

Epilogue

War by numbers

A “technocratic hubristic fable”?’¹

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Abstract

This chapter discusses the idea that only quantitative data can help manage a war, explain its characteristics and dynamics, and predict its course. To this end we elaborate on the case of Robert McNamara, since his ‘technocratic’ statistical approach has guided the US war effort during the Vietnam War. In spite of the fact the US lost that war, the underlying idea has had a lasting influence that can be traced both to the conduct of contemporary wars, but also to the analysis of past wars. In the second section of the chapter we show that such approaches often disregard the complexity and imponderabilia of unique historical wartime contexts. We argue that for this reason the integration of quantitative-generalising and qualitative-historicising approaches is critical, whether aimed at understanding contemporary warfare or warfare in the past.

Keywords: Operations research; Qualitative approach; Qualitative approach; Data analysis; the McNamara fallacy

15.1. Introduction

In our data-obsessed cyber-age, it is easy to forget that the collection and use of data is hardly a new development. Since time immemorial, communities have counted livestock and bushels of grain, which were an indication of the chances of survival of that community, or at the very least implied the legitimacy of those in power. This applied to the military domain as well. The Mycenaeans of Bronze Age Greece, for instance, registered the number of available wheels and chariot frames, and allotted a corresponding number of horses to them so that they could be used in battle.² Series of baked clay tablets found in the ruins of Pylos list numbers of men available for service in the coast guard, and rowers to be sent to the city of Pleuron, just across the Gulf of Corinth.³ The collection of data for military intelligence can boast a long history too. Sun Tzu in his *Ping Fa* stressed the importance of intelligence for a military commander, while leaders such as Ottoman sultan

Süleyman the Magnificent (1494-1566) and Frederick II of Prussia (1712-1786) were avid consumers of intelligence, especially on their enemies' military capabilities.⁴

By the 19th century European governments for the first time had acquired the technological means and the modern bureaucracy to effectively control their territory. The French Revolution had stimulated a sense of urgency in managing popular sentiment. At the same time, the exact sciences made great strides, increasingly accurately predicting the occurrence of natural phenomena. These developments produced the idea that it would be possible to identify laws governing *human* development as well. Measuring, counting and applying statistical analysis in order to identify patterns and enable accurate predictions gradually became second nature to 'positivist' liberal and conservative elites.⁵ But even before that, in the military domain, theorists and practitioners like Jomini, and Von Bülow, were debating 'military systems' and applied mathematical logic to warfare.⁶ The organisation and implementation of conscription from the late 18th century onwards required keeping track of quantifiable indicators such as age, weight, height and level of education. After 1850 such numerical indicators increasingly underlay the planning of operations and campaigns, as in Moltke's campaigns against Austria and France in 1866 and 1870, respectively.⁷ Coal and steel production figures, the capacity of the railways, the potential of the logistics and meticulous calculations about the effectiveness of weapons became critical factors. Even studies in moral and psychological aspects of warfare were replete with measurement, quantification and calculations.⁸ As each of the Great Powers, with the possible exception of Britain, had reasons to strike at the earliest possible moment rather than postpone what was believed to be inevitable, it may likewise be argued that the decision to go to war in 1914 was to a large degree inspired by prognoses of the number of troops their opponents could field, the efficiency of troop transports by train and the exact amount of firepower.⁹

During the World Wars the quantifying approach was also applied to military operations and Operational Surveys and Operational Analysis soon came of age.¹⁰ Air Forces in particular were interested in hard data on the number of sorties, bombs dropped and their effects.¹¹ In this way, the contribution of the air force could be measured, adjusted, and, if necessary, justified. But they were hardly alone in this: the Battle of the Atlantic, that, ultimately, came down to enforcing a favourable ratio between the destruction of Allied tonnages of cargo or ships and the elimination of German submarines was also fought with statistics.¹² The same was true of course for the 'measurable' effects of the blockade of Japan and the ratio between Japanese and allied carriers, aircraft and pilots.¹³ In the Cold War, both nuclear and conventional strategies were underpinned by endless sets of data on combat ratios and calculations on possible future wear and tear of enemy and friendly troops.¹⁴ Its logic underlies both the peacetime and wartime direction of the military to this day.

