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Editorial

In this issue of *POINTER*, issues on training, technology, strategy and international law are included for your reading pleasure.

In our first article, COL Tay Lim Heng writes on *Technology's Role in Training* and updates the reader on the training technology currently available in the Army. *Training a World Class Navy* by MAJ Lim Khia Teck emphasises the need for a strong and well trained navy to protect Singapore's sea lanes and to be prepared to shoulder additional responsibility together with its ASEAN counterparts for peace and security in the region. *Computerised Battlefield for the Army in 2016*by MR Lee Yeaw Lip gives a preview on the use of computers in the battlefield of the future.*Unmanned Warfare*, by MAJ Tew See Mong, examines the viability of using unmanned equipment in battles in the face of increating manpower shortages.

LTC Sng Seow Lian, in his article, *Women in Combat - What's Wrong With That*, aruges the case for allowing women to take part in combat at the battlefront as combatants and not merely in the support roles that they are currently accustomed to. The article *Gulf War: A Case of Indirect Strategy* by MAJ Tan Suan Jow focuses on the use of indirect strategy by the coalition forces in securing victory over Iraq during the Gulf War.

The final article for this issue of *POINTER*, *International Law and the Use of Force: Armed Intervention in Internal Affairs* by MAJ Neville Fernandez, examines the use of rmed intervention by external powers in the internal affairs of a country.

The book, *Scapegoat: Percival of Singapore* is reviewed by Mr Bernard Loo in the Book Review column. Anwar Sadat, who sought peace in the Middle East, is the subject of our personality profile. The Selected Books and Reports section highlights John Naisbitt, author of *Megatrends and Megatrends 2000*.

On a final note, we would like to encourage more views from our readers on the articles appearing in *POINTER* and other professional issues. The column, Letters to the Editor, has been created just for this purpose, and published letters will be awarded a token of appreciation.

Technology's Role in Training

by COL Tay Lim Heng

INTRODUCTION

Training technology today truly offers the modern Army a vast array of options to meet its operational training needs. When BG SIN BOON WAH, the former Commander of Singapore's Training and Doctrine Command (TRADOC), addressed this forum (PAMS) in 1995, he described how simulation technology was being applied in the Singapore Army. Some of the items he spoke of were then only on the drawing board; but since then, several of the projects have progressed onto the development stage, and will be delivered over the next two to three years. Apart from simulation technology, we are also continuing to invest heavily in information technology or IT. Indeed, we have found that IT has provided us with many ways to enhance the quality of military education and training management.

I would like to talk in general about some of the opportunities offered by Simulation and Information Technology. I will touch on why Singapore specifically has chosen to invest in training technology, and provide you some thoughts about introducing technology into training.

TODAY' S OPPORTUNITIES

I am certain many of you are already familiar with the general technology available to support training. Rather than describing these at length, I would like to talk about the opportunities which the training community can look forward to harvesting from an investment in training technology.

SIMULATION TECHNOLOGY

Earlier generations of simulators for ground forces tended to be video-based due to technological limitations or the high costs associated with image processors. Such video-based trainers are effective when fitted into a transitional stage of training between classroom lectures and actual field training, or for refresher training. They can serve as a training gate to ensure that fundamental skills are in place before proceeding onto more complex training manoeuvres involving many more troops and equipment.

Video-based training simulators however can become predictable, and offer limited flexibility in varying the scenarios without incurring high filming or programming costs. A number of significant advances in simulation technology over the last five years has expanded the potential for Army training.

> a. Firstly, representation of terrain details from the ground-level has become much more realistic and simulators can process and display larger numbers of computer generated vehicles and soldiers. This is made possible through cheaper and more powerful image processors.

> b. We now have the potential to conduct larger scale training using simulators through the establishment of common standards and protocols such as Distributed Interactive Simulations (DIS) and High Level Architecture (HLA) as defined by the US Modelling and Simulation community.

> c. Computer-generated semi-automated forces have become more sophisticated and can provide a realistic "thinking" enemy for troops to train against, or own forces for the training of commanders in applying tactics.

The increased levels of realism afford ground forces much greater scope for the use of training simulators and simulations.

a. Simulators will allow us to present troops with situations which might be too difficult or dangerous to conduct in the field. Force-on-force training using laser engagement systems such as MILES, for example, do not produce the same signatures as live rounds. In a virtual simulator, though, troops can see and hear reproduced weapons' effects much closer to the real thing. Virtual reality offers us the potential to fully immerse combat leaders into a training situation, and to interact with computer generated entities in the virtual environment. These developments will benefit the dismounted soldier training in particular, and can be used for judgmental training in unconventional roles.

b. We now also have the potential to conduct true combined arms training. In the virtual simulator environment, we can link armour simulators to artillery simulators or helicopter simulators, as is currently being developed under the US Army's Combined Arms Tactical Trainer (CATT) programme. During field training, instrumentation will enable us to better simulate the combat effects of close air support, artillery or mines on manoeuvre units.

With this greater flexibility and realism, we can expand the use of simulation beyond serving as a training bridge before field training. Networked simulators will allow us to conduct collective training in parallel to field training, while live simulation and instrumentation will allow us to enhance the realism of field training. This may result in a higher proficiency of skills.

A second major area of benefit from the use of simulation technology derives from the ability to conduct better training analyses and after action reviews.

a. Trainees undergoing simulator training can view a video replay of all their actions with objective analysis of their training performance. We have seen such methods used for many years in the sports arena, and it will certainly enhance military skills training. We have also found that providing trainees with quantifiable performance measures - a score - appeals to the video game culture which is prevalent among our youth.

b. Trainers benefit from having this second perspective - another pair of eyes - to appraise the performance of their soldiers. For example, our Individual Marksmanship Trainer (MT) provides the trainer with an important diagnostic aid and enables him to focus on soldiers who have not grasped the fundamentals of shooting at an early stage. In the past, this was something which only the practised eye of a very experienced instructor might be able to pick up.

A third area of benefit from the use of training simulators is the gold mine of performance data which can be extracted for operational testing and evaluation. The Air Force, for example, is able to extract data such as the best combination of range or attack speeds and angles for a successful missile engagement which may not be apparent to an individual pilot. The collective experience of many pilots going through the same simulator can then be collated to determine what the most successful tactics are. For the Army, the potential is even greater, namely to identify whether there have been changes in the main determinants of battlefield success out of a complex system of combat systems; as well as to experiment with future combat systems in training before major decisions are made.

INFORMATION TECHNOLOGY

There are also new training opportunities opened up through the proliferation of multi-media personal computer ownership, and the exponential growth of Internet usage. This is the second major area of training technology development for the Singapore Army. We are, in fact, leveraging of an aggressive school computer literacy programme, and the establishinent of a national IT network linking every home on the island.

We see opportunities to exploit information technology in the following areas:

      a. self-paced learning for soldiers using computer and video based training

      b. establishing an electronic library of instructional materials, and doctrinal references

      c. performance support for commanders and soldiers at the workplace

Today's computers and video offer instructors the means to present multi-media information to trainees on a whole host of subject matters. These have been possible with training films and videos but in the last few years, it has become feasible for desktop computers to also deliver high resolution graphics, video images and sound. Computers also allow instructors to include interactive elements such as quizzes to test a student's understanding before proceeding to the next stage. Computer based training (CBT) can include structured scenarios which require the student to plan or make decisions. At the upper end of the spectrum, this can be similar to a wargame which allows the student to apply concepts and to examine outcomes. Other complex applications include PC-based simulations which allow the trainee to practise troubleshooting or maintenance procedures on a computer generated model.

From an efficiency viewpoint, computer based training allows students to learn at their own pace, which has been shown to reduce training time by as much as 30% on average, since faster students need not be held back by the pace of the slower students. CD-ROMs now allow such training materials to be conveniently packaged for distribution, and in the near future, high bandwidth fibre optic networks will allow electronic distribution, direct from the Training School to the soldier's home or office.

Such networks can also improve soldier access to doctrinal manuals and references, or supporting materials, such as training plans and exercise files, needed for the conduct of training. These ensure that training materials are kept updated, without the heavy administrative burden of replacing or amending paper volumes. The open structure of the Internet has certainly demonstrated to us that it is a suitable medium for promoting self-paced learning.

Performance support systems are still in a developmental stage but offer tremendous potential in providing on the job assistance to commanders and soldiers. We are currently developing a system which will assist us in the conduct of training management and planning. We aim to capture the collective knowledge of experienced personnel and make it available to more juntor staff to assist them in their duties. This will enable us to focus training time on more value added areas, rather than on administrative procedures. Other simple forms of performance support systems include the help tools and wizards found in word-processing, spreadsheet or graphics software packages today. We have found that such job aids reduce the need to send staff for formalised training.

WHY SINGAPORE HAS CHOSEN TO INVEST IN TRAINING TECHNOLOGY

Our two main challenges in providing effective and efficient training are:

      a. Providing a comprehensive foundation for our junior leaders - Officers and SpecialIsts or NCOs - within a short period of time, so that they can assume unit appointments and begin collective training with their soldiers early.

      b. Maintaining the proficiency of individual and collective skills among our National Servicemen in a thriving economy which competes for their available time. (Our National Servicemen or NSmen in short are enlistees who have finished their active service but are still part of the operational ORBAT).

We see investment in training technology as an essential means of achieving these challenges.

Higher Levels of Education Allows for Shorter Learning Curve

First, we have found that overall levels of education among the conscripts whom we enlist every year has improved dramatically over the last decade. Over the next few years, the proportion of high school leavers (A Level/Diploma Holders) who will join us annually will form some two thirds of the intake. These new recruits are generally faster learners and are more conversant with IT.

Computer-based self-paced learning enables us to reduce the duration of training courses, especially for mature students. Alternatively, the self-paced learning approach allows us to cover more ground by exposing our junior leaders to military technology and combined arms knowledge. In addition, we are building up the support structure to enable junior leaders to further their military knowledge beyond the training schools. We are in fact exploiting both the Army's internal networks, as well as the national IT networks which will benefit our NS personnel who have completed full-time service.

Our aim is to translate these efforts into junior leaders who are conversant with the three Services as an integrated fighting system, and individually more knowledgeable about their own specialist fields. Continuation training for junior leaders in units, for example, has always lagged behind that provided in our training schools, largely because the emphasis and attention of our unit commanders has been on collective training. Our thrust is to export learning from our training schools to the individuals in units to support this important requirement. For our NS men who are no longer on full-time duties, the provision of an on-line link enables them to remain current and updated in their military specialty before and after their annual refresher training.

More Realistic Training Through Simulation Technology

We are also supporting the training of our commanders through simulators. One example of this is the Section Marksmanship Trainer or SMT which allows the Section Commander to replay and to immediately analyse the effectiveness of his section in a firefight, down to the individual soldier. Unlike live fire training where the tendency is to expend all rounds in the magazine, the SMT allows the Section Commander to exercise proper fire control, to concentrate his section's fires on the more important target and to halt firing when the enemy has been dealt with, according to the tactical situation.

High Proficiency at Low Cost

The Army is always concerned that our NS men are able to maintain a high level of proficiency. I have discussed the value of information technology in refresher training. I would like to elaborate more on how simulators are also being used for this purpose.

> a. NS men undergoing refresher training using the Individual Marksmanship Trainer perform as well as if not better than in the previous system which relied exclusively on live fire ranges. By converting one third of our NS marksmanship refresher packages to simulator training, we will save considerably on the administrative overheads and time spent in preparing for and conducting a live fire range. The time saved can thus be channelled to collective tasks during annual refresher training. We are also looking at whether the diagnostic features can be improved even more so that NS men can undergo this training on their own at our reservist clubs.

> b. Our armour tactical trainer enables tank crews to undergo tactical gunnery refresher training in half the time or less compared to field training. Those of you from the armour fraternity would appreciate the expense and administration involved in getting tanks and armour fighting vehicles prepared for field training, and the cleaning and maintenance involved afterward. When those tank crews trained using the simulator go onto live fire, we noted that they registered improvements in accuracy and reaction times.

c. Our NS Forward Observers (FO) can also hone their skills through our Artillery Fire Control Training Simulator (AFCTS). Without this system, the resources needed to provide a live fire unit for the 40 or so times a year during which NS FOs come in for refresher training would prove simply prohibitive. We estimate that we save up to $l0m a year on 155mm rounds by using the simulator instead.

Overcoming Land Constraints

Apart from cost and administrative time savings, one of the biggest returns gained through the use of training simulators has been in terms of training land. Our main island measures only 570 sq km, about one third the size of Oahu. Of this, we have the use of only 30 sq km of land for live firing training. We have been fortunate to have been granted access to overseas training areas by various defence partners. These cannot fully replace the need to support skills and refresher training locally. We certainly cannot afford to send our NS men for overseas training every year.

Our artillery and armour training simulators have given us the biggest savings in land usage, in view of the large safety templates required when firing artillery and tank rounds. Without the two simulators, we would need at least 20 sq. km more locally, with very limited angles of fire. If we wanted to achieve the flexibility to engage targets on the move in any direction, as provided by our armour tactical trainer, we would probably need at least 80 sq. km more. For artillery training, we simply do not have the space locally to support FO training with 155mm rounds.

New Systems Coming On Stream. The introduction of two new systems will provide us with more value added training:

a. **BFI**. We have commenced development of a Battlefield Instrumentation System which will use a combination of GPS and laser-based engagement systems to track the training performance of our manoeuvre units. We have deliberately chosen to instrument down to the individual so as to provide detailed after action reviews not only to the Battalion and Company Commanders, but also to our junior leaders at section and platoon level. The take home packets to be provided to each training unit will serve as teaching materials, and we would be able to share the training experience of several units, instead of limiting lessons learnt to the unit being trained.

b. **SIMLAB**. We will soon take delivery of a more sophisticated constructive simulation system to enable the training of Higher HQs beyond the battalion-level. The improved sophistication of the system will allow us to inject many more combined arms elements into the training without the need for the numerous manual workarounds and large control staff associated with board-based wargames. We expect that this will foster much greater consciousness of the many variables which affect the performance of fighting units and formations; including such factors as resupply rates or communications.

GETTING STARTED

I will now share some thoughts on managing technology for training. For a start, it is important to be clear about its intended benefits, and how this would fit into the overall system of training individuals or units. The expertise of your training staff in designing training which maximises the benefits of the technology is something which grows with familiarity. If you are looking to jump-start the process, though, we have certainly benefited from discussing with other Armies on how they use that particular training technology, and we would likewise be happy to share our own experience in specific areas.

We have learned that an evolutionary approach is best when introducing new technology into the training system. A pilot phase is recommended during which training staff can develop comprehensive programmes to exploit the capabilities of the equipment.

a. In computer- based training, we had to invest a lot of time to build up skills for good courseware development. We started off equipping people with technical skills, but we soon realised that it is equally important to build up the expertise of our training staff in technology management also. Without this, decision makers in the units were not adequately aware of all the development issues when CBT was first introduced to Army units. To date, this is a continuing effort, as the technology is evolving all the time, and we have to ensure that training managers focus on good training design, and not on the "bells and whistles".

b. We found that training simulators allowed us to conduct many more training exercises than was previously done as live or field training as it was not bounded by the same cost or safety constraints. We thus began to reap even more returns after the systems had been in place for some months or even years. The lessons learnt from using earlier generation systems has now been ploughed back into developing even better systems for the future.

The next major consideration in getting started is to establish a technology base and in-house technical expertise. This can be a limiting factor when it comes to specifying requirements. With simulators, we continue to learn that many features which were ruled out as not feasible two to three years ago are now either readily available or significantly less expensive. You need to establish a good dialogue between training staff, technical staff and industry to determine whether or not training needs can be met, and more importantly, to keep abreast of new opportunities which can be exploited. We have found that having in-house expertise in training technology helps training staff to design technology around training instead of the other way around.

Our final word on training technology is on costs and benefits.

a. Start up costs can be fairly significant, and one should therefore plan to maximise the technology once it is deployed. In order for this to happen, the training technology must be well integrated with the training system. Our MILES equipment, for example, plays a major part in the evaluation of manoeuvre units. There is thus a high demand for its use during field training. We subsequently purchased MILES simulators for all the anti-tank weapons in our infantry units. Unfortunately, we did not lock into place a requirement for infantry anti-tank crews to train in the field against armour units. As such, usage of the anti-tank MILES remained relatively low, although they are good training devices.

b. As the development efforts and costs are high, one must also be clear about the tangible benefits which can be derived from the technology. Training technology should contribute directly towards training better ommanders, soldiers or units, and this represents an improvement in the operational capability of the force. Without this objective in mind, however, in a tight budget situation, it is easy for training projects to be sidelined in favour of acquiring combat systems. Furthermore, savings derived through the introduction of training technology tend to become significant only after several years.

CONCLUSION

Training technology does not represent a panacea for all the various constraints which affect the quality of training today. It requires a sensible and well thought through implementation plan, and must be developed with the training system in mind from the onset. For the Singapore Army, we feel that the two main technology areas - IT and simulators - have proven to be sound, long term investments which contribute both to meeting our training needs, as well as to overcoming our constraints. With a well developed system of training, we are very confident that training technology contributes directly towards preparing commanders and soldiers for the demands and uncertainties of the battlefield.

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Training A World Class Navy

by MAJ Lim Khia Teck

INTRODUCTION

The development of the RSN in the last 30 years has been nothing less than phenomenal. From two Second World War vintage ships in 1965, the navy has today become a professional force of multi-dimensional warfare capability. As the navy sails into the 21st century, we have set our sights on becoming a world class navy, up there with the best.

To be world class, we want to build an organistion that meets up to the standards of best practices. We want to put in place systems and processes which will ensure that we are recognised as being the best. By realising this vision, the RSN will not only fulfill our national defence objectives but also contribute to our wider regional responsibilities.

One of the cornerstones of a world class navy is its training system; a training system which generates quality people with operational proficiency of world class standards. This system must ensure that the components of the navy, the individuals, warfighting teams and the command organisation, are ready for their wartime tasks and missions.

Without the "benefi"' of war to validate our operational readiness, training takes on the all important role of building up our operational experience and testing our fighting concepts. Ultimately, our training system must produce a fighting Navy which delivers victory in war.

CHALLENGES TO TRAINING

In our drive to achieve a truly world class training system, developments within and outside the RSN pose a serious challenge to our training planners.

As the navy extends its reach and punch beyond its present operating space, force structural developments have become more diverse, complex, and highly specialised. Therefore, we will need a wide spectrum of individuals and teams with very specific warfare skills.

Our qualified and experienced operators are sought for in both training and operational units. Since it is necessary to arm the teeth rather than the tail, if training were indeed the tail, training must continue to thrive with less manpower.

With shorter career contracts, and a high turnover rate of personnel in the Navy, the time for training is very short indeed. This is especially true for NS men in the bid to maximise their deployable time within the enlistment period.

The implementation of UNCLOS will place further restrictions to our available training areas, forcing us to conduct sea training further from Singapore.

As we increasingly turn to technology to overcome many of these constraints, our current knowledge and skills will face rapid obsolescence and require constant updating and renewal.

TRAINING STRATEGY

The training system we envisage must more than overcome these challenges. We need to transform untrained individuals into trained professionals and operational warfighting units. It must also ensure that the RSN has an effective warfighting organisation in order to successfully conduct the entire naval campaign. In drawing out our strategy to achieve this, the training process is guided by six key principles.

