throughout the war and are consistent with similar Soviet squadron sizes. However, while the Soviets tended to organize each airfield into a three squadron regiment, the Iraqis normally had only one squadron per air base.

The IQAF resembled similar Soviet aviation organizations on paper, but the similarity stopped there. Instead of a well-disciplined, cohesive unit, the average Iraqi fighter squadron consisted of individual pilots who rarely flew together. Although the IQAF included the air defense forces, there was literally no integration among manned and unmanned defenses. The Iraqi air force was merely a hollow impersonation of its Soviet counterpart.

Organizational Summary

The military in Iraq is a victim of political control.[15] Historically, this political involvement by the armed forces was a voluntary one, but under Hussein, participation became mandatory. With leadership politically appointed and the rest of the forces closely monitored by party lackeys, Saddam's military was controllable but not professional. This politicization of the military, although a temporary expedient to ensure some degree of loyalty, haunted Hussein during most of the war with Iran.

In the Arab world, piloting an aircraft commands much more respect than driving a tank or marching with a rifle. Consequently, the air force tended to attract individuals of a higher social status.[16] With its generally more educated and better traveled officer corps, the IQAF was the

most rebellious of Hussein's military services.

In a broader sense, exposure of political-military relationships in a country can reveal the actual source of its control. Leadership serves as a focal point for uncovering an opponent's strategy and determinjng a means of defeating that strategy. Understanding the connection between a country's armed forces and its government offers planners a chance to get inside the decision loop of the enemy and effectively defeat his plan.

Notes

1. Francis Fukuyama, The Soviet Union and Iraq since 1968 (Santa Monica, Calif.: Rand Corporation, July 1980), 16.
2. Ibid., 20.
3. Marion and Peter Sluglett, Iraq since 1958: From Revolution to Dictatorship (London: KPI, Ltd., 1987), 206.
4. Committee against Repression and for Democratic Rights in Iraq (CARDRI), Saddam’s Iraq: Revolution or Reaction? (London: Zed Books, Ltd., 1986), 240-41.
5. Frederick W. Axelgard, A New Iraq? The Gulf War and Implications for U.S. Policy (New York: Praeger, 1988),4.
6. Ibid.
7. Edgar O'Ballance, The Gulf War (London: Brassey's Defence Publishers, Ltd., 1988), 185.
8. Ibid., 87.
9. Ibid., 123.
10. Axelgard, 52.
11. Anthony H. Cordesman and Abraham R. Wagner, The Lessons of Modern War, vol. 2, The Iran-Iraq War (Boulder, Colo.: Westview Press, 1991), 60.
12. CARDRI, 217.
13. See The Military Balance (London: International Institute for Strategic Studies, 1980'1989).
14. Ibid.
15. John S. Wagner, Fighting Armies: Antagonists in the Middle East (Westport, Conn.: Greenwood Press, 1983), 78. Specifically, the Iraqi military-which previously controlled the government of Iraq-is completely dominated by Hussein.
16. Anthony Pascal, Michael Kennedy, and Steven Rosen, Men and Arms in the Middle East: The Human Factor in Military Modernization (Santa Monica, Calif.: Rand Corporation, June 1979), 42.

Chapter 2

Training

> We have to be proud that our beloved leader has developed new concepts in military principles which hitherto were viewed in an unbalanced way during war time. We have to be proud His Excellency is enriching the military ideology and drawing new experience from the lessons of war.
>
> -Ba'ath Party Journal, August 1984

Importance of Training

Training is the education of military forces while developing them into an effective fighting machine. While the leadership of a country controls its military organization, the quality of training in military forces has a similarly significant impact on effectiveness. Air power is perhaps the form of warfare most sensitive to the education level of its forces. Almost any nation can place small arms in the hands of its countrymen and organize them into an army, but the technical aspects of aviation place severe requirements on lesser developed nations.

Military training is not the only aspect of schooling a country faces when building a viable force. A modern air force also relies on public schooling and industry to serve as a foundation in the complex training required of its personnel. Mass education of a population reduces illiteracy and raises the trainability of individuals. Industrialization provides jobs with increased levels of technical expertise that are readily filled by an educated population. Integrating the populace into a modern industrial society supplies a highly capable labor pool for an air force.

In comparison to either industrialized or third world countries, the Middle East faces a peculiar circumstance. The petroleum industry supplies many inhabitants of the region with a standard of living that exceeds that of most nonindustrialized nations. At the same time, cultural influences leave a large portion of the population reliant on the Western industrial nations to handle the more complicated aspects of the petroleum industry. The Arab culture commonly exhibits a strong disdain for manual labor and a tendency to leave things undone until the last

possible minute.[1] The result is a handful of nations paying cash for the best military hardware, while relying heavily on outside expertise to keep their modern forces operational.

This incongruity leads to overestimates of military potential among the Middle Eastern states.[2] Although numbers look impressive in terms of military hardware, projecting capacity based solely on the size of a force often results in overinflated estimates. One missing consideration in these estimates is the type and quality of training the armed forces receive.

Public Education in Iraq

Iraq qualifies as one of the oil-rich Middle Eastern nations. With high per capita income, the Iraqi standard of living has steadily climbed in the last two decades in spite of almost 10 years of fighting. The country's educational system, on the other hand, has not kept up with this new wealth. As recently as 1988, 55 percent of Iraqis were considered illiterate.[3] A majority of the Iraqi population is Arab and Islamic, two cultural influences that further highlight the disparity between wealth and education.

Within Arab-Islamic societies, the key means of educating the masses is memorization and imitation.[4] Naturally, this teaching method profoundly hinders flexibility and adaptability. Further, the strong sense of shame or loss of face limits any criticism which might improve performance. Risk takers are often punished.[5] This heavily structured environment only sluggishly adapts to change, leaving much of the Arab world underdeveloped in technical and mechanical aptitude.

There are many reasons attributed to the stagnation of Arab education. First, domination by the Ottoman Empire for over 400 years retarded the Arab culture. Second, Western imperialism after World War I continued this repressive influence. Third, the more recent excuse espoused by Arabs is the disturbing presence of the Israeli state.[6] In order for Arab nations to independently

industrialize, they would have to modify the whole Arab national character.[7]

Iraqi Military Training

Just as organization in the Iraqi military is heavily politicized, so is training. This is most prevalent in the officer corps since all Iraqi armed forces officers are graduates of the Iraqi Military College. Originally located in the outskirts of Baghdad, the Military College was transplanted by Hussein to his home town of Tikrit to keep it away from the political environment of the capital.[8] After 1974 enrollment in the school became dependent on membership in the Ba'ath party. This selectivity ensures Hussein a corps of politically loyal officers who have never experienced education outside the borders of Iraq.

Training for noncombat, support activities in the air force is performed through a combination of internal and external sources. Internally, only the most basic maintenance, supply, and disciplinary tasks are done by Iraqi officers and senior enlisted troops. Externally, nearly all technical training is handled through foreign military advisory teams. This is also true of pilot training.

Iraqi pilots undergo beginning flight instruction in Iraq but receive nearly all combat training outside the country in the USSR or France.[9] After returning to Iraq, pilots enter a follow-on training program characterized by extreme conservatism.[10] Most training missions take place above 5,000 feet and consist of basic flight maneuvers. Lacking realism, this restrained approach grew from the combined effects of safeguarding aircraft/pilot resources and confining training missions to limit Saddam's exposure to assassination attempts from the air .[11] This restrictive environment resulted in Iraqi pilots entering the war against Iran with no live weapons training, unfamiliar weapons loads, and limited combat experience except against Kurdish villages. [12]

Foreign Training

Iraq's inability to sustain a comprehensive air combat training program compelled it to rely heavily on the expertise of foreign nations. The two primary suppliers were the Soviet Union and France, but Iraq also received considerable assistance from Egypt. This variety of training sources explains the unique style of the Iraqi pilots.

The most influential training program came from the Soviet Union. Formally tied to the USSR in a Friendship and Cooperation Treaty in 1972, Iraq relied almost entirely on Soviet military aid during most of the 1970s.[13] Soviet training was characterized by strictly choreographed maneuvering and limited flexibility which allowed no initiative or individuality. As compatible as it might seem with the rigid Arab-Islamic learning style discussed earlier, Soviet training was hardly distinguishable in Iraqi performance during the war. The reasons for this contrast rest in the combination of the Soviet desire to restrict Iraqi tactical knowledge and the Iraqi aversion to high levels of discipline.[14]

A unique feature of Soviet military sales is the lack of included training as part of a major weapons purchase. Unlike most Western nations, the USSR charges its recipients for additional training beyond initial qualification. Additionally, purchases from the Soviet Union don't include spare parts or maintenance capability. [15] Conceivably, the Iraqis may have purchased more aircraft than they could readily support. The 20-50 percent in-commission rate for their fighters during much of the conflict with Iran certainly indicates a limited repair capability. [16]

By the mid-1970s, skyrocketing oil revenues left Iraq less reliant on Soviet generosity. As one Iraqi air force official put it, "Now that we have money, we want to purchase the very best."[17] Although Iraq had not maintained diplomatic relations with the US or Great Britain for nearly 15 years, they found a willing supplier in France.

As early as 1985, Iraq began approaching France for advanced aircraft and weapons.[18]

Unlike the purchases from the Soviet Union, the more expensive French items included stocks of spare parts and a fairly comprehensive training program. French training was also considered of higher quality than that offered by the Soviets. In French flying programs, Iraqi pilots were encouraged to show initiative and be more aggressive than in the Soviet counterpart. Naturally, this more comprehensive training program was reserved for only the best Iraqi pilots, but the selection process led to two problems. First, Soviet-equipped squadrons declined in capability as their better aircrews were skimmed off to fill the new French fighters. Second, the aggressive French schooling encouraged pilot initiative. This prompted Hussein to place tight restrictions on training within Iraq after the pilots returned. [19] These two factors combined to degrade, rather than improve, IQAF war-fighting capacity.