While the importance of data for the conduct and the study of warfare can therefore not be denied, this chapter questions the idea that only quantitative data can help manage a war, explain its characteristics and dynamics, and predict its course. It is useful, necessary even, but there are a number of pitfalls involved. To highlight these, we elaborate on the case of Robert McNamara, since his 'technocratic' statistical approach has guided the US war effort during the Vietnam War. If there has been one person who has pushed the quantification method and its underlying idea that data can help predict the future, to extremes, it is McNamara. In spite of the fact the US lost that war, this idea has had a lasting influence that can be traced both to the conduct of contemporary wars, but also to the analysis of past wars. In the second section of the chapter we show that such approaches often disregard the complexity and *imponderabilia* of unique historical wartime contexts. We argue that for this reason the integration of quantitative-generalising and qualitative-historicising approaches is critical, whether aimed at understanding contemporary warfare or warfare in the past.

15.2. "Every quantitative measurement (...) shows that we are winning the war".¹⁵

A brilliant student of economics, statistics and management, in the months following the Japanese attack on Pearl Harbor Robert Strange McNamara (1916-2009) became involved in a US Army Air Forces program to teach their officers 'analytical approaches'.¹⁶ In the context of this program, 'analytical' was synonymous with the quantifying method. Over time, he transferred to the Statistical Control Team at the Pentagon that was dominated by statisticians and RAND economists who held that the military had thus far been virtually 'blind; they had hardly any idea about numbers, types and dislocation of aircraft and spare parts. These 'Whiz Kids' advocated data-driven decision making. McNamara and his colleagues mapped out the stocks, the numbers and location of spare parts and in so doing were able to make operations much more efficient and cost effective.¹⁷ He was subsequently made co-responsible for the analysis of the deployment of the US bombers in the Pacific Theatre and the B-29s in particular. McNamara now applied his mathematical and statistical approach to Operations Research and was able to improve both their effectiveness and efficiency.¹⁸

Returning to civilian life after the war, McNamara embarked on a career at the Ford car company, where he put his approach to good use. Developing a modern planning, organisation and management control system at Ford, integrating the crucial figures into trend graphs and using early computer modelling in decision making, he helped lay the foundation of an innovative and very influential management style.¹⁹

As Secretary of Defence in the Kennedy and Johnson Administrations, McNamara continued this approach. From the outset he demanded 'scientific' data from the armed forces about just about anything. McNamara advocated 'statistical rigor' among his officials and military personnel: each complex military problem was translated into numerical indicators and patterns on the basis of which he could make policy and strategic decisions. McNamara and his (civilian) staff used all kinds of numbers, paperwork and management tools for the *Planning, Programming and Budgeting System* (PPBS), the *Future Years Defense programs* (FYDP) and the *Draft Presidential Memorandum* (DPM), to analyse military conflicts, fund specific programs, cut budgets, as well as reorganise the ministry and military apparatus.²⁰

Figures were not only compiled for analysis which brought about an increase in efficiency, but they also served as a political weapon, for in the process McNamara reduced the military apparatus to a supplier of data to the *Systems Analysis Office* he had created, when it, and the Joint Chiefs of Staff in particular, had been decision makers before.²¹ As Sapolsky wrote: "Eisenhower fought political battles with his generals' stars; McNamara fought them with heaps of statistics."²²

These innovations in Department of Defence decision-making and its justification, the introduction of modern management methods in order to enhance efficiency and effectiveness, and the establishment of civilian control over the military apparatus, undeniably were of profound importance and they should be characterised as McNamara's lasting legacy.²³ In his conduct of the Vietnam War, McNamara applied this approach as well; its drawbacks were quick to emerge, however.²⁴

During his first visit to South-Vietnam, in May 1962, McNamara announced that "every quantitative measurement (...) shows that we are winning the war." His obsessive belief in graphs and charts was immediately exploited by South-Vietnamese leader Diem who presented him prefabricated graphs that only led to one conclusion: the war would soon be won indeed. At the end of 1962, McNamara entertained the thought of ordering the repatriation of the American advisors from South Vietnam, since his calculations indicated the war would certainly be won in 1964.²⁵ Nevertheless, already in December 1963, a still confident McNamara had to report to President Lyndon Johnson that 'the figures' that had been obtained probably did not correctly reflect reality: instead, the situation was "very disturbing" because "current trends" pointed to a possible Communist victory. He had to admit that earlier computer models and statistics were "grossly in error."²⁶

