THE DANGERS OF DOCTRINE

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From the Trojan Horse until the present, history is littered with examples of how military leaders who broke free from the conventional wisdom of their time triumphed over those who were bound by the limitations of their training and traditions. The problem seems greater now because for the last 232 years we have had staff schools around to develop and indoctrinate our officers in the "proper" doctrine. The point from which the military's evolution away from leadership and excellence began was when the Marquis de Bourcet opened the first staff college in Grenoble in 1764.

Bourcet's "…administrative school was far more than the first staff college. It was the first modern administrative school of any sort."[1] To be fair this first staff school, and the others that followed shortly afterward, were developed with the idea of creating a professional officer corps that would make the successful undertaking of war technically and materially possible. This, in theory, freeing the commanders to fight the war. Napoleon, however, changed all that.

The lesson learned from the Napoleonic era, "…was that the combination of professionalism with genius created dangerous men. Genius suddenly appeared to be the enemy of stability, even though the central justification for creating an army based upon the principles of reason was precisely to harness that genius in the service of the nation. Abruptly the authorities inverted the purpose of professionalism and used it as a structure designed to eliminate genius. That is, they removed professionalism's very reason for existence—the creation of soldiers who can win—and reduced it to a talent for bureaucratic organization."[2]

Add to this the separation and subordination of military leaders from civil authority and it meant that the important battles to the generals were now not on the battlefield, but in the backroom. Backroom victories became the only way for generals to increase their prestige, or assure themselves of a civil service position after retirement. This meant that the civil staffs had a vested interest in encouraging the mediocrity of the military staffs. This was best stated by Guibert in his *General Essay on Tactics*.

> If by chance, there appears in a nation a good general, the politics of the ministers and the intrigues of the bureaucrats will take care to keep him away from the soldiers in peacetime. They prefer entrusting their soldiers to mediocre men, who are incapable of training them, but rather are passive and docile before all of their whims and beneath all of their systems. . . . Once war begins, only disaster can force them to turn back to the good general.[3]

The evolution of the staffs that were created did not lead to greater professionalism but to a dangerously limiting form of bureaucratic logic.

The staff schools developed a shared vocabulary among themselves and their students, and this vocabulary has had the effect of reinforcing errors by providing a collective means of action while eliminating either singular or collective questioning of the status quo. Thus the "bureaucracy, safely repeating today what it did yesterday, rolls on as ineluctably as some vast computer, which once penetrated by error, duplicates it forever"[4]—or, until the programing is rewritten. These schools, like many of their civilian equivalents, have also developed defence systems to protect their—and their students'—reputations. Although most have stopped short of revisionist history, many have actively encouraged the selective recording of history as it occurred.

The staff schools gave the technocrats the intellectual tools—shared method; shared, self-serving vocabulary; predigested arguments; and the superior air of professionals—to prove, even when surrounded by self-generated disaster, that they are right. The standard defence being that it was the circumstances that were at fault, not their or the system's actions. It is not surprising that the military is so much more advanced in this culture than the rest of government or business. We have been training technocrats in our staff schools for almost a century longer than government administrators and 150 years longer than business. A large part of what our staff schools have been teaching has come to be called Doctrine.

Military doctrine serves a useful purpose in that it provides a framework for the initial education of neophyte military thinkers, but may make it difficult to change our organization. After the initial introduction, doctrine hinders the building of an intellectually strong, powerful and creative officer corps. Although, as we have examined, this was intentional we must examine the current system and decide if it really operates in the best interests of our country, our subordinates, and ourselves. To do this we may have to turn to people other than our current or past professional officer corps.

It will be very difficult for people born of, or adopted by, the system to reengineer themselves and the system, because they are products of it. They may find it hard to break out of the use of the common method and vocabulary that has been inculcated in them from the day they joined. What Winston Churchill noted about buildings extends also to our staff schools and doctrine—"*we first shape them, then they shape us*."[5] The elements that make up our doctrine are manifestations of past ideas, and they help the past ideas to quietly endure. Our rigid rank structure, and steadfast determination to maintain it at all cost, and without exception, supports the idea that seniority is of primary importance and makes the length of one's tenure visible. This abets the tendency of the chain of command to dismiss the opinions and ideas of "fresh blood"—this, even in an organization that has recently seen a more adaptive corporate culture as beneficial. The best way to reengineer the system is to find people who have a close familiarity with the system, but have not be subjugated by it, and by becoming aware of the *Dangers of*

Doctrine.

