

Chapter 2

Electrochemistry in a Divided World: The Political Background

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The “Cold War” was a state of extreme military tension that arose after 1945 between the Western Powers (principally the United States and its NATO allies) and the Eastern Bloc (principally the USSR and its Warsaw Pact allies). The tension emerged at the end of the Second World War, as the United States began to reform the global economic system, while the USSR began to consolidate its political and military control over Eastern Europe. The Cold War split the fragile wartime alliance against Nazi Germany, leaving the United States and the USSR as two opposing “superpowers” with divergent political and ideological interests: the former being a multiparty capitalist state and the latter being a single-party Marxist–Leninist state. Among the prewar powers, Germany itself was demilitarized and partitioned, while France and the British Empire were financially ruined.

The origins of the Cold War can be traced to the closing years of the First World War. As a result of the 1917 Bolshevik Revolution, Soviet Russia found itself isolated from international diplomacy. Its first Head of Government, Vladimir Il’ich Ul’yanov (Lenin), worked hard to overcome this isolation, and by late 1924, the USSR had secured the political recognition of all the world’s major governments except the United States. Nevertheless, Lenin remained philosophically opposed to the world capitalist system and called on workers around the world to organize themselves into communist parties to overthrow capitalism. This call was widely answered in the colonial world, even though communism was far from secure inside Russia itself. After Lenin’s death in 1924, his successor Iosif Vissarionovich Dzhugashvili (Stalin) brutally eliminated all internal opposition in Russia. Although it cannot be denied that Stalin successfully increased industrial output, his forced collectivization of agriculture cost millions of lives. During the

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Great Terror of the 1930s, his purges of supposed “enemies of the state” resulted in the torture and execution of innumerable innocent people and the transfer of millions into the gulag system of forced labor. The historical triumph of Stalinism cast a dark shadow across Europe, which, with its improving communications, should have been moving towards a second enlightenment.

The Second World War from 1939 to 1945 drew in all of the great powers and led to the creation of two unstable military alliances: the Allies and the Axis. The Allies included the Soviet Union, the United States, and the United Kingdom, whereas the Axis included Germany, Japan, and Italy. It was the most destructive war in history, with the participants focusing their entire economic, industrial, and scientific capabilities behind the war effort, erasing the distinction between civilian and military research. The war in Europe ended with the surrender of Nazi Germany on May 8, 1945, but, incredibly, the Japanese continued to fight on.

In early August 1945, the United States dropped two atomic bombs on Japan, destroying the cities of Hiroshima and Nagasaki. In Hiroshima, it was estimated that 45,000 people died on the first day and a further 19,000 during the subsequent 4 months. In Nagasaki, 22,000 people died on the first day and another 17,000 within 4 months. These remain the only use of nuclear weapons for warfare in history. The Japanese government finally surrendered on 15 August 1945.

The realization that the United States had nuclear weapons, and was willing to use them against civilian populations, profoundly shocked the Soviet Union. They immediately embarked on an urgent program to develop their own nuclear weapons. The Cold War had begun. Between 1946 and 1962, the Soviet Union conducted 221 atmospheric tests in Semipalatinsk (Kazakhstan) and Novaya Zemlya (Russian Federation). Meanwhile, the United States conducted 216 atmospheric tests, 106 of which were only 63 miles from Las Vegas! The fallout from these tests contained radioactive materials which were widely dispersed by the wind. As a result, millions of people across the northern hemisphere were exposed to radiation.

With the victory of the Communist side in the Chinese Civil War and the outbreak of the Korean War (1950–1953), political tensions between the USSR and the United States became acute. Competition was particularly fierce in Latin America, in Southeast Asia, in the Middle East, and in the rapidly decolonizing states of Africa. Meanwhile, the Hungarian counter-revolution of 1956 was halted by the intervention of Soviet tanks. The Cold War also sparked a series of dramatic political crises, such as the Suez Crisis (1956), the Berlin Crisis (1961), and the Cuban Missile Crisis (1962). Following this last crisis, a new phase began, with Russia and China moving apart inside the communist bloc and France and the United States moving apart inside the capitalist bloc. Meanwhile, the USSR crushed the 1968 “Prague Spring” liberalization program in Czechoslovakia, and the Vietnam War (1955–1975) ended with the defeat of the US-backed Republic of South Vietnam, prompting a reconsideration of U.S. foreign policy.

