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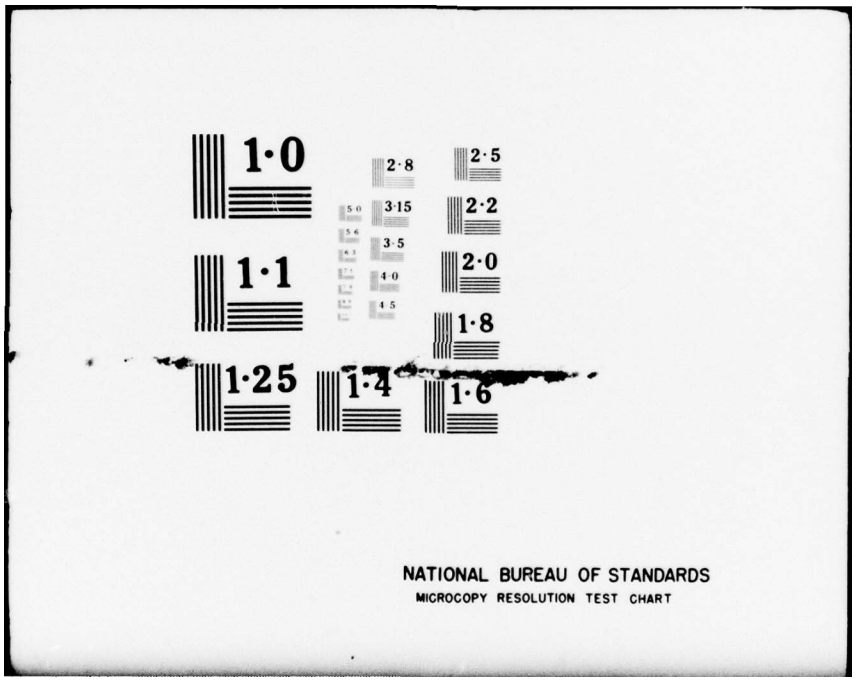
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THESIS

EGYPTIAN ARMS PROCUREMENT IN
THE POST-1973 WAR ERA; A CASE STUDY IN
THE DYNAMICS OF THE
ARMS DIVERSIFICATION PROCESS

by

William George Sykes

March 1977

Thesis Advisor: E. J. Laurance

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This thesis explores the post-1973 Middle East War arms procurement policy of Egypt. In embarking upon a policy of arms diversification shortly after that conflict, Egypt is seeking to end a 20 year period of exclusive reliance on the Soviet Union as a source of military hardware and training. Egypt is a unique case because she will face not only the wide array of problems common to any nation seeking to change the hardware and training base of its military forces from one source →

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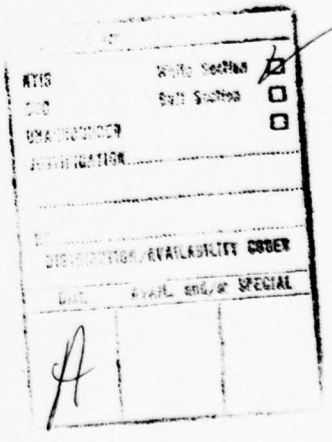

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Egyptian Arms Procurement in the Post-1973 War Era; a Case Study in the Dynamics of the Arms Diversification Process

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Submitted in partial fulfillment of the requirements for the degree of

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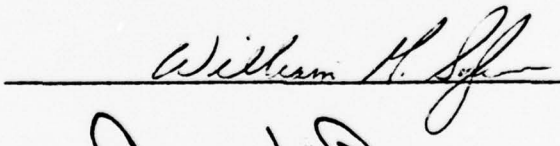
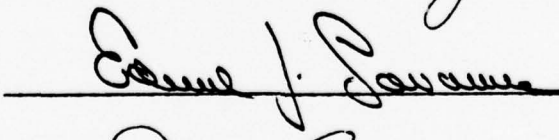
Author 

Approved by: 
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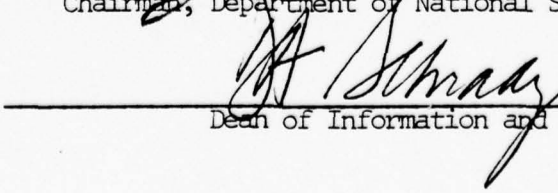
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ABSTRACT

This thesis explores the post-1973 Middle East War arms procurement policy of Egypt. In embarking upon a policy of arms diversification shortly after that conflict, Egypt is seeking to end a 20 year period of exclusive reliance on the Soviet Union as a source of military hardware and training. Egypt is a unique case because she will face not only the wide array of problems common to any nation seeking to change the hardware and training base of its military forces from one source to another, but an additional set of problems stemming from the fact that she is one of the principal Arab confrontation states in the Middle East. This thesis addresses the decline in Soviet/Egyptian relations which led to the new arms procurement policy, the evolving status of Egypt's military capability, and the technical problems to be overcome in acquiring Western hardware and integrating that hardware into the Egyptian force structure. It finally addresses the political issues which will complicate the process of arms diversification. It concludes that in the absence of significant pressure for a new war in the Middle East, it will be possible for Egypt to rebuild its armed forces using Western equipment, at the exclusion of the Soviet Union.

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I. EGYPTIAN ARMS DIVERSIFICATION: IMPETUS AND PROBLEMS

A. INTRODUCTION AND PURPOSE

In March of 1976, Egyptian President Anwar Sadat went before the People's Assembly of Egypt and, at the conclusion of a lengthy speech on a variety of subjects, asked that the Assembly vote in favor of abrogation of the 1971 Treaty of Friendship and Cooperation with the Soviet Union. President Sadat's wish was granted by an overwhelming majority, and it appeared that, after a long period of strained relations with the USSR, Sadat had finally had enough, and decided to rid himself of the Soviets once and for all. A major question for Western policy-makers, however, is: If Egypt is free of Soviet influence, can she remain that way indefinitely? The question is rooted in the fact that Egypt is the most important confrontation state opposing Israel, and is committed to recovering all its lost territory and securing the rights of the Palestinians. Further, despite Sadat's apparent moderation and acceptance of Israel's right to exist, it should not be lost upon the West that Egypt is quite willing to go to war again in the event that satisfactory progress is not made toward a Middle East peace settlement in the near future. For war to be a plausible option, however, President Sadat must maintain Egypt's military capability at a credible level, and herein is the crux of the problem. Despite Egypt's approaches to the West for weapons's systems, the vast majority of Egypt's military equipment is still of Russian origin. By abrogating the friendship treaty with the USSR, Sadat has apparently cut himself

off from further supplies of Soviet military equipment, and in the process virtually guaranteed that his overall military capability will decline over a period of time variously estimated at between five and ten years. The decline can eventually be stemmed by the purchase of sufficient quantities of military hardware from other sources, but the key question is, can Eqypt acquire sufficient non-Soviet hardware, and train its people to maintain and operate this equipment, before her military capability reaches such a low ebb that the Egyptian military command will no longer allow Sadat to pursue the policy?

The Egyptian Armed Forces, and particularly the officer corps, remain the most powerful and effective interest group in Egyptian society [Ref. 1, p. 3]; if the officer corps becomes sufficiently disenchanted with the status of Egypt's military capability, it is highly probable that it will take whatever steps are necessary, including the ouster of Sadat, to ensure adequate supplies of military hardware. The purpose of this thesis is to examine the likelihood of success of the current Egyptian policy of arms diversification, taking into account both technical/hardware considerations and political considerations.

In order to examine the prospects for success of President Sadat's current arms procurement policy, this chapter will trace Egypt's relations with the Soviet Union from the period of the July, 1972 ouster of Soviet advisors from Egypt through the abrogation of the friendship treaty and events of the ensuing six months; the primary vehicle for this examination is speeches and interviews of President Sadat and Foreign Minister Fahmi. This chapter will also introduce the problems Egypt must face in switching from Russian to Western sources of arms supply, as well as the principles and concepts which must be examined

in order to assess the prospects for success in switching arms suppliers. Subsequent chapters will examine in detail Egypt's current military capability, the problems of acquisition and integration of Western military hardware, and introduce several political scenarios which could impact differently on the success of arms diversification, with a view toward drawing some conclusions about the likelihood of an eventual complete changeover by Egypt to a Western-supplied military establishment.

B. EGYPT-USSR RELATIONS FROM MID-1972 TO THE PRESENT

Following the 1967 debacle in the Middle East, the Soviet Union undertook a reassessment of its policy vis a vis Egypt, and displayed a reluctance to provide Egypt with everything she sought in the military domain. In the Soviet view, Egypt's armed forces had not absorbed all the equipment already given to them; additionally, Moscow probably hoped to avoid another war in the Middle East, as the 1967 war had proven disastrous to the prestige of the USSR as a weapons supplier. The Soviets felt that training was the answer, and from 1968 until mid-1972, Soviet advisors and technicians penetrated virtually every segment of the Egyptian military infrastructure. Soviet advisors were located at Egyptian air and naval bases, military training facilities, and major maintenance depots; they operated air defense facilities and SAM sites, and infiltrated the Army down to the battalion and company level. The Soviets even had some say in personnel matters such as promotions and assignments within the Egyptian military [Ref. 2, p. 168]. Along with the advisors, who numbered about 21,000 by the time of their ouster in 1972, the USSR did continue to introduce some new weapons into the Egyptian inventory, and to build up Egypt's stock of existing weapons; during the 1970-1971 time frame, such weapons as the FROG surface-to-surface

missile,SA-3 SAM system, and ZSU-23-4 mobile anti-aircraft gun were introduced, while additional TU-16 medium bombers, MI-6 helicopters, MiG-21 fighter/attack aircraft, and SU-7 fighter bombers were delivered [Ref. 2, p. 168]. In exchange for all the technical assistance and weapons deliveries, Moscow received extensive use of facilities at Alexandria and Port Said, began development of a deepwater port at Mersa Matruh, and was granted the right to base some Soviet aircraft in Egypt. The 1971 Treaty of Friendship and Cooperation was also part of the quid pro quo for weapons and technical assistance.

Despite the apparent high level of Soviet assistance, (or in some cases, because of it), President Sadat was not totally happy with the USSR, and in July 1972 evicted virtually all the Soviet advisors and technicians from Egypt, in the most significant open break with his benefactor up to that point. The most important reasons were as follows: [Ref. 2, p. 169, and Ref. 3, p. 35]

1. The continued no war, no peace situation along the front, and the apparent lack of Soviet enthusiasm for changing the status quo in the Middle East.

2. Perceived infringement by the Soviet advisors on Egyptian sovereignty, and arrogance in their dealing with the Egyptians they were advising; these perceived insults to the dignity of the Arabs eventually became intolerable.

3. Continued rebuff of Sadat's pleas for advanced weapons, such as the MiG-23 variable geometry fighter. Despite what he was getting, Sadat felt he required more, which the Soviets were unwilling to give.

4. A growing realization by the Egyptians that the Soviets were technologically and culturally inferior to the United States, France,

the United Kingdom, and West Germany. It was also realized, in light of this, that the most useful means of upgrading Egypt's pathetic economy would be to apply Western technology, financed by Arab oil money. As the majority of the Gulf oil states are conservative monarchies and staunchy anti-Soviet, Sadat probably felt that putting some distance between himself and the USSR would help to free up both the importation of the technology and the money.

5. A feeling by President Sadat that the Soviet Union had been behind the perceived 1971 attempt of Ali Sabri and others to remove him from power.

6. One final reason for the ouster became apparent after the October 1973 war with Israel, namely, that President Sadat wanted to whole world to know that the war with Israel was planned and executed 100 percent by Arab minds; this would only be possible if the Soviet advisors were removed from the scene.

Despite the ouster of the Soviet advisors, Soviet weapons continued to arrive in Egypt, including such new systems as the SA-6 and SA-7 SAM systems and the SU-20 aircraft. The weapons may not have represented everything that Sadat wanted; nevertheless, he felt he had sufficient weapons with which to go to war on 6 October 1973. During the war, the Soviets resupplied Egypt with over 100 aircraft (including 35-40 "Super" MiG-21's), 600 T-62 and T-55 tanks, and equipment for 30 SA-3 and SA-6 batteries. However, the USSR insisted on hard cash payment, which was provided by Algeria, Libya, and the oil states [Ref. 2, p. 170]. It may be the fact that payment was demanded which explains President Sadat's continued assertion that the USSR has not replaced his wartime losses, but has merely fulfilled some previously signed

contracts. It must be pointed out that it is President Sadat's perception of events which is the key to understanding his actions, and not the perceptions of Westerners, Soviets, or anyone else.

The perceived failure of the Soviet Union to compensate Egypt for its Yom Kippur War losses led to the next significant step in President Sadat's drift out of the Soviet orbit, his speech of 18 April 1974 announcing his policy of diversification of sources of arms supply. He said that the Soviet Union had responded to only two of four messages he had sent to Leonid I. Brezhnev between October 1973 - April 1973, and that the responses had merely stated that his requests were under study [Ref. 4, p. 1]. Therefore, he decided to end his total reliance on the Soviet Union as an arms supplier. He subsequently acknowledged, in an interview in his home, that it would take several years to retrain troops to handle new equipment [Ref. 5, p. 1]. Additionally, although highly critical of the Soviet Union, he stated that "Egypt does not want to be friendly with the United States at the Soviet Union's expense, or vice versa", [Ref. 4, p. 1] a clear indication that he did not desire a total break with the USSR.

One immediate impact of Sadat's speech was a total embargo on military shipments from the USSR. The alleged failure of the USSR to compensate Egypt for losses of the October war, as well as its failure to provide Egypt with other sophisticated military hardware she desires, is a recurring theme of President Sadat in speeches and statements from early 1974 onward. A second theme which began to appear in late 1974 was the failure of the USSR to reschedule Egypt's military debt. Because of President Sadat's desire to rebuild and strengthen the Egyptian economy in the aftermath of the October war, Egypt is seeking a ten year

moratorium on debt repayments, followed by a stretching out of the debt over a period of 30-40 years (the debt under discussion is primarily that incurred by Egypt as a result of the 1967 war). A number of statements by the President point out that the USSR has made only token payments on its World War II debt to the United States, and therefore should have no objection to rescheduling Egypt's wartime debts. This the USSR has refused thus far to do; talks on debt rescheduling in November 1975 ended in deadlock, because the USSR would not move from its position of no moratorium on payments and a 20 year repayment period. The failure of the Soviets to grant concessions on the debt repayment is attributed to Moscow's displeasure over President Sadat's rapprochment with the West and his attempt to diversify his sources of arms [Ref. 6, p. D-1].