Trainees must be given optimal training, at the right level and sufficient for him to perform his job competently. Training will be administered effectively and efficiently by employing technology and well-developed methodology.

We must provide realistic training to allow trainees to be exposed to conditions resembling the operational environment and fighting scenarios expected during the conduct of their tasks and missions.

Our trainers, in schools and in operational units, must take full ownership for their roles in the training system and ensure their trainees can meet up to the navy's stringent demands.

We must have a closed-looped training system. Responsive feedback is crucial to ensure that training remains relevant and effective. Experiences must be retained, analysed and assimilated to make the entire organisation better than before.

Applications of technology must be well planned to enhance the quality of our training and overcome our constraints in training space, time and manpower.

Finally, inter-service operability at all levels must be enhanced in our training in preparation for operations in an integrated environment.

THE TRAINING CONCEPT

The RSN training process will consist of two broad phases: Individual Training and Warfighting Training.

In Individual Training, officers and specialists will undergo formal training in the schools and continual training in the units. The emphasis for the individual is to gain professional knowledge and proficiency in operating procedures before integration into warfighting teams.

Warfighting Training is divided into two levels. The operational level involves units in the operational commands, the ships, task units and task groups. The system level of training will be targetted at the Navy's various command headquarters.

At the operational level, units will firstly undergo basic shipboard procedural training. They will then proceed on to intermediate and advanced tactical training. This process will arm the units with the necessary combat abilities in the warfare areas appropriate to achieving the Navy's requirements in an integrated warfare environment.

The various command Head quarters will undergo system level training with actual deployment of assets at sea or through link-ups to the tactical shore trainers. This training will ensure that the Headquarters warfighting organisations are armed with the necessary skills to achieve effective command and control of units and inter-operability in an integrated campaign.

KEY INITIATIVES

Training in the RSN has seen many changes in recent years. With the re-structuring of the training organisation, Training Command was formed and training functions were re-defined. Several key initiatives have been identified for both Individual and Warfighting Training. These initiatives serve to meet key

organisational requirements and concerns of the ground units. They will be crucial in translating the training concepts and strategies into a complete Training Masterplan.

Individual Training

In individual training, the new initiatives aim to tie in training with career planning, as well as provide continual and quality training.

For the first part, the training Route-of-Advancement (ROA) of each servicemen must be closely co-ordinated to match his career ROA. This will ensure that he will undergo training at the right point in his career before moving to a new appointment. This can be achieved by integrating the training roadmap with the career ROA to form a Profession ROA. This profession ROA will synchronise both the training and advancement roadmaps and change in accordance with each individual's performance and potential.

With our force structural developments into diverse warfare areas, there will be a need for our people to become experts in their field of specialisation. In order to maximise the potential of each trainee, we will assesseach individual's aptitude and select him for specialisation. This process will be moderatedby operational demand and is flexible so that we can deploy these personnel to other fields.

A Personnel Training Management System using IT tools will ensure the successful implementation of these initiatives. The system will assist us to select and identify "raw" personnel for suitable training ROAs. Once trained, the management system will track his progress in order to identify him for further training.

Upon completion of formal courses, individuals will continue training at their place of work. This will shorten the formal training time and ensure a speedy delivery of trained personnel to the operational units. The Self-Paced On-Time On-Need training concept and Distance Learning programmes will allow our servicemen to upgrade themselves continually.

These two learning concepts can also be extended to NS-men Training. We can reach out to the NS-men with training materials without having to physically recall them. In this way, we can expand NS-men training beyond maintaining their skills to upgrading them, and do so even off the ICT periods.

To support these self-learning concepts, a Training Intranet will be developed. A virtual library, containing reference materials and computer training packages, will reside in our new Changi Naval Training Base. Distance learning architecture will be a key design in the development of this new training base.

In response to the needs for more hands-on training, we will commit resources in procuring practical trainers and put in place a systematic On-the-Job Training (OJT) programme. Personnel will therefore transit more smoothly from schools to operational units with confidence. At the same time, units can take ownership of its personnel training.

To instill the sense of pride and mission in our training institutes, they will be designated as centres of excellence. These centres will seek to continually improve the provision of training and help to build a self-learning culture. By recognising the institutes as specialist authority, a culture of maintaining high standards will be developed. This will ensure that quality training is provided and maintained.

Where possible, courses conducted in the navy will be accredited with the same status as courses run by commercial or other military schools. This will ensure high standards for the courses and raise the market value of training in the RSN. This equips RSN personnel with a recognised job skill upon completion of service with the Navy, and ties in well with the RSN's drive to tap into expertise of institutes of higher learning.

Good trainers are the key to quality training. Imparting not only their knowledge and operational experience, they also act as role models to motivate and inculcate in trainees the navy's values and culture. The ground

perception that "the less capable and motivated" are posted to training must be radically reversed. The best personnel should be selected for the training community in order to maintain high standards. Trainers must be well trained for their job in terms of professional knowledge and training techniques. In other words, we must Train the Trainers.

Schools and operational units must work ever more closely to keep abreast of changes in operational requirements and expectations of trained individuals. This is consistent with the key requirement for a closed loop training system.

Warfighting Training

While much effort has been committed in laying a strong foundation for individual training, emphasis is also required in developing the system for warfighting training. The output of trained personnel from Training Command and SAFTI-MI must be integrated into combat ready teams to man the ships of the fleet and COSCOM.

Our key initiatives in warfighting training aim to provide a systematic training process, extract maximum value from our exercises, ensure a closed loop system and capitalise on technology to enhance realism and integration of our training. For the operational units, a systematic training cycle comprising multi-level exercises will be completed within a fixed time-frame. This will start with basic single ship exercises, progressing on to multi-unit and task group level exercises for the intermediate and advanced levels. Warfighting training for the Command Headquarters will follow a similar training cycle culminating in an exercise by the various HQs.

To extract maximum value and increase the robustness of our training, we need realistic and rigorous two-sided exercises. These will be based on realistic threat scenarios and 'threat' strategies as defined by a specialist 'Threat' Agency. This agency will draw on experts from the intelligence community and the Institute of Maritime Warfare. They will maintain a constant and accurate update of capability developments of possible enemies. In this way, they will be able to postulate the strategy of the threat and role-play as the enemy in place of our traditional controllers for higher level tactical training.

Wargaming exercises should be focused towards supporting and evaluating the navy's six capability areas as detailed in our Operational Concept Formulation. This will validate the navy's core capabilities in a naval campaign.

To ensure we draw the correct lessons from our exercises, a credible assessment system must be put in place. Assessment teams comprising warfare experts with operational experience will be formed. These teams will provide objective assessments on the performance of ship teams and the HQs. These teams will also assist the commanders levels to fine tune specific warfare skills of their subordinate units between inspections.

In order to ensure a closed loop warfighting system, lessons learnt from exercises must be captured and infused into our doctrine development process. The Doctrine Development and Management System will be set up for this purpose. It will draw upon a central depository in IMW which houses the RSN's corporate warfighting wisdom, including all the lessons learnt from past exercises. It will also facilitate warfare specialists throughout the RSN in giving their inputs to warfare issues, thus harnessing the corporate thinking power of the Navy. Together with Fleet and COSCOM, who are the lead agencies for doctrine development, IMW will put the resulting new doctrines and tactics through vigorous testing using Operational Analysis and OT & E. The tested products will then be quickly disseminated to the operational units for application.

An exciting new development promising unprecedented realism and integration of warfighting training is the Vision for SAF Simulators or VSS 2000 masterplan. The RSN's focus in VSS 2000 is to support our drive to Train Virtual, Fight Real. VSS 2000 must also provide seamless integration for HQ RSN vertically within the

RSN warfighting command chain and horizontally across to the other service command posts. This process has already begun with the Naval Wargaming System targetted at inter-command post exercises.

Under VSS 2000, the training system shall ride on the actual operational systems in the form of CIC embedded trainers. This materialises the concept of Train As You Fight. Operational systems will be able to support training requirements by the simple flick of a switch from the normal operational mode.

Shore tactical trainers should be able to exercise with ships and aircraft at sea through live training systems. These systems will also provide realistic engagement results between aircraft and ships to allow them to evaluate their engagement effectiveness.

Riding on the virtual battlefield created by VSS 2000 , operational plan rehearsals can now more accurately zoom into operational bottlenecks. Potential problems can be identified in good time and refinements made to existing battleplans.

BENCHMARKING

What you have just read about were some highlights of initiatives in the training system as guided by the 6 key pillars. To measure our progress towards the desired state of training, a performance framework needs to be developed. The framework will be based on the three principal goals of Organisational, Process and Product Excellence.

For Organisational excellence, we assess the availability of facilities, the quality of materials and instructors, trainer-to-trainee ratio and the accreditation of RSN conducted courses.

For Process excellence, we want to measure our success in capitalising on commercialisation, technology and customer feedback to improve training quality while reducing costs in manpower and training time.

For Product excellence, we want to ensure our trained personnel and ships can perform their tasks and missions. At the operational level, performance indicators are mission based and pegged at the ship and task group levels. At the system level, we will measure the effectiveness of RSN and other RSN command organisations.

To ensure we keep up with the world's best, we want to benchmark our organisation and products against world recognised institutions and best practitioners. Our centres of training excellence must rank with insitutions of international repute, such as the US Naval Academy and the Royal Navy School of Maritime Operations. We will know we have arrived when top navies around the world want to send their best people to be trained by us.

Our products must also emerge top when competing with the best in the world. Our ship teams must match up to the best in combined exercises with top navies. Our officers and specialists must continue to produce outstanding results in prestigious courses that they attend with the best practitioners.

CONCLUSION

In conclusion, to develop a training system that is 'world class' for the RSN is not simply emulating the best practices of others. We do not always have the luxury of resources some established navies have. We need to recognise our own unique circumstances and take into account our constraints of costs, manpower, training time and training areas. Our training system must therefore be unique, and tailored to meet our larger corporate objectives.

The strategies and concepts highlighted above will give the RSN the unique training system it needs to achieve its vision of world class standards. Some of the planned framework and organisations are in place,

and some of the supporting technology and infrastructure are in the pipeline. It is now crucial for our people to operationalise the initiatives we have put in place and play their part in building a training system worthy of a world class Navy.

Note: The author wishes to thank MAJ Harris Chan,, MAJ Tan Kai Cheong and CPT Keith Lim for their contributions.

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Computerised Battle Field for the Army in 2016

by Mr Lee Yeaw Lip

INTRODUCTION

In an era of rapid globalisation and growth of knowledge-intensive societies, the dynamic trans-national flows of trade, capital, ideologies, information and communications technologies are radically shaping the way governments do *realpolitiks*, the way businesses make money, the way people organise their lives, and perhaps more significantly for an organisation like defence, the way war will be waged tomorrow. Information superiority has always been an object of warfare throughout military history. Achieving that superiority has become particularly acute in recent times with many of the world's nations embarking upon the large-scale informatization of their Armed Forces. Force *informatization* involves the progressive application of information, communications and computer technologies across all systemic levels of a military organisation to enhance and integrate its multifarious warfighting processes.

Information warfare (Infowar), as a consequence of force *informatization* efforts, can thus be defined as a complex of information support, information countermeasures, information defence systems and information offence strategies, taken according to a single design and planning, and aimed at gaining and holding information superiority over the enemy prior to (in tension/peacetime) or while launching and conducting military actions (in wartime) to decisively destroy its armed forces and information systems, effectively paralysing its total war making capability throughout the depth of a theatre of operation.

The conduct and success of contemporary and future military operations, whatever the scale may be, will be decided by the effective application of infowar skills. Such infowar skills are predicated upon the development of a new generation of seamless Command and Control; Communications; Computer and Intelligence (C^4I) systems which enable synergistic connectivity across all force levels by decentralising traditional hierarchical force structures.

MILITARY TRENDS

If the adage that the present is the product of the past and that the future is the product of the present holds true, then the battlefield of the 21st Century is already being shaped by the advances in new technologies witnessed today. The rapid convergence of information, communication and computer technologies with extensive military application, particularly over the last two decades, has precipitated new military trends. These new military trends encompass the following:

> a. The general adaptive Dual Uses of Military/ Commercial Off-the-Shelf Technologies; and

> b. The digitisation and miniaturisation in military electronics and communications technology.

Dual Uses of Military/Commercial Off-The-Shelf Technology

Information technology is emerging as a unifying force. This unifying effect is most clearly apparent in the technology arena. Technical boundaries have all but disappeared, as have the dividing lines between military and commercial marketplaces. This broad-based consolidation serves to strengthen the bonds of industry and the defence community. Military requirements for application-specific innovations frequently spun off into the commercial arena, and commercial inventions often spawned industries that opened doors to new options for the defence community.

Enabling technologies also have allowed the defence and commercial sectors, where applicable, to share each other's information infrastructures and equipment. Both groups are riding the rapid winds of information age innovation with an eye toward each other's programmes - such as commercial aviation incorporating the global positioning system versus defence communication planning around advanced commercial telecommunications network. The growing linkages within the computer industry between military programmes and commercially derived technologies are becoming increasingly better understood, particularly as they stimulate greater use of commercial off-the-shelf technology in the weapon systems of the near future. This trend would have a significant impact on the weapons and sensors developed and deployed in the computerised battlefield of 2016.

Electronic Digitisation and Miniaturisation

The technological revolution began with large vacuum tube fixed-site radios and the state of art has progressed with solid state breakthroughs that introduced the transistor and integrated circuits; microprocessors that placed a room-sized computer on the desktop; and the current explosion in optical technologies that began the marriage of computers and communications. The quantum leaps and bounds made in electronics and communications technology has resulted in the digitisation and miniaturisation of military C^4I sensors and weapon systems.

Digitisation, in particular, provides the warfighter with a horizontally and vertically integrated digital information network that supports warfighting systems and assures Command and Control (C^2) decision cycle superiority. The intent is to create a simultaneous, appropriate picture of the battlespace at each echelon, from soldier to commander. This picture is based on common data collected through networks of sensors, command posts, processors, and weapons platforms. This allows participants to aggregate relevant information and maintain an awareness of what is happening among them. Digitisation in electronic and communication technologies will therefore aid immeasurably in creating a new computerised battlefield with the following characteristics:

> a. Compilation of a common picture of battlespace in real time.

> b. Shared situational awareness amongst and between battlefield warfighters and operating systems.

> c. Provide commanders the ability to effectively and decisively concentrate battlefield combat power.

> d. Instantaneous exchange of data from disparate sources.

> e. Fusion and display of intelligence data to commanders at all levels.

> f. Rapid exchange of targeting data from sensor to shooters.

At the individual warfighter level, the miniaturisation of sensors and weapons will be the natural handmaiden of digitisation. The birth of the "digital soldier" all wired up for battle will enable our warfighters to fight in smaller units and at greater stand-off ranges while delivering deadly firepower. Advances in digitisation and miniaturisation promises to result in a 21st Century military force with significantly enhanced combat capabilities in terms of battlefield visualisation, speed, precision, survivability, lethality, mobility and deployability.

COMPUTERISED BATTLEFIELD SCENARIO IN YEAR 2016

The computerised battlefield of 2016 will feature extensive infowar capabilities. This fourth dimension of warfare will not replace but will intertwine with, and even underpin the success of conventional military operations such as sea, land and air warfare. The increase in the power and pervasive nature of computer microprocessors, high speed communications and sophisticated weapons/sensors will also mean that such

infowar will be actively exploited by both an armed force and its potential adversary on the computerised battlefield of 2016. The future scenarios of computerised battlefield are painted below.

Command and Control Warfare

The objective of conducting Command and Control (C^2) Warfare, a type of infowar, is to decapitate the enemy's command structure from its body of forces, applied across the operational continuum and all levels of conflict to achieve maximum advantages. The US forces have demonstrated mastery of this key facet of Infowar in the Gulf by destroying many physical mani-festations of Iraq's C^2 structure using pre-cision guided munitions and iron bombs. In the future, C^2 systems can be disabled by cutting off their power by introducing strong enough electromagnetic interference through the detonation of a Electro-magnetic-pulse (EMP) device the size of a suitcase. Computer virus can be inserted into the aggressor's telephone switching stations, causing widespread failure of the phone systems, thereby cutting off the main communication country-wide. Such a potent soft-kill weapon generally has a larger effective radius than conventional munitions such as iron bombs, but require accurate knowledge of the electronic characteristics of the designated target.

For forces at sea, on-going innovations in Multi-beam Array Technology (MBAT/Phased-Array), Super High Frequency Radar and Stealth Technology will radically shape naval warfare. The actual sensors, weapons and tactics employed by the surface and sub-surface combatants of 2016 in any given scenario will also be increasingly man-machine symbiotic; with greater reliance on artificial intelligence inputs in the warfighter's decision making process. Scientists at Johns Hopkins University's Applied Physics Laboratory are testing a virtually omniscient computer system called the Force Threat Evaluation and Weapon Assignment system. The idea is to collate a Navy battle group's radar signals and convert them into a three-dimensional picture presented on a monitor for the Naval Commander's strategic and tactical appreciation. Instead of confusing symbols, he sees graphics of enemy and friendly planes. By simply using a computer mouse, he can manipulate the video to look at the threat from any angle. The computer recommends the target he should attack in order of priority and even keeps watch over the skies. If a threat is detected by the computer, an alert signal will be given out. The same scenario can be applied to an aviator where target information is transmitted to him digitally and presented graphically on the cockpit Heads Up Display. As such technologies are already available today, tomorrow�s versions can be expected to be even more user-friendly, reliable and realistic.

Likewise, this concept can also be applied to buildings. A large computing device will be sitting in the Division HQ's building which will take a huge load of information from the outside world and distribute it within the building. Some of that data will wend its way to "projectors on a chip" that direct images onto "video walls". The "video walls" are sheet rock covered with conductive polymers to display interactive images and will become commonplace in year 2016.

Imagine commanders fighting cyberwars by pressing computer keyboards. Cyberwar tactics can be used to disrupt the enemy's economy and military preparedness perhaps without firing a shot. Computer viruses and computer logic bombs can be inserted into an aggressor's computer system and set to activate at predetermined times to destroy their command and control system. "Couch potato" commanders will be viewing combat action in 3-D and can follow the action from any vantage point, from eyes in the sky down to an individual soldier's view of the combat zone.

Intelligence-Based Warfare

The second type of infowar concerns Intelligence-Based Warfare (IBW). IBW occurs when intelligence is fed directly into operations (notably targeting and battle damage assessment) rather than used as an input for overall command and control. As sensors grow more acute, reliable and proliferate in type and numbers, and as they become capable of feeding fire-control systems in real time, the concept of sending intelligence and accurate battle damage assessment to warfighters and commanders becomes feasible in tomorrow's militaries. The aim is to possess the ability to reduce uncertainty and provide an unparallelled understanding of the battlefield to the commander through effective presentation. This can be achieved by the detailed

orchestration of sensor coverage which will enable the compilation of a virtual picture of the battlefield, providing intelligence support for targeting and battle damage assessment.

In the future, platforms that host operators, sensors and weapons together (e.g. a tank gunner using IR sights detects a target and fires an accurate round) will give way to distributed systems in which each element is linked electronically (e.g. a target is detected through a fusion of sensor readings, the operator fires a remotely piloted missile to a pre-designated location or intelligence of each individual tank location was sent to externally guided precision-guided munitions in real-time). These distributed system or sensors can be arranged into a "battlefield mesh" for intelligence collection, surveillance and targeting.

