

General George Catlett Marshall:

A Cognitive Approach to Who He Was and What He Did

By

Andrew G. Wallace, M.D.

Introduction

George Catlett Marshall, General of the Army, Secretary of State, and winner of the Nobel Peace Prize is an icon among America's military leaders. Furthermore, his plan for the recovery of Europe after WWII is arguably the boldest most successful and noblest foreign policy initiative in the annals of American history. (1) In these dual roles, as soldier and statesman, he is often compared with George Washington. (2)

Howard Gardner, a distinguished Professor of Cognition and Education at the Harvard Graduate School of Education features George Marshall in his book *Leading Minds: An Anatomy of Leadership*. (3) The title of Gardner's book provides a clue to the central premise of my essay; that Marshall's brain was the source of who he was and what he accomplished. I want to suggest that a deeper consideration of Marshall's remarkable cognitive skills may provide added and perhaps new insights about this extraordinary man, and guidance about cultivating in others the skills he expressed so well in our nation's interest.

Marshall's famous ten-minute address at the Harvard Commencement in 1947 (4), where he introduced principles to guide Western Europe's recovery after WWII, has been described as more of an *invitation* than a plan. My essay also is an invitation; an invitation to think about how Marshall's brain worked.

Rationale

In the past two to three decades there have been remarkable achievements in areas such as evolutionary biology, neuroscience, cognition, and educational psychology. As remarkable as individual advances in each of those fields have been, it is their *convergence* and resulting new concepts about how humans learn and think that are most exciting. (5) I will try to relate some of those concepts to George Marshall with the primary goal of encouraging future scholarship focused more deeply on his cognitive capabilities.

Marshall is perhaps best known for *The Marshall Plan* (6), which was signed into Law in 1948. When WWII ended Marshall understood that Hitler's Germany had initiated the

war, killed millions of people, perpetrated the Holocaust, and destroyed much of industrial capacity throughout Europe and Western Russia. Importantly, Marshall also understood that lasting peace depended upon restoring confidence and hope among all people of Europe and upon reestablishing the fabric of Europe's economy as a whole. In its final form *The Marshall Plan* contributed directly to Europe's economic recovery, to restoring morale, and to the containment of communism. Indirectly, through cooperation that the Plan was intended to foster, it also laid the groundwork for the formation of NATO, the European Union, and even a common currency, the EURO. In short, *The Marshall Plan* changed the culture of Europe for the next sixty years". It was a dramatic example of big picture thinking and ethical leadership at the highest level.

During WWII Marshall was the U.S. Army Chief of Staff and among his U.S. counterparts he was "first among equals." More than any other individual Marshall understood the strategic need for balanced strength among our forces on land, air and sea. With an urgent need for cooperation among the Allies, Marshall proposed and Roosevelt and Churchill agreed to merge their respective service chiefs to form a "Combined Committee of Chiefs of Staff" for planning and coordinating the war effort. Marshall further convinced Roosevelt and Churchill of the need for single "Supreme Commanders" in each of the Theaters of War. Many have described this series of organizational changes as Marshall's ability to achieve the impossible. He was capable of thinking about, coordinating and leading a multi-national worldwide war effort – not only because of his military expertise, but also his ability to think strategically and to organize on a grand scale. (7)

Marshall had just become Chief of Staff of the U.S. Army when Germany invaded Poland in 1939. He believed that Britain could not defeat Germany alone and recalling America's lack of preparedness at the beginning of WWI, he convinced Roosevelt (and Congress with an isolationist point of view) to enlarge our Army from 175,000 men to 1,400,000 by 1941. It later grew to 8 million. He did that by speaking candidly and by supporting the Selective Training and Service Act of 1940, the first peacetime Draft in America's history. His pre-war efforts were not limited to the Draft; they also included creation of training sites; identification of new leaders; and mobilizing our manufacturing capacity to produce weapons, ammunition, airplanes and ships. Each step was accompanied by major budgetary implications requiring congressional approval. Sam Rayburn, Speaker of the House during those years, said this of Marshall: "Of all the men who ever testified before any committee on which I served, there is no one of them who has the influence ... General Marshall has." The reason was simple, he continued, "It is because when he takes the witness stand we forget whether we are Republicans or Democrats. We remember that we are all Americans, and in the presence of a man who is telling the truth". (8) In his 1990 book *On Leadership*, John W. Gardner described Marshall as having "a limitless ability to inspire trust". (9)

Much of what has been written about George Marshall appropriately treats these qualities of expertise, strategic thinking, seeing the picture whole, interpersonal communication, and trust as "attributes" of his leadership style. I want to suggest that they were cognitive skills reflecting how Marshall's brain developed. Furthermore, these skills were

expressed by him and appreciated by others earlier in Marshall's life and substantially before WWII. Let me offer just two brief examples of the earlier evidence of these qualities:

First, as a student at The Virginia Military Institute (Class of 1901) George Marshall was an average student, but as a cadet he was noted for his "selflessness, problem-solving skills, and particularly for his integrity". Each year he was selected cadet-leader of his class and in his senior year he was chosen to be the Institute's "First Cadet." (10)

Second, in presenting the Nobel Peace Prize to Marshall in 1953, Carl Hambro said this: "Typical of the high esteem in which he (Marshall) was held is what happened in 1916 ... He took over the training program at a camp in Utah. When the camp closed the commanding officer was required to make a report on the officers under his command." One question was "Would you desire to have him under your immediate command in peace and in war." The Colonel wrote in reply, concerning Marshall, "Yes, but I would prefer to serve under his command ... in my judgment there are not five officers in the Army so well qualified as he to command a division in the field." (11) At that time Marshall was twenty-six years old and he was still a first lieutenant.

How a human brain develops and works (5) (12) (13)

I want to digress at this point from George Marshall and certain of his attributes to summarize several important concepts about how the human brain works. Some of these concepts are relatively new, yet they are an essential basis for examining George Marshall from the perspective of cognitive skills.

While all that went before in our evolutionary history is significant, there has been a nearly thousand-fold increase of the mammalian brain's cortical surface area during the past one million years. Most of that change within the human lineage has been in the prefrontal, parietal and temporal areas; regions of the brain we now know to be critically related to learning, memory, language and thinking.

Cortical neurons responsible for these functions do not originate in the cortex per se; rather they form in embryonic vesicles and then migrate to cortical locations along scaffolds created by radially oriented supporting fibers. (14) (15) Once positioned at their ultimate destination, cortical neurons take on functional identity; e.g. sensory or motor or inter-neurons, and only then do they send out axons to connect with other cells. This latter process is not random. Rather, it too is accomplished in a sequence of intermediate steps following molecular signals.

When axons reach a target cell a communication mechanism is established through the formation of synapses. In these connections the pre-synaptic axon expresses a cluster of vesicles that synthesize and release a diffusible neurotransmitter. The post-synaptic element (a dendrite of another neuron) contains a cluster of receptors for the neurotransmitter. The action of the transmitter on the receptor is responsible for activating the target cell, i.e. communication.

The picture I have painted so far is one of a brain built over time in a programmed manner by processes largely controlled by our gene pool and principally expressed as predictable outcomes within and to some extent even across species. However, to appreciate the complexity of the human brain we also must consider that there are approximately ten billion neurons in the human cerebral cortex and the average cortical neuron makes up to ten thousand synaptic connections with other neurons.

Gerald Edelman has been the principal contributor to a “population-based theory” of brain development that he calls *Neuronal Group Selection*. (16) According to his theory the human brain can be viewed as a product of our gene pool, but only up to a point. Development and organization of the brain also are influenced importantly by “epigenetic phenomena”. For example, the formation of specific neural networks is not pre-specified by a genetic blueprint. Rather, networks arise in part because of regional competition among neurons for growth factors, even before birth.

At yet another level, and largely after birth, synaptic connections within and between neuronal groups are strengthened or weakened by use. Indeed, entire neuronal groups disappear and still others become connected as a result of perceptual experiences (or their lack) with the outside world. Connected neuronal groups form three-dimensional maps, which are key to understanding memory and the ability of the brain to categorize new perceptual inputs. Connected maps, in turn, underlie the well-known cognitive characteristic of associative memory. (17)

Based on these epigenetic features of development there is every reason to believe that no two human brains (even those of monozygotic twins) are identical even at the time of birth. Furthermore, we are each born with neuronal connections that are maintained only if confirmed through use, and additional connections are formed after birth and even into adult life. These processes of subtraction and addition may produce relatively little net change in overall synaptic density. However the turnover of synapses based on experiences with the environment is very considerable. This adds to the view that every mature brain is functionally unique.

Individual processes, which relate to our cognitive functions, reside primarily in one or more neuronal groups. Despite these localized processing elements all complex cognitive functions involve more than one connected cortical area. A good example is language: words that are heard are processed in one area; words that are seen in another area; and words that are thought of but not heard or seen in still another. Even for words heard or seen the recognition of an individual word occurs in one area of the brain, but its meaning within syntactical structures is processed elsewhere. As a result, a localized brain region is not wholly responsible for any complex cognitive function, but rather with elemental processing-components of that function within the context of a larger system.