A third factor imposing strain on Egyptian/Soviet relations became operative in late 1975, in the aftermath of the signing of the second Sinai agreement between Israel and Egypt. Statements by the USSR and Syria following the signing of the agreement were highly critical of President Sadat. In Sadat's view, the Russians and the Syrians (under goading by the USSR) were attacking Sadat personally and accusing him of abandoning the struggle against Israel. The President contended that this simply was not true, that the second Sinai agreement was definitely in Egypt's interest, but that signing it did not mean abandonment of the struggle to recover all occupied territories and secure the rights of the Palestinians. Statements and Egyptian press reports in November /December 1975 express inability to understand the Soviet attitude, and bespeak a pessimistic view of the potential of Soviet output toward peace in the Middle East [Ref. 7, p. D40-45].

Despite the consistently reiterated differences over military supply and debt rescheduling, Egyptian/Soviet relations through the end of 1975 maintained a low profile equilibrium of sorts. There were even occasional signs of improvement, such as the early 1975 resumption of some Soviet military deliveries to Egypt, most notably the first of some 48 MiG-23's to be delivered that year. Deliveries were not sufficient to meet Sadat's perceived requirements, however, and the final blow was struck when the USSR refused India permission in early 1976 to provide Egypt with some desperately required spare parts for MiG-21's, the backbone of Egypt's Air Force. The President had alluded previously to the possibility of abrogating the friendship treaty with the USSR [Ref. 8, p. 76], and the India spare parts episode was the final straw which prompted him to take this momentous step. The abrogation speech included the assertion that in 18 months his armed forces would be just so much scrap iron, implying that he felt this step would result in the total cutoff of even the then-existing trickle of spare parts and equipment from the USSR.

The abrogation of the friendship treaty was hailed in the West as the most significant step in the gradual but constant demise of the relationship between the USSR and Egypt, and as an indication that perhaps Soviet influence in Egypt could be totally extinguished. It is noteworthy, however, that recent statements of President Sadat do not differ significantly in content from those made prior to the abrogation of the treaty. Most statements made up through the end of 1975 contained words to the effect that Egypt was still open to the USSR, if the Soviets would accept Egypt's independent stance in Middle Eastern affairs and not try to influence Egyptian policy as a quid pro quo for arms shipments.

It is true that Sadat's statements and press reports immediately following the abrogation announcement did not contain the usual carrot. Additionally, following a visit by Vice President Husni Mubarak to the PRC, the Egyptian press gave extremely laudatory coverage to the new Egyptian/PRC rapprochment [Ref. 9, p. D-1] in a move that was probably designed to raise the ire of the USSR. Beginning in late April 1976, however, the carrot began to appear again; the most recent theme in Sadat's approach to the USSR is exemplified by the following quotation from a speech before a joint meeting of the ASU Central Committee and the People's Assembly on 22 July:

> "to the extent that the Soviet Union is ready to pursue an open policy which rids itself of the complexes and negativism of the past, Egypt will be prepared to respond to the Soviet Union and to establish bridges again" [Ref. 10, p. D1-D27. See also FBIS Middle East reports 30 April, 3 May, and 14 June 1976.]

The criticism of the USSR is still present, and is now being uttered in the same breath as the willingness to improve relations, but the implication is clear: despite the seemingly irreversible step of abrogating the Treaty of Friendship and Cooperation, President Sadat does not appear to have totally burned his bridges with the USSR, and holds out some hope of a rapprochment, albeit on his own terms.

C. ALTERNATIVE SOURCES OF ARMS

The foregoing has traced the development of Egyptian/Soviet relations from mid-1972 to the recent past. Paralleling the worsening of relations between the two countries has been a concerted effort on the part of Egypt to obtain sophisticated weapons systems from alternate sources of supply. In its effort to maintain a credible military capability, Egypt is currently pursuing a wide variety of approaches. First, using Arab oil money, she is seeking to buy weapons systems,

such as aircraft, helicopters, SAM missile systems, and tanks, to name a few, from Great Britain, France, and lately, the United States. Second, Egypt is negotiating with Great Britain and France for the construction of an indigenous Arab arms production industry at currently existing facilities in Egypt; the Arab Committee for Military Industrialization (composed of Saudi Arabia, Qatar, the United Arab Emirantes, and Egypt) will put up the funds, while the European nations will supply the necessary technological expertise to get the industry going. First priority of this industry is to be the production of aircraft (building the French Mirage F.1 under license is one of the possibilities under discussion) and missiles, with eventual branching out into other areas planned in the future [Ref. 11, p. 18]. Third, Egypt is seeking to upgrade the capability and extend the life of existing Soviet equipment by replacing certain components with Western equipment; re-engining Soviet MiG-21's with British engines was one such plan under discussion.

D. IMPLICATIONS OF CHANGING SUPPLIERS

All of these plans, if they come to fruition, will certainly result in an eventual changeover to a Western supplied Egyptian military. The key question is, how long will it take, and how much will Egyptian military capability decline during the process. President Sadat acknowledged, in commenting on a Jordanian plan to buy some Russian SAM's, that it took Egypt over seven years to change over from Western to Soviet arms in 1955. It must be realized, too, that weapons systems are considerably more complex today than in 1955-1962, implying that the changeover will take even longer in the modern era. A number of factors must be examined to determine the time span of the changeover period.

First, the weapons supply capability of the potential supplier nation must be examined. It is all well and good, for example for Egypt to conclude a contract for 200 Mirage F.1 aircraft with France, or 500 Chieftain Tanks with Great Britain (these are hypothetical figures), but these weapons do not impact at all on Egypt's military capability until they actually are delivered. Given the low rates of production in the United States, let alone Western Europe, it could be a very long time indeed before these weapons actually materialize. Meanwhile, the operational capability of Soviet hardware will continue to erode, forcing such measures as curtailment of training and cannibalization of certain equipment to keep front line units operational [Ref. 12, p. 11].

Secondly, the new weapons systems do not represent equivalent military capability until the personnel who operate them are as proficient on the new equipment as they were on the old. It is one thing to teach a MiG-21 pilot to fly a French Mirage; it is quite another for that pilot to attain the absolute level of proficiency in the Mirage that he had in the Soviet aircraft, so he will react automatically under the stress of combat in a manner likely to maximize his chances of survival. This variable is obviously weapons system dependent; it is probably more difficult by several orders of magnitude to switch from one aircraft to another than to learn how to operate a new SAM system at maximum efficiency.

Thirdly, and related to the above, is the question of the impact of new weapons systems on tactical doctrine. There is a feeling in some circles that weapons are produced for the purpose of implementing a specific military doctrine, with the corollary that a weapon is of little utility in the application of some other doctrine. If the

converse is also taken as true, i.e. that a given doctrine (that is, in this case, Soviet doctrine emphasizing size and numbers of weapons) is of little value in employing weapons not designed for the implementation of that doctrine, then Egypt will have to face the additional burden of retraining its personnel in the employment of the new Western weapons, as well as their mere operation.

A fourth factor impacting on the changeover timetable deals with the problem of establishing an adequate logistics system to support the weapons system. Logistics support is greatly simplified if all of a nation's fighter aircraft, for example, are from one source; it is simplified even more if all the aircraft are the same type. One can imagine a wide variety of scenarios wherein parts destined for a given base, flying a given type of aircraft, get misrouted to a different base having a totally different type of aircraft; in a combat situation the results of such an error could be disastrous. Developing adequate measures to avoid such errors is a major problem that Egypt will face in changing and diversifying its sources of arms supply.

E. THE PROSPECTS

If Egypt existed in a vacuum there is no question that eventually, over a period of time, she could completely convert her military to Western sources of weapons. However, she does not exist in a vacuum; Egypt is the most populous and most important of the confrontation states arrayed against Israel, and feels she must have a credible military option if she is to have any hope of regaining her lost territory. Thus, the difficulties in changing sources of supply are likely to be exacerbated or ameliorated by political considerations in the Middle East. Certain conditions might lessen tensions in the area, thereby

reducing pressure on Sadat to re-open the "Soviet connection", while certain other conditions might have just the opposite effect. The concluding chapter will examine several possible scenarios and assess their likely impact on Egypt's arms procurement policy. This chapter will then bring together all the aspects of the arms changeover process - hardware, personnel, and political - with a view toward assessing the likelihood of Egypt's maintaining a credible military force in the face of all the difficulties described. Egypt is beset by a greater variety of problems of greater severity than any other nation in the Middle East; if it appears that she can effect such a dramatic changeover, the implication is that other Arab nations now dependent on the Soviet Union for arms could also be wooed over the West.

II. EGYPT's PRESENT MILITARY CAPABILITY

A. INTRODUCTION

This chapter will examine Egyptian military capability as it has evolved since the October 1973 War and the subsequent announcement of the policy of arms diversification in April 1974. In addition to looking at numbers of major hardware items currently on hand in the Egyptian Armed Forces (including the few items of Western equipment which have been received to date), this analysis will attempt to look at such factors as age of the equipment, current levels of training within the Egyptian military, and likely combat readiness of major items of military hardware. The analysis will show to what extent Egypt's capability has declined since the initiation of the new policy, not only in absolute terms, but also relative to the military capability of Israel. The focus of this analysis will be on major weapon systems deemed most important to the mission of resuming hostilities with Israel should that option become desirable or necessary to Egypt. Making the assumption that future hostilities will rely heavily on weapons assessed to have had the most impact on the 1973 war, these weapon systems include combat aircraft, tanks, missile systems (surface-to-surface, surface-to-air, and air-to-air), and Naval vessels/weapon systems. It is realized that total military capability is comprised of much more than just these highly visible and expensive items, but it is these systems which will cause the most significant difficulty in converting from one source of supply to another. Similarly, it is

these systems which are the most sensitive to degradation in capability /performance due to the lack of adequate maintenance and training. Finally, these types of weapons are manufactured by the smallest number of prospective supplier nations, making them potentially the most difficult for Egypt to replace from sources outside the USSR.

B. EGYPT'S CURRENT CAPABILITY - THE DEBATE

The precise status of Egypt's current military capability is a matter of some debate. Central to the debate is imprecise knowledge of the exact status of Egypt's relationship with the Soviet Union, and, more specifically, the degree to which the Armed Forces are or are not receiving spare parts for the Soviet equipment in the inventory. On one side of the debate are those who feel that Egyptian military capability has declined seriously since the October 1973 War, due to the fact that spare parts to maintain and overhaul major equipment items have in fact been reduced to insignificant levels.[1] (See for example Ref. 12, Ch. II.) The essence of this view is that President Sadat has been telling the truth about his relationship with the Soviet Union, and that Soviet support for Egyptian military equipment has been reduced to virtually nothing. As a result of the drying up of the flow of spare parts and replacement equipment, Soviet-made armor and aircraft are seriously overdue for overhaul, training has been reduced to levels insufficient to maintain combat readiness, and the Armed Forces have been forced to resort to cannibalization to maintain some of the equipment in working order.

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[1]Roger Pajak has espoused this view in a number of articles on the subject and in a February 1977 interview with this author.

The opposite view of Egypt's capability derives from the belief that Soviet/Egyptian relations are not as poor as President Sadat would have the world believe. While maintaining a low profile vis-a-vis Egypt, the Soviet Union has been quietly supporting the Egyptian military with spare parts and equipment, both by direct shipment and via intermediaries such as Yugoslavia, North Korea, and Czechoslovakia. These shipments have enabled Egypt to conduct military training and exercises at rates comparable to those observed prior to the October 1973 War [Ref. 13, p.A7].

Perhaps the most ardent supporter of this second view of Egypt's military capability is Dr. Uri Ra'anan of the International Security Studies Committee of the Fletcher School of Law and Diplomacy, Tufts University. Dr. Ra'anan's basic view is that, despite the ups and downs of the Soviet/Egyptian relationship over the years, the Soviet supply line to Egypt cannot dry up because Egypt simply cannot afford to let it do so. The line of reasoning, expressed in a prepared statement in hearings before the Foreign Assistance Subcommittee of the Senate Foreign Relations Commitee on 31 March 1976, is as follows; the military, and more specifically, the officer corps, constitutes the power base for Egypt's civilian government. To alienate this power base, by taking steps which would impede the supply lines supporting Egypt's military capability, would be foolhardy. The West cannot substitute for the USSR in supplying military hardware for two fundamental reasons. First, Western nations cannot supply the quantities of armaments needed in time to reequip the Egyptian Armed Forces. Second, Ra'anan asserts that weapons are designed to be employed in a specific doctrinal context; because Egyptian military forces are trained in Soviet doctrine, Western weapons, designed for the implementation of different doctrines would be

of little utility to the Egyptian Armed Forces. For these reasons, the only option open to Egypt, if she is to maintain a credible military force, is a continued supply of Soviet military equipment. Ra'anan cites two quotes from President Sadat which testify to his apparent recognition of these facts [Ref. 14, p. 58, 59], and concludes that whatever efforts the Egyptian President is making to obtain Western military equipment are being made only to add Western technology to the Egyptian Armed Forces, and not to replace the Soviet Union as the principal armorer of Egypt. He later cites figures which are designed to show that, despite the apparent seriousness of postwar rift between Egypt and the USSR, Soviet military hardware of many different types has continued to flow into Egypt in significant quantities. He warns that the West not be deceived by the apparent poor state of Soviet/Egyptian relations. His implied conclusion is that the Egyptian Armed Forces are not in nearly the desperate straits that the massive search for Western arms would lead one to believe [Ref. 14, p. 68].