Imagine, thousands of tiny sensors airborne or covertly planted on land could be used to localise and target enemy forces. The employment of miniature robot to replace soldiers is another likely scenario for a computerised battlefield in 2016. This is based on the "robot-ant" concept evolved by a scientist in Boston University in 1989. He envisages the exploitation of piezo-electric effects in minute (1mm long) silicon whiskers, which twitch in response to electrical stimulation. These would be used to make a robot ant's legs. Its body would be a microchip and the mechanical insects could be equipped with sensor cells, which used collectively could be used for TV or thermal imaging, or with communications systems or cutting devices that could sever cables through use of piezo-electrical energy.

The robot insects could be introduced into enemy command posts or other critical targets where, acting in colonies - like real ants - they could be used to gather intelligence or to carry out sabotage. Individually, they would be almost invisible and undetectable. Flying ants could be constructed to enhance a swarm's mobility. The robot-ants could also be solar-powered. The innovator's ideas have since met with serious interest, by the US Army's Research Command, Fort Monmouth. MIT Lincoln's Laboratory is presently trying to build an unmanned aerial vehicle about the size of a cigarette pack that takes pictures. As a matter of fact, The Straits Times1 recently reported that a remote-controlled cockroach, with an electronic behaviour-control device on its back, was being put through its paces at the Tokyo University laboratory. If the technology continues to advance exponentially, it is possible to deploy miniature aerial sensors to smell out the enemy in 2016. For example, aerosols can be sprayed over enemy troops, or chemical would be introduced into their food supplies. Biosensors would then be able to track enemy troop movements from their breath or sweat.

Information advances can be integrated into military systems to extend human limitations involving distance sensing, memory capacity, programmed perceptions and cognitive capability. Technology allows everyone on the battlefield to be a sensor. In the Army's 21st century warrior configuration, the weapons of individual soldiers could be fitted with video cameras or thermal sights to provide imagery that could be transmitted to higher echelons, providing battlefield intelligence and damage assessment. The weapon will have a wireless link to a helmet mounted-monitor, allowing the soldier to aim at targets without exposing his body to the enemy.

We can foresee the emergence of a "digital soldier" outfitted with an array of virtual-reality (VR) like visualisation techniques, as VR increasingly finds its way onto the battlefield. The integrated headgear will apply high-definition video systems and head-mounted displays which include night-vision sensors and voice activation for a computer built into the soldier's body armour. Two soldiers could exchange battlefield information by shaking hands; the computers would be linked by a "body-area network" created by static electricity. As 2016 grows nearer, computers may even break the shackles that tie them to power lines and batteries. We can foresee the emergence of solar-powered machines light enough to be worn and embedded in the lumbar region of the body armour.

There is just one hitch with these intelligence-based systems: It could magnify the already vexing problem of information overload. There is a general belief that the soldiers and commanders may be overwhelmed with too much information which hamper their decision making instead of assisting them. The computerised operating system in the year 2016 should be able to streamline and package the amount of information presented to the warriors in order to achieve maximum throughput from the man-machine synergy.

Psychological Warfare

Another dimension of infowar concerns psychological warfare, which will entail political and cultural subversion, propaganda, deception of or interference in local media, infiltration of computer networks and databases and efforts to promote dissident or opposition movements across computer networks. Information terrorism, a subset of psychological warfare, can be aimed not at disrupting systems but at exploiting them to attack powerful individuals such as prominent statesmen or leaders; for example, targeted victims may be embarrassed by fabricated scandalous images through video-morphing techniques or they may have potentially revealing personal files stored in public or quasi-public databanks which can be penetrated covertly.

In the future, it is believed that personal files will reside mostly on easily accessible networks. During the recent Haitian crisis, the US in a bid to restore deposed President Jean-Bertrand Aristide made anonymous calls to Haitian soldiers, urging them to surrender and even sent ominous e-mail messages to some members of Haiti's oligarchy who had personal computers. Traditional propaganda usually uses mass media to influence a mass audience. New infowar propaganda, on the other hand, has the potential to customise propaganda down to the individual level. Future databases will be integrated and enhanced by the constant expansion of media channels for transmission of information. This will create new opportunities for custom-tailored or precision psychological attacks. Computer bulletin boards, cellular telephones, video-cameras, fax machines, internet - all provide multiple entry points and dissemination network for customised assault on governmental, commercial and private interests.

With the rapid advancement of IT and satellite technology, direct broadcasts of threats or sending of resentment-provoking information to individual opposing troops would be possible. This could give rise to a scenario whereby enemy vehicle operators are warned that they have been targeted for imminent attack by deadly munitions unless they physically disembarked and abandoned their vehicles. In the Gulf War, coalition forces actually managed to convinced many Iraqis that if they abandoned their vehicles they would live longer.

Future warfare will also see an increase in information denial or deception. For example, Iraq was led to believe that US would use aerial warfare for only a limited time and would recapture Kuwait from the sea. CNN and tomorrow's technologies such as Direct Broadcast Satellite will ease information dissemination and facilitate widespread deception.

Hacker Warfare

Another facet of infowar in 2016 is the conduct of dedicated hacker warfare or net warfare. Hacker warfare refers primarily to attacks on computer networks while net warfare refers more generically to an assault on an entire national information infrastructure. Intent can range from total paralysis to intermittent shutdown, random data errors to wholesale theft of information, theft of services to illicit system monitoring, and illegal access to database for the purpose of blackmail to the injection of false message traffic for sabotage. Computer viruses can also be inserted into the enemy's telephone switching stations, causing widespread failure of the phone systems, thereby cutting off the main communications link country-wide. Popular sabotage devices encompass computer viruses, logic bombs, Trojan horses and sniffers. During the Gulf War, hackers from Denmark, Moscow and Iraq tried to penetrate these systems. A recent case involved a British teenager using his home to hack his way into US military computer network, gaining access to files containing sensitive communications relating to the dispute with North Korea over international inspections of its nuclear program and placed them on the internet which could be read by 35 million people.

Computer logic bombs can remain dormant in an enemy's system until a predetermined time, when they would come to life and begin eating data. Such bombs could attack, for example, computers that run a national air-defence system or central bank. Insertion of computer viruses into weapon systems purchased by the enemy would render it ineffective during operation (e.g. warhead does not explode).

Another form of hacker warfare is known as semantic attack which produces random or systematic failure in systems. A system under semantic attack operates and will be perceived as operating correctly but it will generate answers at variance with reality; for example, altering the enemy's information processing activities like providing false battle damage assessment or sabotaging the enemy's logistics supply train by erroneous re-routing thorough electronic spoofing. Another example, is to fool sensors so as to trick the systems which rely on the sensors' input to make decisions about the real world (shutting down in the face of a non-existent earthquake). As future systems may try to learn from their info-sphere, a semantic attack would feed the server with bad data and create false learning in them.

Cyber Warfare

Cyber wars may also be become a new feature of the 2016 computerised battlefield. Global information systems will enable users to access an extraordinary number of databases, far beyond the internet capability of today. New software technologies permit these accesses to be conducted autonomously, using self-navigating data drones. The drones, or "Knowbots" are released into internet and search for information of their own. They can roam from network to network, clone themselves and transmit data back to their originators and communicate with other Knowbots.

With such innovations, future warfare will look increasingly like today's science-fiction thrillers. As real combat is dirty and dangerous, national leaders may one day decide to fight out virtual simulated cyber wars using computers to decide who wins. In cyber warfare, virtual characters or agents could be created to inhabit the net and conduct missions according to their masterss wants and needs. Examples include inserting false messages, making reservations, acquiring goods, handing over assets and negotiating terms of contract. If the fidelity of simulation is good enough, the results will be a reasonable approximation of conflict. Acquiring weapons will be more for symbolic deterrence rather than for actual use. Could fighting a simulated war one day, prove to the enemy that it will lose? At the moment, the synthetic environments tailor-made for simulating cyber warfare may be composed of disparate and diverse individual elements and interface is complex. Another major obstacle is that it is highly unlikely that each contesting side will own up to the warfare capabilities, number of weapon systems and strategies which will be deployed in an actual war. Mutual simulation cyber warfare requires adversaries to agree on, as well as reveal, what each side's systems can or cannot do. This aspect of cyber warfare still remains in the realm of science fiction; but to be sure, will not be indefinitely.

CONCLUSION

Whatever the nature of the world in 2016, it is not likely to be more benign than the one existing presently. The root causes and nature of war will remain constant. War in an information age may be more surgical, but it will not be sterile - it will still be war. Death and destruction, traditionally the consequence of war, will remain in the Information Age.

Preparing now for the military challenges of the 21St century is crucial to our continued national survival. Even if the specific technologies discussed in this paper have yet to be deployed and battle-tested on a wider theatre of conflict, what remains certain is that the computerised battlefield of 2016 will be multi-dimensional, meaning not only that air, sea and land operations will be integrated, but also that the exploitation of information cyber space and outer space will be a quintessential part of any future war. There will be a need for any armed force to constantly re-invent itself by bold initiatives in force reorganisation to determine how the armed force may evolve to a size and composition that will provide the value-added versatility needed to succeed on a variety of information age battlefields. Infowar skills and technology will have to be increasingly integrated into training, exercises and the professional military curriculum. Regular doctrinal adaptation, robust leadership development and excellence in rigorous combat training must continue.

The first important step to take now would be to forecast as accurately as possible the specific military requirements for the information age, then formulate architecture migration plans and make policy decisions

that meet those requirements. The challenge will be to develop a menu of forces and capabilities that will provide tomorrow's commanders what they need to dominate the computerised battlefield of 2016.

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BIBLIOGRAPHY

Anderson, K. & Dibb, P. (1996) *Strategic Guidelines for Enabling Research & Development to Support Australian Defence*, Canberra: Australian National University Press.

'CyberWars: Can Malaysia Threaten Singapore's Hi-tech Supremacy?' in F*ar Eastern Economic Review*, (27 Feb 97), pp. 44-51.

Edwards, P. N. (1996) *The Closed World: Computers & The Politics of Discourse in Cold War America*, Cambridge: MIT Press. Electronic Warfare Digest, (Feb 97) Vol. 20, No. 2.

Evers, S. (1996) 'Special Report: Infowar' in Jane's *Defence Weekly*, 10 Apr, pp. 22-25.

Komov, S. A. (1996) 'Infowar in Modern War: Theoretical Problems' in *Military Thought: A Russian Journal of Military Thought and Strategy*, 3 May-Jun, pp. 76-80.

Menoher, P. E. Jr. (1995) 'Intel XX1 - The Intelligence Vision for Force XX1' in *American Intelligence Journal*, Autumn/Winter, pp. 35-40.

Military Intelligence Professional Bulletin, (Jan-Mar 1997) - Information Operations Feature.

Rathmell, A. (1997) 'Netwar in the Gulf' in *Jane's Intelligence Review*, Jan, pp. 29-32.

Rochlin, G. I. & Demchak, C.C. (1991) *Lessons of the Gulf War: Ascendant Technology & Declining Capability*, Policy papers in International Affairs, No. 39, Berkley, University of California.

Sullivan, G. R. & Dubik, J. M. (1994) *War in the Information Age*, Washington: U.S. Army War College.

'The Future of Warfare' in *The Economist*, (8 Mar 97), pp. 15/6; 21-24.

The Straits Times, various issues.

1 The Straits Times, Saturday, 18 January 1997, Page 24.

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Unmanned Warfare

by MAJ Tew See Mong

INTRODUCTION

Manpower scarcity has been a perennial problem for many armed forces around the world. Over the years, there has been a decline in the absolute numerical make-up of these organisations, which, if not managed properly, can affect their operational capabilities. This scarcity is a situation that is unlikely to improve in the foreseeable future, given the current low birth rates and conflicting demands for manpower.

From a numerical perspective, this constraint means that the armed forces cannot mass together the sheer number of ground troops as before. From a risk perspective, every soldier on the battlefield is now a precious resource which should not be exposed to unnecessary risks. This translates into further constraints for battle planners, who may not have the leeway to select the riskier but more expedient military options. Finally, from the skills perspective, smaller population bases make it difficult to find, select, train and develop specialised combatant resources like pilots and submariners.

Thus, it is crucial that new avenues be explored to circumvent this prevalent trend of manpower shortages. One viable solution lies in exploiting technology and pushing the limits of force multipliers. Within the domain of force multipliers, there lies a relatively new discipline, unmanned warfare.

DEFINITION

The definition of 'unmanned' chosen for this article is fairly loose, as the emphasis is not solely on taking men out of machines but also on how to employ technology to make better use of its manpower. Thus, while the focus is on unmanned warfare in its literal sense, the article will also touch on some equipment or systems which result in lower manpower usage (or higher operational capability with the same manning). In so doing, please accept that some aspects of this article border on technological innovation as opposed to unmanned warfare per se.

POTENTIAL OF UNMANNED WARFARE

Unmanned warfare is a relatively new approach in the conduct of warfare, where the boundaries are not well charted and limited largely by our imaginations. Unmanned warfare will not only help overcome manpower and resource constraints but will also enhance operational capabilities, since it can now move into areas where mankind has previously feared to tread. With unmanned warfare, the competitive advantage can be swung such that human numerical superiority is no longer an overwhelming advantage or a pre-requisite for victory.

WHY UNMANNED?

The impetus to go unmanned include optimising the deployment of manpower, enhancing operational capabilities and being able to venture into territory once out-of-bounds to mankind (e.g. deep ocean, space). In particular, unmanned systems should be used to replace humans where the work is dangerous, dirty or dull.

Some specific advantages in going unmanned include:

Reduction in manpower requirement. Developments in unmanned technology now enables machines to perform tasks once undertaken by operators with equal if not better precision. This direct substitution of manpower will lead to a corresponding reduction in manpower needs.

Overcome fatigue and human error. Machines do not tire out as easily as men. Operations that require constant alert or repetitive work over long durations are thus potential areas where unmanned warfare can be profitably employed.

Minimise hazards. Risks to humans can be reduced as unmanned systems can take over hazardous jobs previously done by human beings.

Cost savings. Besides manpower savings, there are also cost reductions in the form of human cost (life) savings, training cost savings or even system cost savings as new unmanned systems can enhance work flow and improve general work cycles.

Despite these advantages, there are several limitations which must be recognised and reconciled. Some of the limitations include:

Decision making. Although unmanned systems are becoming increasingly sophisticated and 'intelligent', it is still difficult to entrust machines with subjective decision making. We must avoid careless delegation of responsibilities to technology that perform only under programmed patterns.

Applicability. In certain areas and vocations, unmanned warfare acts merely as a catalyst to facilitate achieving the ultimate goal. The claim that there is no victory until the humble foot soldier occupies the objective is likely to remain valid for some time yet.

Diminution of esprit de corps. As manpower is increasingly scattered, we could witness diminishing avenues for display of teamwork, leadership, valour and other human qualities that make up a well trained and well-oiled armed force. This gradual 'erosion' of values belonging to the profession of arms must be guarded against.

LAND THEATRE UNMANNED WARFARE

The land theatre has traditionally been the largest employers of manpower. With reducing manpower and increasing battlefield risks, technology is no longer regarded as just a force multiplier, but rather one that would produce a paradigm shift in warfighting.

Manpower requirements can be dramatically reduced in the battlefield with unmanned platforms. UAVs, coupled with appropriate sensors, are able to give commanders a bird's eye view of the battlefield, without having to incur risks to himself, observers or pilots. Such a view has obvious benefits - to the intelligence community, to manoeuvre commanders and to targeting agencies. UAVs can also be employed as rebro or electronic warfare platforms. In the longer term, armed UAVs may well become operationally and economically viable, thus enabling them to perform tactical attack roles.

Tactical Unmanned Ground Vehicles (TUGV), the ground equivalent of UAVs, are able to perform some of the roles currently done by UAVs. Equipped with weaponry or sensors, they could complement or even replace some of the roles assumed by scouts and signallers. In these roles, one edge of the TUGV over the UAV is its staying power and ability to hold ground. TUGV is also able to breach and open minefields/ obstacles and clear axes for armour and logistics re-supply.

Unmanned Ground Sensors (UGS) are a cost effective replacement for manned systems that have previously been used for monitoring or for communications. They can, for example, be deployed by helicopters or C-130 to critical points to detect time critical mobile targets (i.e. manoeuvre forces, tank columns). They can

also be used as signals nodes to serve as communication relay platforms, thus relieving signals personnel from performing a tedious and time consuming job.

Dramatic break throughs in robotics and tele-operated mine breaching can greatly reduce the labour-intensive nature of mine-clearing. Also, development of new mine detection technology now permits untrained troopers, using devices which incorporate thermal imaging and ground penetrating radar, to be able to detect metallic and non-metallic mines. This reduces the dependence on specialised combat engineers and simultaneously increases operational capability through speedy mine detection.

There are a few additional unmanned systems that are a long way from seeing operational employment, but which are worth mentioning in view of their long term potential. For example, developments in unmanned technology include robots that can undertake dangerous and dirty work. The US military has been pursuing the concept of '*Pointman*' for some time. *Pointman* is a light-weight, sensor-laden, armed robot used to reconnoiter buildings, bunkers and tunnels, in order to detect booby traps, explosives and the enemy. It will be able to climb stairs, operate in all weather and light conditions, and is expected to be especially useful in what the US Army terms 'operations other than war'.

Still looking at longer term developments, armour units may one day field remotely-controlled tanks. One of the modes of employment is to have one manned tank control and operate two unmanned, remote-controlled tanks. Navigation and targeting inputs provided by the tank commander are utilised by the remote-controlled tanks to acquire and destroy targets. The firepower of armour units can hence be enhanced tremendously with fewer or similar numbers of tank crews.

Remotely-controlled self-propelled guns or howitzers could operate together with manned guns using the same concept as the remote controlled tanks. This concept seems closer to fruition than unmanned tanks, as the technological challenges appear less daunting. The need for human judgement in each individual fighting unit also appears less critical.

UNMANNED WARFARE IN THE AIR

Plagued with constraints of limited human resources and a sizable reduction in the pool of youths who fulfill stringent recruitment requirements, air forces around the world will be compelled to explore means to maintain or extend their operational capabilities with an increasingly trim fighting force.

The employment of unmanned platforms in the modern battlefield serves to alleviate problems caused by the shortage in manpower and resources. In employing unmanned platforms, pilots may also be removed from aircraft penetrating defended enemy airspace, thus reducing the danger arising from exposure to hostile fire.

The benefits are immediately obvious. First, human attrition will be reduced. Second, the aircrew whose functions are now assumed by unmanned platforms can be channeled to other crucial functions like air defence, $C^3 1$ and transportation missions. Finally, planners will be able to undertake more risky but decisive combat missions, such as SEAD, without exposing aircrew to excessive risk.

UAVs can broadly be characterised as lethal and non-lethal systems. As its name suggests, non-lethal UAVs refers to the class of UAVs used for reconnaissance, surveillance, relay, target designation, ECM, SIGINT, ELINT, radar decoy and meteorological surveillance. Lethal UAVs, of course, refer to the class of UAVs which inflicts physical damage to enemy assets or installations operations.

Non-Lethal UAVs

Many non-lethal UAV roles have become well-established in many armed forces. Reconnaissance UAVs are widely used to map the enemy's defence locations, practices, electronic profiles and vulnerabilities. As their endurance and payload improve, these UAVs can take on the more demanding surveillance and airborne

early warning functions as well. EW UAVs are capable of using chaff and ECM to degrade the enemy's radar or communications. Used together with anti-radiation missiles or drones, these EW UAVs can effectively shut down the enemy's radar operations. In SEAD) operations, UAVs can be deployed as decoys to entice the defenders to turn on their radars or fire their missiles at the wrong targets. Manned strikers following behind the UAVs can then move in to complete their missions with relative ease.

