**War by numbers: another quantitative revolution[[1]](#endnote-1)**

**Introduction**

The Vietnam War, and its denouement, the fall of Saigon, was many things, but one, I will contend, was war by numbers. The American military in Vietnam based their strategies and campaigns in part on the collection and analysis of massive amounts of quantitative data. It was a war of big data before that term was coined. Necessarily, substantial use was made of that then recently invented machine par excellence of big data numerical calculation, the computer. IBM’s “Big Blue went to war” too (Felham 2012). Paul Edwards (1996, 144) maintains that the Vietnam War was the first to be fought on an “electronic battleground”. Von Clausewitz’s “fog of war” would lift, and the American military would see everything with perfect clarity from within their electronic “information panopticon” (Zuboff 1988, 349). How could America lose? But it did. In the end the numbers never added up.

The quantitative revolution in military affairs in Vietnam was pioneered by the US Secretary of Defense, Robert McNamara. John Kennedy appointed him to the post in 1961, saying he was the smartest man he knew. Barry Goldwater was not quite as complimentary, calling McNamara an “IBM machine with legs” (Braun 2009). Certainly he was besotted by numbers. Cukier and Mayer-Schönberger (2013) write that McNamara “could comprehend what was happening on the ground only by staring at a spreadsheet – at all those orderly rows and columns, calculations and charts” (see also, Toal 2000, 132).

McNamara remained Secretary of Defense under Lyndon Johnson finally resigning (in McNamara’s version), or being fired (in most everyone else’s version), in late November, 1967. During his tenure he sent to Vietnam more than a half million US troops of whom 30,000 were killed (Braun 2009). Tellingly, Oregon’s Senator William Morse called Vietnam, “McNamara’s War” – a label that McNamara “initially embraced” (Toal 2000, 130).

Interesting for this paper in that during this same period in America there were other quantitative revolutions occurring, including one in geography. While it is not clear that there was a direct causal relationship between the two, I will suggest in the conclusion that they were at least entangled.

**Robert S. McNamara**

McNamara attended Berkeley as an undergraduate. He said that “the defining moment” in his education, “a revelation,” was “to see math as a process of thought – a language which to express much …. of human activity” (McNamara 1996, 6). His motto became: “things you can count, you ought to count”. Revealingly he added, “loss of life is one” (McNamara 1996, 238). Certainly, during his time as Defense Secretary McNamara thought that there little within war that couldn’t be counted.

He held the same view during his earlier service in WWII at the US Army Air Force’s Statistical Control Division. In 1945 he was posted to Curtis (“Bombs Away”) LeMay’s XXI Bomber Command on the Mariana Islands. In Errol Morris’s (2003) documentary film, *The Fog of War*, McNamara says it was a statistical report he wrote demonstrating the inefficiency of American B-29 high-altitude bombing of Japan that led LeMay to change strategy. From March, 1945, LeMay ordered his B-29s to firebomb at low-altitude Japanese industrial cities beginning with Tokyo. In turn, that produced many other numbers for McNamara to count. For Tokyo alone: 1,665 tons of incendiary explosives (“bombs of jellied gasoline”); 16 square miles of destruction; 83,793 Japanese civilians dead, 40,918 injured; and a million people homeless (Searle 2002, 103). In an interview with Gerard Toal (2000, 132-34) in October, 2000, McNamara said that during the same WWII period he began to practice “reflexive modernism,” that is, recognising that modernist methods like quantitative techniques produced unintended detrimental consequences. It makes his culpability seem even worse.

After the War ended McNamara turned to counting cars for Henry Ford II although he said at first he “couldn’t tell the difference between a nuclear warhead and a station wagon” (Weiner 2009). He must have figured it out. By applying statistical control theory to Ford’s operations, he and the so-called other “Whizz Kids” increasingly won back market share for Ford. In late summer 1960 he became President of Ford Motors. Seven weeks later, though, he got the call from Robert Kennedy. A few days after that he was at an impromptu Georgetown news conference standing next to the President-elect who introduced him as the new US Secretary of Defence.

McNamara took office in January, 1961, and, according to Thomas Lippman (2009), “he shook all five floors of the Pentagon”. There was a “McNamara revolution” (Hollis 2008, iii). Decision making in the US military would no longer be based on hunch and intuition, but on “the latest scientific methods,” drawing on “accurate, timely, and detailed quantitative data and analysis” (Hollis 2008, v). Moreover, as at Ford, McNamara was assisted and egged on by yet more Whizz Kids.