The danger of doctrine lies in the stifling effect it can have on the minds of our officers. Our officer corps—and our entire defence structure—should be focused on preparing combat capable, forward thinking, intellectually powerful, flexible and creative individuals not hindered by the traditions, doctrines, institutions, and educational norms of the past. Our doctrine, and the assumed requirement for it, is embedded in the organizational structure and activities that we are exposed to on a continuous basis, and this has made the underlying assumptions all but invisible.

The key to counteracting this tendency is to build the capacity of our officer corps to think creatively and independently. That is, to help them build a more powerful intellect. This process is twofold:

> First, you need to gain control of the raw material—that pinkish-grey matter inside your head on which so much of your life depends. Second, you need to widen your viewpoint to include every perspective; in short, you need to stop seeing through your eyes alone and begin to see through universal eyes. The first will make you intellectually strong; the second, intellectually powerful.[6]

When Pope Alexander VI warned us about the dangers a Pope can encounter he gave us valuable advice to heed as we rise through the rank structure, "The most grievous danger for any Pope lies in the fact that encompassed as he is by flatterers, he never hears the truth about his own person, and ends by not wishing to hear it."[7]

In order to know how to build a system to encourage the foundation of an environment that encourages intellectual power we need to have at least a cursory answer to the question…

HOW DO WE LEARN?

The structure of how we learn throughout our lives is outlined in the following steps:

- *We wonder about something* and try to make sense of it. What we wonder about is related to our current goals or concerns (ie. If we are confronted by a person with a pistol we may wonder about what they want.)

- *We find a stereotype* from our experiences that relates as closely as possible to what we are wondering about. From our stereotype we begin to construct a more realistic description or explanation of what we were wondering about.

- *Ask questions and look for answers*. We then modify our stereotype by confirming the parts of it that turn out to be true, and abandoning those parts we find to be in error.

- *Develop a Knowledge Structure* and fill in the blanks around it. We either find

the answers from our questions, or make them up. That is, we start filling in the slots. This slot filling is critical to understanding. Understanding means being able to predict what will happen next. The better we are able to predict what will go into the next slot the more we understand.

- *Remember past data* and apply it to the current situation. This allows us to make new generalizations. Remembering past data is the basis of learning, because it will occur when odd things happen that start us wondering. We remember past data using pictures of things that have happened to us. Pictures of our own experiences are much more real than pictures we have tried to learn so they will have much more impact on how we fill the slots in our knowledge structure.

- *Develop or alter scripts* that combine our stereotypes and knowledge structures into sets of expectations. These scripts help us to order our expectations and reach conclusions about how certain situations will develop.

Let us now take a closer look at how all this relates to our education by examining…

EXPECTATIONS, SCRIPTS, LEARNING, AND REMEMBERING

We learn from expectation failure—that is, the situation does not follow the script we thought it would so we start wondering why not. If these failures are not small and digestible we go into script overload or failure, and will not be able to learn from them.

One way to avoid script failure is to develop a large number of scripts, hence increasing the probability that we will have one similar to the situation we face. Another is to cultivate a creative mind. It takes time and dedication to expose yourself to as many different types of situations as you can. In short, "You have to care about what you are going to learn in order to learn anything at all."[8]

The real challenge to the learning process is that we come to rely on situations where we know the script, and often feel uncomfortable going into situations where we are not familiar with the new script. The ability to learn depends upon our being flexible enough to abandon scripts that are failing and to acquire new ones. This process becomes more difficult as one becomes more comfortable and dependent on current scripts. We may even ignore or skew information so that we can stay with the script we feel comfortable with—a situation with numerous examples in military history, with catastrophic results.

When we have experiences we do two things. First, we store it as a memory. Our mind breaks it into segments that fit into existing, or newly created, generalizations or expectations (ie, stereotypes, knowledge structures or scripts.) Second, we compare it to other memories so as to expand our expectations. This gives us an index of our experiences so that when our expectations are not met in the future we can re-evaluate, refine or correct our scripts.

From this we can see that if our experience does not cause us to change our generalizations we will not have learned anything, and hence will have little chance of remembering the experience. Once again this leads us to the conclusion that, "to teach students, we need to teach about the cases that might violate their expectations. This is how learning naturally occurs."[9] If the script failure is too great, however, we simply find it to difficult to alter our scripts and we are more likely to simply ignore the facts that do not fit our scripts.