Fascinatingly, this admission did not lead him to question the quantitative approach to warfare itself. Wrong figures merely had to be replaced by correct ones. His belief in the fundamental soundness of his approach was unshattered and in 1967 while admitting that "not every conceivable complex human situation can be fully reduced to the lines on a graph", he stated that "not to quantify what can be quantified is only to be content with something less than the full range of reason."²⁷

Critics who expressed doubts about the quality of the South Vietnamese Army or warned about the corruption of the South Vietnamese regime, were swiftly and decisively brushed aside. They did not understand the numbers.²⁸

This line of reasoning was based on the so-called ‘systems analysis’. The point of departure for McNamara and his personal staff was that reality could be approached as a set of complex systems, and that these systems could best be understood by methodically quantifying and analysing their constituent components and their mutual coherence. Data from this complex world had to be “delineated, denoted, demarcated and quantified”, after which it became possible to understand, tame and transform the world according to one’s own will. By means of a rational analysis of the data, the world could be controlled and improved, or at least made more effective and efficient. The truth was in the data; not in reality.²⁹

Building on this line of thought data-driven analysis, planning and control was intensified during the Vietnam War. In fact, almost every aspect of the war was quantified: the tonnage of goods arriving or destroyed in ports in Vietnam, the number of ships intercepted, the movements on the Hồ Chí Minh Trail, the number of bombs on North Vietnam, the number of troops, the effects of brown-water operations, the percentage of land controlled by the US or the South Vietnamese Army, rice yields, population data, personnel damage assessments, etc. This obsession with data is one of the explanations for the escalation of the war, fixated as its ‘managing directors’ became on systematically increasing the number of GI’s, US firepower and the bombing of targets in North Vietnam. By 1968 over half a million US soldiers were fighting in Vietnam. If the number of GI’s multiplied, so would US firepower and this would ultimately tip the balance, or so the reasoning went. Likewise, in the same period operation Rolling Thunder, the continuous bombing of targets in North Vietnam, was significantly stepped up.

15.3. “If it’s dead and Vietnamese, it’s VC”: Body count as indicator of success

The focus on data also translated into the conviction that the number of Viet Minh and Viet Cong dead, either from the air, by maritime blockade or Search and Destroy Missions, somehow was an indication of progress. McNamara and US military commander General William Westmoreland’s military strategy had become a strategy of (measurable) attrition. The number of sorties or the tonnage of bombs dropped, and the ratio between one’s own casualty rate and that of the enemy in particular, became their most important indicator of progress and success.³⁰ This latter indicator, the so-called body count, was at the core of McNamara’s and Westmoreland’s minds.³¹ It soon became one of the most notorious manifestations of the quantitative approaches to war, as the unintended outcome of this focus was that killing rather than winning became central to the war effort.

But, as John Lewis Gaddis points out, “Statistics of enemies killed said (...) nothing about Vietnamese willingness to absorb those losses in pursuit of their political goal: expelling American troops and uniting the country under communist rule.”³² Not only did the figures not take into account the feelings of the Vietnamese population, their motives and motivation, the corruption of the South Vietnamese regime and its impact and consequences, the quality of the South Vietnamese troops, the morale of the GIs and the support of the home front, to name but a few relevant factors, but they were also largely unreliable. As a matter of fact, the figures were consistently inflated, in part because the measuring system ensured that civilians and enemy combatant were heaped together.³³ Worse still, indiscriminate violence in order to get the highest possible body count bred support for the VC and the North Vietnamese:³⁴

Victory was a high body count, defeat a low kill ratio, war a matter of arithmetic. The pressure on unit commanders to produce enemy corpses was intense, and they in turn communicated it to their troops. This led to such practices as counting civilians as Viet Cong. “If it’s dead and Vietnamese, it’s VC” was our rule of thumb in the bush. It is not surprising, therefore, that some men acquired a contempt for human life and predilection for taking it.³⁵

Nonetheless, McNamara’s stress on the statistical inevitability of the US victory became ever more outspoken and persistent. With the proper data, victory was in reach and all official indicators suggested that the US was winning the Vietnam War.³⁶ His obsession with data caused critics of his approach to see McNamara as a “human IBM machine” who cared more for computerised statistical logic than for human judgments.³⁷

