Excerpts from Triumph and Tragedy: The Evolution and Legacy of 20th Century War Machines

The principal story told here is how they came to exist at all. These imposing machines were, perhaps, the inevitable products of agricultural and industrial revolution, competition among industrialized nations in the face of limited natural resources, and the lust for power. No doubt the extent of their deadly harvest was aggravated by a lagging understanding of the full potential of modern industrialized warfare. In succeeding chapters we will trace the developments that transformed feudal communities into modern industrialized states, the emergence of huge private armament companies to fuel the tragedy, and the mechanisms that governments evolved in mobilizing these resources to fight world wars. We will show how these factors combined to create the most awesome war machines the world had ever seen or experienced, enabling the bloodiest century in the history of humankind. Our focus in this book is on conventional weapons; the reader is encouraged to see my previous books on the Manhattan Project to build the atomic bomb, ***The Neutron's Long Shadow***, and on the development and deployment of nuclear weapons during the Cold War, ***Weapons of Mass Destruction***. In the latter book I argued that the apocalyptic nuclear confrontation that occurred in the Cold War could only be understood in light of the existential experiences that its key leaders had endured in the Second World War. In this book I maintain that the intensity and deadliness of wars of the twentieth century can only be understood in light of the war-making patterns that were set in the First World War. Accordingly, the present narrative places its heaviest emphasis on the developing paradigm of total war that unfolded in WWI.

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So far in our narrative it has been established that improvements in agriculture in Britain meant fewer people were needed to produce food. The rise of capitalism and science together stimulated invention. Inventions were exploited by mines and factories, which in turn provided work for the displaced farm workers. Fortunate as they were to have alternative employment, their living and working conditions worsened as they crowded into squalid cities. For some it was much worse—slavery was an old practice but the industrial revolution in textiles gave it new impetus. The inventions of the spinning jenny in 1764, the water frame for making yarn in 1769, the spinning mule in 1779, and the cotton gin in 1793 mushroomed the demand for cotton in the British textile industry. This in turn boosted the slave trade from Africa to the New World where the cotton was grown. The law of unintended consequences had sneaked into the maelstrom of change, and those individuals swept up into the slave trade would pay the price, all with their freedom and many with their lives. The explosion of knowledge, and more importantly mindset, over the three and a half centuries prior to the twentieth was indeed revolutionary if marked by fits and starts. Its suddenness relative to millennia of comparatively static thought is remarkable, and at the end of the nineteenth century, the Fin de Siècle, the acceleration of change so characteristic of the modern era was having an effect on the psychological stability of society and culture.

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In music Igor Stravinsky's 1913 ballet, *Le Sacre du Printemps* (*The Rite of Spring*), well expressed the social chaos brought about by the industrial revolution and hauntingly presaged the tragic and pointless debacles that were to commence the very next year. *The Rite of Spring* in music and dance tells the story of a pagan Russian ritual, celebrating the renewal of spring, in which a young maiden is chosen to dance herself to death in a sacrifice sanctified by the elders. Having previously electrified Parisians with his musically and choreographically innovative *Firebird* (1910) and *Petrushka* (1911) ballets, there was high anticipation over the newest work. Advance publicity stoked interest to the point that ticket prices doubled. However, this time the assault against convention was too much for the times; hoots and jeers nearly drowned out the performance, which went on despite the pandemonium. The shock of the new against the sensibilities of the old had aroused anger—and not for the last time.

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The 20th century would see every conceivable canon transgressed in an orgiastic frenzy of creative expression and innovation. In every field of thought, the tempestuous swirl of new ideas, some brilliant some half-baked, engulfed the human mind of the late nineteenth and early twentieth centuries. The disruption of the old economic, social, and cultural orders was now virtually complete. What remained was political convulsion.

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When Europe awoke from the nightmare of the Great War, the age of monarchy and imperialism was over. The German Empire, the Austro-Hungarian Empire, the Russian Empire, and the Ottoman Empire had all fallen. Over the course of the century the far-flung colonies would all assert their independence, mostly by force of arms, spawning

countless sectarian conflicts in the process with some still playing out today. But the appalling death toll did not put an end to the suffering. The wounded men of all nations were to be a legacy of war which ended only with their deaths, or with the deaths of those who had lived with them and guarded their broken bodies or minds, or both. Some eight million men were left physically invalided in the wake of the war with another estimated million men psychologically crippled. There were other legacies of consequence. The ruined landscape of northern France and Belgium today still harbors an estimated 300 million unexploded shells filled with high explosives, shrapnel, and various poison gases. In France two million acres of deadly ground is still officially sequestered. Germany experienced a debilitating hyperinflation following the war in the early 1920s. At its worst a dollar traded for more than 4 trillion German marks. Workers would be paid several times a day as the value of the currency changed by the minute. This crisis was followed by the worldwide depression of the 1930s. Through all this chaos, a corporal from the German trenches of France, Adolf Hitler, found fertile ground for his political movement to restore Germany's prestige. From the moment of his appointment as Chancellor in January 1933, preparations by Germany for the next war began—in violation of the Versailles Treaty.

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The twentieth century was both the brightest period in the evolutionary journey of humankind and the darkest. Heir to three centuries of discovery of what the mind can do, humanity used that growing awareness to virtually end the timeless cycles of famine and epidemics of disease; to engineer a walk on the moon; to discover that solid matter is overwhelmingly empty space; to discover that our enormous life-giving sun is but one star out of billions in our galaxy, a galaxy that itself is only one of billions of other galaxies each having billions of stars. The wondrous new powers were used to chart the history of the universe from the tiniest fraction of a second when it was an unfathomable cauldron of light, electrons, and neutrinos, to its distant future of cold, lifeless darkness; and to infer that all the visible matter in the universe with which we are familiar is dwarfed by twenty-five times as much virtually undetectable dark matter and dark energy. These are stunningly magnificent accomplishments. And yet, these same miraculous gifts were placed in the service of chauvinistic ambitions that twice plunged the world into paroxysms of death and destruction on unprecedented scales. This is the great mystery of human existence: its agony and its ecstasy.