An example of massive script failure is *Operation Market-Garden*, Montgomery's plan to capture and hold a bridgehead across the Rhine in northern Holland. From the start it was a high-risk plan that, if it had paid off, might have shortened WWII by several months. It was a two-stage operation. The first, a massive airborne drop on northern Holland timed to coincide with the invasion of southern Holland by land forces; the second, the paratroops and glider-borne forces were to capture and hold the road bridge at Arnhem while the tanks raced across Holland to consolidate their gains. Success depended on:

- an absence of serious enemy resistance in the Arnhem area;
- the capture of the bridge before the Germans could blow it up, or bring in reinforcements;
- successive waves of airborne reinforcements to back up the initial drop; and
- the arrival at Arnhem of the tank Corps within 48 hours of the drop.

When information was received from the Dutch underground that two SS Panzer divisions had been moved to a position alongside the drop zone—information supported by British aerial photographs of German tanks in the Arnhem area—Montgomery described the reports as ridiculous and his staff were quick to jump on the band wagon.

> When one of his intelligence officers showed him the aerial photographs of German armour, General Browning, at First British Airborne HQ, retorted: 'I wouldn't trouble myself about these if I were you ... they're probably not serviceable at any rate.' The intelligence officer was then visited by the Corps medical officer, who suggested he should take some leave because he was so obviously exhausted. And at First Allied Army HQ the Chief Intelligence Officer, a British lieutenant-colonel, decided there was no direct evidence that the Arnhem area contained 'much more than the considerable flak defences already known to exist.' As Ryan puts it: 'All down the Allied line of command the evaluation of intelligence on the Panzers in the Arnhem area was magnificently bungled.'
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> Finally, just in case there were any residual doubts, the intelligence staff of 2nd Army came up with the reassuring opinion that any German forces in the Arnhem area were 'weak, demoralized, and likely to collapse entirely if confronted with a

large airborne attack.'[10]

Market-Garden went ahead, and defeat was absolute and terrible. Short on everything but courage, the airborne troops held on until their number had dropped from 10,005 to less than a quarter of that. Total allied losses (in killed, wounded and missing) exceeded 17,000, some 5,000 more than those who became casualties on D-Day.[11]

This example of massive script failure also demonstrates why it is much more important for the military to avoid the situation than for the civilian community around us. If an executive at The Bank of Canada has massive script failure thousands of people may lose their life savings. If a military leader has massive script failure thousands of people may lose their lives.

Now that we have seen how we learn and what can happen when we fail to learn, we will examine. . . .

HOW SHOULD WE TEACH?

People who need to reason (and military officers are certainly in this category) are not very good at trying out new scripts. They reason from old scripts (specifically the doctrine they have spent their careers trying to memorize for the next test.) "They reason, as the Harvard law and business schools will happily tell you, from cases. In order to reason from cases, you must have some to reason from."[12] However, we must ensure that each case is not looked at in isolation. That is, we must use cases to build up our library of scripts, not just to test the old ones. If the case study does not challenge the student to rewrite their scripts then there is no memory, and "in the absence of memory there is no long-term reflection on results. Instead, one moves rapidly to the next case. The interference of any 'unprofessional' outsider in the application of [the] system presents the only great danger, because he might insist upon the use of memory."[13]

During our search for better ways to teach we must remember that, "Education does not consist of discovering new methods useful in the arid transfusion of knowledge."[14] Teaching is much more than providing facts for people to memorize. To teach people we must do at least two things: first, expose them to enough relevant expectation conflicting experiences; and second, provide some guidance through those experiences. The proof that our students have learned from their experiences is that they have increased their store of scripts when they proved to be inadequate. Of course, such things are hard to measure, but our job is to manage violence and attain victory on the battlefield, surely a small problem like this is not outside our grasp.

The more doctrinal our organization becomes the more we seem to rely on the standardized test to decide who will get a qualification, promotion, or posting. Instead of teaching the complexities of problem solving and inferring another persons goals and plans, or expanding our students creativity we teach doctrine and then test to see how closely the person reacts to the way the examiner would react. We need to share the vision of Maria Montessori

which she stated as: "My vision of the future is no longer of people taking exams and proceeding on that certification from the secondary school to the university, but of individuals passing from one stage of independence to a higher, by means of their own activity, through their own effort of will, which constitutes the inner evolution of the individual."[15]

Since our expectations of how people will react are based on what plan we think they are working from, we need to expose our officers to as many different plans, and value and belief systems, as possible. Our recognition of the other person's plan is predicated on our having seen it before. So the role of the teacher is to expose us to new experiences.