C. ASSESSING EGYPT'S MILITARY CAPABILITY - WEAPONS INVENTORIES

The true status of the Egyptian Armed Forces in early 1977 is believed to lie somewhere between the two extremes articulated above. It can be said with virtual certainty that the current capability of those Armed Forces is not equal to that of the highly trained, finely tuned military machine which initiated the Yom Kippur War on 6 October 1973. What is extremely difficult to quantify is the degree to which that capability has declined; is the decline significant, or only marginal? In attempting to answer this question, the state of the Egyptian military capability existing prior to the 1973 war will be

used as the baseline. The rationale for selecting this period as the baseline is that it represents a theoretical maximum capability which can be attained using Soviet hardware and Soviet training. Although nearly all Soviet advisors had been ousted from Egypt 15 months prior to the start of the war, the efficiency with which the Egyptian Armed Forces operated in the opening days of the war demonstrated a high degree of personnel and materiel readiness, brought about by constant training prior to the war and the highest possible degree of Soviet logistic support. Thus, under any circumstances other than this level of logistic support, it is argued that Egypt's military capability must decline by some finite amount as a result of the inability to properly maintain equipment and the inability to conduct sufficient training to maintain a high state of combat readiness among the Armed Forces personnel. This decline in capability will result even if the orders of battle (that is, the numerical inventories) for major weapons/weapon systems are the same or higher than those existing prior to the October War. Although orders of battle in themselves give little real indication of military capability, they are the logical starting point for assessing the direction in which that capability has evolved.

Before making an analysis of the orders of battle for major Egyptian weapons/weapon systems, it is necessary to articulate the difficulties which one faces in attempting to do the analysis from open source literature. The first problem is a very real uncertainty about the exact quantities of weapons the USSR has delivered to Egypt, especially low visibility items such as missiles. This coupled with uncertainty over

Egypt's exact wartime losses[2], makes it very difficult to ascertain the current quantity of various armaments in the Egyptian inventory.

A second problem is lack of agreement among sources over the number of weapons comprising a particular inventory. For example, the International Institute of Strategic Studies (IISS) Military Balance 1976/1977 carries 50 MiG-17 fighter-bombers and no MiG-19 aircraft among Egypt's front-line Air Force inventory, while another authoritative source puts the numbers of these aircraft at 125 and 45, respectively [Ref. 15, p. 1653]. In reconciling ambiguities of this type, this analysis will utilize IISS figures unless the preponderance of other evidence suggests that these figures are in error.

A third problem impacting on this assessment is ambiguity in format of some of the sources. For example, in the air defense system area, the IISS Military Balances for 1972/1973, 1973/1974, and 1974/1975 give figures for the number of surface-to-air missile (SAM) sites established in Egypt. By contrast, The Military Balance 1976/1977 lists figures which are apparently numbers of launchers for the various SAM's in the inventory, or possibly the numbers of missiles themselves.

With these considerations in mind, the following table (table I) represents the best estimate of Egyptian major weapon system inventories existing just prior to the October 1973 War, and as of 1 January 1977. Unless otherwise noted, the data are taken from the IISS Military Balance. Considerations governing the choice of weapons for inclusion in the table have already been discussed (see page 21).

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[2]Outright losses of tanks, aircraft, etc may be known with reasonable certainty, but losses due to the unserviceability of weapons which remained behind Egyptian lines are virtually impossible to assess.

TABLE I

Equipment Item	Pre-October 1973 Inventory	1 January 1977 Inventory
Heavy tanks		
JS-3/T-10	30	25
Medium tanks		
T-34	100 note 1	0
T-54/T-55	1650	1100
T-62	100	820
AMX-30	0	200 note 2
Armored personnel carriers (various types)	2000	2500
Surface-to-surface missiles		
Scud	40-60 note 3	40-60 note 3
Frog-3	24	0
Frog-7	some	18
Anti-tank guided missiles		
AT-1 Snapper	Up to 800 note 4	Unk
AT-2 Swatter	Unk	Unk
AT-3 Sagger	400 note 4	Unk
BAC Swingfire	0	Some
Euromissile HOT	0	Some
Bomber aircraft		
TU-16 Badger	25	25
IL-28 Beagle	5	5
Fighter/attack aircraft		
MiG-17	100	50
MiG-21	210	200 note 5
MiG-23	0	48 note 6
SU-7	80	120 note 7
Mirage III	0	38
Mirage F.1	0	20 note 8
Helicopters		
MI-1/4/6/8	190	100
Gazelle	0	42 note 9
Commando	0	24
Surface-to-air missiles note 10		
SA-2	Over 600	360
SA-3	160	200
SA-6	Up to 240	75
SA-7	500	Unk
Crotale	0	Some note 11
Fast missile patrol boats		
Osa	12	8
Komar	6 note 12	4
"Egyptian Komar"	0	6 note 13

NOTES

1. T-34 tanks were not used in the normal armor mode, but were dug in in static emplacements as supplementary artillery [Ref. 16, p. 370].

2. 200 AMX-30 tanks ordered in January 1975 have probably been delivered as of early 1977 [Ref. 17, p. 10].

3. Ref. 18, p. 45.

4. Ref. 18, p. 44. Current numbers are estimated to be somewhat less than pre-October 1973 levels due to lack of replacements and expenditures during the War.

5. Based on the total number of MiG-21's delivered since this aircraft first appeared in Egypt in 1962, and losses of about 200 between the 1967 and 1973 wars, total number is probably well in excess of 200. 200 to 250 is the consensus view of the number of operational aircraft in the inventory. Current inventory consists mainly of MiG-21M and MiG-2MF variants of this aircraft. Extra aircraft are in storage, and are probably being cannibalized to keep 200 operational.

6. Ref. 19, p. 907. The aircraft are divided among 24 air superiority fighter versions and 24 ground attack versions.

7. Current figure of 120 includes an unknown number (under 25) of swing-wing SU-20's delivered in 1972 [Ref. 18, p. 44].

8. The order for 44 Mirage F.1's reported by IISS was never finalized into a firm contract [Ref. 20, p. 51]. The 20 Mirage F.1's carried in this table are the result of a Kuwaiti order in Egypt's behalf in late 1973/early 1974 [Ref. 21, p. 16].

9. The Gazelle helicopters for Egypt were reported nearing completion in early 1976, and deliveries being taken as of January 1977. The total of 42 should be in Egypt at present [Ref. 22, p. 16].

10. The pre-October 1973 figures for SA-2, SA-3, SA-6, and SA-7 were taken from Ref. 18, p. 44. The number of SAM sites pre-October 1973 was approximately 130. There are no reliable figures on the current number of SAM sites, but it is believed to be essentially the same.

11. Some Crotale mobile low-altitude SAM launchers were reportedly being delivered to Egypt as of early 1977 in fulfillment of earlier contracts [Ref. 22, p. 16].

12. Source: Janes Fighting Ships, 1976/1977 [Ref. 23, p. 134-138]. IISS Military Balance 1973/1974 does not account for one Komar sunk by Israeli aircraft in 1970. This error is carried over into 1976/1977 figures, which should reflect 4 vice 5 Komar's.

13. Egyptian Komars are indigenously built missile boats similar to Soviet Komar class. Currently unarmed [Ref. 23, p. 137].

The table of equipment inventories shows a mixed picture of Egyptian military capability based on numbers. The Army appears to be in relatively good shape in terms of tanks and APC's. The Frog rockets are of short range and questionable accuracy, and did not have significant impact in the 1973 War, so the numbers here are of little import. The use of the long range Scud was threatened but never implemented in that war [Ref. 16, p. 411-412], and its numbers have probably remained static. In anti-tank missiles, one of the most significant new weapons of the war, current figures are not known, but are presumably considerably lower than prior to the war; a shortage of these weapons may be inferred from the fact that a deal for the British Swingfire anti-tank missile is one of Egypt's first Western procurement efforts to come to fruition (the next chapter details these efforts).

The Egyptian Air Force (EAF), at least in terms of numbers of aircraft, appears to be in somewhat better shape than at the beginning of the war. There is considerable ambiguity over its present capability, however, which will be addressed in the next section of this chapter.

The Egyptian Air Defense Forces (EADF) appear to be down in terms of the numbers of missiles available. Uncertainty about the true size of the Soviet wartime airlift clouds the picture of missile strength, but the EADF Commander, Major General Helmy Afifi, asserted in July 1975 that Egypt had received no missile replacements whatsoever since the end of the October War [Ref. 24, p. 15]. Ongoing negotiations for British and French low-level air defense missile systems (Rapier and Crotale, respectively) suggest that the missile shortage is most critical in this area. Significantly, it was the low level SA-6 which was among the most effective elements of the Egyptian air defense system.

The Egyptian Navy played a relatively insignificant role in the October 1973 war, when its Osa and Komar missile boats were completely outmatched by Israeli Gabriel-armed Saar and Reshef missile boats. Egypt's other naval units played virtually no role at all. Nonetheless, with better naval craft Egypt's Navy could play a potentially significant part in a future war. Egyptian Naval strength is virtually identical to that existing prior to the war, except in the missile boat area.

The major conclusion which can be drawn from the above analysis is that, quantitatively at least, the Egyptian Armed Forces appear to be approximately equal to what they were in October 1973. The major shortages in terms of equipment appear to be in the air defense and anti-tank missile areas.

D. ASSESSING EGYPT'S MILITARY CAPABILITY: OTHER FACTORS

Given that the numbers are essentially equal, any degradation in military capability logically derives from two distinct but interrelated factors: insufficient capability to maintain that equipment in a high state of combat readiness, and inability to conduct sufficient training to maintain the combat readiness of Armed Forces personnel. Both these factors are linked to a third factor which is very difficult to measure, where the Soviet Union is concerned: the flow of spare parts and other support equipment. This support becomes more critical as equipment ages; the longer an item such as a tank or an aircraft goes between overhauls, the more likely it is to break down completely, thereby necessitating replacement.

In analyzing the equipment and personnel readiness of the Egyptian Armed Forces today, it is useful to look again at the pre-war period, making the assumption that this period represented a high point in Soviet support to a Third World client. There is general agreement

among sources that the Soviet Union transferred massive amounts of military hardware to Egypt during the two years preceding the October War [Ref. 18, p. 43-46, for example]. Thus, on the surface, Egypt received the raw materials for a very effective, well supported military force. A study by Lewis Snider [Ref. 25, p. 8-10], however, noted two apparent characteristics of Soviet supply relationships which suggest otherwise. One is that Soviet supply patterns, training programs, manipulation of spare parts shipments, and reluctance to supply certain offensive weapons Egypt wanted indicated a reluctance to arm its Arab clients to launch an all-out war against Israel (see also Ref. 16, p. 54-57). Related to this is the notion that the Soviet Union makes arms transfers more for the purpose of demonstrating a strong political commitment than for the purpose of appreciably upgrading a client's military capability; the refusal to supply offensive weapons desired by Sadat lends support to this notion. Leaving aside comparative capabilities of the weapons themselves (Soviet versus Western), these patterns of Soviet supply suggest that maintenance support for Soviet weapon systems is minimal, even during the best of times. This follows logically from the fact that Soviet maintenance doctrine places little emphasis on field repair, emphasizing instead replacement of entire tanks or tank units on the battlefield, and repair of damaged equipment later on at the battalion level. For example, an Egyptian officer commenting on the inferiority of Soviet spares/logistic support, stated that it is often easier to get an entire new tank from the Russians than spares to fix an old one [Ref. 26, p. 462]. This maintenance problem is exacerbated by a feeling on the part of senior Egyptian commanders that Soviet equipment is unnecessarily complicated and technologically backward [Ref. 27, p. 43].

Against this background, it is difficult to give credence to reports that Egypt's military capability approaches what it was prior to the war, even if the numbers of weapons/weapon systems are essentially equivalent. The Egyptians maintain that Soviet supplies of spare parts have been virtually nonexistent since the 1973 war, and particularly since the end of 1975, when Egypt signed the second Sinai Agreement. Even if Israeli intelligence reports that spare parts supplies are continuing are true, it is highly unlikely that they are at a level anything like that existing before the war. Within the Air Force, for example, the shortage of spare parts to maintain aircraft forced a reduction in flight training hours from 20 to 15 per month per pilot in mid-1975, and necessitated a major engineering effort to design and manufacture spare parts to keep the aircraft combat ready [Ref. 28, p. 12]. An "authoritative estimate" in mid-1975 indicated that pilot losses in training crashes since the war had been almost as numerous as those sustained during the war [Ref. 29, p. 4]. This points to both a degradation in pilot skill and a higher rate of aircraft failure, brought about by inadequate maintenance. Lack of spares was also one of the reasons cited by EAF commanders for investigating with Rolls Royce the possibility of re-engining Egypt's MiG-21's with British engines [Ref. 30, p. 20]. A desire to completely re-engine the aircraft suggests that, even if sufficient spares are available to keep the aircraft marginally operable, the engines are seriously past due for the complete overhauls needed to keep them fully combat ready and dependable in any contingency.

The overall picture that emerges, then, is one of apparent quantitative sufficiency in most areas, with equipment capability being slowly but continually degraded by inadequate repair and maintenance.

How long the Soviet equipment will remain combat worthy is open to question. President Sadat's assertion in early 1976 that his Armed Forces would be reduced to scrap iron in 12 to 18 months is clearly an overstatement, but Egypt's massive efforts over the last two and one-half years to acquire Western military hardware bespeaks a growing concern over the present capability to pose a credible military threat to Israel. The credibility of the threat to Israel is further reduced by the fact that Israel is quantitatively stronger in virtually all areas than she was prior to the war, conducts vigorous training to maintain a high state of combat readiness, and is scheduled to receive even more sophisticated weapon systems such as the F-15 multi-purpose fighter aircraft. Egypt can manufacture some spare parts for its equipment, acquire some spares from other nations (notably Yugoslavia) which operate Soviet equipment, and cannibalize older items in the inventory to keep front-line forces in an adequate state of readiness, but these are only stopgap measures. They do not address the basic problem, which is the aging of equipment in the inventory. With the exception of Egypt's MiG-23 fighter-bombers and possibly some of her T-62 tanks, all the equipment is of 1973 vintage or older. Inasmuch as the USSR has had the capability to ship from on-hand stocks rather than right off the production line, some of the equipment may be a good deal older than its apparent age based on delivery time in Egypt. Thus, advancing age is compounding the problems brought about by inadequate maintenance and training.

