

Did Ronald Reagan Destroy the Soviet Union?

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1. An Alternative Universe in Which Teddy Kennedy Was President

Newspaper editorial upon former president Edward Kennedy's death:

“Most political observers agree that the greatest legacy of Teddy Kennedy's tenure as President (1981-1989) was the demise of the Soviet Union. Paradoxically, at the start of his presidency, the strongest criticism leveled against him was that he was 'too soft' on communism. Leftist victories in El Salvador, Guatemala, and Angola reinforced this belief. Most historians now believe that these victories for allies of the Soviet Union sowed the seeds for their patron's eventual defeat. However, a view commonly expressed in the media is almost certainly not true. It is often said that the rising cost of financial aid to these new allies bankrupted the Soviet Union. In fact, while the USSR did expend the equivalent of several billion dollars in aid to these countries, this sum was only a small fraction of the Soviet GDP and could not have accounted for the USSR's economic decline.

“More likely, it was the general attitude of the Kennedy administration that gave the Soviet Union space for its reforms. The same attitude allowed military oligarchies in El Salvador and Guatemala to fall and rightist insurgencies in Nicaragua and Angola to wither. More importantly, America's tepid response to the Soviet arms buildup of the 1970s helped Soviet leader Mikhail Gorbachev convince more conservative members of the Politburo that they could risk reform. Even with the United States unwilling to embark on a major arms buildup, the Soviets realized that they did not have the resources to attain military dominance. Despite their numerical superiority in troops and missiles, no Soviet ruler wanted to risk nuclear annihilation with a direct military confrontation, such as an attack on Western Europe. Since neither country was interested in attacking the other, the rationale for large military expenditures was called into question. As the Soviet standard of living continued the decline begun in the 1970s, it was increasingly apparent that the country's military strength was sapping its economic and political strength. In another era this could have been considered a necessary sacrifice for defending the country against the United States, but Kennedy removed this excuse.

“While historians may debate the causes of Gorbachev's reforms for many years, one thing is certain. Had Kennedy's opponent in the 1980 election, Ronald Reagan, become president, Gorbachev would never have been able to introduce freedom into Soviet society, slash the military budget, and allow the captive nations of Eastern Europe to go their own way.”

2. An Absurd Consensus?

The above analysis of a fanciful alternative history may seem absurd, but it is no more absurd than much that has been written about Ronald Reagan upon his death. One of the most dubious assertions repeated often in the week of his funeral was that it was Reagan's policies that caused the downfall of the Soviet Union.

It is not surprising that rightist partisans make this claim. Thus, Charles Krauthammer wrote that

Reagan put relentless pressure on the possessors of that power, the Soviet commissars, through his nuclear hard line, military buildup, Strategic Defense Initiative and the Reagan Doctrine of supporting anti-communist guerrillas everywhere (especially Nicaragua). Ultimately, that pressure brought about the collapse of the overextended Soviet empire. [1]

What is surprising is that so many moderate and liberal sources also appear to go along with this claim. The Washington Post editorial on Reagan's death said

A strong argument can be made that Mr. Reagan played a vital role in creating the conditions in which the Cold War could be ended without major upheaval or conflict and in advancing the cause of freedom in lands that hadn't known it for four decades, if ever. He did so through his arms buildup, his firm position on intermediate-range missiles in Europe—continuing the policy of his predecessor, Jimmy Carter—and other acts conveying his intention to enhance and maintain the country's strength. [2]

Liberal columnist Joe Klein wrote

[Reagan] stubbornly insisted on funding an utterly preposterous missile-defense program that his detractors, and eventually his supporters, called Star Wars.

As it happened—as Hollywood would have seen fit to script it—the only people aside from Reagan who really believed in Star Wars were the military leadership of the Soviet Union. The Zap! Pow! Bam! comic-book defense strategy reinforced Moscow's growing despair about the future and hastened the end of the cold war. [3]

These writers do not go as far as Reagan partisans in crediting Reagan for the defeat of the Soviet Union. Still, the media was saturated with the strong form of the

thesis—Reagan’s militarism forced the Soviets to give up their undemocratic and militaristic behavior—contrasted only with the weak form of the thesis—Reagan’s militarism helped force the Soviets to give up this behavior. Understandably, there is a tendency to write something positive about a man who has just died, particularly a former two-term president who is revered by many Americans. However, the assessment of a deceased president is about more than one man. How the media describes this man’s policies helps define the range of thought about our history and our future. In talking to many friends and acquaintances shortly after Reagan’s death, I was surprised to find that a large majority believed that Reagan’s aggressive policies played a major role in forcing the Soviet Union to change its ways. This is true even among those I talked to who were liberal Democrats and otherwise disliked Reagan’s policies.

