Sun Tzu at the Computer: Informationising the "Art of War"

Timothy Thomas

> The theoretical thinking of each era, including the theoretical thinking of our times, is a historical product. It has completely different forms in different times and has completely different content.[1]

Introduction

Unrestricted Warfare, a book written in 1999 by two Chinese colonels, introduced new ways of looking at war and new ways for an inferior force to defeat a superior force. The book appears in hindsight to have been one of the primary motivating forces behind the initiation of a new mode of thinking in the People's Liberation Army (PLA). The history of warfare demonstrates that nations that take the lead in transforming their militaries during periods of revolutionary change will seize the initiative in future war. Without such an impetus, the PLA may have fallen farther behind Western nations in the military arena. It is evident that the information age has generated a period of revolutionary change.

The Chinese concept of "informatized warfare" is the outcome of this transformation in the nation's mode of thinking. Traditional and mechanised methods of thought no longer work in an integrated and systems-oriented environment characterised by rapidly changing time-space relationships. As a result, the strategic focus of the transformation is "on changing the thinking style, introducing innovation in operational theory" according to one source.[2] Engel's prediction was correct. Modern times encourage change and the development of entirely different forms of military thought and content.

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China's White Paper: Formalising the Transformation Process

Evidence of this change is found in the Chinese White Paper on National Defense released in January 2009. China's military White Papers have traditionally explained the general direction in which the PLA is headed. The terms "mechanized" and "mechanization" were used only seven times in the 2009 version while the terms "informatized" and "informationization"[3] were used nearly fifty times, clearly showing where the emphasis is now placed. Only the terms "nuclear" and "defense" exceeded these information terms in word count.[4]

The catalyst for changing the PLA's thinking style emanates from Chinese observations of, and lessons learned from, US and coalition actions in the Desert Storm and Kosovo operations, and then from US/coalition actions in Afghanistan and Iraq. Traditional thinking was unable to meet the demands of China's requirements. The informatisation of the armed forces demands new modes of thinking that "possess more pronounced comprehensive, dynamic, flexible, effective, creative, and forward-looking thought functions"[5] than conventional military thought. Such demands result in completely new warfare concepts[6] that affect every branch of the military.

In the PLA's opinion, these changes are transforming the military from a closed force into a modern information-age power focussing on new missions and roles to include peace-keeping, military diplomacy, and joint anti-terrorism manoeuvres with other nations. These are some of the non-war military actions addressed in Unrestricted Warfare. Most recently, the PLA's Navy has accepted the mission of combating Somali pirates. Such changes not only indicate that China's military reform process is underway, but they also demonstrate that China is increasing its potential capability "to win local wars in the era of information,"[7] another focus of the 2009 White Paper.

The PLA's "informatized thought" transformation is the outer formal reflection of a much deeper reform of the entire Chinese military establishment, a transformation that will affect both doctrine and equipment. At the same time, the fundamentals upon which the PLA's thought process rests (use of the dialectic, comprehensive assessments, Sun Tzu's principles, stratagems, etc.) remain as the thought platform to which integrated and system-oriented applications will be attached. Perhaps in this sense not as much has changed as Chinese theorists like to posit. Mixing the old and the new is akin to having "Sun Tzu at the computer."

Informatised Thought: Can the Inferior Still Defeat the Superior?

The work of PLA Major Peng Hongqi demonstrates the application of informatised warfare concepts to age-old Chinese military principles that result in a new mode of thinking. His article, "A Brief Discussion of Using the Weak to Defeat the Strong Under Informatized Conditions," was written for the authoritative journal, China Military Science. The article offers nine ways that an information-based inferior force could attack an information-based superior force.[8]

Peng offers a number of suggestions to help an inferior informatised force (China) overcome a superior informatised force (the US). First, Peng states that it is imperative that the weaker side in an information confrontation find a way to limit a superior opponent's control over information. The weaker side must adhere to the active offence, he notes, especially in peace-time. This latter assertion contradicts the active defence emphasis of China's White Paper. Offence in peace-time provides the inferior side with a moment of relative equality that changes the traditional law of the weak always being on the defensive. Active offence is an asymmetric operation that requires properly determining key targets such as those that control data and make decisions. An inferior force must strike first or lose its opportunity to subdue the enemy. Attacks must be continuous once initiated, Peng notes, and both the military and the people must be mobilised. Society's informatised elite must be absorbed into the military's plans, since everyone with a notebook computer can become a combatant.[9]