All the factors cited above point to a continuing decline in military capability, a decline which will not be reversed until either a full scale military supply relationship is reestablished with the USSR,

or until some of the hardware sought from the West enters the Egyptian inventory. President Sadat appears to have cast his lot firmly with the West. The next chapter addresses Egypt's Western procurement efforts, and their likely effect on Egypt's military capability.

III. THE PROCESS OF ARMS DIVERSIFICATION

A. INTRODUCTION

This chapter will review in depth Egypt's ongoing efforts to implement the policy of arms diversification, and thereby reverse the trend of declining military capability. These efforts include the retrofitting of existing Soviet hardware with improved Western components, direct procurement of entire new Western weapons/weapon systems, and attempts to establish an indigenous Arab Arms Industry based on the license production of Western equipment. All these efforts have varying potential for reversing the decline in Egyptian military capability; this analysis will attempt to assess that potential, as well as the problems inherent in each of these types of efforts. The focus here is on hardware aspects of the capabilities problem; the analysis will look at the items of equipment being sought and the probable timespans required for their acquisition. The next chapter will examine the problems to be overcome in integrating the new equipment into the Egyptian force structure.

B. THE MOTIVE FOR DIVERSIFYING

President Sadat and his senior military commanders have often stated that the motive behind the policy of arms diversification is to ensure that Egypt is never again dependent upon a single source of supply for all of its military equipment. It is readily apparent that arms diversification will lessen Egypt's former total dependence on the USSR. However, one is still left with the question of the ultimate scope of the

policy. As with the question of Egypt's current military capability, there are two views regarding this particular question. To a large extent, the view one takes is dependent upon one's view of the status of the current Soviet/Egyptian relationship and one's view of Egypt's current military capability. One view is that the policy of diversification is designed primarily to put into Egyptian hands the Western technology currently possessed by Israel. The Egyptians have sought sophisticated Western weapons in order to better enable them to combat the technologically superior equipment possessed by the Israelis. It is argued that doctrinal and Western production capability constraints would make a complete reequipping of the Egyptian Armed Forces a prohibitively long term venture. These considerations do not, however, prohibit the acquisition of some items of equipment, as long as they are confined to "essentially marginal categories, that can be isolated from the mainstream of Egyptian logistics..." [Ref. 14, p. 58]; such items as a few squadrons of fighters, trucks, electronic equipment, etc are placed in this category. It is concluded that these efforts, which are expected to continue, do not imply a desire to replace the Soviet Union as the main Egyptian arms supplier. Rather, they are designed to strengthen pro-Egyptian sentiment in countries where public sympathy has tended to favor Israel, and also to acquire Western technology in order to better combat Israel [Ref. 14, p. 59].

Central to this argument is the contention that the current Egyptian /Soviet rift is not nearly as deep as it would appear on the surface. The opposing view is that this rift is in fact the most serious in a long series of Soviet/Egyptian disagreements, and that Egypt has been, if not totally cut off, then almost totally cut off from any significant

level of Soviet support. If this is the case, then Egypt has no alternative but to commit herself to the long term replacement of Soviet with Western equipment. There is no question that one of the motivations behind the diversification of arms sources is the acquisition of superior Western technology. Egyptian military officials have expressed the view that, while Soviet equipment is rugged and serviceable, it is also overcomplicated and technologically backward, and Egypt cannot hope to compete with Israel's Western technology even if the Russians supply their latest equipment [Ref. 31, p. 7]. This would suggest that the acquisition of some Western technology in a few areas would be of limited value were it Egypt's aim to continue relying on the Soviet Union as its main arms supplier. The wide range of Egypt's Western procurement efforts, as well as the sheer size of some of the potential acquisitions suggests strongly that Egypt is committed to a long term effort to completely reequip her military, and not just acquire a few items of hardware on the margins. Thus, despite the acknowledged difficulties involved (which will become more apparent in the remainder of this and the following chapter), it is the conclusion of this author that Egypt's ultimate aim in arms diversification is to eventually reequip its military forces entirely with Western hardware, while taking whatever steps are necessary to extend the life of the Soviet weapons currently in the inventory. The following analysis will examine the entire range of Egypt's diversification efforts, highlight the problems which have been and are impacting on those efforts, and calculate, where possible, the likely time frame during which the sought after items will enter the Egyptian inventory.

C. UPGRADING MILITARY CAPABILITY THROUGH DIVERSIFICATION: THREE ALTERNATIVES

1. Alternative I - Retrofit of Existing Equipment

Proposals to retrofit existing Soviet equipment with improved Western components have been evident in all branches of the Egyptian Armed Forces except the Air Defense Forces (and efforts within the Air Force would impact indirectly on the Air Defense Forces). This approach to weapons diversification appears to stem from three underlying reasons. First, in some instances the proposed retrofits are designed to replace components which are simply wearing out. Inasmuch as the Soviet Union has apparently ceased to do engine overhauls, for example, the Western components will prolong the life of Soviet equipment which is basically serviceable in respects other than those related to the replaced component.

The second apparent reason for the retrofit approach is to upgrade the capabilities of weapons or weapon systems to a level beyond that achievable with totally Soviet components. The already mentioned feeling on the relative backwardness of Soviet technology is the driving factor in the desire to replace certain equipment components, even if the existing ones are basically sound.

A third reason to retrofit, rather than replace, is that the former option is considerably less expensive than the latter. As will be seen later in this thesis, economic considerations have had a very significant impact in limiting the success of Egypt's arms diversification policy to date; hence the desirability of a less expensive approach such as retrofit.

The following paragraphs describe Egypt's efforts to have some of its Soviet equipment retrofitted. By and large, these efforts have

met with little success thus far, and they appear to hold little promise for the future.

a. Army

The only major effort toward retrofitting Army equipment is directed at upgrading the capability of Egypt's approximately 2000 Soviet tanks. Information on these negotiations has been very sparse, but discussions were underway with Italy in early 1976 on a plan to re-gun Egypt's T-62 tanks, and with Great Britain to rebuild her 1100 T-54 /55 tanks with new engines and 105mm main guns (London Times article cited in Ref. 14, p. 80). There is no indication that these negotiations have resulted in any contracts, and this sort of retrofit is of dubious value anyway in that it fails to address the major deficiencies of Soviet tanks in the desert warfare setting. Soviet tanks, particularly the T-62, rate highly in mobility and firepower, but they lack the sophisticated ranging devices available on U.K. and U.S. tanks. Additionally, Soviet tank gun barrels can depress only four degrees below horizontal, compared with ten degrees for most Western tanks (see Ref. 16, THE TANK BATTLE following page 370 for a discussion of tank characteristics applicable to desert warfare). Regunning the tanks, without a major modification to the turrets and the addition of better rangefinders seems of little value in improving the capability of Egypt's armored forces. Replacing the engines may have more operational value, but the project has not yet begun, and thus cannot have any significant impact on Egypt's large inventory of Soviet tanks for a long time to come.

b. Air Force

Two projects have been discussed with regard to upgrading the capability of the EAF. Discussions began in 1975 between Egypt and

two British firms on a proposal to equip Egypt's MiG-21's with an improved weapons delivery system. Ferranti, Ltd. was reportedly selected in learly 1976 to develop the system [Ref. 17, p. 5]; however, no further evidence indicates that the system has actually been developed or flight tested.

Of potentially greater significance was a proposal to re-engine the MiG-21 force with Rolls Royce SPEY engines. This modification would have increased performance and fuel efficiency, simplified maintenance, and most importantly, prolonged the life of what is essentially a good, maneuverable interceptor aircraft. The proposal was found to be technically feasible but too time-consuming and cost-ineffective for further development, and the project was dropped in early 1976 [Ref. 30, p. 20].

c. Navy

Efforts to upgrade Naval capabilities via retrofit have centered on improving navigation/target acquisition capability of Egypt's missile boat forces, and replacing the obsolescent Styx missiles aboard those boats with a better Western missile. One modification which has already begun is the fitting of Decca ESM (electronic signals measurement) receivers and series 1200 navigation radars to four of Egypt's eight Osa class missile boats [Ref. 32, p. 665]. The remaining four Osa's, the four Komar's, and possible Egypt's six indigenously built missile boats are expected to be similarly fitted. The same source also indicated that negotiations were continuing (as of August 1976) for Marconi Sapphire fire control systems, which could be fitted to the missile boats in association with an improved missile system.

In the weapons area, advanced negotations were reported in progress with Oto Melara for at least 30 of the Italian versions of the

Matra/Oto Melara OTOMAT anti-shipping missile. This missile would replace STYX on Egypt's Osa/Komar fleet, and/or be used to arm the six "Egyptian Komar" class vessels [Ref. 19, p. 907].

d. Prospects for Alternative I

It should be apparent from the preceding discussions that retrofit of existing Soviet equipment has not had any significant impact on Egypt's military capability, nor is it likely to in any service except the Navy. The Air Force and Army programs involve either too many units or too many technical problems to represent viable equipment improvement options. It would appear that these proposals began to surface as negotiations for direct procurement of new equipment and/or license production in Egypt of Western equipment bogged down. While it is not so stated in any source known to this author, these moves may have represented a desperation attempt on the part of the military to find some way of arresting the decline in capability of some of their most important hardware items. As they are apparently going to have little impact in arresting that decline, success in arms diversification would appear to lie firmly in the areas of procurement and license production.

2. Alternative II - Direct Procurement of New Equipment

A casual reading of the press and defense-related periodicals over the past three years would lead one to believe that Egypt had essentially solved its military problems through the massive purchase of Western hardware. At various times deals have been reported for the purchase of 200 Jaguar attack aircraft, 250 Lynx helicopters, 200 Hawk trainer aircraft, hundreds of Mirage F.1 fighter/attack aircraft, and the like. The author ran across many such proclamations in the course of this research, only to find that some later article or statement on

the same given deal reduced the number of items, denied the deal entirely, or said words to the effect that, yes, Egypt is still interested in the weapon, but there are many details to be worked out, and no contracts have been signed as yet. Tracing through the web of contradiction and misleading information leads one to the question of why there is such a disparity between what is announced at one time and what is agreed upon for delivery at some later, often much later, date. An article in the London Times (27 March 1976, cited Ref. 14, p. 78-80) focused on two very logical reasons for this disparity. First, it is necessary politically for President Sadat to pursue a vast rearmament policy to assuage the fears of his military leaders that he is letting the military forces decline in capability to an unacceptable level. An "agreement in principle" for a large number of aircraft, for example, can be an effective tool to convince the military leaders that the President has not in fact abandoned the military option if his diplomatic strategy fails to secure Egypt's aims in the Middle East.

The second reason for the disparity is largely economic. Even if Egypt does in fact desire the large quantities of weapons that have sometimes been discussed, the money to pay for them simply has not been there (or at least the prospective suppliers have felt sufficiently unsure that the money would be there to avoid committing themselves to large sales). Negotiations for a wide variety of weapons were reported stalled or proceeding with extreme caution because the prospective European suppliers were uncertain if funds would be available to pay for them. The slowdown in funds from Saudi Arabia and the other Gulf oil states has been attributed to Egypt's mismanagement of funds already given her [Ref. 33, p. 84], a more circumspect view of Sadat due to his

having signed the Second Sinai Agreement in September 1975, and a general decline in excess cash in the oil states due to lessened worldwide demand for oil in 1975.

The disparity between what Egypt has sought and what she has received will become apparent in the following analysis. The first section deals with Western weapons which have actually been received in Egypt or are likely to be received within a few months time. Note that in some cases these items were ordered in Egypt's behalf by other nations before the official announcement of the policy of arms diversification in April 1974. The second section addresses weapons for which contracts have been signed but delivery is still a long way off, or those for which negotiations are well advanced but contracts are still unsigned. For items not yet delivered, an attempt will be made to forecast the time period during which the desired items can begin to impact on Egyptian military capability.

a. Weapons Delivered/ Delivery expected prior to 1 July 1977

(1) 38 Mirage III fighter aircraft were delivered in 1974; originally ordered by Saudi Arabia.

(2) 20 Mirage F.1C fighter-bomber aircraft have probably been delivered; ordered by Kuwait in late 1973/early 1974.

(3) Six C-130 transport aircraft.

(4) 42 Aerospatiale Gazelle helicopters; armed with Euromissile HOT wire-guided anti-tank missiles.

(5) 24 Westland Commando helicopters delivered in 1974; originally ordered by Saudi Arabia.

(6) Six Westland Sea King helicopters.

(7) An undetermined number of vehicle-mounted BAC Swingfire wire-guided anti-tank missiles were delivered in 1976.

(8) Several batteries of Thomson-CSF Crotale mobile low-altitude SAM systems had been delivered as of January 1977.

(9) 200 AMX-30 tanks were reportedly ordered in January 1975; at an assumed production rate of 20-25 per month, the 200 tanks could have been delivered, but there is no substantiating evidence that they have been.

(10) Three British Hovercraft Corp. SRN.6 hovercraft were purchased by Egypt in early 1976, and may have been delivered. This craft fires the BHC-7 missile. Egyptian crews were trained in England prior to the purchase.

b. Weapons Currently in Negotiations

(1) Dassault Breguet Mirage F.1 Fighter Bomber. Acquisition of this aircraft has been under discussion since at least late 1974. A January 1975 order was reported for 44 aircraft, to be delivered in 1979. It was subsequently reported in March 1976 that no contract had been signed due to uncertainties over funding. Current negotiations are for Egyptian assembly of 150-200 F.1's, possibly preceded by delivery of up to 50 completed aircraft. At production of eight aircraft per month as of mid 1976, it would be early 1978 before existing orders of 250 for other clients could be filled. Thus, this aircraft will not likely begin to appear in Egypt until at least mid-1978. As of January 1977, a contract for Egyptian production was still months away due to uncertainties over financing.