The idea that Reagan’s militarism was a major factor in destroying the Soviet Union has become something of the consensus view in mainstream America. I will now explain why this consensus is absurd.

3. Defeat or Conversion?

When Mikhail Gorbachev ascended to the leadership of the Soviet Union in 1985, he inherited a repressive dictatorship that presided over a continent-sized country with the world’s third-largest population and one of the world’s two strongest militaries. The government had long abandoned the unrestrained internal mass-murder of the Stalin era, but still wielded overwhelming centralized control over both the economy and culture. Since the end of World War II the Soviet Union had maintained client dictatorships in the countries of Eastern Europe, using force to suppress popular dissent in Hungary in 1956 and Czechoslovakia in 1968.

By 1990, Gorbachev had reversed some of the major tenets of Soviet government. Simply reducing the size of the Soviet military [4] and withdrawing from the military quagmire in Afghanistan [5], as he did, were remarkable policy reversals, but these pale in comparison to his other actions. His policy of “glasnost” allowed—in fact, encouraged—open and critical discussion of the shortcomings of Soviet policies and society. Glasnost was soon followed by increasing democratization, with the Communist Party relinquishing its official monopoly on political power in February, 1990 [6]. Significant reforms were made in the economy, though the impact of these reforms was more negative than positive for most citizens. Finally, Gorbachev allowed the Soviet client states in Eastern Europe to collapse.

A notable feature of these actions is that most of them can not be considered mere reforms or corrections to policies. True, the reductions in arms can reasonably be characterized as an attempt by the Soviet government to live within its means, and the withdrawal from Afghanistan, analogous to the United States withdrawal from Vietnam, can be seen as

an effort to cut losses on an unsuccessful enterprise. On the other hand, introducing glasnost and multiparty elections was essentially abolishing the very essence of 70 years of Bolshevik rule. A Soviet Union ruled by Politburo decree and one ruled by elected parliament is hardly the same country. Similarly, the freeing of Eastern Europe indicates that the ruler of the “Evil Empire” was in fact willing to give up that empire. As early as 1985, Gorbachev warned some Eastern European leaders that they could not depend on the Soviet military to protect them from their own populations [7]. Referring specifically to international relations and to Eastern Europe, Gorbachev told the Nineteenth Party Conference in June, 1988, that “A key place in the new thinking is occupied by the concept of freedom of choice,” and made similar remarks in the United Nations in December, 1988, saying “Freedom of choice is a universal principle and there should be no exceptions” [8]. These words were shown to be more than empty rhetoric in November, 1989, when Soviet troops stayed peacefully in their barracks as crowds of people tore down the Berlin Wall.

Another notable feature is that none of these actions occurred in a crisis. As will be discussed more in the next section, the Soviet economy was in bad shape in the 1980s, but it was not in a state of collapse. The Soviet army was not winning the war in Afghanistan, but the roughly 13,000 Soviet dead by the end of the war [9] was small compared to about 50,000 United States soldiers killed in Vietnam and millions of Soviet soldiers killed during World War II. Public outcry within the Soviet Union for freedom and democracy was restricted to a small number of dissident intellectuals and did not constitute anything like a mass movement for change [10]. Except for Poland, where Solidarity did constitute a serious challenge to the communist government, Eastern European governments ruled over fairly quiescent (if unhappy) populations; for instance one Czech reformer said in private in the 1970s that “nothing will change here until things change in the Soviet Union” [11].

It is a general principle of human behavior that if a person wants to do something, he or she can overcome many obstacles to doing it, and if he does not want to do something, he will find it difficult to do it no matter how easy the path. On the national scale, countries in which the leadership wants to achieve a certain goal can undergo much privation to achieve it. This is especially true of dictatorship. Consider the fates of Cuba and North Korea after the fall of the Soviet Union. Both are small, economically weak countries which lost key trading partners (and, in the case of Cuba, important subsidies) and which have economically and militarily powerful adversaries next door. Both underwent severe economic downturns, in Korea’s case including widespread starvation. Both are much more vulnerable to outright attack from the United States than Russia, which repelled invasions from much more ruthless adversaries in Hitler and Napoleon. However, the leadership of Cuba and North Korea do not seem to be interested in the kind of revolutionary change that Gorbachev instigated, and none has occurred.