Less is known about the effect that Egyptian instruction had on the Iraqis. Egypt, eager for reinstatement into the Arab League after its expulsion following the Camp David agreements, supplied up to 60 pilots to Iraq during the war.[20] The Egyptian pilots' influence is difficult to establish, but they offered Iraq three benefits that France and the USSR could not. First, as a fellow Arab-Islamic nation, Egypt had closer cultural ties to Iraq than did the other two. Second, the Egyptians were already receiving security assistance training from the United States, which provided the Iraqis insight into the type of training the Iranian pilots had received from the Americans. Third, during the war, Iraq could replace aircraft losses easier than it could pilots. This left them with a shortage of instructors which the Egyptians stepped in to replace. The exact nature of the Egyptian instructions is not known, but the Egyptian pilots were obviously welcomed by Iraq since they remained there for the duration of the war.

The Training Factor

Training has a significant impact on a nation's ability to sustain a modern air force. Without

a strong industrial base tied to a competitive system of higher education, lesser-developed countries depend on extranational sources for many of their technical skills. This system of foreign military advisors makes a country vulnerable in war since advisors normally evacuate for political or safety reasons. Iraq learned this lesson when it invaded Iran and the Soviets declared neutrality in 1980.

A wide variety of weapon systems places further strains on a nonindustrialized nation. The Iraqi air force experienced rapid growth and diversification during the war when it turned to the French for modern, Western systems while reestablishing ties to the Soviets for airframes at bargain prices. Able to muster only a rudimentary technological base, the Iraqis found that this diversification stretched an already fragile program to the breaking point. For example, Iraq was unable to increase its pilot-to-aircraft ratio much above 1:1 for much of the war.[21] This may account for rumors that Egyptian pilots flew actual combat missions in Iraqi aircraft.[22]

Dependence on outside technology increases third world air forces' predictability compared to that of self-sufficient militaries. The training they receive is at the whim of the supplying nation and is subject to exploitation. Additionally, reliance on a foreign nation's expertise limits the inclusion of the training into doctrine because unreliable sources bring unexpected changes into a country's plans to employ its air power.[23] Without a comprehensive doctrine, a nation's air force becomes a loose collection of pilots with no common employment foundation.

Training, then, is a key factor for understanding a foreign air force. Inability to achieve technical self-sufficiency forces reliance on outside sources of support. Further complicating the problem is the tendency for Western weapons to modernize faster than the countries buying them can train individuals. As modem weapons become more complicated, lesser-developed countries will find that their ability to field these weapons becomes more difficult.

Notes

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5. Ibid., viii.
6. Patai, 257-58.
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16. Cordesman and Wagner, 81.
17. Fukuyama, 6.
18. Ibid.
19. Neuman, 24.
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21. Aharon Levran and Zeev Eytan, Middle East Military Balance, 1987-1988 (Boulder, Colo.: Westview Press, 1988), 249.
22. Adel Darwish and Gregory Alexander, Unholy Babylon: The Secret History of Saddam's War (New York: Saint Martin's Press, 1991), 155.
23. Neuman, 54.

Chapter 3

Equipping

> We believe that no country with serious problems which relies on importing its weapons can claim to be absolutely independent.
>
> -Saddam Hussein, 1975

Access to arms is a problem for nonindustrialized nations. This issue is more acute under the new world order as the Soviet Union backs away from its client-state policies of the past. Military effectiveness is the ability of a military establishment to "consistently secure the resources required to maintain, expand, and reconstitute itself."[1] While some lesser-developed countries manufacture weaponry, usually in the form of small arms and ammunition, only the most technically advanced nations can sustain a viable aviation industry. This gap in industrial capability leaves the third world highly dependent on imports for its air forces. Securing these resources can be an insurmountable challenge.

Expanding the Military in Iraq

During its war with Iran, Iraq could consistently acquire weapons from other countries for two reasons. First, Iraq enjoyed several ready sources of money. Domestically, the petroleum exporting business financed Iraq's rapid force buildup in the mid to late 1970s. Even when the onset of the war closed the Gulf to Iraqi exports, Iraq offset this handicap by building pipelines through Turkey and Saudi Arabia, thereby eliminating its reliance on Gulf shipping. Iraq also received considerable financed support from the Gulf Cooperation Council (GCC) states. Second, Iraq had plenty of arms supply sources. By 1985 Iraq was the largest importer of military goods,[2] leading the world from 1984-88 with $16 billion worth of imports and accounting for 9 percent of the entire world's military sales.[3] In spite of its lack of a domestic aviation industry, Iraqi air power assets grew rapidly in the 1980s.

Iraq also fostered growth in its domestic weapons industry, but this program was dwarfed by imported arms.[4] Limited production of small arms, ammunition, and nuclear and chemical weapons was still surpassed by battlefield expenditures. Iraqi industry could not fully supply the most basic wartime commodities, and air power was completely reliant on outside sources.[5]

Growth of the Iraqi Air Force

Hussein's iron-handed control of the military never prevented him from providing large quantities of the finest equipment available. His philosophy was to assure his commanders of "unimpeded access to all resources...which would make their agreed tasks possible."[6] To guarantee access to arms, Saddam expanded the list of supplying nations from three at the beginning of the war to 29 by its end.[7] Not surprisingly, the air force grew rapidly.

Iraq obtained aircraft from three sources. The IQAF fielded several British fighter aircraft at the start of the war with Iran but relegated the surviving aircraft to training duty after the first two years of fighting. Poor political relations with Great Britain prevented the purchase of any spares or replacements, so aircraft from France and the Soviet Union made up the bulk of Iraqi imports (fig. 1).

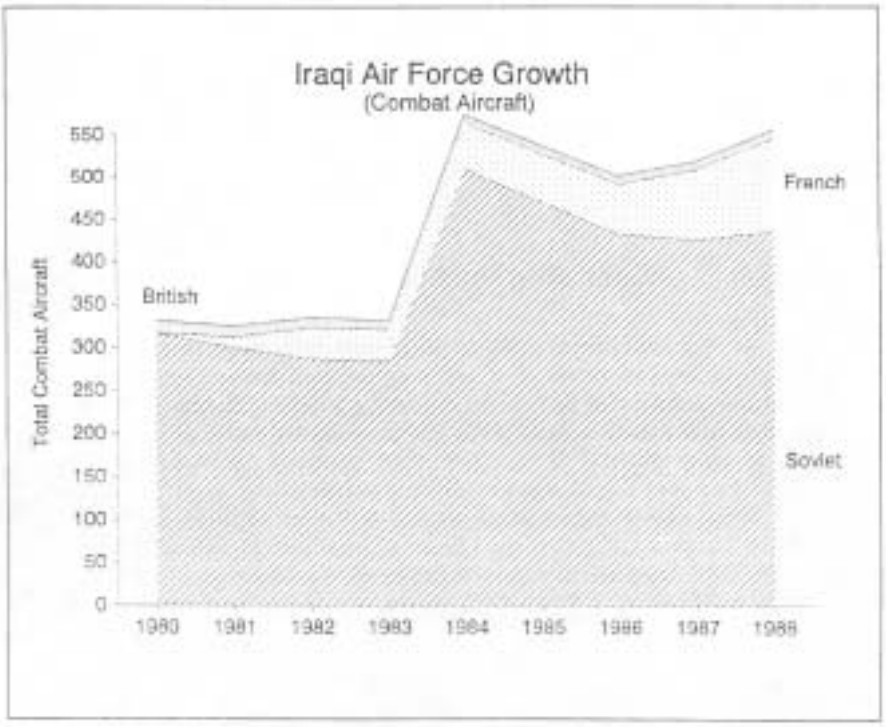

Figure 1. Iraqi Air Force Growth (Combat Aircraft). The increase in aircraft indicates the dominance of Soviet equipment throughout the war, even after modest increases in French hardware (from the Military Balance[London: International Institute for Strategic Studies, 1980-1989]).

Just as the Soviets dominated the IQAF training programs, so did their equipment dominate the Iraqi air force. Throughout the war, Iraq relied on the Soviets for the bulk of their aircraft, which were originally obtained through the previously mentioned Friendship and Cooperation Treaty of 1972. However, Iraq's vulnerability to outside supply was highlighted by tile USSR's declaration of neutrality at the start of the war, which left Iraq without a dependable source.[8] Vowing never to become reliant on the Soviets again, Saddam increased his trade with Western suppliers, especially France.[9]

France was ready to step up exports to Saddam. Viewing Hussein as a bastion against the spread of fundamentalist Islam as well as a cash-paying customer, France eagerly added Iraq to its growing list of customers. [10] The French military attaché in Baghdad summarized the French

attitude when he explained, "France, in selling arms, cannot afford to have many scruples." Not surprisingly the French exported over $90 billion to the third world in the 1980s, nearly $20 billion of which went to Iraq.[11]

Although the French weapons accounted for only 15-20 percent of those used by the Iraqi air force, their greater cost helped France surpass the Soviets in dollar sales by 1985. The first purchase deal was negotiated personally by Saddam in 1975 for $1.7 billion in Mirage F-1 fighters. Just prior to the start of the war, Iraq signed a contract for an additional $4.5 billion worth of the Mirages.[12] As the war progressed, Iraq continued acquiring Mirage F-1 and Super Etendard fighters until their numbers exceeded 100. By the end of the war, Saddam was behind in payments, owing France $3 billion for aircraft purchases, a debt that he still has not paid.[13]

Iraq's Money Supply

Unlike other third world nations, Iraq was able to remedy its industrial shortfalls with money. Endowed with a prospering oil industry, Iraq paid cash for its weapons. Even after the fighting started, Iraq managed a steady supply of money. When the Iranian navy kept Saddam from the Gulf, he built overland pipelines through Turkey and Syria to get his petroleum to market. In the spring of 1982. Syria cut off its pipeline, leaving Iraq with only a 600,000-barrels-per-day (BPD) capacity-down from a prewar high of over two million BPD (fig. 2).[14] When it looked as if Iraq's sole means of income was about to dry up, the GCC states came to Iraq's defense. Just as the Syrian pipeline shut down, Iraqi expenditures reached their peak for the war (fig. 3). Fortunately, money from Kuwait and Saudi Arabia-totaling $15 billion and $30 billion, respectively, by 1986-more than compensated for the losss.[15] By the end of the war, Saudi Arabia was lending over $1 billion per month to the Iraqi cause, burdening Hussein with a total postwar debt of over $80 billion.[16] As long as Iraq offered protection to the GCC states, there

were plenty of fund sources.

