GREAT POWER WAR, 1815-1945: AN EXAMINATION OF
SOME POWER POLITICS ARGUMENTS

by

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Trudy did without a husband and Francis and Suzanne did without a father during too many summers. I hope that they will forgive me.
ABSTRACT

GREAT POWER WAR, 1815-1945: AN EXAMINATION OF SOME POWER POLITICS ARGUMENTS

The concept 'the balance of power' covers a welter of conflicting propositions, all of which follow from the basic assumption that states maximize power. The purpose of this thesis is to examine empirically some of the conflicting power politics arguments concerning the causes of each great powers' wars from 1815 to 1945. As such, I may appear to be mustering yet another party to explore very familiar grounds for the power politics arguments have attracted many quantitative studies. However, few, if any, of these statistical analyses are relevant to the arguments which they purport to test. Therefore, this thesis is a test of commonplace arguments and a demonstration of the inappropriateness of the commonplace methodology.

Sixteen propositions relating alliance commitments, industrial growth, and relative power position to great power participation in interstate war are drawn from the power politics 'paradigm.' Each is examined using data sets from the Correlates of War Project, augmented with other time series. My methods are less elegant than the statistical analyses but the results are, thereby, sturdier stuff.

While there is a relationship between non-defense commitments between great powers and activist participation by some of them against a smaller state, there are no associations between the number of various types of allies and involvement in war.
The four propositions linking economic prosperity and war involvement receive modest support. They are modest propositions. For example, activist wars occurred in times of high economic growth but high growth rates cannot predict to war. There are many prosperous years and few wars. Four of the relative power position propositions have the same limitation. Wars occur after an increase in relative power position but most increases do not lead to war.

Parity of geopolitically non-separated great powers increases the likelihood of war between them. Preponderance and geopolitical barriers preserve peace.
Chapter I
INTRODUCTION

1.1 GREAT POWERS AND WAR

While the threat of war pervades the state system, participation in war is not randomly distributed across the population of states. States, according to the conventional and legal definition, can and do engage in warfare; but members of a distinct class of states, the great powers, are far more war-prone than others. Warfare, like participation in numerous other interstate activities, tends to be rank dependent.¹ The higher the rank or the more powerful the state, the more wars it fights and the more fatalities it inflicts, just as it trades more goods, exports more capital and joins more international clubs than those less powerful.

The most active combatants in international war during the 1815-1945 period are listed in Table I:1.

Table I:1

¹ The phrase is Johan Galtung's. See, for example, the essays in his Peace And World Structure: Essays In Peace Research, vol.IV (Copenhagen: Christian Ejlers, 1980).

- 1 -
### Table I:1

**State Participation In War, 1815-1945**

<table>
<thead>
<tr>
<th>State (Great Power)</th>
<th>Interstate Wars</th>
<th>Extra Systemic Wars</th>
<th>Total Wars</th>
<th>Battle Deaths Suffered</th>
</tr>
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<tbody>
<tr>
<td>France (1815-1940)</td>
<td>10</td>
<td>4</td>
<td>14</td>
<td>1 813 540</td>
</tr>
<tr>
<td>Italy (1860-1945)</td>
<td>10</td>
<td>1</td>
<td>11</td>
<td>759 600</td>
</tr>
<tr>
<td>Turkey</td>
<td>10</td>
<td>6</td>
<td>16</td>
<td>756 400</td>
</tr>
<tr>
<td>Russia/USSR (1815-1917, 1921-)</td>
<td>8</td>
<td>5</td>
<td>13</td>
<td>9 605 560</td>
</tr>
<tr>
<td>Japan (1895-1945)</td>
<td>7</td>
<td>0</td>
<td>7</td>
<td>1 365 300</td>
</tr>
<tr>
<td>Austria (1815-1918)</td>
<td>6</td>
<td>2</td>
<td>8</td>
<td>1 287 200</td>
</tr>
<tr>
<td>Prussia/Germany (1815-1918, 1925-1945)</td>
<td>6</td>
<td>0</td>
<td>6</td>
<td>5 353 500</td>
</tr>
<tr>
<td>Greece</td>
<td>6</td>
<td>0</td>
<td>6</td>
<td>53 270</td>
</tr>
<tr>
<td>United Kingdom (1815- )</td>
<td>5</td>
<td>11</td>
<td>16</td>
<td>1 293 590</td>
</tr>
<tr>
<td>Spain</td>
<td>5</td>
<td>4</td>
<td>9</td>
<td>188 900</td>
</tr>
<tr>
<td>China</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>2 170 000</td>
</tr>
<tr>
<td>United States (1898- )</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>554 800</td>
</tr>
<tr>
<td>Rumania</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>639 500</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>74 000</td>
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</tbody>
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Although some smaller states were involved in as many, or more, wars than some great powers, the pattern is clear. The over-representation of the great powers would be far more striking if Table I:1 could be expanded to include the remaining one hundred and twenty states which were members of the interstate system between the end of the Napoleonic wars and the end of World War II. The great powers of those 130 years -- namely the United Kingdom, France, Prussia/Germany, Austria/Hungary, Russia/USSR, Italy, Japan, and the United States -- fought on more occasions, and suffered and caused others to suffer more casualties than the non-great powers. Always a distinct minority among states, the great powers had at least one of their number engaged in 65% of the 80 international wars Singer and Small catalogued in *The Wages Of War* for this period.² If we discount the imperial or colonial wars and concentrate upon the more restrictive interstate category, this percentage drops minutely. Similar percentages can be obtained from Wright's compilation of modern wars and from Richardson's


George Modelski performs similar computations in "War and the Great Powers," *Peace Research Society (International)*
list of deadly quarrels. Furthermore, if we, following Singer and Small, determine the initiator of each war by noting which party first attacked in force, we find that, of the 52 international wars in which at least one great power participated, nearly all were initiated by a great power. This fact accounts for the abnormal war-proneness of the few non-great powers found listed in Table I:1. Turkey and China, more often than not, were the objects of attack by a great power. All of China's wars were initiated by a great power and most of her casualties were the result of a series of wars with Japan.

The strong association between war and great power states is not unexpected. A defining quality of a great power has been, and continues to be, the capacity to wage war effectively. The interests of great powers are commensurate with their more extensive participation in the inter-state system. However, in Wight's judgement, "power is more important than interests" and "this means that the great powers can afford to incur a war." "We might simplify the whole matter," continues Wight, "by saying that a Great

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Papers, 18(1972), 45-59. He shows that while the battlefields have shifted from the territories of the center states towards the territories of the periphery since World War II, the involvement of the great powers in war remains high. See also Istvan Kende, "Twenty-five Years of Local Wars," Journal Of Peace Research, 8 (1971), 5-22 and "Wars of Ten Years (1967-1976)", Journal Of Peace Research, 15 (1978), 227-241.

* The military initiators of interstate wars are identified in Wages Of War, pp.366-370.
Power is one that can afford to take on any other power whatever in single combat." Although pointing correctly to the intimate connections between state power and war, this criterion, as Wight is aware, oversimplifies the matter.

Some states which were accepted as great powers could not "afford to take on any power whatever in single combat." Italy certainly could not do so. After her wars of national unification, Italy joined the United Kingdom, France, Prussia, Russia and Austria in the great power set, and thereafter occupied with them a position far more than a notch above that of ordinary states. Her peers achieved and maintained their predominant position by increasing their industrial and military capabilities with which to fight, and demonstrating, when necessary, the ability to fight. Italy, on the other hand, rarely fought successfully in European wars, was humbled during her military ventures in Africa in the 19th century, yet maintained great power status "by courtesy" of others and the ability to attach herself to the winners in great power wars.  

Prussia, Italy's ally in the Seven Weeks war, followed the textbook pattern. Already a great power at the beginning of the 19th century, Prussia enhanced her position in the Bund and in the great power hierarchy with a series of wars against her

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5 Martin Wight, Power Politics (London: Royal Institute of International Affairs, 1946), p.19. A revised and much expanded version of Power Politics has been published under the editorial supervision of Hedley Bull and Carsten Holbrand. See Power Politics (Leicester University Press: Leicester, 1978).
neighbours: Denmark, Austria and France. Similarly, in 1895, Japan joined the European great powers after defeating China. The United States soon followed in 1898 after defeating Spain.

Just as states become great powers by means of war, so also do they become mere states once again. After surrendering in 1919, Germany lost great power status temporarily, while her ally, Austria-Hungary, was dismembered and permanently excluded from the great power ranks. Russia, defeated by Germany in 1917 and rent by revolution and civil war, withdrew from world affairs until 1922. The victors of World War II once more removed Germany and her allies, Italy and Japan, from the great power set.

The relationship between great power status and war appears to be self-perpetuating and circular: great powers 'cause' wars and wars 'cause' great powers. Often the size of these states is thought to be the most important element in this feedback process. War, in Kohr's assessment,

is the consequence not of evil schemes or evil disposition but of the power that is generated by excessive social size. For whenever a nation becomes large enough to accumulate the critical mass of power, it will in the end accumulate it. And when it has acquired it, it will become an aggressor, its previous record and intentions to the contrary notwithstanding.

The mystery of their war-mindedness was always their sudden acquisition of power, as the mystery of their conversion to the abandoned ways of peace was always their sudden loss of power. Nothing else ever counted.6

6 Leopold Kohr, The Breakdown of Nations (1957; rpt.)
Others disagree and stress the nature of the inter-
relationship among the great powers in order to explain
their war-proneness. Rather than size per se, argues
Wright,

the more important reason for the excessive
belligerency of great powers... lies in the
structure of the balance of power, which
practically assures that all great powers will
enter wars which threaten the balance in order to
preserve it, a responsibility which the smaller
states do not have. 7

Still others argue that peace among the smaller states is
maintained by collusion of the great powers and that the
competition between them is regulated by the balance of
power. Rather than assuring war, the balance of power
prevents great power war and keeps the less powerful in
check.

The purpose of this thesis is to examine empirically
these conflicting views of the balance of power and other
prominent "power politics" theories concerning the causes of
each great power's wars from 1815, when the term "great
power" entered the diplomatic vocabulary, until 1945, when
the distinction between the "great" and the "super" powers
became necessary. These theories are often and pejoratively
labelled "traditional," in contrast to "scientific". To
join in a fray fought under the banners of "Wisdom" and
"Science" would be futile and foolish. The caricatures of

Llandybie, Carmarthenshire: Christopher Davis, 1974),

7 Wright, A Study Of War, p.849.
the "traditionalists" as "incompleat theorists" and of their works as "insight without evidence" are far less inflammatory and more to the point.8

1.2 OVERVIEW

Hoffmann contends that the "balance of power" remains "indispensable to the understanding of international relations", "despite the very different meanings and uses of the notion and the equally divergent assessments of the political realities to which it refers."9 One source of ambiguity in many conceptions of the balance of power is the chameleon-like nature of the explanandum: in one place war is to be explained; in another, peace; and in still another, the status quo ante bellum.

I am concerned with the incidence of the wars of the great powers. Great power war may be defined precisely, but "war" is a blanket term. There are good reasons for differentiating between types of war and, more importantly, between types of involvement in war. In Chapter II I discuss the categories of war and of involvement in war, then describe the war experience of each of the great powers.


in the 1815-1945 period. Thanks to Richardson's *Statistics of Deadly Quarrels*, Wright's *A Study Of War* and, particularly, Singer's and Small's *The Wages of War*, this once formidable task is now a relatively straightforward one.

On the other hand, the problem of determining the balance of power explanation of great power war is not a straightforward one. The ambiguities of the phrase "balance of power", such as the changing *explanandum*, serve to protect the theory rather than to place it in jeopardy, and if scientific theories cannot be placed in jeopardy, they do not remain scientific. The meaning of "balance of power" varies between different theories and within the works of individual theorists. Moreover, where the key concepts are confined to specific definitions, the empirical implications of a particular balance of power theory are often contradictory. There is no single theory. At best there exists a set of putative explanations of interstate war, some of which are conflicting, and all of which wobble about an assumption of power maximization.

Figure I:1 summarizes the nomological net woven by balance of power theorists. Some of the strands are not found in particular conceptions of the balance of power, and others could be suggested, but the thickness of each strand does describe its visibility and importance in the literature as a whole. These propositions relating great
power war to alliance activity, industrial capabilities and relative power position are discussed and elaborated upon in Chapter III.

---Figure I:1---

The promise of this thesis is neither a full-fledged theory of great power war nor a decisive, albeit ex post facto, experiment which would eliminate all save one of two or more competing theories. Articulate rival theories do not exist. I have not reached into the balance of power mess, replaced the power maximization assumption with a less permissive one, and proceeded to deduce tidy consequences. "A theory is a cluster of conclusions in search of a premiss." The promise of this work is to examine empirically the plausible, commonplace and, at times, conflicting conclusions found in the "traditional" or "Realist" literature.

I may appear to be mustering yet another party to explore very familiar ground. Most of the arguments which I propose to examine have attracted empirical studies. Indeed Modelski, reviewing the recent history of the study of world politics, declares that "the technical advances (of the behavioral revolution) ... did little more than give some

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Figure 1:1

Theoretical Relationships In The Power Politics Literature
quantitative dimensions to familiar Realist theories."\textsuperscript{11} There is more than a little truth in this position. However, I think that it is more significant to recognize that few, if any, of the statistical studies to which he refers seriously confront the familiar Realist arguments. Many of the "relevant" studies not only do not, they cannot, confront the propositions which are discussed below in Chapter III. More often than not the technical advances prevent them from doing so. The argument of Chapter IV is not Morgenthau's argument that a barrier must exist between his Realist balance of power theory and quantitative analysis; the argument is that one does exist.\textsuperscript{12} To examine the balance of power arguments properly, the barrier must be overcome.