An example of a country that did introduce important changes is the People's Republic of China. The Chinese reforms were more like what one would expect in a country reacting to economic and military pressure. The government held on tightly to political power, while restructuring the economy in order to promote growth. Had these reforms come in the aftermath of a Sino-American arms race, I have no doubt that hawks in the United States would be taking credit for the change. As it happens, China's reforms started in the late 1970s, several years after relations with the United States had begun improving under Richard Nixon.

Though otherwise very different, the enormous changes in Chinese and Soviet policies had a similar proximate cause: the old leader died and new ones came to power with different ideas. In the case of the Soviet Union, Gorbachev came to power only after a succession of older leaders died; Brezhnev in 1982 at the age of 76, former KGB head Yuri Andropov in 1984 at the age of 70, and Konstantin Chernenko in 1985 at the age of 74. Gorbachev was 54 when he became General Secretary.

The revolutionary nature of the changes in Soviet policies, and the relatively stable situation prevailing at the time, indicate that the Soviet Union did not change because it had to, but because its leaders wanted to. Gorbachev and his allies talked frequently of the necessity of change, but the perception of that necessity, and the kind of changes it implied, was also a function of their world view.

Suppose the tables had been turned, and it was the United States that was trailing the Soviet Union in military and economic might. One can easily imagine an American government doing many things to accommodate an ascendant adversary. It is much harder to imagine the United States replacing capitalism with communism and rewriting the constitution so that Congress and the Presidency were replaced by the Communist Party Politburo and the General Secretary.

The direct cause of the changes induced in the Soviet Union was Mikhail Gorbachev. Where did Gorbachev's "new thinking" come from? As a rising official in the Communist Party, Gorbachev did not make any revolutionary impulses apparent to his superiors. His promotions seemed to stem more from ideologically neutral characteristics, such as his capacity for hard work, his intellectual abilities, and his forceful personality [12]. Gorbachev's failure to publicize an agenda of democratization and freedom contradicts the contention of Reagan official Richard Pipes, who argued that the selection of a reformist such as Gorbachev indicates that the conservatives were themselves looking for deep reforms in order to deal with American pressure [13]. On the other hand, the lack of such a public agenda does not prove that Gorbachev's political evolution did not have deep roots. Khrushchev seemed to be a loyal Stalinist until he took power in 1953 and began important reforms. Brezhnev, in turn, appeared to be a loyal supporter of Khrushchev until he participated in a coup to

oust him. Such was the way in the Soviet Union, where the space for dissent was constricted even at the level of the oligarchy [14].

In retrospect, there are some indications that something was going on below the surface before Gorbachev became leader. One of his closest friends in law school was a Czech Communist named Zdenek Mlynar who later became a leading reformer in the Prague Spring of 1968. Gorbachev, true to his careful upward career path, did not meet with Mlynar after the Soviet crackdown, but in 1967 Gorbachev did tell Mlynar that, in the words of Fred Coleman, he was “in favor of more independence for the Soviet Union’s East European allies” [15]. Both the books by Brown and Coleman, cited above, discuss the presence, by the early 1980s, of a significant number of people in the Soviet establishment—Party, government, think tanks—who essentially agreed with many of the critiques of the dissidents but whose official work and public face towed the Party line. One of the most influential of such closet dissidents was Alexander Yakovlev, who in the 1970s was demoted from a relatively high position in the Communist Party to ambassador to Canada. In the summer of 1983, Gorbachev participated in a trade delegation to Canada during which he spoke at privately Yakovlev. “We spoke very frankly about everything...” Yakovlev recalls. “The main point was that society had to change, that it had to be constructed on different principles” [16].

Gorbachev’s many statements during and after his tenure as leader of the Soviet Union show a commitment to peaceful, democratic socialism strongly in tune with the sort of policies and philosophy expressed by Western European leaders such as Felipe Gonzalez, the Prime Minister of Spain. Much of what Gorbachev said about the insanity of the arms race or the need for peaceful coexistence was no different than what Western liberals also believe. Moreover, his words and actions together suggest a value system at odds with the old Soviet system. American nuclear missiles or plans for Star Wars or economic pressure may influence actions; it’s hard to see how they can change values.