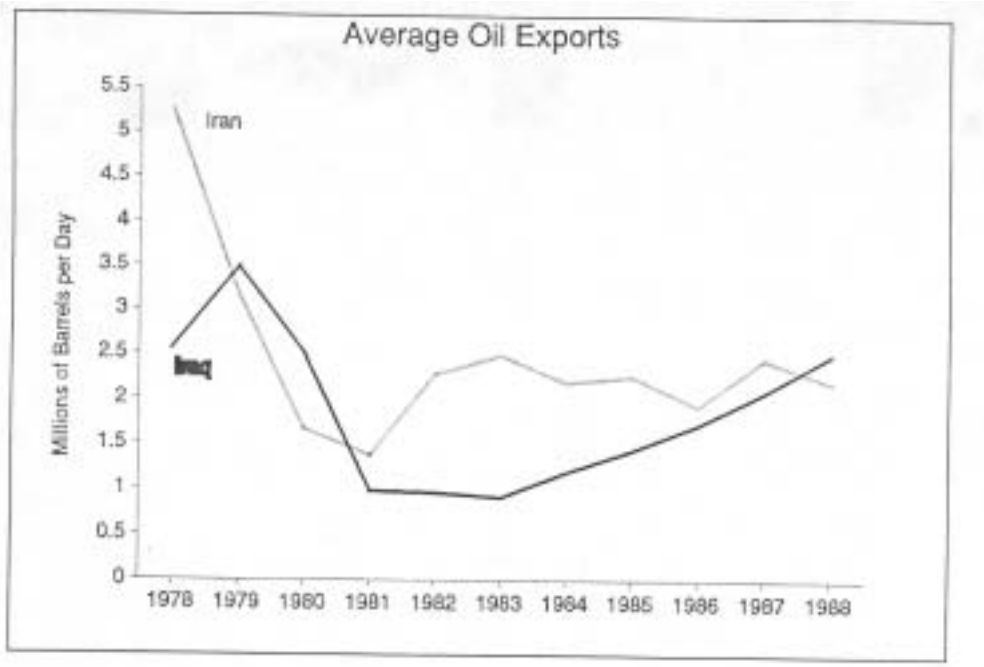

Figure 2. Average Oil Exports. Both combatants suffered significant losses in oil exports at the start of the war, but Iraq sustained the greatest loss for the longest period (from Anthony H. Cordesman and Abraham R. Wagner, The Lessons of Modern War, vol 2, The Iran-Iraq War [Boulder, Colo.: Westview Press, 1991]).

Problems of Acquisition

The Iraqi example describes a nonindustrialized nation with nearly unlimited access to arms imports, a rare case for most of the third world. Even with its vast resources, Iraq repeatedly found itself at the political whim of other countries. The Soviet Union's neutral stance at the start of the conflict nearly grounded the IQAF. Syria's cutting off of the oil pipeline nearly broke Hussein's ability to resist Iran until money flowed in from the Gulf States. Saddam minimized the impact of unreliable foreign arms suppliers by establishing a program of diversified sources, which assured a steady flow of weaponry into Iraq.

With this ready supply of arms, Iraq faced other problems. Convoluted supply organizations, incompatible parts, and changing weapon systems strained Iraq's ability to cope. In some

instances, as war-fighting potential increased through new acquisitions, capabilities decreased. The IQAF learned through the lessons of war that advanced systems are harder to comprehend, more difficult to integrate into doctrine and strategy, and more troublesome to maintain, compared to older, simpler weapons.[17]

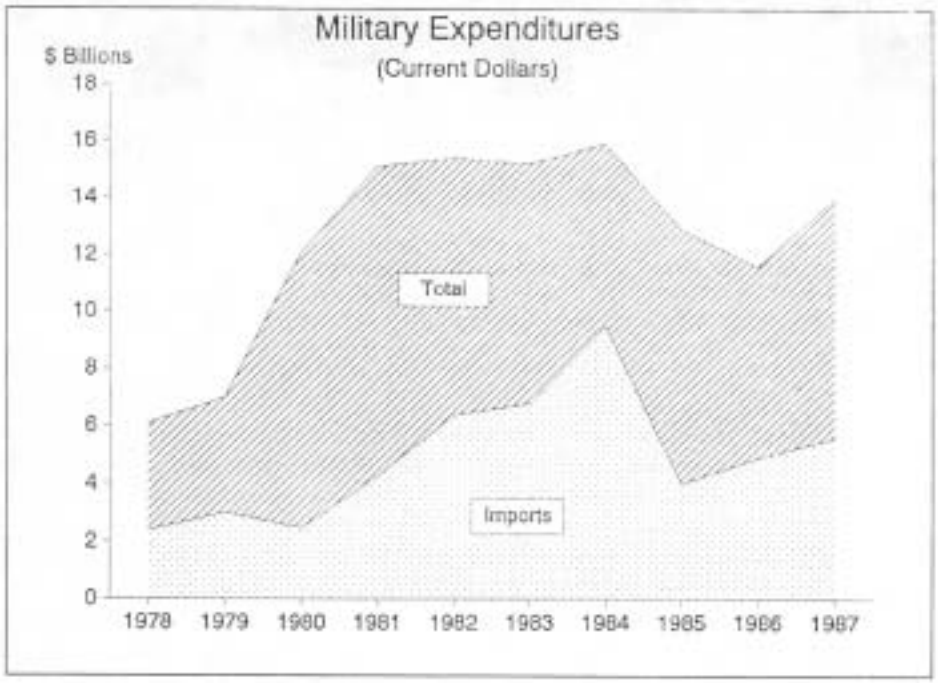

Figure 3. Iraqi Military Expenditures (Current Dollars). Iraqi military expenses during the war illustrate the dependence on outside sources for military hardware purchases (from Anthony H. Cordesman and Abraham R. Wagner, The Lessons of Modern War, vol. 2, The Iran-Iraq War [Boulder, Colo.: Westview Press, 1991]).

Most third world nations are not as fortunate as Iraq and contend with limited funds in addition to aviation-related problems, such as those facing the IQAF. The prospect of developing a comprehensive aviation industry is beyond the reach of most of the third world. Consequently, if less-developed countries are determined to field a modern, decisive air force, they must rely on the sponsorship of an industrialized country. The words of Saddam Hussein at the beginning of this chapter best describe the dilemma facing nonindustrialized nations in their pursuit of modern aerial weapons.

Notes

1. Jack W. Dees, Iraqi Military Effectiveness in the War with Iran (Newport, R.I.: Naval War College, February 1990), 8.
2. Frederick W. Axelgard, A New Iraq? The Gulf War and Implications for U.S. Policy (New York: Praeger Publishers, 1988, 48.
3. Dees, 11.
4. Ibid., 9.
5. Morris Mehrdad Mottale, The Arms Buildup in the Persian Gulf (New York: University Press of America, 1986), 145.
6. Dees, 8.
7. The list included Austria, Belgium, Czechoslovakia, Egypt, Ethiopia, Hungary, Jordan, Kuwait, Morocco, Pakistan, Philippines, Poland, Portugal, Saudi Arabia, Spain, Sudan, United Arab Emirates, and Yugoslavia as nations supplying only to Iraq. Countries supplying both combatants included: Brazil, (China, France, East Germany, West Germany, Italy, North Korea, Switzerland, US, United Kingdom, and USSR. Stephanie G. Neuman, Military Assistance in Recent Wars: The Dominance of the Superpowers (New York: Center for Strategic and International Studies, 1986), 41-42.
8. Dennis Ross, "Soviet Views toward the Gulf War," Orbis 28 (Fall 1984): 437.
9. Shahran Chubrin, "Hedging in the Gulf: The Soviets Arm Both Sides," International Defense Review 20, no. 6 (1987): 732.
10. John Bulloch and Harvey Morris, Saddam's War: The Origins of the Kuwait Conflict and the International Response (Boston: Faber and Faber, 1991), 83.
11. Peter Fuhrman, "It Couldn't Happen to a Nicer Guy," Forbes.", 4 March 1991,39.
12. Committee against Repression and for Democratic Rights in Iraq (CARDRI), Saddam's Iraq: Revolution or Reaction? (London: Zed Books, Ltd., 1986), 227.
13. Fuhrman, 39.
14. Anthony H. Cordesman and Abraham R. Wagner, The Lessons of Modern War, vol. 2, The Iran-Iraq War (Boulder, Colo.: Westview Press, 1991), 134.
15. Neuman, 102.
16. Bulloch and Harvey, 85.
17. Neuman, 107.