In a surprise interpretation of United Nations (UN) regulations, Peng states that, according to the self-defence charter of the UN, "the inferior side carrying out a preemptive strike to subdue the enemy stems from the need to seize freedom of military actions, which is fundamentally different than a powerful enemy interfering in the internal affairs of another country and carrying out aggressive 'first strike' actions." Thus, Peng seems to imply that it is the RIGHT of an inferior force to attack a superior force first.[10]

A second way for an inferior informatised force to defeat a superior informatised force is through the manipulation of the latter's "price disparity," the point where psychological weakness occurs, and through the use of allies. Causing massive war losses and casualties may affect the will of the superior force to continue fighting before it affects the inferior force, since the former fears paying the price for victory more than the inferior force. This difference in "price disparity" was clearly evident to US forces in their fight with insurgents in Iraq. Winning the support of allies and destroying an opponent's coalition (through

persuasion and the use of the "righteousness of a war effort") are other ways the inferior can defeat the superior.[11]

It is imperative that the weaker side in an information confrontation find a way to limit a superior opponent's control over information. The weaker side must adhere to the active offence.

Third, Peng states that one must grasp the laws and circumstances of informatised conditions that guide information-based societies and militaries. One such issue to exploit is that only 20 per cent of systems actually play key roles in the sustenance of a society or military force. The other 80 per cent are only of secondary importance. The most vulnerable and most important of the 20 per cent are space systems, networked systems, and logistics systems, in that order. These are the systems that should be targeted. Another key measure, Peng notes, is developing counter-measures in conjunction with strategy.[12] After a well-conceived and integrated strategy is developed, attack planning can be set in motion.

Fourth, the enemy must not be allowed to control information superiority, especially "the control of perception." Control of perceptions allows an inferior force to induce information confusion in a superior force via information excess, information inflation, or information inundation. "Technological blind spots" (those areas not covered by satellites) can also aide an inferior force's plans. Studying the operating principles, systems, and conditions of an adversary's technical and theoretical conditioning allows Chinese forces to nullify some components of an adversary's overall perception system.[13]

Fifth, Peng believes an inferior force must conduct information reconnaissance and prepare confrontational responses as asymmetric checks and balances on an opponent's strategy. With regard to the element of time, an inferior force must use the slow to control the fast. An inferior force must control an adversary's combat preparations. Protracted control over an enemy is a means by which effective control is maintained over time and space. Protraction also requires demonstrating counter-measure potential to a superior opponent; otherwise the adversary would have no reason to go along with a protracted fight.[14]

Sixth, much of an inferior forces' reconnaissance can now be done surreptitiously on computers through the use of hackers or other civilian means. This enhances the PLA's ability to claim plausible deniability

when accused of being part of the attack. Forces begin engagements and reconnaissance well before a conflict emerges. Peace-time collection of key information on another force's data collection and processing systems is vital to success and offers an opportunity to act before a war breaks out.[15] Peng states that one should

> …treat the peacetime struggle for information supremacy as a "genuine, perpetual, and never-ending battle" in preparations and implementation. It must practice strict information secrecy. The essence of information confrontation is to gain as much enemy information as possible and keep the enemy from gaining information on one's own side.[16]

China appears to have performed Peng's vision well if the number of accusations levelled against the mainland is any indicator. India, South Korea, Germany, Australia, the US, and others have all accused China of penetrating their computer systems. The Chinese government has denied all of these accusations against them. Peng also notes that "the only way the inferior side can compete with a powerful enemy is by taking full advantage of peace-time to energetically elevate its material and technological foundation."[17]

Seventh, Peng states that the process through which information is understood (and how it can be manipulated) is important for nations to understand. The struggles between reconnaissance and counter-reconnaissance and deception and counter-deception are indicative of why this requirement is so important. One side can collect huge amounts of information on the other side, but if 50 per cent of that information is deceptive input, then the side collecting information can be placed at a significant disadvantage.[18] Verifying data reliability is a requirement that cannot be delayed.