(2) Dassault Breguet/BAC Jaguar Strike Fighter. This aircraft seriously entered the Egyptian procurement picture in November 1975 when the U. K. reportedly assured President Sadat that it would provide Egypt with up to 200 Jaguars. As of October 1976, there was no

further mention of orders for this aircraft other than 402 for the U.K. and France, and two export orders totaling 24. Existing contracts for this aircraft will run until early 1978, preventing its arrival in Egypt prior to that time even if a contract is signed.

(3) Hawker-Siddeley Hawk Jet Trainer. The Hawk trainer surfaced in late 1974 as one of the possibilities for production by the nascent Arab Arms Industry. In late 1975 it was still being evaluated against the Franco/German Alpha Jet for this production effort (the Alpha Jet has since fallen into disfavor as a result of the FRG's reluctance to sell military hardware to "areas of tension"). By February 1976, the negotiations had reverted to proposals for Egypt to buy 100 trainers, and leave the question of license production open. Deliveries to export clients could begin in 1977, but there is no evidence at present of any contracts with Egypt. Production is approximately four aircraft per month.

(4) Aerospatiale SA-342 Gazelle Helicopter. 42 Gazelles were in the process of delivery to Egypt in early 1977. It was reported in December 1975 that Gazelle was in competition with the British Lynx helicopter for a possible order of up to 250. At a production rate of 15 per month, it will be early 1978 before existing orders for Gazelle are filled (574 as of December 1974).

(5) Westland WG-13 Lynx Helicopter. In early 1974, a potential order of several hundred Lynx helicopters was under discussion with the U.K. These negotiations included the possibility of license production, and U.K. assistance in setting up an Arab Arms Industry. At one point production of the Lynx was thought to be tied to production of the Hawk trainer on the same site. As of early 1976, however,

negotiations over production of this helicopter were bogged down due to unresolved political and economic issues, and there is no evidence of a contract for purchase or production of Lynx. Production rate for this helo is to be ten per month in 1977.

(6) Augusta 109 Helicopter. An agreement in principle was reportedly reached in mid-1976 between Egypt and Italy to adapt this helicopter for military use, sell Egypt 100 outright, and start a production line. Nothing further has been reported on this deal, and it is unlikely that any contract has actually been signed.

(7) Matra R550 "Magic" and "Super 530" Air-to-Air Missiles. Engins Matra, manufacturer of both these missiles, was reportedly negotiating several missile deals with Egypt in late 1976. The Jaguar can carry Magic, while the Mirage F.1 can be armed with both these missiles. Little else is known of the status of these negotiations, but Egypt is expected to acquire these missiles if a deal for the Mirage F.1 is eventually concluded.

(8) BAC Rapier Low Altitude Air Defense Missile. Negotiations on the sale of Rapier commenced in early 1974, and evaluation continued at least through November 1975. Rapier has apparently been abandoned in favor of Crotale for low altitude air defense.

(9) Aerospatiale Exocet Anti-Shipping Missile. Negotiations began in 1975 and were reported in an advanced stage as of September 1976. However, funding problems were cited as the cause of delay in reaching a firm agreement, and Exocet has apparently been abandoned, at least for the near term, in favor of the Matra/Oto Melara Otomat anti-shipping missile.

(10) Chieftain Medium Tank. Talks were apparently underway in early 1976 for the purchase of an undetermined number of these tanks,

as well as the possible reengining of Egypt's Soviet tanks. No further information is available on this subject, but the U.K. production line for this tank is heavily committed to filling a large Iranian order, and it is unlikely that the Chieftain will make a significant impact on Egypt's armored forces for at least several years, if ever.

(11) Vosper Thornycroft Tinacity Class Patrol Boats. Egypt has been negotiating with the manufacturer for the purchase of up to nine Tinacity class missile boats to replace some of her aging Osa/Komar fleet. Tinacity is armed with four Otomat missile launchers. The status of these negotiations is not known.

3. Alternative III - The Arab Arms Industry

Throughout the preceding paragraphs, mention has been made of prospective deals involving Egyptian license production of various Western weapons. The idea underlying these arrangements is to use them as the initial production programs of a new Arab Armaments Industry. The industry would employ Egyptian labor and utilize existing production facilities at Helwan, Heliopolis, and Cairo. It would be financed by Saudi Arabian and other Gulf oil money, and make use of Western technical expertise for initial setup of the various production programs. Initial emphasis was to be on aircraft production, while gradually building the capability to manufacture missiles, armored vehicles, and other items. The development of this Arms Industry in Egypt would lessen Arab dependence on outside sources for arms, ammunition, and logistics support items, increase the transfer of sophisticated Western technology to the Arab nations, and perhaps ultimately enable the Arab nations to begin exporting arms on a limited scale.

Before examining the specific problems related to the establishment of an Arab Arms Industry in Egypt it is instructive to look

briefly at the problems common to any underdeveloped nation attempting to set up an indigenous industry for the production of sophisticated weapons. The problems faced by India, which has had its own defense production industry since the mid-50's, are considered typical of those to be faced by any Third World country, and will be used in this illustration (see Ref. 34, p. 723-758 for a more detailed treatment of these problems).

One subset of problems is related to actual production of the equipment in question. Third World countries generally lack the financial resources, the appropriate defense-related raw materials, a well developed infrastructure of defense-related industries, and the large pool of highly skilled labor necessary to establish a truly indigenous arms production industry. As a result these industries, even when established, tend to rely heavily on the importation of many of the components necessary to the manufacture of sophisticated weapons. These types of problems largely negate one of the alleged advantages of domestic production, namely the independence it gives a nation from foreign suppliers of arms. Despite its relatively long history of defense production, India still must buy large numbers of ships, aircraft, and tanks abroad, and what she builds herself is still largely assembled from imported components.

A second problem relates to cost; analysis of India's aircraft industry has shown that it actually costs India more to produce aircraft such as the MiG-21 locally than it would to buy the aircraft outright. Costs are driven up by such things as the greater expense of importing aircraft parts than whole aircraft, the necessity to use some facilities outside the country for testing various components of

the aircraft, and the fact that production rates are likely to be much lower in the developing country than in the original producer nation.

Political and prestige considerations interacting with the planning process form a third subset of problems. As a sophisticated defense industry is regarded as an attibute of power, there has been a tendency in Third World countries to embark upon ambitious projects without sufficient prior planning. A case in point is the Indian HF-24 supersonic jet fighter project, a high visibility/high prestige undertaking which dragged on for years before finally ending in failure. In this project, political considerations outweighed the objective reality that India simply was not capable of the indigenous manufacture of such a sophisticated weapon system.

Turning now to the proposed Arab Armaments Industry, in August 1975, Egypt, Saudi Arabia, Qatar, and the United Arab Emirates held the first formal meeting of the new Arab Military Industrialization Organization (AMIO) to discuss plans for setting up the industry. The oil states made an initial capital commitment of 1.04 billion dollars to the effort. A number of reports in late 1975 indicated that both the U.K. and France had agreed to supply the technical know-how to get the industry started; construction plans for revitalizing the old Egyptian production facilities were reportedly under study, and several aircraft surfaced as likely or possible initial projects for the industry - Jaguar, Hawk, Lynx, and Mirage F.1. As with direct procurement, however, plans to establish the Arab Arms Industry have borne little fruit thus far. At this point, license production of the Mirage F.1 seems the most likely program to start the industry, but as of January 1977 a contract was still months away. The major snag in this

contract (and doubtless with the other prospective projects as well) is the issue of financing by the oil states; as alluded to previously, these states (the Saudis in particular) have been less free with their dollars since late 1975 than previously, and the West European nations are understandably reluctant to make a major investment in Egypt unless they can be assured of payment.

A second reason for reluctance to invest in Egypt relates to the potential for further hostilities in the Middle East in the absence of a comprehensive peace agreement. President Sadat's open door economic policy has largely failed to attract significant Western investment into Egypt for precisely this reason. Even if the West Europeans do not fear nationalization of their investments, they are likely to proceed with extreme caution prior to making major commitments in Egypt. Widespread rioting in January 1977 probably raised fears in Europe over the potential instability of the present Egyptian government (even though Sadat appears to have successfully weathered this crisis), and this additional factor will likely promote even further caution.

It is clear from the above discussion that any appreciable upgrading of Egypt's military capability through local production is a very long-term venture. Egypt is beset by the same problems faced by India 20 years ago in starting an armaments industry, plus the unique problems deriving from the potential instability in the Middle East. Selection of the Mirage F.1 as the initial production venture, if it occurs, represents the same sort of ill-conceived, prestige-oriented undertaking which has failed in other Third World countries. While the establishment of an Arab Arms Industry is certainly a desirable goal, it will clearly not reduce Egypt's military problems for a long time to come. It thus appears that the only way for Egypt to reverse the

trend of declining military capability in the relatively near future is by significant outright procurement of completed weapons/weapon systems.

D. EGYPT'S WEAPONS ACQUISITION EFFORTS: A SUMMATION

This review of Egypt's search for Western weapons leads to the following general conclusions:

1. In the Army, no significant progress has been made in lessening the dependence on available Soviet tanks. Procurement of British tanks seems unlikely, at least in the near future, and proposals to revitalize the Soviet tanks in the inventory appear ill-considered. Procuring more French tanks seems the most promising prospect, but there is no evidence of any deal beyond the original 200. With respect to anti-tank weapons, some progress has been made in replacing Soviet weapons, and the prospects for further procurement appear good due to the relatively low cost of these items.

2. In the Air Force, there has been a great deal of talk but relatively little real progress thus far. Mirage F.1 fighter aircraft and Jaguar close air support aircraft in quantity would enable Egypt to phase out Soviet aircraft in the inventory, but initial deliveries of these planes, if contracted for, cannot commence until at least mid-1978, perhaps later (unless, of course, Egypt is given some sort of preferential treatment, which seems unlikely). License production is even further off.

3. The Air Defense Forces have begun to acquire replacements for the mobile SA-6 low altitude air defense missile system, and further procurement of either Crotale or Rapier is likely. There is no evidence of a search for a new high altitude SAM to replace Egypt's SA-2/SA-3 network.

4. The Navy has begun to acquire better navigation and ESM equipment, and is apparently on the verge of acquiring a better missile to replace the Styx. Fire control systems to go with the new missiles are also under active consideration.

Overall, not a great deal of progress has been made, but if funding uncertainties can be overcome, Egypt could begin to receive significant quantities of Western hardware during the mid-1978-1980 timeframe. Once acquired, Egypt will still face the problems associated with integrating the new weapons into its force structure. Those problems and their likely impact are the subject of the next chapter.

IV. THE PROBLEMS OF WEAPONS INTEGRATION

A. INTRODUCTION: THE THREE FACTORS

The effective employment of any weapon in combat depends upon three basic factors. The most fundamental of these is adequate training in the operation of the weapon. For a relatively simple weapon such as a rifle or an artillery piece, training involves only teaching the operator how to load and fire the weapon. As weapons increase in complexity and versatility, an ever increasing premium is placed on thorough training in all aspects of operating the weapon. This premium reaches its zenith in the modern fighter/attack aircraft, which is actually a weapon system. With aircraft the operator must not only be trained in all aspects of the aircraft's own capabilities, he must also be well versed in the capabilities of the sensors and weapons carried aboard the delivery platform. To be able to merely fly the aircraft to its intended target is of little value if the sensors and weapons cannot be effectively employed once the target is reached. The same applies to tank warfare, albeit to a lesser degree; a tank driven to the battlefield is of little value if the crew cannot effectively exploit its mobility and firepower.

The second factor which impacts heavily upon the employment of weapons/weapon systems is the effectiveness of the tactical doctrine employed. Military commanders must be thoroughly aware of the capabilities and limitations in the various weapons at their disposal in order to formulate a doctrine which maximizes the strengths and minimizes the weaknesses of their forces. The employment of sound weaponry

using the wrong doctrine can often lead to disaster. An example of this is the initial armored counterattack at Qantara by the Israeli 190th Armored Brigade on the second day of the October War. The Israeli tanks charged ahead as they had done so successfully in previous wars, and were decimated by dug-in Egyptian infantry using new Soviet anti-tank weapons [Ref. 35, p. 10-16]. The old and formerly successful doctrine was no longer adequate for the existing situation.

The third factor effecting the successful employment of military forces is the existence of an adequate logistics support system. This involves having on hand an adequate supply of spare parts and ammunition, having an effective means of keeping battlefield units supplied with these necessities, and development of a corps of personnel trained in effecting repairs to battle-damaged equipment.

Dr. Ra'anan mentions or alludes to all these factors as part of his argument that the West cannot ever hope to supplant the USSR as the main source of arms supplies to Egypt. He seems to come down hardest on the question of military doctrine, asserting that weapons are manufactured for the specific purpose of implementing a particular military doctrine, and to employ them in some other context is largely counterproductive. He asserts that Soviet doctrine, with its emphasis on size, numbers, and relative simplicity of equipment is particularly suited to Egypt, which is populous but not exceptionally advanced technologically. The implication is that a major shift to Western weapons would require a fundamental re-education of the Egyptian General Staff in the employment of a new doctrine to utilize those weapons effectively. Further, the shift away from Soviet weapons would require a retraining of personnel which he apparently feels to be beyond the technological

capability of the Egyptians, given the relatively greater complexity of the proposed Western arms. For these reasons (as well as the quantitative reasons mentioned earlier) he concludes that a complete substitution of Western for Soviet arms would require a prohibitively long time, and is not what Sadat has in mind anyway [Ref. 14, p. 58-59].