Chapter 4

Employment

> I am staying even if [the war} lasts another ten years. I consider the condition [set by Iran} as silly and should be trampled under my foot.
>
> -Saddam Hussein, 13 November 1982.

The war between Iraq and Iran lasted nearly the entire decade of the 1980s and was the longest conflict of this century. It resembled World War I with its static front, trench warfare, and high loss of life. Air power also played a comparable role in each of these wars--always present. but never decisive. Instead, its nature vacillated as the combatants experimented with a variety of roles for their aircraft. In World War I neither side developed what might be called an air power doctrine, but equipment, strategy, and employment progressed enough to establish the aircraft as a useful weapon system. The same might be said for the Gulf War, especially in the case of Iraq. Entering the conflict with no apparent strategy or doctrine, Iraq spent the next seven years exploring practical uses for its air force in support of the war effort. This account of the IQAF's evolution during the Gulf War describes how its strategy developed.

For clarity, the air war is divided into five distinct divisions, each demonstrating a different aspect of Iraqi employment. First, the opening attacks of the war expose Iraq's ill-prepared initial game plan. Next, the two years following the war's start indicate the Iraqi unwillingness to commit its air assets. Third, the export war reveals an increase in Iraqi aggressiveness while attempting to stem Iranian oil exports. Fourth, while conducting the export war, Iraq repeatedly attacks Iranian population centers in a strategic bombing campaign. The last category traces the relationship between Iraqi air and land forces as they adapt themselves to a combined-arms form of warfare.

Prewar Air Power Balance

Through most of the 1970s, Iran's air force outpaced Iraq's because of US support to the shah. However, after the Islamic revolution, the Iranian air force nearly collapsed. During this same period, Iraq concentrated on building its land forces at the expense of a large air force; therefore, when the war began, Iran statistically held the upper hand. International isolation exacted a toll from Iran, resulting in dwindling supplies of spare parts and trained personnel. The Iraqi air force, on the other hand, enjoyed the material benefits of an expanded Friendship Treaty with the Soviet Union and placed orders for modern weapons with France. By 1980 Iraq's combat aircraft totaled nearly 350 to Iran's 450,[1] but better foreign supply sources gave Iraq greater potential to make its aircraft mission-ready. Iran may have had as few as 90 aircraft available and even fewer aircrews to man them, giving Iraq up to a 3: 1 aircraft advantage.[2]

Start of the War

The origins of the conflict dated back several centuries, but the ayatollah's recent attempts at fomenting unrest in the Shi'ite regions of Iraq were at the root of the war's beginning. After several months of border skirmishes, Hussein finally made the decision to invade Iran. Politically, Saddam hoped to topple the Khomeini regime and reestablish Iraqi control of the Shatt al Arab waterway, Iraq's only access to the Gulf. Unfortunately, Iraq's military objectives were not nearly so clear. The invasion was characteristically a limited war fought for unlimited objectives. Hussein seemed to believe that a penetration of 50 kilometers into Iranian territory would result in a collapse of the Iranian government.

The air and ground wars began simultaneously on 22 September 1980. After several weeks of minor border incursions, Iraq launched a full-scale offensive. Iraq's opening air attack was a series of preemptive strikes against 10 Iranian airfields near the Iraqi frontier.[3] Iraq apparently

had learned the value of this counterair strategy from its participation in previous Middle Eastern conflicts. During the Six-Day War of 1967, Israel destroyed the Egyptian air force on the ground in a preemptive strike while Egypt unsuccessfully attempted the same scenario against Israel at the start of the Yom Kippur War in 1973.[4] The Iraqi effort fell far short of either of these performances, lacking in both intensity and capability.

The Iraqi air attack came as a complete surprise to the Iranians and presented an opportunity for the lead in air superiority.[5] However, instead of neutralizing or even seriously damaging the ayatollah's air force, the bombing had no measurable impact on Iranian capability. One often repeated scenario highlighting the IQAF's lack of skill was the inability of Iranian witnesses to identify the Iraqi attackers' intended targets at the airfields.[6] Several factors contributed to this poor performance.

One Iraqi shortcoming was the inability to generate sufficient sorties to accomplish the desired objective of destroying the Iranian air force. Insufficient pilots, deficient maintenance, and old Soviet aircraft accounted for mission-capable rates as low as 20 percent in some squadrons.[7] Estimates show that several hundred sorties over several days were required just to weaken the Iranian air forces.[8] Iraq's first-day total of fewer than 80 sorties followed by two more days of fewer than 50 sorties fell far short of this requirement.[9] After the original strikes on the airfields, Iraq's follow-on missions were random and unorganized due to meager battle damage assessment.[10] Low sortie generation became the trademark of Iraqi air operations for much of the early war years.

Actual weapon systems created another Iraqi shortcoming. Light payload and poor avionics of their aircraft further aggravated the effect of low sortie rates. At the beginning of the war, the bulk of Iraq's combat aircraft was Soviet-built fighters and bombers. These export versions were

significantly degraded compared with the Soviet frontline variants. [11] Limited in both carrying capacity and delivery accuracy, the less capable aircraft contributed to the low success rates of the initial attacks.

Iraqi pilots' skills also contributed to poor performance in the opening strikes. This indicates an "entrenched deficiency in the integration and employment of advanced weapons systems with modern tactics," suggesting a lack of realistic training.[12] Iraqi aircrews lacked combat experience in the preceding years-except for random attacks against undefended Kurdish villagers. At the outset of the war, the pilots found themselves employing unfamiliar weapons against heavily defended targets. [13]

Mission planning was nearly nonexistent. Before the war, the IQAF lacked intelligence on Iranian facilities except for the general location of targets, and Iraq failed to employ its reconnaissance assets after the start of hostilities. Planners misunderstood the types and numbers of weapons required to destroy a target, favoring a more inflated capability than actually existed. Limited prestrike reconnaissance and optimistic weapons estimates characterized the pattern of Iraqi attacks for the next several years.[14] Iraqi planners routinely sent their missions improperly armed with too few sorties to destroy a designated target.

After the initial attack, the Iraqis not only failed to follow up on the early raids, but actually dispersed their own aircraft to wait out the Iranian reprisal.[15] Iran's counterattack was meager, owing to the country's limited resources, but the effect of the attack was magnified by the lack of Iraqi air protection. While Iranian fighters were dropping bombs on Baghdad, Iraqi fighters waited out the attack for several days in Jordan and the Gulf states, leaving their own country relatively undefended from air attack.[16] The Iraqi air force began the war with a limited and faulty strategy.

Air Power in the First Two Years

After the opening campaign, the air war settled into a series of raids and counterraids without strategic or tactical consequence.[17] For two years, neither side developed a consistent air strategy, striking each other with haphazard and ineffectual raids instead. Iraq possessed significant advantages over Iran in aircraft and crews, yet the IQAF could not turn this potential into superiority in the sky. Iraqi performance lacked aggressiveness.[18] Like the ground war, the air war progressed slowly, avoided conflict, and lacked persistence.[19]

The mistakes of the opening air strikes continued during follow-on missions. Iraqis tolerated limited intelligence, inadequate reconnaissance, and insufficient sorties against a given target. They also exaggerated the effectiveness of their infrequent raids, using false poststrike assessment to fit their prestrike objectives. The Iraqi command structure institutionalized this circle of incomplete planning, limited sorties, and inaccurate assessment.[20]

The air strikes flown in the last months of 1980 focused on strategic Iranian targets and ignored any integration with ground forces. Unfortunately, effectiveness of the attacks was limited by the IQAF's failure to concentrate its forces.[21] Iraq seemed reluctant to attack Iranian economic targets in the beginning of the war for several reasons. First, Iraqi pilots were timid against a determined surface-to-air defense and often lost in early air-to-air engagements.[22] Second, the enormous value Iraq placed on its own infrastructure suggested that an attack on Iran's industry would invite unthinkable counterattacks.[23] Third, the Iraqis felt they could not stop an Iranian reprisal due to their own limited air defense capability.[24] These factors combined to keep Baghdad's air war at low ebb in the final months of 1980.

Iraqi air defense weaknesses were obvious from the outset. Poor positioning, wide dispersion, and old Soviet design limited its effectiveness against Iranian attacks.[25] The air defense forces of the IQAF managed the early warning systems while the army controlled the

surface-to-air weapons. System breakdowns repeatedly led to instances of Iraqi fighter fratricide.[26] Wisely, the air defense fighters avoided populated areas altogether, although cities were the most common Iranian fighter targets.[27] The relatively ineffective Iraqi air defense forces permitted Iranian retaliatory strikes to be a real threat. One Iranian mission against Al-Walid Airfield in April 1981 destroyed 46 Iraqi aircraft. Additionally, the success of the Israeli raid on the Osirak nuclear facility in June 1981 showed the inadequacy of the Iraqi air defense.[28]

In 1981 and the beginning of 1982, IQAF activities nearly ceased due in part to three factors. First, in the spring of 1982, the entire air force was repeatedly grounded during purges for plots against Saddam's regime.[29] Second, Iraq only attacked undefended-and therefore relatively insignificant-targets. Still, these raids invited fierce retaliatory strikes from Iranian air force fighters with enough range to hit any target in Iraq. Third, the defeats suffered by land forces in the ground war compelled Saddam to hold back the air force as his strategic reserve. Iraq found itself in an untenable position. When Iraqi warplanes supported the army, losses were unbearably high, but when they struck Iranian economic targets, Iranian warplanes retaliated against the heart of Iraq.[30] The loss of 175 warplanes during this period indicated the high cost of indecision.[31]

Iraq's uncertainty ended when Teheran mounted a counteroffensive against Iraqi land forces in Iran. This turn of events forced the Iraqi air force into a strategic reserve role it held until the end of the war.[32] Hussein began committing his air assets against enemy ground formations in a strategy designed to slow the Iranian advance. For example, in the Khorramshahr battle of May 1982, the IQAF supported the army with over 100 sorties per day. The tactical effects were minimal due to communications problems, target identification, single-ship tactics, and nonexistent night capability. Strategically, however, Iraqi air power bought time for the

retreating ground forces by converting a rout into an orderly withdrawal.[33]

The first two years of the air war ended indecisively. Poor training, substandard equipment, and a nonexistent strategy confirmed Iraq's inability to combine advanced weapon systems with modern tactics.[34] Facing persistent shortages of supplies and replacement aircraft, Iraq hoped the deterring potential of its air force might preclude its use in combat. Changes in strategy would eventually develop, but thus far Iraq had failed at building an effective air defense, massing forces, and persistently attacking Iran from the air.