However, in spite of his outward assurances to the contrary, in private McNamara gradually opened up to the possibility that US objectives were not feasible.³⁸ He had always paid special attention to Air Force data. In his view, the effects of Operation Rolling Thunder, for example, were easier to measure than those of land operations, but by the Summer of 1967 he had come to realise that destroying 80% of North Vietnam’s industry meant rather little, since that economy was only 1% dependent on industry. Two years of relentless bombing had caused about \$300 million in damage but it had cost \$900 million in bombers.³⁹ In addition, despite the ongoing aerial bombardment, the North Vietnamese were still able to send large numbers of people and equipment through the Hồ Chí Minh Trail to the South. In other words, the numbers had turned against McNamara. Testifying to the Senate Armed Forces Committee in August 1967, he had to admit that he lacked “any confidence that they (North Vietnam) can be bombed to the negotiating table.”⁴⁰

Fascinatingly, McNamara’s pessimism was buttressed by the same sort of statistics he had used to predict approaching victory earlier. His 1967 plea to Johnson to end the war – behind closed doors of course – was based on numbers and graphs

just like his earlier predictions of a swift victory had been. At the end of 1967, on his last working day, the overworked McNamara shouted at his colleagues: “This goddamned bombing campaign, it’s worth nothing, it’s done nothing, they dropped more bombs than on all of Europe in all of World War II and it hasn’t done a fucking thing!”⁴¹ Even his despair was substantiated with numbers!

The Secretary of Defence only once considered an alternative approach. This was several months before, when he had already become convinced the war effort was in great trouble. McNamara then commissioned a major investigation into the way the US had become involved in Vietnam; an effort that can only be characterised as qualitative *historical* research. Tellingly, its gloomy conclusions were rated *top secret / sensitive* and shelved in some deep Pentagon drawer. The report stayed there until 1971 when it was leaked to the *New York Times* and became known as the *Pentagon Papers*.⁴²

15.4. “What can’t be easily measured really doesn’t exist.” The ‘McNamara fallacy’

Sociologist Daniel Yankelovich was probably the first to term McNamara’s obsession with numbers, graphs and models to study and control a complex phenomenon such as warfare, ‘the McNamara fallacy’. He summarised it as follows:

*The first step is to measure whatever can be easily measured. This is ok as far as it goes. The second step is to disregard that which can’t be easily measured or to give it an arbitrary quantitative value. This is artificial and misleading. The third step is to presume that what can’t be measured easily really isn’t important. This is blindness. The fourth step is to say what can’t be easily measured really doesn’t exist. This is suicide.*⁴³

The McNamara fallacy can be characterised as a tunnel vision. Experts on the Vietnam War and on statistical or quantitative management methods have highlighted additional methodological problems.⁴⁴ Kenneth Cukier and Viktor Mayer-Schönberger for example stress the poor quality of the data McNamara and his team used. The data failed to “capture what it purports to quantify”, or was “used to frame desirable outcomes.”⁴⁵ Jonathan Salem Baskin shows that McNamara and his team

*spent over a decade looking within their model for revelations about underlying reality, and saw metrics that reaffirmed their hypothesis, while frequent and often loud external data points [that] challenged it were ignored.*⁴⁶

Matthew Fay argues the approach itself was flawed because for military organisations it is hardly ever possible “to judge competing approaches in terms of their efficiency” in producing “output”. What is more, McNamara’s econometric approach failed to get to grips with the political aspects of the war. Not everything that he deemed measurable could actually be measured and when it could, he failed to see that the usefulness to do so depended on “recognising the real issues at stake”, the real issues ultimately being political choices. In Fay’s words, “Economics is a useful tool. But the essence of national defense is still political”.⁴⁷ These critics also point out that McNamara and his staff assumed that the adversary reasoned along the same mathematical and apparently rational lines as they themselves did. This ‘mirror imaging’ was obviously a major miscalculation.

McNamara’s former military subordinates felt the same way. After the war Brigadier General Douglas Kinnard opened the cesspool in his book *The War Managers*. In response to a questionnaire that he prepared, most of the top brass dismissed the tactics to win the war as ill-conceived: “The U.S. was committed to a military solution, without firm military objective – the policy was attrition – killing VC – this offered no solution – it was senseless.” Sixty-seven percent of the generals that had served in the Vietnam War filled in Kinnard’s form and the great majority was utterly dismissive of the disproportionate quantification of the war, and the body count in particular. In fact, only two percent of the respondents indicated they considered the body count a valid means to measure progress. The great majority responded that figures had been grossly inflated and that the model itself was nonsensical.⁴⁸

There is ample evidence that lower ranked officers subscribed to this assessment.⁴⁹ Not only did the quantitative approach stimulate extensive fraud, it also fully disregarded the human dimension, Vietnam’s social fabric and cultural-historical background, and the devastating effect of the South Vietnamese regime’s political incompetence and corruption.⁵⁰ Worse still, McNamara’s fixation on the body count was counterproductive because it engendered more resistance than it helped to suppress.⁵¹

15.5. “Combat Power = force strength x variables”?