While the above argument appears to be a powerful one against the ultimate success of arms diversification on a major scale, the fact is that it is refuted by Egyptian employment of weapons in the 1973 War, and by observations of the Egyptian military since the War. Before addressing these areas it is necessary to examine briefly the doctrine for which Soviet weapons were designed. Because the Armored Corps and the Air Force represent two of the most important services wherein weapons capabilities must be keyed to doctrinal considerations, the following paragraphs will concentrate on these two areas. The analysis is taken from a study by Lewis Snider [Ref. 25, p. 29-34].

B. SOVIET DOCTRINAL/WEAPON RELATIONSHIPS

1. Armor

Soviet tanks have been designed for close combat on the open, flat plains of central Europe. The Soviet doctrinal emphasis is on massed armored charge and heavy fighting at close quarters; consequently Soviet tanks have low, rounded turrets to present a minimal target. This has resulted in the inability to depress their gun barrels more than four degrees below horizontal; the importance of this characteristic for desert warfare will be apparent later in this analysis. Soviet tanks also have smoothbore main guns, limiting their effective anti-armor range, and ineffective rangefinders compared to Western tanks, further limiting their accuracy of fire at longer ranges. In the close

quarters for which they were designed, however, the effects of these deficiencies are minimized.

2. Aircraft

Soviet emphasis in aircraft construction has appeared to concentrate most heavily on single-purpose aircraft designed for the interceptor/air defense role. This role emphasizes high speed at the expense of weapons payload and combat radius; for the ground support role high weapons payload and combat radius are more desirable than high speed. Even the SU-7, which is classified as a ground support/attack aircraft, is very much inferior to Western aircraft as regards these two characteristics. The MiG-23 shows a movement away from the trend of single-purpose interceptor aircraft, but it does not possess the degree of multiple capability evident in such Western aircraft as the F-4 or the F-15. The lack of Soviet emphasis on the close air support role, due to doctrinal leanings in the direction of interception/air defense, has conditioned the capabilities of the aircraft she has developed.

C. EGYPTIAN EMPLOYMENT OF SOVIET WEAPONRY

1. Armor

Soviet tank doctrine in the opening days of the October War would appear to have called for the engatement of Israeli tanks by Egyptian tanks at close quarters on the East bank of the Suez Canal. The tactics used in this phase of the war, however, were not taught by the Soviets. Egyptian generals pointed out that they had taken what they believed to be useful from Soviet and other writings, then adapted their own armored doctrine from there. Realizing that the Egyptian Army was still inferior to the Israelis in the mobile armored

warfare setting, Egypt held back its armor after the initial canal crossing and let its infantry forces deal with advancing Israeli tanks using anti-tank missiles [Ref. 36, p. 3-11]. This clearly shows the capability to modify doctrine to suit the circumstances, and is the more significant because the Egyptians evolved the new tactics themselves. When Egypt launched the armored offensive in the Sinai on 14 October, in a more conventional (by Soviet doctrinal standards) employment of armored forces, the differences in terrain between the desert and the flat plains of Central Europe exacerbated the inadequacies of Soviet armor. The Israelis were able to fire at longer ranges and from more hull-down positions behind undulations in the desert terrain due to the superiority of Western tanks for that type of warfare.

The above summary has pointed up two aspects of the doctrinal implications for arms diversification. First, Egypt has shown the capability to use armor in a doctrinal context other than that for which it was intended, and to use it effectively. Secondly, the more conventional employment of Soviet armor in the latter stages of the War pointed up the deficiencies of Soviet doctrine and weapons in the desert warfare arena; a more suitable tank might have altered the outcome of the Sinai tank battle significantly.

2. Air Force

The Egyptian Air Force operated under two very serious constraints in the October 1973 War. The first of these is the relative unsuitability of Soviet aircraft for the close air support (CAS) role. As pointed out previously, most Soviet aircraft possess characteristics which make them most suitable as fighters or interceptors, even if they

are nominally classified as attack aircraft. The SU-7 was Egypt's most capable ground support aircraft, but its capabilities fall far short of those of such aircraft as the A-4 Skyhawk or the F-4 Phantom.

The second handicap, and a far more serious one, is the inadequacy of Soviet pilot training methods, at least as far as the training of Egyptian pilots was concerned. The shortcomings in this area are as follows [Ref. 37, p. 15-16]:

a. Once basic flying skills had been taught, there was no program to refine those skills. Thus, Egyptian pilots did not have the intimate familiarity with their aircraft that is required for maximum effectiveness in a combat situation.

b. By Western standards, formal training in air-to-air combat was extremely limited, and in CAS it was practically non-existent. This exacerbated the ineffectiveness of the aircraft as CAS platforms. Training was limited to Soviet set-piece tactics, thus impairing the capability of pilots to deal with situations where those tactics could not be used.

c. Flying in peacetime was limited to conserve fuel, and there was little emphasis on night, overwater, or instrument work.

d. Technical manuals, when provided, were in English or Russian, neither well understood by Egyptians, and consequently there was little motivation to become really familiar with the aircraft and their weapons on one's own time.

Despite these handicaps, the Egyptian Air Force acquitted itself well in the 1973 War. In its only large-scale ground attack effort on the opening day of the war, the EAF succeeded in knocking out several Israeli airfields in the Sinai, and damaging a number of other targets.

The attacks were made without opposition from the Israeli Air Force, but the fact remains that the EAF demonstrated the capability to employ a doctrine for which it had been inadequately trained and for which its aircraft were less than optimally suited.

For the defensive air battle against the CAS missions of the Israeli Air Force the EAF developed the tactic of fighting within the air defense missile belt. While this entailed some risk of shooting down one's own aircraft with misdirected surface-to-air missiles (SAM's), in the swirling melee of battle, actual accidents of this nature were rare, and both EAF and EADF commanders contended that the use of interceptors and SAM's together in the air defense missile zone was an operationally sound tactic [Ref. 38, p. 16-18].

The preceding discussion demonstrates that in the area of air warfare, as well as in armored warfare, the Egyptian Armed Forces were not constrained by the rigidity of Soviet doctrine; it further demonstrates their capability to adapt their weapons to the situation and to make effective use of them, despite the inferiority of their prior training and of the weapons themselves.

D. THE MAINTENANCE TRAINING PROBLEM

Recall that it has been argued that the greater technological complexity of Western weapons generally will limit the capability of the Egyptian Armed Forces to operate and maintain these weapons effectively. The training efforts underway in Egypt as of mid-1975, however, would appear to refute this assumption. Several sources within the Egyptian Military have noted that while Soviet equipment is technologically less sophisticated that comparable Western equipment, it is nevertheless overly complicated and difficult to maintain. Rear Admiral Hassam Ezzi,

commander of the Egyptian Armed Forces Technical Institute (AFTI), expressed the view that Egyptians would have little difficulty operating and maintaining Western equipment [Ref. 39, p. 53]. Similarly, the deputy commander of the Air Force Technical Training Institute (AFTTI) anticipated that while Western equipment requires a broader theoretical background and expanded knowledge of advanced technological concepts, training on this Western equipment would be easier than on Soviet equipment [Ref. 27, p. 43]. While these two statements must be interpreted in light of the fact that they were made to visiting editors of Aviation Week and Space Technology, these editors' observations of programs underway at the AFTI and the AFTTI confirmed that Egypt is making an all-out effort to expand the technical competence of its Armed Forces personnel. The AFTI, which was to be capable of handling 5000 students when new facilities in Heliopolis were completed in late 1975, teaches courses in five areas of weapon system maintenance: aviation maintenance, rockets and radar (including all SAM systems and associated radar), gunnery, communications, and ground forces equipment. The training programs were initially guided by the Russians, but the current emphasis is on national autonomy; there are no foreign advisors at the Institute, and some of the training programs - notably electronic warfare - have been formulated entirely by Egyptian officers. Other emphasis at the school are on repair of battle-damaged equipment and on acquiring a broad theoretical background in a variety of subjects, followed by specialized training on the particular system upon which the student will ultimately work. The shift to Western equipment is not expected to have much effect on the broad technical curricula at the school since many of the features of Western technology have already been incorporated

into the course work. Only the specific systems training will change, and AFTI instructors were already training in England and France (as of mid-1975) in preparation for setting up courses in the new systems.

The AFTTI, with a capacity for 2700 students, is the primary source of training for Egypt's aircraft mechanics and other non-commissioned technicians. Like the AFTI, the emphasis is on giving students a broad theoretical background in the technical areas necessary to maintain and repair Western equipment. This broad technological grounding reflects not only the desire to prepare Egyptian maintenance personnel for the reception of Western equipment/weapons, but also the dissatisfaction with the extremely narrow and specialized training provided by the Soviets. At the AFTTI, this broad technical grounding is followed by specialization in either the area of routine maintenance and repair, or the area of overhaul and major repair. Like the AFTI, the Air Force Institute makes extensive use of damaged and scrapped equipment to give its students practical, firsthand knowledge of the systems upon which they will be working.

The preceding discussion is not meant to imply that there will be no difficulty in changing over from Soviet to Western weapons. What it does show is that Egypt is making a concerted effort to train a cadre of maintenance personnel for all the services; further, by giving the students a broad theoretical background as opposed to the overly restricted and specialized training given by the Soviets, Egypt's mechanics and technicians will be better able to repair and maintain equipment regardless of the source. Visits to the two institutes left observers with the impression that the students were highly motivated, thoroughly capable of absorbing the subject matter being taught, and

very innovative (as demonstrated by the large number of training aids, for example, which had been developed by the students and their instructors) (See Ref. 27, p. 42-47, and Ref. 39, p. 49-53 for further information on the AFTI and AFTTI.) The overall picture, then, is one of a nation making a concerted and apparently successful effort to acquire the technological grounding necessary to cope with Western technology when it arrives.

E. OPERATOR TRAINING

The second major facet of training which will impact upon the capability to change over from Soviet to Western arms is that of training operators of the weapons/weapon systems. Because combat aircraft are highly complex weapon systems, exist in relatively large numbers, and will be delivered at relatively slow rates, it will take the Air Force longer than the other services to complete a major changeover to Western equipment. For that reason this analysis will look at the Air Force with respect to the problems of transitioning operators from one piece of equipment to another. The same sorts of problems, on a lesser scale, will exist within all the services.

Egypt has two options she can pursue in making the changeover to Western aircraft. First, she can train new recruit pilots from the ground up on the new Western aircraft once they arrive in Egypt. This option requires ground school, flight training in a succession of piston and jet powered trainers, assignment to operational training units for further flight work on a specific aircraft, and finally assignment to an operational squadron. The final two stages should provide the pilot with intimate familiarity with the aircraft itself and all of its associated sensors, avionics, and weapons capabilities. The training of a

MiG-21 pilot typically took about two years by Soviet methods, but it has already been pointed out that those methods were less than optimal. Training by Western methods takes approximately the same length of time, but results in pilots much better qualified to fly and fight their aircraft. The current extent of Egypt's effort to train new pilots on Western aircraft is not known, but one of the critical items lacking in the EAF is a modern advanced jet trainer such as the British Hawk. Some pilots are known to have been in France in 1975 training on Mirage's, and Egyptian pilots flew Libyan Mirage's during the 1973 War, so there is at least a small cadre of qualified Mirage pilots within the EAF. These pilots will probably form the corps of instructors whose duty it will be to oversee the advanced operational training of Egypt's future Mirage (or other Western aircraft) pilots.

The second and potentially better approach to this problem, at least for the short term, will be to transition pilots from Egypt's operational squadrons directly to the new aircraft as they arrive. This approach has the advantages that the pilots are already well grounded in flying skills, have a large number of flight hours in combat aircraft, and in many cases have operational combat experience. The major areas requiring re-education will be in the specific layout of the new aircraft, its particular aerodynamic capabilities and limitations, and the operation of its sensors, avionics, and weapons. As a rough guideline for the length of time required to make this transition, the author examined a U. S. Navy plan for training Greek Air Force pilots on the A-7H attack aircraft. The underlying assumptions in the plan were that the Greek trainees be experienced jet pilots with at least 80% English comprehension level. Based on those assumptions, approximately four and one half months was allotted for the transitioning. At the end of this time the

Greek pilots would be fully competent to operate the aircraft under all conditions of weather and visibility, and to use all of its sensors, avionics, and weapons in a combat situation.

While this plan is not directly applicable to the transitioning of Egyptian pilots from Soviet to Western aircraft, this author believes that an experienced MiG-21 pilot could easily make the transition to a Mirage or Jaguar within six months. Given adequate flight training hours, the transition could in many cases be accomplished in a good deal less time than that. Obviously, transition along these lines on a large scale cannot commence until the Western aircraft arrive in Egypt. However, Egypt currently has in its inventory 38 Mirage III's and 20 Mirage F.1's, which have been there since 1974. If the Air Force has been rotating some of its pilots through these squadrons on a continuing basis since that time, it is possible that Egypt has a fairly sizeable cadre of pilots with at least some exposure to the Western aircraft. These pilots could then move rapidly into the new aircraft when they arrive in quantities sufficient to form new operational squadrons, with a minimal and temporary loss of combat efficiency during the period immediately following the changeover.

F. LOGISTICS

The third major area where transition to Western weapons and equipment will cause difficulties is in the area of establishing an adequate logistics support system for the equipment. This entails not only having adequate access to supplies of spare parts and ammunition, but the development of an adequate distribution system to ensure that the right parts and ammunition are delivered to the squadrons or battalions which require them. It also entails the development of an effective inventory

and control system for logistics support items so that critical replacement parts which are in short supply can be identified and reordered before that supply is exhausted. These problems are difficult to cope with even in a country which manufactures all of its own military hardware; anyone who has served aboard a United States Navy ship can recount instances where spare parts to fix a weapon or radar (parts which should have been on board) were not available and could not be obtained for periods ranging from days to weeks or even months. These problems can be exacerbated when a nation's armed forces operate a number of different kinds of equipment supplied by several different supplier nations. For Egypt, assuming she eventually begins to acquire significant quantities of Western aircraft, tanks, missiles, and other equipment, these problems will be particularly bothersome during the period when she is phasing in new weapons while still operating some units using the best of the remaining Soviet hardware.