Export War

To deprive Teheran of its sole means for financing the war, Baghdad extended the conflict into Gulf oil shipping in 1982. Unfortunately, Iraq faced a major obstacle in its maritime warfare capability; it possessed no navy. Iran, with its own modest naval force, successfully cut Iraq from the Gulf, forcing Hussein to build oil pipelines through neighboring countries. These pipelines tentatively secured Iraq's link to world oil markets, an insurance Iran did not have through the Gulf. Unsuccessful in its land campaign, Iraq used air power to strangle Iran's industry. Politically, this action highlighted the hostilities to the rest of the world, threatening outside intervention. Economically, it put Iran's financial means of support at risk.

Iraq's blockade attempts began at the start of hostilities with insignificant raids on the Kharg Island oil terminal, but attacks on the complex in November 1982 proved more determined. The IQAF stepped up its bombing missions against the oil terminal so that by the end of December, the IQAF had flown 74 strike missions. Still, the raids' effectiveness was disputable.[35] Iraqi pilot skills and perseverance proved wanting in the attacks, as accounts claim that many of the pilots actually dropped their ordnance offshore while avoiding the defenses at Kharg.[36]

Not discouraged by its shortcomings, the IQAF continued attacking oil related targets until

January 1983, when a series of raids and counterraids resulted in a combined loss of 135 aircraft by both sides.[37] The losses brought Iraq's total wartime attrition to over 200 aircraft.[38] Neither side of the conflict could afford such high attrition figures, but Iraq could replace its aircraft much more easily than could Iran. Baghdad's French F -Is, with improved range and accuracy over Soviet planes. became operational in early 1983.[39] Further, impressed with the capability of the Exocet in the Falklands War, Iraq had purchased the missile from France in 1982. The missile was originally launched from Iraq's French-built Frelon attack chopper, but the short range of these helicopters convinced Iraq to purchase more capable systems from France.[40]

A key phase of the export war, dubbed the "tanker war," started in 1983. On 12 August Iraq formally declared an exclusion zone in the Gulf extending from the Shatt-al-Arab along the Fao Peninsula to Kharg Island, a distance of only 100 miles (fig. 4). Three days later, Iraq warned all commercial traffic to clear the zone.[41] The following day, Iraq started shipping attacks in and out of Iranian ports. The number of raids was small, barely equaling the number of sorties flown against Kharg Island at the end of the previous year, but Iraqi fighter and helicopter pilots claimed high success rates. Most reports show that fewer than 20 vessels were actually attacked, with none sunk in these early efforts. [42]

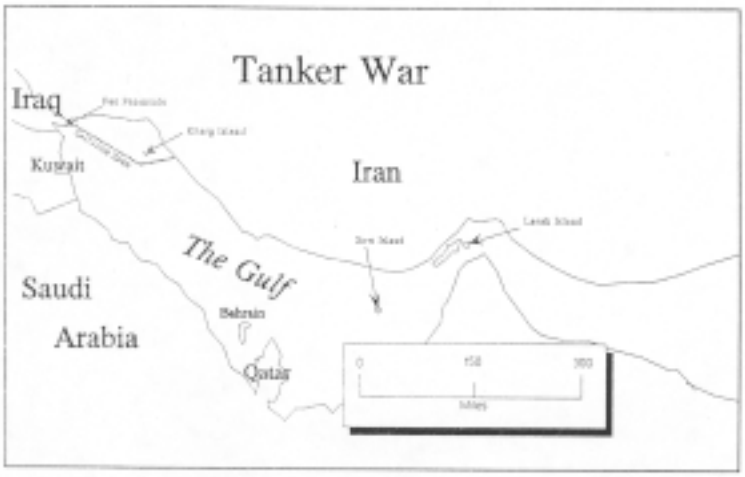

Figure 4. Key Targets of the Tanker War

October 1983 was an especially volatile time in the tanker war-regionally and internationally. France approved the delivery of five Super Etendard fighters, providing Iraq the capability to deliver the Exocet missile at greater ranges with considerably more accuracy than the Frelon helicopters.[43] Organized and financed by Saudi Arabia, leasing the five aircraft caused a political crisis in the Gulf region.[44] Iran's threat of escalating the tanker war if the delivery took place seemed ominous to the other members of the GCC states. Increasing hostilities in the Gulf region forced other Gulf nations to reconsider their support of Iraq by pressuring Baghdad to cease its antitanker operations.[45] Internationally, Iran boycotted French products and supported the bombing of the French barracks in Lebanon shortly after the Etendard delivery occurred.[46] Frustrated with continued western support for Baghdad, Iran publicly claimed that western powers were fueling the Gulf War with arms sales in order make it last longer .[47]

After a few months of training, the Iraqis exercised their new capability over the Gulf. In March 1984, the IQAF flew its first antishipping attacks using the Etendard-Exocet combination. This new Iraqi maritime threat was more successful politically than militarily, due in part to the relatively poor showing by the Exocet.[48] In the remainder of 1984 Iraq managed a total of only 35 successful attacks against Gulf shipping, an average of only four attacks per month.[49] This erratic strategy against Iranian oil exports was only partially successful. Initially, Teheran's exports dropped, but they slowly rebuilt as Iran invented other means of transporting the oil to world markets (fig. 5). Again, Iraqi planners failed to mass their resources, opting for a piecemeal strategy instead.

Figure 5. Effects of the Tanker War on Iranian Oil Exports. Iraqi tanker attacks were unable to stop Iran's exports. (From Sreedhar Kapil Kaul, Tanker War Aspect of the Iran-Iraq War [New Delhi: ABC Publishing House, 1989]).

The next two years of the tanker war were similar in intensity. Iraqi air attacks consisted of a two-ship flight of Exocet-capable Etendards escorted by a pair of Mirage F-ls. They took off from bases in southern Iraq, flying out over the Gulf at medium to high altitude.[50] Approaching an area of known tanker activity, the aircraft searched the water for telltale radar returns indicating tanker-sized targets. Once a likely tanker was detected, the attacking aircraft launched their Exocets, turned and descended, then ran for home. At no time were the intended targets visually inspected before these engagements.[51] Figure 2 indicates no significant jump in Iraqi shipping strikes until 1986.

The 1985 campaign saw a more determined effort by Baghdad to curb Iran's oil exports by concentrating attacks on Kharg Island oil terminal. Termed a sampling of "comprehensive war" for the Iranian regime by Sad dam Hussein,[52] Iraq launched over 60 separate strike missions against the complex between August and December .[53] A typical attack consisted of two to four aircraft, but some raids had two waves of four aircraft each.[54] The weapons used in the attacks against Kharg marked another major milestone. After receiving the AS-30 laser guided bomb

from the French earlier in the year, Iraqi pilots received comprehensive training in France for these more accurate weapons.[55] The August attacks on Kharg proved much more effective than earlier attempts since Iraqi pilots could release their weapons from reasonably safe stand-off distances outside Kharg Island's defenses.[56] Still, Iraqi strikes against Kharg Island through the rest of the year met with sporadic success. The lack of persistence in follow-on attacks allowed the Iranians to rebuild, and the irregular strikes against Iran's oil exporting capacity proved indecisive even after the introduction of more capable weapon systems.

In 1985, the tanker war was also inconclusive. Lloyd's of London Shipping Intelligence indicated Iraq attacked 33 tankers, a decrease of 20 from the previous year. Events in the ground war might explain this decrease as the IQAF tried to carry out its strategic reserve role in support of the ground war. When Iranian ground offensives seriously threatened Iraqi land forces, the Air Force halted its strategic bombing missions to shore up defenses. Additionally, Iranian threats against the GCC states often resulted in GCC pressure against Iraq to stop its indiscriminate attacks.

In 1986, Iraq continued pressuring Iran's economy with attacks on Kharg Island. To reduce the effect of the Iraqi attacks on the island complex, Iran developed a unique solution. Instead of simply building up the defenses around Kharg, in 1984 Iran constructed new complexes at the south end of the Gulf on Sirri and Larak Islands.[57] These depots were assumed to be well outside the range of Iraqi aircraft and therefore immune from attack. To supply the new island terminals with crude oil, Iran shuttled its own fleet of defended tankers between Kharg and the outer islands, protecting international customers from making the voyage. Although initially unable to stop the Iranian scheme, the Iraqi air force prepared to counter it.