Our cognitive functions include at a minimum perception, attention, learning, memory, language and other symbolic representations such as numbers, social cognition (e.g. understanding ones self and others), and executive processing (e.g. reasoning, decision-

making, and problem solving). (18)

“*Learning* is the word used to represent the process by which we perceive and acquire information about the world through our senses, while *memory* is the word used to represent the processes by which we store that information in a form that can be retrieved at a later time. Memories are formed in stages. The initial stage is called *encoding* and includes a brief but adequate time period during which attention is focused on a sensory input that activates an appropriate network of neurons. Repeated activation within a short time frame leads to facilitation of synaptic transmission in the network, which persists for seconds or minutes after the input is removed. This brief period of facilitated transmission within existing networks is called *short-term memory*.

Conversion of short-term to *long-term memories* is referred to as *consolidation*. Long-term memories last for hours, days, years, or even a lifetime. At a functional level consolidation represents a long-lasting increase in either the strength or number of synapses within a network. At a molecular level consolidation involves gene expression, new protein synthesis, and the turnover of dendritic spines. Thus, consolidation causes a long-lasting structural change in the brain.

In research we are familiar with a distinction between data and information. The latter generally reflects both the conclusions drawn from data and the meaning of those conclusions in some broader context. It is useful in thinking about how the brain works to draw a parallel distinction between long-term memories and *knowledge*. Knowledge depends upon several individual memories that are accurate and have been categorized as to importance. Knowledge also depends on *associative-memory*, i.e. maps of memories that are not only accurate, but also connected and related. *Constructivism* is a theory which views knowledge as actively built over time by the learner. (19) Put another way, knowledge is built from what one already knows: then as a consequence of either adding or subtracting or correcting elements essential to understanding the resulting knowledge is modified.¹

The most important messages from these considerations are three; first, knowledge and by extrapolation expertise are higher order cognitive capacities that depend upon associative neural connections related to memory, second the learner builds these neural connections through structural changes to the brain at a molecular level, and third building these connections is an active process.

Of special interest to my goals for this essay is the concept of *Expertise*. Experts have acquired extensive knowledge in their domain, but what distinguishes them most from novices is; their knowledge is organized along core concepts or principles, they have the ability to look at new situations and see features and patterns not evident to the novice, and despite holding a vast repertoire of knowledge in their domain that knowledge is

¹ The three paragraphs above are either direct quotes or paraphrases from an unpublished essay I wrote in 2007, and they also appeared in a chapter I wrote; *Passing on the Stead Legacy* for a book called *Learning to Learn* (20) to be published in 2010.

conditioned so it can be selected, recalled, and applied in a seemingly effortless manner. Areas of expertise in which these characteristics have been studied and are especially well documented included: chess, electronics, music, math, computer programming, physics, history, and teaching. (21)

Human cognitive functions also depend upon more than would be predicted from either individual or even the sum of discrete competences. These “higher-order” functions include the ability to initiate (or inhibit) processes such as reasoning, planning, decision-making and problem solving, and to shift between tasks. The selection and weighing of inputs to these latter processes adhere to previously learned rules that guide goal-directed actions. Collectively, these functions are referred to as “*executive processes*”. The neural networks responsible for executive processing reside principally in the frontal cortex of the brain, but also in the cingulate cortex. (22) (23)

Finally, in 1983 Howard Gardner challenged the long and widely-held view that *intelligence* is a general cognitive capacity; possessed in varying degrees by everyone, measurable by a pencil and paper test, and reducible to a single number – your “I.Q.” In his Book: *Frames of Mind* (24) Gardner introduced a new view referred to as “Multiple Intelligences.” Gardner’s theory starts with a premise: “an intelligence is a cognitive competence that results either in the creation of a novel product or the solution of a problem, and further ... this product/solution is valued by the culture in which the competence is expressed.” He went on to suggest several criteria that could be used to assess whether a candidate-ability should be regarded as an intelligence, or not. His first criterion was that the competence could be either selectively destroyed or compromised as a result of brain injury. Closely related to this criterion was that the competence may be expressed in a precocious manner in otherwise normal children, or it may be spared in the presence of highly retarded performance in most other intellectual domains (i.e. *the savant syndrome*). Lastly, the competence can be developed to varying levels with training and it may be expressed at exceedingly high levels in a few individuals.

According to Gardner these independent neural-based *intelligences* include at a minimum: linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, and personal intelligences (the latter embracing both a sense of self and separately a sense of others). A few of the most notable features of Gardner’s thoughts are these. First, we all possess these intellectual competences and perhaps more. Second, as a result of interactions between heredity and environment during brain development no two individuals express these competences in exactly the same proportion. Third, we each have a unique profile of *intelligences* and a unique potential for their individual development.

Back to George Marshall

My goal in this essay is to invite readers to view George Catlett Marshall through a particular lens, a view that postulates that who he was and how he did what he did were reflections of how his brain worked. It seems to me that George Marshall possessed a remarkable portfolio of neural-based cognitive abilities. I am not suggesting that he was

born with those abilities, although in the sense of Howard Gardner's *Multiple Intelligences*, he may have been born with an unusual potential for the development of at least some of them.