Lethal UAVs

Lethal UAVs can best be looked at by dividing them into two distinct categories: counter-air and strike. I will examine these two components separately and assess the viability of UAVs to replace manned aircraft during wartime.

Air-to-air combat is very dynamic and dependent upon the pilot's judgment and skill to outwit and out-manoeuver the aggressor so as to get into an advantageous position for the kill. This applies even when an aircraft is armed with the most advanced AAMs, especially if the enemy is similarly equipped. Furthermore, in an air battle, the air picture is usually a complex one, with many real-time injects like weather, use of ECM or ECCM, changes in tactics, attntion, etc. The pilots, with the help of GCI, will have to make impromptu, split- second decisions to circumvent the friction of war.

The use of UAVs as interceptors will expose one of its biggest shortcomings; its lack of decision making abilities. However advanced the UAV, it is still unable to replace the pilot in a dog-fight. The situational awareness is just not the same. More often than not, UAVs are very scenario dependent and operate well only in a predictable environment. The lack of a human on board limits a UAV to perform mostly pre-programmed standard functions.

Although UAVs cannot replace manned fighters in air-to-air combat, they can be used as decoys to reduce friendly losses. Decoys can be scrambled together with manned interceptors to complicate the enemy's air picture, distracting their pilots or causing them to expend their missiles on the decoys.

Strike missions are a hazardous task as the strike aircraft are susceptible to many threats: enemy fighters, SAMs, AAA etc. A typical strike mission would involve a lot of resources. Besides the strikers, sweepers to fly ahead and clear the path for their transit. In addition, to have accompanying escort fighters are needed to eliminate hostile aircraft that slip through to threaten the strike aircraft.

UAVs can be used to reduce the heavy demands and risks of strike missions. Many strike aircraft and bombers follow a pre-determined route into enemy territory and strike specific targets on the ground. The predictable nature of this task makes it suitable for UAV execution. Technically, the cruise missile is a small, disposable UAV. These missiles are cost-effective, proven in war, and do not need escorts or sweepers. Re-usable bomber UAVs are also under development, but these are probably less flexible and effective than missiles as they would require a great deal more support for them to fulfill their role.

A final benefit of using UAVs is that they are less dependent on runways. Most unmanned platforms are easier to store and deploy than fixed wing aircraft, and many do not need a long runway to launch from. Of particular significance, land or sea launched cruise missiles would allow an armed force to retain a long-range strike capability even if its runways were closed and its aircraft temporarily grounded.

NAVAL UNMANNED WARFARE

Unmanned platforms are relatively new naval forces. Naval forces should consider adopting more unmanned systems in the naval theatre, with manned warships deployed as a controlling force or a follow-up strike force when a high casualty rate has been inflicted on the opposing force.

They are the Unmanned Aerial Vehicle (UAV), Unmanned Undersea Vehicle (UUV) and Sound Ocean Surveillance System (SOSUS). The following discusses the ways these platforms can replace or supplement a navy's manned platforms and improve its operational effectiveness.

UAVs

Navies should acquire a mix of ground based and sea launched UAVs. Complete surveillance packages configured for tactical surveillance should be available in the sea launched version. Real time data-linked, probably through satellite communications, should be the main command and control requirement so that commanders ashore and at sea are able assess the reconnaissance picture. High adaptability to mission changes and reassignment should also be essential features of the vehicle.

Land based UAVs should augment the manned Maritime Patrol Aircraft (MPA) so that round the clock surveillance and intelligence collection can be achieved. These UAVs would be especially useful at the beginning of war when naval warships have to be deployed beyond NADA controlled areas. The UAVs will remove the need to send manned MPAs to unprotected airspace, thus reducing the risk to the aircraft and its crew.

Sea-launched UAVs would by necessity, be lighter and have less endurance than their land based counterparts. However, they have an important role in that they provide flexibility and autonomy to the commanders at sea, who can then solve immediate tactical surveillance problems without assistance from shore.

For littoral warfare, UAVs should be able to solve some of the problems when ships operate in proximity to land. When warships operate in hostile coastal waters, the risk is invariantly higher as they are subjected to threat from ashore and ambushing enemy military or para-military craft. Surveillance pictures provided by UAVs would finish task group commanders with valuable early warning of enemy presence.

Clearance of island groups by warships is another challenging task. In this case, a naval force should further exploit unmanned technology by acquiring remote controlled arsenal craft equipped with short to medium range high discrimination missiles to engage hostile craft detected by the UAV.

In the area of naval gun fire support, UAVs can provide spotting and eventually Target Damage Assessment to the Shore Bombardment Commander.

Undersea Vehicles

The application of unmanned vehicles for underwater warfare is predominantly in the area of mine clearance. Mine clearance in hostile waters can be fulfilled with the Self-propelled Acoustic and Magnetic Minesweeping System (SAMMS). This unmanned, remotely controlled mine sweeping craft is capable of establishing a safe route through mined waters.

Navies could consider acquiring a passive mine clearance capability so as to expand their mine-sweeping versatility. The US Navy is currently developing a tactical scale Unmanned Undersea Vehicle (UUV) to conduct covert, fully autonomous, long duration mine warfare and tactical oceanography in littoral waters. To date, the UUV has demonstrated a navigational accuracy of 0.18% of distance traveled. Such a vehicle allows naval forces to conduct covert mine clearance and seabed surveys during POT when aggressive counter-mine measures could not be conducted. Another advantage of the UUV is that it can be launched covertly from a submarine.

Anti-Submarine Warfare

Manned assets are still largely used in the area of Anti-Submarine Warfare, as it remains the playground for tacticians. However, SOSUS can be used to monitor submarine movements at various key points in our area of operations. This will reduce the demands on manned anti-submarine warfare assets. With further development in UAVs, ASW packages can also be fitted onboard to provide an extended arm to airborne ASW.

TECHNOLOGY FOR THE DEVELOPMENT OF UNMANNED SYSTEMS

Competition to dominate the battlefield of the future is competition to create, adopt and dominate emerging technologies. In the area of unmanned warfare, getting ahead requires:

      a. A keen understanding of how future battles would be fought and how unmanned warfare fits in.

      b. A developmental process for exploring, assimilating and exploiting current and emerging future technologies applicable in unmanned systems.

The unmanned warfare paradigm may be defined in three dimensions. Service groups broadly describe the various services in the Armed Forces, or who is being satisfied. Service functionalites describe service needs, or what is being satisfied. Technologies describe the way, or how the service groups needs are satisfied. The who and what, having already been discussed, we can see that the how may be classified into three main areas of required technologies. These are:

      a. Sensory. This is predominantly in the departments of sight & sound (e.g. to detect the enemy), touch (e.g. to ascertain reality) and smell (e.g. to determine toxicity of air).

      b. Mechatronics. This entails the delivery systems upon which the unmanned systems would ride on. It would include technologies such as propulsion, aerodynamics and robotics.

      c. C^4. For the human operator to command the unmanned systems, technologies that need to be mastered include artificial intelligence, radio-frequency technology and micro-controllers.

The key to mastering unmanned warfare would include the complex tasks of cross-selecting the technological components and integrating them into our military hardware. The selected components should be seen as capabilities a country's armed forces and defence industries must master, for they constitute the very essence of its future fighting capabilities.

Through a systematic and rigorous programme of developing this unmanned capability, new core competencies would emerge and these are potential highways to the future for our local defence industry. Besides providing a country's armed forces with a military advantage, technologies applied in unmanned systems have potential for a myriad of commercial payoffs. For instance, car manufacturers are beginning to explore unmanned driving on highways for safety as well as time and highway efficiency. Hence, unmanned technology offers our defence industry an attractive area to venture into, with additional potential for commercial payoffs.

CONCLUSION

The employment of unmanned platforms in the battlefield serves not only to overcome the constraints arising from manpower and resource shortages, but also increases the operational capability of a fighting force. They will provide tangible increases in combat range, firepower, speed, element of surprise, command and control, etc. As unmanned warfare and the mastery of unmanned technology will become increasingly important parts of a nation's strategic architecture, her armed forces and her defence industries will need to pay appropriate attention to this aspect of warfare.

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Woman In Combat - What's Wrong With That?

by LTC Sng Seow Lian

In today's armed forces, no subject raises as much controversy as the role of women in combat roles. This controversy is mainly to be found in Western societies where women have been campaigning for sexual equality for many years. Several decades back, social attitudes and male discrimination had limited the role of women in society to that of mother and homemaker. This is no longer the case. As a result of the maturation of Western societies and the efforts of the women's liberation movement, traditional barriers against women especially in the work place have been removed.

Women successfully penetrated the armed forces at about the turn of the century. Understandably, they were first employed in support roles, that is, non-combat roles such as nursing, clerical and administrative work. During World War II, women in some Western countries came closest to combat when they served in anti-aircraft units. There seemed less reluctance to allow women in anti-aircraft duties presumably because an enemy air attack would have brought the war to women and children anyway. Only the Soviet Union formally employed women to fight the German invaders but then its survival was at stake at the time. In fact, history shows that society is usually more amenable to the idea of women's participation in combat when national survival is in grave danger.

In recent years, feminist groups in the West have been arguing for women to be employed in combat roles, and not merely in combat support or combat-related roles which government legislation have sanctioned thus far. (Although countries like Britain, Denmark and the Netherlands allow women in combat roles, government legislation limit their employment only on board warships.) Their argument is of course based on the issue of equal rights for men and women. Feminists point to the fact that women can never achieve complete equality unless they are given equal responsibilities since this is a basic assumption of democratic societies. They also argue that modern warfare with its emphasis on the use of long range weapons do not discriminate between the sexes, and that in any case current laws that allow women in combat support roles place them in situations where they can find themselves in the thick of a battle. If these feminists succeed in getting women into combat roles, the last bastion of male 'domination' and 'discrimination' would have been demolished. Should society give in to their demands?

In my view, the answer is yes. Not to do so would perpetuate discrimination against women besides depriving the armed forces of another source of manpower. To opponents of the idea, the question of allowing women in combat roles is not an equal rights issue. They argue on the basis of what seems an even higher cause which is that of national security. If having women in combat roles weakens the fighting prowess of the armed forces, then they must be excluded whatever else may pertain. This argument has merit but only if we think in terms of allowing women into combat roles indiscriminately. This is certainly not the proposal. Hence, it is necessary to establish an important premise before we proceed further.

When we speak of allowing women in combat roles it is not to suggest that they be accepted wholesale without taking into account the physical capability of each individual. Critics of women in combat roles often emphasise the fact that men are physically more suited than women for the rigours of the battlefield. That is true in most cases but not all, and there is no reason to deny the exceptional women from combat roles any more than we want the exceptional men to be in them. In other words, when considering women for combat roles there is a need to subject them to selection tests as stringently as we apply them to the men. Each job needs a set of physical standards which must be met by all personnel intended for that employment. There is no room for double standards.

Even feminist groups would concede that requirement. Not to do so would be a form of discrimination against men. Obviously less women than men will qualify for combat roles but that is irrelevant. Much of the debate on women in the armed forces also revolves around the issue whether or not they should be employed in combat roles, combat support roles or combat service support roles. This question is again

irrelevant once a woman is tested and found to be fit for combat roles. Another objection made irrelevant is the claim that military training is less effective because of the presence of women. There is no reason for this to be so if the women selected are as capable as their male comrades in the rough and tumble of military training.

Having established the point that there are women in society who should be permitted in combat roles from the physical point of view, there is no need to discuss the issue about how changing technology have made weapons lighter and easier for women to handle, although they do mean that more women would qualify for combat roles since physical performance standards can be less exacting. We will now address some of the objections commonly expressed against having women in combat roles.

Critics of women in combat roles argue that combat effectiveness on the battlefield is dependent not only on physical and technical proficiency but also on the cohesion of combat groups, and that this cohesion is the result of a socio-psychological process leading to male bonding. There is no doubt that bonding is important for any group effort to succeed and no less so than in the stressful environment of the battlefield, but there is no evidence to suggest that women placed in that kind of environment are not able to bond with their male comrades. There is in fact a great deal of evidence to suggest that men and women can work closely together in many civilian areas. What comes readily to mind is the overwhelming success of 'quality control circles' in Japanese industrial enterprises where men and women work closely together in intense competition with other groups.

So, male-female bonding is possible in the work place. But critics also maintain that such bonding is in fact based on sexual attraction and that men and women can never be 'mates' or 'buddys' the way men can because 'sex gets in the way'. While that may or may not be true in social situations, one can safely say that experience at civilian work places again shows that men and women can develop respect for each other and perhaps even form a 'brother-sister' relationship. In fact, it may be easier to establish good male-female relations in actual combat than during the routine of peacetime.

Men are socialised from young to believe that women are the weaker sex and hence need to be protected from harm. It is argued that such a belief may jeopardise combat missions because male soldiers would be distracted from their tasks if they have to give additional thought to the protection of their female comrades. The Israeli Defence Force subscribes to this view, but we should note several points which might have influenced the Israeli decision to exclude women from combat roles:

> (1) The Israelis have an obsessive fear about what their enemies would do to their women POWs;

> (2) The perceived threat from the enemy does not warrant the inclusion of Israeli women in combat roles;

> (3) Most importantly, the idea of women in combat violates the Jewish concept of womanhood and the status of women as mothers.

The Israelis employed women in combat in the fledgling years of nationhood (in organisations known as the Haganah and the Palmach) and in the 1948 war when invading Arab armies threatened to destroy the infant Jewish nation. I would suggest that the employment of Israeli women in combat is still not beyond consideration should there be another similar survival crisis, only that such a crisis is very remote ever since Israel acquired nuclear weapons. (The Yom Kippur War of 1973 may well be the last conventional war between Israel and its neighbours.)

The point is often made that women are less able than men to withstand battlefield stress. Unless there is evidence to support this statement, we should not take it seriously. One is reminded of women astronauts and cosmonauts who have taken to space, of female adventurers who have scaled the heights of Mount Everest and dived beneath the Arctic ice. Few activities are as stressful as these. Then again, consider Margaret Thatcher who was not dubbed the Iron Lady without very good reasons. These are women with very tough mental constitutions; there is no reason to believe that there are no others like them who can

cope with battlefield stress. Women certainly shed tears more easily than men - the Iron Lady cried in public when her son was reported lost during an African motor race - but one can argue that this gives them a 'safety valve' while men not having it might implode more easily from suppressed emotions.

That women menstruate is often taken as an argument against their participation in combat. In my view, this is nothing more than a hygiene problem and provided the logisticians do not neglect to load their trains with sanitary napkins there is no reason why we should be so concerned about it any more than we concern ourselves with the need to empty our bowels on the battlefield daily. What about the problem of privacy for menstruating women? In my opinion, the last thing any soldier should worry about during combat situations is privacy. Experience at West Point shows that women cadets often miss their periods when under strenuous physical activity. I do not think that these women cadets were lying in order to justify their presence in what is essentially a male preserve. Active female athletes report the same curiosity. Scientists surmise that this is nature's biological defence mechanism which is also found amongst women in societies under stress. That makes sense, for nothing can be more dreadful than to have women conceiving during a drought or a war.

What about pregnancies? Undoubtedly a pregnant woman should not be allowed to fight at the front-line. But women in general are not frequently pregnant and this removes the reason for excluding them from combat roles. There is of course the possibility that women might resort to intentional pregnancies in order to avoid combat duties but this is a problem to be addressed by clear policy regulations governing pregnancies during 'awkward' periods. It is not a reason for excluding women from combat roles.

Throughout history, society's attitude towards the role of men and women in combat has been shaped by the belief that men are by nature active and aggressive while women are passive and submissive; men had the hunting instinct while women kept home and raised children. Hence, men have always been regarded as suitable for fighting while women were left at home or consigned to the baggage train. There are two difficulties with this argument. Firstly, there is a repetition of the mistake to compare the (temperament of the) average man with the (temperament of the) average woman. The fact that some women can be more active and aggressive than men is ignored. Secondly, it does not explain why there are mild-mannered and passive men who have made good as combat soldiers, and men who will never make good soldiers. In my view, what matters more is proper training, positive values and a strong conviction.

The concern that women POWs may be raped by their captors is another reason why women have been excluded from combat roles. This concern is misplaced for women who opt for such roles are aware that the possibility is a job hazard no more repulsive than torture or other forms of abuse. Just as the possibility of being sodomized by the enemy does not bring about the exclusion of males from combat, likewise the possibility of being raped should not prevent women from being given such a role. In any case, this is strictly a matter for the individual woman to think about. Society need not be involved in the decision which only she alone can make.

It has also been argued that male machismo is such that men would rather fight to the death than surrender to women soldiers thereby prolonging combat and increasing casualties. This is another myth based on naive stereotyping. This was the same reason for the previous exclusion of women from law enforcement jobs in the United States. There is no evidence to show that male criminals are less willing to submit to female police officers than they would to male police officers. This myth was laid to rest during the Gulf War where battle-hardened Iraqi troops frequently surrendered to U.S. servicewomen.

Women have been admitted into most if not all armed forces but in most cases they are employed in non-combat and combat support roles. It is easy to see that women would have difficulty advancing to higher ranks if they are not permitted a share of combat roles. In other words, women would not achieve complete equality unless they are given equal opportunities and responsibilities. In some armed forces, there is an institutional disrespect for women soldiers. Consider for instance the notorious Tailhook incident in 1991 where twenty-six women naval officers were manhandled, groped, and abused by their male counterparts after a convention held at a Las Vegas hotel. This lack of respect for servicewomen will not change unless they have the same career opportunities as men.

This paper has argued for the inclusion of women in combat roles so long as they meet the physical and psychological requirements needed for employment. Ultimately the military mission must take precedence and not the gender of the combatants. When a commander assigns a mission, he looks for the most competent person. Just as there are capable and competent servicemen, there are similarly able service women.

Although the SAF is not desperately short of manpower, we should not be averse to the idea of employing women in combat roles. The future is hard to tell. What is needed is calm and rational thinking, and lots of persistence given the difficulty of changing social values and attitudes. Vocal feminist groups in the West often do a disservice to their cause by absurd demands. There was a report once of a demand by some Western feminists to have the word 'manhole' changed to a more 'neutral' term. I had mused over the absurdity of the idea for I could see no more of a man in a 'manhole' than I could see of a woman in a 'ladybird'. Preposterous demands like this and the militant language that often accompany them will not advance the cause of the feminist movement, or women's right to combat roles.

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Gulf War : A Case Study Of Indirect Strategy

by MAJ Tan Suan Jow

INTRODUCTION

The attack began at 01:00 am (Baghdad time) exactly on 2 Aug 1990. Iraqi forces led by three Republican Guard divisions invaded Kuwait. Within 24 hours, the Iraqi forces took over Kuwait City. The 16,000-strong Kuwaiti Army was not mobilised; only the Air Force managed to put up some resistance. Nonetheless, by 4 Aug 90, the Iraqi forces overran Kuwait and amassed along the Kuwait-Saudi border, all poised and ready to advance further into Saudi Arabia.

The world's first post-Cold War military crisis was underway, a crisis that cut sharp with dangerous economic, military and political angles. With almost half the world's oil supply at stake and the threat of mass destruction by the modern Iraqi war machine, fuelled by Saddam's political ambition, the world had to react.

