

INDUSTRIA BELICA AMERICANA:
PRESENTE Y FUTURO

POR

TCNL. LOUIS NAVARRO (EE.UU.)

Y

CPFG.DIEGO MANTILLA (Ecuador)

Trabajo de Investigación
presentado al Colegio
Interamericano de Defensa
como requisito para la
obtención del Diploma
aprobatorio del Curso
Superior de Defensa
Nacional.

WASHINGTON, D.C., MAYO DE 1994

Certifico que he revisado este Trabajo de Investigación y lo he encontrado ajustado a la Normativa y Metodología del CID.

CNEL. Pedro J. SERRANO
Asesor Coordinador

FECHA

NOTA ACLARATORIA

Las opiniones vertidas en el presente trabajo son de la exclusiva responsabilidad de los autores y no representan la opinión del CID.

AUTORIZACION

Autorizamos al Colegio Interamericano de Defensa la Publicación de este trabajo como artículo para lectura seleccionada en la Revista del Colegio, para dar difusión a la Escuela de las Américas, Fuerte Benning, u otros institutos de altos estudios.

TCNL. LOUIS NAVARRO (E.E.U.U.)

CPFG DIEGO MANTILLA (ECUADOR)

FECHA: _____

COLEGIO INTERAMERICANO DE DEFENSA
FORT LESLEY J. McNAIR
WASHINGTON, D.C.

THE AMERICAN ARMS INDUSTRIES
ITS PRESENT AND FUTURE

BY

LTCOL. LOUIS NAVARRO (USAF)
CPFG. DIEGO MANTILLA (ECU)

JANUARY 1994.

TABLE OF CONTENTS.

I. THE STRUCTURE OF ARMS INDUSTRIES IN LATIN AMERICA

WHY AN ARMS INDUSTRY IN THE SOUTH ?	1	
THE ARMS RACE IN LATIN AMERICA	4	
THE STATE AS AN INDUSTRIAL	6	
THE ARMS INDUSTRIES IN SOUTH AMERICA		7

II. U.S. INFLUENCE IN THE ARMS INDUSTRIES

THE ARMS TRADE FROM 1945 TO 1970	20	
THE ROLE OF US MILITARY ASSISTANCE.....		20
THE TIAR AND THE ARMS INDUSTRIES	23	

III. THE FUTURE OF THE ARMS INDUSTRIES IN THE U.S.

THE SHAPE OF FUTURE WARS	25	
FUTURE STRATEGY	31	
RESTRUCTURING THE DEFENSE TECHNOLOGY AND INDUSTRIAL BASE	32	
CONCLUSIONS	34	

IV. THE FUTURE OF THE ARMS INDUSTRIES IN LATIN AMERICA.

A MARKET OVERVIEW.....	36	
COLLECTIVE SECURITY AFTER THE COLD WAR	44	
PRIVATIZATION.....	48	
CONCLUSIONS.....		53

BIBLIOGRAPHY	57	
---------------------------	-----------	--

INTRODUCTION

The changing environment of defense has made is a reality that cannot be denied. At the end of 1993 we have seen in the past five years the most devastating changes in the social, political and economic institutions in the world. One could probably argue that all things change, and all things remain the same; indicating that there are still enemies, there are and there will be conflicts, and that wars will be fought in the future, so at the end nothing has changed. This argument fails to highlight the point that new conflict will be fought along new lines, not in the vast front established in the cold war. It is very easy now, when some countries that used to be part of the Warsaw Pact have adamantly requested to be admitted in the NATO, that the Cold War is over and that the United States won.

In this new framework security alliances that had lasted decades were rendered useless and irrelevant in a matter of years, nato after "redefining" itself in late 1991¹, was forced to redefine its role only two years later in January of 1994. The OAS that had convived comfortably with the Inter American Defense Board and the terms of the Inter American Reciprocal Assistance Treaty, set a deadline for 1994 to define the future character of those institutions.

At the beginning of the decade a war was fought in the Gulf, it was quick, it was destructive almost bloodless for the winner, and it was the first announcement that a new type of war was emerging, one in which old concepts, weapons and strategies would not work. These two facts the end of the cold war, and the emergence of a new type of warfare made massive accumulation of weapons that had characterized the industrial era warfare unnecessary, and vast programs oriented towards reducing the size of the armed forces were started in the major powers.

The end of the cold war had another fast reaching conclusion, it made the economic model of the west apparently the only successful, the one it had to be copied. This alone has had a devastating effect in the socio economic structures of Latin America, where vast industrial conglomerates built to implement a policy of import substitution that was at the hub of the development model designed by the CEPAL almost 30 years ago, at the height of the ideological confrontation, was to be dismantled and replaced by a more competitive, more efficient market oriented private owned industrial establishment.

All the changes mentioned so far are not all of the changes that have been taking place in the world, we would have to consider all social, economic and political transformation that in

¹ See "The alliance Strategic Concept" Agreed by the heads of State participating in the Meeting of the North Atlantic Council in Rome on 7th-8th November 1991. NATO Office of Information and Press .1110 Brussels, Belgium. Nov.91.

a world that is ever more closely interrelated have inspired changes in the way societies interact, thus have forced major modification in the way armed forces are trained and equipped, and in doing so they have changed the requirements for armaments.

In this paper we will try to analyze the current status of the arms industries in Latin America, and try to predict what is going to be the future of the arms industries in the region. A lot of topics will have to be touched and dealt with in order to make this a complete appraisal, but it must be recognized that at best it has become increasingly difficult to become a short-term guru in military and security issues, and by the time this report is finally read some of the conditions that led to predictions may have changed. With this limitation in mind we set ourselves to provide the best possible insight and evaluation of the future in this area.

Washington, May 1994.

THE ARMS INDUSTRIES IN AMERICA

ITS PRESENT AND FUTURE

by

Lt Col Louis NAVARRO, U.S.A.

and

CPIFG. Diego MANTILLA, ECUADOR

Research paper presented to the Inter American
Defense College as a Requisite for obtaining a
diploma in the National Defense Superior
Course.

WASHINGTON, D.C., MAY 1994.

•

THE ARMS INDUSTRIES IN AMERICA

ITS PRESENT AND FUTURE

CHAPTER I

THE STRUCTURE OF THE ARMS INDUSTRIES IN CENTRAL AND SOUTH AMERICA

WHY AN ARMS INDUSTRIES IN THE SOUTH?

It becomes evident that before any attempt to analyze the current status of the arms industries in Latin America we should revise the reasons that made the appearance of such industries a fact. The mere fact that we call this sector of the economy *Arms Industries* should suggest that we cannot possibly deal with its past, present and future without dwelling into the social, political and economical reasons that made the emergence of such industries a fact. In this aspect, we can find very little that may suggest a common pattern or a single factor that could, in simple form, allow us to understand the assignment of resources to an apparent non profitable economic activity such as the development, funding and installation of arms industries.

We will not discuss in this paper the need to have armed forces or the major security issues that make necessary the development of a military establishment. Even the most ardent advocates of demilitarization find that there are legitimate reasons for keeping a military component and maintaining its role in the development of society. The "political role performed by the Latin American armed forces in the twentieth century is constrained by their earlier identity and functions. The military has been historically important in the continent's struggle for independence, first from Spain's formal rule and then from its informal domination. Through this process, the military has been the guarantor of the economic liberty of national oligarchies.² The use of the word "oligarchy" in this context may suggest that the military worked for the government of a reduced group instead of doing it for the well being of the majority of the nation. Let us remember that in almost every country that became independent of its colonial ruling power it was not the vast majority of the nation that designed the new social and economical entities, but reduced groups of learned individuals. Mostly these were part of the ruling class themselves, distantiated from the colonial oligarchy because of its birthplace and an unproportional share of power. These group of "free men" were usually wealthy and educated.

²Halperi, Tulio. *"Historia contemporanea de America Latina"*, quoted in Augusto varas, "Militarizationand the Internatinal Arms race in Latin America", *Foreign Relations of the Third World*, No.4, Westview Press, Boulder, Colorado, 1985. pp. 5.

The fragile societies needed at the time, and everytime from thereon, a military institution capable of defending the new democracies from the attempts of foreign powers to regain colonial ownership, and the internal dissent that threatened to factionalize and desintegrate the emerging free and democratic societies.

As we have made a case for an unselfish military dedicated to protect democratic values rendered by their own personal volition as sacred, a description that may well fit those the likes of Bolivar, San Martin, Sucre and O'Higgins, it cannot be forgotten that there were also those of a lesser kind. Their names are not important, and could probably be forgotten, if it were not for the fact that their personal ambition, greed and selfish ideals divided great nations where they could exert their power and rule in the name and the benefit of a few. These "*caudillos*" molded the military for the larger part of the XIX century and in some countries influenced the course of history of Latin America well into the first half of the XX century.³ We have presented two alternative views of the military. In either case their role in forming societies in Central and South America cannot be denied.

To carry out the duties implicit in nation building, the military has to form, arm, train and maintain standing armies. The *arming* of these groups that sometimes was informal and appeared only when required, was done at the beginning with very few resources. By the end of the independence wars in Latin America most countries had to develop military forces capable of defeating the Spanish organized forces. This entailed buying modern weapons and heavy borrowing, especially from England's arms dealers who were quick at the opportunity for new business opportunities and increasing the sphere of influence of the British Empire.

According to Vargas "The incompetence of the dominant classes explains, in part, why military leaders were the ones to gain coherence to the state in the postindependence power vacuum. The lack of politics left emerging nations with no recourse but to turn to the military leaders. The military faction thus became identified with the emerging nations."⁴ Even though this identification made possible the survival of the young nations in Latin America it had some lasting effects that cannot really be described as positive:

- It left historians and contemporary observers with the impression that the continent was nothing more than a grouping of countries enslaved by a series of armed bands.
- As armed forces became key factors to ensure national unity, they were called to set limits on the rivalries of local oligarchies, thus destroying the possibility of thinking of collective security or a greater America based on

³ Molina Flores, Alberto (Col.), "*Las Fuerzas Armadas Ecuatorianas, Paz y Desarrollo*", published by the ALDHU, Asociacion Latinoamericana de Derechos Humanos, Quito, Ecuador; pp. 24-30.

⁴ Varas Augusto "*Militarization and the International Arms Race in Latin America*", Westview Press, Boulder, 1985. p7.

federated cooperation, thus leaving the continent with a legacy of settling disputes by war.

- As the independent countries were not big enough to be self sufficient, the armed forces also facilitated the expansion of capitalist productive forces by conquering or securing territory rich in raw materials or commercial routes. Examples of such conquests are the wars of Chile with Peru and Bolivia, between Ecuador and Peru, and between the Triple Alliance of Argentina, Uruguay and Bolivia against Paraguay.

This perception under which the armed forces saw themselves as essential to the state, and identified the principles of the military institution with those of the nation was primordial in the role of the armed forces in all countries in Latin America. Even though its role was free of any particular class link, in reality the military was penetrated and fragmented by political struggles. These contradictory ideological positions explains the permanent oscillation between interventionism and formal constitutionalism, and explains the great variety of military interventions, coups and military governments until the middle of the century.

We therefore have to conclude that until the end of the cold war the military was essential, or perceived to be so for the survival of the nation in almost all of Latin America, thus confirming the need to have armed forces. But this does not fully explain the process of the arms race and the construction of military facilities in the region in the second part of this century.

If we try to find the motives for developing an independent arms industry, several authors have found different rationales, but they can generally be grouped into military, political and economic justifications.⁵

First, militarily the autonomy of arms procurement due to a lack of trust or unreliability of the traditional suppliers is the primary reason for establishing arms industries. In this context we will later analyze the role of the US as an arms provider and the failure to use this position as an instrument of foreign policy, creating distrust and a large market for arms elsewhere. Within the realm of family reasons we also have a geostrategic rationale. According to Ray Cline's concept, arms production capability increases a country national power, thus increasing its ability to influence other nations and become an important factor in the redistribution of power which is, at the same time, a key element in the determination of the national standing. Second, the political reasons for an arms capability mention nationalism, and the need to have a military credibility in order to gain ascendance in the diplomatic arena. Finally, we have the economic reasons. If a country is a net importer of weapon, the deficit in the balance of trade can be reduced with a capability to manufacture arms in the country. If some of this production can be

⁵ This section is based on a lecture by Dr. P. Franko Jones of Colby College , Maine on the "Future of Arms Industries in Latin America". Lecture was given at the Inter American Defense College, Washington DC. on 05/09/94.

exported, there is even a further benefit to the balance of trade. But more relevant that this economic concept is that, in Latin America, military technology was seen as a keystone for the technical development of the society at large. The slipover effect of the development of military technology would benefit all members of society.

Dr. Franko also argues, that this three justifications do not have the same intensity or the same application throughout time. In the 1960's and 1970's the military rationale was the predominate one, with the political and economic arguments subordinated. In the 90's, the economic justification seems to be the predominant one, so many projects that seemed viable and beneficial in the 70's, today they are only perceived as uneconomical and a drain on scarce resources needed elsewhere for economic development.

THE ARMS RACE IN LATIN AMERICA.

After World War II the countries of Latin America were integrated into the hemispheric defense system by means of the Rio Treaty signed in 1947. Although this was an instrument designed to foster collective security and to deter armed invasions from outside the continent, it also contained elements that eased and legitimized US intervention within the framework of the Pan-American system. This alliance with the US allowed local military forces to disengage from the traditional ties with the oligarchy, and distantiate themselves in a higher institutional level. It also allowed the Latin American military to attain a greater degree of modernization and professionalizism. The main source from this process was the US supplied weapons from the vast surplus left after World War Two. This held true for almost every Latin American nation, even though the US favored those nations deemed more important for their strategic objectives. Regarding profesionalism, "the US. disseminated the ideological elements of the Cold War within the Latin American military institution. An exaggerated anti communism was thus inculcated into the armed forces of the continent and the potential danger of Soviet aggression was identified with the internal threat from the political left." ⁶

Thus the emphasis of the mission of the armed forces in the region was not placed, as it has been for decades since the independence, in the defense of the faction or the oligarchic group that had acquired enough political and economic influence to place itself in the government, but it now pursued the defense of the perceived interests of the whole region, unified by now by the Cold War fears. The presence of the US. and the agrandized image of the Soviet Union as the international aggressor was one of the factors that made such unity possible. The other one was the weakening of the traditional groups of power in every country and the principal means to generate wealth and the emergence of new groups of power. The new common interest was the defense of democracy. A new form of intervention was left behind, namely the military "caudillo" was not now the dominant figure but the military institution as a whole was now the defender of the national interest. This new type of intervention created what it became known later as the National Security State or, *el Estado de Seguridad*

⁶ Varas Auguato, "Militarization snd the International Arms Race in Latin America", p12.

Nacional.⁷ The armed forces of Brazil created the model in the military coup d'état against João Goulart on March 31, 1964. With this event a new chapter in the military history of Latin America started. The Brazilian example became the model for future military takeovers, and changed the rationales for the access to power. This model was present in 1966 in Argentina when Juan Carlos Onganía assumed power and in October 1968 with the beginning of the revolutionary government of General Velasco Alvarado in Peru. In 1971 General Hugo Banzer would assume power in Bolivia, and 1972 would be the year that the government in Ecuador would be replaced by military rule with the ascent of General Rodríguez Lara. In 1973 Uruguay and Argentina would have military rulers. This cycle reached its acme in the region in 1976 when General Jorge Rafael Videla assumed power in Argentina.

Hence, in the lapse of a few years, in the political context the military in Latin America have changed its role from supporter of national power factions, to become the actual holders of the reigns of power. In the military context, the region for the first time had acquired some kind of unity and identified the Soviet Union as the likely enemy through a communist subversive movement spreading worldwide like a mortal disease for democracy and capitalism.

This new political and military role could be carried through only with the adequate strength. Arms were needed to control the other political factions in the ascent to power, and arms were needed to fight the communist and avoid the destruction of military ideals. Thus came into being the first arms build up in Latin America, almost all of these with direct support from the US. After all, the new military governments were defending mainly US interests.

One aspect that changed the US-Latin America relationship was the human rights issue. "Sandwiched between the assertive actions on behalf of US strategic and security interests have been two major efforts to promote democratic reform and human rights in Latin America. John F. Kennedy's Alliance for Progress was an aid program tied to economic and political reform and Jimmy Carter's human rights campaign was an effort to put some distance between the US and the authoritarian and military governments of the region. Neither effort met with notable success."⁸ However, the real "success" of the Carter human rights campaign was that official violations or perceived failure to comply with the recently introduced human rights doctrine led to sanctions for those governments. These sanctions resulted in suspension of military aid that had been considered by the US as an instrument of foreign policy.

The new political context, even though we have recognized that it had united the military of the region against a single enemy, did not change in absolute the underlying causes for arms acquisitions. The US failed to see that governments of the region had used the communist issue to enlarge its military institutions, not because they wholeheartedly believed in the doctrine but because it was suited very well to the national interests of every country. It should be

⁷ See Luis Maira, "El Estado de Seguridad Nacional en América Latina", Published in "El Estado en América Latina: Teoría y Práctica", Universidad de las Naciones Unidas, Editores Siglo XXI 1990, p108.

⁸ Molineau Harold, "U.S. Policy Toward Latin America" Westview Press, Boulder, 2nd Ed. 1990, p9.

remembered that states arm and counter arm competitively because they anticipate the possibility of war. Because weapons are only instruments of political forces and desires, arms control can never withstand the traffic of heavy political antagonism, and must always fail to meet reasonable expectations of utility.⁹ Thus the region had participated in an arms race with the support of the US. Now devoid of military aid from this country it started to look for weapons suppliers somewhere else because the underlying causes for acquiring arms, the intraregional conflicts, had never been dealt with effectively. The so-called interamerican unity and the Rio Treaty had not fostered at all inter American collective security and had only been an instrument to legitimize US military intervention and defend US interests.