\textsuperscript{12} Citation patterns reveal the barrier and its semi-permeable nature. Favourable references to Hans J. Morgenthau's classic \textit{Politics Among Nations} flow peacefully to the bottom of pages in "Indicators of Cross-National and International Patterns," for example. There they share the space with notes such as "this analysis comprised the oblique (biquartimin) rotation of the initial fifteen factor solution." Rummel, the author of this paper, does use a water simile:

As the course of a river is determined by the fertile valleys through which it flows, so is quantitative research channelled by traditional
If the balance of power theories are deemed to be the work of the "incompleat theorist", many of the quantitative studies which they have attracted suggest the presence of his opposite number, the "compleat empiricist". The compleat empiricist is not the naive inductionist, not the apocryphal individual who busied himself collecting trunks of miscellania which he proudly willed to the Royal Society so that the Fellows might put together explanations. The facts of the compleat empiricist are generally relevant to the problem at hand, but they then are rendered irrelevant by his method. The one fact which the compleat empiricist is not as wary of as he should be is that theory and method cannot avoid one another. Particular types of problems demand particular methods and his methods are inappropriate.

insight and knowledge. Together the land and river produce an abundant harvest and together the precision and reliability of quantitative scholarship combined with the rich comprehensiveness of traditional scholarship bear new fruit. (American Political Science Review, 63 (March 1969), 128-129.

To continue the simile, Morgenthau's citations suggest that things simply have gone downhill. There is a strong continuity in the references in Politics Among Nations from the first edition in 1948 onwards. There are no references to any statistical studies in the latest edition.

For an example of the good use to which citation patterns can be put locating various schools of international relations scholars, see Bruce M. Russett, "Methodological and Theoretical Schools in International Relations," in A Design for International Relations Research: Scope, Theory, Methods, and Relevance, Monograph No. 10, American Academy of Political and Social Science, ed. Norman D. Palmer (Philadelphia, October 1970), pp.87-105. In this area of research John Morton's "On Recursive Reference," Cognition, 4 (1976), 309 is a definitive treatment.
To solve a problem, or more accurately to try to eliminate solutions to a problem, an appreciation of the structure of the problem is essential. Method and measurement are to conform to the shape or form of the problem rather than the other way around. Weaver describes three types of scientific problems — of simplicity, of disorganized complexity and of organized complexity — and the methods appropriate to each of them. When making these distinctions Weaver uses a billiard ball analogy, a very apt analogy when discussing Realist theories, and one I now will elaborate.

Imagine one ball on the billiard table: we know its speed and direction and wish to calculate its course and position at various times. This is a simple problem and remains so even if we complicate it with the addition of another ball, the direction of and speed of which we know also. Now we wish to determine if and where they will collide. Problems of this sort, involving one or two objects and few variables, occupied students of classical dynamics. But with the addition of another ball, then another and another, the problems rapidly became insurmountable with the available techniques. Weaver writes that now we should imagine

a large billiard table with millions of balls rolling over its surface, colliding with one another and with the side rails. The great surprise is that the problem now becomes easier, for the methods of statistical mechanics are applicable. To be sure the detailed history of one special ball cannot be traced, but certain
important questions can be answered with useful precision, such as: on the average how many balls...?

The methods of statistical mechanics are valid only when the balls are distributed, in their positions and their motions, in a helter-skelter, that is to say a disorganized way.\(^\text{13}\)

Now imagine far less than millions of billiard balls upon the table: they are different sizes and move at various speeds, often congregating at opposite ends of the table and travelling in tandem; collisions are rare, but not equiprobable, and the majority of collisions involve the few very large balls. In short, movement and collision are not helter-skelter or random: they have an order to them. To chart the paths of the balls and to account for their periodic collisions is not a problem of simplicity nor is it one of disorganized complexity. The problem involves "a sizable number of factors which are interrelated into an organic whole," or organized complexity.\(^\text{14}\)

Whereas Figure I:1, which summarizes the balance of power propositions, describes a problem of organized complexity, Figure I:2, which summarizes the quantitative work which they have attracted, describes a set of problems of simplicity. The nomological net becomes, under quantitative

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scrutiny, a knot: each of the key factors -- alliances, relative power position and industrial capabilities -- is tied directly and autonomously to interstate war.

---Figure 1:2---

Of course we must break apart the complexities of the social world in order to understand it, but some ways do not enable us to return the pieces to a coherent whole. The whole is different from the sum of the parts. For example, the relative power position of a great power depends upon that state's alliance activity and industrial development and upon the alliance activity and the industrial development of each of the other great powers. When the strands connecting these factors are broken, the prospects for primitive accumulation of the existing empirical riches by a theorist are diminished.

The empirical riches themselves are diminished also. The organized and complex propositions are turned into simple ones and turned over to methods suitable to disorganized complexity. The common techniques of analysis rest upon assumptions which, I argue, must be met and which often are incompatible with problems of organized complexity. For example, many of the conclusions about the strength of single strands leading to interstate war are products of cross-sectional statistical manipulations. This cross-
Figure 1:2

Power Politics Relationships Examined In Empirical Studies
sectional mode of analysis precludes any meaningful causal analysis and, more often than not, any meaningful interstate relations requiring such analysis. Moreover, attempts to remedy the frequently-noted static character of cross-sectional analyses by the introduction of time "lags" or "leads" exacerbate these difficulties. So also do attempts to recover the international relations which have been lost by analysis of dyads. If chaos is to precede, not to proceed from, order, the problems of measurement and method demand further attention. This they receive in Chapter V.

Consider once more the notion of relative power position. Four different types of indices of relative power position are found in the empirical studies reviewed in Chapter IV. They are: (1) the absolute differences in war potential between pairs of great powers or the ratios; (2) the rank position; (3) the percentage share of the total capabilities of a group of states; and (4) the percentage deviation from the mean share of the total war potential. Each of these indices has significant limitations, the common denominator of which is the inability to exploit fully the existing information on the interrelations between the great powers. Aside from wasting information about the position of a great power vis-a-vis its competitors in terms of individual capabilities, all of the indices disregard the principal means of redressing the balance -- alliances.
To measure relative power position without taking into account the alliance commitments states make to one another is to insulate the empirical analysis from the basic balance of power argument. Whether the balance of power is thought to generate war, to continue peace, or to maintain the more nebulous "stability", there is no doubt that it is a theory of alliance and counter-alliance. If the balance of power refers to a set of scales in equilibrium, alliances maintain it in equilibrium; if the balance of power refers to a bank balance, alliance participation adds to some accounts and subtracts from others; if the balance of power refers to the configuration of power, balanced or not, alliances alter it.

In Chapter V I demonstrate the technical and substantive limitations of the available indices and describe and defend a more suitable index of relative power position which I have constructed.

The alliance data and the indicators of war potential, like the information on great power war, are products of the Correlates of War Project.\(^\text{15}\) The power capabilities data consist of annual observations on iron production, steel production, number of military personnel, military expenditures, and energy consumption for each great power. While some weighted combinations of these and other series

\(^{15}\) They are described briefly in J. David Singer, "The 'Correlates of War' Project: Interim Report and Rationale," *World Politics*, 24 (January 1972), 243-270. My debt to this research project and to J. David Singer, the project's director, is immense.
are to be found in the literature, I have not found them satisfactory. Some are very complicated, and in questions of measurement and technique, I value simplicity. With concepts such as "foreign trade", "national income" and "unemployment" which do have adequate theoretical substrata, "the technical problems of index number construction are heroic." When the theoretical substratum is far more rudimentary, as it is with "power capability" or "war potential", the problems are monstrous. There is no requirement that the technical difficulties be made more monstrous with the use of complicated techniques. Factor analysis, for example, adds to the problems rather than reduces them. My amalgam of power capabilities is simple and the results are reasonable.

Chapter V continues with a discussion of the difficulties of measuring industrial growth and alliance activity and of finding the appropriate techniques of analysis. Throughout the injunction is: Do not waste information when we have so little! Proper procedures of data analysis, like proper measurements, conserve information.

The formal statistical techniques such as correlation, regression and various forms of tabular analysis common in empirical studies of international relations compress rather than conserve information and are ill-suited to an

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examination of the balance of power theories. The balance of power propositions, like most propositions in the field, are crude, and the precision formal statistical analysis provides is often superfluous, hindering rather than expanding opportunities to further theoretical development.

Testing the propositions is the first step in data analysis. The second step — one our rudimentary theory and paucity of evidence requires us to take, and to take seriously -- is to expose the data. As Tukey and Wilk argue:

Exposure, the effective laying open of the data to display the unanticipated, is to us a major portion of data analysis. Formal statistics has given almost no guidance to exposure; indeed it is not clear how the informality and flexibility appropriate to the exploratory character of exposure can be fitted into any of the structures of formal statistics so far proposed.17

Graphical displays are simple, powerful and flexible techniques of data analysis, and I use them extensively. Aside from their quirks and the opportunities provided for self-deception, graphical displays have the disadvantage of demanding far more space on a page than statistical analyses. Perhaps bulkiness accounts for the near complete absence of graphics of any sort in the published studies relevant to the balance of power propositions.

The next three chapters contain the data analyses, the conclusions they permit, and the conjectures they suggest. In Chapter VI I examine the propositions concerning alliance commitments and economic growth rates and the interaction between growth rates and alliances and great power war. Relative power position and great power war is the subject matter of Chapter VII. Chapter VIII, the conclusion, is both a catalogue and a coda. There I summarize my diverse findings and illustrate how some of them can be used to explain some of the diverse results of studies of the balance of power system during the 1815-1945 period.18

Chapter II

GREAT POWER WAR, 1815-1945

The balance of power is supposed to preserve stability; but "stability" is nebulous. "Stability" may refer to peace, or to the absence of major war, or the return to the status quo ante bellum. In the first two instances war signifies that the balance of power has "failed", and in the last instance war is a means to maintain the state system and to prevent empire. The purpose of this study is to examine explanations of the incidence, not the consequences, of war. A war is an organized violent conflict between two or more political communities. However, not all organized violent conflicts are wars, and not all wars concern the balance of power theorists. The task at hand is to describe the international wars each great power fought during the one hundred and thirty years between 1815-1945 and which are in the purview of the balance of power theorists. To do so, we must classify the types of great power war, distinguishing between wars and other violent conflicts, and determine the kinds of involvement in war.

1 Of course the consequences of a war, like the consequences for the chicken of crossing the road, may be part of the explanation of the incidence of war and must be a large part of the explanation in a theory which presumes rational action, as does the balance of power theory.
"War", like "cancer", is a blanket term and as cancer covers a variety of types—leukemia, lymphoma, sarcoma, carcinoma—so too does "war." The balance of power theory purports to explain warfare between members of the state system; therefore, the civil wars which occasionally rend states and the many imperial or colonial wars which occupied the great powers at the periphery are irrelevant here (even though they may have consequences for the balance of power). Wright in his monumental *A Study of War* identifies "balance of power wars" with wars between recognized states, but this is too crude for my purposes. Whether applied to a group of wars, or to a group of theories about the causes of war, the label "balance of power" obscures what may be significant differences. As Morgenthau writes, the implication that all states are involved in the balance of power is to be avoided.

We have spoken thus far of the imbalance of power as if it were one single system comprehending all nations actively engaged in international politics. Closer observation, however, reveals that such a system is frequently composed of a number of subsystems that are interrelated with each other, but that maintain within themselves a balance of power of their own. The interrelationships between the different systems is generally one of subordination, in the sense that one dominates because of the relatively great weight accumulated in its scales, while others are, as it were, attached to the scales of that dominant system.


Obviously, the European great powers—France, the United Kingdom, Prussia, Austria and Russia—constitute the "dominant system" at the beginning of the nineteenth century, and some states adhere to it, and others are drawn in as the years pass. The problem is to locate these other, mainly non-European, states in relation to the great power competition.

A series of sociograms describing the networks of great power activities since the Congress of Vienna and enabling one to separate the involved and influential from the uninvolved and non-influential would be a boon. Such rigorous guides do not exist. Indeed, it would be remarkable, and perhaps a sign that something is amiss, if maps of political space were as stark as maps of physical space. The few attempts to map politically effective distances demonstrate that arbitrariness can be reduced, but it cannot be avoided. However, to be arbitrary does not mean to be capricious.

For the period 1815 to 1919, Singer and Small divide the members of the state system into a central group, which is predominantly European with the great powers at the core, and a peripheral group which is composed of minor European states plus almost all of the non-European states. After World War I, they merge the two groups and simply distinguish between the great powers and ordinary states. This does not resolve the problem of locating balances, but with the distinctions between types of states, six strains of Wright's "balance of power war" can be identified. See Table II:1.

Table II:1 about here

The numbers in the cells are the frequencies of interstate conflicts involving at least 1000 battle fatalities during the 1815-1945 period. The causal paths to each type may vary as do those to various biological cancers.

Table II:2 about here

Table II:2 summarizes the incidences of war for each of the great powers. A state does not participate in war by a declaration to do so: participation requires "a minimum of 1000 armed personnel engaged in active combat

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5 Singer and Small, The Wages of War, pp. 22-23.
### Table II:1

**Types of 'Balance of Power War', 1815-1945**

**Combatants**

<table>
<thead>
<tr>
<th>Combatants</th>
<th>Great Power</th>
<th>Central State</th>
<th>Peripheral State</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great Power</td>
<td>8</td>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Central State</td>
<td>13</td>
<td>6</td>
<td></td>
<td>19</td>
</tr>
<tr>
<td>Peripheral State</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25</strong></td>
<td><strong>12</strong></td>
<td><strong>7</strong></td>
<td><strong>44</strong></td>
</tr>
</tbody>
</table>

*Source: Singer and Small, *The Wages Of War*, Table 4:2.*
### Table II:2

**Number of Each Type of Interstate War: Great Powers, 1816-1945**

<table>
<thead>
<tr>
<th>Great Power</th>
<th>Great Power</th>
<th>Other Central State</th>
<th>Peripheral State</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Kingdom</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>France</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Prussia/Germany</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Russia/USSR</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Austria/A-H</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Italy</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>United States</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Japan</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: Singer and Small, *The Wages of War*, Table 4:2.
within the war theater" or suffering at least 100 battle deaths. While the number of deaths provides a threshold to distinguish wars from less significant, though still deadly, quarrels between states, incidence and severity—the latter measured by the total number killed—are distinct variables. They are not merely alternative indicators of the amount of war a great power experiences; one is dichotomous and, hence, cruder than the other. Within the Realist paradigm, war is, to quote von Clausewitz, "nothing but a continuation of political intercourse with an admixture of other means," but it is not a continuous variable. It is extremely discrete: it occurs and has a definite end point, or it does not occur. The task of accounting for variation in severity arises once a great power experiences wars.