With the F-1 delivery from France, Iraq received range-extending, external fuel tanks. Insufficient for reaching the southern Gulf islands, the extended range made attacks against Kharg and other shipping in the northern Gulf easier. Iraq also began training in aerial refueling techniques. Whether through a modified AN-12 Cub or through a "buddy refueling" operation between flights of Mirages, this in-flight refueling capability allowed Iraq to strike all the way to the southern end of the Gulf.[58]

Baghdad unveiled its new capacity in August 1986 when Iraqi fighters attacked the Sirri Island oil terminal damaging the Iranian facilities and several ships in the harbor. The IQAF shocked Teheran further by attacking the Larak Island oil terminal in November 1986 on a round-trip mission of over 1,500 nautical miles.[59] Iraq proved that no area of the Gulf was secure from air raids. The sporadic attacks against these facilities affected Iran's exports only slightly but did raise customers' insurance rates.[60]

These technological improvements resulted in a modified strategy, but Iraq seemed reluctant or unable to exploit them extensively. By November 1986, Baghdad Radio announced Iraq's 25Oth attack against Kharg Island, a figure drawn from the previous six years.[61] Attacks on tankers increased too. Iraq struck 66 ships in 1986, up from a total of 33 the previous year.[62] As in previous years, the attacks were infrequent, causing only a slight decline in Iran's oil exports. The final two years of the tanker war had only slight increases in shipping attacks. In the first half of 1987, international pressure forced Saddam to limit Gulf shipping attacks, as highlighted by the US reflagging of Kuwaiti tankers.[63] By the end of August 1987, Iran was still unwilling to accept a truce in spite of the increased pace in the tanker war. Tanker strikes and missions flown against Kharg, Sirri, and Larak Islands continued until the end of the war but were a small factor in Iranian oil shipments, only modestly pressuring the Iranian economy.

The export war proved Iraq incapable of turning a key target into a decisive factor. There are two reasons for this failure. First, Iraq did not mass sufficient aircraft in its attacks, thus causing only limited damage to the Iranian oil industry. Second, Baghdad's campaign was not systematic and persistent, allowing Iran the opportunity to make necessary repairs to its industry. A continuous, concentrated campaign against the Iranian oil industry would have had decisive effects. The severe, short-term reductions of Iran's capacity after individual attacks indicated the effectiveness of the raids, but the Iraqi air force's routine failure to follow up its strikes against Iran's oil industry allowed the conflict to drag on.

Targeting Iran's Will

Iraq's air campaign also targeted the morale of the Iranian people in hopes of a speedy political solution to the war. As with its other air power strategies, Iraq also made serious errors in this form of warfare. With limited resources and a tendency to husband the ones he had, Saddam used his air assets in piecemeal fashion against Iranian civilian targets. The Iraqi strategic bombing campaign was sporadic and often deterred by an inability to prevent Iranian retaliatory attacks.

A determined civilian bombing campaign began in August 1982 with a series of air raids against several Iranian cities.[64] Iraq's decision to attack civilian targets reflected a growing concern that the tide of the war was turning in favor of Iran. Initially satisfied with strikes against military and economic targets, Saddam changed his attitude in light of the large gains by the Iranian army against Iraqi ground forces. He stated that Iraq had the right "to select special means and methods to make Iran's rulers understand that the price of aggression is very high."[65] The attacks against Iranian civil targets were meant to demonstrate to the Iraqi people that their country was still on the offensive. If the public knew the truth concerning Iraq's retreats in the

ground war, that fact might prove politically destabilizing.[66]

The early rounds of civilian targeting grew in intensity, reaching a peak in January 1983. On 18 January, Iraq launched a mass raid against 30 urban centers and several economic sites in Iran.[67] The raids failed. Not only did Iran successfully retaliate the next day, but Iraq lost over 80 valuable aircraft while destroying only 40 of Iran's.[68] Realizing the high attrition suffered for such minimal return, both sides unilaterally stopped their strategic bombing for several months' recuperation.

Iraq resumed the air offensive in early 1984 after receiving several new Mirage F-l fighters from France. The aircraft gave Iraqi pilots greater range, payload, and accuracy over their older Soviet aircraft. These aircraft were also inconsistently employed either as retaliation for Iranian air attacks or in extremis to repulse the Iranian "human wave" attacks in the ground war. The renewed attacks against civilian targets in February 1984 led to a UN-mediated cease-fire for populated areas.[69]

By 1984 Iraq had a greater than five-to-one advantage over Iran in aircraft, although the figure is somewhat misleading in terms of sortie-generation rates. Iraq, with over 300 aircraft, could barely launch over 150 sorties per day. Iran, on the other hand, often flew over 120 sorties per day in five-day increments with its 60-80 operational fighters.[70] This surge capability prevented Iraq from determining Iran's aircraft shortfall for the next two years.

Iraq resumed its random attacks against Iranian targets in June 1984 but still failed to mass its air power in a decisive manner. Baghdad's strategic bombing campaign reaped limited benefits but was the only available weapon for attacking Iranian territory.[71] According to Iranian radio, from January 1982 until February 1984, Iraqi air raids accounted for over 4,000 Iranian deaths and 22,000 injuries.[72]

In March 1985 Iraqi air attacks against a steel mill and an unfinished nuclear power plant led Iran to claim the beginning of a "war of the cities" in violation of the 1984 UN agreement.[73] A series of air and missile strikes followed against populated areas by both sides. Iraq flew over 150 sorties against cities in a three-day period.[74] By the end of March, Teheran reported that the Iraqi attacks killed over 1,400 noncombatants, bringing the total for the war to 7,000 civilians killed and 30,000 injured.[75] One Iraqi general related Iraq's reason for resuming the war of the cities by stating, “We want to bring the Iranian people into the front lines of the war. We hope this will encourage the Iranian people to rebel against their government and bring the war to an end.”[76] On 6 April both sides arranged another cease-fire for city attacks, but Iraq again resumed the strikes at the end of May. By the middle of June, after 50 sorties against Teheran, Iraq inexplicably stopped its attacks.[77]

Owing to its willing arms suppliers, by the close of 1985, Baghdad enjoyed a numerical superiority of seven-to-one over Iran in combat aircraft.[78] In spite of these overwhelming numbers, Iraq was still either unwilling or unable to concentrate its air power. Still, the bombings did have one indirect consequence in the war. Iranian defenses surrounding some of the key oil installations such as Kharg Island were weakened when many of the emplacements were moved to Teheran to bolster defenses in the spring of 1985.[79] This contributed to the lower losses of the Iraqi raids against Kharg the following August. The strategic bombing campaign began to affect other parts of the war.

Strategic operations slowly started in 1986. Initially, air assets were drawn off in support of the ground forces to help blunt a major Iranian offensive. With insufficient aircraft to support both strategic bombing and the army, the Iraqi air force was obliged to use a majority of its resources to slow the Iranian advance in southern Iraq near the Fao Peninsula. Once the

defensive perimeter was secured, the IQAF resumed its strategic bombing.

Iraqi strategic air power in the fall of 1986 was notable. In addition to the surprise attacks against the Sirri and Larak Island oil terminals, Iraq stepped up its attacks against the infrastructure of major cities. For the first time, Iraq concentrated its efforts against targets such as electrical power plants and refineries.[80] The intensity of this newest aerial assault produced significant results. The destruction of 25 percent of Iran's domestic oil products at Tabriz coupled with the damage at the Teheran and Isfahan refineries forced the Iranians into an energy-rationing program in the winter of 1986-87 and required them to import refined petroleum products.[81] The increased magnitude of the Iraqi strikes began to have the desired political effect. Teheran was encountering open opposition from its people in protest against the war.[82] Increased resistance to conscription compelled Iranian leaders to make domestic unity the central theme of their public speeches instead of anti-Iraqi rhetoric.[83]

The year 1987 began with a major Iranian ground offensive in the south. In response to the offensive, Baghdad increased its attacks against Iranian population centers. By the end of January, these attacks added another 1,800 deaths and 6,200 injuries to the growing civilian statistics.[84] The Soviet Union, in an attempt to act as mediator between the two rivals, persuaded Iraq to cease attacking Iranian cities by offering to replace Baghdad's aircraft losses with modern MiG-27s and MiG-29s.[85] This precipitated yet another stand down in the war of the cities, but not before Iraq faced a more serious problem in its air campaign. Iraqi aircraft losses were intolerable. Replacing the aircraft, although expensive, was not the biggest problem. The severe attrition experienced by the pilot force degraded the ability to generate sorties. Iraq lost nearly 90 airplanes in the opening months of 1987, but it still had nearly 500 fighter aircraft. Unfortunately, the ranks were whittled down to only 70-80 experienced aircrews.[86] As a result,

the rest of the air war of 1987 consisted of the same indecisive campaign seen at the outset of hostilities.

The first two months of 1988 started slowly in the air war, but an effective Iraqi attack against the oil refinery outside Teheran at the end of February returned Iran to fuel rationing.[87] This assault touched off a new wave of city attacks by both sides, but this time the Iraqi forces sharply increased the severity of their offensive. Combining fighter sorties with the al-Hussein missile--a modified Scud-B-Baghdad claimed over 300 aircraft and 135 Scud attacks in March and another 110 aircraft and 66 Scud attacks in April.[88] The effect of these strikes was far greater than that of past episodes in the war of the cities, bringing an atmosphere of desperation to the Iranian capital. Coinciding with the Iranian elections of 1988, the raids caused panic among the populace and a general evacuation of the city. This prompted an Iranian program of free food-ration books to people who stayed at home to vote.[89] A combination of massed forces with continuous attacks by the Iraqi air force finally wore down the Iranian populace.

The Iraqi strategic war seems to have paid off in 1988. Although the war of the cities cannot be credited as the reason for Iran's withdrawal from the conflict, the magnitude of the campaign near the end of the war certainly was a significant contribution. Even with its preponderance of hardware, Iraq never gained air superiority to such a degree that attacks against the Iranian people could be made without fear of retaliation. As was their practice in other forms of aerial combat, the Iraqis conducted strategic air warfare in a piecemeal manner.