The Vietnam experience could have led to discrediting the quantifying approach. But this did not happen. In a sense this approach was reinvigorated by Colonel Trevor N. Dupuy (1916-1995), US Army, who in the 1970s and 1980s wrote a number of books on the subject. Dupuy was convinced that studying past wars was crucial in preparation for future ones. By the end of the 1970s, he had developed a radically quantitative method to compute combat power. From a study of German and Allied

troops in the Second World War he concluded that the Germans had been better soldiers than the Americans and he could provide 'hard evidence' to prove it.⁵²

His analysis was based on a natural-science-like method that he had developed and which he called the *Quantified Judgment Model*.⁵³ This, he claimed could objectively determine the combat strengths of units and individuals. By attributing fixed figures to weapons and weapons systems and units and correcting them for what he termed 'variables' such as weather, terrain, etcetera, he was able to determine a so-called 'Score Effectiveness'. He even identified scientifically verifiable patterns that provided lessons from the past that could be applied in future wars. Dupuy's formula ran like this:

$$SE(f) = \frac{\sqrt{Case(e)}}{0.001 \times S(f) \times V(f) \times U(f)}$$

in which SE(f) stood for 'Score Effectiveness', Case(e) for 'the number of casualties inflicted on the enemy'; S(f) for 'friendly force strength'; V(f) for 'friendly force vulnerability factor'; and U(F) for the friendly posture factor. In principle, these were all easy to measure, Dupuy argued. In fact, his model promised an accuracy of up to two decimal places.

Dupuy's conclusions were criticised by John Sloan Brown of the Department of History of the United States Military Academy, West Point.⁵⁴ Dupuy's case selection was flawed, according to Brown, as he had selected cases that saw the Americans attacking and Germans defending. In addition, he had compared the best German troops, Panzer units, with average regular US army infantry. Furthermore, he did not take into account all kinds of factors that were also critical around 1944 such as the staggering lack of manpower on the German side, and logistics and strategical errors. Some of these factors, notably morale, motivation and the fog of war were also very difficult to quantify, to say the least. Brown argued that in Dupuy's simplified formula, *Combat Power = Force Strength x variables*, it was precisely these variables that determined the outcome. However, Dupuy presented these variables as a minor component. Brown reasoned that he could have reached the opposite conclusion with the same set of data, i.e., that the American soldiers were better fighters than the Germans and concluded that the model 'implied a precision its subject does not warrant'.⁵⁵

These were the opening salvos of what became known as the Dupuy-Brown Controversy. Unfortunately, Dupuy was not willing to engage Brown's criticisms, for in subsequent pieces he merely reiterated his claims and stressed that his model had been peer reviewed. Eventually, Brown was overawed and retracted some of his criticisms: the model itself was correct, he only had intended to question the *score effectiveness*. This outcome was unfortunate, because Brown's initial critique that Dupuy's formula multiplied arbitrary quantifications by non-quantifiable

elements and that he ignored or downplayed the impact of factors that were hard to quantify or not quantifiable at all, was a warning that should have been heeded.

Instead, Dupuy's clinical numerical approach, like McNamara's before him, has remained attractive: we saw its logic repeated in military operations in the 1990s (the Kosovo War), and 2000s (Iraq and Afghanistan). In a sense, it promises a tidy and manageable model of warfare in which pawns can be moved at will to achieve a certain guaranteed effect. However, especially at the tactical level it would be utterly misleading to think that war is about moving pawns or about dots and arrows of the kind strategists and policy makers like to place on maps. But even at the strategic or policy level it would be wise to keep in mind that no matter how much data you collect, you only win when the opponent concedes defeat; war is an unpredictable clash of wills, and a dirty and chaotic one at that.