6 Ibid., pp.36, 35. Note that 1000 battle fatalities is a criterion for war and not participation in a war.

7 The total numbers of military dead are recorded by modern states as a matter of bureaucratic necessity, but bureaucratic necessity does not guarantee accuracy and bureaus often differ. Singer and Small discuss the accuracy and reliability of these numbers on pp. 347-370 of their compendium of misery The Wages Of War.

Note that civilian casualties often outnumber military casualties, but the numbers are unreliable. Some very reasonable estimates can be found in Gil Elliot's portrait of "the nation of the dead"—the results of the mass political violence of our century. His book, The Twentieth Century Book of the Dead (Harmondsworth: Penguin, 1973), is a fine work of necrology. Necrology, as Elliot defines it, "simply means the naming or listing of the dead."

power engages in war and the correlates of one need not be the correlates of the other.

To account for incidence, the unit of analysis is the state, and to account for severity, war becomes the unit. We easily can imagine a situation in which a state would be unlikely to participate in war and, if a war were to occur, it would be extremely bloody. For example, Deutsch and Singer argue that in a bipolar world one would expect few but severe wars and in a multipolar world one would expect many less severe wars.\(^9\) In this sense, frequency of war may vary inversely with intensity: just as the accident-prone person suffers more bruises than broken bones, accident-prone states suffer more wars with "minor" fatalities than major fatalities.\(^10\) To repeat, explaining incidence and severity poses two problems, not simply variations on the single theme of the amount of war.

An examination of a recent study of "Capability Distribution, Uncertainty, and Major Power War, 1820-1965" illustrates the possible pitfalls of lumping all great power wars together and of failing to distinguish between the incidence of war and the characteristics of wars once they occur.

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\(^10\) Evidence that this is the case for deadly quarrels in general, and international wars in particular, can be found in Richardson, *Statistics of Deadly Quarrels*, p. 153, and in Singer and Small, "Alliance Aggregation and the Onset of War," pp. 256-257.
do occur. Singer, Bremer and Stuckey investigated two incompatible propositions concerning the consequences of the distribution of military-industrial capabilities and of changes in that distribution within the great power group of states.\textsuperscript{11} The first proposition was that an unequal distribution of power and movements towards greater inequality made war less likely. The second contended that approximate parity and movements towards further equality decreased the chances of war. The reasoning underlying both propositions was that parity would increase "decisional uncertainty" (defined as "the difficulty which foreign policy elites experience in discerning the stratifications and clusters in the system and predicting the behaviour of other members of that system"). The question to be settled was whether decisional uncertainty inhibited initiation of war or permitted stumbling into one. Note that both propositions purport to account for the incidence of war.

In the section of their paper subtitled "The Incidence of War," Singer, Bremer and Stuckey empirically define the dependent variable. "The particular index used," they write, "is a reflection of the magnitude of war underway, as measured in nation-months of...major interstate war"! The substitution of a measure of the magnitude of war for the incidence of war is not, and cannot, be justified theoretically. Furthermore, the inclusion of all interstate

wars "in which at least one major power was an active participant" is not, and cannot be justified theoretically. As can be gleaned from the figures in Tables II:1 and II:2, most of the interstate wars since 1815 pitted a great power (or great powers) against minor powers. If the great powers are treated as an entity, as they are by Singer, Bremer and Stuckey, the theoretical rationale offered provides little help in explaining why a coalition of great powers destroyed the Turkish fleet at Navarino Bay, or Napoleon III began his ill-fated imperial adventures in Mexico. The theoretical statements are limited to competing explanations of wars between great powers, and to remain faithful to them, the eight such wars which occurred during the 1815-1965 period should not be intermingled with the twenty-one other

12 Singer, Bremer and Stuckey are aware of some problems of their criterion for including great power wars. They write in a footnote (p.41):

Parenthetically, for those who suspect that the definition of war used here may be too broad in that it embraces all inter-state war involving major powers, we mention a relevant finding. That is, if we look only at those eight wars in which there is a major power on each side, we find that there was a decline in \text{CON} (concentration of capabilities) during the half decade preceding all but one of those wars. Since these are almost equally divided between the centuries, they lend some support to the peace through preponderance doctrine.

I find this footnote extremely puzzling. For one thing, it implies a contradiction with the findings reported in the body of their paper. Moreover, they conclude that the "parity and fluidity" model fits the 19th century and the "preponderance and stability" model fits the 20th century, but the more relevant analysis noted "parenthetically"
interstate wars in which a great power participated. 12

Eight wars between great powers is too few a number for elaborate statistical manipulations. I suspect that the purpose of substituting duration for incidence was to create the statistical variation required by the multiple regression techniques the authors employed. As the statistical variation increased, the fault line between the theoretical arguments and the empirical tests widened. Therefore, the study provides an example of technique's domination. 13 The problem of 'too few wars' for statistical analysis is a substantive problem, not a technical one and one that is more important where the unit of analysis is the state rather than a group of states.

favours the latter for the whole time period. For another thing, the footnoted finding is mistaken. When the bivariate correlations (the point biserial is the appropriate statistic) are computed for CON, the other independent variables and the incidence of war among the great powers, the original findings are reaffirmed without mangling the theory.

13 The word "domination" is used with care. "Tyranny of technique" is alliterative and more common, but the phrase obscures the problem. Tyranny is obvious, and every reasonable person is against tyranny; whereas, "domination, compared to all other modes of oppression, is unique in that the dominated remain oblivious of their domination."

The world of the dominated is a falsified reality that has been granted the semblance of the natural which in turn grants it an aura of rationality and legitimacy.

(Alkis Kontos, "Domination: Metaphor and Political Reality" in Domination ed. Alkis Kontos (Toronto: University of Toronto Press, 1975), pp. 218-219. See Chapter 4, below, for
If the great power group is the unit of analysis, war becomes an attribute of the group and not a relationship between states: therefore, it is not necessary to pry into the anonymity the group provides. If, on the other hand, the individual great power is the unit with which we are concerned, as in this study, failure to identify the initiator or "aggressor" poses a plausible threat to the validity of the results obtained. It would imply that war is a symmetrical relationship between states -- both combatants are equally "aggressors" or "defenders." This assumption of symmetry is often theoretically inappropriate and empirically inaccurate. However, we must be careful not to replace the assumption of symmetry by embracing its opposite, the assumption of asymmetry. "Remember that between posit and opposite the game need not be zero sum."  

Many explanations of interstate war, including some of those in the balance of power school, are explanations of the bellicosity of states, not mere involvement in war. For example, it is argued that the dominant state A, unless checked by a coalition of its weaker neighbours, will initiate war in order to further its dominance. Whether A (in fact) does attack B, a weaker state, is something to be

an expansion of this argument and numerous illustrations.  

examined. If A does so, the war is decidedly asymmetrical and the explanation of B's participation is quite straightforward—it is defending itself. The elementary, if not always heeded, point is that B's warfare is not necessarily evidence against the argument and should not always be taken as such. "Treating asymmetric conflicts as if they were symmetric can be disastrously misleading. We all appreciate the fraud that can be perpetrated by appropriate definitions of equality. There is the case of the butcher accused of adulterating rabbit meat. When asked how much horse meat he added, he replied, 'No more than 50%: one horse, one rabbit'."

Separating rabbit from horse meat is trivial when compared to reliably and validly distinguishing between different kinds of involvement in war. The equivalents of the butcher cannot be questioned, and even if they could be, the answers they might give would not prove helpful. Goldmann, after classifying the states which had engaged in war since 1945 according to the justifications which national leaders offered, points out the most plausible threat to the validity of such a procedure.

After all, justifications are determined by the desire to make an action appear compatible with existing norms; they may tell us little about other types of motives and they are obviously unreliable as sources of information about the situation.16

Goldmann's concern is misleading tests of the rank disequilibrium hypothesis in Galtung's structural theory of aggression. He illustrates that the use of the inappropriate symmetric data inflates the relationship between rank disequilibrium, or status inconsistency, and war. Assessing his "experiment in asymmetry", Goldmann writes:

none of the four ways of creating asymmetry that have been experimented with here is satisfactory. The point is, however, that the symmetric approach is not very satisfactory either. Indeed, whereas the validity of the four asymmetric approaches can be argued for and against, the symmetric approach is obviously invalid to most hypotheses considered here.

Goldman ends his project dejectedly.

It is difficult to distinguish between "aggression" and "defense" in a way that is both valid and reliable. Therefore, asymmetric theories about warfare...cannot be tested quantitatively. Much can be said in favour of that defeatist conclusion.

And that is truly a defeatist conclusion because, if it were accepted, all inquiry, quantitative or not, into asymmetric theories would have to cease. Reliability and validity lie upon a continuum where they pull against one another.


19 Ibid., p.278.
Instead of trying to maximize both, it would be preferable to forego the literally utopian search for a single criterion or an all-duty checklist which would be both valid and reliable for identifying various types of involvement in war. Perhaps the first thing to do is to dispense with the term "aggressor" and, following Goldmann, to talk of "active conflict behavior." Our task is not the vulgar and superficial one of naming the cause of each war. "All we can say is that one nation initiated or started or opened the war, but that is a description, not explanation of the beginning of a war." 20

Singer and Small, in their compendium The Wages of War, identify the initiators—those states "whose battalions made the first attack in strength on their opponents' armies or territories" 21—of all but one of the great power wars.

Table II:3

As the figures in Table II:3 indicate, the asymmetry of great power war reflects the asymmetry in capabilities between the combatants. Only two mice appear to have roared: Sardinia in her first war with Austria in 1849 and Turkey in the Crimean War, one of her many wars with Russia. Singer and Small carefully state that their identification


21 Singer and Small, The Wages of War, Table 14:7, pp.366, 368-370.
### Table II:3

Initiators in Great Power Interstate War, 1816-1945.

<table>
<thead>
<tr>
<th>Great Power</th>
<th>Number of Wars Against Non-Great Power</th>
<th>Number of Times Great Power Initiated</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Italy</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Russia/USSR</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Japan</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Austria</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Prussia</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

The numbers include Navarino Bay (1827).

is "as crude as it is tentative" and they are not trying to reach a firm data-based conclusion as to which participant "caused" the war whether by action, threat or other provocation.\textsuperscript{22}

The "particularly ambiguous cases" of great power war which they list—Navarino Bay (1827), the Crimean (1853-1856), Italian Independence (1859), and the Sino-Indian War (1962)—suggest that the military initiator need not be the more "active" party. Navarino Bay was left out of Singer's and Small's initiation/victory or defeat tabulations because Turkey, which attempted to break a blockade of her fleet imposed by France, the United Kingdom and Russia, misleadingly would be named the initiator according to their definition. Singer and Small point out that actions by Russia may have provoked Turkey into what became the Crimean War, and that the same sort of argument could be made in the other two cases. Austria can be seen as responding with large scale military actions to the Sardinian provocations, and China can be seen as responding to Indian activities in the disputed border area between the two states.\textsuperscript{23}

Ray, in his dissertation on status inconsistency and great power war, examines each great power war, interstate and imperial, and seeks to identify the "activist involvement." He defines activist war involvement as engagement by a state "in an international war which arises

\textsuperscript{22} \textit{Ibid.}, p.366.

\textsuperscript{23} Singer and Small, \textit{The Wages of War}, pp. 366-367.
Table II:3

Initiators In Great Power Interstate War, 1816-1945.

<table>
<thead>
<tr>
<th>Great Power</th>
<th>Number of Wars Against Non-Great Power</th>
<th>Number of Times Great Power Initiated</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Italy</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Russia/USSR</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Japan</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Austria</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Prussia</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

The numbers include Navarino Bay (1827).

out of a conflict in which that state advocated a change in established political arrangements." Established political arrangements are those in existence for more than a year. The asymmetries made are certainly debatable but the debate, rescued from the abstract and universal, can now be awarded. The military initiators and the more broadly defined activists are, far more often than not, the same.

Table II:4 describes the incidence and severity of great power wars and the types of involvement of each great power.

Table II:4

From an humanitarian perspective, the list in Table II:4 is far too long but, from the perspective of a data analyst, it is much too short. Peace is far more common than war. Some natural scientists are confronted with an analogous problem. Earthquakes, for example, are difficult to predict because they are infrequent: the causal paths are not understood clearly and the paucity of such natural disasters restricts the opportunities for clarifying the causal paths. Consider the following comments on current earthquake research. They apply with equal force to the study of man-made disasters.