Air Support of the Army

The Iraqi air force experienced its greatest evolution in support of the ground war (fig. 6). At the beginning of the conflict there were no provisions for IQAF interaction with the army. By the war's conclusion, the air force made considerable contributions during the final offensives.

Surprisingly, between 1980 and 1987, there was limited evolution in tactical air power. In fact, during these years, it was apparent that the Iraqi air force only supported the army when forced to by circumstances.

The historical precedent for IQAF support of ground troops explained its distaste for the mission. During the 1973 Arab-Israeli War, Iraq sent several

Figure 6. Geographic Extent of the Land War (From Anthony H. Cordesman and Abraham R. Wagner, The Lessons of Modern War, vol. 2, The Iran-Iraq War [Boulder, Colo.: Westview Press, 1991]).

squadrons of attack fighters to support both Syrian troops in the Golan Heights and Egyptian troops along the Suez. The Syrian and Egyptian advances, reinforced by Iraqi fighters, were initially successful against the surprised and overwhelmed Israeli defense forces. However, after regrouping, the Israelis destroyed over 40 Iraqi planes with a combination of air-to-air and surface-to-air weapons.[90] This disaster influenced Iraqi pilots' planning and training through 1980.

Other important considerations affected the air force during preparations for the war. The army was the preeminent branch of the military within the hierarchy of Ba'athist Iraq, since it

best served the purposes of Saddam Hussein's internal security. At the same time, the air force was the more technical-and therefore generally more educated--segment. This led to a natural rivalry that prevented any tendencies toward joint strategy development. As a result, Iraq entered the war with no developed means of communication between air and ground forces[91] and an air force that was convinced its own army was as likely to shoot it down as was the enemy.[92]

For the first three years of the war, the IQAF interdiction and close air support (CAS) efforts alternated between no allotted missions at all to hundreds of sorties per day in last-ditch attempts to stall Iranian attacks. The lack of command and control, ground forward air controllers, target identification training, and night capability confirmed what army and air force leadership already believed: CAS and interdiction would not work.[93] Iran's meager air forces were the reason Iraq could continue with this strategy.

In 1983, during Iran's spring offensives, the IQAF finally conducted a determined campaign in support of the army. Although C^2 systems were still a problem, improved pilot proficiency and French F-1 fighters offered a beneficial, although indecisive, contribution to the Iraqi defenses.[94] One notable change in Iraq's force composition was its increased use of attack helicopters. Assigned to the air force at the beginning of the war, they were reassigned to the army in a political move by Saddam Hussein after the army exaggerated claims of Iranian helicopter force effectiveness.[95] The increased use of helicopter gunships against the Iranian invasion of 1983 gave the army a new potential on the battlefield. Not surprisingly, the helicopters were originally employed as indirect artillery, lobbing their missiles from behind the front lines.[96]

For the next two years, the IQAF supported the ground forces only when they were about to be overrun by Iranians. Predictably, aerial bombardment in a static trench-warfare environment

proved nearly useless. During the Iranian offensive against the Fao Peninsula in January 1986, Iraq committed 355 fighter and 134 helicopter sorties to the battle, but the Iranians moved at night, dug in during the day, and exploited the generally poor weather during the season to avoid Iraq's air force.[97] All Iraq could show for its efforts was the loss of the peninsula as well as of several dozen fighters and helicopters.[98]

Iraqi air force ground support experienced another setback in late 1986 through early 1987. Facing another Iranian offensive against the city of Basra, Iraq fully committed its air forces, generating several hundred sorties per day.[99] Although successful at stemming Iran's human-wave attacks, the presence of a dense surface-to-air threat-partly supported through Hawk missiles received by Teheran in Iran-Contra sales[100]-left Iraq with a loss of over 50 aircraft in two days of fighting, for a 10 percent attrition rate.[101] Although Baghdad's ability to recoup its equipment losses through weapons imports far outstripped Teheran's, the losses put Iraq at a critical shortage of pilots. The remainder of the fighting in 1987 consisted of a series of small Iranian offensives, with the well-developed Iraqi defenses easily repulsing them.

Iraq kept pressure on the Iranian populace with the war of the cities while pursuing the offensive land warfare. Between April and August 1988, the Iraqis achieved five major victories, drove the Iranians from their land for the first time since 1982, and reinvaded Iran using blitzkrieg-style tactics.[102] With nearly 600 combat aircraft against Iran's 70 remaining fighters, the IQAF combined interdiction against enemy staging areas with CAS strikes on the retreating Iranian army.[103] Saddam Hussein finally selected certain military leaders for their abilities instead of their political preference and thus improved his fighting force's capabilities. With the Iranian population exhausted and Teheran's army bled nearly white, Iraq finally put its superiority in arms to good use.

Summary of Iraqi Air Combat

Air power was a minor factor during the bulk of the conflict. Faced with a static front on the ground for most of the war, Iraq used its aerial assets as a temporary expedient instead of as an enduring instrument of power projection. By the end of the war, after six long years of wasted effort, Iraqi air power made a contribution to the collapse of Iran. This success came only after resolving many weaknesses inherent in the Iraqi military.

Combining modern technology with antiquated tactics led to a situation much like that in World War I. Both antagonists were equipped with improved weapons of war but relied on tactics that antedate much of this century. Frontal attacks, trench warfare, positional battles, and human-wave assaults led to immobility on the ground front. Inferior air tactics that either harassed the enemy's population or extended artillery did nothing to break the impasse. The IQAF failed to employ the principle of mass in its air campaign until near the very end of the conflict, virtually wasting many of the missions it flew in the first seven years.

Air power is of no value unless it is at least strong enough to prevent or deter enemy air action over friendly territory. For the first five years of the war, the IQAF possessed substantial numerical superiority over Iran but did not exploit it for two reasons. First, Baghdad failed to correctly assess its aerial supremacy over Iran until 1985. With only a token flying force, Iran hid its true condition from the Iraqis by carefully selecting only those missions offering the greatest psychological effect. This left Baghdad with the perception it was receiving more punishment than it was inflicting. Second, unable to prevent Iranian retaliatory missions with any consistency, Iraq found itself deterred from executing a more persistent strategic campaign. Initially haphazard in its performance, the IQAF spent many years maturing from a small, relatively ineffectual force into the fifth largest air force in the world.

Notes

1. Mark Heller. Dov Tamari, and Zeev Eytan. The Middle East Military Balance (Tel Aviv: Jaffee Center for Strategic Studies. 1983), 18.
2. Ibid.
3. Nils Wessel. ed., The Iran-Iraq War: New Weapon.... Old Conflicts (New York: Praeger Publishers. 1983).43,
4. Maj Ronald E. Bergquist, The Role of Airpower in the Iran-Iraq War (Maxwell AFB, Ala.: Air University Press, December 1988), 57.
5. Wessel, 43.
6. Bergquist, 58.
7. The Military Balance (London: International Institute for Strategic Studies, 1980), 55.
8. Anthony H. Cordesman, The Gulf and the West: Strategic Relations and Military Realities (Boulder, Colo.: Westview Press, 1988), 655.
9. Bergquist, 57-58.
10. Morns Mehrdad Mottale, The Arms Buildup in the Persian Gulf (New York: University Press of America, 1986), 160.
11. Anthony H. Cordesman and Abraham R. Wagner, The Lessons of Modern War, vol. 2, The Iran-Iraq War (Boulder, Colo.: Westview Press, 1991), 83.
12. Mottale, 157.
13. Cordesman and Wagner, 84.
14. Efraim Karsh, The Iran-Iraq War: A Military AnalY.5is (London: International Institute for Strategic Studies, Spring 1987), 36--37.
15. Cordesman, The Gulf, 664.
16. Cordesman and Wagner, 98. The IQAF's tendency to run and hide when vulnerable to counterattack was reenacted in the 1991 Gulf War.
17. Edgar O'Ballance, The Gulf War (London: Brassey's Defence Publishers, Ltd., 1988), 70.
18. Richard Gabriel, Fighting Armies: Antagonists in the Middle East (Westport, Conn.: Greenwood Press, 1983), 70.
19. Wessel, 43.
20. Cordesman and Wagner, 84.
21. O'Ballance, 42.
22. Ibid., 546.
23. Stephen C. Pelletiere, Douglas V. Johnson III, and Lief R. Rosenberger, Iraqi Power and U.S. Security in the Middle East (Carlisle Barracks, Pa.: Strategic Studies Institute, US Army War College, 1990), 48.
24. Cordesman, The Gulf, 549.
25. Bergquist, 52.
26. Karsh, 40.
27. Ibid., 52.
28. Cordesman and Wagner, 119.
29. O'Ballance, 87.
30. Karsh, 38.
31. Cordesman, The Gulf, 671.
32. Karsh, 38.