One would expect that the liberalizing efforts of one faction in the government would engender a reaction from more conservative elements. This indeed occurred. The ways in which Gorbachev was able to outmaneuver his political opponents for the first five years of his term form an interesting story which is too complicated to detail here. The way in which Gorbachev’s leadership ended shows that the more liberal values described above started to influence the conservative opposition as well.

In August, 1991, Gorbachev was to sign a new treaty that would have weakened the Soviet Union and allowed the Baltic states to gain independence. KGB chief Vladimir Kryuchkov and others decided to take over the government before this could happen. They placed Gorbachev under house arrest, positioned tanks on the streets of Moscow, and declared a state of emergency. Scores of top officials were to be arrested, and a KGB team

were deployed outside the home of Boris Yeltsin, who by then was an important political figure. But the team did not stop him from leaving his house to go to work in Moscow [17].

In another time, Yeltsin and Gorbachev would have been at least in jail, and probably dead. Instead, Yeltsin performed his famous act of defiance in the streets of Moscow, facing down the tanks. Soon thousands of citizens joined him in the streets. The army could have killed some of them and dispersed the others, as the Chinese army had done in Tiananmen Square just two years earlier. In the case of China, the outright massacre of thousands of pro-democracy demonstrators caused much condemnation in the United States, but no significant American reaction beyond that. Why didn't the coup plotters give the order to fire? Perhaps Russian society had reached the point where a government could no longer maintain legitimacy by liquidating its domestic opponents. The coup quickly collapsed, as did the Union of Soviet Socialist Republics.

4. The Cold War

Having discussed the changes in society induced by Gorbachev and some principles for evaluating the meaning of these changes, we now turn to some details of the Cold War. It must be pointed out that, while America's anti-Soviet policies are associated most strongly with Reagan, many of them were actually begun by the previous president, Jimmy Carter. For instance, after many years of post-Vietnam decline, the US military budget began to climb in the last year Carter's presidency, though the rise accelerated under Reagan [18]. As alluded to above, the introduction of cruise and ballistic nuclear missiles to counter Soviet intermediate-range nuclear missiles in Europe was decided by Carter and other NATO members in December, 1979 [19]. Military support for El Salvador, which was battling a leftist insurgency, also began under Carter. Finally, it should be noted that arming the Afghan resistance to the Soviets was a policy which generated very little controversy in the United States, unlike SDI or Central America. It is doubtful that Carter would have done much less than Reagan in this area.

Gorbachev and his advisors often reiterated the fact that their poor economy had to be improved, but most observers agree that the Soviet economy had serious internal problems due to its counterproductive structure and a high military burden inherited from previous years. Is it possible that the United States was able to further damage the Soviet economy enough to pressure the Soviets to make significant reforms? A problem with answering this question is the difficulty in assessing the real state of the Soviet economy. There appears to be wide agreement that the Soviet economy was doing badly by the 1970s, though the World Bank estimated that real per capita annual GDP growth for the Soviet Union was a respectable 4.2% in the 1970s and 3.8% in the 1980s, and did not plummet until the 1990s, when it reached -5.2% [20]. Official Soviet figures of "Net Material Product," which is similar to GDP, show the annual growth rate declining from 8% in the late 1960s, to 4% to the late

1970s, to about 3% in the 1980s. The CIA estimated a similar trend in GDP, but with somewhat lower values for each year. Other Soviet economists estimated a downward trend with even lower values, with approximately zero growth by the mid 1970s, and some decline afterwards. To put this in context, US GDP fell by about 46% from 1929 to 1933; I haven't seen anyone claim such a crisis-inducing Soviet decline in the 1980s [21].

Variations on the theme of United States economic pressure can be found. Perhaps the United States colluded with Saudi Arabia to depress global oil prices, thus lowering Soviet export earnings [22]. Perhaps restrictions on technology transfer or opposition to a natural gas pipeline to Europe were important. It's hard to discern any evidence that these factors were large enough to have a regime-shaking impact on the economy.

Similarly, Soviet involvement in Central America and Africa was such a peripheral enterprise that it is hard to see its influence on Soviet history. Even had pro-Soviet regimes popped up in every nation of Central America, this would not have helped the Soviet economy.

