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Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

(FOUO 12/80)

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CONTENTS

PEOPLE'S REPUBLIC OF CHINA

CHINESE NUCLEAR STRATEGY DISCUSSED

Paris STRATEGIQUE in French No 3,1980 pp 26-62

[Article by Georges Tan Eng Bok*]

[Text] This article does not deal with China's positions in regard to nuclear proliferation or to arms control, these two topics being themselves the subject of another article.

Sources:

We have worked solely with documentation drawn from the public domain such as press dispatches and radio broadcasts.

To not burden the text needlessly with too many bibliographical references, we indicate below the principal source materials for this article:

1) The Fei-ch'ing Nien-pao (Taipei) 1967 and 1968 Yearbooks, and those of their successors, Chung-kung Nien-pao from 1969 onward;

2) 29 issues of the GONGZUO TONGXUN [Bulletin of Activities] covering the first half of 1961. These are internal documents intended only for officers of the PLA [Peoples Liberation Army] from regimental commanders up. Released in August 1963 by the State Department of the United States, these documents are a treasure house of information and, above all, of details that appear not to have suffered the erosions of time. They moreover provide an insight into the state of mind and preoccupations of the PLA cadres before the Cultural Revolution;

3) The magazine CHUNG-KUNG YEN-CHIU (Taipei) published a major study by Xiang Zhuanshu on the Chinese potential and nuclear strategy, serialized in seven issues beginning in April 1979. We extracted from it a substantial compilation of raw data.

* Georges Tan Eng Bok (1951) has already published one article: "Military System and Political System in Communist China" in STRATEGIQUE No 2.

Abbreviations:

DN [DEFENSE NATIONALE]

FEER [FAR EASTERN ECONOMIC REVIEW]

IS [ISSUES AND STUDIES]

JFJB [JIEFANGJUN BAO]

NCNA [NEW CHINA NEWS AGENCY]

RMRB [RENMUN RIBAO]

SCMP [SURVEY OF MAINLAND CHINA PRESS]

CY [CHUNG-KUNG YEN-CHIU]

In China, the development of nuclear weapons responds to political ends. China's leaders are bent on equipping the nation with the indispensable material means for ensuring its national independence and territorial integrity. They are also making clear their rejection of the nuclear duopoly that enables the United States and the USSR to impose a bipolar international system. In the context of recent years--the end of the 1950's and beginning of the 1960's--this bipolar system signified the impossibility of a national reunification, since the American zone of influence included Taiwan. By becoming a "nuclear power," China delivered itself from Soviet guardianship and protected itself from an American aggression that its leaders deemed probable at the time.[1]

China's currently inverted perception of these threats does not change the underlying principles of its nuclear power. But the qualitative evolution of nuclear weapons technology is eroding its "accession-émancipation"[2] character. We have in mind, of course, the advent of accurate ballistic weapons systems that, by enabling selective attacks, tend to alter the absolutist nature of nuclear deterrence.

Without going so far as to consider it from the standpoint of a counterforces capability, and even assuming it remains in the nature of a deterrent by a weaker power against the stronger, it appears evident to us nevertheless that China's nuclear deterrent capability cannot hope to maintain its credibility in the absence of certain material improvements. But will evolution of its equipment alone be sufficient? Will it not also be necessary to reconsider certain aspects of its use which, in our opinion, still includes some obscure points?

Its Means

Basic Research

Personnel

China's personnel withstands comparison at the international level. Most of its experts are graduates of Western universities, among which Caltech and MIT predominate. Some of them have taught in those universities and carried on research in them.

In accordance with the objectives of the Chinese nuclear program, these experts pertain to three disciplines: nuclear physics, of course, but also aeronautics and automation. Well known figures such as Qian Sanqiang, Qian Weichang, Qian Xeusen, Wang Gangchang and Zhou Peiyuan need no introduction from us; the many studies dealing with the Chinese nuclear potential cite them frequently.[3] We would like to point out, however, two reports that appeared recently in the Chinese press:

--In its July 1978 issue, LA CHINE EN CONSTRUCTION published a highly laudatory article on Wou Tchong-houa, director of the Institute of Mechanics of the Academy of Sciences. In 1950, Wou Tchong-houa presented a theory on three-dimensional subsonic and supersonic flows in turbojet engines at an annual meeting of the American Society of Mechanical Engineers. This theory makes it possible to design high-performance jet engines. It was the basis for the design of the Rolls Royce Spey engine mounted on the Trident airliner and the Phantom F-4K; the T-69 engine on American radio-controlled aircraft; and the Boeing 747 engine;[4]

--In November 1978, the NCNA reported the admission of Wang Daheng, director of the Institute of Precision Optical Apparatus in Changchun, into the Chinese Communist Party. During the 1960's, he developed the first Chinese laser.[5]

Research

Research is carried out through the combined efforts of three major sectors: the Army, the Academy of Sciences, and certain ministries for the mechanical industries. Within the PLA, three centers are involved in the nuclear program: the Academy of Military Sciences, the National Defense Commission on Science and Technology, and certain sections of the Zone of Interior Services Department. Within the Academy of Sciences, at least five institutes participate in the research effort: the Institute of High-Atmospheric Physics, the Electronics Institute, the Institute of Automation, the Institute of Nuclear Energy, and the Institute of Mechanics.

Aside from these institutes, the contributions of certain highly scientific companies, such as the Chinese Aeronautics Company, the Chinese Electronics Company, the Chinese Mechanics Company, and the Chinese Automation Company, should not be overlooked, as also the role played by the University of Science and Technology. Three ministries for mechanical industries contribute their know-hows and potentials: the Second, for nuclear energy; the Fourth for electronics; and the Seventh for ballistic missiles.

Locations of Centers

In this regard, we note a concentration in the Northwest:[6]

--at Lanzhou, a complex of three centers to which power is supplied by two hydroelectric dams: one producing 600,000 kW and the other 1,225,000 kW; one gaseous-diffusion isotope separation center that went into operation in 1963 and is producing 100 kg of uranium-235 a year, with a peak production of 500 kg in 1967; an adjoining plant, the Helan Shan one, using the centrifuge process and producing 400 kg of uranium-235 annually.

--the Huangyuan plant in Qinghai: completed in 1962, it has included, since 1965, an underground section at a depth of 30 meters, where thermonuclear weapons are being manufactured;

--the Yumen plant in Gansu: since the end of 1966, it has been producing 200 kg of plutonium 239 a year;

--the Baotou plant in Shanxi: In service since 1964, it is equipped with two large nuclear reactors and its production is estimated at 40 kg of plutonium-239 a year.[7]

Nuclear Testing

Since 1964, China has carried out 25 tests.[8] From the outset of each test, foreign observers have not failed to express, on each occasion, their surprise at the level of technical expertise the Chinese had attained in the short intervening times. The first explosion was characterized by two major features: the use of enriched uranium-235, which had necessitated a gaseous-diffusion process starting from uranium-238, marking an advance over the methods that had been chosen by the French and the English; and detonation by implosion. The second test, 7 months later, consisted of a bomb of some 30 kilotons dropped from a TU-4. The following year, the Chinese exploded a 200-kiloton bomb doped with lithium-6 and dropped from a TU-16. The fourth test, 5 months later, also failed to pass unnoticed: "The experiment was unprecedented, since it was the first time that a rocket and the warhead it is designed to deliver have been tested simultaneously."[9] Finally, in 1967, a 3-megaton thermonuclear bomb was exploded using the 3 F principle (fission-fusion-fission). On this occasion, China expressed its well-earned pride: "China has taken only 2 years and 8 months between the explosion of its first atomic bomb in October 1964 and the successful test of its hydrogen bomb. To accomplish the same thing the United States 7 years and 4 months, the Soviet Union 4 years, and Great Britain 4 years and 7 months. China's time was therefore the world's fastest."[10] This experiment, however, appears to have marked an apogee, following which China's advances began to slow down, particularly as regards the development of missiles. Economic imperatives intervened at that point, and China's political climate over the last decade has not tended to produce great economic strides. But let us beware of hasty conclusions, for, since 1978, China's economy and its sciences have followed new and very encouraging directions in this regard.

Current Nuclear Weapons Systems Development

Development is proceeding in three directions: ICBM's [Intercontinental Ballistic Missiles], SNLE's [Missile-Launching Nuclear Submarines] and SLBM's [Submarine-Launched Ballistic Missiles], and ANT's [Tactical Nuclear Weapons]. Since 1972, these programs have stagnated. Among the possible different reasons, the difficulties encountered by the Chinese in the development of solid fuels may have played an essential role.

ICBM

In an interesting article on Chinese space activities, published in DEFENSE NATIONALE,[11] P. Herpaix has pointed out the close kinship that exists between ballistic missiles and satellite launchers, and neither the United States nor the USSR, nor China now, can escape that common kinship. In September 1973, it was learned that China had tested a missile with a 5,600-km range. Subsequently identified as the CSS-3, it served also as the satellite launcher for China's third, fourth and fifth space trials. Because of its range, the CSS-3 represents a first stage in China's ICBM development program. 1975-1976 saw the start of experimentation on a longer-range missile: the CSS-X-4. According to indications by Ren Xinmin, director of the Chinese Space Institute, while visiting Japan in 1978,[12] this missile, this 200-ton, liquid-fuel propelled missile consists of three stages and would appear to resemble the Titan-2 or the SS-9. Its range appears to be 10,000-11,000 km. A Japanese source attributes to it an explosive force of 1 megaton.[13]

Two experimental launchings of the CSS-X-4 took place in 1979.[14] Two others were recently carried out between 18 and 21 May 1980. But not until the Chinese succeed in developing adequate solid propellants,[15] will their program experience a substantial advance. Sound financial considerations evidently keep them from devoting major resources to the development of first-generation ballistic missiles. Reversal of threats serves their purpose equally well: Their ICBM's were aimed specifically at the United States while the USSR is within range of their IRBM's [Intermediate-Range Ballistic Missiles].