Consequently, the Carter doctrine left the region without the main supplier of arms, and the need was satisfied by the new manufacturers of arms in Europe, especially France and Germany who were prompt to satisfy all of the requirements of the region. In the mid-1980s, a French defense official, pointing to his country's success in promulgating new coproduction ventures around the world, suggested that France should erect a statue of Richard Perle, the US Assistant Secretary of Defense for International Security Policy, to "demonstrate its gratitude."¹⁰ Two aspects that should be highlighted are: first, the purchase of the new weapons implied large spending because the weapons were actually more expensive, more modern and more sophisticated. Second, most of these deals to sell arms were made under the scheme of joint ventures, co-production, licensing, manufacturing offsets and other forms of manufacturing that led to the emergence of military industries in Latin America.

THE STATE AS AN INDUSTRIAL

Arms production programs are also motivated by economic rationales. "Often is hoped that by manufacturing equipment and weapons indigenously, a country can secure them more cheaply than if purchased abroad. This would save foreign exchange and make available resources for other projects. Further, if the products can be sold abroad there are potential foreign exchange earnings. The program can also mean greater employment opportunities for workers. It may also provide an incentive for technically trained manpower to remain in the country, thus reducing the brain drain. Individuals who might otherwise be tempted to emigrate and seek appropriate jobs in developed countries can therefore find suitable positions at home. There is also an additional bonus. Putting production programs into place requires generally upgrading the skills of local workers. These skills may be translatable to other economic productive skills."¹¹

⁹ See "Arms Control does not Control Arms", Colin S. Gray, published in *Orbis*, Summer 1993, p333-348

¹⁰ Nolan John E., "Trappings of Power, Ballistic Missiles in the Third World", The Brookings Institution, Washington D.C. 1991, p125.

¹¹ Katz, James Everett, "Arms Production in Developing Countries", DC Heath and Co. 1984,p4-5.

If we combine the economic reasons to establish arms industries in the region with the autonomy that is cited by Katz or the political independence that is cited by Vargas,¹² we have a powerful mixture that will lead or compel a government to establish defense industries. Why governments? Arms industries usually require large expenditures in capital goods, installations, labor and engineering training, materials and components, licenses and co-production rights. Its products are by nature of restricted production. Even countries that are net exporters of weapons cannot justify the installation of these arms industries from an economic point of view. Arms industries can only become profitable when the market is ready to receive its production without considering the cost, as it was the case in the US. If arms industries are not profitable, only governments, on the grounds of national security, can establish weapons industries. Occasionally, private investors participate in these ventures once that the government has decided to invest in this area. Thus, a tripod is formed by state capital, private capital and international capital. This occurred in Brazil and other countries where the development of the defense industry was based on the governments coordination of economic and political strategies, as well as the disposition of both private and international capital to collaborate with state-led initiatives. ¹³ The established industries rely to a great extent on subsidiaries to acquire the high degree of technological capacitation required to run these industries.

If, to the factors that we have listed, we add a regional economic policy that emphasizes the substitution of imports as a necessary requirement for development as it occurred in Latin America, we have all of the necessary ingredients to compel the State to participate very actively in the economy by investing heavily in arms industries.

THE ARMS INDUSTRIES IN SOUTH AMERICA.

We will make a quick review of the current status and structure of the military industries of Latin America¹⁴ by country. In most cases it will be found that developments of the arms industries are closely related with certain weapons systems which is why in every country, in conjunction with the description of the facilities, major weapons associated with that facility will be identified.

ARGENTINA

Argentina has one of the oldest arms industries in Latin America. As early as 1927 the FMA (Fabrica Militar de Aviones) was established in order to attain the self sufficiency national policy goal that has been mentioned earlier. But it was not until the decision of the US was

¹² Vargas, p. 52-54

¹³ De Gouvea Neto Raul, "El papel de las empresas transnacionales en el tripode de la Industria Brasilena", Trimestre Economico, Issue 230, Vol 58, Apr-Jun 1991, p.357-404.

¹⁴ Unless other sources are indicated in the footnotes, this section is based on the content of the DMS *Market Intelligence Report*, Market Overview, published by the Jane's Information Group, 22 Commerce Rd. Newton, CT, 1989. The content of this chapter has been also reviewed with military of the countries indicated, and reflects the best that can be obtained with non-classified sources.

made to limit military aid to Argentina after a coup in 1964 that this country decided to adopt the so called Plan Europa that called for license production or co-production of all weapons acquired by the armed forces. The Argentine Defense Industry received a more recent political stimulant for indigenous growth following its unsuccessful 1982 Malvinas conflict, after the war the UK succeeded in getting US and some other western governments to block arms sales to Argentina. This forced, on one hand, an increased effort to achieve self-reliance, but it limited on the other hand, the transfer of certain technologies that are indispensable to reach certain stages of development previous to achieving full self-reliance. At the time, as of this writing, relations between UK and Argentina are showing some improvement and some of the US restrictions related to defense cooperation with Argentina are diminishing. However, industrial cooperation and transfer of technology between the US and Argentina will continue to be a sensitive issue until the territorial dispute on the Malvinas is finally settled.¹⁵

The following are the major companies that comprise the arms industries of Argentina:

AIRCRAFT: MA/FAMA, formerly the principal aircraft manufacturer, has been a component of the Air Force's Materiel Command traditionally since 1927. Its current name is Fabrica Argentina de Material Aerospacia (FMA). At the peak of production it employed over 5000 workers and its principal factory is located in Cordoba. The company's current programs are the **IA-58A Pucara**, that has been sold to Iraq, Uruguay, Colombia and the Central African Republic besides the more than 150 units sold to the Argentine Air Force (FAA). The **IA-58 B Pucara Bravo** is an improved version and 40 units have been sold to the FAA. The company was working on an even more improved version to be named the **IA58C**, but reportedly the project was dropped in the late 1980's. Another project is the **IA-63 Pampa** which was originally developed jointly with Dornier. A production of 100 units was envisioned for the FAA. The **Pampa 2000** is currently one of the eight companies being considered as the future primary trainer in the US, the **JPATS** program, even though a purchase from the US seems politically unlikely¹⁶. FAMA ceased to exist in 1990 with the new government in power. The **CBA-123** is a civil transport that was developed in conjunction with Embraer that was produced in the early 90s, but discontinued due to financial problems. There are other projects such as the proposed fighter based on the Alpha Jet and talks for manufacturing parts for the A-4 have not produced results. Other companies to be mentioned are **RACA** (Representaciones Aerocomerciales Argentinas) which assembles from CKD¹⁷ the Hughes Model 500 helicopter, and **Chincul S.A.** de Buenos Aires manufactures Piper light aircraft. During the 1980's the

¹⁵ FAMA ceased to exist in 1990, FMA was transferred to the Ministry of Defense that have been looking for a possible buyer or joint-venture associate, Lockheed had been named as interested in the deal.

¹⁶ A comment from an argentinian officer more familiar with the program establishes that this is no 100% accurate, The Vought-PAMPA 2000 program is one of the two best contenders to win the JPATS to provide more than 500 advanced trainers to the U.S. Navy and Air Force.

¹⁷ CKD is the acronym for Components Knocked Down, and constitutes probable the most widespread use of industrial co-production and transfer of technology, in which a company receives from a foreign supplier all of the parts/components to be used in the final assemble. It has been used in warships, aircraft and vehicles in the private and defense sector.

FAA carried out several programs of "riesgo compartido" (Joint Venture) with private contractors investing in manufacturing weapons and systems that were developed in the FAA research facilities. Even though these contracts have been stopped, there is no doubt that the military capability for defense conversion was created.¹⁸

WARSHIPS. Argentina's effort in this area was to indigenously build one major class of warships and one class of submarines. For the first case, the German designed **MEKO 140** Type frigate was selected. This was going to be built at **Astilleros and Fabrica Navales del Estado (AFNE)** and **TANDANOR**. The submarine program was started with the construction of a specially designed facility called **Astilleros Domecq Garcia**¹⁹ which would eventually build the **TR-1700**, a Thyssen design. By late 1989, both programs have encountered serious financial difficulties and, it seems as of now, that the frigate program produced modest results. The submarine program will be cancelled altogether. **TANDANOR** most likely will be privatized.

MISSILES. The programs in this area have been more controversial than other areas especially because of the sensitivity of any missile program as a possible source of delivery vehicles for nuclear weapons such as the **Condor II**, solid fuel surface-to-surface ballistic missile. The facility that designed this system was the **Centro de Investigacion Tecnica y Cientifica de las Fuerzas Armadas (CITEFA)**. Successful programs developed in this facility were the **Martin Pescador (Kingfisher)** anti surface missile (ASM) and the **Mathogo Anti-tank missile**, both in use in the Armed forces of Argentina. The controversial **Condor II**, reportedly developed with the participation of Iraq and Egypt, has been officially cancelled as of the time of this writing, and Argentina in 1993 joined the Missile Technology Control Regime (MTCR), thus sealing off the development of this weapon.

ORDNANCE. The principal facility in this area is the **Fabrica Militar de Armas Portatiles (FMAP)** located in Rosario, Argentina. Established in 1947, it has produced more than half a million small caliber weapons. The following are manufactured under license from **NF Belgian Fabrique Nationale**: the Browning Model 1935 GP, the **FAL** a light 7.62 mm assault weapon and **MA 6** machine gun. The **Fabrica Militar de Rio Tercero** has produced the heaviest weapons, among them the **Model 177** 155mm towed howitzer, initially designed and built in cooperation with the French but currently is wholly an Argentinean enterprise; the **SLAM Pamper** and **SAAB-1** multiple artillery rocket system for ground forces; and, the **CABs-1 Albatross**, a tactical rocket designed for naval use. Also in 1987, Argentina and Spain agreed to establish a joint venture to produce bombs for the FAA through a the company called **Sistemas Tecnologicos Aeronauticos (SITEA)**.

¹⁸ Comments by a senior FAA officer that reviewed this paper.

¹⁹ La Domecq Garcia es uno de los elefantes blancos ...que de acuerdo con fuentes militares, le costo al pais entre 700 y 1000 millones de dolares. La fabrica de submarinos es a la Armada, lo que el misil CONDOR II fue a la Fuerza Aerea y el TAM al Ejercito" Taken from La Nacion, Bs, Aires, 15Apr94.

VEHICLES. The widely known program of the **Tanque Argentino Mediano (TAM)**, was a joint effort with **Thyssen-Henschell of West Germany**, to be carried out in Argentina by **Tanque Argentino Mediano Sociedad del Estado (TAMSE)**. The program also included an armoured personnel carrier (APC) version of the TAM to be designated VTCP. The program needed export sales to be commercially feasible, when sales to Peru, Panama, Malaysia, Ecuador, United Arab Emirates and perhaps Iran fell through in 1988. Production was no longer feasible financially. TAMSE has produced approximately 500 tanks and VTCPs. The last 100 of them were delivered to the Army. The company has also produced a self propelled 155mm gun (PALMARIA) over the TAM chassis. This facility will be preserved as the primary maintenance facility for Argentinian armor, thus preserving its production capability

20

BRAZIL

This country's defense industry is by far the most developed, the largest and the most advanced in Latin America, and one of the most advanced among the developing countries. Starting with an infrastructure that supplied less than 5 percent of its needs in 1960, Brazil's defense establishment grew to a military industrial complex that supplies 75 percent of the country's needs. Even with that high level of participation Brazil's domestic requirements were not enough to justify the development of a large industrial base. At one time close to 90 percent of the defense sector's output was export oriented.²¹ If we try to find a milestone in the history of Brazil's industry, we have only to look at the Gulf War in 1990. After that event, Brazil's main customer *Iraq* stopped purchasing arms thus hurting an economic sector designed primarily for the export market. By the early 90s it became obvious that Brazil's defense establishment was seriously threatened by the changing environment of defense in the world. Major companies were declaring bankruptcy, orders were almost nil and a bleak future was envisioned throughout the sector.

The main industries that conform the military-industrial²² complex of Brazil are determined by an strong demand from a single buyer and the characteristics of the international

²⁰ Comments by a senior Argentinian Army Officer,

²¹ It is not possible to cover in the scope of this paper the importance and the rationale behind the development of Brazil's defense sector, it is suggested that the following publications should be reviewed : Franko-Jones Patrice "*The Brazilian Defense Industry*", Westview Press , Boulder, Colorado 1992; "*Public Private Partnership: lessons from Brazilian Arms industry*. Journal of Interamerican Studies and World Affairs, 1987 December; vol 29 (No.4), pp.41-65; Dagnino Renato, "*Cuando negocios no son negocios: los aviones de guerra del Brasil*. Nueva Sociedad 1988 September, (No. 97): pp. 178-187.; Katz James Everett, *Arms Production in Developing Countries*, Lexington Books, Toronto. See also many of the publications of Chilean social scientist Augusto Varas that has written extensively on the subject, some quotations from his works are used in this study.

²² Though the phrase Military -industrial complex was a concept formulate in 1956 by C. Wright Mills in his Classic *The Power Elite*, and legitimized by President Eisenhower in his Farewell Address in 1961, in which described the establishment's " *influence - economic, political , even spiritual - is felt in every city, every State House, every office of the Federal government*". In this context it can be argued that brazils

arms sales has determined the existence of a single dominant firm in each of the military sectors, Thus the industry is hierarchically shaped, with **EMBRAER**, the state-owned fixed wing manufacturer, in aeronautics; **ENGESA**, a privately owned company, in armored vehicles, and **AVIBRAS** in missiles.

The **EMBRAER** group is comprised of six firms, the most important of which are **NEIVA** and **AEROTEC** which specialize in small aircraft and complement **EMBRAER**'s main production lines when required. It was founded in 1969. Its most successful military program include the *EMB-312 Tucano* turboprop and its most ambitious project is *AMX* light, single-seat, strike aircraft, in which Embraer is collaborating with *Italy's Aermacchi and Aeritalia*. Other successful projects are the *EMB-110 Bandeirante*, of which more than 450 were built, the *EMB-120 Brasilia* and the *EMB-121 Xingu*.

AVIBRAS is active in four interrelated areas of production: defense, space research, chemical research and electronic telecommunications. **AVIBRAS** has three subsidiaries: **TECTRAN** which produces launch vehicles; **TECTRONICS** which produces power electronics, control panels circuit breakers; and, **TRANSVIP** which works in transportation and tourism. This company has been the chief manufacturer of rocket and missile systems. Its most successful program has been the *Astros II* multiple rocket launcher. Other projects not as successful or in development include the *AVX-1* anti-tank missile, the *Barracuda* anti ship missile and the *MAS-1 Carcara* television-guided, air-to-surface missile.

ENGESA has a group of 11 plants that offer a wide variety of products and services, and in some cases act as suppliers of other companies of the group. These are **ENGEX** (guns, transfer cases, gears), **ENGEQUIMICA** (ammunition and explosives), **ENGEVIDEO** (video training), **AEROBRASIL** (air cargo), **AXIAL** (insurance), **ENGESA** (armored vehicles), **VIATURAS** (turrets, tractors), **ENGEXCO** (trading Company), **ENGESA FNV** (railway and mining equipment), **ENGEPEQ** (research engineering), **ENGETRONICA** and **ENGELECTRICA** (for electronic and electric components respectively). This group is by far the largest manufacturer of armored vehicles and emerged in the late 1980s as one of the leading exporters in this field. Engesa is best known for its *EE-9 cascavel* and the *EE-11 Urutu* which have been widely exported. The company manufactures other kind of armored, tracked and military vehicles which include: the *EE-T1 Ososrio* MBT, which reportedly outperformed the US M1, the British Challenger and the French AMX-40 in the Saudi request for proposals; the *EE-4 Jaraca* light scout car; the *EE-18 Sucuri* tank destroyer and the *EE-T4 Ogum* multi-purpose tracked vehicle. Other companies in the field of vehicles in Brazil are: **BERNARDINI** which has upgraded the M41s for Brazil and Thailand and has designed the *MB-3 Tamoyo* light tank; **BISELLI** Viaturas Equipamenttos Industria which manufactures a tank transporter; and finally, **MOTO PECAS** Transmissoes of Sorocaba has developed an APC the *Charrua* and a variant called the *EB-3 Trinity*.

defense industry became the embodiment of the military industrial complex. For a detailed analysis see Rosen, Steve. *Testing the Theory of the Military Industrial Complex*, Lexington Books, Toronto.

Warships. Brazil has developed a vast infrastructure that placed this country among the world's leading builders of commercial vessels in the 1980s, but warship construction is limited to the **ARSENAL DO MARINHA DO RIO DE JANEIRO**, the Navy's umbrella shipyard. In 1982 the government established **ENGEPROM** to serve as a link between the Navy and private companies involved in shipbuilding. These companies include *Verolme, Industrias Reunidas Caneco, CCNE Maua, Ishibras and Estailero So*, all of them based in Rio de Janeiro. Included is *Industria Naval do Ceara* in Fortaleza. Most of the naval vessels built thus far in Brazil have been of foreign design, current construction programs include the *Inahuma* class frigates and the *HDW-IKL 209* (Type 1400) submarines.