Eighth, Peng writes that the initiative in battle can only be won when "external potential" is achieved. "External potential" means using clandestine special operations (hackers?) to disrupt enemy plans, using the media to advertise the crimes of an enemy force, and applying external pressure on the enemy from other countries. External operations are important because science and technology are shrinking the power of spirit, strategy, and other non-technical elements. Outside pressures must be increased on these elements as a result.[19] With this argument, however, Peng infers that if technology and strategy are joined in the efforts of the inferior to defeat the superior, then "external potential" is an element of Chinese strategy.

Finally, Peng contradicts many of his colleagues by noting that at times there is too much emphasis placed on so-called "trump" weapons. Weapons alone cannot decide a conflict. They can be countered by other "trump" weapons that also contain asymmetric superiorities. Inferior forces are required to find technological niches and occupy a small space in that field if they are to maintain some type of counter-force (and, thus, balance) when dealing with a superior opponent. Optimising the use of existing technologies, using strengths to make up for weaknesses, putting together things that are weak to make something strong, and using structural changes to enhance combat strength are other effective measures.[20] Perhaps China's ability to control the US dollar may some day fall into this category.

Peng's article indicates that informatised war is a confrontation of not only technologies but also knowledge and the information-age talents of people, the "overall confrontation of the two combined."[21] The slant of Peng's article is very important since it offers thoughts foreign to many US analysts who don't (can't) think as Peng does due to their own prisms and limitations (legal, ethical, cultural, etc.). Peng's thinking resembles the unrestricted warfare thought process.

Peng's analysis of a simple thought from the era of Sun Tzu, how "the inferior can defeat the superior," demonstrates how the PLA's informatised thought has not thrown out the baby with the bathwater. PLA theorists continue to look at new technological advances, in concert with China's ancient principles of war that can be integrated into these informatised developments. Peng is one of many authors who have looked at the use of strategies in informatised warfare. A Jiefangjun Bao article in January 2008, for example, examined warfare strategies for network attack and defence, to include "preserving and breaking," "attacking and defending," "peculiarity and straightness," "showing the shape," "form and force," and "using space" to influence the struggle over network space.[22]

Changing a "Mode of Thinking"

The information age offers Chinese leaders a unique chance to make a "quantum leap" in military affairs and bypass many long years of research and production of mechanised equipment. The apparent acquisition of tetrabytes of information from foreign systems (German, Australian, Japanese, etc.) is but one indicator of this enhanced leap in capabilities.

However, the transformation from a mechanised to an informatised force requires qualitative changes to the military's mode of thinking as well. The PLA has

to learn how to apply new technologies and to develop new thinking styles quickly or risk falling further behind. Military leaders are confronted with digital, high speed versions of command information, control information, early warning information, survey information, intelligence information, systems information, and evaluation information that change the way operations are conceived and executed, according to several prominent Chinese authors, and requiring new thinking.

Targets have also changed. The foci of Chinese information attacks are enemy command centres, information systems, and information capabilities rather than troop formations as in the past. Battles will be fought over information resources at both the tactical and strategic levels. New modes of thinking are required to protect operations, logistics, and other associated areas. [23]

Li Deyi, deputy Chair of the Department of Warfare Theory and Strategic Research at the PLA's Military Academy of Science, highlighted what must change (and why) in the PLA's mode of thinking. He stated:

- Changing the mode of thinking is a requirement for ensuring victory in future war. It moves conventional thinking from individual system engagement toward systemized thought and system-to-system engagements. Group and organizational decision-making replace individual thought.
- Strategy and technology are unified for planning purposes. The information superhighway can produce information misdirection, spread the fog of war, and interfere with, and disrupt, the enemy's strategic perceptions. Electronic deception, camouflage, and interference along with viral infiltration and interference with/deception of satellites can cause enemy errors in judgment.
- Systems methodology has broken armies away from singular cause and effect determinism that is characteristic of conventional warfare. Systems use information, information technology, and information system modes of thought to reduce an enemy's combat effectiveness.
- Information and information technology determine combat effectiveness, victory, and defeat in war and stand alongside materials and power as one of the three major strategic resources.
- Information deterrence (that is, information technology, weaponry, and resource deterrence as well as counter-information deterrence) are new modes of strategic thought and are important new deterrent forces, just behind nuclear deterrence, in achieving national strategic objectives.
- New modes of thinking will enable breakthroughs in control theory.