In our opinion, the Spring 1980 tests are to be interpreted in four ways. From a general standpoint, the Chinese must maintain their research potential. Considering the presence of observation ships in the planned impact zone, the launchings probably had to do with the system of guidance and the accuracy of the missile. Similarly, we cannot exclude the development of solid propellants. And lastly, these tests preceded by only a few days the visit of Geng Biao, chairman of the Central Committee's Commission on Military Affairs, to the United States, responding to Harold Brown's visit to China. It was important for the Chinese delegation not to arrive empty-handed for their talks on military matters with their hosts.

SNLE and SLBM

The plan to build a nuclear submarine goes back to 1965. Initial experiments began in June 1968 in the Red Flag Shipbuilding establishment in Dalian. Jane's 1975-1976 Yearbook reported that this submarine would be called the "Han." An

in-depth study by Ti Chung-heng, which appeared in the April 1977 issue of MING-PAO YACH-K'AN, indicated that tests of the "Han," beginning in 1974, had revealed a number of defects such that, currently, it is often berthed: The nuclear boiler is not yet fully tried and tested, and the "Han" cannot be taken to its intended cruising range.

Thus, China has encountered at least four obstacles: the propulsion problems just mentioned in the case of the "Han"; the advanced technology of underwater telecommunications; the development of solid fuels or, strictly speaking, stockable liquid fuels; and mastery of the techniques of cold launches. If China seeks to develop an SNLE to patrol in the vicinity of its coasts, it will also have to have an SLBM of a range equivalent to that of the American Trident. The technical difficulties and the financial cost of such a project place it out of China's reach, for the time being at least. If China settles for an SNLE to patrol the Arctic or the Indian Ocean, it can limit the range of its SLBM to that of an IRBM.

But in the latter case, the operational distance away from the Chinese coasts raises additional problems. To keep two submarines on continuous patrol would require, according to a study by E. Luttwak presented at the 7th Chinese-American Conference on the Chinese Continent, organized at Taipeh under the auspices of the IIR [expansion unknown],[17] at least six SLNE's of this class; hence, a far from negligible financial burden. Telecommunications with submarines raises other problems as well. In principle, "the intensity of the received field decreases exponentially with depth and varies inversely with distance from the transmitter and with frequency";[18] hence, the advantages of very long wavelengths (VLF) [very low frequencies], subject, however, to resolving the problem of adequately high-powered transmitters, and miniaturization and protection of antennas. Multiplicity of stations is perhaps a solution if we disregard the dissuasive aspect of financial cost: The United States has 10 stations it can use for its submarines, and the USSR 9 (4 in Siberia, 3 in European Russia and 2 on the North Sea). Lastly, in the inverse direction, namely, transmissions from submarine to surface, the Chinese must also overcome the risks of goniometric location of emissions and consequently that of the transmitting submarine. By way of information, we point out that, in 1967 and 1977, China sent some oceanographic research ships into the Pacific to carry out various tests, including experiments on communications to land.[19]

ANT

We use the term ANT here to designate a type of weapon based on the energy it releases, disregarding its possible employments. Within the terms of this definition, certain scientific works published in communist China are indicative of that country's interest in enhanced-radiation weapons.

In 1978, W. Rupert translated, in a specialized Viennese magazine,[20] an article published in the December 1977 issue of KEXUE SHIJIAN [Scientific Experimentation]. This article, signed by Zhang Mengjun and titled "The Neutron Bomb," deals with the principles and applications of this weapon. According to the reference notes, this study was based mainly on an article by Fred M. Kaplan: "Enhanced-Radiation Weapons" appearing in the May 1977 issue of SCIENTIFIC AMERICAN. Among these notes, we think it desirable to point out an important passage concerning the Lance.

More recently, in the August 1979 issue of a magazine published in Shanghai, HEJISHU [Nuclear Techniques], an article dealt with "measurement of the explosive force of shells based on detonation by fast neutrons."[21] This article, a purely technical one in nature, discusses the determination of the ratio between fast and slow neutrons. It deals also with the initiation of the fusion reaction. Can we deduce from this that China is in the process of developing neutron artillery shells?

If this is so, the slowdown perceived in the development of nuclear weapons would only be masking a long-term program dealing with the design and production of weapons of another technological level. This possibility has also been addressed, by Thomas W. Etzold, professor of strategy at the United States Naval College, during a conference held in Taipei in June 1978.[22] In this case, it could be a matter of a choice between present needs arising from the sole Soviet threat and the future needs of a nation bent on surpassing its merely regional influence. To the extent the latter needs prevail, the Chinese leadership could settle for a minimal security accompanied by a more flexible policy toward the USSR. This approach seems to us the more logical, for, in the present state of its economic and scientific capabilities, China could not produce other than equipment of a past generation. This is equally true of its ICBM's and SLBM's.

The Second Artillery

The Second Artillery groups the Chinese nuclear forces. It has been known by several successive designations.

Historical

Upon coming into power, the communists immediately showed an interest in the applications of nuclear physics. True, they were already endowed with scientists of renown. But research for military ends did not start until after 1957.

In 1957, a high-ranking Chinese military delegation arrived in Moscow to take part in the festivities of the 40th anniversary of the October Revolution. Headed by Peng Dehuai, Ye Jianying and Su Yu, this 20-member delegation was invited to visit the Red Army Academy and the principal military applied scientific research centers. It was subsequently learned that China and the USSR had just signed an "agreement on new national defense techniques" covering 122 categories of cooperation.

From that point on, the pace of events quickened. In February 1958, the Second Ministry for Mechanical Industry, which since its creation in 1952 had been responsible for weapons production, took charge of nuclear weapons. The following month, an Academy of Military Sciences was opened in Peking. It was intended to familiarize the higher-level cadres of the PLA with the problems of nuclear strategy. And surely in accordance with the 1957 agreement, the Soviets began delivering missiles to the PLA. They were no doubt short-range missiles,[23] probably Frog-1's. The first launch trials took place beginning in 1959 at Qilianshan in Qinghai and at Shuang-nhengzi in Gansu.

GONGZUO TONGXUN mentioned, in 1961, the existence of "Special Techniques Units" (tezhong budui) recommending that youths with college degrees in the sciences be assigned to it. The qualifications being sought indicated the role of these units in the missiles field. The Special Techniques Units were thus the precursors of the Second Artillery. Then, between 1962 and 1964, "Units 83" (Basan budui) were displayed in Peking, Luoyang (Henan), Zhangzi (Shanxi), Datong at 8 kilometers south of Tianjin, and in the district of Conghua (Guangdong). In 1965, a 4-digit number was assigned to the units of the PLA. Units 83 must have been included in this change, because no further mention was made of this designation. This did not halt the continuation of experimentation: On 24 October 1966, the fourth Chinese nuclear test was carried out using a Soviet Sandal SS-4 missile.

On the occasion of the 46th anniversary of the founding of the CCP (20 June 1967), mention was made, for the first time, of a "Second Artillery" (di'er paobing), sparking intensive interest. Military analysts were quick to identify the Second Artillery with the Chinese nuclear forces. But to date, to the best of our knowledge, no Chinese source has ever confirmed or denied this assertion. On the other hand, a recent RADIO-PEKING broadcast indicated that the National Defense Commission on Science and Technology also has missile units. These, however, probably serve only an experimental purpose.

Organization

The organization of the Second Artillery consists of two echelons. The central echelon includes the general staff, the Policy Department and the Department of Zone of Interior Services. At the regional level there is a Major Military Regional Command.

Tactically, the battalion is the basic unit. The internal structure of the battalion varies according to the nature of the equipment in service. According to estimates by Taiwanese services, there are 4 types of surface-surface missile battalions:

--SRBM of 30-100 km range: 1 battalion of 3 batteries, each battery equipped with around 6 missiles;

--SRBM of up to 300 km range: 1 battalion of 3 batteries, 1 launching ramp per battery;

-- MRBM of 1,000-1,500 km range: 1 battalion of 3 batteries at most, 2 of which equipped with 1 launching ramp per battery;

--IRBM of over 1,500 km range: 1 battalion equipped with 1 launching ramp.

The Second Artillery also includes surface-air missile units. The surface-air missile units are organized as follows: 1 communications section, 1 headquarters and headquarters company, 1 engineer section, 1 transportation section, 1 Fan Song B or Gin Sling radar section, and 3 surface-air missile batteries. Each battery is equipped with from 4 to 6 type CSA-1 missiles (SA-2 Guideline).

Potential

Its strategic nuclear forces consist of:

a) Ballistic missiles

--MRBM: 30 to 40 type CSS-1 (1,100 km range);

--IRBM: 50 to 70 type CSS-2/Sandal SS-4 (1,500-1,800 km range depending on warhead);

--reduced-range ICBM: 3 type CSS-3 (5,600 km range).

b) Aircraft-deliverable missiles

--80 to 90 Badger TU-16 subsonic (cruising range 2,500 km).

According to tests carried out,[25] the missiles can carry 20-kt warheads, and the Badger TU-16 one 10- to 200-ton atomic bomb or a 3-MT thermonuclear bomb. In its "Handbook on the Chinese Armed Forces" published in 1976, the DIA (Defense Intelligence Agency) of the United States estimates that the CSS-2 uses stockable liquid propellant and can deliver a 2- to 3-MT yield.