Was the Soviet Union driven into crippling new military spending in order to keep up with the United States? Definitive statistics on this point are even harder to find than good GDP figures. Reagan's CIA director Robert Gates testified that Soviet military spending increased at a modest 2% per year in 1977–1983, in contrast to a 4–5% annual growth rate in 1965–1975 [23]. Similarly, revised estimates by the CIA showed fairly stable military spending throughout the 1980s [24]. A somewhat alarmist article on Soviet strategic defense research estimated that the Soviets were spending about a billion dollars a year on laser research [25], which was not a large fraction of the Soviet economy at the time.

Many authors cite Reagan's Strategic Defense Initiative (SDI, or "Star Wars"), announced in 1983, as a cause of the Soviet downfall. This is an especially creative idea, since tests of the program did not even shoot down a single missile until nearly twenty years after the program was proposed [26]. To this day it remains unclear whether the system could succeed against a handful of missiles equipped with simple countermeasures [27], let alone the thousands of Soviet warheads aimed at the United States at the time. Some Gorbachev advisors, notably space research head Roald Sagdeev, also discounted the risk from SDI, though others in the military establishment were truly concerned about it [28]. Did the prospect of having to compete with SDI cause the Soviets to call it quits? Gorbachev stated later, "These were unnecessary and wasteful expenditures that we were not going to match;" more generally, he had already concluded that neither country was interested in attacking each other, so that continuing or accelerating Brezhnev-era military spending was simply a waste of money [29]. Even if we accept that Soviet military leaders were frightened by Star Wars, that is a long way from saying that they were so frightened by it that they were willing to tear up their society in order to meet a threat that was still decades away. A case can

be made that the fear of Reagan's military buildup in general, and SDI in particular, made it harder, not easier, for Gorbachev to convince conservatives in his government to go along with Gorbachev's proposals to end the Cold War [30].

5. Conclusions

The peaceful dissolution of the Soviet dictatorship and its hold on Eastern Europe was one of the most momentous events of the twentieth century. The death of Ronald Reagan in 2004 became a pretext to give the former president much credit for this event. These tributes downplay the obvious fact that the direct cause of radical changes in the Soviet Union was Soviet leader Mikhail Gorbachev. The American right has strenuously asserted that Reagan's militaristic rhetoric and action played a great role in setting this change in motion, either by creating circumstances which allowed a reformer such as Gorbachev to take power or by convincing Gorbachev himself to become a reformer. American liberals have at least partially accepted this view.

I have attempted to show that this explanation of Gorbachev's rise is quite implausible. The scope of the change from a closed, dictatorial, imperialistic society, to one trying to emulate democratic socialist values of peaceful coexistence, indicate that it was a real change of heart among a younger generation of Soviet leaders and technocrats that overturned the system of their fathers. Such a change of heart must stem from internal experience, not a relatively modest external military threat. The Soviet Union was having significant economic difficulties due to internal factors, even before Reagan came to power. It is possible that American policies seriously exacerbated these problems, but there is some evidence that this was not so. A determined regime could have survived the challenges faced by the Soviet Union for decades. Some suggest that Reagan's policies "sped up" the transition to more open-minded leaders, but the record suggests that this transition simply occurred when the previous generation of leaders died of old age.

Ronald Reagan should be given much credit for the significant changes in his own policies he made in response to Gorbachev's New Thinking. He might have accidentally been able to save the old commissars by maintaining an aggressive stance and discrediting Gorbachev, but he did not. The great success of the Reagan administration was not in causing Gorbachev's changes to the Soviet system, but in cooperating with Gorbachev once these changes started.

Tributes to Reagan often comment on the feeling of reassurance and pride he elicited in Americans. In contrast, my memory of the early Reagan years was one of fear mongering and alarm. According to the cold warriors of America at the time, Europe was about to be overrun by the Red Army, Communist Nicaraguans would be overturning dominoes that led to our doorstep, and the Evil Empire was dangerously expanding. In reality, the 1970s saw

Soviet gains in some relatively poor and strategically marginal countries in Southeast Asia, Central America and Africa, while large and important countries, notably China and Egypt, oriented themselves more towards the United States. Rather than seeing Reagan bring down the Soviet Union with his policies, I saw him increase spending by hundreds of billions of dollars and facilitate the killing of hundreds of thousands of people in Central America, Africa, and elsewhere in an effort to stop an adversary that was about to relinquish power voluntarily.