Ordnance. We have already mentioned the largest manufacturer of ordnance, **AVIBRAS**. There are other enterprises that work in this area which include *Britanite Royal Ordnance Do Brasil* a joint venture that is reportedly the largest manufacturer of non-military explosives in South America, *Companhia Brasileira de Cartuchos (CBC)* which produces special purpose guns and a wide variety of ammunition. The state owned *Industria de Materiel Belico do Brasil (IMBEL)*, produces a variety of small arms and munitions including the *FN 7.62mm FAL* rifle, the *H & K 7.62mm G3* and the *Baretta 9mm* submachine gun. **ROSSI** produces rifles and pistols and **TAURUS** produces a wide range of small arms including *Smith & Wesson* revolvers under license.

Electronics. This is an important area of development. **AEROMOT** manufactures drones for artillery training and several components for aircraft. *Computadoras e Sistemas Brasileiros (COBRA)*, a state controlled organization, started to build computers for the Navy in 1974. **D.F. Vasconcellos S.A.** has been for more that 40 years and is still Brazil's sole industrial precision optics manufacturer. It currently manufactures most of the optic components for aircraft and armored vehicles, and night vision goggles. In the weapons field, it has also produced 37mm and 70mm unguided rockets and napalm bombs. The **Electronic Warfare Center** is a new enterprise that supposedly will work with Engesa's Engetronica to establish an electronic warfare company within the Brazilian Army. **ELEBRA** is Brazil's largest electronics company. It produces consoles, auto pilots and other components for the aerospace industry. There is also **Empresa Brasileira de Defesa**, established as a joint venture between *Honeywell* and *Embracom* in 1981; and **SFB Informatica**, a Ferranti subsidiary that is manufacturing components for the 209 class submarines.

CHILE

The Military industry in Chile²³ developed aggressively as a response to the military embargo imposed by the US and others in the mid 70s. It is also noted that its development has

²³ Sohr, Raul; "La Industria Militar Chilena", Comision Sudamericana de Paz, Coleccion Posiciones y Debates, Santiago de Chile, 1990. This is an excellent description and analysis of the structure of the military defense sector in Chile, it contains not only information available in the public sources, but it has the information provided by interviews with senior military officials.

not been solely based on state owned enterprises, but has had a strong participation of the private sector.

The Chilean Army has five major industrial components grouped under a military command, the Comando de Industria Militar e Ingenieria (CIMI). These are: Fabrica y Maestranza del Ejercito (FAMAE). This is probably the largest and most active facility and has started to manufacture the PIRANA 6x6 armored vehicle and the MK81 and MK82 bombs which are both weapons had been manufactured previously by a private enterprise in Chile. This new development is oriented towards a possible export market. FAMAE also produces mines, hand grenades, ammunition, artillery and mortar shells, and, under an agreement with Switzerland's SIG, has produced the SG 542 rifle which has been exported to Honduras and El Salvador. Complejo Quimico en Industrial del Ejercito (CQIE), the Instituto de Investigaciones y Control (IDIC); the Instituto Geografico Militar and the Centro de Coheteria del Ejercito (CECOE).

The Navy operates Astilleros y Maestranzas de la Armada (ASMAR). The principal facility is located in Talcahuano. This facility has been constantly improved and is probably the best naval shipyard in the Pacific Coast of South America. It has proved that it can overhaul submarines by the reworking of the Oberon and German HEW U-209 class submarine. ASMAR has not pursued the construction of large combatants as Peru, Brasil and Argentina did, and have only constructed the Batral class landing craft, and, in 1986 delivered to the navy the Aquiles IV, a passenger-cargo ship. ASMAR maintains two other facilities, one in Punta Arenas that has a new facility developed at a cost of \$13 million in a joint venture with South Africa's Sandock-Austral. This will be operated by a joint company called the Strait of Magellan Shipyard Co. The other is in Valparaiso where in a joint venture with Spain's BAZAN, it has operated a 30,000 DWT floating drydock. since 1965.

The Chilean Air Force (FACH) was forced by the embargo to expand its small maintenance facility that had operated since 1930 and converted it into Industria Aeronautica (INDAER) in 1981. This company developed the *T-35 Pillan* trainer based on its experience assembling the Piper Dakota. In 1984 the name was changed again to Empresa Nacional de Aeronautica de Chile (ENAER). Besides the *Pillan*, this company has pursued include other major projects such as the *T-36/A-36 Halcon* (C-101 Aviojet) developed and assembled under a license from CASA; and the upgrade of the *Mirage 50* with the technical support from Israel Aircraft Industries (IAI). This upgraded version is a completely different plane that has been named the *Pantera* by the FACH. It had shown interest in assembling the MBB BO-105, but the program has been suspended due to financial constraints. In the electronics area ENAER has developed electronic warfare (EW) systems that include the *Caiquen II* radar warning system, the *Itata* airborne electronic intelligence system and the *Eclipse* chaff/flare dispenser.

In the private sector the most widely known is CARDOEN. This company specializes in the area of metallic manufacturing. In 1977, in response to an Army's request to fabricate defense material, it offered its first defense products in the way of improvised land mines. From that point the company grew with several other products. By 1989 Cardoen employed more than 1000 people in five plants in Chile, and one subsidiary in Spain. The success of CARDOEN started with the assembly of armored vehicles which include the *BMS-1 Alacran*, the *BV-206*, the *Piranha* based on the Swiss *MOWAG 6 x 6* and the *VTP-1 Orca*. None of these has been extremely successful. The Iran-Iraq war offered CARDOEN the opportunity of expanding its international sales by providing Iraq with low priced gravity and Cluster bombs. The company has also pursued the licensed construction of helicopters, aircraft and submarines. Other companies in the private sector include: Makina which has been active in the maintenance of aircraft and armored vehicles, Sogeco which manufactures a 20 mm, twin anti-aircraft cannon for artillery and air defense, and Merrimar Ltd., which was originally a subcontractor in shipbuilding.

COLOMBIA

The Colombian defense industry remains concentrated in the manufacture of light warships, small arms and the assembly of aircraft. The aircraft production has been confined toward satisfying the needs of the civilian sector and there are no projects to start major military programs. In the shipbuilding area, it has designed and built several small craft. Small arms programs have been restricted and proven not too reliable.

AIRCRAFT. There are two firms engaged in aircraft assembly. Agricopteros Ltd. located in Cali assembles the American Aerosport Scamp B cropduster and Aviones de Colombia S.A., which is a 15,000 square meter plant located in Guaymaral. After several years of assembling Cessna models since 1969, some of them for export, it now has the technology, the skilled labor and the resources to assemble jet trainers, light transports and helicopters in the near future.

WARSHIPS. Colombia has three major shipyards, all of them capable of eventually building small craft. These are Astilleros Magdalena and the Union Industrial de Armadores, both located in Barranquilla, and the Cartagena Naval Dockyard. As has been stated, these three yards have been primarily involved in supplying light craft and river boats to the Colombian Navy, but they do have the capability for an eventual license production of larger warships and small submarines.

ORDNANCE. Colombia has developed a small arms industry, but its products have been often proven unreliable. There are hopes to increase the scope of activities, rockets and missiles for export to other countries of the area.

COSTA RICA

Costa Rica has no domestic arms manufacturing capability nor are there any current plans to develop any.

CUBA

Very little is known about Cuba's arms industries. Soviet supplied weapons equipped the Cuban armed forces, but it seems that very little was done in the area of developing manufacturing capability in any of the important areas and reportedly has no significant arms manufacturing capability. However, in 1989 it was reported that the Ignacio Agramonte factory, originated with Soviet support in Camaguey, had previously been manufacturing components for the assembly of a rifle, presumably the *Kalashnikov* and would start manufacturing the entire rifle. It also has a capability of manufacturing small arms ammunition and explosives. In ship construction during the 70s there were programs to produce large fishing vessels in Cuba with Soviet help, and some Spanish technology. These programs were never completed successfully and it is unknown if a capability to build naval vessels was developed.

DOMINICAN REPUBLIC

WARSHIPS. Astilleros Navales Dominicanos has the capacity to build small vessels up to 100 tons displacement. Six patrol boats were built in 1975.

ORDNANCE. The San Cristobal Arsenal developed several designs of small arms including submachine guns, but only the *Cristobal M2* rifle was ever produced in large quantities. Development work was also initiated for mortars and anti-tank weapons, but not to the point of actual production. For the last two decades the San Cristobal facility has essentially been used for production of small arms ammunition and maintenance of a variety of army ordnance including vehicles and artillery.

ECUADOR²⁴

Ecuador does not have a large defense related industry sector, and it has been primarily oriented towards maintenance of their own defense equipment. The Army has most of its facilities grouped under the Direccion de Industrias del Ejercito (DINE), a conglomerate that includes the Sta. Barbara ammunition factory and participation in a series of companies that includes explosives, metallic structures, vehicles and mining. Of these industries only Sta. Barbara has the potential for weapons manufacturing, but its activities have been restricted to fabrication of small caliber ammunition, and

²⁴ The information from Ecuador is based on the personal experience of the authors, and is based on non-classified material .

maintenance of the FN-FAL which is the official rifle of the armed forces. In the past two years the Army has started a project geared towards an indigenous modernization of the French *AMX-30*. The Navy runs Astilleros Navales Ecuatorianos (ASTINAVE) which has built small patrol boats and carried out major overhauls of the Lurssen designed TNC-37 (which were converted from torpedo to missile boats in a joint program with Israel Aircraft Industries) and TNC-45, a 1000DWT tanker launched in 1982. In 1990 The Ecuadorian Navy started two ambitious programs: the refit of its own *HDW U-209* and the modernization of the CNR built *Esmeralda* Class corvettes. The Ecuadorian Air Force does not have any aircraft assembly projects, but it operates a large maintenance facility in Latacunga that serves the commercial sector .

EL SALVADOR

El Salvador has recently begun to assemble APCs on a small scale, following earlier improvised manufacture of various light patrol vehicles based on trucks and tracked chassis. Salvadoran engineers designed their own APC, the *Cashuat* based on the chassis of a *Dodge M37B1 Power Wagon*. This provided insufficient protection, so the Army requested help from the *US Army Automotive Command (TACOM)* to improve the design. The result of this program has been a joint development that has enabled the army to start a production line with an output of two APC per week. Beyond this work on armored vehicles, El Salvador lacks the military infrastructure to manufacture most military equipment.

GUATEMALA

In 1983 Guatemala completed the construction of an ammunition plant that was expected to fulfill most of the domestic requirements. Reportedly the technology was provided by Austria and at present the plant is producing 5.56 mm ammunition for the Army's *M-16s* and *Galil* assault rifles as well as 9mm ammunition for the *Uzi* submachine gun. Guatemala also has a plant in Coban, Alta Verapaz which produces under license the *Galil* assault rifle and *Uzi* submachine gun. In the area of electronics, in 1984, in association with Israel's *Tadiran Electronics* Guatemala built a \$12 million plant in which began licensed production of various tactical radios.

GUYANA

Guyana has no known arms manufacturing capability.

HONDURAS

Honduras has no arms manufacturing capability and must import all of its military equipment and supplies.

HAITI.

Haiti has no known arms manufacturing capability.

MEXICO

Mexico has maintained a small defense industry, and it is much smaller than the defense sector of similar economies such as Brazil and Argentina²⁵. There were plans for major expansion of capabilities in the 70s and 80s, but those programs have not materialized probably due to lack of resources. In the past Mexican manufacturers developed some weapons indigenously, particularly small arms; but recently, larger systems such as patrol boats and APC have been produced under license.

AIRCRAFT. In early 1986 there were reports that the Mexican Government together with Israel Aircraft Industries and some private investors wanted to establish Helisur, a helicopter maintenance facility in Merida, Yucatan. The status of Helisur is uncertain. Mexico also showed interest for coproduction with Brazil and Israel of the *Xavante* and *Arava* aircraft, but no concrete results have been obtained in these projects.

WARSHIPS. Mexico's two major shipyards, Astilleros de Veracruz and Astilleros de Tampico have launched several ambitious programs for the manufacture of various patrol boats. In addition to some local designs, they have worked in licensed production arrangements such as the production of the *Azteca* patrol craft with Associated British Machine Tool Makers Ltd., two multipurpose logistic ships and four helicopter capable coast guard vessels. In 1979 the Mexican Government invested \$22 million to develop a new shipyard for construction of tankers up to 80,000 dock weight. This shipyard has the potential for building warships larger than patrol craft.

VEHICLES. Information on particular system is scarce, but state owned Diesel Nacional (DINA) is a large enterprise with potential to build military vehicles. Reportedly in 1988 a locally built derivative of the US-built Cadillac Gage *V-150 Commando*, named *DN-III/V Caballo* reconnaissance vehicle, was delivered to the Mexican Army. DINA also manufactures the *Sedena 1000* APC. The Army has sought possible joint ventures with German, Israeli and Brazilian manufacturers but financial constraints and poor steel production make this unlikely in the near future.

²⁵ The Report on World Development 1993 of the World Bank lists these three countries with a GDP per capita of 3030, 2940 and 2790 respectively, and between 30 to 40 percent participation of the industrial sector in the overall GDP, thus it can be ascertained that their economies are somewhat related, in absolute terms the size of Brazil with 151.4 million inhabitants makes it by large the largest economy of all three countries mentioned.

ORDNANCE. Mexico has produced small arms and ammunition with mixed success since the early 1900s. Most recently the German *G-3* automatic rifle has been produced under license.

PARAGUAY

Earlier in this century Paraguay had a limited arms manufacturing capability, but currently no military equipment is produced domestically.

PERU

In 1985 it was reported that a new military organization called ENTRAMSA, which is the acronym for Empresa Nacional de Transporte y Equipo Military, was created to oversee Peru's four major military enterprises: Industria Aeronautica del Peru (INDAER), Servicios Industriales de la Marina (SIMA), Industrias Militares del Peru (INDUMIL) and the Moraveco vehicles plant.

AIRCRAFT. Peru actually started a limited assembly effort of aircraft as early as 1930, but the road towards the production of military aircraft has been slow. In 1976, an agreement was reached to establish a helicopter assembly plant to be located near Cuzco. This was a joint enterprise with Italy's Augusta and reportedly it would manufacture, under license, the *Bell 214-E*. Similarly, in 1978 Peru tested a Soviet MI-6 that has been assembled in Peru, but neither of these efforts became a full fledged program. In the mid-70s Peru's military government established INDAER. It lay dormant until 1982 when it unveiled a long range program to manufacture a major combat aircraft by the year 2000, Aermacchi of Italy was the counterpart and the source of technology. The program started with the production under license of 66 *MB.339A* and *MB.339K* light attack aircraft. In 1984 the government suspended the initial assembly program due to financial constraints. In August 1987 INDAER conducted a successful test of the *Chuspi*, a light aircraft. The project was sponsored by the Peruvian Air Force which would probably use the aircraft for utility/liaison duty. In mid-1988, the first of such airplanes entered service in the FAP. Peru has also had some experience upgrading its aging fleet of *Canberra* bombers and its *Mirage 5s*. Under Dassault guidance the Mirages were upgraded with a new inertial navigation system and a computerized firing system. This upgrade has been offered by Peru to other Latin American, but it seems unlikely that they can compete with Dassault and Israel Aircraft Industries in such types of modernizations.

WARSHIPS. Peru has a significant shipbuilding industry. It is reported that at the height of the fishing boom Peruvian shipyards delivered one large fishing vessel per day. This created the technology and the expertise for a modern shipbuilding industry. Peru has produced most of their small craft and patrol vessels since 1950. In the 1980s, under an agreement with Cantieri Navali di Riuniti of Italy, Peru built two *Lupo*

class frigates. These vessels are considered to be state of the art vessels and they are both currently in service in the Peruvian Navy. The shipbuilding capability is concentrated in SIMA, which is a state owned enterprise run by the navy. Its main facility is located in Callao. Besides this facility SIMA operates a major shipyards one in Chimbote and a small one in the south.

MISSILES. INDAER began a program to manufacture an air-to-surface missile, apparently with assistance from an Argentine company called Ingenieria Munex. Reportedly the missile was tested in 1984, but the current status of the program is unknown.

VEHICLES. In the past Peru has assembled some Swiss designed MOWAG *Roland* APCs from parts manufactured under license by Argentina. In 1985 Moraveco S.A., a large Peruvian enterprise partly state-owned, announced plans to convert a defunct automobile factory into a facility for assembling military vehicles. The new plant products would include jeeps and trucks assembled with assistance from Brazil and Germany.

ORDNANCE. SIMA has also participated in this area and has, since 1980, unveiled the production of the *MGP 9mm* submachine gun. It reportedly has a limited production of hand grenades. In 1982 an ammunition plant was established with Italian assistance in Huachipa. This plant is called the Army Shell Casing Factory (FABLE), and it is designed to meet a major share of Peru's ammunition requirements. In February 1988 there was an unconfirmed report that North Korea was helping Peru to establish an ammunition factory for the rifles recently supplied to the Peruvian Police Forces. The ammunition presumably will be 7.62 mm for *AK-47s* or *Type 68* modification produced by North Korea.

URUGUAY

Uruguay is capable of producing some small arms ammunition and small naval vessels, but essentially the country has no local defense industry.

VENEZUELA

Venezuela has no important arms industry, though it hopes to gradually develop one. It has had some experience building ships and aircraft in the past and is currently producing FN pistols and FAL rifles under license.

AIRCRAFT. The government has pledged its commitment to establish an aircraft assembly plant but thus far the venture has met with little progress. A team of aeronautical engineers from Venezuela's Polytechnical University of the Armed Forces (IUPFAN) has reportedly been working in the final design of the country's first

military aircraft which is designed for training, counterinsurgency (COIN), reconnaissance roles and is named the *Manapare*. Previously in 1986 the IUPFAN presented the *Taricagua*, the first aircraft built in the country.