The composition of its tactical nuclear weapons is less known, but they probably include:

a) Nuclear artillery shells

According to Jane's,[26] China has received type S-23 180-mm shells from the USSR. This type of weapon is known for its ability to deliver nuclear yields of 1 to 5 kt.

b) SRBM

Under the 1957 Sino-Soviet agreement, the USSR is committed to furnish SRBM's to China. The type of missile actually furnished is unknown, but the Soviet SRBM's in service at that time were the Frog-1 and Scud-A. CHUNG-KUO YEN-CHIU has mentioned a Chinese SRBM with a range of around 100 km, the T-5.[27]

c) Aircraft-deliverable missiles: the Qiang-5, derived from the Mig-19, is capable of delivering a tactical nuclear bomb.

Operational Capabilities

We refer here to the theoretical capability. The CSS-1 could reach the Soviet West; the CSS-2, eastern Asia and central Asia; the CSS-3, all of Asia, part of European Russia, Australia and part of the Middle East. The CSS-4, under experimentation, could reach the United States. However, all of these missiles have the disadvantage of being liquid-propelled, which means a delay of several hours between the decision to detonate it and the actual firing. During this rather long interval exposed to the open air, these missiles offer a target for an enemy

counterforces strike, against which they are able to guard until then owing to their semimobility or by remaining sheltered in natural cavities fitted out for the purpose. Silos would reduce this vulnerability,[28] but does China have them? In sum, Chinese missiles represent only an anticity capability.

Uses

Comparing Chinese public statements on the use of nuclear weapons with certain passages in GONGZUO TONGXUN, an internal bulletin restricted to the rather high-level cadres of the APL, Jonathan D. Pollac suggests the idea of a sharp disparity between these two points of view.[29] The reference materials he has used actually bear him out. However, in our opinion, he has compared sources of a different nature and, above all, of different hierarchic levels. The public statements issue from the supreme policy body charged with defining the overall policy guidelines, whereas those to whome GONGZUO TONGXUN is addressed must concern themselves with military operations based on these guidelines. A similar distinction, generally speaking, is found in the Soviet Union as well, between doctrine and the art of war: Doctrine sums up the directives of the Central Committee which the Army must apply within the terms of reference of the military arts. Under these conditions, a distinction should be drawn between the principle and its modes of use.

The Principle

The principle emerges from an overall strategy that is at one and the same time political, diplomatic, economic and military in the service of a single aim: to preserve national independence. In accordance with this aim, Chinese military doctrine is essentially defensive: "Our preparations in anticipation of an eventual war are entirely defensive. If we are not attacked, we will not attack; but if we are attacked, we will counterattack. This is our consistent, reasonable and solemn position."[30] This statement, dating back to 1971, has not taken on any wrinkles: It was reaffirmed during China's conflict with Vietnam in February 1979. It defines the principle of China's eventual use of nuclear weapons. On 16 October 1964, the day of its first nuclear test, the Chinese government issued the following statement:

"The development of nuclear weapons in China ensures its defense and the protection of the Chinese people... On the question of nuclear weapons, China will never commit the error of irresponsibility, nor that of irresolution. The Chinese people can be believed."[31]

It adds to this its total refusal to be the first to use the weapon: "The Chinese government solemnly declares that at no time and under no circumstances will China be the first to use nuclear weapons."

The principle governing the use of nuclear weapons by China could thus be summarized as follows: For the needs of its defense, China will not hesitate, in case of a nuclear aggression, to respond using weapons of the same nature.

The Modes

Before addressing the modes, it seems to us well to recall some general relevant concepts defined by Mao Zedong.

1) War takes on a class character: "War, which began with the advent of private property pertaining to classes, is the supreme form of struggle to resolve, at a given point in their development, the contradictions between classes. If one does not understand the conditions of war, its character, its relationship to other phenomena, one does not know the laws of war, does not know how to conduct it, and is incapable of winning it."[32]

2)It is not only a matter of winning the battle, but also of annihilating the aggressor: "The blows dealt to the enemy must aim to annihilate him; otherwise, they make no sense.[33] In case of an attack on the enemy and to the extent that conditions enable us to beat him, our party will automatically take the position of legitimate defense to annihilate him resolutely, radically, integrally and totally."[34] Since the Peking leadership bases itself on Marxism-Leninism, we must complete the first of these statements concerning the class character of war with this analysis, by Lenin, of international relations: "The period of modern capitalism shows us that among capitalist groups there become established certain relationships based on an economic division of the world, and that concurrently and consequently, among political groups, among states, there become established relationships based on a territorial division of the world, on a struggle for colonies, on a struggle for economic territories."[35] In sum, only imperialism yesterday and socioimperialism today nurture warlike intentions in regard to China, not to control a territory, but to add to their economic potential.

Under these conditions, the Chinese leadership does not shrink back from the principle of a strategic bombardment, fully aware though it is of its destructive effects. The ultimate aim of war being the acquisition of an economic potential, the reason for being of such bombardment is, in their view, dim. Thus, the development of an aggression against China would necessarily end up in conventional type confrontations: "Although atomic bombs are very powerful, they serve only to destroy the centers and economic reserves of the enemy during the strategic bombardment phase. Thereafter, they serve mainly as supporting fire in preparation for the assault. In any case, armies and conventional weapons are necessary to finish a war, destroy the enemy, occupy territories, and win victory. To count on armies and conventional weapons means according primacy to the human factor."[36] Furthermore, the sparse concentration of Chinese economic objectives would lessen their vulnerability in case of strategic bombardment: "... Nuclear weapons are more of a threat to imperialist and socioimperialist countries, where industry and populations are more concentrated. Our national economy has agriculture as its base and industry as a dominant factor. A policy combining industry and agriculture, cities with the countryside, large enterprises with small and medium ones, and peacetime work with preparedness for war fears neither modern weapons nor bombardments."[37]

In addition, a sustained policy of civil defense was put into operation beginning in 1973. That year, the joint editorial of the RENMIN RIBAO, the HONGQI and the LIEFANGJUN BAO for the feast of the New Year used Mao Zedong's directive: "Dig

deep underground shelters, store vast reserves of grain everywhere, and never act like a superpower." Very recently, the NCNA revealed the existence of an urbanization and civil defense plan for Peking covering the period 1979-1985.[38] From a more general standpoint, Marshal Ye Jianying advocated, during the 3rd National Conference for Antiaircraft Defense of the People, the adaptation of urban and infrastructural constructions to the imperatives of civil defense.[39]

On the other hand, the Chinese leadership devotes a great deal of interest to the possible uses of the tactical nuclear weapon. "Although the atomic bomb is a paper tiger, it is no less true that atomic weapons are a real danger. Their destructive capability is relatively substantial, and while we may disregard them from a strategic standpoint, we must take them very seriously into account from the tactical standpoint. If we wish to overcome the nuclear forces of imperialism and socioimperialism, we too must develop our own nuclear and conventional arsenals."[40]

This statement is of recent date: 1977. Moreover, the officers of the PLA have been schooled for a long time on the battlefield uses of chemical and bacteriological weapons:

"When launching an attack, we must be able to concentrate rapidly our manpower and firepower on the lines of advance of our offensive and exploit the effects of a nuclear strike. When the situation demands it, we must also be capable of dispersing and camouflaging ourselves rapidly. In a defensive situation, we must have the capability of concentrating our manpower and firepower at essential points, and of organizing and protecting ourselves against nuclear, chemical and bacteriological weapons."[41]

This text dates back to 1961, a period in which China did not yet have nuclear weapons. In this regard, it should be noted that in 1958 there appeared in China a collection of studies on nuclear weapons: "Yuanzi Wuqi Lunwen Ji."[42] It was the translation of a Soviet treatise published in 1955, dealing with the following points: bases of nuclear physics, causes of the destructive effects of an atomic war, aerial bombardments and civil defense.

In 1961, the units of the PLA on a regimental level and above received instruction not only in NBC [nuclear, bacteriological, chemical] defense but also in the principles of the use of these weapons. But although the leaders of the PLA sustain the principle of a nuclear strike, such an eventuality would not supervene except within the terms of a battle to defend China against an aggression. It is not a matter, therefore, as J. D. Pollack would have it, of a concept of use that departs from the official viewpoints. Moreover, since the military engagement aims at the annihilation of invasion forces, a recourse to nuclear weapons in no way implies their use without the use of conventional weapons. The recourse to nuclear weapons must be interpreted within a combination of all the means necessary to destroy "resolutely, radically, integrally and totally" the aggressors.

This proposition could cast light on the designation "Second Artillery" given to the Chinese nuclear forces. However, from a semantic viewpoint, a Second Artillery would imply the existence of a First Artillery. If this were the case, would

not the Second Artillery comprise all those weapons in their entirety which, though being comparable with those of the First Artillery, or the traditional artillery, as regards their mode of use, nevertheless differed from the latter in their technical characteristics? The Second Artillery does in fact include also the surface-air missile units. Furthermore, it could include Styx SRBM battalions assigned to coastal defense. We advance this hypothesis for two reasons: certain photographs published by the NCNA show Styx batteries on the seacoast, but the tactical organization of the coast artillery divisions, under the Navy,[43] do not, to our knowledge, include Styx units.

Critical Analysis

These principles and modes of application call, in our opinion, for some comments:

1) The Chinese arguments in support of the scarce probability of strategic bombardments appears to us soundly based. In this regard, one cannot avoid linking them with the slowdown noted in the ICBM, SNLE and SLBM programs, since, under these conditions, the latter weapons would lose their priority status, at least for the time being. These arguments also recall those developed by Samuel T. Cohen and by Colonel Geneste in favor of a nuclear barrage. In particular, the latter writes:

"... Bombardment alone does not conquer; it only enables the conquest that must be effected by the army and the maintaining of infantrymen and tanks on the objective."[44]

However, in the event of a Soviet-Chinese conflict, there is nothing to indicate that the USSR would follow this reasoning. As Alain Besancon has so wisely remarked: "... purely strategic reasoning is sterile if it is not subjected to political reasoning. This is the way the Soviets proceed."[45]

Under these conditions, although the USSR may be interested in the economic potential of Western Europe, it need not be sparing of China for the same reasons: "China is neither controllable--too vast--nor exploitable--too poor--nor decisive in the overriding socialism-versus-nonsocialism conflict."[46]

Besides, the concept of Soviet strategic bombardments with coercive aims cannot be disregarded as long as the credibility of a Chinese nuclear deterrent remains in doubt.