Even this should not pose an insurmountable problem in Egypt's quest for arms diversification. In the first place, it has been pointed out that logistic support with the Soviet Union as the sole supplier was not exceptionally good; maintenance training was limited, and the Russians tended to manipulate shipments of spare parts for their own purposes. In a multiple supplier situation, with each supplier striving to demonstrate the superiority of its own weapons and logistics support programs (no doubt with a view toward capturing further sales), the capability to adequately maintain and overhaul equipment may well be better than it was under the single source procurement plan.

Secondly, it has been demonstrated that nations <u>can</u> develop very effective military forces while operating equipment from several

different suppliers. The primary example of this is Israel. Besides a variety of Western equipment (British and American tanks, French and American aircraft, for example), Israel has successfully utilized captured Soviet tanks, for which she is obviously not on the distribution list for spare parts. Granting that Israel is more advanced technologically than Egypt, this example nonetheless demonstrates that a country can effectively operate armed forces employing weaponry from several different suppliers.

The capability that Egypt demonstrated in the 1973 War to repair battle damaged equipment in the field, and the development of a growing capability to manufacture spare parts for some of her Russian equipment point to a growing awareness in Egypt of the importance of adequate logistic support, and to an emerging technical capability to implement that awareness. Should the Arab Arms Industry ever become a reality, the familiarity with equipment that derives from manufacturing it will further enhance Egypt's logistics support capability. The chief problem will be in developing a distribution system to ensure that Mirage squadrons get Mirage spare parts and Mirage ordnance. As it appears that most major weapon systems will be phased into the inventory rather slowly, due to constraints caused by production rates, this author believes that Egypt will have the time and the capability to adequately address and cope with problems of this type.

G. SOME PRELIMINARY CONCLUSIONS

The overall impression which should emerge from the foregoing discussions of the problems of weapons <u>procurement</u> and weapons <u>integration</u> (the changeover process) is that the problems involved in switching from Soviet to Western armed military forces are formidable but not

insurmountable. Given that major Western procurements cannot in most cases begin prior to mid-1978, and that integration of the new weapons cannot take place overnight, one is unlikely to see a significant reversal of the trend in declining Egyptian military capability until at least 1980-1981. That would likely be entirely acceptable to the Egyptian military commanders, given their distaste for the Russians. were it not for the fact that a state of belligerency still exists between Egypt and Israel. Too, large shipments of Russian weapons to neighboring Libya, led by the mercurial Colonel Qaddaffi, are bound to be causing Egypt's military leaders unease. Thus, while there do not appear to be any insurmountable technical problems associated with the changeover to Western arms, political problems may intrude to deny Sadat the time required to make the large scale changeover. The next chapter addresses some of these problems.

V. POLITICAL IMPACTS ON ARMS DIVERSIFICATION

A. INTRODUCTION

The major operative hypothesis of this thesis is that a complete changeover to a Western-supplied military establishment is within Egyptian capability, notwithstanding the problems already discussed. It must be pointed out, however, that the policy of arms diversification has been orchestrated by Egypt's present leader, Anwar Sadat. As long as President Sadat is able to remain in power the policy is likely to be continued, given Sadat's personal distaste for the Russians. If continued long enough the policy will succeed and Soviet influence will be virtually eliminated from Egypt. There are several key conditions which must continue to apply, however, if this policy is to have the time to ultimately succeed. These conditions are as follows:

1. Prospective procurements of major weapons systems must incur little or no further delay. It has already been pointed out that major procurements under discussion at present will not have any significant impact in Egypt until at least mid-1978. Every delay in procurement, for whatever reason, simply extends the period of reliance on aging and ill-maintained Soviet hardware.

2. President Sadat must remain in power; it is conceivable, although unlikely, that he could be overthrown for reasons unrelated to the progress of his arms procurement policy.

3. The President must continue to enjoy the full support of the military establishment.

B. DELAYS IN PROCUREMENT

Continued funding difficulties and/or unwillingness of Western European nations to sell military hardware are the two principle factors which could cause further delays in significant procurement of new weapons. Uncertainties over financing have been cited as the major stumbling block in several of Egypt's procurement efforts. While the conservative oil states have shown a reluctance to provide Egypt with blank checks for either weapon purchases or economic development, they are not likely to force Egypt into a position of having to return to the USSR for weapons procurement. Funding problems can and probably will be worked out, but this may require that Egypt scale down the size of some of its prospective procurements. Given the anti-Soviet bent of the conservative oil monarchies, however, it is unlikely that funds will not be forthcoming in the near future for at least some of the weapons Egypt desires.

It is also unlikely that West European nations (possibly excluding West Germany) will prove unwilling to sell to Egypt should funds be forthcoming. They are and probably will continue to be cautious about making major investments in Egypt itself in the absence of a comprehensive peace agreement, but the potential arms industry is a long-term venture anyway; two year's further delay in starting this industry would have far less impact that two year's additional delay initial deliveries of advanced combat aircraft. The West European suppliers' desire to portray themselves as friends of the Arabs suggests strongly that they will sell weapons to Egypt as soon as they know the money will be available to pay for them.

C. PRESIDENT SADAT'S POSITION

President Sadat, with the support of the military, has orchestrated Egypt's policy of arms diversification. As long as he retains the support of the military, it is unlikely that he will be overthrown, despite the recent erosion of his domestic position. Sadat has by and large been a popular president, but mounting economic difficulties, a massive foreign debt, and rising expectations among the Egyptian people have done much to undermine his domestic position [Ref. 40, p. 21]. As pointed out by Gurr [Ref. 41, p. 185], one of the most basic preconditions of civil strife is relative deprivation; as relative deprivation increases, so does the potential for widespread civil strife. President Sadat's opening of the Egyptian economy to the West and his steps toward political liberalization following the oppression of the Nasser years have led Egypt's masses to expect a better life than Egypt's economy is able to provide them; hence, relative deprivation. This feeling is exacerbated by the sight of Egyptians who have profited by the economic liberalization policy, and also by the feeling that the oil-rich Arab states are not doing enough to help Egypt out of its troubles [Ref. 40, p. 21]. January 1977 rioting over the cutting of subsidies on bread and cooking gas could have mushroomed into a movement to overthrow Sadat were it not for the presence of one of the most important mitigating factors of civil strife, i.e. coercive potential. Coercive potential refers to the coercive forces of a nation (Army, security forces) weighted for their degree of loyalty to the regime [Ref. 41, p. 186]. The effectiveness of the coercive forces of a state increases linearly with the degree of loyalty to the regime. In the January 1977 rioting in Egypt the Army acted swiftly to restore order, and by restoring the subsidies Sadat apparently emerged with little harm to his position.

The effectiveness of the Army's intervention to restore order bespeaks a high degree of loyalty to President Sadat. As long as that loyalty remains, it is unlikely that Sadat will be overthrown, however shaky his domestic position may appear to grow.

D. SUPPORT OF THE MILITARY

If financing problems are overcome and Sadat can weather most of the storms foreseeable on the domestic horizon, then the only thing which might thwart the policy of arms diversification is growing dissatisfaction within the military leadership over the efficacy of that policy. It would be nice to be able to look at statements made by Egyptian military leaders and deduce from them at exactly what point dissatisfaction would result in positive steps to change that policy. Unfortunately, those leaders are unlikely to say at what point military capability will have declined sufficiently for them to take action, and they are also unlikely to present a clear picture of the precise status of that capability. The analyses presented in previous chapters has shown clearly that Egypt's military capability is declining, and that that trend is unlikely to be reversed prior to 1980-1981, assuming present procurement plans come to fruition in the timeframe expected. While there have been occasional reports of dissatisfaction within the military over this trend (Ref. 12, p. 12, for example), there have been no signs that this dissatisfaction is on the verge of turning into action to reverse the trend by other means (such as a return to the Soviet Union). It is the feeling of most analysts that the military, and the Army in particular, is still firmly behind Sadat's policy, despite the difficulties which that policy is causing for military preparedness. One may infer this loyalty from the swiftness of the Army's action in

curbing the January 1977 riots in Egypt. In order to assess the prospects for continued military support of Sadat's policy, one must hypothesize that at present the military is at least nominally satisfied with current and projected near future conditions, look closely at what those conditions are, then examine closely a number of possible scenarios in which those conditions are likely to change. Looking at the prospective impacts of the various scenarios, and the likelihood of each of them should give some insight into the prospects for continued military support of Egypt's arms procurement policy. Since continued military support is essential to the ultimate success of that policy, the analysis should give some insight into those prospects as well.

Present military/political conditions existing in the Middle East are as follows:

1. Egyptian military capability has declined relative to that of Israel and will continue to do so until at least 1980; reversal of the trend by that time is contingent upon the near future implementation of arms deals currently being discussed.

2. The prospects for the resumption of the Geneva Peace Conference on the Middle East prior to the end of 1977 are good. Press reports in early 1977 indicate that all parties are positively motivated to reconvene the conference before the end of the year.

3. The United States appears to be pursuing an even-handed policy with respect to the Middle East. While Egyptian leaders do not expect to receive large amounts of military hardware from the U. S., the possibility of some sales above and beyond the six C-130's has not been flatly rejected; the main point at issue is whether or not certain weapons can be classified as strictly defensive.

4. There is a feeling in the Middle East, pushed strongly by President Sadat, that the United States is capable of arranging a Middle East settlement if it has the will to do so (see Ref. 42, for example.

Before discussing possible changes in these conditions and their effects on military support for Sadat's armaments policy is is necessary to state some underlying assumptions about behavior of the Egyptian military elite. The most basic assumption of this thesis is that if this elite becomes too dissatisfied with the state of Egypt's military capability under the policy of arms diversification it will take whatever steps it deems necessary to restore a steady flow of military equipment to Egypt. Reaching this level of dissatisfaction implies dissatisfaction with Western Europe, inasmuch as that is where the arms are being sought. As it is extremely unlikely that the U. S. would even consider supplying such arms as attack aircraft or tanks, the only other alternative open to the military would be to reinstitute a military supply relationship with the Soviet Union. If President Sadat should prove unwilling to do so, it is highly probable that he would be deposed. It must be reiterated that the Egyptian military leaders are not overly fond of either the Russians or their equipment. To depose Sadat in order to return to the Russians for military supply would be a very grave step, one which would be taken only if the military felt that:

1. The threat from Israel was increasing while Egyptian capability to deal with that threat continued to decrease.

2. Significant deliveries of Western arms were being pushed unacceptably far into the future; at some point, even given no increase

in the perceived threat from Israel, the military would feel the decline in capability of Soviet hardware would make it incapable of responding credibly to any threat (for example, ominous gestures on the part of Libya's Colonel Qaddaffi). Although the Israeli threat has always been a prime reason for Arab arms acquisitions, it has also been true that the Arab states are extremely sensitive to tensions with one another. For this reason, Egyptian demands for arms, while they might become less imperative in the presence of a peace agreement with Israel, would certainly not cease altogether. Indeed, many have written that it is only the presence of Israel, the common enemy, which has prevented traditional inter-Arab rivalries from exploding more frequently into open conflict. In this setting it is difficult to imagine the Egyptian military sitting idly by while its capabilities dwindled away to insignificance.

E. POSSIBLE MIDDLE EAST SCENARIOS AND THEIR IMPACT

With present conditions and underlying assumptions about the behavior of the Egyptian military in mind, the remainder of this chapter will examine several scenarios which may occur in the Middle East in the next six to 12 months and assess their impact on the prospects for continued success in the policy of arms diversification.

1. Failure to Reconvene the Geneva Conference on the Middle East

While all interested parties appear to be strongly motivated toward reconvening the Geneva Conference before the end of 1977, it is still possible that it would not be reconvened. Such things as the failure to resolve the question of the seating of the Palestinian delegation, or a fresh outbreak of Palestinian terrorist activity might scuttle the conference before it could begin. Regardless of the reason(s)

for failure to convene the conference, it is likely to be viewed from the Arab side as another manifestation of Israeli intransigence. This in turn would have the effects of increasing the perception of the threat posed by Israel, and also reducing Arab faith in the capability of the United States to exert pressure on Israel. It might also increase the belief still held by many Arabs that the United States is not really interested in getting Israel to the conference table.

The impact of this scenario on arms diversification would be severe. It would likely result in increased calls for a new war in the Middle East, accompanied by increased military pressure in Egypt to redress the declining military capabilities problem with all speed. Under these circumstances, any delays in the prospective Western procurements detailed earlier in this thesis would likely convince the military that President Sadat had erred in casting his lot so heavily with the West. Unless steps were taken to expedite some deliveries of Western hardware, the military would quite probably bring heavy pressure on the president to take steps to reinstate a larger military supply relationship with the USSR. It is unlikely that Western procurement efforts would cease altogether, but their efficacy as a means of redressing Egypt's military capabilities problems within a desired timeframe would be lessened substantially in a situation where a new war in the Middle East was being seriously considered.

2. Reconvene the Geneva Conference; Make No Progress

Given that issues standing in the way of convening the Geneva Conference could be resolved, it is still possible that the conference could end in total failure to resolve any of the substantive questions at issue. The conference could fail for any number of reasons given

the long tradition of animosity existing between the principals; failure to resolve territorial questions or new outbreaks of Palestinian terrorism are only two occurrences which might abort the conference once it began. As with the issues involved in convening the conference, President Sadat has banked heavily on the capability of the United States to ensure that progress is made once the parties are seated at the conference table. An unsuccessful dissolution of the conference would do much to undermine Sadat's position, not only among other Arab leaders but also among his own military leaders. Further, as with the issues involved in convening the conference, failure to make progress would be viewed from the Arab side as a manifestation of Israeli intransigence and lack of desire for a change of status quo in the Middle East.

The impact of this scenario would likely be similar to that of the first scenario discussed, but possibly lessened and pushed farther back in time. It is unlikely that the Geneva Conference will be reconvened prior to the end of 1977. Once it is reconvened, it may take a considerable time before all parties realize that it is going to fail; on the other hand, it could fail immediately. Failure is likely to result in renewed calls for war in the Middle East, but if the conference drags on for some time before failing Egypt may have had time to resolve some of the issues standing in the way of Western arms procurements, and their impact on redressing the military capabilities problems may be more clearly known than it is at present. Nevertheless, since even under optimum conditions significant Western procurements will not begin to impact heavily on Egyptian military capability until after mid-1978, failure of the conference is likely to result in increased military pressure to reestablish a large scale supply relationship with the USSR.