WARSHIPS. Development of a shipbuilding program is centered around small shipyards such as Astilleros Navales Venezolanos (ASTINAVE) and the DIANCA Naval Shipyard at Puerto Cabello, which is currently building 10 patrol launches under license from an Italian company.

CHAPTER II

US INFLUENCE IN THE ARMS INDUSTRIES

THE ARMS TRADE FROM 1945 TO 1970

At the end of World War II, we had on one side the defeated Axis Powers. Their industries, converted to a wartime economy, had been almost completely destroyed and there was very little in the field of domestic industry. The Allied Powers, on the other hand, and the United States specifically, had managed to mobilize their industrial capacity to build the most powerful armed forces that the world had seen thus far. Relying on its industrial base for victory, the United States during World War II not only sent 15 million men to war, but mass manufactured nearly 6 million rifles and machine guns, over 300,000 planes, 100,000 tanks and armored vehicles, 71,000 naval vessels and 41 billion rounds of ammunition.²⁶

Much of this awesome war machinery had to be destroyed, but most of it was transferred to developing nations. The United States enjoyed for many decades the ability to be the only supplier of weapons to certain areas, and its capacity to use these weapons trade as a part of a foreign policy grew accordingly. Latin America was a region that received a substantial amount of these surplus arms in the name of military assistance. Would the arms trade scenario have remained the same, there would have been little incentive to develop arms industries. After all, most of the requirements were satisfied by the United States at a very little cost to receiving countries. States that had developed some arms industries before the Second World War (such as Argentina and Brazil), did not make a substantial effort to develop their arms manufacturing capabilities. But starting in the late 1960s there were several changes in the policy that had a profound impact on the structure of arms industries in Latin America. The trade became internationalized and new way of doing business emerged in the region.

It has been stated that competition for sales of major weapon systems, particularly among the Western European nations, is one of the main reasons for military technology acquisition in the Third World. In order to understand the nature of the competition it is necessary to examine briefly the Pattern of US Military Assistance since the Second World War.

THE ROLE OF US MILITARY ASSISTANCE

Often ignored in the discussions of arms transfers is the fact that Military assistance from the United States was widespread in Europe, Asia and Latin America in the decades following

²⁶ Toffler, Alvin and Heidi, "War and Anti-War", Little Brown & Co. New York , p.40.

World War II, but it virtually disappeared in 1970. Also often ignored in the discussions about the rise of European arms suppliers and the rise of Latin America arms industries are the changes in US military assistance policies, particularly the change in the use of grant assistance. Grant assistance was simply non-reimbursable aid that, at the end of the war, ²⁷ was very extensive and provided the backbone of weaponry for Latin America Armed Forces. However, by the late 1960s the US government, largely in response to Congressional criticism, began phasing out grant military aid and insisting that countries assume a larger burden of the defense costs by, at the minimum, reimbursing the US for the military equipment that they acquired. In this point, a differentiation should be made. While European States usually received first rate, top performance weapon systems, Latin America was assigned older weapons. The Military Assistance Program (MAP) diminished from a high point of more than \$18 billion (constant 1985 dollars) in 1952 to less than 1 billion in the 1980s. The MAP program since the 1960s has been replaced by the Foreign Military Sales (FMS) and other cash or credit programs as the means of financing arms transfers. A great deal of changes in policy occurred in the McNamara years. That is a period in which the bottom line mentality was introduced in other areas of the defense environment. Some of those policies have proved to be wrong in the long run. We can ask ourselves then if the changes in the military assistance policy were not equally mistaken.

The cash or credit program quickly replaced grants in Europe and other regions. Indeed, by 1974 more than half of the military equipment, supplies, services and training to the world were provided through cash sales or reimbursable credit sales. Over the years, the amount available to Latin America in the form of grant aids became increasingly unimportant. ²⁸

Moreover, of the diminishing grant assistance available from the US, fewer countries were recipients. Even the credit provided by the US was narrowly focused. The Reagan Administration FMS financing request for FY 1988 provides clear evidence of this distribution. Of the \$4.4 billion of credit available to purchase military equipment, 41% was directed to Israel, 29% to Egypt, 10% to Greece, 6% to Spain and 5% to Turkey. This left only 2% for all other States. The MAP program had an equally narrow focus.

²⁷ Since the early 1950s United States security assistance has been provided under several dread programs: the Military Assistance Program (grants), the Foreign Military Sales Program (FMS), the Military Assistance Fund (largely a Vietnam era instrument for participants in that conflict) and the International Military Education and Training (IMET) Program. In addition, commercial arms sales (not government to government like the other programs) have increasingly become a major instrument for transfer of military equipment and technology. For a more detailed explanation of these programs see Hammond P.Y., Salomone M.D., Louscher D.J and Graham N.A., "The Reluctant Supplier, U.S. Decision Making for Arms Sales".(Cambridge, 1983)

²⁸ This section is based in "Patterns of Third World Military Technology Acquisition", D.J. Louscher and Anne Naylor Schwarz, included "The Dilemma of Third World Defense Industries", CIS-Inha University, Westview Press, 1989.

Thus, by the 1970s the many importers of US military equipment and services were in a position in which they would have to finance purchase of defense equipment themselves. This led to individual States to look for less costly ways of satisfying its defense requirements. Foreign suppliers were not only more than ready to satisfy these needs, but they did not consider their sales as instruments of foreign policy, especially when that foreign policy tried to interfere with internal matters disguised as human rights concerns. Foreign competitors were also more inclined to agree and cooperate in the development of indigenous arms industries, to transfer technology and to enter into cooperative arrangements for coproduction of arms in the purchasing country. Their competition with the US and themselves drastically altered the scenario of arms trade that was predominant in the decades following the Second World War when the Soviet Union and the United States were responsible for almost 80% of deliveries at the end of the 1960s. Although the Soviet Union maintained its share of the market constant at about 30% of total exports and was by 1985 the top arms exporter, the US market share declined drastically from about 60% to 33% in 1985. By 1989 the top European suppliers included France, the United Kingdom, West Germany and Italy. The top Third World producers raised their participation to 15% of the world's market. Between 1985 and 1991 we had a reversal in the international arms trade. The US. doubled its share of arms exports and moved ahead of the Soviet Union.²⁹

From the suppliers point of view, the rationalization of internationalization seems clear in Latin America. Securing a market and overcoming competition within it are chief motives for coproduction or licensing arrangements in the region. This way of doing business was a major driving force for the establishment of defense industries in the region.

There are two main reasons for the decline of Soviet exports. The first requirement was that all exports be paid in hard cash due to the inability of the arms industries to maintain a liberal military assistance policy. As the rest of the Soviet economy collapsed, most Soviet customers in the Middle East and Latin America were lost. The emergence of the United States as the World's top arms exporter occurred in a declining world market. US arms exports actually declined almost 34% between 1989 and 1991, but overall arms sales were dropping even more-by 53 percent.³⁰ The result was that the US share doubled from 19.3 percent to 37.8 percent while the Soviet Union's share declined from 43 percent to 26 percent in 1991.

Therefore, it has been established that the change in the military assistance policy in the early 1970s lead to a decline in the market share of arms and military technology to Latin America. This in time led to a process of competition that changed the suppliers to the region. These new suppliers working in a competitive environment were very cooperative in the

²⁹ The lack of interest in soviet weapons can probably be also be traced to a lack of interest due to the poor performance of Soviet Military hardware in the Gulf War, but it is very hard to put this as the main reason, because weapons perform only as good as the men operating them.

³⁰ Figures are reported in the Washington Post, "U.S. Doubled Arms Exports Share in '80s", 01 April 1994, p. A24.

development of arms industries in the region, industries that probably wouldn't have been established if the US had remained as the main, if not the only, arms supplier in the region.

THE INTER AMERICAN RECIPROCAL ASSISTANCE TREATY (TIAR) AND THE ARMS INDUSTRIES.

After World War II the Latin American countries found themselves with much closer ties to the United States if compared with those existing at the outbreak of the war in 1939. This process is explained by A. Vargas as follows:³¹ "at the beginning of World War II, US military missions were established throughout Latin America to provide logistical aid in the event of an attack by the axis powers. These bases were later subordinated to US needs during the Cold War. Under US leadership, the region was politically and militarily prepared to prevent or repel an attack by the Soviet Union or Communist bloc countries. The Inter American Reciprocal Assistance Treaty (TIAR), signed in Rio de Janeiro in 1947, declared unequivocally that attack on any one of the signatories would be considered as an attack on all. As a result, South American political and Military commitment with the United States was assured."

The United States proceeded to equip the region according to the needs it perceived necessary for hemispheric defense. In this process, under the umbrella of the TIAR, the countries of the region entered into a number of bi-lateral military agreements with the US and, as we had already seen, the latter became the predominant arms supplier in the region. The question to be asked at this point is: would this support had been available to the countries of the region if the TIAR wouldn't have existed? The answer is no. The TIAR made cheap arms available, and it built up the military institutions in countries where military power had been negligible or non-existent.

Later, changes in US interests, defined in response to a new international configuration of military forces, eventually made the "hemispheric defense" an outmoded concept. As the Soviet attack on the continent became less feasible, the usefulness of transferring arms to the region was also questionable. Instead, real threats to the US interests in the region were seen as more likely to arise from within. The poverty, and the large economic inequities had generated a leftist movement that inspired an anti-American sentiment in the region, which was said to feed internal communist subversion. Thus the externally oriented defense strategy was shifted to an internal one. Hemispheric defense was replaced by a policy of security and development, and

³¹ See Varas, Augusto; "Militarization And The International Arms Race in Latin America", Westview Press, Boulder, Colorado. 1991, p.42. In this simplified version of the events, the author rest relevance to the war effort of the allied powers in WWII. To defend the continental U.S. against an axis attack that seemed plausible in 1941, bases were operated and built. In Latin America more than 30 bases were operating by the end of 1943. (See "Building the Navy's Bases in World War II", U.S. Government Printing Office. 1947) The change in the tide of war made this bases unnecessary by 1944, but the US. influence was established and remained in the continent.

development was equated with the capitalist modernization of the region. Armies were no longer viewed as an strategic reserve to be deployed in case of an external aggression, and instead became a controlling factor of internal subversion

CHAPTER III

THE FUTURE OF THE ARMS INDUSTRIES IN THE US

THE SHAPE OF FUTURE WARS

In the wake of the Cold War, the future of the gigantic military establishment that was designed, developed and built at an immense cost has been one of the main topics of discussion among heads of state, military strategists, national security managers, defense establishments and, in general, it is almost impossible to find a defense related publication that does not address in some way the future of the defense establishment.

A certain strategical stand can only be taken once the threats are analyzed and all the defense planning is carried out. Nevertheless, the shape of the wars is something that is dependent on the state of development of a civilization and is therefore placed at a higher level than national strategy. In 1978, General Sir John Hackett ³²wrote about the war of the future. His work was the result of a detailed studies from top ranking NATO generals and advisors and was based on the general strategic concept of NATO, and what we thought is was the War Planning of the Soviet Union. The war itself was a recreation of World War II, with massive displacement of forces and massive confrontation. The Gulf War proved that this concept has changed, that new wars have to be conceived within the new frameworks of advanced technology, new means of communication and an altogether different structure of command and control.

So the "Third World War" would probably lead us to the conclusion for the requirement to plan for the future but restraining the thought to current military thinking is bound to produce a shortsighted if not completely wrong prediction. Where should we look then? One possible answer is to look into the works of people that have made their living by looking into the far future. One of the best references is the recently published book by Alvin and Heidi Toffler³³. His main argument is that "throughout history, the way men and women make war has reflected the way they work"³⁴. The way in which we choose to interact with violence against our fellow human beings must be closely related to the way we make wealth, to the underlying economic, political and psycosocial foundations of the society.

³² See "The Third World War: August 1985" , by General Sir John Hackett, Macmillan Publishing Co. Inc., 1978. This book was at the time probably an accurate description of the shape of the future wars based on strategic concepts. In hindsight it can be said that he was wrong, but the foremost conclusion of his book, the collapse of the Warsaw Pact forces after the war with NATO and the emergence of a new differen superpowers "the US and the China-Japan coprosperity sphere" are two key elements of today's world.

³³ The general ideas for this section can be found in: Toffler Alvin and Heidi "War And Anti-War: Survival at the dawn of the 21st. Century, Little Brown & Co. New York 1993; Toffler Alvin Avances y Premisas, Plaza & Janes S.A. 1983; Toffler Alvin "La Tercera Ola", Plaza & Janes S.A. 1980 and Naisbitt John, "Megatrends", Warner Books Inc, New York, N.Y. 1982. Exept for "ar and Anti-War" these books were written in the 1980s, so a review gives a good appreciation of the correctedness of the autors prophesies.

³⁴ War and Anti-War p5.

Hence, to further explore what is the character of the war we must first look at history of men in a very large context. In "The Third Wave" Toffler describes the three big changes that have shaped mankind's relationship among themselves and with earth. The first one was the agricultural revolution, which did away the nomadic search for food that had characterized early societies. It gave rise to permanent settlements and other many social and political innovations. War itself was one of this innovations because "It enabled communities to produce and store an economic surplus worth fighting for. And it hastened the development of the state. Together these provided the preconditions for what we now call warfare. Output in agrarian societies was so low and food surpluses still so small that over 90 percent of all manpower was needed simply to work the land.. War was a seasonal occupation, with the volunteer soldiers coming mainly from the farms which needed no looking after the winter months". This broad generalization possibly is not applicable to the highly organized Roman legions or the Inca armies that swarmed over most of South America, but it generally describes the shape of feudal armies way into the middle ages. He concludes "first wave wars bore the unmistakable stamp of the First Wave agrarian economies that gave rise to them, not only in technological terms alone, but in organization, communication, logistics, administration, rewards structures, leadership styles, and cultural assumptions"³⁵

The next innovative change in the way society interacts came with the industrial revolution, at the same time that the way millions of people make their living became different by the appearance of factories, and mass migration from the fields to the big cities where hundreds of factories were now becoming a common sight. At the same time, war became progressively industrialized. "Mass production was paralleled by the *levée en masse* - the conscription of mass armies paid by and loyal not to the local landowner, clan leader, or warlord, but to the modern nation-state. The draft was not new, but the idea of a whole nation in arms - *Aux armes citoyens!* - was a product of the French Revolution, which roughly marked the crisis of the old agrarian regime and the political rise of a modernizing bourgeoisie" ³⁶. The mass production methods that produced thousands of similar items were applied now to the production of arms, one can found the names of the great engineers of the revolution: Watts, Eriksson, Eli Whitney, are the same that pioneered new forms of mass destruction. With the growth of standardization in the manufacture of equipment soon came the standardization in training organization and doctrine. Toffler states "the division of labor in industry was reproduced in the rise of new branches of the military. As in business, bureaucracy grew and armies developed general staffs. The "machine age" gave birth to the machine gun, to mechanized warfare, and to entirely new kinds of firepower, which in turn, led inevitably to new kinds of tactics". ³⁷ Consistent with this new type of warfare, most of the doctrine emphasized the maximization of destruction. World War II showed the potential that mankind had acquired to industrialize death. United States manufactured 6 million rifles, 300,000 planes, 100,000

³⁵ Ibid.,p37.

³⁶ Ibid, p39.

³⁷ Ibid, p40.

tanks, 71,000 naval vessels and 41 billion rounds of ammunition. With these they sent 15 million men to war. Six million Jews were killed and processed in true factory style, and warring powers managed to slaughter 15 million soldiers of all nationalities, and kill probably twice as much innocent civilians. Contrary to popular belief, Hiroshima and Nagasaki were not the pinnacle of mass destruction, because they only accomplished with more proficiency what more than 300 American bombers had achieved on March 9, 1945 over Tokyo, not to mention Coventry, Dresden and other examples of maximum destruction consistent with the new morals of mass production. When strategists reached the concept of Mutual Assured Destruction (MAD) in the early 1970s, we were probably witnessing the limits of the capability of mass production weapons. What else could mass destruction accomplish besides the guaranteed destruction of the world? Toffler recognizes that "the development of modern war had reached its ultimate contradiction. A true revolution in military thinking was needed, a revolution that reflected the new economic and technological forces." But before we try to predict the shape of future wars, or "Third Wave Wars" we should first review the sweeping changes that are occurring in the way we make wealth.

The key features of the new revolution in the way we make wealth the key features of the new economic revolution are³⁸:

- 1. Factors of Production.** Knowledge is the new factor. Knowledge can reduce labor requirements, cut inventory, save energy and raw materials and reduce the time, space and money needed for production.
- 2. Intangible values.** The real value of companies is now increasingly based on intangibles.
- 3. De-massification.** There is a shift towards flexible manufacturing, and production oriented towards the satisfaction of every consumer choice.
- 4. Work.** From low skilled, highly replaceable, interchangeable muscle work that drove the assembly lines of the industrial revolution, the third wave is being characterized by highly skilled and usually non-interchangeables. Also the distinction and the ratio between "direct labor" to "indirect labor" is changing as just as much value is produced by either one.
- 5. Innovation.** Constant innovation is needed to compete. Smart firms encourage employees to take the initiative, to come up with new ideas; and there is a constant drive to create new products.
- 6. Scale.** The Industrial Revolution was based on the benefits of economies of scale and large production runs characteristic of a smoke stack economy. These

³⁸ See "War and Anti-Wars", pp.58-64. This listing of the new features of the way we make wealth closely agrees with the ten trends of the future in "Megatrends" (cited earlier), and the same content can be found in "Made in America", a report written by M.L. Dertouzos, R.K. Lester, R.M. Solow and the MIT Commission on Industrial Productivity. Basically all three books address the need to recognize that at the eve of the 21st. century a new economic revolution is taken place, and there is an imperative to recognize the elements of this new innovation.

benefits are grossly outweighed by the complexity of world economies with millions of transactions where bigness is a liability rather than an asset.