- New modes of thinking integrate information reasoning, analysis, strategic capabilities, and the experiences of warfare with information collection and storage, information processing, information transmission, and the logical reasoning capabilities of computers and artificial intelligence. C4ISR system decision-making is scientific, collective, real-time, and precise.
- Systemized warfare is represented by activities that have organization, planning, objectives, measures, layers, and steps. It is networked thought built on a network foundation. Networks are systems so systemization thinking is also "networkization" thinking, another new mode of thought.
- The design of military system architectures, defensive alignments, and attack countermeasures must utilize qualitative and quantitative analysis. Precise analysis, planning, design, guidance, and management are the requirements of the man/machine process for new thinking.[24]

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Li is not the only Chinese leader to emphasise the need for new thinking styles. Major Gen Zhan Yu, commandant of the Shijiazhunag Army Command Academy, believes new problems will emerge that transform solutions based on books toward solutions based on facts. This transformation requires a change from conservative to creative thought. Personnel must discuss what has never been discussed and do what has never been done. This is not a thought transformation that deals with emergencies but rather with the long perspective. Finally, this is a "systems engineering" project and ways of thought must change from "singular" or individual areas to "systemic" thought that is integrated.[25]

Another leader emphasising change was the Dean of the Department of Military Political Work of Shijiazhunag Army Command College, Senior Colonel Deng Yifei. He wrote that change requires foresight, flexibility, effectiveness, and awareness of how information resources are expanding infinitely, being transmitted in an unobstructed way, and being shared without time differences. Information technical tools enable more complex and precise planning, release

the energy of thinking, and inspire creative thought. Information resources are a "multiplier" of thinking effectiveness.[26]

War Engineering: An Example of a New Mode of Thinking

Informatised thought has led to developments in systemic thinking or, as Zhan Yu noted, "systems engineering." A close relative of systems engineering is the Chinese concept of information-age war engineering. Maj Gen Hu Xiaofeng, a professor in the Information Operations and Command Training-Teaching and Research Department at China's National Defense University, noted that the age of informatisation requires new approaches to the study and management of information-age wars. War engineering is one of these new approaches.[27]

War engineering arose, Hu contends, from the requirement to find a method to study, manage, and control information-age war systems. Chinese war engineering is "a method of systems engineering that studies, designs, tests, controls, and evaluates war systems and that is guided by systematic thinking, based on information technology."[28] The most important element of war engineering is to maintain control of war systems. Through war systems, control of the course of operations is possible.[29] The concept is centred on managing warfare and has total victory as its goal. It is quite different from the US concept of "capabilities engineering" according to Hu.

War engineering looks at combat as a non-linear, complex, adaptive system. War engineering studies, designs, and manages war requirements, theories, experiments, and processes. It has five parts: requirements, planning, testing, control, and evaluation engineering. Control engineering, the most important element, consists of strategic, campaign, and tactical command information systems which monitor situations, control decision-making, handle anomalies, and evaluate results.[30]

Hu concluded his thoughts on war engineering by quoting Engels, who noted that "it wasn't the inventors of new material measures; it was the first person who, in the correct manner, used a new measure that had already been invented." China is searching for a way to be the first to use US inventions (the internet, information war, etc.) to its benefit and prove Engels correct. China hopes to be able to manage and control war instead of reacting to it and to make war-time changes in advance (through simulations) instead of making changes as war requires or demands. War engineering will be one of several catalysts that promote the further development of information war studies as China transforms its military from a mechanised to an informatised force.[31]

System Attack Warfare and Innovative Thought: The Essence of a New Mode of Thinking

New modes of thinking require, above all else, creativity and innovation. Without them, thought will remain stagnant. Dai Qingmin, the director of the All-PLA Informatization Consultation Committee (and former head of the Electronic Warfare Department of the Chinese General Staff), wrote an important article regarding innovation and informatised thought in 2007 in China Military Science. He discussed information attack theories, not active defence theories, and he stressed the importance of innovative developments.