Ironically, it is the lack of even moderately-sized earthquakes in California that is proving most frustrating to American researchers. Without a long period of observation, including a number of moderate or large earthquakes, it would be impossible to sort out the various geophysical

### Table II:4

**Great Power Interstate War, 1816-1945: Duration, Severity and Type of Participation**

<table>
<thead>
<tr>
<th>War</th>
<th>Duration (Months)</th>
<th>Battle Deaths</th>
<th>Participants (ACTIVIST)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Franco-Spanish 1823</td>
<td>7.3</td>
<td>1 000</td>
<td>France</td>
</tr>
<tr>
<td>Navarino Bay 1827</td>
<td>0.1</td>
<td>3 180</td>
<td>UNITED KINGDOM, FRANCE, RUSSIA</td>
</tr>
<tr>
<td>Russo-Turkish 1828</td>
<td>16.7</td>
<td>130 000</td>
<td>RUSSIA</td>
</tr>
<tr>
<td>Austro-Sardinian 1848</td>
<td>4.7</td>
<td>9 000</td>
<td>Austria, Sardinia</td>
</tr>
<tr>
<td>Schleswig-Holstein 1848</td>
<td>8.1</td>
<td>6 000</td>
<td>PRUSSIA, Denmark</td>
</tr>
<tr>
<td>Roman Republic 1849</td>
<td>1.8</td>
<td>2 200</td>
<td>France, Austria, Two Sicilies, Papal States</td>
</tr>
<tr>
<td>Crimean 1853, 1854</td>
<td>28.3</td>
<td>264 200</td>
<td>United Kingdom, France, Sardinia, Turkey, RUSSIA</td>
</tr>
<tr>
<td>Anglo-Persian 1856</td>
<td>4.6</td>
<td>2 000</td>
<td>United Kingdom, IRAN</td>
</tr>
<tr>
<td>Italian Unification 1859</td>
<td>2.5</td>
<td>22 500</td>
<td>SARDINIA, FRANCE, Austria</td>
</tr>
<tr>
<td>Conflict</td>
<td>Year</td>
<td>Population</td>
<td>Participants</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------</td>
<td>------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Franco-Mexican</td>
<td>1862</td>
<td>57.7</td>
<td>France, Mexico</td>
</tr>
<tr>
<td>Schleswig-Holstein</td>
<td>1864</td>
<td>3.6</td>
<td>Prussia, Denmark</td>
</tr>
<tr>
<td>Seven Weeks</td>
<td>1866</td>
<td>1.4</td>
<td>Prussia, Italy</td>
</tr>
<tr>
<td>Franco-Prussian</td>
<td>1870</td>
<td>7.3</td>
<td>France, Prussia, Bavaria, Baden, Saxony, Wurtemberg, Hesse-Electoral, Hesse-Grand Ducal, Mecklenburg-Schwerin</td>
</tr>
<tr>
<td>Russo-Turkish</td>
<td>1877</td>
<td>8.8</td>
<td>Russia, Turkey</td>
</tr>
<tr>
<td>Sino-French</td>
<td>1884</td>
<td>11.8</td>
<td>France, China</td>
</tr>
<tr>
<td>Russo-Japanese</td>
<td>1904</td>
<td>19.3</td>
<td>Japan, Russia</td>
</tr>
<tr>
<td>Italo-Turkish</td>
<td>1911</td>
<td>12.7</td>
<td>Italy, Turkey</td>
</tr>
<tr>
<td>Conflict</td>
<td>Year</td>
<td>Deaths</td>
<td>Countries</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------</td>
<td>--------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>World War I 1914</td>
<td>1914</td>
<td>9,000,000</td>
<td>United Kingdom, France, Belgium, Russia, Portugal, United States, Italy, Serbia, Greece, Rumania, Japan</td>
</tr>
<tr>
<td>Manchurian 1931</td>
<td>1931</td>
<td>60,000</td>
<td>Japan, China</td>
</tr>
<tr>
<td>Italo-Ethiopian 1935</td>
<td>1935</td>
<td>20,000</td>
<td>Italy, Ethiopia</td>
</tr>
<tr>
<td>Sino-Japanese 1937</td>
<td>1937</td>
<td>1,000,000</td>
<td>Japan, China</td>
</tr>
<tr>
<td>Russo-Japanese 1939</td>
<td>1939</td>
<td>19,000</td>
<td>USSR/Russia, Japan</td>
</tr>
<tr>
<td>World War II 1939</td>
<td>1939</td>
<td>15,000,000</td>
<td>Germany, Hungary, Italy, Bulgaria, Rumania, Finland, Japan</td>
</tr>
</tbody>
</table>

- United Kingdom
- France
- Belgium
- Russia
- Portugal
- United States
- Italy
- Serbia
- Greece
- Rumania
- Japan
- Germany
- Austria-Hungary
- Bulgaria
- Turkey
- Japan
- China
- Italy
- Ethiopia
- China
- USSR/Russia
- Japan
- Germany
- Hungary
- Italy
- Bulgaria
- Rumania
- Finland
- Japan
- United Kingdom
- France
- Russia
- Poland
- Belgium
- Canada
- United States
- Brazil
- Holland
- Yugoslavia
- Greece
- Bulgaria
- Italy
<table>
<thead>
<tr>
<th>Russo-Finnish</th>
<th>1939</th>
<th>3.4</th>
<th>90,000</th>
<th>Finland</th>
</tr>
</thead>
</table>

phenomena that may foretell a damaging earthquake from those that are unrelated.

But as long as underlying earthquake mechanisms remain poorly understood, the only alternative appears to be to observe as many likely precursory phenomena as possible and try to deduce those that can be used to predict the time, location, and size of major earthquakes.25

Peace and war -- earthquakes and the absence of earthquakes -- are to be explained.26

Having described the dependent variable, the next tasks are: 1) to draw out putative explanations and precursors of great power war; 2) to formulate them into testable propositions; and 3) to examine the existing evidence. Once those tasks are completed, I can turn to ways and means to examine the propositions properly.


26 As Geoffrey Blainey rightly stresses, it is "peace that passeth understanding" in many would be explanations of war. "The Peace That Passeth Understanding" is the title of the first chapter of his sometimes irritating, but never dull, book The Causes Of War.
LEAF 36 OMITTED
3.1 PRELIMINARIES

The 'balance of power' is the most prominent of the 'Realist' or 'power politics' explanations of war and peace. The identifying marks of these explanations include the following assumptions and definitions.

1. The state is the sovereign entity.
2. The state is a unitary actor.
3. Rational decision-making prevails.
4. The goal is to maximize power.
5. Conflicts between states, each bent upon maximizing power, are unavoidable.
6. War is a rational instrument of policy. Rather than a disease or a disaster, war is "a continuation of political commerce, a carrying out of the same by other means"\(^1\)
7. Peaceful international relations, to reverse von Clausewitz's definition, are a continuation of violent commerce, a carrying out of the same with other means.\(^2\)

\(^1\) von Clausewitz, On War, p.119.

\(^2\) This formulation is from Anatol Rapoport's introduction to the Penguin edition of On War, p.22. Rapoport compares the Clausewitzean philosophy of war, the Leninist view, the philosophy of modern peace research, and the thinking of contemporary nuclear strategists who claim to be the Prussian's progeny. See also W.B. Gallie, Philosophers of Peace and War (Cambridge: At the University Press, 1978), chp.3.
Before describing and evaluating the balance of power theory, I will comment briefly upon some versions which are incompatible with these assumptions and definitions and upon a criterion of evaluation which is both common and incorrect.

For most 'Realists', the cornerstone of the approach is the assumption that man is innately aggressive and selfish. That assumption need not be accepted in order to examine, and perhaps embrace, their 'power politics' explanations of interstate war. It contributes nothing to them, although it does provide some normative glue to bind 'Realists' against 'Idealists' — those who advocate policies which work against rather than "with the forces inherent in human nature." The Realist goal is a political "theory which tries to understand international politics as it actually is, and as it ought to be, in view of its intrinsic nature". The

---

3 The Realists tend to assume that men are states writ small while they pretend to leap the distance from the nature of man to the nature of the state system. Idealists, and others, are correct to reject such claims. Realists are correct to reject the claim of Idealists that man is by nature co-operative and, therefore, war is unnatural. Both sides are correct for the wrong reasons. Assuming man to be a selfish, aggressive individual helps little when trying to explain participation in warfare and other forms of organized destruction. The opposite assumption is far more compelling. See Stanley Milgram, Obedience To Authority: An Experimental View (New York: Harper & Row, 1974).


4 Morgenthau, Politics Among Nations, p. 14
distinction between a positive theory and a normative one, a distinction often hard to make in practice and an anathema to Realists, is worth maintaining.

Organski, an ardent critic of the balance of power theory, writes that "the balancer is the keystone of the entire theory" and the balancer is supposed to be a state "reserved, self-restrained, humane, moderate, and wise". Or, in other words, one state is supposed to act contrary to the rest for the good of all; moreover, it is essential that it do so. For Organski this is yet another contradiction among a pile of contradictions. However, neither of the two balance of power theorists from whom he documents the theory, namely Morgenthau and A.J.P. Taylor, posit so aberrant a state in their explanations. I think they would applaud Cobden, the British pamphleteer Organski cites, who attacked those of his country's leaders who professed to restrain themselves for the good of Europe, unlike the less wise and less moderate continental statesmen. Cobden wrote in 1836 that

England has, for nearly a century, held the European scales - not with the blindness of the goddess of justice herself, or with a view to the equilibrium of opposite interests, but with a cyclopean eye to her own aggrandizement.

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6 Morgenthau's discussion of the "balancer" is on pp. 187-190 of Politics Among Nations and Taylor's balance of power theory can be found in his The Struggle For Mastery In Europe, 1848-1918 (London: Oxford University Press, 1954).
The balance of power theory does not require a balancer in order to explain the relations among a group of sovereign states, each of which pursues its own advantage. "Private vices, publick benefits" (to borrow a subtitle from a work of another, far more nettlesome, British pamphleteer) are what is promised.6

Like many other critics, Organski attempts to topple the balance of power by digging away the reality or accuracy of the realist assumptions upon which it sits. Quite accurately he writes that "not all nations are bent primarily upon maximizing their own power"9 and from his observations "the basic errors of the balance of power theory become apparent" to him.

To begin with, it is based upon two erroneous assumptions: 1) that nations are fundamentally static units whose power is not changed from within and 2) that nations have no permanent ties to each other but move about freely, motivated primarily by considerations of power. But we have seen that these assumptions are not correct, and since the assumptions of the theory are wrong, the

7 Richard Cobden, The Political Writing of Richard Cobden, 4th ed. (1903; rpt. New York: Kraus, 1969), p. 201. Organski closes his critique with the following vitriolic passage from Cobden's work:

the balance of power is a chimera! It is not a fallacy, a mistake, an imposture, it is an undecided, indescribable, incomprehensible nothing; mere words, conveying to the mind not ideas, but sounds... (197-198).

This need not be so.


9 Organski, World Politics, p. 298.
conclusions are also in error.  

As with the assumption of the balancer, the first of these two assumptions is not a part of the balance of power theory, or at least not a part of the theories of Morgenthau and Taylor which Organski draws upon. 

There is no requirement that a state's power be generated externally and not internally, (say) by means of industrial growth or increased military spending. In his critique, Organski is laying the groundwork for his theory of "power transition" which stresses the influence of rapid and differential rates of industrial development. I will discuss that theory below because it does fit within the assumptions and definitions outlined above. The important point here is that the assumptions are theoretical.


The balance of power is a physical and mechanical idea. It is based on the questionable assumption that the friend-enemy relations between States are immutable, and that other States do not change over from one side to the other (174).

11 There is some ambiguity in the case of A.J.P. Taylor. Taylor prefaces his The Struggle For Mastery In Europe with a quantitative description of the industrial, military and demographic might that defined the protagonists and writes in the bibliographical essay at the end of the book that "policy springs from deep social and economic sources; it is not crudely manufactured in foreign offices" (215). However, in the text in between, the reader is plunged into the elaborate diplomatic shuffle. E.B. Segal, referring to Taylor's once controversial book on the origins of World War II, sums up the difficulty. E.B. Segal, "A.J.P. Taylor and History", in The Origins of the Second World War: A.J.P.
assumptions and, as such, are not open to direct empirical attack. They are inaccurate. How could they be otherwise? Their inaccuracy provides no basis for rejecting the propositions that are derived from them.

Truly important and significant hypotheses will be found to have "assumptions" that are wildly inaccurate descriptive representations of reality and in general, the more significant the theory, the more unrealistic the assumptions (in this sense). The reason is simple. A hypothesis is important if it "explains" much by little, that is if it abstracts the common and crucial elements from the mass of complex and detailed circumstances surrounding the phenomena to be explained and permits valid predictions on the basis of them alone. To be important, therefore, a hypothesis must be descriptively false in its assumptions; it takes account of and accounts for none of the many other attendant circumstances, since its very success shows them to be irrelevant for the phenomena to be explained.¹²

The underscored phrase, "and permits valid predictions on the basis of them alone", brings me to the crux of this chapter and of the critics' complaint: the assumptions are far too permissive. They are able to support all sorts of contradictory predictions within the balance of power literature, as a whole, and within the works of particular balance of power theorists (plus the predictions of their most severe critics). Carrying so much is a sign of


weakness, not strength. To have a positive theory of the incidence of interstate war something must be tightened, added, thrown away or replaced.

For those theorists, such as Riker, who are inclined towards the deductive approach to theory construction, the immediate task is to repair the foundations. I do not agree with them. The "building" metaphors, which we use so often that we no longer recognize their metaphorical nature, mislead us to believe that theoretical structures -- like the other structures we admire, work in, and eventually leave behind -- must also be created from the bottom up. Our task is more akin to the architect's than it is to the carpenter's. The latter must have secure foundations in order to do his work, while the former does his work and then secures it to the ground. If theories must be "constructed", I prefer to start from near the top and to use sky-hooks. We can afford to ignore gravity for a little

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13 William H. Riker, The Theory Of Political Coalitions (New Haven: Yale University Press, 1962), pp.1-31. Riker substitutes "winning" for "power" maximization and proceeds to erect a "size principle" upon the foundations of the mathematical theory of games. To wit: "In social situations similar to n-person, zero sum games with side-payments, participants create coalitions just as large as they believe will ensure winning and no larger" (32-33).

14 For those who think that this yields to the temptation of inductivism or "mere fact gathering", Robert Merton provides a homily.