The Cold War had a huge effect on the development of science and technology in both the United States and the Soviet Union. Initially, atomic bombs were designed to be dropped by airplanes. However, their ease of interception soon led

to the development of Intercontinental Ballistic Missiles (ICBMs), which could travel through space at high speed before reentering the atmosphere above their targets. Because these missiles could not be recalled if launched by accident, their existence created great anxiety. As the number of nuclear weapons spiraled out of control during the 1950s, both sides found themselves wanting to maintain nuclear parity with the other, yet simultaneously alarmed at the pace of the arms race and the growing possibility of a nuclear holocaust.

At the human level, the scientific and industrial rivalry between the two superpowers compelled both sides to restrict the employment and travel of their leading scientists. Stalin was willing to imprison scientists who were ideologically suspect or non-performing; meanwhile, the United States was gripped by a series of “red scares,” in which it was thought that communist subversives were poisoning the minds of America’s youth. On both sides, dissent from Cold War orthodoxy led to rapid dismissal (in the Soviet Union, much worse). Adding to the overall sense of paranoia, data interception and espionage became commonplace tools of the intelligence services.

For 20 years, vast sums of money were spent on uranium processing, atom bomb tests, nuclear submarine programs, satellite development, and ICBMs, with little or no regard for the cost to civil society or the damage to the environment. Despite all this military hardware, the resolution of the Cold War was, ironically, brought about by a change in the western economy, from old-style acquisitive capitalism, with its focus on property and class, to modern Keynesian capitalism, with its focus on infrastructure development and rapid circulation of capital. This led to an unprecedented rise in the standard of living of most Western countries, which the Soviet Union was unable to match.

By the 1970s, both sides were militarily fatigued and sought to reach a political accommodation. A period of *détente* followed, in which Strategic Arms Limitation Talks took place, and the US opened diplomatic relations with the People’s Republic of China. Unfortunately, *détente* collapsed at the end of the decade following the Soviet invasion of Afghanistan.

The early 1980s saw a return to high tension, with the Soviet downing of Korean Air Lines Flight 007 (1983) and the provocative “Able Archer” NATO military exercises (1983). The United States boosted its military spending at a time when Soviet industry was suffering from profound structural problems. In an attempt to stave off economic collapse, the new Soviet leader Mikhail Gorbachev introduced the liberalizing reforms of *glasnost* (“transparency,” 1985) and *perestroika* (“reorganization,” 1987) and also ended Soviet involvement in Afghanistan. However, around this time, pressures from national independence movements were also emerging in Eastern Europe, causing further instability. In a remarkable change of long-term policy, Gorbachev refused to intervene. The result in 1989 was a wave of counter-revolutions that peacefully (with the exception of the Romanian Revolution) overthrew all of the Communist regimes of Central and Eastern Europe. On 9 November 1989, the East German government permitted its citizens to travel freely to the west. Throngs of East Germans immediately clambered over the “Berlin Wall.” These symbolic actions paved the way for German reunification,

which was formally announced on 3 October 1990. Soon afterwards, the Communist Party of the Soviet Union itself fell from power and was banned following an abortive coup attempt in August 1991. This in turn led to the formal dissolution of the USSR in December 1991 and the collapse of Communist regimes in other countries such as Mongolia, Cambodia, and South Yemen. The “Cold War” had ended.

Ironically, despite 45 years of confrontation, the West had few plans for dealing with the Soviet Union’s collapse, and there were no adequate political or military structures in place to accommodate the re-emerging countries of the Eastern Bloc. As a result, many of them have simply been absorbed into the existing structures of NATO and the EU, thus alienating Russia. At the time of writing (2015), a long-term settlement remains elusive.