3. Reconvene the Geneva Conference; Make Progress

Given the apparent interest of all parties in making progress at the Geneva Conference this time around, the prospects for making that progress would have to be considered better than at any time in the past. What is difficult to gauge is that which would be considered acceptable progress to both sides. The flavor of the rhetoric emanating from the Middle East seems to indicate that resolution of Sinai and Golan Heights territorial issues, an end to the state of belligerency in the Middle East, and the creation of some sort of Palestinian entity are required before progress can be adjudged to have been made. The recent announcement of a unified Egyptian/Syrian political command indicates strongly that Egyptian and Syrian territorial issues must be resolved together; resolution of one set of issues without the other will probably not constitute acceptable progress. Similarly, the failure to reach some sort of working compromise on the issue of a Palestinian entity might mean unacceptable progress, even if the other issues were resolved. Notwithstanding the complexity of all the issues involved, a scenario in which the Geneva Conference is convened and progess is made is a distinct possibility in 1977.

The impact of even partial success at Geneva on arms diversification would be profound. President Sadat's faith in the American connection would be vindicated, the perceived threat posed by Israel would be lessened, and military pressure on Sadat for a quick fix of the military capabilities problem would be lessened as well. An end of the state of belligerency would have the most profound effect, but even more limited progress accompanied by an agreement to meet again to continue discussions would reduce significantly the incentive to return to the

Russians for military hardware. Limited progress would result, at the very least, in postponement of calls for a new war in the Middle East (indeed, such calls would clearly be counterproductive under those circumstances), and Egypt's military leaders would feel that they could proceed with arms diversification, as long as the timetable remains substantially the same as it appears to be at present. Even under this scenario, substantial new delays in major Western procurement efforts might erode Egyptian military belief in the efficacy of arms diversification; however the impact of those delays would not be nearly as severe as under either of the first two scenarios presented.

F. IMPLICATIONS FOR THE UNITED STATES

The conclusion to be drawn from the preceding three scenarios is that, in the absence of some sort of progress toward an eventual Middle East peace settlement in the upcoming round of negotiations, there will be significant pressure applied by the Egyptian military to end or modify the policy of arms diversification, with an implied increase in Soviet influence in Egypt. The importance of the United States role in the eyes of Egyptians cannot be overstressed. Whatever the true capability of the United States to exert pressure on Israel, in the eyes of moderate Arab leaders, and particularly President Sadat, the United States holds the key to a Middle East settlement. If the conference is not convened or if it ends in failure, the Arabs will likely perceive that the United States is satisfied with the status quo in the Middle East and has abandoned its policy of even-handedness. Should this result in significant pressure from within the Egyptian military to abandon the policy of arms diversification, the only apparent alternative open to the United States would be to offer to sell to Egypt some of the

hardware she is seeking in Western Europe. Egypt has expressed a desire for such American weapons as the F-5 aircraft and the TOW anti-tank missile, and in late 1976 President Sadat expressed the belief that the United States owed him weapons as a quid pro quo for his moderation vis a vis the Middle East situation. In the event of failure to make progress at Geneva in 1977, such sales would help to redress the declining military capabilities problem, thereby ameliorating military pressure to return to the Russians, and would also help to restore Egyptian belief in the even-handedness of the American approach to the Middle East. However, given the political reality of the United States relationship with Israel, the prospects for sales of any weapons with anything approaching an offensive capability must be considered extremely slim, even if it were argued that such sales were the only means of preventing the return of a significant Soviet presence in Egypt. The conclusion to be drawn from this discussion is that the United States must employ all the diplomatic means at its disposal to ensure that satisfactory progress is made in the next round of negotiations at Geneva. The Arabs recognize that the United States will never abandon Israel, and they are not asking that it do so. President Sadat, however, feels that his moderate stance on Middle East issues and his willingness to put distance between himself and the Russians, even at the risk of his position vis a vis the military, have gone a long way to establish the necessary preconditions for a Middle East settlement. Failure to make some progress in that direction would seriously undermine the faith of all moderate Arab leaders in the United States position, and would also have serious repercussions with respect to Egypt's attempt to restructure its military forces around Western

equipment. That attempt can succeed if Egypt is given time to procure and integrate Western arms into its force structure; it will have that time only if Egypt is not subjected to substantial pressure for a new war in the Middle East.

G. CONCLUSIONS

During the course of this research this author reached a number of conclusions about the process of arms diversification in general and its impacts and prospects with respect to Egypt in particular. Many have been stated or at least implied in the body of this thesis. To sum up, the major conclusions of this research are as follows:

1. Egypt's overall military capability has been declining since the end of the War of Ramaden of October 1973. While pre-war and present weapons inventories appear to be substantially the same, inability to properly maintain Soviet equipment comprising 90% of the present inventory has resulted in reduced combat effectiveness and the concomitant decline in overall military capability.

2. Egypt's search for Western weapons is not intended merely to acquire some Western technology and a few weapons in certain select areas, but rather to entirely reequip its armed forces with Western hardware. The size of the desired acquisitions, the wide range of these desired acquisitions, and the limited utility of acquiring a few Western weapons while relying on the Soviet Union for the bulk of its military support are the factors underlying this conclusion.

3. Egypt should not be hampered by either tactical/doctrinal considerations or the greater technological sophistication of Western equipment in its quest to reequip its military forces. Egypt has shown the capability to adapt its weaponry to the prevailing tactical situation

and has undertaken an ambitious training program which is keyed to many of the technological concepts required to handle Western equipment effectively.

4. Transitioning of operators (e.g. pilots) from Soviet to Western equipment will take time, but can be accomplished gradually due to the relatively slow pace at which major Western procurements will likely occur.

5. A substantial reversal of the trend of declining military capability can be effected by 1980-1981, assuming that deliveries of major weapon systems such as combat aircraft begin to occur by mid-1978. Delays in these procurements will result in a lengthened period of decline of military capability.

6. The establishment of an Arab Armaments Industry is not likely to have a significant impact on Egypt's military capability for a long time to come, due to the magnitude of the problems facing any Third World country attempting to establish an indigenous arms production industry. Retrofit of existing Soviet equipment is at best of only limited utility in enhancing military capability; Egypt's best means of redressing its current problems is through outright procurement.

7. In the final analysis, the only factors which could prevent Egypt from eventually restructuring its forces around Western equipment are political factors. Calls for a new war in the Middle East, resulting from either a failure to reconvene the Geneva Conference or a meeting of the conference followed by hopeless deadlock, would likely result in substantial pressure from the Egyptian military to reestablish military supply relationship with the Soviet Union as the most effective means of redressing Egypt's declining military capability expeditiously.

8. It is in the interest of the United States to ensure that Egypt is not forced to return to the Soviet Union for significant arms supplies. The U. S. could probably forestall this development (in the event of the failure of the Geneva Peace Conference) by agreeing to large scale arms sales to Egypt. As this option is politically unrealistic, the United States must use all of its influences with both Arabs and Israelis to ensure that at least a beginning is made at Geneva toward resolving the long-standing problems of the Middle East. This would help to give Egypt the time she requires to successfully pursue arms diversification, enhance United States prestige in the Arab world, and perhaps even influence other nations dependent upon the Soviet Union for arms supplies to take steps to lessen that dependence.

APPENDIX I

Important operational characteristics of major weapon systems in the Egyptian inventory or being sought by Egypt.

TABLE A: Aircraft Characteristics

Aircraft	Max Combat Radius (NM)	Max Speed (Mach #)	Max Pay-load (Lbs)	Designed Role	Remarks
Mirage IIIE	647	2.2	9000	Long range Fighter-Bomber/Interceptor	
Mirage F.1C	267	2.2	8820	All-Weather Interceptor	F.1E version has increased payload and combat radius
Sepecat Jaguar	710	1.5	10000	Tactical Support	
H/S Hawk Trainer	280	.8	5600	Basic and Advanced Trainer	Close support is a distinctly secondary mission
F-5E	485	1.6	7000	Light Tactical Fighter	Combat radius approx 165 NM with full external ordnance load
MiG-21MF	250	2.1	3300	Fighter/ Light Strike	
MiG-23B	375	2.3	7500	Air Combat Fighter	
MiG-23D	425	1.4	7500	Strike	
Su-7	260	1.2	5500	Strike	SU-20 version has increased payload and combat radius

TABLE B: Helicopter Characteristics

Helicopter	Max Speed (KTS)	Max Range (NM)	Max Troop Lift Capability	Remarks
SA-341 Gazelle	142	193	5 troops	Can be armed with a variety of weapons; Helos for Egypt carry 4 HOT anti-tank missiles
Commando Mk2	112	240 w/ 28 troops	28 troops	Can carry a wide variety of guns, missiles, etc at customer request
WG-13 Lynx	148	365	4 troops	Can carry up to 8 HOT or TOW missiles in two external pods, plus 6-8 reloads
Agosta 109	168	305	7 troops	Can carry 4 HOT or TOW missiles in external pods
Mi-6	162	350	65 troops	Heavy transport helo
Mi-8	140	259	28 troops	Can carry external ordnance such as rockets; follow-on to Mi-4

TABLE C: Anti-tank Missile Characteristics

Missile	Range (M)	Guidance/ Control	Remarks
Euromissile HOT	75-4000+	Optical aim/infrared track/wire guided	Adaptable to variety of ground and air launch platforms
Euromissile MILAN	25-2500	Same as HOT	Tripod ground launch or adaptable to various light vehicles
BAC Swingfire	150-4000	Optical aim/wire guided	Can be mounted on virtually any vehicle; portable version (Golfswing) for infantry
Hughes TOW	65-3750	Optical track/ wire guided	Suitable for wide variety of ground and airborne platforms
AT-1 Snapper	500-2300	Optical track/ wire guided	Vehicle and infantry launch versions; now obsolete
AT-3 Sagger	500-3000	Optical track/ wire guided	Ground launch and vehicle mountings available

TABLE D: Anti-ship Missile Characteristics

Missile	Max Range (KM)	Terminal Guidance	Remarks
Aerospatiale MM38 Exocet	42	Active radar homing	High subsonic, low altitude flight profile
Matra/Oto Melara Otomat	60	Active radar homing	High subsonic, low altitude flight profile; Mk II version has 100+ KM range
SS-N-2 Styx	42	Active radar with possible infrared version	High subsonic cruise; obsolescent

TABLE E: Surface-to-air Missile Characteristics

Missile	Range (M)	Alt Limits (M)	Guidance	Remarks
Matra/ Thomson CSF Crotale	500-8500	Up to 3000	IR gathering beam rider	Std mobile launcher carries 4 missiles; Shahine variant for Saudi Arabia has 6 missiles/launcher
BAC Rapier	500-7000	Up to 3000	Semi-automatic/command to line of sight	Fully mobile; 4 missiles per launch vehicle
SA-2	40,000-50,000	18,000	Radio command	Fixed system
SA-3	30,000-35,000	100-15,000	Radio command	Normally fixed but can be mobile
SA-6	30,000 low alt, 60,000 high alt	100-18,000	Radio command plus semi-active radar	Fully mobile, 3 missiles per launch vehicle
SA-7	3000-	45-1500	IR homing	Portable, shoulderfired

TABLE F: Air-to-air Missile Characteristics

Missile	Range(M)	Guidance	Remarks
Matra Super 530	36000	Semi-active radar homing	Missile can acquire despite vertical separation of ± 7500 meters; production to begin in 1977; has twice the capability of current 530 version
Matra R550 "Magic"	500-6000+	IR homing	Highly maneuverable dogfight missile
AA-2 Atoll	6500	IR homing	EAF pilots report this missile has poor seeker lock-on characteristics
AA-7 Apex	27000	IR and radar versions	Standard MiG-23 armament
AA-8 Aphid	8000	Probable IR homing	Dogfight missile; possibly derived from Atoll; MiG-23 armament

TABLE G: Tank Characteristics

Tank	Major Operational Parameters
AMX-30	The AMX-30 tank has a maximum road range of 5-600 KM, with a maximum speed of 65 KPH. It has a 105mm main gun which fires HE and HEAT ammunition. Maximum anti-armor range is 3000 meters. The tank employs a optical rangefinder.
Chieftain	The Chieftain tank has a maximum road range of 500 KM, with a maximum speed of 48 KPH. It has exceptionally accurate, hard-hitting 120mm main gun which fires HESH and APDS ammunition. Maximum effective anti-armor range is 3000 meters with APDS, 8000 meters with HESH. It employs a laser rangefinder.
T-54/55	These tanks have a maximum road range of 630 KM, with a maximum speed of 48 KPH. Main armament is a 100mm smoothbore gun firing AP and HEAT ammunition. Maximum effective anti-armor range is 1000 meters. Armor protection is poor, and ranging is by visual estimate only.
T-62	The T-62 tank has a maximum road range of 480 KM, with a maximum speed of 55 KPH. It has a 115mm main gun firing HE, HEAT, and APFSDS ammunition. Maximum effective anti-armor range is 1500 meters. The tank employs a stadimetric rangefinder.

TABLE H: Missile Boat Characteristics

Missile Boat	Max Range (NM)	Max Speed (KTS)	Armament	Remarks
Osa-I	800 at 25 kts	35	4 30 mm guns 4 SS-N-2 Styx Missiles	
Komar	400 at 30 kts	40	2 25mm guns 2 SS-N-2 Styx Missiles	
Vosper Thornycroft Tenacity	2500 at 15 kts	40	2 Machine guns	Only one of these boats has been built in the U.K. Egypt reportedly desires up to 9, to be armed with Otomat missiles
SRN-6 Hovercraft	200	50	unk	Egypt reportedly bought 3 in 1976 armed with BHC-7 missiles; no info available on this missile

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