During one of the conferences mentioned above, Edward N. Luttwak developed a scenario in the following sense. According to him, 140 ss-20's would be amply sufficient for a counterforces strike on 200 Chinese objectives that would include China's missile sites, its warhead depots, and its principal industrial and scientific centers. This hypothesis assumes the widest dispersion possible of the Chinese TU-16's. The Soviet attack could be carried out in two waves of 70 SS-20's, each delivering 210 independently targeted, high-accuracy warheads. E. Luttwak also remarks that the Soviets would have no need to resort to their ICBM's. According to these figures, 28 objectives could survive the first attack and 8 could survive the second. In the event Chinese missiles were among the survivors, no rational attitude would counsel their use: On the one hand, no

major Chinese urban center would have been destroyed during the two attacks; on the other hand, the Soviets would have maintained such an overkill capability that the few surviving Chinese missiles would inevitably lose their significance. This is obviously only a theoretical scenario: It describes a technical possibility but does not integrate the political motivations that could induce the Soviet leadership to arrive at such a decision.

2) The tactical use of Chinese nuclear weapons, for example to stop the advance of invasion forces, would tend to underestimate the consequences of certain technological advances such as the increased accuracy of theater ballistic missiles. Soviet advances in this domain put them in a position to disarm at a distance the forces that would oppose their offensive: The circular error of the SS-20 probably does not exceed 300 meters. This capability moreover falls under the "preemptive" type of attacks in the Soviet "art of war" and entails another consequence: The Chinese troops could no longer hope to contact the enemy troops to protect themselves from an enemy nuclear strike,[47] the enemy having used its nuclear fire at the start of the conflict and limited its conventional forces to occupation of the terrain thus neutralized. Thus, an eventual Soviet-Chinese duel would substantiate the situation described by General Galois: "... The gap is widening between the countries equipped with mobile nuclear weapons--such as missile-launching submarines and very long-range bombers--and those that rely on traditional forces.

"The former retain the advantage of invulnerability to direct strikes or, at least, the privilege they enjoy of not being subject to being invaded unless the aggressor is willing to take considerable risks in doing so. The latter countries, on the other hand can only submit their defense arsenals to being destroyed with no means for demanding a high price in return. In reality, they are defenseless."[48]

Within the terms of this definition and considering the means currently at its disposal, China falls into the second category of nations. It does not yet possess the necessary nuclear deterrent capability--a second strike capability--to shelter itself from possible nuclear attacks by its big northern neighbor.

Facing Realities

A mere comparison of arsenals suffices to dispel all doubt: A difference of levels exists for the moment between China's nuclear ballistic weapons and those of the major powers. China has remained at the first-generation, very vulnerable weapons level, while the weapons of the other powers have evolved considerably. True, the notions of balance or equivalence--of nuclear parity--play no part in nuclear deterrence by a weaker power against a stronger one. However, the weaker power cannot maintain the credibility of its threat of nuclear response unless its weapons systems continue to convince the stronger power of the prohibitive level of risk their destructive capability represents. General Poirier reminds us in this regard that: "The art of deterrence is not to constrain--as in war--but to convince. (...) Belief is not a static condition: One who takes a threat seriously at a given moment may no longer believe it under other circumstances."[49]

In the Chinese view, nuclear forces alone will not suffice to win a war. Their use together will the other forces must also be considered. Generally speaking, Chinese military doctrine takes as starting hypotheses the two following constants: recognition of China's material inferiority by comparison with their potential aggressors; but primacy of the human factor over the material one. As a corollary, it advocates exploitation of the enemy's possible weaknesses. The advent of nuclear weapons has not upset these hypotheses.

Initially, the atomic bomb was considered by China a paper tiger.[50] But the puerility of this representation masked an incisive analysis of the limits being imposed by the United States, the leading atomic power at the time, on the use of nuclear weapons. Without entering into detail, we believe the Chinese leaders had, unlike their Soviet counterparts, foreseen the passage of American nuclear strategy from the principle of "massive retaliation" to that of the "graduated response": The Korean war revealed that, despite their nuclear superiority, the United States was unable either to prevent a conflict from erupting or to even resolve it in its own favor.[51] From China's viewpoint, that American superiority concealed an exploitable weakness.

On the international level, Peking's leaders decided to depart from the prudence of the Kremlin's masters and posit itself as the champion of Third world revolutionary movements. From another standpoint, in their obsession with the notion of an American invasion, which seemed a possibility as the situation evolved in Indochina, the top leaders of the PLA drew up, near the end of 1960, a new two-point strategy: abandon the concept of a stopping blow at its borders and allow the invasion forces to penetrate deeply into Chinese territory until they bogged down; press contact with enemy troops so that their command would not be tempted to resort to nuclear weapons.

When China joined the atomic club, its military doctrine underwent no concurrent change. Although they represented two extremes, the principles of a "peoples' war" and eventual recourse to nuclear weapons appeared complementary. A peoples' war is aimed at deterring any attempt to occupy China by resorting to prolonged guerrilla warfare, relying, in principle, on the support of the population as a whole. For their part, nuclear weapons would safeguard China from an attack by weapons of the same nature.

But what would happen if a potential aggressor were to discard this preconceived scheme? If, for example, instead of seeking to occupy China, he were to limit himself to creating an accomplished fact in the form of a military incursion of brief duration, limited in space, but decisive by way of the means utilized. The fact is that the conquest of China would entail more disadvantages than any benefits it might produce: vast and densely populated as it is, its occupation would immobilize such immense resources as to divert the power undertaking this initiative from its other objective. By contrast, limited actions, like a "surgical strike" or a "political lesson," would be more of a threat to China. A "surgical strike" would seek the destruction of its military-industrial complex, which is concentrated in a geographically very vulnerable region: natural obstacles that are easily overcome, a vast plain made to order for maneuvers by large armored and mechanized units, sparsely populated. A "political lesson" would serve

essentially to demonstrate to the Peking leadership the futility of certain of its current foreign orientations. Under these conditions, and once the potential aggressor has been identified, what becomes of the preparations called for by the Chinese doctrine?

The Potential Enemy

The material possibility of a Soviet attack does not necessarily indicate its probability. This eventuality, however, is not to be neglected. Soviet military doctrine lends itself to such initiatives, especially when they are mandated by "objective reasons."

Provisions of Soviet Doctrine

As far as can be gleaned from Soviet writings on the subject, two themes dominate Soviet military doctrine. The first is none other than a paraphrase of Clausewitz by Lenin: "War is the extension of policy by another means. Every war is indissolubly linked to the political regime from which it ensues." Thus, for the Soviets, war results only from the bellicose actions of imperialism. In "Marxism-Leninism on War and the Army," published in 1976, a group of Soviet officers affirms: "It is with the utmost secrecy, but in a deliberate manner and in accordance with a plan that has matured over a period of many years, indeed decades, that the exploiting classes prepare their wars of aggression, and it is with equal conscientiousness that their governments and their parties unleash those wars when they judge the moment timely and most advantageous."[53]

The Red Army therefore cannot be other than defensive. But this conception of defense goes beyond the national territorial boundaries, as Marshal Gretchko's writings perceive it: "The historic function of the Soviet Armed Forces is not limited solely to the defense of the motherland and the other socialist countries. In its foreign policy activities, the Soviet state actively and intentionally opposes the exportation of counterrevolution and political oppression; it aids the struggle for national liberation and resolutely opposes imperialist aggression in whatever distant region of the planet it may manifest itself."[54]

Thus, we could one day see the Soviet Armed Forces aiding "FUSNK" [Kitaii National Salvation Front] to "liberate" the Chinese people from the "Maoist dictatorship" being sustained by "world imperialism and reaction."

'Objective Reasons' for an Attack

We see three: the "defense of the gains achieved by socialism," the new trend of Chinese-American relations, and the time factor.

The Soviets identify their interests with those of socialism. Every time it has become necessary, they have taken the required measures to "safeguard the gains of socialism." The inhabitants of East Berlin, Budapest and Prague have learned this at cost to them. The vigor of the Soviet reaction is explained by their refusal to retreat from socialism. This attitude provides an understanding of the moderation Moscow has shown until now in its behavior toward the Chinese. In

effect, without overlooking in the background some of its national aspects, the Chinese-Soviet conflict has mainly taken the form of divergences over determination of the international communist movement line. And it is our opinion that as long as the disagreement between the two countries remains on an essentially doctrinal level the Soviets will adjust as if to the lesser of possible evils. On the other hand, they would certainly modify their attitude if the Chinese were to abandon the doctrinal character of their grievances. Actually, Peking's current behavior lacks clarity, and its references to the "polar bear" are not designed to reassure Moscow.

Moreover, the new trend of Chinese-American relations is adding to Soviet concerns. A genuine "Chinese card" psychosis has overtaken the Soviets. In November 1978, Boris Ponomarev expressed to visiting American senators his concern over certain implications in the normalization of Chinese-American relations: "... The fact that some circles in your country are seeking to strengthen Chinese-American ties on the basis of anti-Sovietism cannot be other than disturbing."[55]

Far from bringing appeasement into the situation, the subsequent unfolding of events exacerbated the fears of the Soviets, who were already tending toward a fear-of-the-besieged complex. In October 1979, the NEW YORK TIMES revealed the existence of a study ordered by the Pentagon[56] on the possibility of aiding China to defend itself in the event of a large-scale Soviet attack. In the wake of the Soviet invasion of Afghanistan, and less than 2 months after requesting it, China obtained an agreement with the United States granting it most-favored-nation status, a status the Soviets have been seeking for years.