In my research on Marshall I have tried to look at what has been written about him, to search for clues to specific cognitive skills, when and how they developed, and how he used them either individually or together to achieve purposes of such great importance. However, it is vital to emphasize that the relationships I will suggest, between cognitive skills and Marshall's performance, should be viewed as "hypotheses" potentially worth testing rather than as conclusions. I am neither an expert on George Marshall nor a cognitive neuroscientist, but as an outsider I have studied and been intrigued by both and their possible connection.

Let me begin with a general comment after reading the on-line version of the *Pogue – Interviews and Reminiscences* with George Marshall. (25) These consist of five hundred and seventy six pages of transcripts, based on nineteen taped interviews with Marshall, conducted during 1956 and 1957, by and for Forrest C. Pogue. The subjects covered span George Marshall's life from childhood in the 1880s to The Marshall Plan, which officially ended in 1952.

My overarching impression from the transcript of Pogue's interviews is that George Marshall had an outstanding, and possibly an extraordinary long-term memory. We know that Pogue sometimes gave Marshall a list of questions in advance, but there is little evidence that Marshall had access to or used documents from the past to prepare for the interviews. Rather, he relied principally on memory. Here is a very brief example of his memory at work. When asked by Pogue for some general comments about his early life, Marshall began by saying this:

"To begin with, my first very clear recollection is going out to our barn in which we kept a horse and a cow. It was rather large for a place in town and when originally built had been on the edge of town. My recollection goes back to climbing up the ladder, which was fastened to the side of the barn, in an effort to get to the haymow - the first time I had ever tried this. My brother had gone ahead of me and had disappeared in the haymow. And as I climbed up the ladder, being very cautious and a little frightened, I came to a windowless opening, which I could look out of between the rungs of the ladder. In a sense, it seemed to me - my recollection is - that this was my first look at the world. A creek ran through our place, and my line of vision went down the line of the creek. I saw some little distance below me some highly colored ducks swimming about, which of course attracted my eye immediately. There was a dog or two along the bank. There were chickens wandering about. All of it fascinated me and it seemed a whole world exposed in an instant to my eye." (26)

The experience described above must have occurred at least sixty years prior to being recalled by Marshall at the interview. Note the level of detail, the feeling, the color and

movement, and the succinct capture of meaning "... it seemed a whole world exposed in an instant to my eye". Almost every page of the Pogue Interviews contains Marshall's recollections at this level of detail.

Nearly everyone who worked with George Marshall, or who has written or spoken about him, attests to his exceptional memory. He had trouble remembering names, but he could remember something about practically everyone he met. At press conferences he would begin by asking up to thirty reporters what questions they wanted him to address. Then, after hearing all the questions he would speak for perhaps thirty minutes answering each question and usually making eye contact with the reporter who had earlier asked the question. When he testified before congress over one hundred times, he prepared ahead of time, but he typically spoke without notes. (27) Eric Severeid, the CBS news correspondent, summarized Marshall this way: "a ... man ... [with] the memory of an unnatural genius". (28)

Carl Hambro, in presenting the 1953 Nobel Peace Prize to George Marshall said: "The first of two things that stand out for those trying to follow Marshall's development was his insatiable desire to learn, to know, and to understand..." (29) This feature of Marshall's cognitive development was not particularly evident in his youth, or even when he was a student at VMI. He was an average student at best. Marshall received his commission as a second lieutenant in 1902. In 1906 he qualified to attend the Infantry and Calvary School at Fort Leavenworth, which offered what amounted to the army's first post-graduate program in the theory and practice of war. Marshall thrived on this experience and he finished first in a class of highly motivated and mostly older students. Marshall said later: "this is where I learned how to learn." (30)

One of Marshall's skills was his ability to learn from experience. From 1910 to 1916 he had a series of assignments, mostly in the U.S., and then in 1917 he joined the American Expeditionary Force (AEF) in France during WWI. He held important staff roles, including one at AEF General Headquarters where he planned major campaigns with the English and French and served under General Pershing. After WWI he served for five years as aide-de-camp to General Pershing when the latter was the Army's Chief of Staff in Washington, DC. In that role Marshall acquired considerable experience in dealing with congress, the President, and foreign leaders. Pershing became not only Marshall's role model, but he also provided in-depth education in civilian-military interactions. Subsequently, Marshall taught at the Army War College and held a series of assistant commandant and command positions, which included the Civilian Conservation Corps and the National Guard. In these roles he acquired deep respect for and skill in promoting the morale and motivation of those who served under him, including civilians. From 1938 to 1939 he served as assistant chief of staff, then as deputy chief of staff, and then later as Chief of Staff, U.S. Army, War Department, Washington, DC.

