cal science, and the seminal works here are the *Nichomachean Ethics* and the *Politics*.

In most of the contemporary social sciences a fact-value dichotomy is observed. That is, the researcher must carefully distinguish between facts based on empirical observation and values based on personal preferences. This distinction is denied in Aristotle's works, however, and one must read the *Nichomachean Ethics* and the *Politics* as one extended work. Thus, Aristotle distinguishes six types of states, according to qualitative as well as quantitative considerations. Monarchy is the rule of one in the interest of all, while tyranny is a corrupted form of monarchy. Similarly, aristocracy is the rule of the few in the interest of all, while oligarchy is the selfish rule of the few. Polity, finally, is the rule of the many in the interest of all, while democracy is the decayed rule of the many in their own interest. To Aristotle, human beings are political by nature, for they develop in association with others—beginning with the household, progressing through a village organization, and coming to full maturity in the *polis*, or city-state. This teleological approach to the human or social sciences pervades all of Aristotle's writings on the practical sciences.

Aristotle's influence in Western civilization is such that he was considered "the philosopher" throughout the Middle Ages. His influence has also been considerable in Christian theology, especially through the works of Thomas Aquinas (1225–1274); in philosophy, especially in his teachings regarding intellectual and moral virtues; in the physical sciences, notably as the target of extensive criticism by modern giants such as Galileo Galilei (1564–1642); and in the modern social sciences, with particular reference to political science. See also *Philosophy; Plato; Political Science*

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### Armed Forces

See *Military*.
TYPES OF ARMS CONTROL
It is useful to distinguish between rivalry-specific and general arms control measures. In the rivalry-specific form, adversaries seek to manage their security competition through agreements that are tailored to the shape of their strategic relationship, in order to make a more stable or at least less costly military balance. By contrast, general arms control measures aspire to universality: With a broad ambit and generic guidelines, they are meant to exert desired effects over the multitude of strategic relationships in international politics.

The 1922 Washington Naval Treaty, for example, was rivalry specific. In it, the United States, Britain, and Japan agreed to reductions in battleship fleets according to specific ratios of strength between them, and to a ten-year hiatus on new construction, as well as limitations on battleship tonnage and armaments. The goal was to stabilize the existing balance of naval forces at lower levels, and to forestall an arms race among the three parties. Similarly, in 1972, at the peak of cold war détente, the United States and the Soviet Union pledged in the first Strategic Arms Limitation Talks agreement (SALT I) to limit the number of ballistic nuclear missile launchers to then-current levels, and to abide by major limitations on the deployment of strategic missile defense systems. Behind these arrangements were mutually held cooperative and competitive goals: to slow down the arms race and reduce worrisome instabilities and to maximize restraints on the other side while minimizing those on one’s own side.

As for general arms control measures, the most extensive early efforts were the conventions produced at the Hague Conferences of 1899 and 1907. Those widely endorsed conventions promulgated, among other things, prohibitions on the use of certain types of arms, such as “dum-dum” bullets, poisonous chemical weapons, or bombs dropped from balloons. In 1925, during the heyday of the League of Nations, the Geneva Protocol was added to the conventions, reinforcing the prohibition on the use of deadly gases. Later in the interwar period, participants in the World Disarmament Conference in Geneva (1932–1936) tried to enact a blanket prohibition on the use and development of “offensive” weapons, which were (and still are) thought to be conducive to war. The effort was ill fated for many reasons, but chief among them was the bane of many such qualitative exercises—the thorny and politicized issue of distinguishing between offensive and defensive weaponry. At the Geneva conference, for example, Britain, France, and the United States argued that aircraft carriers were essentially defensive; conversely, Germany, Italy, the Soviet Union, and Japan asserted that they were inherently offensive because they were useful for launching surprise attacks. In the era of the United Nations, similar attempts to foster far-reaching agreements have been carried forward by groups of states in the General Assembly; the current locus of these efforts is the sixty-six-member Geneva Conference on Disarmament (CD). Begun in 1979, the CD has been the forum for adoption of the 1992 Chemical Weapons Convention and the 1996 Comprehensive Test-Ban Treaty, and for negotiating various additions to the 1975 Biological Weapons Convention.

The most recent general effort was the tightly focused 1997 Ottawa “Landmines” Convention, which prohibits the use, stockpiling, production, and transfer of antipersonnel mines and mandates the destruction of existing stocks. As a general measure with aspirations to universality, the treaty has had mixed success. As of 2007, 155 member states had joined, while 37 had not, including 3 permanent members of the United Nations Security Council: the United States, Russia, and China. However, although the United States has not signed the treaty, it has funded and supported demining efforts worldwide. Thus, even though many important countries have not signed the convention, it has had a tangible humanitarian impact. Demining efforts catalyzed by the convention have resulted in the removal of hundreds of thousands of mines, saving a large number of lives worldwide.