Time is the third reason. Certain circles in the USSR estimate that a military incursion into China beyond the latter half of the 1980's would be too costly in relation to the results that could be obtained. This evaluation takes the following form:

--1976: With the death of Mao Zedong, the "Four" were eliminated. A major hindrance to the modernization of China disappeared.

--1977/1978: Political and economic reorganization with the return of Deng Xiaoping to power.

--1978/1979: The "New Long March" commences. As viewed from the outside, the results appear less unsatisfactory than had been predicted.

--1980/1985: If development continues at the same rate, the 1976-1985 10-year plan will provide a solid base for the realization of the "four modernizations."

Soviet Concepts

While Soviet doctrine espouses the defensive, the Soviet art of war, on the contrary, teaches the offensive or, more exactly, the preemptive action. Despite the seeming contradiction, the preemptive action is designed to head off the

enemy's attack. This being so, the preemptive action must be decisive to accomplish its purpose. Consequently, any preemptive attack must be executed under the conditions most favorable to the obtaining of decision: superiority and the combined use of all necessary means.

Based on the three "objective reasons" we have just set forth, a Soviet preemptive action agains China could take the form of a "lesson" or of a "surgical strike." These two types of action could also be brought to a conclusion.

The masters of the Kremlin would have no compunctions about displaying their pedagogic talents if the evolution of Sino-American relations were to strengthen their "Chinese card" obsession. The fact is that during the next 5 years--a period in which the probabilities of a Soviet attack against China seem high--the American nuclear commitment to defend Western Europe will be problematical, given the Euro-strategic and conventional superiority of the Soviets and the balance between the American and Soviet central systems. Nevertheless, there is an institutional framework of Atlantic solidarity, a framework that is absent as of now from the relations between the two Pacific powers. A preemptive action would demonstrate to the Peking leadership the illusory nature of seeking a Sino-American convergence.

The Soviet intent to undertake a "surgical strike" against the Chinese military-industrial potential is not new. It was expressed in 1969, when Soviet military attaches stationed in Tokyo and Canberra stated it to their American counterparts.[57] In the context of that period, they could have been seeking to head off the start of a Chinese-American dialog. The Americans, if advised of the Soviet threat hanging over China, could conceivably be induced to make such demands as would discourage the Chinese. Currently, the danger is greater. In April 1978, Brezhnev's presence at the Red Army's large-scale maneuvers in Siberia coincided with the arrival of Sir Neil Cameron in China. On both sides, these events assumed a symbolic character of the first order: Sir Neil Cameron was in fact the first chief of staff of the army of a member of the integrated NATO command to visit China. It turned out, by way of this occasion, that Great Britain was the only country, among several that had been approached, to agree to supply China with reactors capable of equipping a new type of fighter plane being developed. In our opinion, the Soviet warning was crystal clear and unmistakable: The USSR will not stand by without reacting toward a China that, even as it draws closer to NATO, strengthens its own military potential.

Flaws in the Chinese Doctrine

Mao Zedong developed the principles of the "people's war" as part of the "war of anti-Japanese resistance." Subsequently, the Military Affairs Commission, toward the end of 1960, based its preparations against an American invasion on similar principles. Soviet designs would differ from those of the Japanese and from those ascribed to the Americans. In addition, they would be favored by geography. Under these conditions, the PLA's margin for maneuver would be small, whether or not it resorts to nuclear weapons.

A Failing Doctrine

In invading China, Japan sought a colony. The Japanese presence was thus intended to assume a durable character. Besides, geographical constraints compelled the Japanese to effect their penetration from East to West. The Japanese army thus landed on Chinese territory from the sea. In doing this, it penetrated into China's overpopulated area, which has always grouped three quarters of China's population in 23.5 percent of its territory. This population density was therefore capable of becoming the breeding ground necessary to the pursuit of a "prolonged war." But this was all in theory. The fact is that the Japanese army never lost its full freedom of strategic action throughout the hostilities. Actually, the zones occupied by the Chinese communists were never considered a priority by the Japanese.[58] In the North, these zones were either contained by the general line of the Japanese front or were outside the main railway axes controlled by the Japanese. In central China, the Japanese forces virtually ignored the hinterland.

Be that as it may, the Soviets would enter from the North, descending upon the Manchurian plain. They would thus penetrate a very sparsely populated region, if one judges from the following densities:

--43 inhabitants per square kilometer in the Heilongjiang region:

--90 inhabitants per square kilometer in the Jilin region;

--215 inhabitants per square kilometer in the Liaoning region.

It must be recalled that the mean national density is 297 inhabitants per square kilometer. Moreover, a "prolonged war" would have no purpose unless the Soviets were to pursue their penetration. This seems very unlikely. On the other hand, the Soviets could maintain themselves in Manchuria if they wanted to.

A Geography Favorable to the Aggressor

Geography favors the Soviet designs. Let us consider the theater of operations. The Sino-Soviet frontier between Vladivostok and the Pamir plateau compares in length with the distance between Paris and Bombay, that is, 7,200 kilometers. This gigantic front is divided, however, into three sectors of approximately equal lengths but sharply different geostrategically, one from the other:

--the western sector, made up of mountainous rock masses, some of them reaching altitudes of 8,000 meters;

--the central sector, extending over sparsely populated regions of Mongolia, the Gobi desert;

--the eastern sector, comprising the coastal provinces of Siberia and Manchuria, which present a terrain that is sometimes flat, sometimes mammilated with groups of medium-sized, easily crossed mountains.

The latter sector is in northeastern China, that is, the sparsely populated but highly industrialized Manchurian plain. This plain lends itself admirably to maneuvers by the Soviet large armored and mechanized units. These are currently equipped to advance 75 kilometers a day against NATO units. Against the PLA units, their advance would be even more rapid. They have a sustained combat range of three days. Let us not forget, also, that since 1972, the Soviets have been building a gigantic logistical complex consisting of airports, supply dumps, hospitals, roads, and pipelines to sustain an eventual military incursion into China. Aside from the new Soviet air transport capability, let us also recall that the doubling of the trans-Siberian rail line will be completed very soon. Thus, the Soviets could, in a matter of a few days, take over an essential part of China, without even penetrating toward the interior of the country. To carry out a "lesson" of a political nature, they would need merely to pursue their advance on Peking.

To prevent this, the PLA would have to be able to stop the invasion forces at the frontier. But, as of now, Chinese military doctrine excludes this type of preventive strike in favor of drawing the invader into the interior of its territory.

Conclusion

There are numerous indications that a change is in progress. The extent of this evolution can be assessed from the decisions taken by the Military Affairs Commission, and especially its Bureau of Training Manual Revisions, in 1961.[59] Subject to the usual cautions, the following passage from the article by Marshal Xu Xiangqian, published in HONGQI on the occasion of the 51st anniversary of the founding of the PLA (1 August 1978), appears to us highly significant: "Marxism will not stagnate, but will develop as practice progresses. The same holds true for the theory of people's war. It will advance as history evolves; modern war differs from the ancient in many respects. Our enemy has experienced major changes, and our own country is very different from what it was. This requires that we link more closely the theory of people's war enunciated by President Mao with the new historic conditions, that we study the new characteristics and the laws of that war, and that we intensify our preparations in all domains (...). Defending ourselves actively and drawing the the enemy deep within our territory are the fundamental strategic principles that will enable us to win. (...). Drawing the enemy deep within our territory does not mean allowing him to go where he wishes, but rather constraining him to expose himself to our blows. We must concentrate powerful defenses at a few key points to prevent penetration by the enemy and to lead him to the battlefield we will have prepared, to annihilate him."[60]

The fact is that China's perception of the source of its dangers has changed from the United States to the USSR, modifying the geographic aspects of its potential engagements. The PLA's top leaders therefore have a keen interest in being able to halt an invasion from the Northeast before it can cause too much devastation.

From the standpoint of nuclear strategy, it appears vain to us to think in terms of changes in the absence of a prior technological progress that would raise China's means to current international levels. This would of course involve the

development of mobile reprisal weapons capable of escaping a preemptive strike or, at least, of minimizing its effects. With this technical constraint as a point of departure, we could consider a two-phase approach: for the short term, gain time by developing a minimal deterrent based on present capabilities; favor the long term by preparing, starting now, the design of new generations of weapons.

The first phase hinges on political action. In recent years, Chinese leaders shown shown alarm over the inevitability of a new world war, as when, at the 23d session of the UN General Assembly (28 September 1978), Huang Hua applied heavy shading to this view. Huang Hua went even further to stress China's peaceful aspirations: "Step by step, as the rivalry between the two superpowers intensifies and planetary strategic deployments of social-imperialism spread, local wars are becoming more numerous and the danger of world war is increasing. To delay the start of this world war and maintain international peace represents at this very moment an important task for the peoples of the different countries (...) The Chinese people ardently desire peace and oppose all that is leading to a new world war. Besides, we need an international situation of peace over a long period, to rebuild our country."[61]

These statements were reiterated some days later by Hua Guofeng in his speech for the 1 October national feast day. Despite their general character, they appear to be addressed particularly to the USSR. In the current evolution of the Sino-Soviet conflict, the turn being taken by the China-United States-USSR triangular relationships is proving dangerous. Although the United States occupies the privileged position of arbiter, the rigidity of Sino-Soviet relations induces an escalation in the systematic search for reciprocal checks and balances that could accidentally result in a war. Also, although we have spoken at length of the Soviet threat perceived by China, let us not forget that the Soviets, for their part, feel threatened by the objective rapprochement that has developed among China, the United States and Japan. Thus, China, by maintaining a certain dialog with the USSR, is trying to minimize the dangers of armed confrontations.