7. Organization. One of the characteristics of the industrial revolution was the standard organization that resulted from the division of labor. This now gives way to matrix organization, profit centers and a diversity of strategic alliances.

8. Systems Integration. Sophisticated integration and management is required for world reach companies that must contend with high volumes of information.

9. Infrastructure. The new infrastructure is communications related. In the US the "information superhighway" is now a common term and billions of dollars will be used to build electronic networks that link computers, data bases and managing networks.

10. Acceleration. Through the network money moves at the speed of light, and time is more valuable than ever.

Toffler concludes that "taken together, these ten features of the Third Wave economy, among many others, add up to a monumental change in how wealth is created. The conversion of the United States, Japan and Europe to this new system, though not yet complete, represents the single most important change in the global economy since the spread of factories brought about by the industrial revolution. This historical transformation, picking up speed in the early-to-mid seventies, was already way advanced by the 1990s. During this period, war itself began to be transformed in tandem. Second Wave war, like Second Wave economics, was racing towards obsolescence."³⁹

The new form of war, with all encompassing forms of warfare, appeared in January 1991 in the Middle East, the gulf war has characteristics that made that confrontation entirely different to any of the wars fought anywhere, so we are going to analyze this war using as a framework the key features of third wave economies listed before.⁴⁰

1. Factors of Destruction. We cannot discount the value of the material elements for destruction, but in the Gulf War "knowledge came to rival weapons and tactics in importance, giving credence to the notion that an enemy might be brought to its knees principally through destruction of the means for command and control." Computers added another factor to the knowledge equation in the war. "Virtually every aspect of warfare is now automated, requiring the ability to transmit large quantities of data in different forms."⁴¹ By the end of the war there were more than 3,000 computers in the battlefield linked to computers, data bases and command networks in the US and over the skies of the Gulf flew the most powerful information weapons known so far -- AWACS (Airborne Warning and Control System) and J-STARS (Joint Surveillance and Target Attack Radar System), bringing to the battlefield commander an unparalleled view of the enemy's ground and air forces in a radius of more than 150 miles,

³⁹ "War and Anti-War", p63.

⁴⁰ Ibid, pp 69-79.

⁴¹ Campen Alan D., "The first Information War", cited in "War and Anti-War" pp67.

almost vanishing the Clausewitzian 'Fog of War'. Knowledge, in short, became the central resource of destructiveness just as is the central resource of productivity.

2. Intangible Values. If you make a Second Wave comparison and add up the tanks, planes, men and guns in each side, you don't find a clear reason for the coalition victory in the Gulf, so the final military balance must be determined taking into account more intangible, hard-to-quantify factors than just looking at the usual easy-to-count elements. In war, just as in business, the ways in which "value" is measured have fallen behind the new realities.

3. De-Massification. In this area we have to address the smart weapons, highly technical devices that can track, identify, evaluate, attack and destroy one target in a single attempt. These weapons that are based on information technologies rather than 'dumb' weapons that rely on firepower, dominated the battlefield and reduced the amount explosives and equipment that had to be used⁴².

4. Work. The new soldier is the counterpart of the highly skilled worker of the modern economies. The man in the cockpit is not performing alone. He is just one more element of a complex system of information, and command and control. Over 98 percent of the all-volunteer forces that fought in the Gulf were high school graduates. We also saw an increase in the ratio of non productive labor, as every effective soldier requires now a larger degree of support.

5. Innovation. The skills and knowledge of today's soldier have been combined to increase the ability to innovate and solve problems at a level not seen before. "The computer-driven network that fed all source intelligence to US troops about to plunge across the Saudi-Arabian border on February 24, 1991, did not even exist on that day, six months earlier, when Iraq invaded Kuwait."⁴³ Even J-STARS, one of the systems that provided a key element in the information network, was put into service ahead of schedule in a smart and competitive way.

6. Scale. The push is not only toward smarter weapons, but smaller crews and more "lean and mean" units that in the battlefield can deliver a greater firepower than large conventional units. As in the civilian economy, fewer people with intelligent technology can accomplish more than a lot of people with brute-force tools of the past.

7. Organization. A reduced emphasis on nuclear weapons and the increased need for a flexible response point to a new command structure that allows for greater flexibility. This

⁴² The value of some of these weapons has been questioned in recent publications, i.e. Expert analysis showed that of all Patriot missiles launched, all but *one* are to be considered misses. This highlights another point that the American public and the world saw in their screens the patriots destroying the mass launched Scuds. This led to the perception that Scud warfare was not effective and probably helped to keep Israel out of the War, hence the importance of knowledge. Third Wave wars are a combination of all elements.

⁴³ "War and Anti-War", p76.

downward shift of authority throughout the chain of command is a natural consequence of the new type of soldier that now conforms the army. ⁴⁴

8. Systems Integration. The growing complexity of the military tasks has increased the requirement for a systemic integration that can make deploying, targeting, tracking, detection, destruction and logistics to function as a single unit.

9. Infrastructure. The gulf war caused the mobilization of the largest assets in electronic, computers and communication equipment to build a network that relied on 118 mobile ground stations for satellite communications, supplemented by 12 commercial satellite terminals. That made available 329 voice and 30 message circuits that handled 700,000 telephone calls and 152,000 messages per day, and used 30,000 radio frequencies.⁴⁵ Without this modern Third Wave infrastructure, an integrated effort of the coalition forces would have been impossible.

10. Acceleration. The swift maneuvers around the western end of Saddam's defenses was a classic and predictable strategy, what was not predictable was the speed at which the coalition forces moved on the ground. This unprecedented speed was also observed in logistics built up, intelligence analysis and communication effectiveness. *Forbes* wrote "America won the military war the same way the Japanese are winning the high technology trade and manufacturing war against us by using a fast-cycle, time-based competitive strategy"⁴⁶

We can conclude now that there are reasons to conclude that a new way of waging war has emerged. The solution then appears to be quite simple. This could be true in a single unified world, but the reality is quite different. We live in a trisected world, where we still have some First Wave societies, especially in the Southern Hemisphere where we can still find some agricultural economies. In the middle we have smoke-stack economies. This comprises most of the developing and developed world and on top we have a reduced number of countries that have managed to make the partial transition to a knowledge-based economy.

The likely result of this will be the diversification of the future wars. It is very hard to predict a single form of war in such a complex world as arsenals will be still full of highly capable Second Wave weapons, and it gets even worst when considering some First and Second wave nations acquiring, or seeking to acquire, Third Wave weaponry. The growing heterogeneity of war will make it vastly more difficult for each country to assess the military strength of its neighbors, friends or rivals. War planners are faced with an unprecedented complexity and uncertainty. Diversity is now raised to a level that no country, even the United States, can bear the responsibility for financing or fighting all kinds of wars. Coalition warfare

⁴⁴ See Segal David, "Organizational Designs for the Future Army, by the United States Army Research Institutes for the Behavioral, and Social Sciences. This study seems to agree with Tofflers perceptions, specially with those related to labor, organization and training.

⁴⁵ War and Anti War. p 79.

⁴⁶ Ibid, p80.

will probably be the best answer in the future, each country producing and contributing to the war effort according to its stage of development.

FUTURE STRATEGY

The most recent version of the National Strategy of the United States establishes the four fundamentals of the new strategy and these are basically the assurance of strategic dissuasion, to maintain forward presence, to maintain a capability for quick and efficient crisis resolution and the ability to build up standing forces when required.⁴⁷ These four basic concepts are likely to remain as the main concepts of national strategy for a long time, they were the first major change to the containment policy that dominated over the cold war era. The strategic paradigm of the cold war, preventing the spread of communism does not fit.

In order to fight a war in this new scenario, the Department of Defense conducted a review of the structure of the armed forces. According to the administration, this Bottom Up Review (BUR) provides the United States with a blueprint for transitioning from a defense posture designed primarily to counter the Soviet Union to one oriented towards the challenges of the Post Cold War security environment. These new challenges have been primarily identified as the threats posed by aggression by regional powers, ethnic or religious conflict, the spread of nuclear chemical and biological weapons, the failure of the former Soviet States to transition successfully to democracy, and the failure of the U.S. to build a strong and growing economy.⁴⁸

According to this BUR the U.S. should maintain "sufficient military power to be able to win two major regional conflicts that occur near simultaneously"⁴⁹ The program has been criticized on the grounds that the very scenario used to size the force structure is not a realistic one, and by the fact that even this reduced force is not sustainable over a long period with the resources currently allowed for defense. Overall, the defense budget will remain nearly constant, but in real terms this will mean a reduction in the range of 2-3% annually. The most affected areas will be those assigned to weapons procurement and funding of research and development of new weapon systems.

RESTRUCTURING THE DEFENSE TECHNOLOGY AND INDUSTRIAL BASE⁵⁰

The US is basking in the warmth of the Cold War victory and Operation Desert Storm successes. The U.S. military strategy of the past thirty years strained the Soviet Union to their

⁴⁷ George Bush, "National Security Strategy of the United States". The White House, Washington D.C. U.S. Government Press, August 1991, p25.

⁴⁸ Krepinevich A.F., 'The Bottom Up Review, An Assessment', Defense Budget Project, Washington D.C.

⁴⁹ Ibid, p21.

⁵⁰ References in this section are referred to the bibliography at the end of the paper.

economic breaking point. The Cold War, however, could not have been won without a dedicated defense industrial base. (1:1) America now needs to downsize to meet the military challenges of the future which means getting away from weapons designed for the "old superpower polarity." We need to plan for the future of an industrial base and the future of trained military personnel. We must also consider these needs against the demands for a peace dividend and fears of massive unemployment and a crumbling defense industrial base. (1:1)

It has been said that "where there is no vision, the people perish."(3:1) Just as dangerous is vision without action to carry through that vision. A typical example of lack of vision and the strength to carry out that vision concerns U.S. steel firms. These firms refused to invest the necessary capital to integrate sophisticated technologies into their production processes in order to compensate for the comparative labor-cost advantages of foreign competitors. Doing so would have generated comparable productivity levels for U.S. firms. They also refused to specialize so that they could compete with the minimills. The long-term, combined effects of all these factors led major U.S. firms to diversify out of steel or to seek partnerships with richer and more technologically innovative foreign producers in order to ward off bankruptcy. In the process the U.S. lost part of its industrial base. (2:1)

The U.S. in general has taken a short range view which industry has adopted in order to maximize their profits at the expense of long range consequences. (1:1) The U.S. government had attempted to help steel but finally abandoned the cause when the point was reached whereby steel's status was noncompetitive and irredeemable. Apparently industry made profits with the government's assistance but funds provided by the government were not spent, as the government intended, on capital investment for modernization. (2:3)

The argument has been made that the executive branch of U.S. government has used trade policy as a surrogate for industrial policy. This has resulted in bypassing strategic considerations. The thrust of this is that the executive does not intervene in cases of "infant industries" which are the ones most likely to generate a dynamic economy. This has been labeled "compromise protectionism". (2:1) A example of this is the area of high definition television (HDTV) which represented an opportunity because it could "affect major national interests relating to both national security" since HDTV could have applications in military aircraft cockpit displays. National security issues could be affected because of related competitiveness of the U.S. semiconductor and computer industries. The National Advisory Committee on semiconductors warned the government that the U.S. "faced some dire economic consequences if it did not help the electronics industry."

There is one initiative which would help the U.S. maintain their technology edge if properly implemented. In a proposed visit by William Perry, U.S. Deputy Defense Secretary, a technology-sharing initiative would require an equal exchange of Japanese dual-use technology. In the past, the Japanese have received "tremendous amounts of technology from

the United States. Now we are saying that as a mature, adult partner with considerable capability and potential, it is time to ask for a balanced relationship in the technology area." However, there are concerns such as the bureaucratic bottlenecks and government restrictions from both the Japanese and U.S. sides. (7: 3, 21)

The dilemma remains that future military success similar to that of the Gulf War depends on a national security policy that is based on the best technology and support by a strong industrial base. Both will help keep the peace and protect America's interests abroad.

Although the results of the Gulf war were no big surprise, what was at stake was the amount of casualties. The U.S. military victory was obtained with a minimum of human loss thanks to training, technology, equipment, mobility, good planning and an excellent strategy. The U.S. needs to demand no less for the future. (1:1)

It is difficult to prove that we need more war materiel and improved models of the same, given the current threat. (4:34) However, the end of the Cold War does not signal complete peace and security. Tyranny, tribalism and terrorism still exist which will challenge the military interests of the U.S. and its allies which seem to imply a shift toward contingency warfare. Strength may be the only way to secure the peace. (1:1) There can be no long term security without a solid war industrial base.

However, contingency warfare is bad for industry and worse yet for research and development. It never provides enough stability to make it a reasonable investment. Also, old stocks need to be used up before any new procurement takes place (4:34) which implies further stagnation for the industrial base. Companies are reluctant to invest in a climate without assured production because the financial risks are too great in the current environment. The United States, as well as other countries, constantly encounter themselves at the crossroads of one type of crisis or another. Potential enemies of the U.S. will have the ability to pit weapons against the U.S. of the same sophistication as those used by the U.S. in the Gulf War. This will result in reluctance by the U.S. to engage in future contingency wars. Otherwise, we will need to focus on how to defeat enemy forces while not incurring heavy casualties.

Some companies are diversifying but are largely limited to receptive audiences such as NASA, the Post Office or the FBI where they can utilize their DoD contracting skills. (1:2) Companies are thus leaving the industry due to the inability to invest because of lack of national direction after the cold war. The results are that in the near term taxpayer dollars will probably be wasted because of program stretch-outs and delays. For the long term, the U.S. will lose high technology manufacturing resources with a resultant shortfall in military readiness and a shrinking defense manufacturing base. Uncertainty over how to plan for a smaller defense force is all but paralyzing the industry. (1:2) DoD's task therefore is to ensure that the massive defense industrial base is equitable, orderly and results in staying healthy in order to enable it to respond to DoD's future requirements. (1:2)

Improvements to the system could come in military export procedures which are too confusing and redundant, causing decided disadvantages to U.S. companies compared to foreign companies. Improved procedures will result in less expensive U.S. government procurements and will benefit the U.S. defense industry. (1:2)

However, the way U.S. industrial base does business is changing. If the past history of the U.S. is any indicator, the "military-unique prime contractor level" industrial base will go away to a large degree. This translates to a system that has subcontractors, as opposed to prime contractors, selling to commercial markets and only occasionally selling to the military. The U.S. then will again revert to a system it has had between all major wars, that is, of maintaining an arsenal system of guarding and improving technologies performed by the state using direct commercial suppliers. (4:4)

CONCLUSIONS

Looking at the issue of the future shape from a more technological point of view, the OTA made a in-depth study of the restructuring process, its findings constitute an analysis of current situation and a long range prediction for the industry. It can be resumed as follows:

GENERAL FINDINGS

- The capacity of the DTIB exceeds the foreseeable National Security Requirements
- A proportional downsizing, maintaining the current structure would not serve the nation's needs, what is needed is a smaller DTIB but with a different allocation of resources among R&D, production and maintenance.
- The elements of the future DTIB must be integrated.
- The changes in the DTIB require a concomitant shift in thinking about what constitutes national security and the role of science and industry maintaining it.
- The current debate over maintaining a warm production base is incorrectly framed, the real issue is how to maintain a warm capability.
- Legislative and regulatory barriers impede civil-military integration.
- DOD should establish priorities for those technologies in which it wishes to be at the forefront.
- People are the single most important element of the DTIB
- The end of the cold war requires the demobilization of many private and government facilities.
- Advanced technology remains critical to the nation's military strength.
- Out of all possible alternatives, the path defined by **dual-use technology, private ownership, and competitive acquisition** is the most promising alternative.

SPECIFIC FINDINGS

- Congress and the administration must support R & D.
- Without offsetting actions, funding reduction will cause a disproportionate reduction of R & D. performed by private industry.
- Present efforts to consolidate R & D do not meet the requirements for a complete restructuring of the R & D base.
- DOD must make greater efforts to exploit civilian technology.
- Current policy places too little emphasis in improving manufacturing technology.
- Prototyping is narrowly focused on performance and does not incorporate manufacturing and maintenance requirements.
- A prototyping-plus strategy is needed in the overall plan to restructure the DTIB.
- Prototyping-plus will require more integrated DOD management.
- Efficient, responsive and mobilizable production is required.
- A robust maintenance capability with private industry participation and diminishing depot activities should be implemented.
- Integrated management should be developed in the defense sector.