In spite of this, time and again claims are made to the contrary. A recent example is Ingo Piepers' PhD dissertation *Dynamics and Development of the International System: A Complexity Perspective*.⁵⁶ Piepers argued that the history of 'the international system' is best explained by applying the second law of thermodynamics. In the natural world, the build-up of pressure causes a phase transition, like ice that is heated will melt. The international system behaves in the same way, according to Piepers; for transitions to materialise a 'systemic war' is necessary. This will lead to a new system that will then function for a while until the inherent build-up of tensions inevitably leads to a new systemic war that will cause a transition to a new order. On the basis of what he perceived as historical trends in system-changes, Piepers identified four 'systemic wars', i.e., the Thirty Years' War (1618–1648), the French Revolutionary and Napoleonic Wars (1792–1815), the First World War (1914–1918), and the Second World War (1939–1945) and went on to predict the outbreak of a new one in 2020.⁵⁷

A number of methodological flaws should be pointed out. A large-scale war, the Seven Year's War (1756–1763) was fought on at least three continents and involved all great powers and numerous smaller ones. It is treated as an anomaly, while the fact that the 'system' returned in more or less the same shape should have caused Piepers and his academic supervisors to rethink the model, as should the fact that the model dictated the treatment of post-World War II Europe as a single entity, when, in reality it was divided into two dynamic blocs with a number of states being members of neither. Secondly, it is far from obvious that the behaviour and interaction between human beings (which is what politics is about) is guided by laws derived from physics. Thirdly, Pieper's conclusions about the dynamics of inter-state interaction are built on rather modest evidence. Pieper's central premise that wars occur in fixed cycles was not (and could not be) substantiated if only because none of the central concepts such as 'international order', 'tensions', and even 'systemic war', was properly defined. While it no doubt is true that war breeds

war, there is no simple connection between them and the development of the international system. To think otherwise is to ignore the complexity of the interplay of a very large number of variables, several of which cannot be quantified at all. Even in a simulator the outcome is never the same. Lastly, variables do not carry inherent numerical value or meaning. It is people that attribute meaning and act upon this attribution. Early 20th Century German demographics and steel production worried the French not because their numerical value was bigger than France's, or because both states were part of an inherently unstable system that was bound to invite a systemic war, but because they were Germany's. In 1871 France had lost territory to Germany and the only way to reclaim it was to defeat Germany. Morale was believed to compensate for numbers, hence the focus on the offensive spirit that nearly spelled the end for France in its opening campaign in 1914.

15.6. Statistics and the historical approach: a reappraisal

At this point, the reader might be tempted to infer that we propose to anathematise the quantitative approach. This would be premature. A modern army cannot do without data and figures; the complexities of the battlefield, logistics, and joint and combined operations simply require a metric approach. Likewise, at the operational and tactical levels, concepts such as the *Effects Based Approach to Operations* with its focus on clear objectives and achievable goals, demand an array of quantitative indicators that possess a certain predictive power. In addition, the political and strategic levels often require such figures to be able to justify (or 'sell') a certain course of action. Figures serve their purpose in establishing a measure of cost-effectiveness in the peace-time management of the armed forces. In short, many aspects and facets of war and warfare actually lend themselves very well to this approach.

But – and this is key – the quantitative and the qualitative approaches ought to benefit from one another, as transpires from the study of *past* wars. The historiography of warfare has long been dominated by the descriptive, so-called 'Rankean' tradition. In this tradition, there was a focus on *national* history, and on 'great captains'. It was characterised by a strong emphasis on what is historically unique and specific of the time and the place. From the 1950s however, a number of academic counter-movements gained steam among historians. Several of these made ample use of quantitative analysis. Their aim was not to glorify individuals and provide anecdotal evidence of illustrious battles, but to 'scientifically' discern historical patterns and laws. Since then, it has been shown many times that a 'hard', data-driven, quantitative approach and a more historical-interpretative approach to the military and to the field of military history are not mutually exclusive. On the contrary, they are quite compatible, and it could be argued that the one cannot do without the other.

Examples include Addington's *The Blitzkrieg Era and the German General Staff, 1865-1941*, and Van Creveld's *Fighting Power: German and U.S. Army Performance 1939-1945*.⁵⁸ Another great example is offered by Richard Overy's studies on the history of *Airpower*.⁵⁹ Overy frequently used quantitative methods, processing the numbers of aircraft, sorties, bombings, losses and effects measurements. But he did not squeeze the numbers into a formula or model or let them speak 'for themselves'. For example, the fact that virtually every city in Germany during the Second World War was reduced to ashes might justify the conclusion that the allied strategic offensive mathematically speaking had been effective. But Overy concluded that precisely because of this wanton destruction the main goal of breaking the morale of the German population had not been achieved. At the same time, he pointed to many unexpected and unintended but crucial effects of the bombing campaigns, such as refugee flows, disruption of logistics networks, etc. He elaborated on this again in *Why the Allies Won*.⁶⁰ The three-volume *Military Effectiveness*, edited by Alan Millet and Williamson Murray, is exemplary as well. Like Dupuy, they emphasised studying combat, but unlike him, they included unique contexts and paid due attention not only to firepower, but also to the political domain, the strategic setting, the operational level and tactics. In fact, the most fascinating insights in their study on *military effectiveness* arose from the interaction between the two domains and the two different methods used. In other words, the combination of quantitative and qualitative analysis led to a better understanding.⁶¹