The fact is that China's military doctrine is currently inadequate, for China does not have the means to back its policy. As regards the long term, the Peking leadership is counting heavily on the development of means to strengthen the credibility of China's nuclear deterrent capability. Although it is still too early to judge, we can at least discern its intention in this regard as reflected in this statement by Su Yu on the occasion of the 50th anniversary of the founding of the PLA: "We have decided to constantly improve our weapons and equipment and, through our own efforts, to possess the same weaponry that our enemies have, indeed to invent new weapons."[62]

As regards these new weapons, two trends may actually be taking shape. The first would be bearing on the development of enhanced-radiation weapons, as we have already mentioned. In our opinion, because of their nature and possible uses, this type of weapons would be extremely well suited to an essentially defensive doctrine as is that of the "people's war." However, we are aware of certain limitations: the very small area covered by each weapon would necessitate a large stock of them so that their action would not result marginal and lack decisive effects on the battle;[63] the risk of remote disarmament would also, for that

matter, not be resolved. To this effect, we must underscore the importance being accorded to particle physics, which is one of the eight priority sectors of the National Scientific and Technical Development Program (1978-1985). Is China also concentrating on the development of particle-beam weapons designed for ABM [Anti-Ballistic Missile] defense?

Annexes:

1. Location of Missile Production and Test Centers.

2. Second Artillery - Organization Chart.

3. Second Artillery - Top Leaders.

4. Missile Sites By Major Military Regions.

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1. Location of Missile Production and Test Centers [see map next page]:

1) Weapons test centers and launching test centers: Six: Shanghai, Baotou, Jining, vicinity of Yinchuan, Qilian Shan, Shuang-chengzi (Gansu);

2) Missile manufacturing plants: Five: Zhenxi Plant (Xinjiang), Yinchuan Plant (Ningxia), Shibao Plant (Gansu), Gansu Military Plant, Xi'an Weapons Plant;

3) Experimental production centers: Eight: Peking, Tianjin, Shenyang, Harbin, Shanghai, Wuhan, Chongqing, Xining;

4) Missile engine factories: Four: Peking, Taiyuan, Xi'an, Gansu;

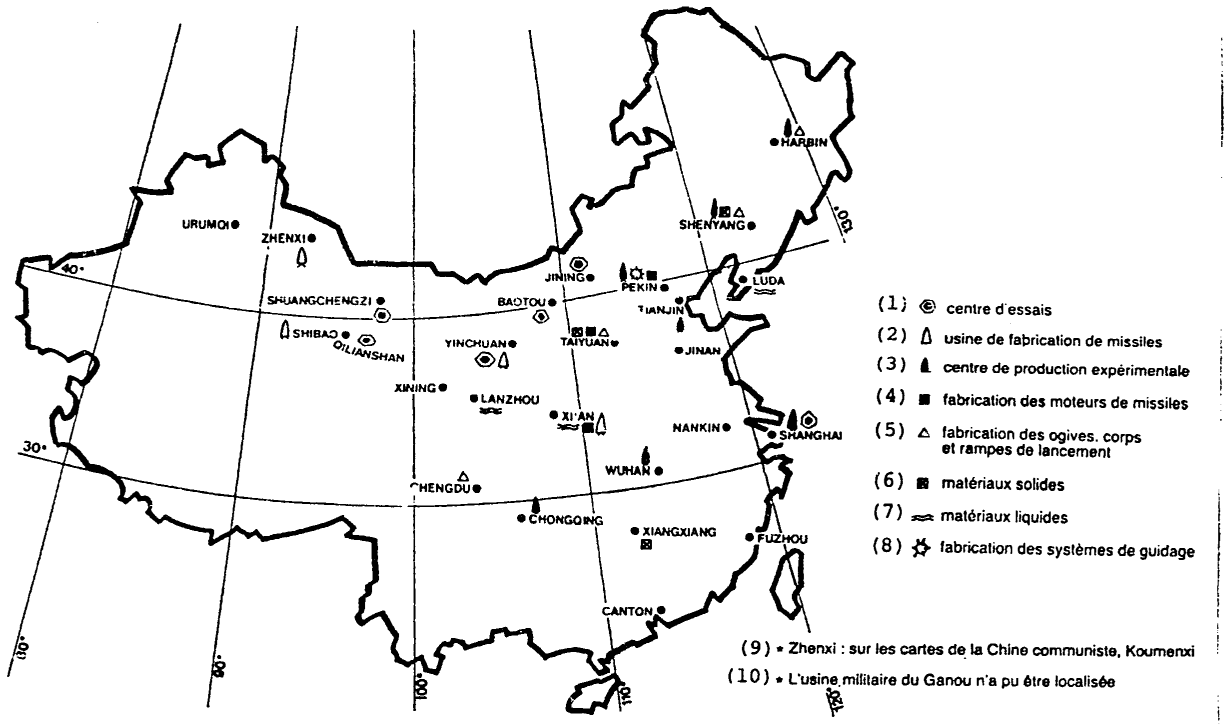
5) Missile warhead, body and launching ramp factories: Four: Shenyang, Harbin, Taiyuan, Chengdu;

6) Solid propellants: Three: Taiyuan, Shenyang, Xiangxiang;

7) Liquid propellants: Three: Xi'an, Lanzhou, Luda;

8) Guidance systems factories: One; Peking.

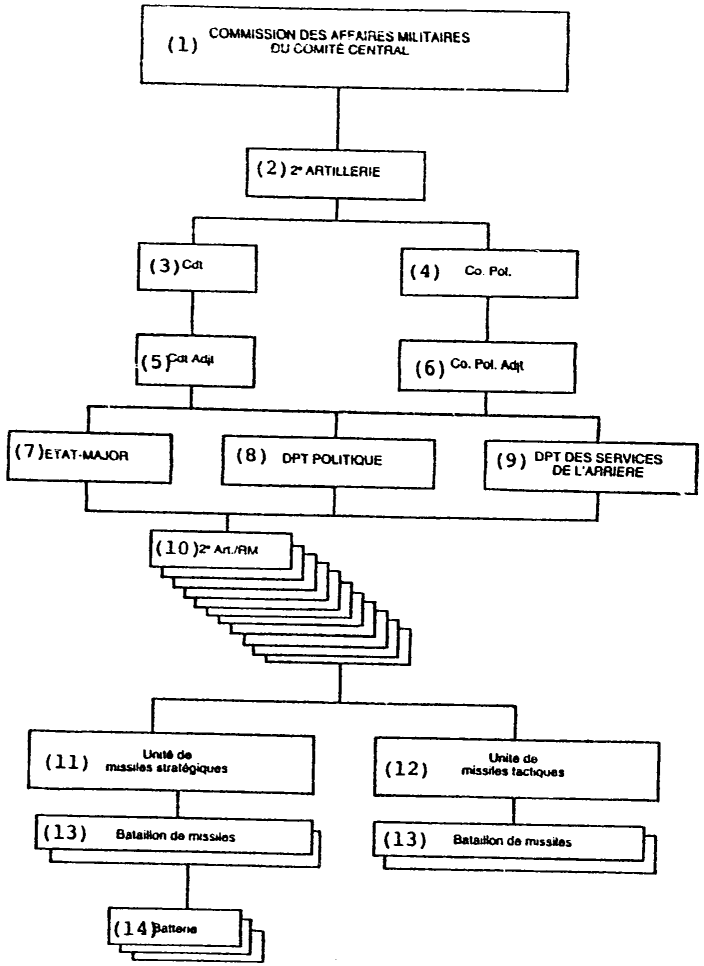
Location of Missile Production and Test Centers [see listing preceding page]



Key:

1) Test centers
2) Missile manufacturing plants
3) Experimental production centers
4) Missile engine factories
5) Missile warhead, body and launching ramp factories
6) Solid propellants
7) Liquid propellants
8) Guidance systems factories
9) Zhenxi: Koumenxi on communist Chinese maps
10) Gansu Military Plant could not be located

2. Second Artillery - Organization Chart



Key:

1. Central Committee Commission for Military Affairs
2. Second Artillery
3. Commander
4. Commissar
5. Deputy commander
6. Deputy commissar
7. General Staff
8. Political Department
9. Rear Area Services Department
10. Second Artillery/ [expansion unknown]
11. Strategic missiles unit
12. Tactical missiles unit
13. Missiles battalion
14. Battery

Source: Hsiang Chuan-shu: "Chung-Kung Te Ho-tzu Fei-tan Pu-tui Te Chien-li Yu Lien-yung" [Communist China's Nuclear Policy. Organization and Functions of Nuclear Missile Units]. CHUNG-KUO YEN-CHIU XIII (8), August 1979, p 128.