All of these experiences contributed to his growing knowledge and to his extraordinary gifts as a leader. However, I think that key to understanding this growth and his expanding knowledge was that he approached each and every experience as a learning opportunity. What he learned shaped his brain and how it worked in a lasting way. The

ability to learn was one of his distinctive cognitive skills.

My second impression from reading the *Pogue Interviews and Reminiscences* is that George Marshall was broadly informed by his extensive reading. He grew up in a family where reading was a part of most days and always enjoyed. For example, "... the General recalled that his father read very well. The family assembled several nights a week, he (the father) read to them, and these were serious books: *Sant' Zlario* and *Don Orsino* by F. Marion Crawford, many of the books of James Fenimore Cooper, Arthur Conan Doyle's *The Refugees*, Eugene Sue's *The Wandering Jew*, and William Prescott's *Conquest of Mexico*. "Even in older years the General remembered some of the tales, particularly those that concerned Indians, so vividly he could hardly forbear to retell them and recapture the excitement of those evenings long ago." Marshall went on to say: "My favorite books were of a historical nature. I don't mean just histories, but books that bore on history [for example] the G. A. Henty books. I read all of them, I think." [There were over 100]. (31).

Pogue later asked, "What were the books you read while at VMI?" Marshall responded: "Of the books that I read at that time, it was pretty much anything I could get my hands on, particularly the last year and a half. I didn't discover until then that my roommate Nicholson - he and his brothers were orphans and they owned the *Times-Picayune* [newspaper] - made a casual remark one day that they got all these books to review and they sold them for five cents apiece. So we immediately got him to contact a friend of his on the paper and ... the friend would send us a barrel of books at a time. ... I was a rapid reader and Peyton was a rapid reader. Peyton and I just read through the barrel. ... I [also] read a little in the library. I remember coming across for the first time Rudyard Kipling and I read every book they had by Kipling." (32)

As an adult Marshall read almost every night before going to bed, mostly for pleasure. He read widely, but mostly history. He read Thucydides on the Peloponnesian War, about the Roman conquests, about Cicero, Napoleon, and the Civil and Spanish American Wars. He read rapidly, but he also had a remarkable capacity to digest what he read and to capture lessons he could remember and use on future occasions.

Here is one example from his 1953 speech accepting The Nobel Prize, titled *The Essentials of Peace* (33):

"I will try to phrase my views or suggestions in the simplest possible terms though I lack the magic and artistry of that great orator whom the Nobel Committee in Stockholm so appropriately honored yesterday. In making my statement I will assume your familiarity with the discussions and efforts of the past eight years and also with something of the conditions which have governed each long continued peace in world history. I would like to make special mention of the years of the *Pax Romana*, which endured through almost all of the first two centuries of the Christian era. I do so because of a personal incident, which made a profound impression on me in the spring of 1919. Arriving late at night in Chaumont, the American Headquarters in France, I sought shelter for the night in

the house of a group of friends. I found they were temporarily absent; so I selected an unoccupied room and looked about for a book to read as I waited for sleep to come. The books available were mostly in French or German. Since I was unable to read them with facility, I looked further and finally found an English textbook on the history of Gaul. Casting about for an interesting portion, I landed on a description of the famous Roman Peace. Included in this description was a statement of the dispositions of the Roman troops during this prolonged period, a legion at Cologne, another at Coblenz, a third at Mayence, and the reserve at Trier. Now those happened to be the identical dispositions of our Allied Forces some eighteen hundred years later, with the Peace Commission sitting in Paris and evolving the policy of the League of Nations.”

This is George Marshall at his best, remembering something he had read thirty-four years earlier and associating that memory with the effort to create a League of Nations at the end of WWI, and then with his rationale for *The Marshall Plan* after WWII.

Marshall’s experiences and his reading both contributed to his vast knowledge. But his knowledge also was organized around principles and themes. L. J. Halle said of Marshall: “He could distinguish what was important from what was not important.” (34). In the book *Thinking in Time* (35) Neustadt and May observed that Marshall developed a habit of “seeing time as a stream,” that is applying a consciousness of past problems, ideas, and solutions to the present rather than seeing every current problem in isolation. Marshall’s knowledge was organized and could be expressed and applied in the manner cognitive scientists refer to as expertise. (36).

Marshall developed over time a special way of interacting and communicating with others. These abilities highlight another of his cognitive skills, what some have referred to as social cognition (37) or what Howard Gardner called personal intelligence. (38).