This is not only true in academia. During the Second World War for instance, it was noted that planes that returned from bombing missions over Europe had similar patterns of damage. Quantitative analysis suggested that it was wise to reinforce those parts, but to little effect. It took considerable time before anyone dared suggest that the planes that displayed this particular pattern were the ones that had made it back to the United Kingdom; there were no returning planes with different hit patterns, because these had been downed by enemy fire. It was only when the Allies, rather counterintuitively, started reinforcing the parts that had initially seemed protected enough that their losses were reduced.⁶²

15.7 Conclusion: "Numbers don't talk. People do."⁶³

*Earlier theorists aimed to equip the conduct of war with principles, rules, or even systems, and thus considered only factors that could be mathematically calculated (e.g., numerical superiority; supply; the base; interior lines). All these attempts are objectionable, however, because they aim at fixed values. In war everything is uncertain and variable, intertwined with psychological forces and effects, and the product of a continuous interaction of opposites.*⁶⁴

Whether one studies McNamara's obsession with data to understand and manage war effectively and efficiently, or critically examines past scientific research into combat power, it becomes clear 'the figures' in themselves do not provide an objective representation of (historical) reality. Rather, they form a set of pre-selected parameters that refer to partial aspects of the war situation. They must be made to speak. There is no clear self-evident correlation between the numerical representation of reality and that reality itself. A model is *not* reality and war is *not* a laboratory setup that you can use to make measurements. It is a complex and very chaotic whole, "intertwined with psychological forces and effect, and the product of a continuous interaction of opposites," as Clausewitz wrote.

Hopefully, this understanding will contribute to a certain restraint with regard to our present obsession with data, and to a realisation that the quantitative-generalising and qualitative-historicising approaches need each other. Both approaches have their strengths and weaknesses, which can be balanced only by recognising the necessary interaction of the two. The qualitative method can take into account complex variables that are difficult to measure, such as the motives of the actors involved and other *imponderabilia*. It can relate to time- and place-specific contexts. Its weakness though lies exactly in its focus on the unique and contextual, which makes comparison and generalisation often almost impossible. Whereas the quantitative approach may suggest pathways to success that do not exist in reality, the qualitative approach may easily degenerate into casual talk and anecdotal evidence.

Conversely, the mathematical, quantifying approach has obvious advantages, especially when it comes to data-driven modern warfare. You will have to measure, organise and model in order to properly interpret modern military planning, decision-making and actions. However, (methodological) problems arise when we limit ourselves to this approach; what should we do with the unmeasurable or the poorly measurable? What do the variables and data(sets) exactly say? There is obviously no such thing as 'pure data', especially when it comes to managing and understanding the complex phenomenon that is war(fare). After all, its collection reflects what *we* think important.⁶⁵ Worse still, data may "lure us to commit the sin of McNamara: to become so fixated on the data, and so obsessed with the power and promise it offers, that we fail to appreciate its inherent ability to mislead."⁶⁶ In short, data should not just be collected and modelled, they should be interpreted and contextualised. If, as Clausewitz wrote, war is like a chameleon that changes its colours all the time, we would do well to realise that when we come face to face with one, statistics alone are not enough to subdue the beast.

Notes

- ¹ The phrase 'a technocratic hubristic fable', a characterisation of Robert McNamara's obsession with data, was taken from Paul Hendrickson, *The Living and the Dead: Robert McNamara and Five Lives of a Lost War*. Sydney: Vintage, 2000, 356.
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- ³ Thomas Palaima, "Maritime Matters in the Linear B Tablets," *Thalassa: l'Égée Préhistorique et la Mer, Actes de la Troisième Rencontre Égéenne Internationale de l'Université de Liège*, ed. Robert Laffineur and Lucien Basch. Liège: Université de Liège, 1991, 273–310, at 308.
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