3. Second Artillery - Top Leaders
(as identified in 1978/1979)

Commander	Li Shuiqing
Commissar	Chen Heqiao
Deputy commander	Liao Chengmei Fu Xianhui Wang Ting Yan Jia'an He Jinheng Liu Lifeng Cha Guozhen
Deputy commissar	Liu Youguang Wang Wenjie Wang Zonghai Sheng Zhihua Lu Yishan

Biography of Li Shuiqing

He was born in 1919 at Jiangxi. He participated in the Long March as the commissar of a regiment of the 1st Red Army. During the Anti-Japanese War of Resistance, he served in a unit of the 115th Division commanded by Yang Chengwu. In the Spring of 1942, he was political commissar of an anti-Japanese resistance base west of Peking. In 1948, he commanded the 4th Division of the 11th Army (Ma Long) pertaining to the Northern China Field Army (Nie Rongzhen). During the Korean War, he commanded 199th Division of the 67th Army (Ma Long). At that time, he was considered one of the PLA's best experts on combined operations as well as one of the leaders of the Armed Forces modernization movement. At the conclusion of the Korean War he was given command of the 67th Army. From 1961 to 1963, he headed the Qingdao Garrison. The Cultural Revolution appears not to have gone against him: From deputy chief of staff of the Major Military Region of Jinan in 1968, he was promoted to deputy commander in December 1968; meanwhile, he had entered the Central Committee as a regular member during the 9th congress. In March 1971, he occupied the position of first minister of mechanical industry. Between 1971 and 1974, his functions took him to the following countries:

--November 1971: Pakistan;

--July 1972: Algeria;

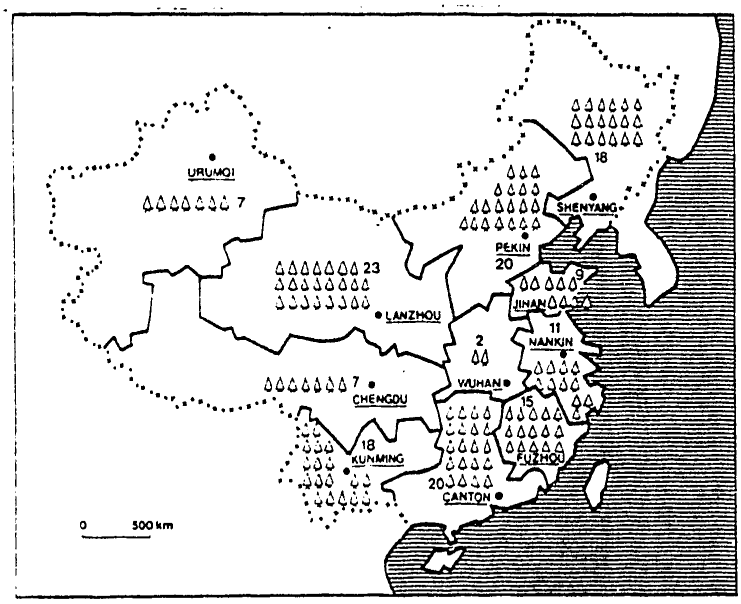
--September 1972: Sweden, Norway and Finland;

--October 1974: Algeria.

In January 1975, Zhou Zijian replaced him in that position. He was identified as the deputy commander of the Major Military Region of Nanking in July 1976. In August 1977, he was reelected as a regular member of the Central Committee that resulted from the 11th congress. Since 19 June 1978, he has commanded the Second Artillery.

(Sources: Huang Chen-hsia. "Chung-Kung Chun-jen Chih." Hong Kong: Research Institute of Contemporary History, 1968, p 754; "Chung-Kung-jen Ming-lu Taipei": Institute of International Relations, 1978, p 168.)

4. Missile Sites by Major Military Regions



(1) +-+-+ limites des Etats
(2) ——— limites des Grandes régions militaires
(3) Δ site de missile
(4) 18 nombre de sites de missiles par Grande région militaire

Key:

1. National boundaries.
2. Major military regional boundaries.
3. Missile site.
4. Number of missile sites in each major military region.

FOOTNOTES

1. In the view of the Chinese leaders at the time, this probability could become a reality with escalation of the American action in Vietnam. To appease these apprehensions, the American representative, during the 25 February and 22 April 1965 meetings if the Sino-American talks in Warsaw, reaffirmed that his country's intentions were to limit its operations to the Gulf of Tonkin (cf. J. Cheng: "More on the Chinese Strategic Debate, 1965-1966," ASIA QUARTERLY, 1977-3, pp 202-222.

2. This term is borrowed from Leo Hamon: "The Art of War in the Nuclear Age," DN April 1968, p 617.

3. In French, consult the two books by J.P. Brule: "La Chine a vingt ans" [China 20 Years Later]. Paris, Fayard, 1969, pp 159-198, and "Demain l'Armee chinoise" [The Chinese Army Tomorrow], Paris, Balland, 1974, pp 205-216.

4. Ho Houang-Piao: "Wou Tchong-houa, An Outstanding Thermodynamics Expert," CHINA UNDER CONSTRUCTION July 1978, pp 6-8.

5. NCNA, 18 November 1978.

6. CY XIII (7), July 1979, pp 140, 141.

7. Initially, it produced 10 kg of plutonium 239 annually; Liu Yeh-Yun: "China as a Nuclear Power in World Politics," London, Mac Millan, 1972, p 39.

8. For details, see K'ang ti: "Chung-Kung Kuo-fang K'o-chi Fa-chan Hsien-K'uang" [Insight into the Development of the Sciences and Defense Technologies in Communist China], CY XI (4), April 1977, pp 81-90.

9. J.P. Brule: "La Chine a vingt ans," op. cite, p 195.

10. "A Brilliant Victory for Mao Tse-tung's Thought," JFJB, 17 June 1967 (SCMP 3964, p 3).

11. P. Herpaix: "Chinese Space Activity," DN July 1976, p 124.

12. R. Spurr: "Stepping Up the Space Race," FEER 102 (41), 13 October 1978, pp 13, 14.

13. AGENCE KYODO 7 September 1978.

14. RADIO-PEKING 19 June 1979 and LE MONDE 7 September 1979.

15. Interviewed by the daily ASAHI SHIMBUN during their visit to Japan in July 1979, Xu Ming and Chan Fangyun stated, without indicating precise dates, that during certain trials of weather observation rockets solid propellants were used. The weight of these rockets, however, was only 100-300 kg (ASAHI SHIMBUN 8 July 1979). For other details concerning this Chinese mission to Japan, see Chung Mou: "Chung-Kung T'ai-K'ung K'o-chi Fa-chan Ch'ing-K'uang" [The Point of Communist China's Development of Space Technologies] CY XIII (11), November 1979, pp 102-110.

16. Ti Chung-heng: "Kuo Kung Hai-chun te Pien-chih yu Chan-li" [Organization and Potential of the Nationalist and Communist Navies] MING-PAO YUEH-K'AN 136, April 1977, p 27.

17. IS XIV (7), July 1978, p 64.

18. Lieutenant-Commander Dupont-Nivet: "Telecommunications With Submarines" DN January 1976, p 65.

19. NCNA 6 July 1976 and 20 July 1977.

20. W. Ruppert: "Die Neotronen Bombe aus Inner Chinesischer Sicht," CHINA REPORT (Vienna), 44/1978 pp 21-25.

21. Pan Hongjin, Xu Xinlong, Xie Kuanzhong and Pan Haochang: "Kual Zhongzi Huohuafa Huohuafa Celiang Paodan Zhayao Midu" [Yield Measurements on Shells Detonated by Fast Neutrons], HEJISHU 3, August 1979 pp 42-46.

22. IS XIV (7), July 1978, p 73.

23. Hsiang Chuan-shu: "Chung-Kung te Ho-tzu Cheng-ts'e - Chung-Kung tui Ho-tzu Wu-ch'i te Ching-ying" [Communist China's Nuclear Policy - Development of Nuclear weapons], CY XIII (7), July 1979 p 132.

24. RADIO-PEKING, 21 May 1978.

25. K'ang Ti: previously cited article, pp 81-90.

26. C.F. Foss: "Jane's Pocket Book of Towed Artillery," 18, London, Macdonald & Jane's, 1977, p 197.

27. Hsiang Chuan-shu: "Chung-kung te Ho-tzu Cheng-ts'e - Chung-Kung Ho-tzu Fei-tan Pu-tui te Chian-li Yu Lien-yung" [Communist China's Nuclear Policy - Organization and Missions of Nuclear Missile Units], CY XIII (8), August 1979, pp 125-131.

28. For a development of this topic, refer to the article by J.B. Margeride: "Technical Aspects of Counterforce Strategy," STRATEGIQUE No. 1, 1st quarter 1979, pp 95-144.

29. J.D. Pollack: "Chinese Attitudes Toward Nuclear Weapons, 1964-69," CHINA QUARTERLY 50, April-June 1972, p 268.

30. Statement for the 44th anniversary of the founding of the PLA, 1 August 1971.

31. SCMP 3322, p 2 (emphasis provided by us).

32. Mao Zedong: "Strategic Problems of Revolutionary War in China" (December 1936), "Military Writings," Peking, ELE, 1969, p 84.

33. Mao Zedong: "Strategic Problems...," op. cit., p 163.

34. Mao Zedong, "Circular Issued by the Chinese Communist Party Central Committee Regarding Peace Negotiations with the Guomindang" (26 August 1945).

35. Lenin: "Imperialism, Supreme Evolutionary Stage of Capitalism," Peking, ELE, 1966, pp 88,89.

36. Ye Jianying, speech to Conference on Organized Instruction Through the Commission on Military Affairs (end of January 1961), GONGZUO TONGXUN, 10, 20 February 1961.

37. Su Yu: "Great Victory for Chairman Mao's Guideline on War," RMRB, 6 August 1977, in SCMP, 6406.

38. NCNA, 1 November 1978.

39. NCNA, 1 November 1978 (SWB FE/5960/B 11/1, 4 November 1978).

40. Hsie Tchan:"The Atom Bomb, A Paper Tiger," PEKIN-INFORMATIONS 30, 25 July 1977, p 18 (emphasis provided by us).

41. "Our Army's Combat rules and Regulations Are the Product of Mao Zedong's Military Thought," CONGZUO TONGXUN 29, 1 August 1961.