Many sources could be used to document this highly effective element of Marshall’s cognitive repertoire. I have chosen a few excerpts from H. Merrill Pasco’s *Marshall Lecture* delivered in 1996 (39) to illustrate the point. Pasco handled Marshall’s personal correspondence, summaries of staff studies, schedule, and served daily as liaison to the Secretary of War and to the White House from 1941-1945. So he knew Marshall well. Here is Marshall in Pasco’s words:

“His public persona was the result of overpowering self discipline which he cultivated purposefully to suit his style of leadership. The aura he was able to create intentionally of an impersonal, wholly objective and serious public servant who would tolerate no interference with the performance of his public duties, coupled with his unshakable integrity and profound intellect, enabled him to achieve a position of respect with the media and the Congress as well as with President Roosevelt and Secretary Stimson that no other public figure even approached.”

Note that Pasco describes Marshall’s public persona as “cultivated purposefully” and

“intentionally” to achieve respect with the media and those he served under. Yet Pasco goes on to say:

“ ... This courtly, austere officer in public with the icy blue eyes, formal public manners and serious countenance differed 180 [degrees] from the warm, relaxed, compassionate, considerate man of simple tastes in private life.

... My first impressions of General Marshall ... were the overwhelming power and force of his presence ... At the same time the General constantly had great concern for the feelings of others, including his immediate staff ... Marshall's humanity and consideration for others was manifest in the intense concern he had for the welfare, both mental and physical, of the soldiers in the Army.

... One of the most vivid impressions I have of General Marshall was his quiet confidence in his own ability to handle people and arrive at sound judgments ... There was no doubt that he was quite aware of his ability to run the Army and the war better than anyone else.”

Pasco then quotes this description of General Marshall by Ambassador Bruce:

“Marshall radiated a sort of majesty about his selflessness. He was a wonderful combination of strength, understanding, and almost gentleness. He always spoke to the purpose. Although he never thundered like a prophet, you found yourself clinging to every syllable he utters, afraid of missing any of it. ... His moral character was almost physically apparent.”

We see in George Marshall a remarkable combination of social skills. One aspect of this combination is focused internally – a consciousness of his own emotions, understanding, and abilities – and the use of self-awareness to guide effective behaviors aimed at others. The other aspect of this combination is directed outwardly, an ability to discern the mood, temperament, motivations and intentions of others, and to incorporate these insights ... in ways that are responsive to their needs. Marshall used these skills to interact with those who worked for him, those who worked with him, and those for whom he worked. And, at all of these levels they were skills that contributed to the successful accomplishment of his purposes. From my perspective Marshall expressed exceptional skills in social cognition.

I want to address one final aspect of Marshall's cognitive ability, what contemporary cognitive scientists call “*executive functions*”. Executive functions describe a set of mental abilities that either control or regulate other cognitive behaviors. For example, executive processing is called on to initiate or inhibit certain behaviors, to perform goal-directed actions, to follow previously learned rules, to monitor the consequences of a task, and to think abstractly. As implied by the term, executive functions are higher-level abilities that influence other cognitive skills such as attention, learning, memory, and interpersonal skills. Most investigators agree that the frontal lobes, and the prefrontal cortex in particular play the central role in these executive functions. (40)

George Marshall said this in recalling his VMI experiences to Pogue: “What I learned at VMI ... was self-control, discipline, so that it was ground in. (41) What Marshall saw at

VMI was externally imposed [discipline] aimed at securing obedience. What he practiced was self-imposed discipline, based on force of habit of mind and respect rather than on fear. (42) He encouraged others to develop and use self-discipline and he thereby learned to exercise authority without creating resentment.

Marshall's day began early with a horseback ride, whenever possible. His workday typically started at 7:30AM with intense morning and afternoon schedules. However, it was his habit to go home for lunch with his wife and to take a short nap. He left the office at 5PM sharp to have dinner with his wife and then he either read a book or took Katherine to a movie. He religiously divided work and off duty time because he always felt he could perform better with a fresh mind. He led a self controlled disciplined life. (43)

Marshall also was focused continuously on clarity and efficiency of communication. When he asked his staff for a report or a study, his instructions were clear and he wanted the report in one page, or two at most. If a memo or a report was to go out over his name he edited drafts with care to assure use of simple direct language that accurately projected his own thinking. When he testified before congress he was thoroughly briefed, but he spoke without notes because "he knew that the minute you began to read you lost your audience. It was better to forget something." (44) He always treated congress formally and with respect, and he always spoke the truth whether it was good news or bad. In frequent dealings with Presidents Roosevelt and Truman, Marshall said: "I never haggled with the president. I swallowed the little things so I could go to bat on the big ones." (45) Marshall's interactions with others reflected his disciplined approach to himself. His approach was an expression of "executive control" in the cognitive sense. Marshall lived, worked and interacted by a set of previously learned rules that guided his behavior in all spheres.