General and rivalry-specific characteristics of arms control can overlap—for example, when a rivalry-specific formula is nested within a more general arms control agreement. The most important and contentious arms control agreement of the early twenty-first century—the Nuclear Nonproliferation Treaty (NPT)—is a good illustration of this. The NPT, which first came into force in 1970, has a nearly universal membership (by 2007, 188 of the 192 members of the United Nations were signatories). Its general aims are to reduce and eventually eliminate the role of nuclear weapons in international politics. Behind these sweeping generalities are a variety of undertakings that apply specifically to two different “classes” of signatories—the Nuclear Weapons States (NWS) and the Non-Nuclear Weapons States (NNWS). The NWS parties “legitimately” possess nuclear weapons, but must work to reduce them (eventually to zero), and must not share them with states that do not possess nuclear weapons. The NNWS cannot “legitimately” possess nuclear weapons, but in return for foregoing them, they are entitled to develop nuclear energy for peaceful purposes, and to international support for those efforts channeled through the International Atomic Energy Agency (IAEA). Thus, although the NPT is a nearly universal and general agreement, it is politically oriented toward managing a dangerous and difficult imbalance between the nuclear haves and have-nots. Similarly, the parties to the 1990 Conventional Forces in Europe (CFE) treaty were all members of either the NATO or Warsaw Pact alliances. Although a general aim of the treaty was to reduce conventional forces in...
Europe, its organizing principle was military balance between the two blocs. There was thus a strong rivalry-specific core within the broader general agreement.

Yet another form of arms control is the supplier-cartel regime, in which participants who share a leading position on a given weapons technology agree to restrict its transfer to other parties outside the cartel. A formula of this sort is wired into the NPT in that the NWS agree not to transfer nuclear weapons to NNWS. But the purest example is the Missile Technology Control Regime (MCTR), which enjoins parties possessing advanced ballistic missile capabilities not to export the technology to other states. Begun in 1987 by the United States and six of its closest allies (Britain, Canada, France, West Germany, Italy, and Japan), the MCTR cartel grew to thirty-three members, including Russia, and also attracted the “unilateral” adherence of a number of other key players, most notably China and India.

PROBLEMS AND CRITIQUES OF ARMS CONTROL

The most important general critique of arms control is that if states become or threaten to become aggressive, arms control is rendered irrelevant and even pernicious: It encourages false hopes, wastes political energies on panaceas, and, worst of all, lowers defenses that need rather to be raised. By the same token, critics contend, arms control is most readily achieved and likely to work when it is least needed—that is, when international politics are placid or when foes concur that the weapons in question lack utility. In the 1991 Strategic Arms Reduction Treaty (START I), struck after the cold war evaporated with the end of the Warsaw Pact and the withdrawal of Soviet forces in Eastern Europe, Washington and Moscow achieved stunning success in agreeing to 30 to 40 percent cuts in the number of deployed strategic nuclear weapons: Such cuts had been impossible in the hostile and distrustful atmosphere of earlier decades. Once the political bases for enmity are removed, arms control can seem easy.

In circumstances of rivalry, in which trust and confidence-building is most needed, solutions to the verification problem (of measuring compliance with arms control agreements) can prove elusive. Insistence on highly intrusive forms of verification, moreover, can mask a basic unwillingness to reach agreement and negotiations can become a charade: Here the goal is not to find common ground but merely to avoid taking the blame for the failure to do so. Assuming a workable verification mechanism can be agreed on, there remains, as Fred Iklé famously observed, the enforcement problem—how to punish the cheaters that are caught. There is nothing about an arms control treaty that can make sanctions automatic: Although effective verification may make it harder for cheaters to covertly “break out” of agreements, the basic political problem of when, where, and how to counter their threatening military power remains, and will be decided by the parties that are both willing and able to do something about it. Thus, although it is a form of international cooperation, arms control does not transcend political powers.

There is one more note of caution: Effective arms control agreements that do produce mutual verifiable cuts will expose new gaps and asymmetries in the balance of forces among potential rivals, and, as a result, may encourage them to channel new investments into other—and potentially more destabilizing—weapons systems. This is most likely to occur when, despite major agreements, the embers of political competition continue to smolder. One of the important effects of the Washington Naval agreements was to facilitate the parties’ shift of focus and resources to competitive aircraft carrier development—with portentous consequences for the outbreak and conduct of World War II in the Pacific.