What followed was first a battle of political will and then of grand strategy between the coalition forces led by US President George Bush and the Iraqi forces led by Saddam Hussein. This led to the eventual contest of operational strategy in the military arena. As it turned out, the coalition forces' superior military hardware reinforced with sound strategies and tactics defeated the battle-tested Iraqi forces decisively and did so with a miraculously low casualty rate. Indeed, it was a war that deserves microscopic scrutiny, especially the strategies employed in it.

AIM

Many military scholars and authors had pointed out that the coalition's strategies were heavily influenced by Sun Zi's and Liddell Hart's work, and thus classified as indirect strategy. The aim of this paper is to examine the extent to which the Persian Gulf War can be considered as a case study or an illustration of indirect strategy.

SCOPE OF PAPER

In order to avoid any ambiguity, the definition on the various types of strategy will be presented first. A brief description of some key strategic thinkers' writings on those strategies will also be presented. The definitions highlighted will be used to pursue the aim of this paper.

Following the definitions on strategy, this essay will examine the grand and operational strategies deployed in the Persian Gulf War. The lessons on indirect strategy that can be drawn from the war and its limitations will be presented. A conclusion will be drawn on whether the Persian Gulf War could be considered a case study of indirect strategy.

DEFINITION OF STRATEGIES

Grand Strategy

Liddell Hart's exhortation of the term grand strategy was aimed at bringing out the sense of policy in execution. To him, the role of grand strategy was to co-ordinate and direct all the resources of a nation, towards the attainment of the political object of war. In his teaching, the ability to fight (military actions) was but one of the instruments of grand strategy. The other instruments included the ability to apply the

power of financial pressure, diplomatic pressure, commercial pressure and ethical pressure to weaken the opponent's will.[2]

Clearly, grand strategy encompasses indirect strategy (see below) at the highest level when it expounded on means other than the military option. As in the case of Gulf War, the coalition governments applied diplomatic and economic pressures before the launch of Desert Storm and continued to do so even after the war.

Operational Strategy

Having cleared the ground for grand strategy which is practically synonymous with war policy[3] , we can now derive a definition for operational strategy as one which is on a lower plane that encompasses the art of distributing and applying military means to fulfil the ends of policy.[4] This is in line with Clausewitz's definition in his masterpiece On War - the art of the employment of battles as a means to gain the object of war. Operational strategy concerns the deployment and use of armed forces to attain a given political objective.[5] In this study, the strategies applied by allied forces under US General Norman Schwarzkopf and those used by Saddam Hussein on the battlefield will be examined.

Direct Strategy/Approach

At the highest level, direct strategy advocates such as Jomini and Fuller see that the best way to defeat enemy's political will is to defeat his army in a decisive battle. In other words, they see the ability to fight (military operations) as the main instrument to weaken the opponent's will. The other instruments will take secondary roles. To Jomini, the purpose of warfare was to occupy enemy territory and this was done through progressive domination of zones of operation.[6]

On a lower plane, direct strategy or approach stresses the need to mass superior forces against weaker enemy forces at decisive point such as supply lines or flanks, so as to cut them off and destroy them.

Indirect Strategy/Approach

On the opposite end of direct strategy and at the highest level, Sun Zi believed that one must try to overcome the enemy by wisdom and not by force alone.[7] To him, a military struggle was not only a competition between military forces, but also a comprehensive conflict embracing politics, economics, military force and diplomacy.[8] His priority in warfare was, first to attack enemy's plan; next to attack his alliances; then to attack his army; and last to attack his cities.[9] As one can see, the military option was third in priority.

On an operational plane, Liddell Hart emphasised on the use of movement and surprise, to take the least line of resistance and hence expectation, to achieve not just physical dislocation of enemy forces but also psychological dislocation.[10] The desired effect was to render enemy forces ineffective without a decisive battle.

The success of such an approach in warfare is dependent upon deception, surprise and flexibility. Deception and surprise are essentials to distract the opponent's mind to deny him the freedom of action and subsequently, his conception.[11] Flexibility is needed to allow for simultaneous threatening of two or more objectives so as to cause the enemy to over-extend his defence or prioritise his defence in favour of one objective for the other, thus offering the most economical method of distraction to the enemy.[12]

In essence, the indirect strategy encompasses physical and psychological dislocation of the enemy's poise through a combination of attack through the least line of expectation and the use of deception, surprise and flexibility on the battlefield.

GULR WAR : GRAND STRATEGY

This part of the paper examines the non-military effort at the highest level, in particular the diplomatic and economic pressures applied on Iraq by the coalition governments, to drive the Iraqi invasion forces out of Kuwait. Although the nuclear deterrence did not in any way constitute part of such driving forces, it did influence and limit the type of battlefield for the allied forces, which helped to secure a victory at a lower casualty rate.

Coercive Diplomacy

The scope and intensity of the international response mustered at the beginning of the conflict must have surprised Saddam Hussein. One could argue that he was not altogether mistaken in believing that the United States was encouraging him to strengthen his position prior to the invasion and the Americans would not object to an Iraqi move against Kuwait.[13] He seemed to have over-estimated the US government's reluctance to get involved in the dispute and believed that with no lead from Washington, the world would not act against him. If there had been a stern and unambiguous warning from America[14] prior to the invasion, Saddam Hussein might have re-assessed his risk before sending his army into Kuwait.

Other than the initial blunder, the Bush administration was quick to rally international opinion against Iraq. On the day of invasion, the US diplomats moved with alacrity to obtain international backing for United Nations Security Council Resolution 660 (1990), demanding Iraq's immediate and unconditional withdrawal of all its forces from Kuwait.[15] The high point of success in the diplomatic arena was reached on 29 Nov 1990, when Resolution 678 (1990) was adopted, which authorised Member States to co-operate with the Government of Kuwait, to use all necessary means (including military forces) to uphold and implement Resolution 660 (1990).[16]

On the Iraqi side, the strategy from the start of war was to urge their fellow Arab states to resist the "internationalisation" of their local squabbles.[17] Saddam sought to counter the American strategy by striking at the fragility of the international coalition, especially the Arab members. He tried to justify Iraq's seizure of Kuwait by stressing its historical legitimacy of Iraq's claim to Kuwait. His spokesmen attempted to convince other major powers such as the Soviet Union and France that their national self-respect were being undermined by slavish subservience to Washington.[18] Arab states that supported the coalition were also not spared. He sought to generate popular protest against them by highlighting their cooperation with the United States, an anti-Islam, anti-Arab, Pro-Zionist and anti-Palestinian foe. The Palestine question was also brought to bear on the agenda. However the unambiguous character of his aggression and his deception prior to the outbreak of war had infuriated other Arabs. No one was convinced that the Palestine issue could be resolved with the invasion of another Arab state. To this end, Saddam's diplomatic effort to confine the conflict to Arab squabble and to undermine the coalition had failed miserably. When all his efforts failed to yield results, he threatened unacceptable battlefield losses for the coalition in the event of hostilities, as described by the infamous phrase "Mother of all Battles". He strongly believed that America's commitment would evaporate once casualties started to mount.

Despite unprecedented political and diplomatic effort, including the threat of force by the United Nations, Saddam did not retreat from his hard-line stance. It appeared that the coalition could not offer any carrots that could be presented as "reward' for aggression and it was not politically acceptable for Saddam to back off unconditionally.[19] Saddam reckoned that with time he could complete the incorporation of Kuwait into Iraq's structure, and with time international interest would wane and he would be able to obtain the sort of deal he hoped for.[20]

As it could be seen, coercive diplomacy applied by the allied forces had failed to stop the eventual armed encounter. It was understandable that diplomacy could not succeed when dealing with a dictator (Saddam Hussein in this case), whose only interest lay in keeping control over his country rather than the furtherance of national interest in building cordial relationship with other nations. Hence, diplomacy could only claim success in forging the coalition forces to apply military actions (direct strategy) against Iraq. It had no direct impact at all in driving the Iraqi forces out of Kuwait.

Economic Pressure

Full trade embargo was implemented right from the start (under United Nations Security Council Resolution 661 (1990) and subsequently Resolution 665 (1990)) and was enforced more rigorously than any previous instance, but it did not produce the desired results. Economic sanctions would probably be effective if linked to a more promising diplomatic solution, but as we have noted earlier, there was little or no "middle ground" upon which to build such a deal. It was also only likely to be effective against an elected government rather than a dictator. As it turned out, the economic misery was directed at the Iraqi people and had little effect on Saddam's personal position.[21] He was in a position to divert available resources to his armed forces and those upon whom his political future depended on.

In the end sanctions alone were judged to be insufficient to force Saddam to back down. Furthermore, the imposed suffering on the innocent Iraqi people would invoke doubts on the moral ground of coalition's actions. Nonetheless, the influence of economic sanctions should not be disregarded. The five months of sanctions did undermine the ability of Iraq to sustain a prolonged war and the enforcement of sanctions helped to forge the allied troops (which were deployed to enforce economic sanctions) for subsequent military actions.

Nuclear Deterrence

The coalition forces had never at any moment contemplated the use of nuclear weapons to liberate Kuwait. In fact, President George Bush had decided at Camp David in Dec 1990 that the US forces would not retaliate with chemical or nuclear weapons even if Iraq resorted to non-conventional weapons. He also decided that the best deterrence on the use of weapons of mass destruction by Iraq would be a threat to go after the Ba'ath regime itself.[22] However, the threat to use tactical nuclear weapons with a vengeance in response to Iraqi use of chemical or biological weapons was deliberately left ambiguous when US Secretary of State James Baker met Iraqi Foreign Minister Tariq Aziz in Geneva. This could form part of the reason why there had been no confirmed use of chemical weapons by Iraq during the war.

Though the threat to use nuclear weapons was never for real, it did help to confine the war to a conventional one. Iraq in abiding by this limitation, hoped not only to keep the allied war aims to Kuwait, but to emerge victorious from the conflict. Instead, it helped the coalition forces, which were better equipped and better-trained in conventional warfare to secure victory without the otherwise high casualty rate expected in a non-conventional warfare.

Conclusion for Grand Strategy

The grand strategy adopted by the coalition forces had failed to eject Saddam's forces from Kuwait, even though all the possible measures were enforced to the letter. With Iraqi's outright defiant stance against the world community, there was little chance for diplomacy to work. Coupled with his ability to channel resources to his vital armed units, the economic embargo only served to worsen civilian suffering though it did undermine Iraq's capability to support prolonged military operations. With growing impatience for economic sanctions to work[23] and the possibility of breakdown in international coalition especially the Arab members due to Saddam's indirect strategy, the allied forces had to adopt more direct and offensive measures.

Nevertheless, the unprecedented political and economic measures undertaken by the coalition had helped to soften the ground for military operations to take place. Hence the effectiveness of the indirect strategy adopted should not be discarded. The scale and intensity of coercive diplomacy and economic pressure applied in the Persian Gulf War gives an illustration of indirect strategy, even though the end result was far from desired.

GULF WAR : OPERATIONAL STRATEGY

When President Bush wanted a briefing on an offensive military option in early October 1990, the initial idea presented was a direct assault against the enemy's strongest positions using a single Corp.[24] It was predicted that if the Iraqis behaved logically and withdrew after losing about 50 percent of their forces, they could stand and fight for about a month and that the US forces would suffer about 30,000 casualties in the process.[25] This actually stirred up numerous responses from the President's advisers. Some advised against force-on-force while others suggested going around and coming from the side. General Schwarzkopf had not intended the initial plan to be convincing. He wanted to send a clear message to the President, that the ground forces were insufficient to guarantee success.[26]

After that briefing, the Pentagon began its own analysis on the flanking option and General Schwarzkopf briefed his staff to work up ideas along that line. The idea of indirect approach was already mooted right from the beginning. That more or less set the tone for the operational strategy of the coalition forces.

Air Campaign

In line with the overall strategy, the air campaign was directed at achieving both physical and psychological dislocation of Iraqi troops. The intended targets were Iraqi centres of gravity[27] , command, control and communication centres, supply routes, electrical, military and oil production facilities, and critical terrain such as bridges and railroads and major highways to seal the Iraqi's escape routes. The key objectivewas to paralyse Saddam's chain of command and control and to render the forces operating in Kuwait isolated. With a highly rigid and centralised command structure, the failure of command, control and communication systems had left many intermediate commands confused and without directions. It also softened the will of the Iraqi forces to fight and prepared the ground for the coalition forces' land assault.

The attacks against leadership and command and control facilities had political and psychological dimensions. Separating the national leadership in Baghdad from the military forces in the field would show the Iraqi forces the powerlessness of their leaders. The air campaign planners also hoped for a more direct political effect. If Saddam Hussein could not communicate with the Iraqi people, he could not propagandise against the coalition forces nor mobilise the country for war.[28]

The continuous and relentless air attacks lasted for 43 days with no less than 44,000 combat sorties[29] flown by the coalition army, navy and air force aviators. By then, the Iraqi troops were already psychologically dislocated and utterly demoralised. The ground was "sweet" for the coalition land campaign.

Land Campaign

The evident desire to avoid high casualties that would follow from a head-on confrontation and adhering to their manoeuvre warfare (Air-Land Battle) doctrine, led the coalition to adopt what came to be known as the "left hook" or "Hail Mary" sweep. The basic issue was feasibility; would there be sufficient forces made available, could the terrain support such a manoeuvre and would Saddam realise what was up in time to redeploy his troops?

The decision was made in Washington to double the planned air, sea and land forces[30] to undertake the wide envelopment of Iraqi forces. Deception plans were also devised to mislead the Iraqi forces of its actual intention (see Deception Plan below). The wide envelopment was a sudden and massive transfer of land forces from Kuwait-Saudi border to a totally unexpected location 300 kilometres west of the western end of Kuwait-Saudi border and about 150 kilometres deep into the rear of Iraqi ground troops along the Euphrates River. This unexpected direction of attack exposed Iraq's undefended western flank while bypassing its stronghold along the Kuwait-Saudi border. As a result, the 7th Armoured and 18th Airborne Corps were able to trap and destroy the Iraqi strategic reserves to the north of Kuwait, which thus destabilised and created confusion within the Iraqi command.

This left hook clearly epitomised the exploitation of the least line of expectation and hence resistance, which was instrumental in achieving psychological and physical dislocation of the enemy. In addition, the

mechanised and armoured forces executing the wide envelopment were able to exploit speed and flexibility to enhance the dislocation effects. It had all the elements of indirect approach and certainly attained the desired results. The land battle was over within 100 hours after the commencement of ground campaign.

Psychological Campaign

To further soften the ground prior to the land campaign, the coalition conducted numerous operations to lower the morale of Iraqi ground troops. 14 million leaflets were dropped within Kuwait to urge the Iraqi forces from fighting a futile war. Similarly, 120,000 bottles with notes were beached to urge the Iraqi defenders along the coast to surrender.

Other than urging the Iraqis to forsake their equipment, desert and surrender in the leaflets, the coalition's promise to uphold Geneva convention in treatment of prisoners of war was also reflected in them. The content of the leaflets also aimed to instil hatred between elite officers and men[31] and to play up the feelings of abandonment felt by Iraqi soldiers trapped within Kuwait. Most importantly, it tried to paint a white knight image on the coalition forces - to free Kuwait and not to fight the Iraqi people, Arab values or social traditions. Coupled with the relentless and precision bombing day and night for six weeks, such leaflets and notes were highly effective.[32]

The Iraqi high command also had a hand in psychological warfare. Saddam threatened a prolonged war similar to Vietnam War and promised high casualty rates which would be unacceptable to the coalition governments. He also threa-ened a worldwide terrorist campaign against the coalition forces. The launching of Scud missiles into Israel was part of his psychological offensive plan targeted to weaken the coal-ition by provoking the Israeli into battle[33] even though he was fully aware that the Russian missiles could not inflict much damage in Israel with a conventional warhead. Though the plan was not successful in drawing the Israelis into the fray, it tied down a huge portion of the coalition's air arm to hunt down the mobile launchers.[34] Last but not least, he tried to play down the moral high ground of the UN coalition by broadcasting pictures of civilian casualties caused by coalition aerial bombing, in particular the destruction of the baby milk factory[35] and the Amiriya command and control bunker.[36]

Deception Plan

The success of the wide envelopment was heavily dependent on the ignorance of such movement by the Iraqi forces. The deception plan was thus necessary to provide security and surprise, the latter being a crucial element of indirect strategy.

Any trained staff officer could see that the most likely plan of action was a march around the open Iraqi flank. However, the deposition of coalition forces prior to the land offensive was deliberately made known to the Iraqi forces to convince them that the main assault would come from the south of Kuwait. Even when the 7th Armoured and 18th Airborne Corps moved to the western flank, care was taken to mask their movement. A small group of Marines called Task Force Troy acting as a deception force was deployed and by using wooden tanks and artillery mock-ups mixed with real tanks and TOW vehicles, they created a false presence. A psychological warfare unit was added to Task Force Troy to send audio and electronic signature to fake tank movement at the Corps' old location.[37]

Similarly, to the east and out in the Persian Gulf, the 18,000 strong US Marine Task Force was poised to conduct an amphibious assault, threatening the eastern front. Regular training and bombing raids were conducted along the coast to enhance the deception. The Iraqi command was so convinced that they prepared for a major amphibious landing along the coast of Kuwait.

The deception plan was so effective that the Iraqi command tied down no less than 10 divisions along the coast of Kuwait[38] in preparation for the amphibious assault and another 10 to 15 divisions in defensive fortifications along the Kuwait-Saudi border for the frontal attack. As a result, a sizeable force was prevented from interfering with the main battle coming from the western front.

Conclusion for Operational Strategy

All the elements of indirect strategy were thoroughly exploited by the coalition forces in their operational strategy. The wide envelopment from the west to take the line of least expectation, the exploitation of speed and flexibility and the conduct of deception to maximise surprise in their attack plan had fit in nicely into the teachings of Liddell Hart. The merciless and continuous aerial bombing and the propaganda leaflets further enhanced the psychological dislocation of the Iraqi forces. It was without doubt a clear example of indirect strategy for the history books.

LESSONS DRAWN FROM GULF WAR

Applications of Indirect Strategy

As highlighted earlier, the grand strategy adopted by the coalition forces had every intention of ousting the Iraqi invaders out from Kuwait without having to use force. However, coercive diplomacy and economic pressure could only do so much when dealing with a defiant dictator, whose concerns were more for his own political survival rather than the interests of his country or subjects. Saddam's absolute control over Iraq allowed him to channel resources to his armed units and which in turn helped him quash any uprising against him. As a result, it was the civilian population that received the backlash from the sanctions intended for Saddam's war machine. Even if the people had revolted against Saddam Hussein for the disaster he led his country into, there was little chance that such an uprising would be successful, given the absolute control he had over the armed forces.

Given the circumstances, the coalition had to adopt a more offensive stance against Saddam Hussein. Since grand strategy (therefore indirect strategy) did not accomplish the job, the only option was a military one. As mentioned before, the coalition hoped to win the battle with minimum casualties. The US administration had decided on the onset to use indirect approach (the wide envelopment from the western front) to achieve the dislocation effects that was so well documented in the Battle of France in World War II and in the amphibious landing at Inchon in the Korean War. And they did. The results were simply awesome. The land campaign was over in 100 hours with no more than 370 coalition troops killed in action[39] ; a miracle when considering it a war between 443,000 allied troops against 41 divisions (no less than 430,000 soldiers) of battle-tested Iraqi forces.