The hackneyed phrase often expresses an unexamined and impatient philosophy of investigation. It reflects the compelling urge to arrive directly at an explanatory idea. Yet practiced investigators
while until we see if there is something to support.  

I can now rehearse the ambiguities of the balance of power theory and present the bundle of arguments that I empirically examine below.

3.2 THE MOST PROBABLE THEORY

According to the balance of power theory,

All the various bodies, the greater and the lesser powers, were poised against one another, each exercising a kind of gravitational pull on all the rest— and the pull of each would be proportionate to its mass, though its effect would be greatly reduced as it acted at a greater distance. When one of these great bodies increased its mass, therefore— when for some reason, France, for example, had an undue accession of strength— the rest could recover an equilibrium only by regrouping themselves, like sets of ballet dancers, making a necessary rectification in the distances, and producing new combinations. Otherwise, the overgrown power would swallow up the little ones near at hand, and become greater still— just as the moon would fall into the earth if there were no counteracting forces to offset the effect of gravity.  

[15]

tell us that often a fruitful idea can be adequately formulated only after reasonably sound data have brought it to mind. In sociology as in other disciplines, psuedo-facts have a way of inducing pseudopproblems, which cannot be solved because matters are not as they purport to be. It is only when tedious recitations of unrelated fact are substituted for the absent idea that inquiry declines into "mere" fact-finding.


The theory, with roots extending farther and further afield than this Newtonian description of the so-called classic European balance suggests, is among the oldest in the international relations literature. From the contemporary post-Newtonian world, where it remains central to many explanations of war and peace, the roots of the balance of power notion can be followed in Polybius' histories of ancient Greece and Rome, and in Kautilya's advice to princes of ancient India.¹⁶

For Morgenthau, the most influential exponent of political Realism and the balance of power, the latter "is only a particular manifestation of a general social principle" analogous to the law of gravity in physics.

the balance of power and policies aiming at its preservation are not only inevitable but are an essential stabilizing factor in a society of sovereign nations... the instability of the international balance of power is due not to the faultiness of the principle, but to the particular conditions under which the principle must operate in a society of sovereign nations.¹⁷

To those who value physical laws such as the law of gravity for their accuracy, an accuracy bestowed by mathematical form, and who, therefore, pooh-pooh social science, Morgenthau's statement is dubious. However, scientific laws need not be, and often are not, quantitative, and inaccuracy is a very respectable trait in scientific laws. Scriven argues that inaccuracy is "the key


property of physical laws." A physical law, he writes, expresses a relationship between properties "which is the simplest useful approximation to the true physical behavior and which appears to be theoretically tractable.\textsuperscript{18} The balance of power is certainly a simple approximation; however, it is neither useful nor theoretically tractable. We should not ask a candidate for law status if it is descriptively honest. We must ask what great truth it represents. Here the balance of power is very ambiguous.

Ambiguity saturates the notion of the balance of power, and the longevity it has enjoyed is a simple function of that ambiguity. For each person who extols the virtues or decries the excesses of the balance of power, another appears and points out once more the confusion the term begets. With tongue firmly in cheek, Pollard demonstrates that, if this is to be continued, it will continue for some time yet. Aided by the \textit{Oxford English Dictionary}, he calculated that the number of permutations permitted by the various uses of the three words "balance", "of" and "power" approaches 21,000.\textsuperscript{19} Like Heinlein's extraterrestrial hero, Pollard "had discovered that long human words rarely changed their meanings but short words were slippery, changing

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\textsuperscript{19} A.F. Pollard, "The Balance of Power," \textit{Journal of the British Institute of International Affairs} 2 (March 1923), 51-64.
\end{flushleft}
without pattern. Short human words were like trying to lift water with a knife."^20

Haas and Wight, in more empirical surveys, located eight and nine distinct usages respectively. Zinnes, who excluded the prescriptive ones they had included, found six.\(^{21}\) As Zinnes points out in her survey, the many distributions of states which have been labelled "balanced" do share a common feature: no state or existing coalition is in a position of dominance. The virtue of the balance of power is that it inhibits empire and preserves independence. The question remains: why and when do states choose war as the instrument of policy rather than (say) alliance, and attempt to swallow their neighbours? One plausible answer is provided in the Newtonian description of the balance of power at the beginning of this section, and other plausible ones exist. That theories from different schools differ is not remarkable, and perhaps it is to be expected that those within the same school differ among themselves, but it is disconcerting when they differ, as they do, within themselves. Once we extract the ambiguity concerning the meaning of the term "balance of


power", the theoretical ambiguity persists. Let me illustrate this with an example.

In a footnote beneath the passage from Politics Among Nations exhibited above, Morgenthau informs his readers that in his book the term has four meanings. Often it is not clear from the context which of the four is operative, and his critics have suggested that four is only the lower limit to the number of meanings to be found in his writing. Recall Morgenthau's basic principle: "international politics, like all politics, is a struggle for power".

The four definitions he does give are: (1) actual relative position; (2) an increase in relative power position; (3) the distribution of power; and (4) an approximately equal distribution of power. The analogy in the first two usages is to a bank balance: each state constantly assesses its account and seeks a favourable balance by increasing military and industrial capabilities, joining alliances and fighting wars with less solvent states. The line dividing national credits from debits floats in relation to the accounts of other states. Each state's account is in balance so long as all the states are at approximate parity. When speaking of equibalance or parity and of the actual distribution of power, the analogy is to a physical balance.

Now, what is to be gained by declaring that the balance of power is "not only inevitable" but also "an essential stabilizing factor in a society of sovereign nations"? The third definition is uninformative: a balance of power is inevitable because, given a number of states, power will be distributed. The probability of the truth of that statement, like the probability of other tautologies, is 1.00. The same can be said when the first definition is substituted and the second one simply restates the power maximization assumption. The statement that an equibalance between states or coalitions is inevitable is far more informative, less probable, and has theoretical potential. Richer still is the statement that equibalance preserves peace and prevents war. The major problem with Morgenthau's discussion of the balance of power (defined as equibalance) is not that it lacks this proposition, and others equally rich, but that it also contains the converse.

Equibalance, according to Morgenthau, creates uncertainty of advantage, and this uncertainty of success, if war were to occur, makes the decision of any state to initiate war less likely. On the other hand, calculations of national power are inherently uncertain -- there is no currency of power -- and the uncertainty created by approximate parity may lead to war as well as prevent it.

Since in a balance-of-power system all nations live in constant fear lest their rivals deprive them, at the first opportune moment, of their power position, all nations have a vital interest in anticipating such a development and doing unto others what they do not want others to do unto them.²⁴
While "peace can be maintained only by two devices" — the balance of power and normative limitations on conflict — "it is not hard to see that most of the wars that have been fought since the beginning of the modern state system have their origin in the balance of power."\(^2\) This balance of power theory lacks, therefore, one key property any explanatory theory need possess — the ability to be wrong.\(^2\)

If we accept Popper's distinction between the probability of a theory and the degree of corroboration, and if we desire the most probable theory, then the balance of power theory is it. The probability of a statement or set of statements being "true" is, according to Popper, in inverse proportion to the information content of the statement or set of statements and information content is in direct proportion to explanatory power.\(^2\) Empty of empirical content, the balance of power theory is the most probable, explaining anything, and, therefore, explaining nothing. The lack of content precludes falsifiability or


\(^{25}\) Ibid., pp. 22, 204.

\(^{26}\) This is not a sin committed exclusively by the "traditional" balance of power theorists. For example, Morton A. Kaplan in his innovative "systems analysis" points to many testable empirical consequences of his "balance of power model" which in fact serve to define that model. See the Preface and pp. 22-36 of *System And Process In International Politics* (New York: John Wiley and Sons, 1957).

testability, the basic criterion of a scientific theory.

In part, the difficulty is the ambiguity and malleability of the terms. Even where the meaning of the "balance of power" is pinned down to equibalance, the theory contains conflicting propositions. To repeat, the conjecture that equibalance deters war, and its converse, that equibalance stimulates war, are both informative, improbable and falsifiable. When they devolve from a single theory and are combined within it, these very desirable qualities vanish. Then the theory is rendered irrefutable and useless: the explanatory power of the argument that equibalance leads to peace or war is nil. Rather than confronting empirical evidence, the balance of power theory envelops it and in this manner the balance of power is chimerical over and above the ambiguities in the core concept. In graphical terms, the logic is not along straight lines. The logic is full of reversals, and, where tight tautological circles are avoided, the propositions seem to be arranged as if they were on a moebius strip. As you follow it, up becomes down; inside, outside; and plus, minus. To tell one from the other, empirical evidence is needed.

In short, the balance of power theories, as found in the power politics literature, are scientifically uninteresting, and the power politics literature does contain numerous interesting and testable propositions. Moreover, the basic elements of the arguments - alliance commitments, relative power position, distribution of capabilities - do seem essential to any explanation of great power war.
3.3 LESS PROBABLE PROPOSITIONS

An examination of the complete processes described by the balance of power theorists would entail investigation of the formation, maintenance and breakdown of coalitions of states, for whatever else it may be, the balance of power is a theory of alliances and counter-alliances. My aim here is less ambitious and I confine myself to the putative explanations of great power war. Although the influences of alliances between great powers upon their relative power positions will be taken into account, alliance formation and termination are not "dependent variables" in this work.

3.3.1 Alliance Commitments and War

Because alliances between great powers can shift the scales up and down vigorously, they receive far more attention in the balance of power literature than do commitments exchanged between great powers and non-great powers. This does not mean that the latter, and "latent war

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29 The phrase is from Robert E. Osgood, Alliances and American Foreign Policy (Baltimore: Johns Hopkins Press, 1969), pp.18-19.
communities" in general, may not increase the likelihood of war or that the putative path between alliances and war can be an indirect one mediated by relative power position only. (See Figure I:1 above.)

Alliance commitments, particularly those with non-great powers, may represent an expansion of involvement in international politics, and "whether contracted for defensive or offensive purposes, alliances are concluded with war or the bluff of war in view." As Schwarzenberger continues: "alliances tend to increase the field of friction and in case of conflict the area of war," and they "may give additional momentum to the anarchic forces in international society." Two propositions to be examined then are:

Proposition 1: The more allies, the more likely that a great power will become involved in interstate war.

Proposition 2: The more non-great power allies, the more likely that a great power will become involved in interstate war.

While, as Schwarzenberger among others argues, alliances may add to the chaos and expand war once war occurs, he, along with most balance of power theorists, recognizes that alliances, like Janus, have another face. They can reduce chaos. Alliances, it is argued, may prevent war and lend some stability and certainty to international relations. Morgenthau declares that "an alliance adds precision,

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especially in the form of limitation, to an existing community of interests and to the general policies and concrete measures serving them." Here the numbers of commitments are less important than the type of commitments and the pattern which they form.

Alliances alter the distribution of power (for states join other states to increase their position relative to still other states), and they simplify the relations between states. The stability of a social system, like the stability of an ecosystem, depends upon complexity. Formal alliances reduce the number of choices open; define and create friends, foes, and bystanders in the event of conflict; and, thereby, focus perceptions of threat. In this sense, alliances reduce the number of units and simplify the relations between states. The resiliency of ecological and social systems is reduced as the number of components is reduced. As the balance or distribution of power tends to polarize about the two most powerful states or coalitions, the mechanical metaphor becomes more apt: interstate competition comes to resemble a zero sum game. Similarly "the balance of nature" is more suitable when describing a rice paddy rather than a meadow. Bipolar

31 Politics Among Nations, p. 176.

configurations and single species gardens are less resilient to small changes and, therefore, require far more attention than less orderly arrangements of states and plants. Because the consequences of even slight inattention are so ominous, each is carefully managed.33

Great power alliances with "pawns" may not be so much extensions of interest as formal public declarations to protect already existing interests. Snyder, building upon the bipolarity/multipolarity/stability debate, puts the case succinctly:

when alignments are clear and firm, the strength of the interest in preventing the defeat of an ally or an opponent's increase of power will encourage resistance and favor deterrence of aggression. The most dangerous condition is that in which alliance commitments seem questionable to outsiders but are in reality quite firm.34

As Morgenthau argues, an accurate evaluation of the balance of power "is an ideal task and hence incapable of achievement":

The crowning uncertainty...lies in the fact that one cannot always be sure who are one's own allies and who are the opponent's. Alignments by virtue of alliance treaties are not always identical with the alliances that oppose each other in the actual war.35


Morgenthau's first sentence should not be taken as an unconscious denial of his position that alliances lend some precision to calculations of advantage or disadvantage. His argument is sharper than that: Janus does have two faces. Regarding the last sentence just quoted, we should be careful here to separate the incidence of war from the course of war once it occurs. Certainly the incidence of war is related to the expectations about its course, but we take care against \textit{ad hoc ergo propter hoc} and against the logic which proceeds from the observation that some alliances were treated as "mere scraps of paper" to the conclusion that all alliances are "mere scraps of paper". While for some Bethmann's description of the treaty which guaranteed the neutrality of Belgium is a maxim of international politics, it is worth remembering that the German Chancellor was cursing the United Kingdom because the British were to stick to "a word - 'neutrality' ... a scrap of paper."\textsuperscript{36}

Are the expectations embodied in formal alliance commitments to be relied upon? If not, further discussion of possible relationships between them and the incidence of war would be a waste of space. Schroeder suggests it would be a waste of space. "Nothing", he concludes, "can substitute for the painfully empirical task of functional

\textsuperscript{35} Morgenthau, \textit{Politics Among Nations}, pp. 147, 199.

analysis of particular alliances."

analyzing and categorizing alliances according to their types or provisions (defensive or offensive, limited or unlimited, consultative or automatic, with or without military conventions, bilateral or multilateral) are not likely to be very fruitful in describing what alliances really do... 37

To see if formal alliances do bind, Singer and Small performed a modest, elemental, albeit ex post facto experiment.