Proponents of arms control do not deny that these problems exist, but they point out that arms control is not always hostage to the vagaries of the political environment—it can shape that environment too. Arms control is more than just a means by which states press fixed national interests; it involves a political process that may permit them to learn more about each other, to deflate exaggerated images of “the enemy,” and to conceive of interests in more compatible ways. If it is folly to pursue arms control with irredeemably aggressive states, it is just as foolish not to pursue it when the situation is less clear-cut, for arms control itself may help not only to bring clarity but also to prevent potentially aggressive states from becoming aggressors.

ARM RACE: CONCEPT AND CONTROVERSIES

An arms race occurs only when parties for whom war is a possibility engage in strategically interdependent increases in the quantity and/or quality of weapons: Their respective acquisitions and builds are meant to match or overcome the strengths of the other side. The element of strategic interdependence is central to the identification of the arms race as a phenomenon of international politics, which requires states to rely ultimately on their own military forces for security, because the military forces of other states may threaten them and there is no world government to protect them. In such a milieu, where falling behind one’s competitors can potentially lead to the gravest consequences, arms racing can be seen as a normal, survival-enhancing behavior.
Nevertheless, arms races are often considered harmful because they lead states that are trying to outpace each other to devote more resources to military preparations than would otherwise be necessary for their security. Increased military buildup, in turn, means that fewer resources can be devoted to other, welfare-enhancing activities. When the competitive dynamic of arms racing comes to dominate other principles for controlling acquisitions, the buildup (and concomitant waste) can mount precipitously. For example, during the most dramatic upswing of the cold war nuclear arms race, as the Soviet arsenal grew and American planners became ever more ambitious in their target selection, the U.S. nuclear warhead stockpile climbed from approximately 1,000 in 1955, to 18,000 in 1960, to 32,000 by 1967. It was very hard to understand why a much smaller (and cheaper) arsenal of warheads would not have been sufficient to achieve the main strategic purposes: deterring a Soviet nuclear strike on the United States, or a conventional assault on Western Europe.

The worst fears about arms races, however, are not that they are wasteful but that they can cause wars by feeding conflict-spirals that do not just reflect enmities, but create and reinforce them. In this view, arming itself may become the stuff over which states fight. The conflict-spiral premise is what makes many figurative uses of the term arms race inapt. It has, for example, been used to describe the spike in steroid use among the “slugger-elite” of professional baseball, and also the steady pace of miniaturization and computing-capacity innovation among microchip developers. But few would argue that the greatest danger of steroid use in baseball is that the supersized sluggers will eventually fall on each other in sudden bat-wielding melees, or that the technology race among microchip producers will lead to a cataclysmic collapse of the high-tech economy.

Two objections to the conflict-spiral conception of arms racing are often raised. The first and most intuitive is that arms races do not cause hostility but are its consequence. They reflect the maneuvering of rivals consciously seeking a margin of advantage that will permit aggression or deter it, not some unfortunate misunderstanding—and that being the case, buildups may prevent war, because they reinforce mutual caution. Second, even if an arms race between status-quo-oriented states does sometimes culminate in war, their decisions to fight are based on concrete stakes and complex political judgments that simply cannot be reduced to reciprocal fears caused by the arms race itself.

Nevertheless, there is an impressive amount of research on the connection between arms races and war, most of which has tended to focus on a few key questions: Given that some arms races culminate in wars, whereas others do not, are certain types more conducive to war than others? Do the dynamics of qualitative races (in which competitors seek innovative capabilities that will render their rival’s obsolete) differ from quantitative races (in which competitors seek a numerical advantage in relatively comparable weapons)? Samuel Huntington’s answer to these questions blended the two concerns by arguing that quantitative arms races are more dangerous than qualitative ones because, among other reasons, quantitative races require increasingly costly sacrifices that put pressure on states to seek a quick and violent escape from the competition. Others have suggested that arms races that generate large swings back and forth in relative strength (thus creating tempting opportunities for aggression by the temporary leader) are the most dangerous. Still others have made the intuitive point that arms races which give big advantages to states that favor the status quo are more likely to result in peace than those which give big advantages to states with aggressive intentions (although this ignores the possibility that a status-quo state may want to use its temporary margin of strength to defeat an aggressive adversary before it, in turn, becomes stronger).