CHAPTER IV

THE FUTURE OF THE ARMS INDUSTRIES IN LATIN AMERICA

A MARKET OVERVIEW⁵¹

It can be argued that there never was an arms race in Latin America and that the large expenditure in weapons was only the result of an increase in the cost of weapons, but it is undeniable that expenditure in arms increased tenfold in the region in the 70s, the value of imports of major weapons by the region in South America went from \$285 million in 1970 to \$2.83 billion in 1977 reaching a maximum of \$3.21 billion in 1981, in Central America these increased from \$185 million to \$ 557 million in 1977 reaching a maximum of \$1.1 billion in 1982. All of major weapons purchased in the 70s will reach obsolescence in the late 90s. At that point two things can occur, a renewal of expenditure due to the cost of replacement of weapons, or a gradual reduction of military capabilities of the countries of the region. In the following paragraphs we will analyze the future needs of weapons in Latin America, and in the measure that those needs can be satisfied with the indigenous arms industries, we see the possibility of those industries to remain active and working, the analysis will be made by country

ARGENTINA

Aircraft .- Argentina has replaced the planes that were lost in the Malvinas war, earlier attempts to replace them with upgraded *Israeli A-4E/H* or *Kfir C-21s* were blocked by the US. due to British concerns. In late 1993, US sold Argentine 30 Skyhawks A4-Js. Argentina has also worked in the past for the manufacture of the *AMX* light strike fighter, this could probably be manufactured with the Brazilian-Italian consortium that is currently working on the development of such aircraft. The *AMX* is a requirement that probably can be manufactured by *FAMA*. The Navy has a requirement for about 20 helicopters to replace the eight embargoed *Westland Sea Lynx* as well as the aging *Aerospaciale Alouette III* in ASW. The Army and the Coast Guard may have additional requirements for helicopters but it will not be in the amount required by the Navy. The Air Force has a requirements for up to 100 trainers, and the Navy will probably ask for 6-12 trainers, this requirement has been satisfied initially with

⁵¹ The analysis of the future requirements is mainly based on the section of the same name as it appears on the DMS Market Intelligence Report, a publication of the Jane's Information Group, 1989. Other publications reviewed for this section are SIPRI Yearbook 1990. World Armaments and Disarmament. Published by the Stockholm International Peace Research Institute, Oxford University Press 1990, and the Publications of the International Institute for Strategic Studies :Strategic Survey 1992-1993 and Military Balance 1993-1994.

the purchase of the *Embraer 312 Tucano*, but in the future FAMA will continue to deliver its *IA-63 Pampa Jet Trainer*. There is also an need to replace in the future the aging fleet of *C-47s* and *IA-50 Guarani*s for the light transports.

Warships .- In 1988 the ex-British *Colossus* class aircraft carrier *Veinticinco de Mayo* began a two-year overhaul at the AFNE shipyard, the program has been extended and it was not finished at the end of 1993, the major change of the overhaul was the replacement of the Parsons steam turbines for diesel engines, the replacement for this vessels will allow the Navy to continue to operate an air arm in the fleet. The two other major programs that were launched to modernize the Navy after the Malvinas War have been plagued by financial restrictions, the *MEKO 140* frigates program has been finished and the *TR 1700* class submarines has been stopped, the unfinished constructions will probably be never finished and no potential customers have been found for these. The Navy has shown interest in a nuclear powered submarine, but it seems very unlikely the completion of this program in a short term. It should be noted that the Navy and the Air Force will need in this decade a replacement of the next-generation air-to-air, air-to-surface and surface-to-surface missiles.

Vehicles .- No major acquisition of new vehicles are expected, in the next decade purchases may be limited to replacements of existing vehicles, and no orders have been placed from foreign customers, even some orders .

BRAZIL

This country is in the midst of a ambitious defense buildup for all three services, the Army is expanding its ability to project forces into the northwestern regions of the country with an airborne (helicopter) wing, the Air Force is awaiting the *AMX* and has purchased additional *F-5s*, the Navy is building new frigates and submarines, and ambitious missiles projects were started in all three services. However, Brazil's severe economic difficulties have forced the government to focus on cutting the national budget deficit, and for the first time in a long time, the defense budget has not been spared, and as a result of across-the-board budget cutting, since 1988 it has been reported the armed forces have begun postponing or canceling planned acquisitions.

Aircraft .- The *AMX light strike fighter* in the most ambitious project, this will replace the *AT-26 Xavante* , the Air Force also needs a replacement defense fighter, there have been preliminary discussions with *General Dynamics* and *Dassault* for a possible co-production agreement for the *F-16* and *Rafale* respectively, if funds are not available for such purchases upgrade programs for the *F-5s* and the *Mirage III* will have to be established as major projects. The *Cessna T-37* and *Neiva T-25* trainers will have to be replaced, the *Embraer EMB-312 Tucano (T-27)* turboprop will be the selected replacement. There is also a need for a jet trainer that could probably be satisfied with the same airframe of the light strike fighter, the Air Force will probably need 120 to 150 of these plane altogether. Some maritime patrol/ASW and light transport aircraft will be required. In helicopters the Brazilian Army is

establishing a new aviation wing to improve projection capabilities, it is estimated that for this it will require up to 112 reconnaissance and 254 transport helicopters in the next 20 years. The aircraft selected have been the *SA 365K Dauphin* and the *AS-350L Ecureuil*, these are scheduled for co-production with *Aerospatiale* for *Helibras*. The *Westland Sea Lynx* and the *ASH-3D Sea King* of the Navy are scheduled for replacement in the 1990s.

Warships - The submarine construction plan includes the local construction of three German designed *U-209* and a fourth to be built in West Germany. The later underwent sea trials 1988 but the Brazilian built submarines have been severely delayed by financial and technical difficulties; besides all these in November 93 launched the *Tame*, the first of the Brazilian built subs, and it was announced that it would be finished "Em breve"⁵². These will replace the *Guppy II/III* classes, but a replacement for the *Oberon* class or a major refit for such vessels will have to be scheduled. Of the 16 *Inhauma* class frigate initially planned, only four have been built, and the interest shown in acquiring some of the vessels from the US. (four *Garcia* class frigates and one *LST*) could indicate that there is not a commitment to the local construction program. As in the Argentinean case, a replacement would have to be found for the 44 year old *Minas Gerais* aircraft carrier. There also need for Patrol boats, a replenishment tanker, a polar research vessel and replacement for the mine sweeper and mine hunter fleet. The Navy and Air Force will need in the 90s replacement for the air-to-air, air-to-ground and anti-ship missiles.

Vehicles - As part of its broader modernization effort, the Brazilian Army plans to procure additional *Engesa EE-9 Cascavel* and *EE-11 Urutu* armored vehicles, they have a requirement for up to 500 new tanks, but is very unlikely that all will be ordered due to budgetary constraints. The likely candidate for replacement are the *Engesa* produced *EE-T1 Osorio MBT* and the *Bernardini MB-3 Tamoyo*.

BOLIVIA

Bolivia's severe economic difficulties have precluded any major arms modernization in the past, and it will likely do the same in the near future, pressing needs are the acquisition of 24 new fighter aircraft and a future need for light jet trainers is envisioned for the early 1990s, a likely candidate in the *IA.63 Pampa*. No major requirements are foreseen in the Navy and Air Force.

CHILE

Aircraft - For several years Chile has required interceptors to compensate for the deterioration of its F-5 force caused by the US. Embargo on spare parts, the fact that those restrictions are not in place any longer will probable cause a major program of modernization of such aircraft. The upgrading of the *Mirage 50s* is proceeding at a slow pace and it will

⁵² Quoted in NOMAR, from the Brazilian Navy Public Affairs Office, Nov93, No. 608, p4-5.

probably continue for the next several years. For light strike the Air Force would probably continue the purchase of the A-36 Halcon which is the ENAER assembled version of the CASA Aviojet G-101CC. The Air Force had decided to purchase 30 MBB BO-105 helicopters from ENAER but that program has been suspended due to financial constraints and is likely to continue in the future when budgetary constraints are eased somewhat. A light transport aircraft to replace C-47s will also be needed. **Warships.** This country has pursued a policy of purchasing its combatant vessels abroad (mainly in the UK.) thus leaving local facilities only for the construction of auxiliary vessels and major refits. It is foreseen that this policy will be continued in the future. **Vehicles.-** Chile requires new tanks to replace its largely outdated , but this has not been reported as a priority purchase. Likely candidates are the Engesa's Osorio MBT, any purchase program is likely to involve manufacture or coproduction in Chile.

COLOMBIA

Colombia's military needs are tied primarily to a more than 30-year-old insurgency threat and more recently to a crack-down on well armed drug traffickers. With no end to the internal security in sight Colombia's requirements are expected to focus on new small arms, ammunition, vehicles, trainer/light attack aircraft, helicopters light transport, radios and surveillance equipment. In 1987 Colombia announced an urgent \$ 64 million arms procurement plan for all three services to bolster COIN capabilities. Offsets, credits or other financial assistance to Colombia were understood to be prerequisites for any contracts. Also, for many years Colombia faced no serious threat of armed conflict from abroad, thus the armed forces capabilities were largely oriented towards a better and stronger COIN standing. However an August 1987 flare-up of a territorial dispute with Venezuela has given a new sense of urgency to a conventional build up. Within a month of the COIN procurement announcement and the Venezuelan crisis, a political consensus seemed to emerge for a sustained period of higher defense spending. The legislature called for spending at least \$ 400 million a year for the next five years, which would require an annual spending of near \$ 80 million per year in arms. In late November 93, the figures for 1994 Colombian budget were released and they have become the only country in the area where defense spending has almost doubled in one year.

In this framework of increased spending requirements are foreseen: **Aircraft .-** Colombia's self stressed importance as a Caribbean power calls for an increase of ASW capability with the purchase of additional *MBB BO 105s* or surveillance aircraft, additional COIN/Drug interdiction requirements will call for additional *Cessna A-37B Dragonfly*, the possible purchase of *IA-63 Pucarás*. After the purchase of 12 *Israeli Kfirs* in 1987 no new purchases of fighters are anticipated, but a program to upgrade its *Mirage 5* fleet is being discussed with Israel Aircraft Industries, this program reportedly would include in-flight refueling capability. This would require the conversion of at least one of Colombia's *Lockheed C-130s*. Colombia will require new advanced jet trainers to replace older types, it is said to be evaluating the *Embraer-312 Tucano*. **Warships .-** No additional purchases are expected besides the four that were bought in the early 80s . a certain number of patrol ships will be required and considering the country's capabilities this may be obtained with coproduction or using an

indigenous design. **Vehicles** .- Besides *Engesa* vehicles purchased in the early 80s, Colombia's armored vehicles are basically museum pieces, so additional light armored vehicles and personnel carriers may be purchased. As an requirement for COIN warfare a large array of small arms and communication equipment is expected to be purchased.

COSTA RICA

Given its current limited missions, Costa Rica's paramilitary Civil Guard is unlikely to acquire many new weapons systems in the near future. It had been believed that with the planned retirement of American Forces in Panama some instability was to be expected and that would probably force Costa Rica's security forces to take a more conventional appearance.

CUBA

This Country now possesses the best equipped armed forces, it is presumed that after the loss of aid from the Russia and other countries from the Ex-Soviet Union the once impressive Cuban military hardware may be in a great need of spare parts and some renewal of older equipment must be needed. But in any case requirements from this country, if any can be paid for by the cash-strapped Cuban government, is likely to go to the arms manufacturers of the ex-Soviet Union.

DOMINICAN REPUBLIC

The Dominican Republic is a country with few resources and even less external threats, has spent little on military equipment in recent years and this trend seems unlikely to change in the near future, even though most of the country's military equipment is outdated . With the reduction in US security assistance which was the main source of hardware, most of the planned acquisitions have been postponed. Some Cessna A-37B Dragonfly aircraft may be needed to complement existing planes and some patrol boats to replace W.W.II vintage vessels now in service in this Country.

ECUADOR

Ecuador has traditionally has viewed neighboring Peru and to a lesser extent Colombia as the principal threat to its security. Therefore, unlike most of the region, the Ecuadorian armed forces thus far have been equipped with an emphasis on conventional rather than COIN capabilities. However, while the conventional threat remains dominant, and the fact that in 1990 the government reached a negotiated pact with the Alvaro Vive guerrilla, the recent incidents and the probably emergence of new guerrilla group and armed Indian groups has forced the armed forces to redirect more of their resources to COIN requirements. **Aircraft** .- A new batch of aircraft will be requires as most of the fighters now in service were purchased in the late 70s and early 80s, The navy has been interested in ASW helicopters and surveillance aircraft, *Westland Sea Lynx* and the *Fokker F-27M* have been named as candidates. No major

warships replacement are expected in the near future, but some of the auxiliary craft is almost 50-year old, a new LST will probably have to be purchased. **Vehicles** .- There is an urgent requirement for new armor to replace its obsolete *M3s*, the most likely purchase if budgetary restrictions are lifted is *Argentina's TAM*. There is also a need for Armored fighting vehicles the likely candidates include the *Brazilian Tamoyo*, the British Scorpion and the *French AMX 30 and 13*. As in the case of Argentina, the Air-to-air, air-to-surface and antiship missiles in the armed forces of Ecuador will need to be replaced or refitted in the 90s.

EL SALVADOR

The Salvadorean armed forces, bolstered by US. military aid, underwent sweeping changes in size, weaponry, training and weaponry in the 80s. The ranks of the armed forces swelled from less than 13,000 in 1981 to close to 50,000 at the end of the decade. Most of the personnel was focused on COIN and light infantry activities. With the OAS negotiated peace accord, the armed forces will be forced to submit to an equally dramatic reduction, whose final objective is to reduce the armed forces to a police status. Recent developments suggest that the transition to a full democratic and peaceful society may not be smooth and trouble-free, but there are no signs that process may be reversed. Holding true all of the conditions mentioned, in the near future El Salvador will find itself in possession of a large stock of unrequired and surplus equipment; it could be that the armed forces decide to sell those weapons, thus becoming a supplier rather than a consumer of arms.

GUATEMALA

Most of Guatemala's requirements are associated with the COIN role of its armed forces, a replacement for its CM 170 Magisters is required, as well as patrol boats for interdiction duties. Light transports, military vehicles, small arms and communication equipment will also be a part of future requirements.

GUYANA

Guyana has concentrated its efforts on improving its army since independence in 1988. As a result, the Navy and Air Force are in great need of expansion and modernization. The Navy has a pressing need for patrol and fast attack craft, while the Air Force has expressed interest in the purchase of tactical support aircraft and helicopters.

HONDURAS

The Honduran Air Force is badly in need of modernization for a range of requirements, but financial and logistical constraints generally allow only procurement of surplus aircraft retired by other countries. It recently bought 12 *ex-USA F-5 E/Fs*, but an additional purchase is required to replace the other *F-86*. Some transport aircraft and helicopters are also

required. Other forces requirements are characteristics of those of a COIN oriented force, to include military vehicles, patrol boats and small arms.

MEXICO

Mexico's armed forces are in need of an urgent modernization. This process was envisioned in the late 70s and early 80s , but economic difficulties forced the postponing of most major acquisitions. The new government has pursued a successful economic policy that has improved the country's economic outlook, so there is a higher probability that some of the purchases may become a reality. The Air Force needs some additional fighters and some light transport aircraft. The Navy requires various patrol and fast attack craft to defend its vast territorial waters. The Army requires an expansion of its inventory of medium tanks, Argentina's TAM has been mentioned as the likely candidate. It remains to be seen how the recent subversive actions of the Zapatista Liberation Army, an indian movement that revolted in January 1994, may force the defense establishment in Mexico to review its current role, doctrine, equipment and training. In an analysis of the current military situation, the *Washington Post* asserted that "Mexico is likely to witness an overhaul of the military command structure and mission, with the army withdrawing from its roles of fighting drug traffickers and providing welfare services and instead putting a new focus on counterinsurgency"⁵³ The analysis also stresses the fact that Mexico, besides Costa Rica that acknowledges to have no organized armed forces, devoted less than 0.6 percent of its GNP to military expenditures. In this new scenario an increase of military acquisitions is highly likely and Mexico's plans for modernization of its armed forces may finally come of age compelled by the reality of an uprising that found them short of equipment, training and military experience.

NICARAGUA

The threat of the Contras made Nicaragua build large COIN oriented armed forces, once the threat and the support it received from the former Soviet Union have disappeared the forces have found themselves unable to keep the attained level of strength, the weakness of the economy forced the government to make drastic reductions in the armed forces and fostered the sale of some equipment. In this environment no major purchases of weapons are foreseen.

PANAMA

When Panama assumes full ownership of the Panama Canal after 1999, it will also assume primary responsibility for the military defense of the canal , at least that is what is expected according to the official terms of the treaty signed with the US. As a result of these,

⁵³ The Washington Post, "Mexican Army short of funds and experience", January 19,1993.pA21.

past governments tried to improve its conventional military capabilities. This came to a halt after the US. invasion to Panama, the most probable scenario is that the armed forces of Panama will be constituted essentially as a police force, and the equipment, training and organization will be supported by the US. through its military assistance program.

PARAGUAY

Most of Paraguay's military equipment is outdated, but the combination of military constraints and few internal or external threats continue to make future acquisitions highly unlikely.

PERU

While the Peruvian armed forces have traditionally prepared for conventional conflict with neighboring Ecuador and Chile, in the later part of the 80s the arms requirements were driven primarily by the internal security threat posed by the Shining Path and MRTA guerrilla movements. The current government has declared that those movements do not pose a military threat for the future, so the priority given to COIN equipment is expected to diminish in the near future. **Aircraft** .- After the purchase of the *Mirage 2000s* and the upgrade of the *Mirage 5s* being carried out with Dassault's assistance, a major purchase of fighters is not likely. The soviet *Mi-8 Hips* and other soviet helicopters that were purchased in the 70s will have to be replaced on this decade. The Air Force *T-34s* were replaced with *EMB 312 Tucanos* in 1987, in a similar fashion the 40 *T-41s* will require replacements in the early 90s. **Warships** .- Peru has a large and well balanced fleet, that includes the largest submarine force in Latin America. Its cruisers were recently refitted but the destroyers are reaching obsolescence. In this context to purchases of major combatants is foreseen, but there will probably be a modernization program for the destroyer fleet. **Vehicles** .- In the late 80s Peru pursued several programs to improve its tanker force, these included purchase of Israeli tanks, Argentina's TAM and the upgrade of its force of T-54/55s, due to financial constraints all of these efforts have fallen through, this makes a tank program very likely for Peru in the near future. The missiles for the Air Force and the Navy will have to be replaced in the 90s.