If alliance commitments reflect both a congruence of interests among the signatories and a constraint on their future freedom of action, it would seem reasonable to expect that when an alliance member gets into war, the behavior of its partners would be something other than random. That is, alliance partners would be expected to fight alongside one another more often than non-partners, and against one another less often than others. 38

Classifying alliances according to the types of formal obligations they imposed (defense pacts, neutrality pacts and non-aggression treaties and ententes), Singer and Small found that this was the case. Some of their calculations are reproduced in Table III:1.

37 Schroeder notes that he "refers especially" to the studies by J. David Singer and Melvin Small, the makers of the data which I am using here. He writes that

nor are attempts to establish statistical correlations between the numbers and types of alliances existing at various times and the corresponding levels of international conflict and tension likely to be very fruitful.


The types of commitment, contrary to Schroeder's suggestion, do seem to matter.

Defense alliances impose the most severe demands and, unlike ententes which require only consultation in the event of war, they are formally unequivocal. Defense commitments reduce, rather than foster ambiguity in the relations between states. Pawns are likely to be closely watched and potential predators forewarned. Recalling the logic of the 'bipolarity-less uncertainty-peace' chain, a proposition to be examined is:

**Proposition 3:** Defense commitments deter. Non-defense commitments are more likely than defense commitments to lead to non-activist war.

By implication from Proposition 2:

**Proposition 4:** Non-defense commitments to non-great powers are more likely than defense commitments to lead to non-activist war.

No doubt, with a little more imagination, I could unpack more propositions concerning types of alliances, the patterns they form, and the types of involvement in war they might lead to. To do so in the abstract would be both tedious and unproductive. The permutations are too numerous and the balance of power theorists wisely avoid such detailed speculations. I follow their example now and heed the advice of Tukey and Wilk "to begin by obtaining and trying to explain specific findings, rather than attempting to catalogue all possible findings and

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Moreover, I will try to heed these words more closely in the discussion of economic growth rates and war that follows.

### 3.3.2 Economic Growth Rates and War

War begets Poverty, Poverty Peace

Then People will traffic and

Riches increase

Riches produceth Pride, Pride is

War's ground.

War begets Poverty. So we go round.⁴⁰

Very different chains of argument link economic growth rates to war and peace. One type fits the power politics perspective and the other does not. The former arguments usually proceed from economic downturns, recessions or depressions through "societal breakdown", "strain", "stress", "frustration", "tension" or "instability" to release or diversion in war. They often take conflict to be "nonrealistic". That is conflicts

not occasioned by the rival ends of the antagonists, but by the need for tension release of at least one of them. In this case, the choice of antagonists depends on determinants not directly related to a contentious issue and is not oriented toward the attainment of specific

results...

satisfaction is derived from the aggressive act itself."^1

I agree with Coser's comments.

Knowledge gained from the study of nonrealistic conflict is being applied to the field of international relations, overlooking the fact that conflicts in this field are primarily realistic conflicts of power, interests or values and that nonrealistic elements which may be intermingled in the struggle are contingent and play, at best, a reinforcing role."^2

Boulding's concept of "strain" is not psychological, nor does his argument stress non-realistic conflict, but he too relates "the sudden worsening in general economic conditions, as in the depression phase of a business cycle,"^3 to war. His example is the depression of the 1930s.

Viner, another economist who has knocked down and run over the walls between academic fields, argues the contrary. "I can find," he writes,

no distinct historical pattern of impact of mass unemployment or of the business cycle on the problem of war except that countries were more conscious of their strength, were less pre-occupied by internal troubles, and were in better financial shape for war, in the prosperity than in the depression phases of their cycles, and that this seems to have been reflected in the temper of their foreign policies."^4

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^2 Ibid., p.49.

The links in this power politics argument are crisp but few and, the argument is, thereby, limited. Great power A would be less able and less inclined to seek costly engagements, such as war, against B if the economy were faltering. High rates of economic growth, *ceteris paribus*, result in a more advantageous power position; thence, to war, to make it a more advantageous one. The general proposition to be examined is:

**Proposition 5:** A great power is more likely to become involved in war when its rate of economic growth is high rather than low.

The distinctions between types of participation in war and types of participants suggest more specific propositions.

Wars have activist and non-activist participants, and, following the balance of power assumption that the powerful are to be feared, the proposition is:

**Proposition 6:** Activist participation in interstate war is more likely than non-activist participation when a great power's rate of economic growth is high.

Furthermore, because one type of opponent is, by definition, more powerful than the other, the condition of the economy would be more significant in wars between great powers than in wars between great powers and non-great powers.

**Proposition 7:** The association between activist participation in interstate war and high growth rates is stronger when the opponent is another great power and weaker when a great power attacks a non-great power.

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Where the activist party is not a great power, the reasoning from this crude power politics calculus of relative advantage does not suggest any reason why the rate of economic growth should matter at all. Therefore:

Proposition 8: There is no association between economic growth in a great power and non-activist involvement in war with a non-great power.

The set of propositions has an advantage over any one of them because it suggests a pattern to the "errors" which, if empirically accurate, would lend more support to the power politics thinking than each could individually. If the proportion of instances of activist war against another great power war preceded by high economic growth rates is the same as the proportion of non-activist involvements in wars with non-great powers, the power politics calculus would receive no support.

Mere coincidence would be the plausible explanation of the results. Each of the propositions and the set of all of them remains weak, however. The limitations of the propositions are plain: they do not, and cannot, predict from the state of the economy to incidences of war. Wars may be preceded by high rates of economic growth, but we know in advance that so also are many years of peace. There are too many fluctuations and too few wars. The capacity of the propositions, therefore, is to deny, not to affirm, the power politics calculus which prompted them. The most conclusive finding would be no instances of great power war occurred in prosperous times.
To be made stronger these propositions have to be turned around, and the way to turn them around is to search for interactions with third variables. Two interactions suggest themselves. The first comes from the vagueness of the words "depression", "recession", and "prosperity". The second comes from the alliance commitment propositions.

Viner, Boulding and the anonymous author of the quatrain at the beginning of this subsection refer to "cycles", but they leave the question of periodicity open. Students of business cycles have identified many different cycles: aside from seasonal variation, we have Kitchins of 40 months, Juglars of 9/10 years, Kuznets of 15 to 20 years and Kondratieffs of 50 to 60 years. This profusion offers all sorts of possibilities, one of which I will pursue here.

Schumpeter interweaves the Kitchin, Juglar and Kondratieff in an elegant model of capitalist development. He finds it possible, "barring very few cases in which difficulties arise,"

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to count off, historically as well as statistically, six Juglars to a Kondratieff and three Kitchins to a Juglar ...

However, to follow the courses of the Kitchins and Juglars with precision over the history of each great power would be a huge research task, one, if the evidence were available, far beyond the abilities of this neophyte. For the economist, the 'dirty' time series and historical records make the task difficult. The turning points, amplitudes and durations are affected by 'external' events such as the weather or political disturbances. The difficulties are less severe with the Kondratieff wave which, in Schumpeter's scheme, the shorter cycles are thought to generate. The Kondratieff wave, so to speak, absorbs these problems by its very nature; the wave lurches over two generations and over all the great powers. Moreover, for Kondratieff political events are less "external" and more integral to his argument. Wars and revolutions, Kondratieff concluded, occur on the long upswing of economic activity, the phase of his wave characterized by a prevalence of prosperity. Therefore,

**Proposition 9:** Relationships between high rates of economic growth and participation in war vary with the long term phases of economic expansion and contraction.

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Turning to alliance commitments, I find it incongruous that a sluggish attribute such as "number of alliance commitments" could have a temporally specific effect such as the outbreak of war. Perhaps the conjunction of alliance commitments and rate of economic change will enable us to predict properly from the independent variable to the dependent variables, rather than the other way around.

Proposition 10: Great power participation in interstate war depends upon a combination of alliance commitments and high rates of economic growth.

The open-endedness of this proposition is quite deliberate. To add the number of alliance partners, the types of commitments exchanged to the rates of economic growth and the phases of the Kondratieff wave upon which they ride increases immensely the possible permutations seeking association with the incidence and types of involvement in great power war. Once again there is little to guide one in sifting the logically for the theoretically reasonable. I have no specific arguments. Proposition 10 is an invitation to be made more specific or to be withdrawn depending upon the performance of the previous propositions. Whether or not a more specific Proposition 10 supports the crude power politics calculus remains to be seen,
3.3.3 **Relative Power Position and War**

According to the balance of power theories, states enhance their power relative to one another internally by increasing national capabilities and externally by securing the capabilities of some other states to themselves with defense alliances or by denying advantages to potential enemies with non-aggression pacts. Equilibrium, whether bipolar or multipolar, is the expected and natural result of the interplay between power-maximizing, security conscious, sovereign entities. If not, instability or war is to be expected.

Stability will increase as the parity in power of states increases. If there were only two states, there would be great instability unless they were very nearly equal in power. The same would be true if all the states had become polarized in two rival alliances.

And, if there were not any great power alliances,

with a large number of states acting independently, comparative equality of power would tend to augment the capacity of each to defend itself and so to increase stability.⁷

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Germany wants equality, and by that she means, eventually, not only an equality between her armaments and those of France, but an equality between her and her allies on the one hand and France and her allies on the other. If there is such equality that each side thinks the prospects of rapid victory slight, it is probable, other things being equal, that the prospects of war would be reduced. It will, of course, be said that with such equality, while the prospects of German victory would be greater than the
The debate over which specific configuration is more stable is far less furious in the balance of power literature than it is elsewhere. Bipolar or not, stability depends upon parity. The rough consensus among balance of power theorists is that the dominant great power, unless checked or balanced by the others, will press its advantage and wage war. Furthermore, war is a means to keep order and to preserve a status quo favourable to the most powerful.

Proposition 11: The predominant power is more likely to fight than are the less powerful.

Increases in power, 'undue accessions of strength', are dangerous. The presumption is that increases in relative power position are preparations for war and decreases in relative power position make one more vulnerable. The general proposition is:

Proposition 12: Increases rather than decreases in a great power's relative power position are more likely to lead its involvement in war.

Versailles disarmament provisions; that Germany, anxious for a war of revenge will take the field even though the prospects of victory are no more than even. But that denies the whole thesis that peace can be promoted by a stable military equilibrium (57-58).

Following the distinctions between types of participation and types of participants, Proposition 12 may be specified. The first specification is:

Proposition 13: Activist participation in war is more likely than non-activist involvement to follow an increase in a great power's relative power position.

The 'overgrown power swallows up the little ones near at hand' but if the opponent is large, not little, increases in relative power position are more necessary. Following the crude power politics calculus, the second specification is:

Proposition 14: The association between activist participation in war and increases in relative power position is stronger when a great power attacks another great power and weaker when the target is a non-great power.

If a great power is the target of a non-great power or if a great power seeks to preserve the status quo contrary to the interest of a non-great power, increases or decreases in the position of the great power would be less relevant than the gap in the levels of capabilities.

Proposition 15: Therefore, there is no association between changes in relative power position and non-activist involvement in war with a non-great power.

Like Propositions 5 through 8, the ability of these Propositions is to deny. They cannot predict to war but if the evidence is to the contrary, the basic power politics argument would be undercut.
The assumption behind these propositions is that war is the result of imbalance; parity provides peace. Organski, for one, asserts the contrary. The relationship between parity and peace "appears to be exactly the opposite of what has often been claimed." He continues:

Indeed, it is not even logical. Nations are reluctant to fight unless they believe they have a good chance of winning, but this is true for both sides only when the two are fairly evenly matched or, at least, when they believe they are. Thus, a balance of power increases the chances of war. A preponderance of power on one side, on the other hand, increases the chances of peace, for the greatly stronger side need not fight at all to get what it wants, while the weaker side would be plainly foolish to attempt to battle for what it wants.\(^9\)

His own logic is not unassailable. Unlike with alliance participation, each state need not consent to join in a war and, while the stronger need not fight to obtain what it wants, that it will shrink from employing force is not obvious. Many weaker states may have caved in, but we need only to count the number of great power wars with smaller states and note that the great power was not always the activist party. Recall the contents of Tables II:2 and II:3. Organski's argument is far more compelling when limited to handling wars between great powers. I will discuss his explanation of 'major' great power wars -- those wars involving all the great powers -- and then elaborate upon it and extend it to include all wars between great powers.

\(\text{\textsuperscript{9} World Politics, p.294.}\)
3.3.4 Rank and War between Great Powers

Industrialization, Organski argues, transformed states and, hence, relations between them. His alternative to the balance of power jumble focuses on the different starting points and differential rates of growth. This yields four categories of states: the great power which industrialized first and its allies (the "powerful and satisfied"); the great powers which followed (the "powerful and dissatisfied"); the "weak and satisfied"; and last, "weak and dissatisfied". The powerful and dissatisfied, accepting, to use Trotsky's phrase, the "privilege of historic backwardness", challenges and seeks to replace the dominant status quo power. "One could almost say that the rise of such a challenger guarantees a major war," writes Organski.50

Others have made similar cases. Lenin, for example and to pick a strange bedfellow for Organski, argued this in the last pages of his tract on Imperialism.

Finance capital and the trusts do not diminish but increase the differences in the rate of growth of the various parts of the world economy. Once the relation of forces is changed, what other solution of the contradictions can be found under capitalism than that of force.