During the cold war, these concerns were amplified by the fact that the arms race in question was nuclear: If it had led to war, it would truly have been a “race to oblivion.” The survival of human life—let alone civilization—following a major nuclear exchange between the cold war rivals would be questionable. Furthermore, it was clear that unless effective arms control measures were taken to interrupt the competitive dynamic, the superpowers’ nuclear race would metastasize, creeping into other rivalries throughout the international system. Even if arms racing increased the likelihood of war only by small margins, as the number of nuclear “racers” multiplied so too would the prospects for nuclear holocaust. Concerns such as these provided the impetus behind the rivalry-specific and general nuclear arms-control efforts discussed above, and while the politics of the NPT remain contentious, and a number of crucial nuclear-weapons states are not members (Israel, India, Pakistan, and North Korea), the NPT does appear to have helped stem the contagion of nuclear arms and arms races among states.

As the cold war recedes, and with it the chilling imagery of a nuclear-arms-race-spiral, the concept of an arms race remains useful. It has striking relevance to an important issue of international security today: the militarization of outer space. From the 1960s to the 1980s, the Soviet Union and the United States experimented with weapons designed to destroy earth-orbiting satellites, which have tremendous civilian and military utility. The feared arms race in such weapons did not then materialize, and the end of the cold war put the issue on ice. In 2007, however, China surprised the world by testing an antisatellite weapon, challenging the presumption of the
United States’ military preeminence in space. Thus, the prospect of a space arms race was resurrected, and the question of whether such a race could become so intense as to raise the probability of war was reopened—along with the question of whether arms control could serve to prevent war.

Still, in the early twenty-first century concerns over the arms-race-spiral as a potential cause of nuclear war seemed to decline relative to fears of another nuclear nightmare scenario—that of “loose nukes” getting into the hands of terrorists. This perceived and perhaps real shift in nuclear risk raises important questions about the future agenda of arms control concerning nuclear weapons and other weapons of mass destruction: Can the existing nonproliferation regimes—with some clever rewiring—furnish satisfactory solutions? Or must a new matrix of rivalry-specific, general, and supplier-cartel agreements be contrived to manage risky relationships between states and nonstate actors? And if the latter is necessary, will the supportive international political context on which arms control depends take shape and be maintained? For common danger does not make security cooperation inevitable. Without a countervailing common will, a construct entirely contingent on politics, the states that oppose this danger will make a rabble, not a regime.

SEE ALSO Cold War; Deterrence, Mutual; Gorbachev, Mikhail; Huntington, Samuel P.; League of Nations; Militarism; National Security; Politics; Reagan, Ronald; Terrorism; Union of Soviet Socialist Republics; United Nations; Weaponry, Nuclear; Weapons Industry; Weapons of Mass Destruction

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ARMSTRONG, LOUIS

SEE Jazz.

ARONSON, ELLIOT

1932–

Elliot Aronson is a prominent American social psychologist. Born in Revere, Massachusetts, on January 9, 1932, his career has spanned nearly fifty years. He is renowned as a creative methodologist who conducts carefully crafted, highly impactful experiments to explore the causes and consequences of human social behavior. His style of experimentation builds on the legacy of Kurt Lewin (1890–1947) and Leon Festinger (1919–1989). Aronson’s textbook, The Social Animal (9th ed., 2003), is widely used and highly regarded for its pedagogical innovations. He is also known for his work as coeditor of two editions (1969, 1985) of the important Handbook of Social Psychology. He has been a highly successful mentor of doctoral students, including many who have made significant contributions to the field of social psychology during distinguished careers.

Aronson earned a bachelor’s degree in 1954 at Brandeis University, where he was mentored by Abraham Maslow (1908–1970). He then earned a master of arts degree at Wesleyan University in 1956, and completed the PhD program at Stanford University in 1959, where his mentor was Festinger, known for developing the theory of cognitive dissonance. Aronson subsequently held faculty positions at Harvard University, the University of Minnesota, the University of Texas at Austin, and the University of California at Santa Cruz, where he has been professor emeritus since 1994. Since 2001 he has also been distinguished visiting professor at Stanford University.

Beginning in 1959 and continuing through the mid-1960s, Aronson published a number of widely cited experiments that tested derivations from the theory of cognitive dissonance, providing support for dissonance-theory explanations of such phenomena as effort justification (evaluating an outcome more positively after a high degree of effort was required to attain it) and insufficient deterrence (devaluing a forgone pleasure when the threatened aversive consequence was minimal). Aronson proposed a useful modification to the theory of cognitive dissonance by asserting that the dissonant cognitions must be self-relevant, and that dissonance reduction will be directed at preserving one’s self image. In the 1990s he returned to this topic in experiments that show that making salient a discrepancy between the behavior that one advocates for others and one’s own behavior (hypocrisy)