INTRODUCTION

Geopolitics has been defined most succinctly as "the relation of international political power to the geographical setting."[1] This definition has three principal conceptual components—the international system of nation states, political power, and geography—each of which has a significant relationship to technology.

The development of the modern international system of nation states, which can arbitrarily be dated from 1789, coincided with the Industrial Revolution and the inauguration of the age in which technical factors of production—and of destruction—are a primary determinant of much of human activity. The coincidence was not accidental. Improvements in transportation and communication systems were necessary not only to provide the internal cohesion necessary for the viability of a nation state but also to effect the large-scale mobilization of the civilian population and civil resources which characterizes the modern nation state. The development of rail movement, in particular, was of critical importance. As Major-General J.F.C. Fuller has argued, "it was George Stephenson more so than Napoleon or Clausewitz who was the father of the nation-in-arms."[2]

National power is the product of a wide variety of both relatively stable and dynamic elements, perhaps the most stable of which is geography. Another relatively stable factor that exerts an important influence upon the power of a nation with respect to other nations is national resources, and most particularly the extent of national endowment with raw materials, both for industrial production and the waging of war. Less tangible factors are national character, national morale and the quality of national leadership and diplomacy. The most dynamic factor is technology. As Hans Morgenthau has noted, "the fate of nations and of civili-
izations has often been determined by a differential in the technology of warfare for which the inferior side was unable to compensate in other ways."[3] The development of firearms and artillery in the fourteenth and fifteenth centuries "spelled a momentous shift in the distribution of power in favor of those who used those weapons before their enemies did."[4] In the twentieth century the submarine, the tank, air forces, and nuclear weapons and their means of delivery have given enormous power to states which possess them as compared to states without them.[5]

The geographical setting is "a combination of landform distribution and patterns of movement."[6] The physical geographical features which are important in international relations include the distribution of land and sea, the topography, the hydrographic network, the size of the national territory, and its aptitude for production.[7]

The implications of these geographical features for international relations and national security are, of course, neither immutable over time nor invariant as between different geographical settings. For example, essentially similar topographical or insular situations can produce different consequences in different historical periods or in different environmental or technological circumstances in a given historical period. As Jean Gottman has noted, "a mountainous range can be a barrier or a crossroad. . . . The valley in a mountain range can be either an isolated and closed little world or a main street filled with busy traffic."[8]

Technology, geography, political power, and the dynamics of the international system are in fact highly interdependent variables. Intrinsic to the behavior of states in the international system is the projection of political demands "through space from one location to another upon the earth's surface"—an exercise involving the expenditure of energy and the consumption of other resources, the effectiveness of which is primarily determined by the state of technology.[9]

From this perspective, there is a curious lack of appreciation in the writings of the classical geopolitical theorists of the impact of technology on national power, geography, and the dynamics of the international system.

In his most famous book, The Influence of Sea Power on History, 1660-1783, published in 1890, Captain A. T. Mahan listed six fundamental factors affecting the development of sea power: geographical position, physical conformation, extent of territory, size of population, national character, and governmental character.[10] The state of naval technology is a notable omission from