Limitations

Notwithstanding its successful application in the Persian Gulf Conflict, the indirect strategy does suffer some limitations. First is its definitive assumption that the dislocation of the enemy's physical and psychological equilibrium would be a vital prelude to a successful overthrow or collapse of the leadership.[40] This was clearly not the state of affairs despite the success of the coalition forces in the Gulf War. After the war, Saddam Hussein quickly reorganised his army with the remaining 500,000 troops and 2,000 main battle tanks, which is still the largest in the Arab world[41] today. He regained his balance, his bounce and his belligerency and is still very much in control of Iraq.

Secondly, for coercive diplomacy and economic sanctions to work its full effects, it is usually a long drawn event. Under trying circumstances, one may not have the luxury of time, as in the case of Persian Gulf War. Both the Secretary of State James Baker and Central Intelligence Agency Director William Sessions had testified that sanctions would need a very long time to work, and hence were in support of the war option to rid Kuwait of Saddam.[42] Furthermore, as explained earlier, it is less effective or ineffective against dictators, like Saddam Hussein.

Thirdly, at the operational level, the conduct of indirect strategy may not be suitable or feasible at times due to constraints posed by terrain, size of own forces and opposing force. For example, had the ground west of the Iraqi forces been made impassable to track vehicles, such a "Hail Mary" manoeuvre would not be possible. The coalition forces had sufficient resources to conduct feint attacks to support of the deception

plan but such luxury may not be affordable to the armies of another nation or coalition. In short, the terrain, one's own capability and the enemy's capability have a direct impact on the conduct of indirect strategy.

Finally, the over-emphasis on alternate battlefield objectives in indirect strategy to the extent of rejecting a single objective may not necessarily lead to victory. Such an attempt requires complex planning and excellent co-ordination on the ground to ensure success. If mishandled, it can result in unclear objectives and wasteful dissipation of own resources.

CONCLUSION

The Persian Gulf War provides yet another example of successful military execution of indirect strategy. The exploitation of the line of least expectation, speed, flexibility, surprise and deception to achieve physical and psychological dislocation effects was near perfect and the results were telling - no other wars were concluded in such a short time with such incredibly low casualty rates. Although the non-military aspect of the coalition's grand strategy had failed to accomplish the desired results, it was nonetheless instrumental in setting the stage for the military to complete the job. Due to the peculiar nature of Iraq's leadership structure, diplomacy and economic pressure would take a long time to manifest their full potential. In the case of the Persian Gulf War, time was threatening the integrity of the coalition forces and they had little choice but to adopt more drastic measures. Nevertheless, it can be said that indirect strategy had withstood the test of time and will continue to influence the strategy of future commanders, military and non-military alike.

ENDNOTES

1 B.H. Liddell Hart, *Strategy: The Indirect Approach* (London: Faber and Faber Limited, 1967), pp. 335-6.

2 Ibid., p. 336.

3 Ibid., p. 335.

4 Ibid., p. 335.

5 Edward Mead Earle, *Makers of Modern Strategy: Military Thoughts from Machiavelli to Hilter* (Princeton: Princeton University Press, 1993), p. 105.

6 Ibid., pp. 85-8.

7 Samuel B. Griffith, *Sun Tzu - The Art of War* (Oxford: Oxford University Press, 1963), p. 39.

8 Ibid., pp. 39-40.

9 Ibid., pp. 77-8.

10 B.H. Liddell Hart, op. cit., pp. 339-41.

11 Ibid., pp. 341-2.

12 Ibid., p. 342.

13 John King, *The Gulf War* (England: Wayland, 1991), p. 8.

14 James Baker III, "The Politics of Diplomacy", *Newsweek*, 2 Oct 1995,

15 United Nations Security Council Resolution 660 (1990) adopted on 2 Aug 1990.

16 United Nations Security Council Resolution 678 (1990) adopted on 29 Nov 1990.

17 Lawrence Freeman and Effraim Karsh, *The Gulf Conflict 1990-1991* (Princeton University Press, 1993), p. 430.

18 Bard O'Neill and Ilana Kass, "The Gulf War: A Political-Military Assessment", *Comparative Strategy*, Volume 11(2) April-June 1992, p. 220.

19 Lawrence Freeman and Effraim Karsh, op. cit., p. 431.

20 Ibid., p. 430.

21 The Iraqis' suffering cannot be translated into political instability as Saddam had absolute control over his subjects. Example could be drawn from North Korea, whereby the people were dying by the day due to hunger, but had no impact on the control of its dictator.

22 James Baker III, op. cit..

23 Lawrence Freeman and Effraim Karsh, op. cit., pp. 203-4.

24 Ibid., pp. 204-5.

25 James Blackwell, *Thunder in the Desert: The Strategy and Tactics of the Persian Gulf War* (Bantam Books, Oct 1993), p.103.

26 Lawrence Freeman and Effraim Karsh, op. cit., p. 205.

27 The centres of gravity identified were the Iraqi National Command Authority, Iraq's chemical, biological and nuclear capability and the Republican Guard Forces Command - Thomas A. Keaney and Eilot A Cohen, *Gulf War: Air Power Survey Summary Repor*t (Washington D.C.: Library of Congress Cataloging-in-Publication Data, 1993), p. 40.

28 Ibid., p. 44.

29 Richard P. Hallion, *Storm Over Iraq: Air Power and the Gulf War* (Smithsonian Institution Press, 1992), p. 88.

30 Lawrence Freeman and Effraim Karsh, op. cit., p. 206.

31 Many Iraqi officers took care of themselves while their soldiers lived in squalor. In some instances, officers' bunkers had refrigerators well stocked with fresh fruits, cold drinks and bread, while the troops barely got one meal a day. It was the worst imaginable form of leadership - James Blackwell, op. cit., p. 184.

32 This could be seen from the high surrender rate of Iraqi troops (more than 86,000 Iraqi soldiers) in the land campaign. Many of them had the leaflets in their hands when surrendering to the coalition ground forces.

33 Israeli forces would have to violate its Arab neighbours' sovereignty in order to retaliate Iraq's missile attack.

34 James F. Dunnigan and Austin Bay, *From Shield to Storm: High-Tech Weapons, Military Strategy and Coalition Warfare in the Persian Gulf* (New York: William Morrow and Company Inc., 1992), p. 150.

35 The allied forces claimed it was a biological plant for the production of non-conventional weapons while Iraqi claimed it to be a milk powder factory, supplying essential food for Iraqi children.

36 The bunker was used to house civilians at that fateful moment of aerial bombing. 300 civilians were killed.

37 Bruce W. Watson, Bruce George, Peter Tsouras and B.L. Cyr, *Military Lessons of the Gulf War* (London: Greenhill Books 1991), p. 188.

38 Richard P. Hallion, op. cit., p.244.

39 Douglas Waller and John Barry, "The Day Bush Stopped The War", *Newsweek*, 20 Jan 1992.

40 Brian Bond, *Liddell Hart: A Study of His Military Thought* (London: Cassell and Company Ltd, 1997), p. 55.

41 Ray Wilkinson, "Back from the Living Dead", *Newsweek*, 20 Jan 92.

42 James Blackwell, op. cit., p. 110.

Bibliography

Blackwell, James. *Thunder in the Desert: The Strategy and Tactics of the Persian Gulf War*. New York: Bantam Books, 1991.

Bond, Brian. *Liddell Hart: A Study of His Military Thought.* London: Cassell and Company Limited, 1977.

Dunnigan, James F. and Austin Bay. From *Shield to Storm: High-Tech Weapons, Military Strategy and Coalition Warfare in the Persian Gulf War*. New York: William Morrow and Company Inc., 1992.

Earle, Edward Mead, editor. *Makers of Modern Strategy: Military Thought from Machiavelli to Hilter*. Princeton: Princeton University Press, 1993.

Griffith, B. Samuel. Sun Tzu: *The Art of War*. London: Oxford University Press, 1963.

Freeman, Lawrence and Effraim Karsh. *The Gulf Conflict 1990-1991*. Princeton: Princeton University Press, 1993.

Hallion, Richard. *Storm Over Iraq: Air Power and the Gulf War*. Washington and London: Smithsonian Institution Press, 1992.

Liddell Hart, Basil Henry. *Strategy: The Indirect Approach*. London: Faber and Faber Limited, 1967.

Luttwak, N. Edward. *Strategy: The Logic of War and Peace*. Harvard: Harvard University Press, 1987.

King, John. *The Gulf War*. England: Wayland, 1991.

Watson, W. Bruce, Bruce George, Peter Tsouras and B.L. Cyr. *Military Lessons of the Gulf War.* London: Greenhill Books 1991.

Baker III, James. "The Politics of Diplomacy". *Newsweek*, 2 Oct 1995.

O'Neill, Bard and Ilana Kass. "The Gulf War: A Political-Military Assessment". *Comparative Strategy*, Volume 11(2) April-June 1992.

Singh, Deep. "Liddell Hart's Strategy of Indirect Approach in Operation Desert Storm". *Pointer*, July-September 1993.

Waller, Douglas and John Barry. "The Day Bush Stopped The War". *Newsweek*, 20 Jan 1992.

Wilkinson, Ray. "Back from the Living Dead". *Newsweek*, 20 Jan 1992.

Thomas A. Keaney and Eilot A. Cohen. *Gulf War: Air Power Survey Summary Report*. Washington D.C.: Library of Congress Cataloging-in-Publication Data, 1993.

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International Law And The Use of Force: Armed Intervention In International Affairs

by MAJ Neville G Fernandez

For as long as human beings have suffered at the hands of one another, there have been efforts to impose restrictions on the recourse to force.

INTRODUCTION

International law may be regarded as a body of rules which binds sovereign states as well as other agents in world politics, in the conduct of their relations with one another. And in the reality of its practise, the process of legal decision-making is not always purely the application of existing legal rules, but reflects the influence of a variety of factors extraneous to the rules themselves, such as the social, moral and political outlook of judges, legal advisers and legal scholars.[3]

In examining the basis of the doctrine of non-intervention in the internal affairs of a sovereign state, it is necessary to first consider the nature of the international system of states vis-a-vis the restraints on the use of force in general, as this interplay defines the framework and the means by which states conduct their relations. Of interest are the particular legal conditions on the use of force, specifically on the resort to war and on armed intervention.

The various arguments justifying forceful intervention will then be examined to determine the conditions of their validity and applicability. Such arguments include self-defence, collective defence, intervention by invitation, and intervention on humanitarian grounds. A case study on the United States' action in Grenada will serve to highlight the issues and difficulties arising.

THE BASIS OF NON-INTERVENTION

Nature of The InternationaI System

The contemporary international system is characterised by the principle of state sovereignty coupled with the absence of an overarching world government. The principle of sovereignty expresses the ultimate authority of the state in that no other absolute authority exists over it. The coupling of this principle with the absence of an international authority has given rise to the condition of international anarchy, where each state is free to formulate its own goals and priorities, and to pursue its own interests and objectives without a higher authority to coordinate such goals between states. International anarchy thus dictates that a state observes the guiding principle of self-interest or self-help in formulating its foreign policy, to protect its national interests against other states with conflicting goals and interests.[4] Thus, the threat or use of force remains a Clausewitzian tool of statecraft in the pursuit of national interests, resulting in the security dilemma where a state can enjoy true security only in the unlikely event that it can make other states accept an insecure existence.

While the principle of sovereignty implies that states have a duty to mutually respect each other's sovereignty by, among other things, abstaining from intervention in their domestic affairs, such a doctrine of non-intervention conversely secures state sovereignty as a right in international relations, and also serves to delineate the boundaries between domestic jurisdiction and international law.[5]

States resort to force for a variety of motives that are political in nature: the hope of material gain, the fear of other states and the desire to make them conform to a faith or a doctrine. The belief that the rights of a

state have been infringed and that they should hence be set right by remedial or punitive action, may not be present among these motives or may be only one of many other stronger motives. A central difficulty is that international society may not be able to discern, or to reach a consensus on, which side in a dispute is the law-breaker.

Rather than cultural heterogeneity, it is the incompatibility of national interests that constitutes the greater obstacle to a global law. Hence, the greatest affinity between legal positions is found within groups of industrialized nations and within clusters of developing states; and the greatest difficulty lies in harmonizing the interests of the rich industrialized states with those of the poorer developing states.[7] While members of the developed Western world have traditionally engaged each other with a noticeable absence of coercion and violence, their interaction with less developed non-Western members is characterized by economic coercion, violence and interference in domestic affairs.[8]

It is noteworthy that a state can neither be forced into a course of action against its will, nor obligated to agree with any particular set of rules. There are however, restraints on the conduct of international relations[9] between states, and these originate primarily from two sources. The first source is domestic, and consists of the limits imposed by public opinion and available resources. The second source is external to the state, stemming from the willingness of the other international actors to tolerate or prevent that state's behaviour.

Within a sovereign state, the law is enforced by a central authority entrusted with this task. In international society however, sanctions are applied by individual states or groups of states according to the principle of self-help. Such sanctions represent actions carried out in order to enforce the law on behalf of the international community. The element of coercion is present by virtue of the willingness and ability of members to enforce their rights by the resort to self-help.[10]

RESORT TO WAR VS. ARMED INTERVENTION

Noting that military intervention spans a continuum of activities, the limiting definition used in this discussion refers to that subset which involves forceful interference via the despatch of regular military troops, and the conduct of air strikes and naval attacks against another state, while excluding the provision of military supplies and the conduct of covert or subversive actions.[11]Armed intervention is a coercive, temporally discrete activity aimed at the authority structure of the target state. And despite being coercive in nature, such intervention may stop short of war in its use of force. The distinction between declared war and armed intervention is thus primarily a legal one.

The (*jus ad bellum*) framework for the recourse to force has been evolving from the Just War period (c330 BC to AD 1650), when war was deemed morally permissible only when divinely ordained, through to the Positivist period (c1700-1919), when the emerging concept of sovereignty asserted that a state could be bound by no higher law than that to which it consents. Thus, despite whatever moral limits on the recourse to war, it became accepted legal doctrine that a state had a right to go to war whenever it so desired, with only the requirement that war had to be declared to be lawful.[12]

In the aftermath of World War I however, the resort to war as an instrument of national policy was outlawed via the Kellog-Briand Pact of 1928. The exceptions to this prohibition were not explicit, and were generally accepted to cover only self-defence and wars authorized by the League of Nations. And as the Pact did not impose any restrictions on the use of force short of war, the earlier Positivist notions on the use of such force would still apply, namely lawful reprisals and elf-defence. While this Pact failed to prevent World War II, it did succeed in propagating the idea of prohibiting aggressive war amongst world leaders; an idea which surfaced again after this war in the form of Article 2(4) of the Charter of the United Nations.[13]

LEGAL BASIS FOR THE USE OF FORCE : THE UN CHARTER FRAMEWORK

As noted, armed intervention may take the form of a declared conventional war, or may appear as the use of force short of war. Being mindful of both these manifestations, our examination of its legal basis will focus on the contemporary paradigm applicable to the international arena, namely the UN Charter.

The UN Charter can be seen as a law-making instrument due to its status as a multilateral treaty, with its members as consenting signatories. Certain portions are also considered customary international law, applicable to both signatory and non-signatory states alike.[14] This suggests that the Charter's provisions imposing legal obligations on the use of force, may not be accepted at all times and in all circumstances, not even by UN members themselves.

Key Provisions on the Use of Force

Article 2(4): General Prohibition on the Use of Force. The most important provision of the Charter on the recourse to force is found in Chapter 1 which defines the purposes and principles of the United Nations. This article provides that "All members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state or in any other manner inconsistent with the purposes of the United Nations."

This provision outlaws not only the recourse to war, but also the use or the threat of force against another state, including even the use of force short of war. The three explicit exceptions to Article 2(4) on the prohibition on the use of force are Article 51, Chapter VII and Articles 106, 107 and 53.

Article 51 Individual and Collective Self Defence. This article recognizes the inherent right of self-defence, stipulating that if a state is subjected to an armed attack, it has the right to defend itself by force, until the Security Council is able to take action. This right may be exercised individually, or collectively with the assistance of other states.

Chapter VII: Enforcement Actions Authorized by the Security Council. Article 39 of this Chapter empowers the Security Council to determine the existence of any threat to the peace, breach of the peace or act of aggression. Consequently, the Council is authorized under Articles 42 and 43 to direct UN members to use force against the offending state. It is through this mechanism that the use of force effectively becomes the monoploy of the UN.

Articles 106, 107 and 53. Articles 106 and 107 are generally taken to be inoperative[15] since they pertain to the collective use of force before the Security Council was functional (Article 106), and to the use of force against enemy states of World War II (Article 107). Article 53 provides an exception to the prohibition on the use of force by regional arrangements against such "enemy" states. While these articles are still theoretically applicable, it is noted that Article 106 has never been invoked, and that all the "enemy" states themselves have been admitted to the UN as members.

General Assembly Resolutions. While these are technically not binding, they serve as a barometer of the sentiments of the majority of UN members. A notable example would be the 1970 Declaration on Friendly Relations Between Nations, which sought to elaborate on the Charter articles on the use of force. This Declaration, which was negotiated over several years, proclaimed the principle concerning the duty of states not to intervene; that no state has the right to intervene directly or indirectly for any reason, in the internal and external affairs of another state. It thus recognises the use of force, armed intervention and all other forms of interference as violations of international law.[16] However, the lack of efficacy seems to indicate that not many states take such General Assembly resolutions seriously, particularly when they conflict with their national interests.

THE JUSTIFICATION OF ARMED INTERVENTION

An Overview of Difficulties with the UN Charter Framework

When the Charter was being formulated in 1945, the fresh experience of World War II convinced its architects that the use of force was simply too destructive to be used as an instrument to gain territory or to effect political change. The prevailing sentiment was that force was only to be used to *preserve* the existing territorial and political status quo, either through the exercise of self-defence or through other actions as determined by the Security Council. The underlying value judgement was that the maintenance of international peace was preferred to the pursuit of justice. It was believed that the use of force to promote justice or just goals would bring greater harm to the international system than would tolerating any particular injustice. This philosophy led to the belief that "if peacefiil means for seeking justice failed, and the choice was between peace and justice, peace was to prevail. Any threat or use of force against the political or territorial order, no matter how just the cause, was to be considered unlawful.'"[7]

Interpretation of Article 2(4). The use of force against a state's territorial integrity or political independence, and force that is inconsistent with the purposes of the United Nations are not explicitly defined in the Charter provisions. This suggests that certain uses of force may indeed be permissible. For example, an armed incursion into the territory of a state for say, humanitarian reasons may neither theaten its territorial integrity or political independence, nor violate the purposes of the UN - but would such an incursion be lawful by this article?

Interpretation of Article 51. From the article, it is not clear whether a state's right to self-defence may be invoked only after an armed attack has occurred, or whether it may forcibly pre-empt an imminent attack. Secondly, the article appears to imply that an armed attack is only one of several circumstances where the right to forcible self-defence may be invoked, although there is no mention of other such circumstances. And thirdly, in the exercise of collective self-defence, the need for the victim state to first request assistance is not stipulated. Such ambiguities leave the door open to unilateral interventions on the pretext of individual or collective self-defence.