33. Cordesman and Wagner, 139.
34. Mottale, 157.
35. Cordesman, The Gulf, 686.
36. Dilip Hiro, The Longest War: The Iran-Iraq Military Conflict (New York: Routledge, Chapman and Hall, Inc., 1991),92.
37. O'Ballance, 213.
38. Ibid., 123.
39. Ibid., 213.
40. Cordesman and Wagner, 157.
41. O'Ballance, 128.
42. Ibid.
43. Ralph King, The Iran-Iraq War: The Political Implications, Adelphi Paper (London: International Institute for Strategic Studies, Spring 1987), 56.
44. Hiro, 114.
45. Mottale, 161.
46. Hiro, 125.
47. King, 5.7.
48. Nick Cook, "Iraq-Iran-The Air War," International Defense Review, November 1984, 1605. Although the Exocet was generally successful in striking the desired target, the large size of oil tankers and the dampening effect of their cargo meant that the missile made only relatively harmless holes in the side of the ship.
49. Gregory W. Ellison, Operational Art: The Missing Link in the Iran Iraq War (Fort Leavenworth, Kans.: US Army Command and General Staff College, School of Advanced Military Studies, 26 April 1988), 27. At the rate of four attacks per month, Iraq was targeting only .15 percent of Gulf shipping.
50. Cordesman and Wagner, 193.
51. Ibid., 194.
52. Hiro, 144.
53. Ellison, 27.
54. O'Ballance, 171.
55. Heller, Tamari, and Eytan, 114.
56. Pelletiere, Johnson, and Rosenberger, 16.
57. Cordesman and Wagner, 235.
58. Heller, Tamari, and Eytan, 114.
59. Shaman Chubrin and Charles Tripp, Iran and Iraq at War (Boulder, Colo.: Westview Press, 1988), 63.
60. Sreedhar Kapil Kaul, Tanker War Aspect of the Iran-Iraq War (New Delhi: ABC Publishing House, 1989), 2.
61. Cordesman and Wagner, 242.
62. Kaul, 20.
63. Hiro, 293.
64. Ellison, 23.
65. Chubrin and Tripp, 61.
66. Ibid.
67. O'Ballance, 122. 68. Ibid., 213. 69. Hiro, 290.
70. Cordesman and Wagner, 158-59. The disparity between Iranian and Iraqi sortie rates was

often attributed to maintenance capacity, as discussed in chapter 2.
71. Heller, Tamari, and Eytan, 109.
72. O'Ballance, 153.
73. Hiro, 134.
74. Cordesman and Wagner, 205.
75. Mark Whitaker, Rod Nordland, and Jane Whitmore, "Teheran's Blunder: A Decisive Defeat?" Newsweek, 1 April 1985, 36-38.
76. Hiro, 135.
77. O'Ballance, 170.
78. Mottale, 162.
79. Hiro, 144.
80. Heller, Tamari, and Eytan, 108.
81. Pelletiere, Johnson, and Rosenberger, 27.
82. Michael D. Barbero, The Iran-Iraq War of Exhaustion: The Results of the Paradoxical Trinity (Fort Leavenworth, Kans.: US Army Command and General Staff College, School of Advanced Military Studies, 9 May 1989), 34.
83. Mark A Heller, "The War Strategy of Iran," Middle East Review, Summer 1987, 22.
84. Hiro, 182.
85. Ibid., 183.
86. Ibid., 184. Aircrew numbers are often the limiting factor in major campaigns. In spite of efforts to field a sufficient number of pilots, the USAF found that the greatest limitation in the Gulf War air campaign was crew members. Iraq's inability to domestically train its own forces exacerbated this problem.
87. Cordesman and Wagner, 363.
88. Ibid., 366.
89. Elaine Sciolino, "Turmoil Is Reported in Iran; Iraqi Air Raids Add to Mood," New York Times, 21 April 1988, A8.
90. Bergquist, 59.
91. Karsh, 38.
92. Bergquist, 60.
93. Cordesman and Wagner, 139.
94. Hiro, 95.
95. Karsh, 39.
96. Stephen C. Pelletiere and Douglas V. Johnson III, Lessons Learned: The Iran-Iraq War (Carlisle Barracks, Pa.: US Army War College, Strategic Studies Institute, 1991),49.
97. Cordesman and Wagner, 220.
98. Heller, Tamari, and Eytan, 114.
99. Ellison, 28.
100. O'Ballance, 213.
101. Cordesman and Wagner, 252.
102. Pelletiere, Johnson, and Rosenberger, 18.
103. Davis Segal, "The Iran-Iraq War: A Military Analysis," Foreign Affairs, Summer 1988, 956-57

Chapter 5

Conclusion

> As far as Saddam Hussein being a great military strategist, he is neither a strategist, nor is he schooled in the operational art, nor is he a tactician, nor is he a general, nor is he a soldier. Other than that, he's a great military man, I want you to know that.
>
> --Gen Norman Schwarzkopf, 27 February 1991

Failure of the Iraqi Air Force

The failure of third world air power is exemplified by Iraq's performance in its war with Iran. In terms of meeting the requirements of USAF doctrine, Iraq's organization and equipment seemed generally effective, but the IQAF's training left significant holes in its ability to employ its aircraft during the war. On the surface it appears that a better educational structure in Iraq would solve the air force's shortcomings, but a closer inspection reveals its true vulnerabilities.

Leadership in Iraq is so politicized that flexibility and responsiveness of command and control are nearly neutralized. Even with more capable equipment, the over centralization of the Iraqi command structure would still paralyze operational and tactical commanders. As long as the leader of a country cannot trust his own military, efforts spent on bringing forces to heel will take away from combat capability.

The problems associated with training and equipping the IQAF are inseparable. Weaknesses in the air force's technical education were compounded by Hussein's ongoing quest for hardware to keep his forces well equipped. Barely able to master the simplest weaponry, IQAF personnel were overwhelmed by the rapid influx of large numbers of more advanced weapons and were unable to incorporate such increased capacity into war-fighting proficiency.

As a result, Iraq spent billions of dollars supporting a branch of the service that had only a nominal effect on the outcome of the war. At the same time, the Iranian air force with almost no source of supply--could fend off the numerically superior Iraqi air force. The luxury of spending

vast sums of money on such limited military return is available only to a very select number of nonindustrialized nations.

Limits of Third World Air Power

Based on the Iraqi example, other lesser-developed nations face similar, if not more complicated, problems. The challenges of organization can be overcome in most countries although the technical requirements for a modern command and control system may exceed their capacity. Training and education, a major obstacle in Iraq, has been overcome by many nations. Still, in nonindustrialized countries, the size of a skilled work force may be too meager to handle all but the smallest of air forces. The ability of a nation to equip itself with an air force capable of decisive action in conventional war is unlikely.

The immense industrial requirements of a domestic aviation program have left all but a few nations out of the market. Even fewer countries produce military aircraft, and the list is continually shrinking. The expense for education, production, and infrastructure in the aviation industry is out of the reach of all but the top economies. This forces third world nations to depend on the more developed countries to supply advanced weapons.

Nonindustrialized nations are reliant on, and therefore vulnerable to, the industrialized world. Without the protection of a client-state status that was so prevalent in the bipolar world of the past, a nonaligned country's military faces an uncertain future. With a seemingly simple political decision, deliveries of aircraft, spare parts, and technical training can be withheld from any recipient. Overcoming this dependence is beyond the reach of most countries industrially, but alternatives are being explored.

Alternatives to a Large Air Force

To rid themselves of their dependence on the industrialized world, lesser developed

countries must develop indigenous replacements for their air forces. Three factors must be considered when fielding this capability. First, it must be affordable so that employment in combat will not be overshadowed by anticipation of replacement costs. Second, it must be produced domestically. Third, the complexity of any system should not exceed the qualifications of the expected user. At first glance it seems unlikely that a system with these characteristics can replace a conventional air force.. However, the convergence of increasing third world industrial capacity and simplified technology has produced some alternatives.

One option was employed by the Egyptians in the 1973 Yom Kippur War. Unable to match the Israelis in aircraft or pilot quality, the Egyptian military greatly expanded its surface-to-air forces. The result was an effective umbrella over their ground forces that cost the Israeli air force considerable losses during the opening engagements of the campaign. Although the Israelis eventually overcame this problem, Egyptian doctrine showed that a country without effective aerial assets could wreak destruction upon a superior air force.

Ballistic missiles offer another method by which nonindustrialized nations are filling the air power gap. Initially reliant on the Soviet Union for supplies of these weapons, several third world nations are now producing their own. In addition to domestic production, these missiles have other advantages over a conventional air force. First, personnel training is much simpler than developing and maintaining a professional pilot corps. Second, these trained personnel are less likely to be lost in combat. Third, missile range can be increased to the point that any target within an enemy's boundaries can be struck. Fourth, except in rare instances, there are no defenses against ballistic missiles. Fifth, the nature of ballistic missiles allows for a more centralized C^2 structure. Ballistic missiles are gaining popularity in the third world for these very reasons, but they also have their weaknesses.

Ballistic missiles suffer from inaccuracy, limited destructibility, and vulnerability. Accuracy can be improved only through greater degrees of missile refinement and targeting, both of which require substantial increases in technology. Without improvements in accuracy, destructive capacity can be increased only through larger payloads. Unfortunately, the ratio of payload to delivery system in missiles is also a technologically limiting factor. Finally, the relative immobility of most ballistic missile support systems leaves them vulnerable to enemy attack. Still, many third world nations are turning to these weapons to augment or replace many functions previously performed by their air forces.

Weapons of mass destruction also offer lesser-developed countries another alternative. Although combat delivery of these weapons is constrained by the same problems that currently face third world air forces, the promise of more bang for the buck diminishes these limitations somewhat. While producing nuclear weapons seems out of reach of all but the most wealthy countries, the recent "purchase" of Soviet scientists proved that the technology can be bought. Chemical weapons, on the other hand, are more easily produced and appear to be growing in popularity among smaller states. The spread of both of these weapons amongst the militaries of the world raises a new set of questions for the student of third world air power.

The Future

Lesser-developed nations waste considerable resources in their attempts to field a modern, conventional air force. Given the historical performance of third world air power, it is not surprising to see the recent shift to replacement forms of weaponry among those nations that can afford it. With the demise of bipolarity, smaller nations are finding it increasingly difficult to find financing for a comprehensive air force. Their perceptible shift to alternative weapon systems poses another series of complications in the new world order.

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