Any other basis under capitalism for the division of spheres of influence, of interests, of colonies, etc., than a calculation of the strength of the participants in the division, their general economic, financial, military strength, etc., is inconceivable. And the strength of these participants in the division does not change to an equal degree, for the even development... of countries is impossible under capitalism.51

With two coalitions, the satisfied and the dissatisfied, poised opposite each other, the image of the simple pan balance is suitable and becomes more apt as the two sides approach parity. Small increments in capabilities or potential diplomatic advantages are magnified in importance and, as more precise calculations of relative position become crucial, they become less possible. The competition between relatively equal coalitions becomes defined in zero sum terms, and the tendency to over-compensate, to allow for a margin of error, leads easily into an arms race. The normal incidences of international relations quickly turn into crises and crises increase in danger. Major war, therefore, "is most likely when the power of the dissatisfied challenger and its allies begins to approximate the power of those who support the status quo."52

Lenin and Organski are concerned primarily with major wars, and for Organski major wars are wars between two


52 Organski, World Politics, p.370.

53 Compare with George Modelski's argument. He declares that
international orders. On top lie the satisfied and under them lie the dissatisfied. Each is fixed in composition. Industrialization, argues Organski, opened avenues for vertical mobility, but severely reduced horizontal mobility.

Nations are not free to shift from one international order to another without serious internal changes involving usually a change in economic systems, a change in predominant class, a change in the political and a change in ideology. Great or small, their whole way of life is geared to the order to which they belong.

Perhaps this was the case at the time Organski first put forward his "power transition" hypothesis (1958), but the description is not an apt one in the world prior to the Cold War or since that time. Furthermore, it hobblles the power transition argument with an unnecessary problem. Once we agree that the great power ranked 1 is satisfied, how do we decide which other states are satisfied? To answer that the satisfied are those who favour the status quo is, I think, to beg the question to a large extent. Take, for example, four great powers E, F, G and H whose initials do not conceal their identities. G by means of war surpasses H and F and approaches E. H allies with G and F allies with E. Now why is F thereby satisfied and H dissatisfied? The answer is not clear to me. Add I, another great power.

"global wars constitute a separate class...a species of conflict" and suggests that we compare global wars only with each other, rather than swamp them "in longer lists of less homogenous events." See his "War and the Great Powers."

World Politics, p.354.
What if I allies with G and H and then changes to the side of E and F? I, F and H seek to advance, and the reason for their choice of partners need not be, and more often than not is not, a consequence of industrial growth. Defining F and I as satisfied because they ally with the dominant great power gains nothing for the theory and, as I said, also restricts its range. Ockam's razor, as I will illustrate, cuts the hobble.

Some balance of power theorists are not as far from Organski as Organski suggests they are. Morgenthau does argue from 'equilibrium' to 'uncertainty' to 'peace', but he writes:

> all nations must always be afraid that their own miscalculations and the power increases of other nations might add up to an inferiority for themselves which they must at all costs avoid. Hence all nations who have gained an apparent edge over their competitors tend to consolidate that advantage and use it for changing the distribution of power permanently in their favor.\(^5\)

The edge one holds over the other may be more apparent than actual as material capabilities become equal and, concomitantly, the elusive qualitative aspects of power such as diplomatic skill, citizen morale, military elan and political organization become prominent in the decision-making calculus. This is especially true of bipolar situations where alliances are many and both of their faces are visible.

Alliances, particularly defense alliances, reduce the uncertainty which the who/whom question creates, and, in doing so, raise uncertainty in the answers to the question of which side is stronger. The material and non-material capabilities of states must be aggregated into two lumps. Aside from the problem of assigning proper weights to the components of state power, adding the national capabilities to form the sum for each coalition provides only a very crude index. One can tell whether the two coalitions are drawing closer to parity (and that is all that we need to know), but as they draw closer, statesmen demand finer calculations. There is no algorithm and a variety of reasonable answers are possible. "Rational calculation of the relative strength of several nations, which is the very lifeblood of the balance of power becomes a series of guesses the correctness of which can be ascertained only in retrospect." 56 This contradiction between the precision required and that which is available is, according to Morgenthau, the essence of the balance of power. Georg Simmel, rightly dubbed "a master of sociological paradox," puts the argument more clearly than those who are preoccupied with war and international relations.

The most effective prerequisite for preventing struggle, the exact knowledge of the comparative strength of the two parties, is very often attainable only by the actual fighting out of the conflict. 57

56 Ibid., p. 71.
Just as the great powers, as a group, distinguish themselves from other states by the capacity and ability to wage war successfully, so too are the gradations within the group distinguished. Wars between great powers provide opportunities to change rank order by demonstrating the superiority of the winner and diminishing the status of the loser. Aside from such opportunities, they may be fought over "no specific object" as Taylor characterizes the Franco-Prussian War. The Franco-Prussian War "was a test of strength" after which Prussia replaced France as the foremost continental power.58

Who is stronger and who is weaker? Who will get his way and who will have to give in? Such questions...lead to rank lists--such as the rankings of players in tennis or chess tournaments, of baseball clubs in the world series, of chickens in the peck order of the chicken yard, and of great powers in world politics. The fewer the recent actual encounters that have occurred...the larger the extent to which such rank lists must be built up from hypotheses based upon the past performances and present or expected resources of the contestants.59


With the "breakout of peace", the rank order is as clear as it is at other times when disparities in capability are large. As the breakout of peace recedes in time and as gaps diminish, the rank order is blurred. Ordinal position is competitive and competition between A and B, a rapidly rising adjacent great power, becomes zero sum. Ties are unacceptable and must be broken, for only one can occupy the first position, the second position, and so on down the queue. "War itself is a dispute about measurement; peace on the other hand marks a rough agreement about measurement."  

Note that, here, relative power position is individual and excludes the weight which alliance partners could add. War between two great powers is most probable the closer they become in terms of national power capabilities. According to the balancing arguments, on the other hand, war need not occur between any two great powers A and B as the gap narrows, for the large gaps between C, a more powerful state, and A and B are more worrisome to the less powerful. Declines in relative power position are to be compensated for with alliances; moreover, one would expect A and B to

60 G. Blainey, The Causes of War, p. 122.

61 Compare this with the predictions of coalition formation in T. Caplow, Two Against One: Coalitions in Triads (Englewood Cliffs: Prentice-Hall, 1968), pp. 21-40, esp. Figure 3:1; and Morton Kaplan's rules of conduct in a "balance of power" system in his System and Process in International Politics (New York: John Wiley, 1957), p. 23. The fourth rule of a balance of power system is:
ally in order to check C.\textsuperscript{61}

Alliances are a means to augment capabilities of all the partners by joining them, by subsuming the individual into the group should war occur. Such coalitions may detract and constrain the individual bargaining power, and which of the two adjacently ranked great powers is stronger and which is weaker is what the conflict between them is all about. All great powers seek to maximize their power, and this assumption holds whether they are in a coalition or not. Each therefore prefers the impossible; that is, to ally itself with smaller, less powerful partners. If great power B in rank 5 is drawing up on A at rank position 4, each will seek out allies from rank 6 downwards into the non-great power stratum. Neither would have anything to gain from attempts to commit C, a great power superior to them both, to enter a war between them, and, thereby, to deter one from attacking the other. C would have little to gain by letting itself be committed in advance. If C is the dominant great power, squabbles in the lower ranks need not threaten its position unless they are indecisive and/or other great powers threaten to intervene. Moreover, A and B have a mutual interest in isolating their competition from the interference of the higher-ups and in guaranteeing a "fair fight." A "fair fight" is one in which they are the leading

\textit{"Act to oppose any coalition or single actor which tends to assume a position of preponderance with respect to the rest of the system." I do not expect it to be 'obeyed.'}
contenders. If alliances are made with those great powers higher up, they are commitments to keep clear unless the war should prove to be indecisive.

Defense alliances, on the other hand, may be arranged with those smaller states whose cooperation does not detract from national power and may prove beneficial when war occurs. Smaller states are willing allies because war opens opportunities for upward mobility, if they are on the victorious side, and possibilities of skidding downwards, if their neighbours are on the winning side. Theirs is a prudent, not a rapacious, choice. The farther up the great power hierarchy the competition between adjacently ranked pairs is, the larger the potential for disruption of the whole pecking order. The prospect of war between the first and second ranked great powers forces them to seek allies—they will always be dominant within their respective coalitions—and forces those below to one side or the other. The narrowing of the gap between those in rank positions 1 and 2 leads to alliances with other great powers. With those alliances come difficulties in calculating advantage, bipolarity and the numerous crises which make the empirical test of war most probable. The timing of a major war is influenced by the relative power positions of the coalitions even though the dispute over the ranks of the most powerful is at the root of the matter. More generally, adjacently ranked great powers fight each other when they approach parity in power position.
Thus far in this discussion of great power war I have neglected geography — physical barriers and distances, land, sea and location. In the Sprouts' words, I have suggested "the interplay of puppets upon a stage as bare and undifferentiated as the polished floor of an empty room." For the adjacent rank argument, the side walls are pulled in: the room becomes a corridor, a track. As one great power meets another, blows are exchanged; the loser falls behind, and the winner advances to a rank in front of the loser. This neglect is no small matter: opportunities of interaction between states, for good or ill, are structured by social and geographical proximities.

In the ideal space, the pure social space where there are no barriers or friction, the common balance of power argument and the adjacent rank argument are clearly distinct. The predictions of one are opposite to those of the other: according to the former, preponderance leads to war and parity preserves peace, according to the latter, parity leads to war and preponderance to peace. When we consider the two arguments on the ground — in geopolitical space — some differences become blurred.

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63 For examples, see the studies of the frequency of war and the numbers of neighbours. They include: Richardson, *Statistics of Deadly Quarrels*, pp.290-291 and James Paul Wesley, "Frequency of Wars and Geographical Opportunity," *Journal of Conflict Resolution*, 6 (1962), 387-389.
Consider the situation where there are two unequal states with some distance in between them. Both the balance of power argument and the adjacent rank argument would predict no war. According to the balance of power argument "stability tends to increase in proportion to the capacity of the most vulnerable government in the system to resist its most powerful neighbor." Stability is a function of power capabilities and geographic separation. The strong state is to be feared but distance erodes strength.64

The general principle applies that each party can be supposed to be at his maximum power at home (this may be an area rather than a point) but that his competitive power, in the sense of his ability to dominate another, declines the farther from home he operates. This is the great principle of the further the weaker. The amount by which the competitive power of a party diminishes per mile movement away from home is the loss of power gradient.65

On the other hand, according to the adjacent rank argument, rank would not be a source of conflict and, therefore, war would be unlikely.

Now consider the situation where there are two equal states separated by some distance. According to the balance of power argument there would be peace. Both conditions — equality and separation — are satisfied. Note however that peace would not be the result of uncertainty about the outcome of war — the defender would win. Any attacker's

64 Quincy Wright, A Study Of War, Appendix XXIX and pp. 952-956.

combative power would diminish over distance and the knowledge of the outcome, if war were to occur, preserves peace. According to the adjacent rank argument, rank position is a source of conflict and uncertainty of the outcome if war were to occur leads to war as the measure. With no uncertainty of the outcome of war, there would be no war. There would be a standoff. On the ground, rather than in the nether world of a number line, the adjacent rank argument yields the following proposition.

Proposition 16: Non-separated great powers fight as they approach parity in power capabilities.

Separation is not simply a matter of geography. Distances, for example, keep states apart and can be gauged very accurately, but physical distances per se are not relevant. Loss of strength gradients vary with the interplay of technology and geography and that interplay does not have a metric. Only the general trend is clear.

"War can be defined roughly as men throwing things at each other with malicious intent,"^66^ and distance has become less important as men reduce the transportation costs of killing with new technologies.^67^ Corollaries of the obvious will prove helpful when evaluating Proposition 16. Suitable theories do not exist.

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Sprout and Sprout provide a sustained critique of Geopolitik and of those theorists who, perhaps in reaction to geopolitical advocates, eschew geographical considerations and use spatial concepts only metaphorically. Although they do not offer a metric or a theory, the Sprouts do provide the proper perspective. The base of their "ecological paradigm" is a triad composed of (1) "environment", (2) "environed entity", and (3) "entity-environment interrelations." Blunt as it is, this triad is a useful device with which to reconnoiter the propositions listed in Table III:2.

Table III:2

Those propositions which secure themselves to but one or two points of the triad are less reasonable than those attached to all three. Reasonableness is enhanced not by the addition of more variables or specifications or elaborations per se. It is enhanced by bringing in the relations between states. Propositions 5, for example, touches one point in the ecological triad. The specifications of Proposition 5, Propositions 6 through 8, are based upon a crude calculus of relations between states but the rate of economic growth remains an attribute of an individual great power and attributes of states do not explain peace. Indeed, while, in one sense, the specifications make the general argument more precise, they
Propositions Concerning The Incidence of Great Power Interstate War To Be Tested.

Proposition 1) The more allies, the more likely that a great power will become involved in inter-state war.

Proposition 2) The more non-great power allies, the more likely that a great power will become involved in inter-state war.

Proposition 3) Defense commitments deter. Non-defense commitments are more likely than defense commitments to lead to non-activist war.

Proposition 4) Non-defense commitments to non-great powers are more likely than defense commitments to lead to non-activist war.

Proposition 5) Great power wars are most likely to occur when the rate of economic growth is high rather than when it is low.

Proposition 6) Activist participation in interstate war is more likely than non-activist participation when the rate of economic growth is high.

Proposition 7) The association between activist participation in interstate war and high growth rates is stronger when the opponent is another great power and weaker when a great power attacks a non-great power.

Proposition 8) There is no association between economic growth in a great power and non-activist involvement in war with a non-great power.

Proposition 9) Relationships between high rates of economic growth and participation in war vary with the long term phases of economic expansion and contraction.

Proposition 10) Great power participation in interstate war depends upon a combination of alliance commitments and high rates of economic growth.
Proposition 11) The predominant power is more likely to fight than are the less powerful.

Proposition 12) Increases rather than decreases in relative power position are more likely to lead to war.

Proposition 13) Activist participation in war is more likely than non-activist involvement to follow an increase in relative power position.

Proposition 14) The association between activist participation in war and increases in relative power position is stronger when a great power attacks another great power and weaker when the target is a non-great power.