For McNamara measurement was key. As he explained: “I insisted we try to measure progress … [I]t is not enough to conceive of an objective and a plan to carry it out; you must monitor the plan…. So we measured targets destroyed, the traffic down the Ho Chi Minh trail, the number of activities, the weapons seized, the enemy body count, and so on” (McNamara 1996, 237-38)

**The Hamlet Evaluation System and Operation Igloo White.**

With the Gulf of Tonkin incidents, August, 1964, and which produced facts that were far from measurable (indeed, they may not have been facts), American involvement in Vietnam escalated. As it did, with McNamara as Defense Secretary, it became increasingly war by numbers. Let me provide two illustrations.

The first is the Hamlet Evaluation System (HES) (Tyner 2009; Belcher forthcoming). In 1966, to establish in McNamara’s terms “progress” in rural pacification, 244 US military advisors along with their South Vietnamese Army counterparts were dispatched to survey 12,500 hamlets to quantify their degree of security. There were eighteen indicators to check on the “Hamlet Evaluation Worksheet,” each of which was marked on a five point scale. Grade A was given to hamlets with the lowest security risk, E to the highest. The survey information was then transferred to computer punch cards, and analysed on an IBM 360 brought to Saigon by the US military. That machine was cutting-edge, with 8 Megabytes of internal memory, and a line printer (an IBM 1403) that at 1100 lines per minute delivered up to 1400 lbs of paper printout daily (Felham 2012, ch. 4; Belcher forthcoming, p. 3).

Using SYMAP, the computer mapping technique developed at Howard Fisher’s Harvard Lab for Computer Graphics, associated maps were produced that seemingly provided a God’s eye view of the Vietnamese countryside. Belcher (forthcoming, p. 13) writes that these maps “turn[ed] Vietnamese hamlets into objects that could be grasped through objective representation”. Nonetheless, as Belcher also shows, there remained considerable “data anxieties”. Commanders drowned in numbers, creating what Martin van Creveld (1985, 241) called, “information pathologies”. While an IBM machine with legs might keep up, no normal human being could.

Operation Igloo White is the second illustration. It began in 1966 as an attempt by the American military to collect data on North Vietnamese troop and supply movements along the Ho Chi Minh Trail. Through centralized computerization the Operation responded in real time to information gathered, producing potentially deadly consequences. Andrew Cockburn (2015, ch. 2) suggests that Igloo White was an early example of what he calls a “high-tech assassin” that culminated in drone warfare.

A large amount of supplies and troops moved from the North to the South during the Vietnam War along a 3,000 km network of “highway” routes, the Ho Chi Minh Tail. Because of a thick tropical rainforest canopy those movements were frequently hidden from US aerial surveillance, and undetectable using even specialized optical devices or ground radar. In 1966, and in line with the McNamara revolution, Operation White Igloo was hatched to disrupt those movements. Battery-powered sensors disguised as twigs, plants, and animal faeces, and which could register sound, seismic movement, body heat, and even the scent of human urine, were dropped along the Ho Chi Minh by specially equipped US aircraft. The sensors then transmitted data back to one of four “Batcat” aircraft fitted with racks of transreceivers flying overhead. In turn, that data was sent in real time to two IBM 360 computers at the Infiltration Surveillance Center command base in Nankon Phanom, Thailand. They transformed incoming data into moving “white worms” superimposed on to a projected map grid (Edwards 1996, 3). The computers then co-ordinated the subsequent air strikes by Phantom F-4 jets, guided them to the right grid co-ordinates, and triggered the release of their bombs.

Igloo White cost over a billion dollars. The US military claimed 90% of traffic moving down the trail was destroyed. The North Vietnamese, in contrast, said using various simple decoys, much of its supplies and troops still got through. For my purposes, more interesting than who is right, is the changed form of the War at least on the American side as it became a conflict fought by numbers coded electronically in binary form. It was the next stage in McNamara’s quantitative revolution.

**Conclusion**

There were quantitative revolutions elsewhere, of course, including from the early 1960s within the discipline of geography. Rather than Whizz Kids there were “Space Cadets”, with young geography graduate students and Assistant Professors sifting through large amounts of numerical data, shackled to state-of-the-art calculating machines housed usually in one campus basement or another (Barnes 2008). In alluding to this symmetry, I am not suggesting a direct, simple causal connection. Any linkage is knotty and involved, another example of “mangling” in which military and academic knowledge is entangled (Barnes 2008). Interesting here also is that by the late 1960s McNamara began to lose faith in his own project. War was too complicated to be treated only as numbers. It was “an imperfect, untidy world”, skewered by moral judgment that lay outside the confines of arithmetical calculation (McNamara 1996, 323). A similar realisation about complexity and ethical responsibility led human geographers also to question their own quantitative revolution.

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