> We learn by doing, by trying things out, by formulating hypotheses and testing them. But we cannot do this in a vacuum. The teacher should be there to guide us to the right experiences and to answer our questions, or at least to listen to our questions and perhaps suggest ways that we could discover the answers ourselves.[16]

While we are teaching our people and exposing them to various scripts and cases we also need to increase their intellectual power and creativity. This will make script recognition and altering faster and make them more adaptable in situations that they encounter outside of the training system. So let us examine how we go about this…

CREATIVE BRAIN BUILDING.

From accepting that developing intellectual capacity and creativity, rather than knowledge acquisition, is our goal we can see that the actual content of our courses is not the issue at all. We should really be trying to impart the idea that one can deal with new areas of knowledge if one knows how to learn, how to find out about what is known, how to abandon old ideas when they are worn out, and how to predict what will develop in the future. This means teaching ways of developing good questions rather than memorizing known answers. It also means instilling in the individual the feeling of responsibility towards their own development, and the development of the organization.

The output from our training systems[*] should be people who are better able to understand

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[*] Note that this is training *systems* not training *institutions*. Every person in the fleet should be as actively increasing their professional knowledge as the students in our schools. Captains should be as (if not more) involved in the training of their subordinates than commanders of fleet schools. One only has to look back as far as WWII to truly understand what an important role commanding officers play in the education of a navy. If they did their training job well a convoy would make it. If they did not, people died. Some of our captains may have lost some of that sense of urgency and responsibility that was so quickly gained when one saw a ship go down for the first time.

and predict their opponents actions. So we need to start teaching them how to find out about their opponents, their plans, values, and beliefs. By concentrating on teaching doctrine, or worse still, teaching to the exam, we force our students into the same thought processes of the past, and limit their ability to conceive new ones in the future. By presenting them with essentially the same enemy, with the same weapons capabilities time and time again throughout their careers we are wasting the opportunity to have them develop new generalizations about new enemies with new goals, values, and plans. Couple with this the military's "tendency to underestimate the enemy and overestimate the capabilities of [it's] own side,"[17] and we place ourselves in the position of intellectually crippling our officer corps.

If we teach our officers skills or knowledge we have simply given them something to forget, but if we run programmes that encourage them to learn the skills or knowledge required to overcome a problem we will have expanded their minds, and they will never go back to their original dimensions. "Previously established behaviour manifests itself in new situations in new yet orderly ways. Novel behaviour is truly new, but the particular novel behaviour that emerges in a new situation depends on the particular behaviours that were established previously—that is, on prior knowledge. Creativity, in short, is not something mystical; it's an extension of what you already know. To be more specific, new behaviours (or "ideas") emerge as old behaviours interact, and the process by which behaviours interact is orderly."[18] So what we need to do is expose them to situations that they are never likely to encounter so as to expand their prior knowledge base.

Even a cursory look at scientific developments demonstrates that great breakthroughs usually come from people working outside the field, because they bring a new way of looking at the problem with them (see James Burk's series *Connections*, *Connections*^{2}, and *The Day the Universe Changed* for a plenitude of examples)

Now let us look specifically at how we can stretch peoples minds and increase their intellectual power. In their book, *Brain Building: In Just 12 Weeks*, Marilyn Vos Savant and Leonore Fleischer outline ten areas that should be developed to increase your intellectual capacity and flexibility. They are:

- **Calculating**. Developing our capacity to calculate—or increasing our mathematical (as opposed to arithmetical) capacity—is the basis of problem solving and pattern recognition.

- **Logic**. One of the most common situations in everyday life is people hanging on tightly to what they "know" instead of opening their minds and letting in the fresh air of simple logic. This is a four step process defined as follows:

    - Become aware of the problem,

    - Define it and analyse it,

- Approach it rationally from different angles, considering various options and working hypotheses for its solution, and

- Select a solution and verify its effectiveness.

- **Vocabulary**. Building a stronger vocabulary is important to allow clearer communications. With precision of language, thoughts gain clarity as well as ease of expression, and communication with others improves.

- **Insight and Intuition**. These are two different, but related, topics. Our intuition is the split second reasoning done by our sub-conscience brains that helps us to make the correct evaluations of many situations everyday. Insight is what happens after we have evaluated the situation that our intuition gave us an answer for and we discover why the situation happened and how we can better deal with it in the future.