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Innovation, Dai writes, is the precursor to the further development of military technology, weapon modernisation, organisational restructuring, and changes in military practice.[32] The basic task of innovation is to "reveal the law of informatized warfare, put forward a corresponding strategy for informatized warfare, and formulate the principles for informatized operations."[33] Innovation creates new transformation theories, systems integration theories, and service and arms building theories.[34] Technical informatised innovation in the information age must take into account issues not considered in the past in China, Dai notes, such as fair competition, a sound investment mechanism, a legal system for protecting intellectual property rights, and an effective human resources cultivation mechanism.[35]

In another article, Dai wrote that one innovative change is to take "system attack warfare as a guide." Coming from a person of such renown, this is a very important statement and one that should concern the West. There is no mention of active defence in Dai's writing here, just attack options. He also stated that it is imperative to grasp the initiative in future war, take information dominance as a core principle, and develop informatisation operations theories ahead of time.[36] These actions require an objective analysis of the contradictions that exist in the current stage of informatisation,[37] and the focus should be on those that can be exploited. These points and concerns differ markedly from mechanised thought,

where China stressed active defence and the interest in attacking only after first being attacked. Now, Dai states:

> System attack warfare is the basic thought of our armed forces for fighting operations in the environment of informatization. System attack warfare stresses the use of asymmetric offensive actions to seize battlefield control in all battle domains, using elite forces and composite operation means that mix hard and soft attacks to focus attacks on the core and weak links of the enemy operation system…[38]

Zhang Zhiping and Ye Haiyuan mentioned innovation in their work. They stated that innovation must include new viewpoints, concepts, and thoughts. Operations theory, for example, might include information warfare, spatial warfare, precision operations, and integrated joint operations. The development of strategies for operational issues will be particularly important for future informatised warfare concepts.[39] Again, the focus is on combining technology with strategies as others (such as Li Bingyan, cited in Decoding the Virtual Dragon) have repeatedly stressed.

Maj Gen Zhan Yu, mentioned earlier, offered other thoughts on innovation in operations theory. He stated that systemic destructive attack must be emphasised; information must take a leading role; and firepower will control the process of operations, with precision operations the highest state to be pursued. The PLA's operational style must change to the joint, non-linear, precision, and non-engagement (no direct contact) types. Finally, combat capability must undergo a transformation in command and control, information operations, precision strike capability, strategic manoeuvre, fast assault, special operations capability, and comprehensive defence capability for the conduct of informatised warfare. This will enable a qualitative leap in military organisation and force structure.[40]

Naturally, there are serious problems that the PLA will have to overcome as they change modes of thought from traditional to informatised issues. These include structural problems such as breaking down section barriers and department interests; the current inability to independently innovate; and the clarification of unclear demands for the construction of an information network.[41] Military innovations must solve these problems. The fragmentation of interests must end.

Culture Affects Innovation Trends

China's new mode of thinking will develop differently than would a corresponding transformation of thought in the West. This is due to the impact of culture and history on innovation and due to the development of two types of thought processes, metaphysical and dialectical, according to Chinese analysts.

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Those involved in introducing new modes of thinking in the PLA repeatedly stress the importance of innovation and creative thinking. Innovation affects culture and vice versa. Authors Xiao Dongsong, a doctoral student in Military Studies at China's National Defense University, and Li Qing, an associate professor in the Teaching and Research Section for Political Theory at the National Defense University, wrote about the effects of culture on innovation. Xiao and Li defined culture as "the organic unity of knowledge systems, value systems, and methodological systems of thought."[42] Knowledge is gained from cognitive reflections on the essence, patterns, properties, and features of the external world. Values are reflected in the way things and processes are used, resulting in a series of "value reflections, value assessments, value principles, and value concepts to form a value system for society."[43] A methodological system of thought is then created out of "how we know and by what means we know the external world."[44] Informatised thought (such as that produced over the Internet) has greatly changed "how we know" and has created new modes of thought. Wikipedia is perhaps the best example of putting a new spin on "what we know."

Knowledge system innovation includes new phenomena that must be recognised, analysed, and summarised. This will require that existing knowledge categories for military actions, truth, philosophy, and information war be processed and refitted. Existing categories of knowledge (ethics, etiquette, benevolence, justice, gain and harm, material substances, actions, systems, control, information, etc.) must adopt new measures as well.[45] "Value system innovation" is the result of different assessments in attitudes, interests,

enthusiasms, and mental dynamics. Value assessment systems of different societies are reflected in conditions such as geography, demography, customs, and means of production. It is also reflected in how God and people, individuals and groups, mind and strength, and morality and gain are related (and which are the most important to a culture).[46]