Given that the UN Charter was formulated at a time when conventional aggression was the norm, its provisions appear to inadequately address the types of conflict which are currently more common,[18] namely civil conflicts (domestic unrest where a rebel faction challenges the authority of the government) and mixed conflicts (where an outside state intervenes in an existing civil conflict to assist either the rebels or the government). The legal rights of outside states to intervene in an on-going civil or mixed conflict, and the permissible forms of assistance that may be rendered, are not explicitly addressed and are thus subject to interpretation and exploitation.

The UN Charter established an alternative means to the use of force for the pursuit of political, economic and territorial change and the settlement of disputes. Chapter VI enables states to bring disputes to the attention of the General Assembly. On its own initiative, the Security Council may also investigate disputes, with its resolutions being binding. And thirdly, the International Court of Justice considers those legal disputes that states may choose to submit to it. However, there has been an increasing perception of these institutions as being politicized organs incapable of rendering an effective judgement.[19] Insofar as these peaceful mechanisms come to be regarded as slow and ineffective, producing politicized solutions at best, states may become more inclined to resort to force in order to attain change or settlement of a dispute.

As noted earlier, the UN Charter provisions were based on the implicit belief that peace was more important than the pursuit of justice when such a pursuit involved the use of force. Since its formulation however, there has been a growing preference for justice over peace.[20] In many diverse sectors of the international system, it is increasingly claimed that force against existing political and territorial order may be justified at times, to promote self-determination, to resort to just reprisals, and to correct past injustices.

Limitations of the Security Council. The responsibility to enforce the purposes of the UN lies with the Security Council. However, the veto power of its five Permanent Members can effectively forestall the UN from action, and is the key condition that enables these members to continue their dominance of the UN's decision-making process, allowing them to protect their own interests. Further, any reform proposals must be passed by the Council itself and would thus be subject to the veto.[21] To achieve greater compliance of the Permanent Members with the general view held by UN members as expressed say, by the General Assembly, the Security Council would have to be somehow reformed to reduce this veto power.

Having outlined some of the potential grounds for armed intervention, we now proceed to the specific justifications offered in the intervention in Grenada, thus attempting to make some observations on the conditions of their validity and applicability.

THE US INTERVENTION IN GRENADA

In March 1979, the existing administration in Grenada was overthrown in a coup, followed by the establishrnent of the socialist-oriented People's Revolutionary Government (PRG), which was then vested with all executive and legislative powers although the Queen of England remained the Head of State, with the Govenor-General as her representative. In October 1983, internal dissatisfaction with the leadership of the PRG Prime Minister led to him and his Cabinet being placed under house arrest and subsequently executed by the newly-formed Revolutionary Military Council (RMC). It was against this background that the other member states of the Organization of Eastern Caribbean States (OECS), together with the United States, Barbados and Jamaica, considered military intervention in Grenada.[22]

On 25 October 1983, a multinational intervention force effected military landings on Grenada, using the resources of a US carrier task force and airborne forces operating from Barbados. Despite intense resistance, all major military objectives were secured in three days. After two months, the majority of US forces were withdrawn.[23]

Three broad legal grounds were advanced[24] to legitimize the use of force by the multinational intervention force:

> **a) Collective Action or Self Defence.** All participating states asserted that the military initiative was lawfully undertaken pursuant to the authority of Article 8 of the treaty establishing the OECS;

> **b) Protection of Nationals Abroad**. The United States emphasized that the intervention was justified by the need to protect its nationals residing in Grenada;

> **c) Intervention by Invitation**. All the states asserted that the use of force was validated by a prior invitation issued by the Govenor-General of Grenada.

Collective Action: Article 8 of the OECS Treaty

From the start, the US placed emphasis on Article 8, informing the Security Council that the collective action undertaken was fully in accordance with Chapter VIII of the UN Charter on "Regional Arrangements".[25] The US claimed that Articles 52 and 53 of this Chapter accorded to regional arrangements or organizations the responsibility of ensuring regional peace and stability by achieving pacific settlements of local disputes before these are referred to the Security Council, and also conferred upon them the mandate to undertake enforcement action under the authority of the Security Council.

The OECS perspective however, was that the collective action was undertaken in self-defence, pursuant to Article 51 of the UN Charter. It had requested the formation of a multinational force for the purpose of undertaking a pre-emptive defensive strike in order to remove the threat to the peace and security of the Eastern Caribbean, and to establish a situation of normality in Grenada.[26]

Several difficulties with the Article 8 argument arise, whether it is framed in terms of collective action under Chapter VIII, or as collective self-defence under Article 51.

Firstly, Article 8 of the 1981 Treaty[27] establishing the OECS deals with the "Composition and Functions of the Defence and Security Committee" and does not appear to authorize or envisage coercive military action against any member state. Rather, it seems to relate to collective security against external aggression. Further, while the decisions of both the Defence and Security Committee and the Authority of the OECS Heads of Government are specifically and strictly required to be unanimous, the extraordinary session of the

OEC S Authority at which the decision to initiate military action was taken, was conducted without an RMC representative from Grenada. Given this technicality, that decision would be invalid under the very Treaty by which its justification was sought.

Secondly, while Article 51 enables states, including regional groupings of states, to act in collective self-defence without prior Security Council authorization, Article 53[28] however establishes that military action undertaken by a regional organization, other than that used in the exercise of collective self-defence, does require the Council's prior authorization. And since such authorization was neither sought nor obtained, the argument seeking justification of the intervention under Chapter VIII fails.

Thirdly, the argument that the military action was undertaken in the right of collective self-defence would be valid even if the OECS decision was ultra vires the Treaty for lack of unanimity or other reasons, since no institu-tional strncture is required for the exercise of this right.[29] Hence, the question now is whether or not the circumstances in Grenada gave rise to a valid need for collective self-defence on the part of the OECS states.

If it is assumed that anticipatory self defence may be regarded as legitimate grounds for the use of force, it is still necessary to demonstrate a necessity of self-defence, instant, overwhelming and leaving no choice of means and no moment for deliberation".[30] The perception of the OECS states as to the nature of the threat posed to their security alluded to an element of external aggression, possibly Cuba, although no substantial evidence of this has been discerned. Also, their threat perception highlighted the anarchical conditions.... and the consequent unprecedented threat to the peace and security of the region created by the vacuum of authority in Grenada".[31]

While the RMC may not have been well-received by the people of Grenada, its actions in the execution of authority, including an effective 96-hour curfew, do not suggest that such a vacuum existed. Further, there is no self-evident connection between this alleged vacuum of authority and the possibility of a Grenadian attack on other OECS states. And for an island-state without air or naval forces, despite the quantity of its other military equipment, such a military initiative seems implausible. Indeed, while Grenada's mere possession of an armed forces superior to that of its neighbours clearly constituted a security dilemma, this cannot be sufficient justification for anticipatory self-defence.

Finally, it would also be necessary to demonstrate that there were no alternative lawful means of self-defence available to the OECS states. While Trinidad and Tobago refused to sanction the OECS' use of force without first attempting a peaceful resolution, it is noteworthy that the first of such initiatives had been in effect for less than a week before the armed intervention took place,[32]suggesting that the OECS decided to impose sanctions and to remove the RMC by force of arms, at about the same time.

In summary, the legal position that the intervention was undertaken in the exercise of the right of collective self-defence appears untenable.

Protection of Nationals Abroad

The duty of a state to protect its population is arguably its foremost obligation, even at the expense of its conduct towards other international actors,[33] although case law indicates that such actions do not constitute self-defence.[34]

While all the states which contributed to the intervention force expressed concern over the reported human rights violations, which included the execution of political leaders and the murder of innocent civilians by the RMC, only the US emphasized intervention for the protection of its nationals as a central justification. Both President Reagan and Secretary of State Schulz made it clear that the decision to act was taken in order to prevent American nationals from coming to harm, and not because of any threats or acts against such persons.35 It is thus necessary to examine whether international law recognizes the protection of nationals as an exception to the prohibition of intervention.

One view, most commonly identified with a suggested right of humanitarian intervention unre lated to national status, derives from a restrictive interpretation of Article 2(4). As discussed earlier, it suggests that the use of force which is not directed against the territorial integrity or political independence of a state, and which is consistent with the purposes of the UN, is lawful.

A second, more pertinent view seeks to justify intervention on behalf of nationals, on the basis that it is permitted under Article 51, since an injury to a national arising from an act or omission by a foreign state within its territory is, in law, an injury to that individual's state of nationality. The exercise of this right must be subject to the requirements of self-defence, namely an imminent threat of injury to nationals, a failure or inability of the territorial sovereign to protect them, and the measures of protection must strictly be confined to the objective of protecting these nationals.[36]

While the situation in Grenada was certainly cause for concern, and despite the unconvincing Grenadian response to the American request for an assurance of its citizens' well-being, the use of force was not self-evidently justified. Consider that the British High Commissioner in Barbados, who visited Grenada at that time, concluded that a similar forceful evacuation of British nationals was not justified, there being neither an imminent threat to foreign nationals, nor a failure, inability or unwillingness on the part of the RMC to protect them.[37]

Finally, despite the concept of proportionality and the limited nature of the permissible objective for the use of force in this instance, the intervention force effected a total military occupation of the state, removed the RMC from power, supervised the establishment of an interim government and retained a substantial troop presence for weeks after its nationals had been evacuated. Hence, in these circumstances, the US' justification for acting in defence of its nationals is unsound.

Intervention by Invitation

The final substantive legal ground advanced was that intervention was legitimized by virtue of an invitation issued by the Govenor-General of Grenada. In his formal written invitation, which became available for scrutiny only after he had been rescued from the RMC during the course of the intervention, he expressed concern over the lack of internal security, and requested assistance in stabilizing the situation with the establishment of a peace-keeping force in Grenada. And as emphasized by the US, the invitation of a lawful governmental authority constitutes a recognized basis for foreign states to provide requested assistance.[38] Several issues in constitutional and international law arise from such an invitation.

As an essentially ceremonial Head of State without executive and legislative authority under Grenada's independence constitution of 1973, it is clear that it was beyond the Govenor-General's proper constitutional powers under Grenada's internal law, to issue such an invitation.[39] What is not so clear however, is whether the Govenor General would legitimately have some form of reserve power to act without governmental advice under Grenada's 1979 constitution.

Generally, a constitutional crisis where the government has been unconstitutionally removed from office, would result in the absence of a duly constituted authority capable of advising the ceremonial Head of State. In such an instance, it has been argued that he could constitutionally act in his own deliberatejudgement. While the 1969 Vienna Convention on the Law of Treaties stipulates that Heads of State, among others, are to be considered as representing their states for the purpose of the conclusion of a treaty without the need to substantiate their authority, Article 46 of this Convention provides for the invalidating of a treaty if it is concluded in violation of a state's internal law regarding the competence to conclude treaties.[40] Since no such violation occurred in this case, it appears that the Govenor-General was indeed a competent authority to issue a request for external assistance.

However, as the RMC was in effective control of the entire territory of the state, and it was effectively operating as a government at that time, the RMC constituted the lawful authority of Grenada. And as the invitation for intervention originated from the Govenor-General, who was an agent of the previous

constitutional order which had been successfully overthrown in the coup in 1979, the intervention was not in support of an established government. Hence, only the RMC could have issued a legitimate invitation.[41]

An associated issue relates to whether a government has the right to seek, and a foreign state to provide, military assistance in a civil war, at least in those cases where there is no evidence that the insurgents are the benefactors of a priori foreign assistance.

The traditional legal view is that, once the insurgent party in a civil war has attained effective control of substantial parts of the territory, it has the right to international recognition as a belligerent. Consequently third parties are required to maintain neutrality in their relations with the warring factions. The difficulties arising are in determining the point at which an insurgent party becomes a belligerent, and the incompatibility of this view with the right of self-determination. Further, third parties may be bound by their treaty obligations with the government to provide requested assistance.[42]

The 1965 United Nations Declaration on the Inadmissibility of Intervention in the Domestic Affairs of States, which the General Assembly passed with no negative votes and only one abstention, stated that no state shall "interfere in civil strife in another state". Where control of the country is divided between warring factions and if no outside interference had taken place, then any form of interference or encouragement given to any party, is prohibited. This same view was expressed in General Assembly Resolution 2625(XXV) which was adopted by consensus in 1970. Hence the provision of military as sistance to a regime attempting to suppress armed dissidents is unacceptable. On the other hand, the rights of the UN, with its monopoly on the legitimate use of force, in providing such assistance will be explored later.

Another difficulty pertaining to intervention forces that have come at the invitation of; or with the consent of; the lawful government, is whether that consent has been given freely and is not the result of some hidden influence or pressure by a foreign state. In the case of Grenada, no conclusion can be drawn since no evidence is discernible.[44]

In summary then, the legal ground that the intervention was legitimized by virtue of an invitation issued by the Govenor-General of Grenada, is inadmissible.

CONCLUSION

With its contemporary basis in the pertinent UN Charter provisions and resolutions, the doctrine of non-intervention is essential for the continued observance of the principle of sovereignty, despite the lack of universal compliance. Further the U.N Charter which institutionalizes the possibility of humanitarian intervention effectively restricts the principle of sovereignty in order to accommodate evolving notions of human rights.

The time of absolute and exclusive sovereignty has passed, its theory never having been matched by its reality. Humanitarian need has overwhelmed provisions which preclude interference in internal affairs. As contended, humanitarian problems must be seen as more than a moral issue, but as a potential security threat, if the objective of a more secure, stable and prosperous world is to be realized .[49]

ENDNOTES

1 Anthony Clark Arend and Robert J Beck, *International Law and the Use of Force - Beyond the UN Charter Paradigm* (London, 1993), pll.

2 This discussion will exclude other international entities such as transnational companies, as only states are vested, by virtue of their UN membership, with any legitimate authority to use force. See also Hedley Bull, *The Anarchical Society* (New York: Columbia University Press 1977), pp146-149 for an elaboration of the subjects and the objects of international law.

3 Ibid., pp122-123.

4 John M Rothgeb Jr, *Defining Power - Influence and Force in the Contemporary International System*(New York: St Martin's Press, 1993), pp54-55.

5 RJ Vincent, *Non intervention and International Order* (Princeton: Princeton University Press, 1974), p14.

6 Bull, op. cit., p126-127.

7 Theodore A. Couloumbis and James H. Wolfe, *Introduction to International Relations: Power and Justice*(New Jersey: Prentice-Hall, 1978), pp248-249.

8 Rothgeb, op. cit., p80.

9 Rothgeb, op. cit., p56.

10 Bull, op. cit., pp 124-126.

1I Vincent, op. cit., p21.

12 Arend and Beck, op. cit., pp11-19

13 Ibid., pp22-24.

14 Ibid., p30.

15 Ibid., pp32-33.

16 Rosalyn Higgins, "Intervention and International Law", in Hedley Bull (ed.), *Intervention in World Politics*(Oxford, Clarendon Press, 1984), pp37-38.

17 Arend and Beck, op. cit., p34 (emphasis mine).

18 Ibid., p37

19 Ibid., pp39-40

20 Ibid., pp40-45

21 Shahin P Malik and Andrew M Dorman, "United Nations and Military Intervention: A Study in the Politics of Contradiction" in Andrew M Dorman and Thomas G tte (ed.), *Military Intervention - From Gunboat Diplomacy to Humanitarian Interventio*n (Dartmouth, 1995), p165.

22 Ibid., pp2O-3O.

23 William C Gilmore, *The Grenada Intervention: Analysis and Documentation* (New York: Facts on File,1984), p36

24 Ibid., p37.

25 Ibid.,p41-42.

26 Ibif., pp42-43.

27 Ibid., p81.

28 Article 53(1) is excerpted thus: "The Security Council shall, where appropriate, utilize such regional arrangements or agencies for enforcement action under its authority. But no enforcement action shall he take..... without the authorization of the Security Council,..."

29 Gilmore, op. cit., p48.

30 Ibid., p52: Conditions from customary law arising from the 1837 *Caroline* case.

31 Ibid., p53.

32 Ibid., pp54-55.

33 Rothgeb, op. cit., p62.

34 Higgins, op. cit., p38.

35 Gilmore, op. cit., pp55-56.

36 Ibid., pp57-59: From principles enunciated in the 1837 *Caroline* case.

37 Ibid., pp60-64.

38 Ibid., p65.

39 Ibid., pp65-66.

40 Ibid., pp68-70.

41 Ibid., p73.

42 Higgins, op. cit., pp40-42.

43 Gilmore, op. cit., pp72-73.

44 Ibid., pp7l-72.

BIBLIOGRAPHY

Arend, Anthony Clark and Robert J Beck, *International Law & the Use of Force - Beyond the UN Charter Paradigm* (London, 1993), Ch 1-3.

Bull, Hedley, *The Anarchical Society* (New York: Columbia University Press, 1977), Ch 6.

Couloumbis, Theodore A, and James H Wolfe, *Introduction to International Relations: Power and Justice*(New Jersey: Prentice-Hall, 1978), Ch 14.

Gilmore, William C, *The Grenada Intervention: Analysis and Documentation* (New York: Facts on File, 1984).

Graham, Gordon, "The Justice of Intervention", in *Review of International Studies*, Vol 13 No. 2, April 1987.

Higgins, Rosalyn, "Intervention and International Law", in Hedley Bull (ed.), *Intervention in World Politics*(Oxford, Clarendon Press, 1984).

Malik, Shahin P, and Andrew M Dorman, "United Nations and Military Intervention: A Study in the Politics of Contradiction" in Andrew M Dorman and Thomas G otte (ed.), (*Military Intervention - From Gunboat Diplomacy to Humanitarian Intervention*) (Dartmouth, 1995).

Rothgeb, JoIm M Jr, Defining Power - *Influence and Force in the Contemporary International System* (New York : St Martin's Press, 1993), Ch 3.

Vincent, RI, *Non intervention and International Order* (Princeton: Princeton University Press, 1974).

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Book Review:

Scapegoat: General Percival of Singapore

by Mr Bernard Loo

Over half a century has passed since the fall of Singapore in February 1942, and still, the Malayan Campaign continues to attract attention in scholarly circles. A recent publication on the Malayan Campaign was Ong Chit Chung's *Operation* MATADOR: *Britain's War Plans Against the Japanese*1918-1941, which was reviewed in an earlier volume of this journal.[1] But it is by no means the only examination of this episode of military history.[2] Nor is this the first volume that provides a sympathetic treatment of Percival's prosecution of the war effort.[3] That this book explores themes which previous authors have already examined is therefore to be expected. There can be previous little new information on the Malayan Campaign that can still be gleaned from a new publication such as this. Certainly this is true for the strategic and tactical issues pertaining to the campaign.

PERCIVAL UNDER THE MICROSCOPE

It is perhaps in the field of biography that the available literature is lacking. Perhaps it is because the taint of defeat, of being involved in what Churchill called the "worst defeat and largest capitulation in British history" that has deterred scholars from examining the biographies of the major characters in this historical melodrama. There is a body of literature that examines issues pertaining to these characters.[4] Apart from Tsuji, some of the major characters involved in the Malayan Campaign have also published their perspectives of this episode.[5] As one of the two central figures in the Malayan Campaign, Arthur Percival certainly merits scholarly attention.

And in this sense, this book is a welcome addition to the body of literature on the Malayan Campaign. Kinvig traces the career of Arthur Percival, from a volunteer in the Inns of Court regiment Officer Training Corps (OTC) just after the outbreak of World War One, to his bewildering array of senior staff appointments during the early years of World War Two, through to his appointment as General Officer Commanding (GOC) Malaya, his subsequent defeat at the hands of Lieutenant-General Tomoyuki Yamashita and his subsequent incarceration in a Prisoner-of-War Camp. Thereafter Kinvig continues the story of Percival from his release from a POW camp in Korea after Japan's surrender and his presence at the signing of the surrender document by General Douglas MacArthur. It is an interesting and intriguing story, of a talented, intelligent, humane, humble soldier who had the misfortune to preside over Britain's worst defeat in its long military history.