- **Orientation**. *Physical orientation* entails seeing where you find yourself in your surroundings. *Mental orientation* is more difficult. It requires attention to more than what your eyes see. It requires orientation to things such as days and dates. *Intellectual orientation* is a combination of these things producing *Situational Orientation*. With this kind of orientation, you are aware of both the seen and the unseen environments, which affords you the capacity to act with as much power thinking as is needed for the current situation.

- **Attention Span**. Before we can increase our intellectual horizons we must increase our attention span and expand the perceptions of our senses.

- **Communication**. Clarity of communication requires clarity of thought, concise vocabulary, and an ability to bring the two to bear in interactions with other people.

- **Information and Memory**. This is more than simply transferring data from the page to our brains. It is a process of gathering information, evaluating it, and storing that which is of value.

- **Comprehension**. The act of comprehension means, quite literally, to take hold of something mentally. In this case however the idea itself is more important than the sum of its parts; it's the big picture you're going for, and the details can be sketched in later; and

- **Perspective**. Perspective is what gives you a vantage point on the world as it is, not as you or others hope it will be. It is very closely tied in with objectivity. A strong sense of perspective allows you to mentally step back, step forward, or to

> one side to view the circumstances and assess the facts. Only a realistic perspective, or set of perspectives, will give your intellect the tools it needs to form correct judgments.

Increasing our capabilities in the above areas will increase our intellectual capacity. These areas will affect our convergent thinking. "Convergent thinking is measured by IQ tests, and it involves solving well-defined, rational problems that have one correct answer. Divergent thinking leads to no agreed-upon solution [ie. results rather than process driven]. It involves *fluency*, or the ability to generate a great quantity of ideas; *flexibility*, or the ability to switch from one perspective to another; and *originality* in picking unusual associations of ideas. These are the dimensions of thinking that most creativity tests measure and that most workshops try to enhance."[19] In looking back through the history of conflict a point that stands out is the most successful military leaders were the ones who did the unexpected at a critical point in the battle. In developing more creative people we will be developing a defence structure more capable of dealing with future conflicts not one that continually prepares to fight the last war. "Creative individuals are remarkable for their ability to adapt to almost any situation and to make do with whatever is at hand to reach their goals."[20] These are certainly the characteristics we need our officer corps to have.

Once we have accepted that building stronger, more creative intellects is one of the main goals of our training and education system we can see that relying on doctrine and bureaucratic systems can have a crippling effect on our efforts. At this point you may be starting to feel that the author has no use for doctrine and that it is viewed as some demonic presence that should be exorcised from the entire military culture. Be assured, this is not the case. Like all things doctrine has its purpose, and its negative influences occur only when it is used outside of these. So let us now examine…

WHAT PURPOSE DOES DOCTRINE SERVE?

As stated above, the learning system will have to include some case studies to allow people to create a plenitude of scripts to draw on. It makes sense then to expose them to their most likely opponents early in their career. This would mean that in courses dealing with introduction to the military arts our doctrine would serve a useful purpose. This introduction to military thinking is not limited to our officer corps.

Our political leaders have to have a foundation in military thought to be able to do their job, however most do not when they take office. It is incumbent on us, as military leaders, to ensure they understand the basics of what we do for a living so that they will continue to provide us with the funding we need to continue achieving our missions. By having a simple, clear doctrine to work with we will be able to communicate with politicians and still allow ourselves the flexibility required to deal with situations that we did not, and cannot, predict.

Doctrine also provides us with a framework to conduct professional conversations with

the militaries of other nations. This will not only help us understand them better, but also gives us the opportunity to expand our capacity to recognise there assumptions, values, and goals in a practical application. The independent evaluation of the world situation that will be done will also allow us to exercise our capacity to see events from a different perspective.

In short, we should use doctrine for the first contact training of our people. This will provide them with a tool to use in their overall military education. The majority of the rest of the time they are in the training system—the rest of their careers—we should be encouraging the development of their intellectual power. Specifically how this can be developed (and how the various exercises could be applied to the military training system) is a discussion far larger than could be handled in this paper. An important thing to note in this process, however, is that it will mean scrapping our current training systems. So now let us look at…

HOW DO WE GET THERE FROM HERE?