42. Lin San and others (Translation by): "Yuanzi Wuqi Lunwen Ji," Peking, Guofang Shupanshe, 1958, 227 p.

43. Ti Chung-heng: article previously cited, p 25.

44. M. Geneste: "From Anticity to Antiforce," DN December 1979 in the column "Libre-opinion" p 37. See also Samuel T. Cohen and Marc Geneste: "Echec a la guerre, la bombe a neutrons" [Checkmate to War, the Neutron Bomb], Ed.Copernic, Paris, 1980.

45. A. Besancon, in: "Debate, What Does Brezhnev Want?", LE POINT, 369, 15 October 1979, p 83.

46. A. Besancon: article previously cited, p 85.

47. This idea was developed by Ye Jianying at the Conference on Organized Instruction Through the Commission on Military Affairs, article previously cited, see note 36.

48. P.M. Gallois, "Defeat Without Combat," POLITIQUE INTERNATIONALE 2, Winter 1978/1979, p 211.

49. L. Poirier: "Des strategies nucleaires" [Nuclear Strategies], Paris, Hachette (Essais), 1977, p 178.

50. "The atomic bomb is a paper tiger which the American reactionaries are using to frighten people. It looks terrifying, but it is not. Of course, the atomic bomb can produce widespread massacres, but it is the people who will decide a war and not one or two new weapons...", Mao Zedong, "Conversations with Anna-Louise Strong" (August 1946), in "Oeuvres choisies" [Selected Works], Peking, ELE, 1972, Vol IV, p 101.

51. A. Giradet: "Problemes contemporains de defense nationale" [Contemporary Problems of National Defense], Paris, Dalloz (Etudes politiques, economiques et sociales) [Political, Economic and Social Studies Series], 1974, pp 42-49. F. Fejto: "Chine/URSS. De l'alliance au conflit, 1950/1972" [China and the USSR. From Alliance To Conflict, 1950-1972], Paris, Seuil (Politique), 1978, pp 116,117.

52. See note 36.

53. Cited by C. Durand-Berger: "Le defi sovietique" [The Soviet Challenge], Paris, 1979, p 28.

54. In "Les problemes de l'histoire du PCUS" [Problems in the History of the CPSU], 1974.

55. LE MONDE, 17 November 1978.

56. In his contribution to the 7th Sino-American Conference on the Chinese Continent, E. Luttwak had already, in view of the enormous financial outlay required for a modernization of the PLA, advanced the idea of a "lend-lease" program in the event of American military aid (article previously cited, note 17, p 65.).

57. J. Alsop: "To Go or Not To Go There," DN, December 1973, p 8.

58. J. Guillermaz: "Histoire du Parti communiste chinois. 2. de Yenan a la conquete du pouvoir (1935-1949)" [History of the Chinese Communist Party. 2. From Yenan to the conquest of power (1935-1949)] first edition, Payot (Bibliotheque historique), 1968, Paris, Payot (PBP), 1975, pp 309-327.

59. GONGZUO TONGXUN, 5, 12, 25, 26, 27 and 29 of 1961 (respectively: 17 January, 10 March, 28 June, 13 July, 25 July and 1 August).

60. Reproduced in PEKIN-INFORMATIONS 32, 24 August 1978, p 10.

61. Reproduced in PEKIN-INFORMATIONS 41, 16 October 1978, pp 11, 17.

62. Article previously cited, note 37.

63. Passage borrowed from J.B. Margeride: "What is the Neutron Weapon?", DN, December 1978, p 104.

9399
CSO: 5100

CZECHOSLOVAKIA

DATA, MATERIAL USED ON NUCLEAR POWER STATION GIVEN

Prague TECHNICKY TYDENNIK in Czech 23 Sep 80 p 11

[Text] A press conference regarding the construction of the nuclear power plant in Jaslovske Bohunice was held recently in Bratislava. The presentation included a summary of technical data.

The second nuclear power plant in this locality bearing the designation V-2 is of the condensing type, with two VVER-440 type reactors and an overall output of 880 megawatts. It produces annually 5,950 gigawatthours, delivering 5,499 gigawatthours of electric power into the net. Overall construction cost according to project documentation is 8,262 million koruna, of which 1,878 million koruna is for building operations. According to an updated preliminary plan, the cost is envisioned to increase.

The preparatory stage commenced in March 1977, and a resolution of the presidium of the government stipulates that the first reactor block be completed by December 1982, the second block by December 1983. The project investor is the specialized concern Capital Construction of Slovak Power Engineering, the general developer for the project is Energoprojekt Prague. The principal equipment supplier is the Skoda plant in Pilsen, construction contractor is Hydrostav Bratislava.

VVER-440 type reactors burn slightly enriched uranium moderated and cooled by chemically treated condensate. Removal of thermal energy released in one reactor occurs through six circulation loops of the primary circuit, each of which contains a steam generator, a core circuit slide valve, two cut-off fittings and interconnecting conduit Js 500 millimeters. The primary condensate is cooled from 299 degrees Celsius and the released heat is used to produce secondary saturated steam of 4.6 MPa which drives two condensation turbines. Primary equipment is of Soviet design, secondary equipment comes largely from domestic plants.

During operation the power plant consumes approximately 28 metric tons of enriched uranium and replaces 5.2 million metric tons of coal used by orthodox thermal power plants. It uses up 22 million cubic meters of service water per reactor.

Structurally, power plant V-2 differs from the configuration of V-1 in volume and the system used in construction of the main production block. The volume is justified by increased nuclear safety requirements; the construction system was derived from Soviet projects. This system can be principally classified as an open

system of construction with maximum utilization of prefabricated concrete elements (ceilings) and components made of rolled profiles and reinforcing bars. In the hermetic zone the components are lined on one or both sides by carbon or stainless steel sheets. This system poses high demands on welding operations. In view of the requisite precision, the work inevitably had to be contracted for with engineering plants. A problem for manufacturers of both concrete and steel components is delivery and mounting of built-in parts, a task particularly taxing due to the requisite accuracy.

The selected system of construction called for utilization of heavy Potain-type cranes with 20 tons of lifting capacity and a radius of 50 meters.

Outline of the volumes of construction operations: excavations 3.2 million cubic meters, backfills 1.7 million cubic meters, ordinary concrete 72,000 cubic meters, reinforced concrete 364,000 cubic meters, masonry 19,000 cubic meters, partitions 20,000 square meters, coatings 300,000 square meters, plaster 390,000 square meters, pipelines 100,000 metric tons, steel structures 14,300 metric tons, lining, facing and panelling 95,000 square meters, concrete reinforcing bars 37,000 metric tons. Full operation started on the site last year, the current year is of key importance for the project.

8204
CSO: 5100

IRAQ

DAMAGE TO OSIRAK DOME REPORTED

Paris L'EXPRESS in French 18 Oct 80 p 125

[Text] Is Osirak undamaged? In this exclusive photograph taken on Wednesday, 1 October, with telelenses, at a distance of 800 meters from the French-Iraqi nuclear research center of Tamuz, the huge mass of concrete which houses the research reactor does not seem to have suffered any damage.

One must not rely on appearances. In spite of the fact that since their return the 75 French technicians, who were there when the bombing took place, have been enjoined to remain silent, some information has leaked. The Osirak project is going to be at least 1 year behind schedule. And probably much more than that. To quote one of the top French intelligence sources, the flyers who carried out the air raid were "magnificent pilots." Flying at a very low altitude, they aimed their devices--probably American made air-to-surface Shrike missiles--against the lower part of the concrete dome.

The result: on the outside some unspectacular damage which led nuclear physicists to conclude rather hastily that the bombing had failed. But people who specialize in concrete construction were quick to understand. The explosions caused cracks and a general weakening of the building. The reactor core is undamaged but the entire structure will have to be underpinned. And perhaps one will have to start all over again.

What was the nationality of those "magnificent pilots?" Israeli, as was rumored on the very day of the attack.

Today, it is known from more reliable sources that the two Israeli Phantom places took the shortest route and did not hesitate to fly over southern Syria before penetrating at low altitude towards Baghdad. Neither the Israeli official denials strangely made on the day after the raid ("antisemitic slanders") nor the alertness of the military censure in Tel Aviv have been able to conceal this essential fact: Israel took advantage of the war which is going on in the Gulf to win time and delay the threat of the "Arab bomb." Its commandos had already sabotaged the core of the La Seyne reactor near Toulon.

This now unavoidable setback in the Osirak project has prompted mild reactions in Paris. The anger of some officials is strongly neutralized by the relief felt by

by some highranking diplomats and by many technicians from the Atomic Energy Commission. They were having serious misgivings as the date when the research reactor would go into service came nearer; a reactor which could rapidly give nuclear military capability to Iraq. This, in spite of all the officials denials.

8796
CSO: 5100

NIGER

MEETING ON URANIUM PRICE DECLINE

Paris MARCHES TROPICAUX ET MEDITERRANEENS in French 10 Oct 80 p 2480

[Article: "Uranium: The Problem of Price Drop"]

[Text] The chief of state, Colonel Seyni Kountche, received in audience on 2 October a mining group made up of the president-director general of Somair, of the heads of Cogema and Kominak. The president of Somair, Jacques Giscard d'Estaing, said on behalf of the group that they came to report to the chief of state the results of the working session they had with the minister of mines. He added that they had come to Niamey on the invitation of the Niger minister of mines to participate in a discussion which takes place every year at about the same time in order to review together the uranium market situation and study the decisions having to do with the price determination of uranium during 1981.

On his part, the Cogema director Gobert indicated that the price drop that one observes on the international uranium market is due to a production capacity surplus as compared to the capacity for absorption or consumption in the world. The reason for this, he said, is that a number of electronuclear programs in some countries have been delayed while others have been reduced in scale or even cancelled altogether. Gobert expressed the hope that this steep price drop could be reversed at a future date which he hoped to see as soon as possible.

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