Notes

1. Krauthammer, Charles, "Reagan Revisionism", *The Washington Post*, 11 Jun 2004, p. A25.
2. Editorial, "Ronald Wilson Reagan," *The Washington Post*, 6 Jun 2004, p. B6.
3. Klein, Joe, "The Secrets of Reagan's Success," *Time Magazine*, 14 Jun 2004, p. 21.
4. Coleman, Fred, *The Decline and Fall of the Soviet Empire*, St. Martin's Press, 1996., pp. 297–307.
5. See Brown, Archie, *The Gorbachev Factor*, Oxford University Press, 1996. Quoting Gorbachev aid Anatoly Chernyaev, Brown states that in March, 1985, Gorbachev told Georgy Arbatov that he was thinking of withdrawing from Afghanistan (p 234), announced in a newspaper interview in July 1987, that "in principle" a withdrawal had been decided (p 234), and that by February, 1989 the withdrawal was complete.
6. Coleman, p. 265.
7. Brown, p. 249, based on comments from Anatoly Chernyaev and writings of Gorbachev and Vadim Medvedev.
8. Brown, p. 225.
9. *New York Times*, "Soviet Lists Afghan War Toll," 5/26/88, p. A14. The article says that US government estimates of the Soviet dead had been somewhat lower.
10. *The Economist*, "Soviet dissent; Grinding the dust," 5/19/84, p. 62 (US Edition p. 46): "the KGB has all but crushed the political movement which sprang up in the mid-1970s in the brave hope of monitoring Soviet compliance with the human-rights provisions of the 1975 Helsinki agreement."
11. Brown, pp. 247–248.

12. Brown has a good description of Gorbachev's pre-1985 career. He notes that Gorbachev was the first Politburo member to have a university education, which may have given him a more sophisticated view of politics and economics.
13. Pipes, Richard, "Misinterpreting the Cold War; the Hard-Liners Had it Right", *Foreign Affairs*, Winter, 1995, p. 153.
14. See Coleman.
15. Coleman, p. 220, citing Zhores Medvedev, *Gorbachev*, Basil Blackwell, 1986, pp. 62–65.
16. Brown, p. 81, citing Alexander Yakovlev, *Muki Prochteniya bytiya. Perestroyka: nadezhdy i real'nosti*, Novosti, Moscow, 1991, 32.
17. My entire synopsis of the coup events comes from Coleman, pp 341–351.
18. See *Statistical Abstract of the United States*, 1999, Table 574.
19. See for example *The Economist*, "Missiles in Europe; beached", August 23, 1980, p. 42.
20. International Bank for Reconstruction and Development, *Global Economic Prospects and the developing Countries*, 2002, p. 235. After 1992, figures are for the Russian Federation only.
21. *The Economist*, "Ready to fly, A picture of failure", April 28, 1990, discusses the Soviet economy. For US GDP, see US Bureau of Commerce, Bureau of Economic Accounts, "GDP and Other Major NIPA Series, 1929–2003," www.bea.gov/nea/an1.htm.
22. Pipes.
23. Larrabee, F. Stephen, "Gorbachev and the Soviet Military", *Foreign Affairs*, Summer, 1988, p. 1002, citing Robert Gates, Deputy Director for Intelligence, CIA, "Testimony before the Subcommittee on International Trade, Finance, and Security Economics," *Allocation of Resources in the Soviet Union and China 1984*, Washington, D.C: U.S. G.P.O., 1984.
24. Lebow, Richard Ned, and Janice Gross Stein, "Reagan and the Russians," *The Atlantic Monthly*, February, 1994, pp. 35–37.
25. Linn, Thomas C., "Soviet Strategic Defense," *Defense and Foreign Affairs*, December, 1986, p. 17. Linn was a major in the U.S. Marine Corps.

26. The Washington Post, “Withdrawal gives US more latitude in defense tests”, December 14, 2001, p. A41.
27. See for instance The Washington Post, “‘Realistic’ Tests Ordered”, June 18, 2004, p. A13.
28. Brown, p. 226, citing Sagdeev, Roald Z., *The Making of a Soviet Scientist*, John Wiley, 1994.
29. Lebow and Stein.
30. *Ibid.*