As a methodological system of thought, culture provides military theory with innovative tools for thought and with the logical means and patterns for processing information. As an example, Xiao and Li contrasted Greek and Chinese thought:

> The early Greek method of thought was a simple and substantial way of thinking, in that the essence of things was within the things themselves. As such, it held that one should understand the substance, that is, the thing in and of itself in order to grasp the essential nature and pattern of said thing. By contrast, the method of thought in Chinese antiquity was a simple and relational way of thinking, in that the essence of things was reflected in the relationship between a given thing and other things. As such, understanding a thing meant understanding various types of relationships. These two different methods of thinking provide two different anchor points for thinking; one is substantial, and the other relational.[47]

Xiao and Li also contrasted views in the West and in China on the concept of war. They noted:

> The West placed emphasis upon seeing war as an entity, in that new viewpoints, ideas, and theories were extracted during the process of bringing war in and of itself to light. China, however, placed war within a larger relational world, and extracted new viewpoints, ideas, and theories by means of revealing the relationships between war and politics, war and economics, war and the natural environment, and war and leadership.[48]

In terms of logical thought patterns, the West uses metaphysics which is based on analysis and decomposition according to Xiao and Li. A subject is understood as a static and isolated presence that is broken down into a series of mutually independent elements and these elements are analysed as a means of gaining a precise understanding of the subject. China uses dialectical thought.

Here the logical patterns of thought are represented by a high degree of analysis, with a high degree of integration. Understanding a subject is seen as a presence with common links and actions. A comprehensive examination of the relationships between the possible and actual, history and the future, and the whole and the part is performed in order to gain an understanding of the essential nature and pattern of things.[49]

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New modes of thought are affected by this cultural thought process. A person brought up in the Chinese system will analyse information-age developments differently than someone brought up in a Western society who performs the same analysis.

One's level of expertise in military practice also affects one's attempts at innovation. In the area of military practice the PLA is weak since it has not fought a high-tech war yet. But the PLA's work on war theory appears strong and focussed on inculcating information-age technologies into the force. The PLA is attaching particular significance to an examination of philosophical, historical, and scientific culture. Philosophy considers the connections and development of various aspects of nature and society; military history helps summarise the lessons of military culture; and science, in particular the impact of technology (with information technology at its core), has caused fundamental changes in both societal and military activities. Theories of information war and associated theories (Third Wave, etc.) have evolved from these developments.[50]

The use of technology (such as the development of simulations) has led to a closer understanding of military practice and a corresponding move away from Confucianist practice. Technology has encouraged China to move away from traditional military thought and toward an advanced culture, one that takes into consideration new developments and results in innovation in military theory.[51]

The development of an advanced military culture will increase the knowledge level of officers and troops, their scientific knowledge and culture levels, and Chinese combat power. At the same time, the Marxist value system must be updated and enriched in areas such as patriotic devotion. In a reversal of traditional values and modes of thought, now the qualitative must be emphasised over the quantitative and effectiveness emphasised over fairness.[52]

Final recommendations by Xiao and Li included the following:

> Continue to create, learn, and understand new methods of thinking. Pay attention to the latest changes and results of research and understand the content and essential characteristics of modern methodology.
>
> Strengthen the systematic buildup of methods of thinking to include philosophical, sociological, physiological, and psychological methods; and combine and integrate them. Study the structure, logic, and means by which this new organic system can be employed.[53]

Conclusions

> In the information age, creative thinking is the pivot point of thinking for making innovations in military theory and practice, and will become the "golden key" to the door to success and victory in war.[54]
>
> —Deng Yifei

Innovations and creative thinking, in the view of the PLA, are the keys to victory in future war. This requires escaping from the grasp of mechanised thought and finding new and innovative ways to implement "informatised thinking." Innovations involve finding new ways to apply ancient stratagems to information-age developments. In a certain sense, a new mode of thinking is an asymmetric answer to a competitor with technological prowess but who has failed to apply these advances to their fullest. Engels belief that "it wasn't the inventors of new material measures; it was the first person who, in the correct manner, used a new measure that had already been invented" could find new applicability in the information age. Sun Tzu's principles integrated with systems thinking may provide such a cognitive advantage.