WHO'S TO BLAME?

The essential question is who is to blame for the debacle of the Malayan Campaign? This is a question that continues to generate some degree of controversy. Ong Chit Chung points the finger clearly at Whitehall, particularly the British Prime Minister Winston Churchill.[6] It would seem to imply that by Ong's judgement, Percival could not be held to blame for the defeat. Earlier scholars have also hinted at Churchill's culpability; in the process they also suggest that while Percival made tactical errors in his management of the campaign, the overall result cannot be attributed to him alone.[7]

But the problem of Percival's exoneration remains a thorny issue. There were figures that pointed the finger at Percival for his alleged mismanagement of the defense of Malaya. One such person was Lieutenant-General Lewis Heath, who commanded the III Indian Corps during the Malayan Campaign. Heath remained unhappy over Percival's performance, particularly in the indecision over Operation MATADOR in the first few hours of the Campaign.[8] Ivan Simson, who was in charge of civil defense also had some scathing remarks to

make about Percival's leadership, particularly over Percival's alleged rejection of Simson's proposal to construct a series of fixed defenses in Johor.[9] Percival's critics point to the meeting between Simson and Percival, held on 26 December 1941 at about 11.30 PM, in which Simson relayed to Percival Heath's request for a series of defenses in Johor; Percival's reason for his rejection was "Defenses are bad for morale - for both troops and civilians."[10]

Kinvig points out that Percival was not alone in his opposition to fixed defenses on the basis of morale. In mid-January 1942, the Supreme Commander, General Wavell, issued instructions to Percival to begin defense preparations in the northern coastline of Singapore, with the added instruction that these preparations be kept "entirely secret . . . make it clear to everyone that battle is to be fought out in Johor without thought of retreat."[11] In other words, Kinvig suggests that Percival's objections to fixed defenses on the basis of morale were entirely valid.

In similar vein, Kinvig attempts to show how the tactical reversals could not always be attributed to Percival. Whereas Kirby criticizes Percival's disposition of forces on the eve of the campaign,[12]Kinvig argues that in spreading Malayan Command's forces to defend the many airfields in northern Malaya, Percival was not entirely wrong. Percival, Kinvig argues, had every reason to believe the assurances that British air power in Malaya would be built up, that even without reinforcement, existing Royal Air Force resources were sufficient to cope with a Japanese invasion. The Jitra battle, some historians argue, should never have been fought, precisely because its rear was under threat from the Patani-Kroh axis. Percival therefore should have fought the Japanese further south, perhaps at Gurun (which had the added attraction of better anti-tank ground). Percival's handling of the Singapore battle also comes under intense criticism from historians, who point out that Wavell had accurately predicted the location of the Japanese attack, but which Percival had disagreed.

PERCIVAL EXONERATED?

How does Kinvig attempt to answer these charges? In the case of the Jitra battle, Kinvig argues that Percival was aware that Jitra was not ideal country for a defense against the Japanese, but he had to fight there due to circumstances beyond his control.[13] Kinvig points also to the poor quality of the forces under Percival's command, in contrast to the "excellent fighting machine"[14] which Percival faced. More importantly, Kinvig points out that Percival had to satisfy two requirements - the need to preserve British forces in Malaya, and the need to hold onto the Malayan peninsula long enough for the reinforcements promised to arrive in Singapore. For these reinforcements to arrive, the Japanese had to be denied use of the airfields in central Malaya for as long as possible.

Kinvig also points out that Percival was further hampered by the intervention of his Supreme Commander. For instance, the errors of the Johor battle can be partly attributed to Wavell's unfortunate intervention in assigning the key western sector the Gordon Bennett, the Australian commanding 8th Australian Division; his 27th Brigade at Gemas would be augmented with Heath's 9th Indian Division and the newly arrived 45th Indian Brigade. This was in contrast to Percival's original plan to give the key western sector to Heath's III Corps. Wavell's intervention was unfortunate because it allotted the key western sector to a commander who was totally unfamiliar with Japanese fighting methods, created difficult administrative problems for Bennett who had to incorporate 3 additional brigades into his force structure without the necessary manpower in his headquarters to properly manage this force. There was the additional problem of the disposition of forces - Wavell had ordered a lateral defense, whereas a defense-in-depth might have had greater success against the Japanese. But the biggest error was in allotting the key western coast sector to the 45th Indian Brigade. It was newly arrived, totally unacclimatised, and was under-equipped and under-trained.

It is, of course, difficult to determine if Percival's preferred disposition of forces, where III Corps would defend the western sector in depth, would have had greater success. This is pure speculation, and not terribly useful for our purposes. Of greater significance was Percival's behaviour. Instead of arguing his case to his Supreme Commander, Percival had meekly accepted this plan. The historical record shows that Wavell was wrong - indeed it was a miracle that the 45[th]Brigade lasted as long as it did against the Imperial Guards,

in the process buying time for 27thBrigade and 9th Indian Division to withdraw from Gemas after the coastal flank had been turned.

CONCLUSION

In the end the reader has to ask one question - has Kinvig successfully vindicated Percival? Sadly the answer, at least in the opinion of this writer, is no. Percival cannot be held to blame for the poor quality of his forces - much, if not all, of the blame has to go to Whitehall. This is, perhaps, the strongest argument for Percival's vindication. Kinvig hints at Whitehall's culpability, but this is never made as explicitly clear as Ong Chit Chung did. Kinvig's defense of Percival's performance during the campaign itself is also weak. It is true that Percival was often fighting the campaign under extremely adverse conditions - the problems in his relationship with his subordinate commanders, the problems he faced in dealing with the Colonial Governor and his office, the problems he face with his Supreme Commander. But does that exonerate Percival?

Perhaps what Percival needed to do was to be more forceful. It is true that these relationships were a constant problem and hindrance to Percival in his attempt to fight the Malayan Campaign, and it would be tempting to speculate what the end result could have been had Percival dealt with these problems in a more forceful manner. The fact, however, is that he failed to tackle these problems, that he allowed these problems to fester throughout the campaign and distract his attention from the more pressing matter of defending the peninsula and the island.

That being said, Kinvig has added a new dimension to the existing literature on the Malayan Campaign, and deserves it place in this body of literature. This writer can sympathize with Percival, and although Kinvig does not vindicate Percival successfully, he has at least showed the conditions under which Percival had to fight. Perhaps no commander could have saved the Malayan Campaign; certainly Percival was unable to. Whether history will eventually see Percival in a more positive light, however, remains to be seen.

The abovementioned title is available for borrowing at the **SAFTI MI Library**. *The catalog references are:*

Scapegoat: General Percival of Singapore

Clifford Kinvig

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ENDNOTES

1 See *Pointer: Journal of the Singapore Armed Forces*, **January-March 1997, Vol.23, No.1, pp.118-23.**

2 See, for instance, Peter Elphick, *The Pregnable Fortress: A Study in Deception, Discord and Desertion*London: **Hodder and Stoughton, 1995); and Peter Elphick and Michael Smith,** *Odd Man Out: The Story of the Singapore Traitor* **(London: Hodder and Stoughton, 1993). Other previous publications on the Malayan Campaign include Woodburn Kirby,** *Singapore: The Chain of Disaster* **(London: Cassell & Co.Ltd., 1971); Louis Allen,***Singapore 1941-1942* **(London: Davis-Poynter Ltd., 1977); Masanobu Tsuji, J***apan's Greatest Victory, Britain's Worst Defeat: The Capture of Singapore 1942* **(Kent: Spellmount Ltd., 1997); and Stanley Falk,** *Seventy Days to Singapore: The Malayan Campaign 1941-1942* **(London: Robert Hale, 1975).**

3 See, for instance, John Smyth, *Percival and the Tragedy of Singapore* **(London: MacDonald & Co.Ltd., 1971).**

4 See, for instance, Mark Clisby, *The Gordon Bennett Case* **(Sydney: Allen and Unwin, 1992); A. Frank Reel,** *The Case of General Yamashita* **(New York: Octagon Books, 1971); and Lawrence Taylor,** *A Trial of Generals: Homma, Yamashita, MacArthur* **(South Bend, Indiana: Icarus Press, 1981).**

5 Tsuji, op.cit.; Arthur E. Percival,*The War in Malaya* **(Bombay: Orient Longmans, 1949; Ivan Simson,***Singapore: Too little, too late* **(Singapore: Asia Pacific Press, 1970); and H. Gordon Bennett,** *The Fall of Singapore* **(New Delhi: Natraj Publishers, 1990).**

6 Ong Chit Chung, *Operation MATADOR: Britain's War Plans against the Japanese 1918-1941* **(Singapore: Times Academic Press, 1997).**

7 See, for instance, Kirby, *op.cit.***; and Falk,** *op.cit.*

8 Clifford Kinvig, *Scapegoat: General Percival of Singapore* **(London and Washington: Brassey�s,1996), p.233.**

9 *Ibid.***, pp.194-7.**

10 *Ibid.***, p.197.**

11 *Ibid.***.**

12 Kirby, *op.cit.***, pp.113-6.**

13 Kinvig, *op.cit.***, pp.156-8.**

14 *Ibid.***, p.165.**

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Personality Profile:

Anwar Sadat (1918-1981)

President Anwar Sadat has often been described as a 'visionary who dared.' Just four years after surprising the Americans and Israel by launching the Yom Kippur War (in October 1973), Sadat caused another sensation by travelling to Jerusalem to address the Knesset (Israeli Parliament). This was followed by the peace agreement with Israeli Prime Minister Menachem Begin at Camp David, US, in March 1979, resulting in both men receiving the Nobel Peace Prize. Sadat, just like Yitzak Rabin after him, clearly saw the need for concessions to be made for the sake of peace. And just when he was beginning to taste the fruits of his hard and painful labours, he was assassinated on 6 October 1981.

Anwar Sadat was born into a poor peasant family in the village of Mit Abul-Kum, on 25 Dec 1918. Growing up in poverty, and with the further disadvantage of not being the first-born of the family, Sadat honed his survival skills from a very young age. As a teenager, Sadat loved the theatre, but he was not successful in his ambition to be a professional actor. However, he did retain his thespian touch. With great difficulty and determination, he managed to enter the Cairo Military Academy in 1937, and graduated as a second lieutenant nine months later.

Sadat was a serious young man who was very concerned by Egypt's humiliating position as a vassal state of Britain. During World War II, he plotted to expel the British from Egypt with the help of the Germans. In 1942, Sadat was dismissed from the army, arrested and imprisoned. While Sadat was in prison, his army colleagues made sacrifices by supporting his family financially, and this gave him a profound sense of loyalty and gratitude. Sadat was onvinced that loyalty to friends was a supreme factor in a man's life, and betrayal brought human existence to its lowest level. In October 1944, Sadat escaped from a military hospital, and went on the run. The two years in prison taught Sadat valuable lessons in survival; he learned to be more cunning, more secretive and more patient.

With the end of the war and the lifting of martial law in 1945, Sadat resumed a normal way of life. However, Sadat still felt that his country was one dark prison, with the British jailers not in a hurry to leave. In January 1950, Sadat was reinstated in the army with the rank of captain, the same rank he had when he was dismissed; his colleagues had by then been promoted to lieutenant-colonels.

In 1952 Sadat participated in the Free Officers organisation's armed coup, led by Gamal Abdel Nasser, against the Egyptian monarchy, sending King Farouk into exile. Sadat later supported Nasser's election to the presidency in 1956. Sadat held various high offices that led to his serving in the vice presidency (1964-66, 1969-70). Nasser did not deliberately groom Sadat as his successor, and one theory why Nasser picked Sadat as his vice-president was because Sadat was seen as the least aggressive member of the Cabinet, and would thus pose the least likely threat to the president.

Sadat became acting president upon Nasser's sudden death from a heart attack on 28 Sep 1970, and was elected president on 15 October. Although regarded as an interim figure (even the Americans did not expect Sadat to remain in office for longer than six weeks), Sadat soon surprised his rivals with his gifts for political survival. In May 1971, with the support of the army, he survived a coup and outmaneuvered a formidable combination of rivals for power.

In 1972, Sadat expelled thousands of Soviet technicians and advisers from the country as he felt that the Soviet Union did not give him adequate support in Egypt's continuing confrontation with Israel. The following year he launched, with Syria, a joint invasion of Israel that began the Yom Kippur War of October 1973. The Egyptian army achieved a tactical surprise in its attack on the Israeli-held Sinai Peninsula, and, though Israel successfully counterattacked, Sadat came out of the war with greatly enhanced prestige as the first Arab leader to actually retake some territory from Israel. The surprise attack on 6 Oct 1973 surprised not

only Israel but also the world. The aim was not to vanquish Israel, but rather to convince a chastened, if still undefeated, Israel to negotiate on terms more favourable to the Arabs. The initial successes were sufficient to allow Sadat to pronounce the war an Egyptian victory and to openly and honourably seek peace. Egyptian interests, as Sadat saw them, dictated peace with Israel. The signing of the Sinai 1(1974) and Sinai 11(1975) disengagement agreements saw the return of the Sinai, and secured large foreign assistance commitments to Egypt.

Immediately after the war, Sadat began to work toward peace in the Middle East. When Israeli inflexibility combined with Arab resistance to slow events, Sadat made his dramatic journey to Jerusalem on 19 Nov 1977, to place his plan for a peace settlement before the Knesset. This initiated a series of diplomatic efforts that Sadat continued despite strong opposition from most of the Arab world and the Soviet Union. The subsequent meeting in September 1978 of Sadat, Israeli Prime Minister Menachem Begin, and US President Jimmy Carter at Camp David led directly to the Israeli-Egyptian peace treaty of March 26, 1979 the first between Israel and any Arab nation. The treaty provided for Egyptian-Israeli normalization and established a framework for the Palestinian issue. The status of the sraeli-occupied West Bank and Gaza territories and the question of Palestinian autonomy were to be negotiated. Together with Menachem Begin, Sadat was awarded the Nobel Prize for Peace in 1978.

However, peace with Israel was not without its costs. Sadat could not convince the Arab world that the accords dealt justly with legitimate Palestinian rights.This led to the loss fo financial support of the Arab states which in turn resulted in economic hardships at home. While Sadat's popularity rose in the West, it fell in Egypt because of internal opposition to the treaty and deteriorating economic conditions.

Sadat was assassinated by Muslim extremists while reviewing a military parade commemorating the Arab-Israeli war of October 1973. He was succeeded by Hosni Mubarak, his hand-picked vice president, and a former air force general and hero of the October War.

Selected Books and Reports:

John Naisbitt

John Naisbitt author of *Megatrends and Megatrends* 2000, studied Political Science and is a holder of eleven honorary degrees. Naisbitt has been a visiting fellow at Harvard University, a visiting professor at Moscow State University and was made Distinguished International Fellow of the Institute of Strategic and International Studies (Malaysia).

The book *Megatrends* established Naisbitt as one of the world's top social forecasters. In this book, Naisbitt predicted accurately ten major patterns which shaped the world in the 1980s.

Since his success with *Megatrends*, Naisbitt has written *Megatrends* 2000 with Patricia Aburdene which again forecasts major patterns that would shape the world in the 1990s and the year 2000. Here he predicts ten megatrends, such as the booming global economy in the 1990's, the privatization of the welfare state, the rise of the Pacific Rim, the decade of women in leadership, etc, that will affect or have affected our lives.

In *Megatrends* Asia, Naisbitt predicts that Asia will be dominant region in the world and this will have profound consequences for world history. Led by China and the Overseas Chinese, an Asian Renaissance will emerge and this will shift the world's centre of economic and political gravity.

The following books were written by John Naisbitt:

a) *Megatrends*

b) *Reinventing the Coporation*

c) *Megatrends* 2000*

d) *Megatrends for Women*

e) *Japan's Identity Crisis*

f) *Global Paradox**

g) *Megatrends Asia**

Those books marked with (*) are currently available at the SAFTI MI Library.

Letters to the Editor

The False Promise of Strategic Bombing and the True Promise of Airpower

I refer to MAJ David Wong's essay '*Air Warfare - The Relevance of Strategic Bombing in the Nuclear Age*' in the October/December 1997 issue of the Pointer.

The article traced the evolving role of strategic bombing since World War One and asserted its increasing effectiveness in modern warfare. The thrust of the arguments is valid and the conclusions generally sound, that is, until one contests the implied definition of 'strategic bombing' in the essay.

It is not entirely clear what is meant by 'strategic bombing''. Is it strategic bombing in the classical sense as Douhet and Mitchell had visualised and as executed with such ferocity and intensity by the allied powers against Germany and Japan in World War Two? Or is strategic bombing really any offensive air campaign against depth targets as in the Gulf War, even without the World War Two imagery of massive bombing? Without entering into a discourse on semantics, 'strategic bombing' may be distinguished by two criteria: massive bombing; and operations against an adversary's depth. By these criteria, 'strategic bombing' matured during World War Two and continued to feature in major conflicts in which the US participated until the Vietnam War. Deep air operations during the Gulf War could not be considered 'strategic bombing' in the strict sense of the term since massive bombing was not evident on the scale normally associated with it. Is it any wonder that the article used the two terms 'strategic bombing' and 'strategic air operations' interchangeably because clearly while it had focused on 'strategic bombing', it had some difficulty labelling the Gulf air operations as such?

The point is this: modern air operations can be carried out with minimal effort using precision munitions against an enemy's depth targets and still achieve a strategic impact. Massive bombing is no longer necessary. 'Strategic strikes' rather than 'strategic bombing' is a more appropriate term for the class of operations against depth targets in the heart of an adversary's territory: the first suggests a quality of being 'clinical' and 'surgical'; while the second connotes 'a blunt instrument of offence'.

The 'death' of strategic bombing and the 'birth' of precision strategic strikes reflect the further metamorphosis of airpower. If airpower was previously the air auxiliary of land and maritime forces, and was employed largely as 'a flying artillery', it has since come into its own. Airpower is becoming increasingly dominant in modern warfare across its full capability spectrum. Its dominance derives from the fact that existing and emerging technology, such as that related to stealth, PGM and information warfare, favours the offence over the defence. Airpower, being inherently offensive, is well placed to capitalise on such cutting-edge technological developments. The Gulf War provided 'a sneak preview' of what we could potentially and 'potently' achieve with airpower against an adversary.

The marriage of airpower with cutting-edge technology has brought with it new promises of operational cost-effectiveness. As a case in point, PGMs have altered the target/sortie ratios so dramatically compared to earlier periods before the Gulf War that the differential between precision and non-precision weaponry is 13:1, or a better than an order-of-magnitude difference; and stealth has moreover given airpower a quality of relative invulnerability. If technology has transformed airpower into the exponential force-multiplier that it now is, it is because it reinforces airpower's characteristics of 'three-dimensionality', reach, speed and punch. Only airpower, with such a unique combination of factors, can turn a flank from above, unencumbered by geography as well as deliver firepower over vast distances almost instantaneously and simultaneously. The Gulf War with its manifestations of parallel air strikes, crystallised the 'hyperwar' concept in which airpower dominance was incontrovertible. Herein lies the true promise of airpower. 'Strategic bombing' is passe.

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