URUGUAY

The Uruguayan armed forces are in dire need of equipment modernization, but economic difficulties and the lack of an urgent threat make major acquisitions unlikely for the near future, instead Uruguay is expected to invest in critical spare parts and support services for existing equipment.

VENEZUELA

Aircraft .- Venezuela's *Camberra* bombers are being phased out, a likely replacement could be the *Italian-Brazilian AMX*, the fighter force was modernized in the 80s and will not

need new acquisitions for the 90s. The Air Force and Army will likely replace its *Huey* and *Alouette* helicopters, while the Navy will require new ASW/patrol aircraft to replace the *Grumman S2-E Trackers*. Further purchases of transport aircraft is also expected. **Warships** .- There are no current plan to enlarge the fleet after the purchase of Bazan's *Cormoran FAC*. **Vehicles** .- Venezuela did a major purchase of armored vehicles and light tanks in the late 80s, and the modernization of the *AMX-13* was being discussed for the early 90s.

COLLECTIVE SECURITY AFTER THE COLD WAR.

In the field of national security, the end of the cold war has implied the rethinking of old concepts and the redefinition of everything that was at one time taken for granted and guided the post World War II security arrangements. The discussion and the discourse is far from over, at the time of this writing all regions are trying to agree in the basic definitions, the Organization of American States convened in the second week of March in 1993 to define regional security. Once the proceedings of this meeting are analyzed and made public either in the form of a consensus definition, or maybe a set of guiding security principles, or what could be better (but highly unlikely), a completely defined approach to regional security.

The traditional approach ⁵⁴was that all security perceptions had to be based in a analysis of existing or possible threats against the national institutions, and from that point came the determination and implementation of adequate measures to face the threats. In the traditional way of thought, those threats were determined to be predominantly, although not exclusively, to be the armed actions of other international actors that endangered the independence, national integrity and national sovereignty. For more than 50 years this traditional formulation couldn't escape and became tangled in the superpower confrontation. Thus for the allied countries aligned with under the orbital hegemony of the United States, the principal threat was identified with was generically called communism, this was the different manifestations of an expansionist policy of the soviet Union and its allies with the intention to establish its worldwide domination. In Latin America, this influence was specially expressed in the military training programs ⁵⁵that extended the influence of the national security doctrine to most, if not to all, of the armed forces

⁵⁴ This section is based on an article "*La Problemática de Seguridad en Centroamérica en la situación de Post Crisis*", by Gabriel Aguilera Peralta, published in *Fuerzas Armadas y Sociedad*, Año 6, Vol.VI, No 3, Julio Septiembre 1991, in spanish in the original and translated by the author.

⁵⁵ It has been probably overemphasized the role of institutions such as the War Colleges and the Interamerican Defense College in spreading the National Security Doctrine in Latin America, This is at least what is proposed in the previously cited article, the works of Augusto Varas, cited elsewhere in this paper, Osvaldo Hurtado in "El poder político en el Ecuador" mentions the Interamerican Defense College and Luis Maira in el "Estado de Seguridad Nacional en América Latina" in which he states "*[El estado de Seguridad Nacional]...fue el pensamiento de Spykman el que, desde la Universidad de Yale, paso a los grandes institutos de formación de oficiales norteamericanos...del National War College paso a la Escuela de las Américas*". After attending courses in two of the culprit institutions, i would argue that the Institutes has centers of formation has very little to do, it was the mind set of the region, an irrational and zealous fear of communism. The National security Doctrine was only the ideological entity that befitted the dominant military thought at that time.

in the region. "The nature of confrontation changed from open armed conflict to ideological , commercial competition, military posturing and the arms race. In the context of the Cold war the enemy could be identified by its ideology than by its nationality. Given the bipolar structure of the world at the time, only two options were available. The inherent conflict between capital and labor was worked out in every society not only in the context of its own history, politics and material resources, but also in the global context of the dichotomy of ideologies.

In Latin America the fear of communism was transferred from fear of soviet invasion to fear of internal subversion. Leftist forces identified in anyway with socialist ideologies were simply eliminated from political pacts. Local communist parties were persecuted and outlawed. the military concept of total warfare fit smoothly into this ideological dichotomy as applied to the nation. The notion of internal war was thus introduced and consolidated. "⁵⁶

These outmoded concept of security can not longer be held at a national or continental level, a new environment has been developed that can be described as follows ⁵⁷:

1. The countries in the western hemisphere are in a stage of unprecedented harmony in their relations among each other.
2. The end of the Cold War does nor mean the end of the political-military problems, even in a Western Hemisphere without explicit extra continental threats.
3. Regionalism is becoming key to world order.
4. The deepening of democracy in the Western Hemisphere has given the OAS a new foundation.
5. Sovereignty is still the starting point for cooperation
6. The military are one of the keys to democracy as well as to security
7. Regional military relationships are not up to the tasks ahead
8. Mission expansion can be dangerous.

Based on this new security environment, Amb. Einaudi proposes a series of changes in order to integrate the civilian and military universes, recognizing that at the level of debate, the OAS Permanent Council, has avoided political military concerns; and that at the level of operations, the Inter-American Defense Board (IADB) is Largely ineffective, except for its inter-American Defense College (IADC), which is underutilized even for service-to-service contacts. To remedy this:

⁵⁶Varas Augusto, "Militarization and the International Arms Race in Latin America", Foreign Relations of the Third World, No.4, Westview Press, Boulder. p.17.

⁵⁷ Based on a lecture given at the Inter-American Dialogue o March 18, 1993 by Ambassador Luigi Einaudi, Senior Advisor, Policy Planning Staff, Department of State

⁵⁸ Based on the presentation of Amb Hernan Patino Mayer, at the Reunion de Expertos sobre Medidas de Fomento de la Confianza y mecanismos de Seguridad en la Region. 15-18 de Marzo de 1994, Buenos Aires, Argentina. Document OEA/Ser.K/XXIX; SEGRE.doc.25/94; 15 marzo 1994; Original: espanol. Text was translated by author, it is not the official english version.

⁵⁹ **Perez Carlota, "Technology and competitiveness in Latin America: beyond the legacy of import substitution policies", paper presented at a seminar on Globalization, Liberalization and Innovation policy" organized by IRDC, Ottawa, May 27-29, 1992. p1.**

1. A first step would be to make permanent the work on confidence building measures of the OAS Permanent Council's committee on security.

2. To give positive conclusion to the debate over the IADB's relationship to the OAS, instructing the Board on the issues on which he is to advise the Permanent Council.

3. To increase civilian attendance to the IADC. Thus making the College a center for civil-military communication, training civilians in security matters, military officers in human rights, and both civilian and military in public administration and regional comity.

4. The OAS should convene a Conference of Defense Ministers, to be staffed by the IADB, that would bring civilian and military together under a common discipline of political control to discuss military issues, such as joint training, non-proliferation, etc.

These views that can probably be argued are only the view of the US., have been widely echoed by diplomats and official defense experts that attended the Conference of Experts on Confidence Building Measures and Security Mechanisms in the Region. We surmise from the presentation made by Amb, Hernan Patino Mayer⁵⁸ that besides agreeing almost totally with the views expressed by Amb. Einaudi, he adds

:

1. Rejects the traditional concept of security as "an anachronic and geographically limited concept, based in an unbalanced, if not contradictory, understanding of values and interests".

2. Establishes the need for a "redesign of the Hemispheric Security System, starting with a new definition and modernization of the values and interests that this System is to protect".

3. The need to "eliminate definitively, all erroneous perceptions and misgivings among the States in the region, in order to be able to face the new demands generated in the superior states of cooperation and integration"

PRIVATIZATION

As a natural consequence of more than 30 years in which the governments of the area pursued the policy of import substitution, we have now in Latin America a protected and subsidized economy in which a large part of the industrial sector is state owned, wholly or partially. Import substitution " was more than a government policy, it gradually became a thoroughly coherent set of behavior, notions and practices involving firms, workers, government, banks, consumers, politicians, etc., and was eventually ingrained in mutually reinforcing institutions. This legacy is the most powerful obstacle to the assimilation of the modern technologies and modern management practices that determine the competitiveness in a new international environment." ⁵⁹ Even though the policy was successful in the beginning, in later

years it became in most countries a glut of inefficient industries and services and the main source for fiscal deficits. One of the methods to change this state owned inefficient sector so it can compete is through liberalization, decentralization and divestiture, of which privatization is one form. But this is the process that has probably received most of the publicity. The arms industries, by its nature and its relationship with national security are state-owned, and often run by the military - in most cases in an unproductive way, from the purely commercial point of view - so its future is closely linked with the eventual results of this process.

It is necessary then to review the advances made in the privatization process to obtain an indication of how this will affect the status and the future of arms industries in the area. To understand better the privatization process we will analyze by country and will mention the trends that may affect the arms industries in each country.

BRAZIL

In Brazil the privatization of state owned companies was announced as a wide ranging program that included enterprises like Petrobras, Vale, Telebras and Electrobras, but no defense related companies were mentioned at the beginning.⁶⁰ Though originally Embraer and other state enterprises have been targeted as part of the privatization program. The privatization program was reviewed in 1993 and said to include Embraer⁶¹ among 51 state-owned companies to be sold for an estimate of USD\$ 9 billion. The privatization of the nuclear plant "Angra I" and Petrobras was later denied by the energy minister on security grounds and constitutional impediments. The privatization effort will probably be continued in the future, as announced by the Director on the PND (National Privatization Program) when it launched the Immediate Action Plan (PAI) of privatization that views the sale of RFFSA (Railroad Network), UPQ (Petrochemical Union), CSN (The National Iron and Steel Company) and Ecelsa Power Utilities⁶². It was later announced that plans were ready for the privatization of Embraer. The government's efforts may run aground due to allegations of improprieties in the process, the Office of the Attorney General has brought action against the Privatization Commission to explain the loss of USD\$ 376 million in the privatization of 18 companies⁶³, the sale of which should have produced USD\$ 3.744 billion, but only 1.28% of the total amount was paid in cash. Most of the companies were privatized under the Collor regime (14 enterprises); it is then foreseen that any further efforts in the privatization campaign will encounter heavy popular and congressional opposition, and the defense sector in spite of being bankrupt will prove very difficult to nationalize even though experts consider that only privatization can save some of the state owned companies such as Embraer that has accumulated USD\$ 827 million in losses since 1990.

⁶⁰ O Globo, 30Oct92, quoted in FBIS, Latin America Nov. 4/92. p.41

⁶¹ Folha de Sao Paulo, 19Abr93 and O Globo de Rio de Janeiro, 06Abr93, both quoted in FBIS Latin America Apr 08 (p015) and Apr 26 (p031) respectively.

⁶² Gazeta Mercantil, Brazil, quoted in FBIS Latin America 16Jul93, p049

⁶³ Folha de sao Paulo, (May93, p1. Quoted in FBIS Latin America, May 12 92, p019.

ARGENTINA

After president Menen's initial declaration that basically stated that everything is subject to privatization, the program has not develop as fast as some of the 'privatizadores' would probably like. As an example, earlier privatizations such as the one of Forjas Argentinas, one of the defense industries, was called off because the private buyer did not make any of the promised payments.⁶⁴ But it must be emphasized that Cavallo, Menen's Minister of Economy, has carried out a successful program that has revitalized Argentina's economy, and the privatization of state enterprise has been an important part of this program. In early 1992 it was announced that all of the firms of the Military Industrial Enterprise (FM - Fabricaciones Militares) would be privatized by December 92 The Ministry of Defense will maintain a small percentage of shares and veto power in the arms and explosive companies⁶⁵. In spite of a large reduction of personnel (from 8593 to 1974) FM has shown a loss of USD\$ 200 million, and has an accumulated debt of more than 500 million. In early 1992 it was announced that the process would include the nuclear plants, this statement made by Cavallo⁶⁶ explaining that it was necessary "...in order to finish construction of the plant"; it was also stated that this had no relation with Argentina's decision to sign the Non-proliferation Treaty. Cavallo's remarks were later contradicted by the president of the CNEA which explained that they were looking for a "limited privatization", or the "call for private capital...to form a holding". This search of partners is not a full privatization and reflects that the interests of the defense sector and other strategic areas will be preserved. In 1992 it was also announced that SOMILA and the General Mosconi plant, two large defense industries, would be privatized. In 1993 plans were drawn out to privatize the Area Material de Cordova (AMC), the largest aircraft manufacturer in Argentina, the defense minister arranged for a 350 million loan from the World bank to finance this program, and it was hinted that the Ministry would change through a decree AMC's status as an Air Force Operational Unit to a Corporation⁶⁷. AMC is the producer of the Pampa 2000 and its economic future its linked to the unlikely success in the JPATS bidding for the US.

Thus the outlook for Argentina could be seen as a continuation of the process, that so far has produced good results, but with due consideration of the security and strategic reasons that led to the establishment of the defense industries.

CHILE.

While this country has managed to become probably the most successful economy of Latin America, the government strategy towards privatization has experienced a slow through sustained shift. Some officials have cautiously said that they wouldn't oppose selling to private hands some enterprises that so far have been considered indispensable assets of the State. The

⁶⁴ The Buenos Aires Herald, 27 Dec 91, p3. quoted in FBIS Latin America Dec 30,91, p033.

⁶⁵ Rhe Buenos Aires Heralls, 26 Mar 92, p3; quoted in FBIS Latin america, Mar 27, 92, p019.

⁶⁶ Noticias Argentinas, a Bs. Aires radio program, Quoted in FBIS 7 and 11 May, 92.

⁶⁷ El Clarin de Buenos Aires, 26 Abr 93, p21. Quoted in FBIS Latin Amertca, 28 abr 93, p023.

current government will end with little progress in the area of privatization, and the election of Frei as the next president of Chile does nothing but guarantee the continuity of the policy maintained thus far. It has been recognized for the current government, that in privatization, like all selling processes, there is a technically appropriate time for the sale, and failure to consider this may lead to losses⁶⁸. Thus the conservative stand that the government has taken in the privatization area has originated losses because of enterprises that could be transferred to private ownership, remained in State hands originating big losses. The Privatization policy has not recognized strategic sectors, and the main objective has been the well being of the economy. It should be remembered that in 1992 FAMAE sold 34.4 % of the shares of the National Explosive Enterprise (ENAE) for USD\$ 23.5 million ⁶⁹. The private arms industries such as Cardoen have seen their market collapse after the Gulf War and have opted for quitting the fabrication of arms, thus leaving FAMAE's and other state arms in a better business environment to satisfy domestic requirements.

It can be concluded that Chile's economic program has been so successful that it does not require the privatization of its small defense industries in order to better its economy, but some believe that the new President will attempt to privatize the defense sector.

OTHER LATIN AMERICAN COUNTRIES

After reviewing the status of the privatization process in the countries that are considered major producers and exporters of weapons, we will briefly review the status of the arms and defense industries in the rest of Latin America. In **Colombia** in early 1993 it was announced that FNC, IFI, Bank of Colombia, Bank of State, ECOPETROL and the Agrarian bank would be privatized ⁷⁰, no mention was made of the defense sector. It should be noted that for 1994 the budget of the defense sector was increased almost 100% relative to its participation in the GDP (from 0.7% to 1,27%). In monetary terms it means a defense budget of 1.541 billion compared with 1993's number of 937 billion. In order to provide funds for this for this president Gaviria has ordered to step up the privatization process. Investment in basic services such as roads and thoroughfares will be sacrificed for defense and security spending and a 5% tax for the armed forces will be charged in the total value of any contract ⁷¹. Even if the conditions of the economy call for a privatization of all state owned enterprises, the security concerns that had led to an unusual increase in the defense sector will make privatization of the defense industries very unlikely. In **Peru** the success of President Fujimori handling the economy and the Shining Path guerrilla have been successful, and investors in the US are beginning to look for opportunities in this country ⁷². Since 1991 an ample privatization program in which more than 200 inefficient state industries were to be sold was announced ,

⁶⁸ Taken from "Estrategia", A new Privatization Policy", Santiago de Chile, 23 Jun 93, p3.

⁶⁹ EFE, Madrid, 25 May 92. Quoted in FBIS Latin America 28 May 93, p025.

⁷⁰ El Espectador, Bogota , 5 Feb 93, p6A.

⁷¹ El Espectador de Santa Fe de Bogota, 7Feb 93, p1B; 6 Feb 93, p 73.

⁷² The Washington Post, 10Dec 93, p 34.

these companies have been losing more than USD\$ 2 billion per year. This programs ends an era of appropriation of public companies that stated in the early 70s with the military revolution of General Velasco Alvarado. So in a situation similar to Colombia's, the same fact that has made the government popular, the defeat of the guerrilla, implied security consideration and an unconditional support of the armed forces, that will make questionable any attempt to privatize industries of the defense sector ⁷³ In **Venezuela** in mid June 93 a privatization program was announced, for most of 1993 and early 1994. It included hotels, racetracks, airports, ports and airlines, also in this package is the large telephone company CANTV. No mention was made of any of the defense industries in the extensive list that has been prepared for privatization in 1993 and the first quarter of 1994. The recent triumph of Rafael Caldera in the last elections, in which he offered to turn the tide of the economic reform suggests that the rate of the privatizations will be slowed down rather than increased.