George Marshall was much more than just an effective leader; he was a very good public leader in the sense that his decisions and actions were grounded on ethical considerations. Furthermore, whether in the military or as a member of the president's team, these decisions and actions were always in service to the public's welfare. (46)

Ethical behavior is generally defined as pertaining to or dealing with principles of morality or with rules of right and wrong. Some of those rules are regarded as universal while others are unique to a particular culture. Regardless of whether they are universal or particular, much has been learned about the development of those rules in individuals, about the neuro-cognitive systems involved, and about the consequences of damage to regions of the brain responsible for moral cognition. Like other cognitive executive functions, the prefrontal cortex plays a critical role in mediating morality. And like self-discipline, moral reasoning (47) is a higher order function reflecting the influence of previously learned rules on other cognitive processes, including their initiation or inhibition.

In his book *Ethical Leadership* (48) Pops highlights Marshall's integrity, honesty and fairness, his professionalism, his loyalty to agreed-upon goals, and his acting within the

framework of our Constitution. Marshall's career was a model for ethical *public* leadership. In a separate book *Soldier Statesman Peacemaker* Uldrich summarized this consistent attribute in Marshall's own words; "Always [find] the moral courage to do the right thing." (49) In Marshall's case moral reasoning operated at the level of individuals, peer groups, country, and the larger society. Self-discipline and moral reasoning were two of the most obvious and outstanding examples of executive functions among Marshall's repertoire of cognitive skills.

Conclusion

Both George Marshall's life and his exceptional accomplishments have been the subject of noteworthy scholarship in the form of biographies, oral histories, books on leadership, monographs, and speeches. A Foundation in his name was created at Virginia Military Institute in 1953, at the urging of President Harry Truman, to celebrate Marshall's legacy, to perpetuate his leadership qualities, and to inspire and educate future leaders. The Foundation's museum, research library, conference facilities and staff offer a wide range of resources available to the general public to further those goals.

Whether or not my essay finds its way into the Foundation's Archives is not relevant to my purpose. My premise is that who Marshall was, what he accomplished, and how he did what he did were each expressions of how his brain worked. How his brain worked, in turn, was an expression of a remarkable portfolio of cognitive skills developed over time. He may even have been born with a unique potential to develop certain of those skills.

Much of excellent quality has been written about Marshall's attributes and his leadership style but at least from my perspective that scholarship has not benefited optimally, at least so far, from the insights provided by contemporary cognitive-neuroscience. Hence, this essay is an *invitation* to the Foundation to consider Marshall's unique abilities from the perspective of cognitive-neuroscience, and for such a consideration to benefit from the thinking of modern leaders in the field. Such considerations may add to our understanding of Marshall, and more importantly they could complement the Foundation's goal of using his legacy as a basis for inspiring and teaching future leaders. Thus, my purpose is to expand scholarship on Marshall with a relatively new approach; how we learn about how he learned, and how he became what he became.

Sources

1. Behrman G. *The Most Noble Adventure: The Marshall Plan and the Time When America Helped Save Europe*. New York, NY: Free Press; 2007.
2. Bland LI. *George C. Marshall Interviews and Reminiscences for Forest C. Pogue*. 3d ed. Lexington, KY: George C. Marshall Foundation; 1996. p ix.
3. Gardner H. *Leading Minds: An Anatomy of Leadership*. New York, NY: Basic Books; 1995.

4. Marshall GC. The Marshall Plan Speech. 1947.
http://www.marshallfoundation.org/library/doc_marshall_plan_speech.html.
5. Bransford JD, Brown AL, Cocking RR. How People Learn: Brain, Mind, Experience, and School. National Research Council; 1999.
http://www.nap.edu/openbook.php?record_id=6160
6. The Marshall Plan.
<http://www.marshallfoundation.org/TheMarshallPlan.htm>
7. Nelsen JT. General George C. Marshall: Strategic Leadership and The Challenges of Reconstituting the Army, 1939-41. 1993.
<http://www.strategicstudiesinstitute.army.mil/pdf/PUB358.pdf>
8. Tidwell, CT. George C. Marshall: Twentieth Century Patriot.
<http://www.marshallcenter.org/mcpublicweb/en/nav-mc-about-history/nav-mc-about-portrait-marshall/430-art-mc-about-george-marshall-portrait.html?showall=1>
9. Gardner JW. *On Leadership*. New York, NY: The Free Press; 1990. p 5.
10. Pogue F. *George C. Marshall: Education of a General*. New York, NY: Penguin Books; 1993. pp. 46-47.
11. Hambro CJ. The Nobel Peace Prize Presentation 1953.
http://nobelprize.org/nobel_prizes/peace/laureates/1953/press.html.
12. Fuster JM. Cortical Memory. 2007.
http://www.scholarpedia.org/article/Cortical_memory.
13. Kandel ER, Schwartz JH, Jessell TM. *Principles of Neuroscience*. 4th Ed. New York, NY: McGraw-Hill, Inc.; 2000.
14. Rakic P. Neocorticalism - Making New Cortical Maps. *Science* 2001; 294: 1011-1012.
15. Rakic, P. Radial Unit Hypothesis of Neocortical Expansion. Novartis Foundation, 2000 [cited February 16, 2003]. <http://gateway1.ma.ovid.com/ovidweb.cgi>.
16. Edelman GM. *Neural Darwinism: The Theory of Neuronal Group Selection*. New York, N.Y.: Basic Books, 1987.
17. Bressler SL. Understanding Cognition Through Large-Scale Cortical Networks Current Directions in Psychological Science 2002; 11: 58-61.