The PLA is moving from a mechanised to an informatised force as fast as possible. For example, the PLA's University of Science and Technology (UST) reports it is cultivating junior commanders for joint operations under informatized conditions. Five training systems have been formed, to include a "command information engineering" system. Courses have increased their content on complex electromagnetic environments, information security, and psychological operations.[55]

Peng's analysis and recommendations on how the inferior could defeat the superior were the closest examples of an actual way to apply Sun Tzu-type

methods to the information age. Li Deyi listed twelve changes in the PLA's mode of thinking that must be integrated into informatised thought. Systems methodology, information deterrence, control theory, and other factors were highlighted. Some of his recommendations share a common reference point with Western information age theory while others do not. Those in the latter category should be closely examined by Western analysts for their potential implications or use.

Innovations and creative thinking, in the view of the PLA, are the keys to victory in future war. This requires escaping from the grasp of mechanised thought and finding new and innovative ways to implement "informatised thinking."

Gen Dai's new mode of thinking focussed more on systems and innovation than on applying old principles of war. He stated that to grasp the initiative in future war, China must take system attack warfare as its guide and develop informatisation operations theories ahead of time.[56] In accordance with this latter idea, it is best, some Chinese believe, to worry about things before they happen instead of after the fact when it is too late. War engineering, innovation, and creativity are required ahead of time in order to affect efficiency, management, strategy, organisation, and theory with information means.[57]

Culture provides military theory with some of the tools for innovative thought. Xiao's and Li's contrast of Greek and Chinese thought was noteworthy. While Greek thought emphasises understanding the substance of something, Chinese thought lays stress on thinking of things in relation to one another. As the authors noted, these two different methods of thinking provide two different anchor points for thought; one is substantial and the other relational.[58] It is, thus, to be expected that Chinese theoreticians will be looking for all types of relational aspects associated with informatised thought.

While the West uses metaphysics based on analysis and decomposition, China uses dialectical thought. The dialectic enhances the development of counter-measures merely by its thought process of thesis, anti-thesis, synthesis. This requires that Western analysts conduct a close analysis of the links and actions that the PLA stresses and how they are being integrated into the force. A comprehensive examination of the relationships between the possible and actual, history and the future, and the whole and the part is performed in order to gain an understanding of the essential nature and pattern of things.[59]

In summary, it is quite apparent that the PLA's approach to informatised war will vary from Western modes of information-age thought. This is not unexpected. Perhaps, however, too few Westerners appreciate this fact and ignore such developments at their risk. To better understand the Chinese and find ways to work together with them (or to counter any potential aggression), it is strongly recommended that Western analysts study the Chinese as they study us—in detail. We must learn from them as they have learned from us. We can start by better understanding their new modes of thought—and warning them of some of the perils they are contemplating and introducing.

Notes

1 Selected Works of Marx and Engels, Vol 4 (Beijing: The People's Press, 1995, Second Chinese Edition) p. 248, as quoted in Deng Yifei, "A Revolution in Military Thinking in the Information Age," China Military Science, No. 6, 2007, as translated and downloaded from the Open Source Centre (OSC), document number CPP20080527563002.

2. Zhan Yu, "Strategic Considerations for Army Transformation," Beijing Zhongguo Junshi Kexue (China Military Science), August 25, 2008, pp. 86-97, as translated and downloaded from the Open Source Centre (OSC) website, document number CPP20080825563003

3. The term "informationization" is equivalent to the English rendering "informatization."

4. "Full Text: China's National Defense in 2008," Xinhua in English 0208 GMT January 20, 2009, as downloaded from the Open Source Centre (OSC) website, document number CPP20090120968111.

5. Li Deyi, "A Study of the Basic Characteristics of the Modes of Thinking in Informatized Warfare," Zhongguo Junshi Kexue (China Military Science), August 20, 2007, pp. 101-105, as translated and downloaded from the Open Source Centre (OSC) website, document number CPP20081028682007.

6. Ibid.

7. "Military Support to Peaceful Development," China Daily, January 6, 2009, at http://www.china-wire.org/2009/01/military-support-to-peaceful-development.

8. Peng Hongqi, "A Brief Discussion of Using the Weak to Defeat the Strong under Informatized Conditions," China Military Science, No. 1, 2008, pp. 142-148, as translated and downloaded from the Open Source Centre (OSC) website, document number CPP20080624563002.

9. Ibid.

10. Ibid.
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