In **Uruguay** we have a special case that deserves to be mentioned, as early as 1991 the government announced a privatization plan . This was later made official through a decree of privatization based on the Article 2 of the Public Enterprises Law an called for the privatization of Ports, airports, TAMU (Transportes Aereos Militares Uruguayos), the Oil Transport Enterprise (operated by the Navy) and the National Printing House among others. ⁷⁴ But the Privatizacion Law was challenged on constitutional grounds, when it was applied for the first time for the sale of the Telephone Company, and defeated in a referendum after which President Lacalle conceded that the process had suffered a setback. The sale of the telephone company was cancelled put he vowed to continue with the "reform of the state" . a similar situation arose in **Paraguay** , in 1991 the privatization plan was announced, and said to include five state companies LAP, FLOMERES, LAL, APAL and FCCL (airline, shipping line, alcohol and trains). The workers challenged the privatization in a legal process that ended in a Supreme Court's decision declaring the privatization illegal and suspending it. ⁷⁵ The new president elect Wasmozy has declared that it will try to reduce the fiscal deficit and control public spending which suggests some steps in the direction of privatization of state owned enterprises even though no formal declaration has been made related to that subject. In **Mexico** President Carlos Salinas de Gortari has been very successful with an economic process that has included privatization in "crystal clear legal framework and a macroeconomic policy that translates into stability ... public bids paid out in cash. This has allowed us to collect \$ 21.5 billion in resources that in turn help to meet the state social responsibilities" ⁷⁶ He later explained that the resources obtained from the privatization process will be used to reduce the nation domestic debt, which represents 11% of the GNP. He concluded that one of the most important elements in the Mexican experience has been the establishment of a consensus, because that consensus has changed attitudes and, consequently, crated a political and social

⁷³ El Expreso de Lima. Peru, 7 Ene 93, p3. Quoted in FBIS Latin America 17 jun 91, p055.

⁷⁴ El Pais de ontevideo, 26 Feb 94, p7. Quoted in FBIS Latin America 03 Mar 92, p.27.

⁷⁵ ABC Color of asuncion, see 30Nov91, p91 and 6Jan93,p11. Quoted on FBIS 3Dec91, p039 and 11Jan92 p036 respectively.

⁷⁶ Presiden Carlos Salinas in an Interview in Mexico City Canal 13 de Television, 10Nov92. Quoted in FBIS Latin America , 13 Nov 1992, p 020.

consensus based on those decisions. It is assumed that with the passage of NAFTA and the increasing betterment of the Mexican economy privatization will continue, but it will not be a major economic issue for that country. In **Ecuador** the government announced early in 1993 the privatization of close to 100 state owned enterprises, some of them inactive or not important; and recently the National Congress approved the Ley de Modernizacion del Estado which paves the way for the sale/privatization of state owned enterprises but at best privatization is expected to move at a slow pace. Furthermore, the Defense Minister and other officials have opposed the privatization of industries now run by the armed forces, which comprise most of the arms producing facilities. **Guatemala** prepared a vast privatization plan eliminating first the monopolies and the selling those companies whose assets are not essential to the State. This program encountered heavy opposition among the workers and the Congress, and is not expected to move forward at great speed. ⁷⁷ In **Panama** a privatization plan was announced in late 1991 to begin in January 1991 with the sale of Air Panama, the national airlines, to a Panamanian - U.S. group. The ports, National Telecommunications Institute, the Institute for Hydraulic Resources and Electrification were slated for further privatization. ⁷⁸ By mid 1993 it was recognized that the plan had failed, some advances had been made in the sale of small enterprises but the sale of the large ones such as INTEL had failed because the Legislative assembly had failed to pass the required laws ⁷⁹.

We have briefly seen the status of the privatization program in Latin America, we can conclude that after a promising start at the early 90s, in most cases the programs has failed to deliver what it promised and the efforts are at best stalled or have proven to be the source of corrupt and unpopular sales of state assets. The program itself in the area will be carried out at a much slower pace and it will not affect the arms industries significantly.

CONCLUSIONS

The foremost conclusion is that the arms industries that were designed to satisfy local and domestic requirements, such as the manufacture of small caliber ammunition, small arms, explosives and ordnance in general will not have any problems in the near future. One can even foresee that these plants will operate at full capacity as armed forces of the region increase the rate of training to maintain capabilities with aging equipment. But those industries that were established mainly as a source of weapons for export will face severe problems in the near future. Most of them will be closed or are already being closed now. Those industries that survive will probably become very active at the end of the decade when most of the weapons purchased in the 1970s become obsolete.

⁷⁷ See Guatemala Siglo 21 20Jun 91 p7 and Guatemala City El Grafico 27 Jun 91 p 4. Both quoted in FBIS Latin America 2 Aug 91, p11.

⁷⁸ El Panama America de Panama City, 31Dec91, p1A. quoted in FBIS Latin America 3 Jan 92 p 12.

⁷⁹ La Estrella de Panama of Panama City, 13 May 93, p1. Quoted in FBIS Latin America, 14 May 93, p 017.

Another general conclusion is that the arms industries should probably look into the region for a market that could replace the market lost when Middle East purchases stopped after the Gulf War. Now even cash rich countries such as Saudi Arabia, whose arms purchase accounted for 30 percent of the \$ 120 billion of weapons ordered by the developing countries from 1988 to 1992 have stopped or negotiated delays deliveries and a trend of decline is foreseen ⁸⁰ . The aggregate of the requirements of the region - comprising Central and South America - are important and could probably fuel a recovery of the arms industries in Brazil and Argentina; but for it to occur a long standing tradition of purchases in "neutral" countries will have to disappear, and greater degree of confidence should be raised among Latin American countries to be their neighbors as reliable sources.

But one of the most troubling general conclusions is that all the construction programs that are currently being carried in all major Latin America arms industries are the remaining work of projects that were started in the 1980s, supposedly as the initial development from which new orders were to make of this establishment a thriving and prosperous industrial sector. The truth is that for most projects no orders have been placed or they have been limited to satisfy the domestic market. Thus, the large companies that were designed to build for export markets, and were touted at their time as a model for development, would probably become financial failures causing large and irredeemable losses to the countries that established them.

Based on the requirements that were analyzed previously, we have the following outlook for the arms industries in each country,

ARGENTINA .- The aircraft factories of Argentina will probably have enough work to maintain the production lines open with the requirements of the light strike fighter, the trainers and the local manufacture for an off-the-shelf light transport replacement. The AFNE and DOMEQ shipyards will probably have some work, but it is no likely the launching of new programs that will enable this yards to work at full capacity. The vehicle factories have closed their production lines, and they will probably remain closed for the rest of the decade. The need to replace the missiles, will force an increase of activities in the research and development area looking probably for an indigenous substitute, this responsibility will probably be the responsibility of the aerospace sector of the industry. The absence of orders for military vehicles makes a real possibility the closing of such factories. In a short term, there is a grim outlook for the defense industries, most of them will be working at reduced capacity if working at all, and some of them will close their doors for financial reasons.

BRAZIL .- The requirements of the Army, Navy and Air Force will provide some work for Embraer and Helibras, but in the case of the first company domestic work will not be enough to maintain a profitable operation of a company as large as Embraer. The economic problems encountered by this company in 1993 will only become more acute and difficult to

⁸⁰ The Worldwide Weekly DEFENSE NEWS. Vol.9 No.1, January 10-16, 1994. p1. "Saudi Arms Market wanes. By Phillip Finnegan and Barbara Opal

solve. The aerospace industry will absorb some of the requirements for the development of missiles for the armed forces. The shipbuilding industry will face serious limitations as there are no major programs of local construction and replacement for major combatants would probably be purchased abroad. If resources are found for additional combat vehicles and tanks it is probable that some of the production lines in Engesa will remain open. There is no way the domestic demand can guarantee full capacity employment of such facilities. ENGESA by the end of 1993 had more than \$ 500 million in liabilities, it had been declared bankrupt and was working under legal supervision. With these liabilities prospective purchasers such as Brasilimport Bank have expressed that are not interested in the Company, thus making even murkier the future of the once blooming ENGESA.⁸¹

BOLIVIA .- Bolivia does not have a manufacturing capacity , and the purchase of light aircraft by the Air Force could prove to be an attractive market for Brazil and Argentina.

CHILE .- The requirements of the Air Force do not indispensably require major purchases abroad, and overall the modernization of existing planes and the manufacture of helicopters and light aircraft will prove more than enough to maintain a healthy rhythm . The same can be said of ASMAR facilities that having being designed to build small craft and carrying out major refits will have enough work to operate in the next few years. As for the requirement of armored vehicles and tanks, now that Cardoen has closed its doors, the assembly line at will probably get enough work.

COLOMBIA .- This country's requirements cannot be satisfied by its arms industries, and will probably mean some orders for Brazil's Engesa and Argentina's FAMA. It will also mean that some of the work of coproduction and offsets will generate enough work to make Colombia arms industries to operate profitable for the rest of the decade.

ECUADOR .- Budgetary restrictions make unlikely any large purchase of weapons in the near future. A good sign us that in all competitive bids for arms in the last years they have sought to purchase the arms with a manufacturer in the region (i.e. Argentina's TAM and Brazil's Tamoyo). Therefore, if any major equipment acquisition is made it will benefit the ailing arms industries if the region. Most of the indigenous capacity will be used in modernization programs and major refits of existing equipment.

MEXICO .- Considering the way in which the Mexican economy is evolving it is very likely an expansion in the equipment of the armed forces, on the other hand, considering Mexico's industrial development it is very likely that local production may be used to satisfy local requirements.

PERU .- The military industries of Peru are capable enough to carry out the refits and modernization programs that its armed forces will require in the 1990s, all the acquisitions that

⁸¹ Gaxeta Mercantil of Sao Paulo, Sep.93,p27. Quoted in FBIS Latin America,93201,20Oct93.

exceed the country's capabilities , such as the tanks and jet trainers, will probably be satisfied with purchases to the arms industries in the region.

VENEZUELA - This country requirements are small and they will not imply a large purchase of weapons in the near future.

OTHER COUNTRIES OF THE AREA.

Countries such as Costa Rica, Cuba Guatemala, Panama, Haiti and Honduras have arms requirements that will not in the foreseeable future make any difference in the arms market. Furthermore, if the political situation of countries such as Nicaragua and El Salvador continues to improve, the need for a large military establishment oriented towards COIN and fighting guerrilla movements, which have now converted to recognized political parties, will be lessened and will create a surplus of military equipment in the area; this has already been observed when Violeta Chamorro's government put up for sale most of the equipment that was purchased for the Sandinistas after the revolution.

Most of this equipment was purchased by other south American countries.

BIBLIOGRAPHY

REFERENCES FOR CHAPTER III (Restructuring the Defense Technology and Industrial Base)

1. Schwartz, Bernard L., "What's Really Going on and What Lies Ahead in the Defense Industry - A US Perspective," International Defense Review, Defense 93, Vol , No. , (month yr), pp. .
2. Kraus, Ellis S. and Simon Reich, "Ideology, Interests, and the American Executive: Toward a Theory of Foreign Competition and Manufacturing Trade Policy," International Organization, Vol 46, No. 4, Autumn 1992, pp. .
3. Williams, Benjamin H., Ph. D., Emergency Management of the Economy; Vol I, Introduction to Economic Mobilization, Industrial College of the Armed Forces, Washington D.C., 1954.
4. La Berge, Walter, "Dangerous Downsizing," Armed Forces Journal International, Vol 132, No. 3, October 1993, pp.30-34.
5. Schneider, William Jr., "Financial Aspects of Marketing and Investment in the Defense Industry," International Defense Review - Defense '93, Vol , No. , (month year), pp. .
6. Sanders, Ralph, "Arms Industries: New Suppliers and Regional Security," National Defense University, Washington D.C. 1990.
7. Waack, William, "Trade Agreement Signed with Russia," O Estado De Sao, in Portuguese, December 4, 1993, p. B16.
8. Opall, Barbara , "Japanese, U.S. Firms Decry Technology Sharing," Defense News, December 20-26, 1993, pp. 3, 21.

ADDITIONAL BIBLIOGRAPHY (Other references used are cited in the footnotes)

9. Katz James Everett, 'Arms Production in Developing Countries', University of Texas, Austin. Lexington Books, C.C. Heath and Co. 1984.
10. Toffler Alvin, 'La Tercera Ola', Plaza and Janes Editores S.A. Barcelona. Espana. 1980.

11. McNAIR PAPERS: Published by The Institute For National Strategic Studies, National Defense University, Ft. L.J. McNair, Washington DC. 20319.

- Libicki Martin C., 'What Makes Industries Strategic?'
- Carlisle E. (Ed.) 'Developing Battlefield Technologies in the 1990s'.
- Lewis W.H. (Ed.) 'Military Implications of UN Peacekeeping Operation'

12. Patrice Franko Jones, 'The Brazilian Defense Industry', Westview Press, San Francisco, 1992.

13. Al-Mashat, Abdul Monem M., 'National Security in the Third World', Westview Replica Editions, Westview Press, Boulder, 1985.

14. Sohr, Raul. 'La Industria Militar Chilena', Comision Sudamericana de Paz, Coleccion Posiciones y Debates, Santiago, Chile. 1990.

15. Rosen Steven. 'Testing the Theory of the Military Industrial Complex', D.C. Heath & Co., Lexington Massachusetts. 1976.

16. Kwang-il Baek, Ronald D. McLaurin and Chung-in Moon (Editors). 'The Dilemma of Third World Defense Industries- Supplier Control or Recipient Autonomy?' CIS - Inha University, Westview Press, 1991

17. Varas Augusto. 'Militarization and the International Arms Race in Latin America'. Foreign Relations of the Third World, No.4. Westview Press. Boulder. 1985.

18. Rosen Stephen P. "Winning the Next War, Innovation and the Modern Military', Cornell Studies in Security Affairs. Cornell University Press, Ithaca, 1991.

19. DBP Publications, Published by the Defense Budget Project, 777 N. Capitol Street, NE. Washington D.C.

- Adams Gordon, 'The Role of Defense Budgets in Civil-Military Relations'
- Bitzinger R.A., 'The Globalization of Arms Production: Defense Markets in Transition'.
- Bitzinger R.A. & Kiefel E.D., 'The Globalization of the Defense Industry: Roles and Responsibilities of the Federal Government'
- Krepinevich A., 'The Bottom Up Review: an Assessment'

20. The Military Technical Revolution: a Structural Framework. Final Report of the CSIS Study Group on the MTR. Michael J. Mazaar, et al. Center For Strategic and International Studies, Washington DC., March 1993.

21. U.S. Congress, Office of Technology Assessment. Building Future Security, OTA-ISC-530. Washington DC.: US Government Printing Office, June 1992.

22. Crevelde Martin Van, 'Technology and War: From 2000 B.C. to the Present'. The Free Press, Macmillan Inc, New York. 1991.

23. Toffler Alvin & Heidi, 'War and Anti-War: Survival at the dawn of the 21st. Century', Little, Brown and Co. 1993.

ARMS TRADE IN THE AMERICAS UNITED STATES MOBILIZATION REQUIREMENTS

The possibility exists that the United States would have to depend upon sources outside the United States in case of a mobilization emergency. The United States would not spend funds or use resources in peacetime to build up its munitions base to enable the needed capability of meeting wartime requirements necessary for a conventional war. The United States would therefore need to look toward allied or friendly and newly industrializing countries, especially in the early weeks or months of the conflict. (6:134) The argument against this is that the U.S. should commit resources during peacetime for any such contingencies. This is not likely to be approved by Congress, especially in today's political climate and world situation. Thus the U.S. could be forced to buy from foreign sources although it is not a politically acceptable situation. The fact remains, though, that U.S. defense industry have increasingly come to depend on foreign producers for many of their components. (6:136) One study has stated that the U.S. industrial base cannot produce the total mobilization requirements needed due to an unproductive and obsolete industrial base. This is especially true for expendables such as munitions. (6:137)

Since European sources do even less in planning surge requirements, the U.S. would be faced with finding munitions that are compatible with weapons used by U.S. forces. Included in this list are Dirreccion Generale de Fabricaciones Militares of Argentina, Companhia de Explosivos Valparaiba and Engesa Quimica of Brazil and several Far East manufacturers. (6:142) The great advantage would be to procure from these sources and also save shipping costs and burdens of shipping the weapons such as the lead time factors. But even if the procurement had to be made from Brazilian and Argentinian sources, it "would succeed in diversifying its sources of supply and lines of communications, compounding the difficulties of enemy planners." (6:143) One possible problem with procurement outside of the U.S. is the quantity of munitions capable of being produced to meet requirements and timing requirements. However, with the "flow of foreign munitions, U.S. fighting forces could very well avoid defeat and escape the dire consequences that would follow a military catastrophe caused by inadequate munitions." (6:148-9)

Thus, the role of the U.S. should be to take the steps beforehand, to increase the chances of acquiring munitions before they are needed. In order to do this, the U.S. needs to help these countries build manufacturing bases that produce U.S. compatible munitions but which would be limited to low to medium technology items due to the non-transfer of higher technology. Also, the U.S. would need to catalogue these sources and develop memorandums of understanding with these countries. The U.S. must also take a realistic view to avoid being caught unprepared because when the casualties start to accumulate it does not matter what the source is as long as they are available. (6:152)

Already, Brazil is striking up their own agreements with Russia as per a recent trade agreement signed on December 3, 1993. The agreement will increase annual trade from \$200 to \$2 billion within a five year period. Included in the deal are the possibilities of space research, transfer of supersonic airplane technology and Brazilian foodstuffs. One distinct possibility is the purchase of war materiel "with the view to assembling Russian MiG-29 supersonic fighters at the Embraer (Brazilian Aeronautics Company) facilities, as well as the purchase of ships and helicopters." (7: B16)