18. Purves D, Brannon EM, Cabeza R, et al. *Principles of Cognitive Neuroscience*. Sunderland, MA: Sinauer Associates, Inc.; 2008.
19. Bruner J. Constructivist Theory. 2001.
<http://tip.psychology.org/bruner.html>. "<http://tip.psychology.org/bruner.html>.
20. Neelon FA, Estes EH, Wallace, AG. *Learning to Learn: The Teaching Legacy of Eugene A. Stead, Jr., MD*. Durham, NC: Carolina Academic Press; 2010. In Press. p 9.
21. Brunnsford JD, et al. 1999. op.cit. pp 18-38.
22. Purves D, et al. 2008. op.cit. Chapter 23.
23. Executive Function. In: Encyclopedia of Mental Disorders.
<http://www.minddisorders.com/Del-Fi/Executive-function.html>.
24. Gardner H. *Frames of Mind: The Theory of Multiple Intelligences* 2nd Ed. New York, NY: Basic Books; 1993.
25. Bland LI. *George C. Marshall Interviews and Reminiscences for Forest C. Pogue*. In. 3d ed. Lexington, KY: George C. Marshall Foundation; 1996
26. Ibid. p 19.
27. Ibid. p 355.
28. Ibid. Forward by Walter LaFeber. p x. [LaFeber quotes Eric Severeid from: *American Scholar*; 60 (Summer 1991), p 466.]
29. Hambro CJ. 1953. op.cit.
30. Bland LI. 1996. op.cit. p 101.
31. Pogue FC. 1993. op.cit. p 23.
32. Bland LI. 1996. op.cit. p 95.
33. Marshall GC. Nobel Lecture: Essentials to Peace. 1953.
http://nobelprize.org/nobel_prizes/peace/laureates/1953/marshall-lecture.html
34. Halle LJ Jr. Quote from: McCullough D. *Truman*. Simon & Schuster; 1992. p 533.
35. Neustadt RE, May ER. *Thinking in Time: The Uses of History for Decision-Makers*. New York: Simon & Schuster, Inc.; 1986.

36. Brunsford JD. 1999. op.cit. pp 17-38.
37. Cosmides, L and Toobey J. The Cognitive Neuroscience of Social Reasoning. In Gazzaniga, MS (ed.). *The New Cognitive Neurosciences*. pp. 1259–1270. 2000.
38. Gardner H. 1993. op.cit. pp 237-276.
39. Pasco HM. General George C. Marshall and Vancouver: 1996 Marshall Lecture. <http://www.cityofvancouver.usmarshall.asp?menuid=10466&submenuid=10537&itemID16100lecture=16124>.
40. Purves D. et al. 2008. op.cit. Chapter VIII. [Principles of Executive Processing]
41. Pogue FC. 1993. op.cit. pp 46-47.
42. Marshall, GC. Speech at Trinity College Speech, 1941 : *The Papers of George Catlett Marshall*, ed. Larry I. Bland, Sharon Ritenour Stevens, and Clarence E. Wunderlin, Jr. Lexington, Va.: The George C. Marshall Foundation, 1981.
43. Pops GM. *Ethical Leadership in Turbulent Times: Modeling the Public Career Of George Marshall*. Lanham, MD: Lexington Books; 2009. pp 77-80.
44. Bland LI. 1996. op.cit. pp 355-356.
45. Brower, CF. George Marshall: A Study in Character. <http://virtualology.com/ussecretaryofstate/georgemarshall.org/>
46. Pops GM. 2009. op.cit. p 400.
47. Blair J, Marsh AA, Fringer E, Blair KS, Luo J. Neuro-cognitive Systems Involved in Morality. *Philosophical Explorations*. 2006; 9:13-27.
48. Pops GM. 2009. op.cit.
49. Uldrich J. *Soldier Statesman Peacemaker*. New York, NY: American Management Association; 1964.