That's right, scrapping our current training systems. Mere amendment will not accomplish the goal of preparing combat capable, forward thinking, intellectually powerful and flexible individuals not hindered by the traditions, doctrines, institutions, and educational norms of the past. It is only by rebuilding the system from the foundation up that we will start rebuilding ourselves. Currently we have no place for this rebuilding to start. Unlike most other militaries there is no CF sponsored publication for the open interchange of conflicting ideas. Without this open interchange of ideas among our people we, as an organization, will be unable to build a strong structure.

If we abandon the idea of easy measurement of achievement, then we can begin to talk about exciting people with open ended problems, and can begin to create educational goals such as learning to think for oneself (something at least tacitly discouraged in the military.) As leaders and managers of change we must look to the future, not the past, when deciding our destiny. It is true that there are important lessons to be learned from history, however Samuel Coleridge was accurate in saying that if we *could* learn from history there are great lessons it could teach us, but passion and doctrine, "blind our eyes, and the light which experience gives us is a lantern on the stern which shines only on the waves behind us."[21]

There are many who will disagree with the need to change. We will hear people quoting catch phrases like, "If it ain't broke, don't fix it", and "If it was good enough for *(insert historic figure of your choice here)* then its good enough for us." While these phrases may sound realistic they will be mouthed by people who have been shaped by the system and hence may not be able to see the reality of the situation—they are in fact a few examples of those predigested arguments that we examined earlier, and until we challenge them we are destined to continue in the ever increasing downward spiral. We may need to remind them of the words of von Clausewitz, "This is the way the matter must be viewed, and it is to no purpose, it is even against one's better interest, to turn away from the consideration of the real nature of the affair because the horror of its elements excites repugnance."[22]

The thought of having an officer corps that is filled with independent thinkers may strike fear in the hearts of many. There will be statements that the military cannot survive without obedience, and that we can't have a system where every order that is given may be questioned. Our system, being built on loyalty rather than obedience will create individuals that will be striving towards the same goal (a strong, viable defence for our country) and will see the wisdom in following the chain of command. A more likely problem will be reining in the enthusiasm of our officers, rather than trying to get them motivated to action. It brings to mind the words of General Moshe Dayane, "It is better to struggle with a stallion when the problem is how to hold it back, than to urge on a bull which refuses to budge."[23]

ENDNOTES

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1. Saul, John Ralston. *Voltaire's Bastards: The dictatorship of Reason in the West*, Penguin Books, Toronto, 1993, p.190.

2. Saul, p. 193.

3. Comte de Guibert, *Écrits Militaires 1772-1790*, préface et notes du Général Ménard (Paris: Editions Copernic, 1976), p. 192. "Si par hasard il s'élève dans une nation un bon général, la politique des ministres et les intrigues des courtisans ont soin de le tenir eloigné des troupes pendant la paix. On aime mieux confier ces troupes à des hommes médiocres, incapables de les former, mais passifs, dociles à toutes les volontés et à tous les systèmes.... La guerre arrive, les malheurs seuls peuvent ramener le choix sur le général habile."

4. Tuchman, Barbara W. *The March of Folly: From Troy to Vietnam*. Ballantine Books, New York, 1984, p.386.

5. Brand, Stewart. *How Buildings Learn*, Viking, New York, 1994, p. 55.

6. Vos Savant, Marilyn; Fleischer, Leonore. *Brain Building: In Just 12 Weeks*, Bantam Books, Toronto, 1991, p.14.

7. Tuchman, p. 85.

8. Schank, Roger C. *The Connoisseur's Guide to the Mind*, Summit Books, New York, 1991, p. 156.

9. Schank, p. 250.

10. Dixon, Norman F. *On the Psychology of Military Incompetence*, Ebenezer Baylis and Son Ltd, London, 1976. p. 146-7.

11. Dixon, p. 148.

12. Schank, p. 138.

13. Saul, p. 121.

14. Montessori, Maria. *From Childhood to Adolescence*, Schocken Books, New York, 1973, p. 131.

15. Montessori, p. xii.

16. Schank, p. 252.

17. Dixon, p. 153.

18. Epstien, Robert, Ph.D. *Capturing Creativity*, Psychology Today July/August 1996, p.43.

19. Csikszentmihalyi, Mihaly. *The Creative Personality*, Psychology Today July/August 1996, p.38.

20. Csikszentmihalyi, p.36.

21. Tuchman, p. 383.

22. Clausewitz, C. von. *On War*, ed. Anatol Rapoport, Pelican, Harmondsworth, 1968, p. 102.

23. Dixon, p. 149.