Time line

- 1914 August: Outbreak of World War I.
- 1917 March: The Tsar’s government falls, replaced with a Provisional Government.
- 1917 April: Lenin returns to Russia from exile in Switzerland.
- 1917 November: Bolsheviks overthrow Provisional Government, seize power.
- 1917–1922: Civil war in Russia. Trotsky organizes Red Army.
- 1922 December: Official founding of Union of Soviet Socialist Republics.
- 1922 April: Stalin appointed General Secretary of the Communist Party.
- 1924 January: Death of Lenin.
- 1924 December: Stalin publicly articulates his theory of “Socialism in One Country.”
- 1927 December: Stalin consolidates his power at the Fifteenth Party Congress.
- 1928 Beginning of the first Five-Year Plan.
- 1929 December: Collectivization begins.
- 1932–1933: Terrible famine across the Soviet Union; millions die.
- 1934 December: Beginning of “Great Terror,” which continues until 1938.
- 1937 June: Purge of the army; top generals tried and executed.
- 1939 August: Nazi–Soviet Pact is signed in Moscow.
- 1939 September: Outbreak of World War II.
- 1940 August: Trotsky assassinated, by Stalin’s agents, in Mexico City.
- 1941 June: Hitler invades the Soviet Union.
- 1942 August–February 1943: Battle of Stalingrad. Nazis are defeated, marking the turning point in the war.
- 1945 February: Stalin meets Roosevelt and Churchill at Yalta.
- 1945 April: Red Army controls most of Eastern Europe.
- 1945 August: The United States uses atomic bombs against Japan, ending the war in the Pacific.
- 1945–1991: The “Cold War.”
- 1946 March: Churchill makes “Iron Curtain” speech.
- 1948 February: Communists take power in Czechoslovakia, completing Soviet control of Eastern Europe.
- 1948 June (to May 1949): Soviet Union blockades West Berlin.
- 1949 April: Ten West European nations join the U.S. and Canada to form NATO.
- 1949 August: Soviet Union explodes its first atomic bomb.

1949 October: Mao Tse-tung founds the People's Republic of China (PRC).
1950 February: Sino-Soviet Treaty.
1950–1953: Korean War.
1953 March: Death of Stalin.
1953 June: Uprising in East Germany.
1955 May: Warsaw Pact formed.
1956 June: The Poznań protests in Poland.
1956 November: Red Army crushes the Hungarian Counter-revolution.
1957 October: Soviet Union launches Sputnik 1 (first man-made satellite).
1959 February: Fidel Castro becomes Premier of Cuba.
1959 September: First “Summit Meeting” (President Dwight Eisenhower and Premier Nikita Khrushchev).
1961 August: East Germany builds the Berlin Wall.
1962 October: Cuban Missile Crisis.
1964 October: China explodes its first atomic bomb.
1965 March: First U.S. combat troops land in South Vietnam.
1968 August: Red Army crushes Czech Uprising.
1972 February: U.S. President Richard Nixon visits China.
1975 April: Saigon falls to Communist forces.
1979 January: U.S. and China establish diplomatic relations.
1979 December: Soviet Union invades Afghanistan.
1980 August: Polish shipyard workers strike; first “Solidarity” Union formed.
1985 March: Mikhail Gorbachev becomes leader of the Soviet Union.
1989 September: “Solidarity” forms the first post-war non-communist government in Poland.
1989 December: End of Communist government in Czechoslovakia.
1990 May: Free parliamentary election in Hungary.
1989 November: East Germany allows unrestricted travel to West Germany.
1990 October: Reunification of Germany.
1991 June: The last Soviet troops leave Hungary.
1991 August: Communists stage unsuccessful coup against Mikhail Gorbachev.
1991 December: The Soviet Union is dissolved. Boris Yeltsin becomes President of the Russian Federation.
1994 September: The last Russian troops leave Germany.

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Innovations in Eastern Europe in the 20th Century

Scholz, F. (Ed.)

2015, XII, 471 p. 267 illus., 74 illus. in color., Hardcover

ISBN: 978-3-319-21220-3