Proposition 15) Therefore, there is no association between changes in relative power position and non-activist involvement in war with a non-great power.

Proposition 16: Non-separated great powers fight as they approach parity in power capabilities.
leave many more times of peace unaccounted for because each reduces the already small number of wars. Proposition 16, unlike the others, touches all three and offers an explanation of peace — predominance in power capabilities and geopolitical barriers — and war.

The adjacent rank argument, like the contrary balance of power argument, is about international relations and, stripped of all save essentials, the ecological perspective points to the commonplace: international relations is and should be about international relations — relations between sovereign territorial organizations. The commonplace emerges as novel when the ecological triad is fitted to the relevant empirical literature. This is the argument of Chapter IV.
Chapter IV

A REVIEW OF THE EXISTING EMPIRICAL STUDIES

The arguments just presented have been tested quantitatively but few, if any, of the empirical studies provide a basis for accepting or rejecting the propositions. Some of the reasons for this are peculiar to individual studies. Others are not. I will describe general problems in the quantitative study of inter-state relations first and then review the empirical studies of alliances, rates of economic growth, and relative power position and war.

4.1 ECOLOGICAL FALLACIES AND METHODOLOGICAL INVOLUTION

Most of the empirical studies which draw theoretical sustenance from the traditional balance of power literature are studies of the balance of power system. Although they rest upon assumptions and propositions concerning state behaviour, these studies are unable to tell us much at all about the behaviour of states which compose the system. The particular unit mesh restricts the permissible inferences. Expanding the unit mesh, by aggregating the attributes of states in order to examine relationships at the system gauge precludes capturing the finer relationships between the same variables at the level of the states. If the correlation
coefficients are reported for the system of states, the coefficients

have no absolute validity independently of those units, but are relative to them. They measure, as it were, not only variations of the quantities under consideration, but the properties of the unit mesh which we have imposed...in order to measure...\textsuperscript{1}

For example Singer, Bremer, and Stuckey, in their study of the balance of capabilities in the major power group and major power war, properly point out that

no inferences can be made as to which particular nations...become involved in war resulting from the distribution or redistribution of capabilities.\textsuperscript{2}

The balance of power theorists suggest that the predominant great power will initiate war unless those states in less favourable positions combine in order to redress the balance. Some also suggest, as pointed out in Chapter III, that a rise in relative power position may propel a state into war. Evidence for these propositions must come from analyses of states, not of the state system.

In the international relations literature, the difficulty is called the "level of analysis problem" after Singer's oft-cited paper of that title. His paper begins with a choice and attempts to spell out the consequences of that choice for the unwary. "Whether in the physical or social


\textsuperscript{2} Singer, Bremer and Stuckey, "Capability Distribution, Uncertainty, and Major Power War," p. 45.
science," Singer writes,

the observer may choose to focus upon the parts or
upon the whole, upon the components or upon the
system. He may, for example, choose between the
flowers or the garden... the trees or the
forest... 3

The problem, if it be a "problem" at all,4 is an old one.

Since the publication in 1950 of Robinson's classic paper
"Ecological Correlations and the Behavior of Individuals," an inference from an aggregate relationship to the individual relationship has been dubbed "the ecological fallacy". 5 While this name is now prevalent, it is unfortunate; "ecological fallacy" fits easily and more generally into the Sprouts' conceptual vocabulary. Ecological fallacies of the first type, Robinson's type, are infrequent in quantitative studies of international


4 To "solve the problem" is to state what the unit which you are analyzing is and to stick with it.

There are a number of methods to assess the accuracy of inferences from aggregates to individuals. In international relations, these methods are irrelevant. The state most often is the unit and we create our aggregates rather than have them ready made. See W.B. Moul, "The Level of Analysis Problem Revisited," Canadian Journal of Political Science 6 (September 1973), 494-513.

5 W.S. Robinson, "Ecological Correlations and the Behavior of Individuals," American Sociological Review, 15 (1950), 351-357. For another typology of ecological fallacies, one which is far more elegant than the one presented herein, see Hayward Alker, Jr., "A Typology of Ecological Fallacies" in Quantitative Ecological Analysis in the Social Sciences, ed. M. Dogan and S. Rokkan (Cambridge:
relations and they are not difficult to spot. On the other hand, ecological fallacies of the second type, the Sprouts' variety, inhere in much of the quantitative work and are far more pernicious.

An ecological fallacy of the second sort occurs when the analysis denies one or two points of the ecological triad of environed entity, environment, and entity-environment interrelations. The proferred choice of the trees or the forest, or the flowers or the garden, is too restrictive. The choice should be between the trees in the forest and the forest, between the garden and the flowers in the garden. This is the essence of the ecological approach, and the ecological perspective, if not the language, is essential to a proper study of the relations between states. To repeat the truism: international relations is and should be about international relations. An ecological fallacy, to put the matter most plainly, denies relations between states. This is a preposterous situation, given the subject matter.

Following from the three elements of the ecological triad, 


6 This essence of the Sprouts' ecological approach is conspicuously absent from the only statistical study of the Sprouts' arguments which I can recall. Unfortunately it is found in a Festschrift to the Sprouts. Dina Zinnes, "Some Evidence Relevant to the Man-Milieu Hypothesis" in The Analysis of International Politics: Essays in Honor of Harold and Margaret Sprout, ed. J.N. Rosenau, Vincent Davis, Maurice East (New York: The Free Press, 1972), pp.209-251 consists of evidence irrelevant to the man-milieu hypothesis and evidence, relevant and irrelevant, rendered irrelevant by all of the ecological fallacies mentioned in this chapter.
there are three ways of denying international relations. I will deal with the first two briefly. The remainder of the chapter is a prolonged discussion of the third.

The first, and relatively rare, subtype is the use of the results of a study of the international system to account for the external or systemic influences upon state behaviour. For example, Singer, in his discussion of systems theory and the ecological approach, suggests that we may think of the global system as a hierarchy of nested subsystems each embraced by those at the next higher level of analysis and embracing those at all lower levels. It follows from this that any system or set of systems at one level of analysis constitutes the environment of all entities existing at any lower level.7

7 J. David Singer, A General Systems Taxonomy For Political Science, (New York: General Learning Press, 1971), p. 12. It would follow that a great power, (say) France, is environed by the great power system which includes France and, above that, by the total interstate system which again includes France. If so, a "boundary problem," no less serious than those which plague the "systems of action" school Singer criticizes throughout his pamphlet, emerges in Singer's "systems as entities" approach. France is a member of the great power system and the total system; we cannot treat a state as constituting, in part, its own environment and avoid conceptual confusion. Singer's argument here undermines his argument for ecological or contextual analysis.

If we found the relationships between two variables to vary among states, we would want to see if the variation depends upon each state's context. The implication of the quotation is that context of each is the same, and a constant cannot explain a variation. See Cynthia Cannizzo, "Capability Distribution and Major-Power War Experience, 1816-1965," Orbis, 21 (Winter 1978), 947-957 for a recent example of the confusion.
The implication is that the percentage of the variation in the onset of war in the international system "explained" by the properties of the system could be safely added to the percentage of the variation in the incidence of war for any state "explained" by the properties of that state. The dependent variables are not the same, because in each case the unit mesh is different. The suggestion invites operationism in reverse. "By operationism in reverse is meant endowing the measures with all the meanings associated with the concept."  

8 This is the implication of the conclusion to J. David Singer and Melvin Small, "Alliance Aggregation and the Onset of War, 1815-1945," p.286.


The second subtype of the ecological fallacy arose in asking: are the attributes of the state or the attributes of the environment most potent when explaining the behaviour of states? The question leaves out entity-environment interrelations. Rosenau writes that two extreme answers to this question provide "one of the most persistent, if not always recognized, controversies in the study of world politics." This analogue to the nature/nurture controversy is just as sterile in the abstract. Rosenau argues that an empirical investigation which admits the possibility that both sets of influences may be equally potent is required. He and his colleagues, Hoggard and Ramsey, attempt such a test. Dividing predictors into internal and external, or relational, categories, they find "internal" factors to be far more potent than relational factors. They "hope...that the assault on the findings will come from many quarters."

I will be glad to join in. All of the ecological fallacies described in this chapter are found in these two

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13 Rosenau and Hoggard, "Foreign Policy Behavior," p. 143.
studies, but the "internal vs. external" is the primary concern here.

Rosenau and Hoggard point out that others have suggested that "the size attribute is as much a relational attribute as a national one," and the same could be said of developed/underdeveloped dichotomy which is the second "internal" predictor variable. Turning to the external or relational category, no relationships are to be found. All of the relational attributes describe properties of dyads or pairs of states. To make inferences to states from the findings of dyads involves Robinson's ecological fallacy. Aside from that, none of the three relational predictors ("distance", "balance" and "homogeneity") are relations between states. Like many states, we may have distant relations and physical or social distance may limit visits to them, but distance per se is not a relationship except in geometric terms. These two studies cannot answer the question they pose and the main point is that the question is ill-conceived. It is the same thing as asking: does the length or the width contribute most to the area of a rectangle? Surveying gardens, we might note that this one is longer or wider than that one; but what we call length and width will vary with the vantage point, and to talk of area is to talk of an interrelation between the two. To say it may be a little of both is not very helpful.

14 Ibid., p. 142.
If all of these problems could be avoided, the third subtype of ecological fallacy remains. This one concerns the way questions about international relations are answered rather than how they are posed. Along with the cross-sectional statistical mode of analysis comes, covertly, the assumption that the state is an isolate, occupying and giving behaviours into a vacuum. The assumption is not recognized; nevertheless, it is there. An extreme example draws it out.

McGowan and Rood expand upon a remark by Kaplan in his book, *System and Process in International Politics* which, perchance, is found in his discussion of the balance of power. The remark is on the unpredictability of the random bumping together of individual gas molecules and the predictability of temperature and changes of pressure for a volume of a gas. They propose that "when viewed from the perspective of the system all alliances are equiprobable and time independent."¹⁵ That is, in a balance of power system, alliance formation and the intervals between the formation of one alliance and the next are randomly distributed. McGowan and Rood find that the alliance activity in Europe during 1814-1914 fit the values expected if the process were randomly generated. No reasonable person would infer from their very intriguing results about the European state

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system that the great powers acted randomly. The aggregate fallacy would be a minor irritant compared to the massive affront to common sense. To assume that states are independent of each other and of their immediate past, "acting" randomly, is a greater affront to common sense than that inference. However, that is what must be assumed if the powers of classical statistical inference are to be invoked in cross-national quantitative studies. The identification of classical statistical inference with science, and the craving for science, have led to the creation of a wholly perverse situation: to study international relations we must assume that they do not exist or, if they exist, they exist in a haphazard manner.

Moreover, the cross-sectional mode of analysis, the one

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16 Certainly the authors do not. Quite the contrary: each alliance "is based solely upon present state interest and current threats to the balance of power." Ibid., 860.

17 This is the substantive implication of the apparently technical decisions. Recall the distinction between organized and disorganized complexity. For discussions of the "individualistic", "atomistic", or, less commonly and more perceptively, the "liberal" fallacy in other areas of the social sciences, see James S. Coleman, "Relational Analysis: The Study of Social Organizations with Survey Methods," Human Organization, 17(Winter 1958-1959), 28-36; and Johan Galtung, Theory and Methods of Social Research, (New York: Columbia University Press, 1967), pp. 148-160, 358-388.

To cast the argument in a triad, we have three points: (1) theory, (2) technique, and (3) method. Where the lack of theory is bemoaned, technique and more sophisticated technique are prescribed; methodology, the study of relations between theory and technique, is forgotten. Discussions of, and presumably courses on, "Theory and Method" are misnamed. They often confine themselves to either the first point or the second;
favoured, precludes any causal analysis, as I will illustrate below.

Cross-national aggregate data studies are responsible for the supra-exponential growth of quantitative publications in the field of international politics.\(^\text{18}\) In the numerous reviews of the many diverse results, some faults are noted and minor repairs are suggested.\(^\text{19}\) To restore relations between states dyadic analyses are recommended. To capture the temporal order which is necessary for causal analyses, time lags are recommended. Each of the repairs compounds the errors and pushes up the growth curve. For this reason, I have confined the review of the empirical research to a separate chapter. To have accepted the published results as they are and to have included them in the discussion of the propositions in Chapter III, would have invited a multitude

where, on the left, Ockham's razor is made blunt, to the right, numerical crunchers prance on.


of pseudo problems. Clearly pointing out what to avoid should improve the data analysis in Chapters VI and VII.

Through despair over the lack of take-off into cumulative knowledge, there is a pattern in the development of studies relevant to the power politics propositions. It is involution, not the evolution so desired, or the revolution so required. Any cultural pattern has two opposing aspects: "the negative aspect of pattern establishes a taboo, the positive aspect points to a task." As Goldenweiser describes one peculiarity of primitive cultures:

The primary effect of pattern is, of course, to check development, or at least to limit it. As soon as the pattern form is reached further change is inhibited by the tenacity of the pattern. While characteristic of all things cultural, especially in primitiveness, this aspect of pattern is particularly conspicuous in rituals and the forms of religious objects, where the tenacity of pattern is enhanced by social inertia or a sacred halo. The inevitable result is progressive complication, variety within uniformity, virtuosity within monotony. This is involution.21

My intention is to be mischievous, not malicious. I can find no other way to understand the logic of most of the studies which should be relevant to the propositions in the last chapter.

How else, given good will and discounting attempts at black humour, can the logic of the following argument on "fundamental problems" in theory be comprehended?

The nomothetically inclined investigator is naturally interested in maximizing the number of cases for statistical tests in order that empirical descriptions may be derived. If research retains its emphasis on nations as its units-of-analysis, the population size resulting does indeed cast some doubts on the capacity of statistical analysis to uncover meaningful contingency statements.22

The world is at fault and the authors seek ways "of redressing the problems" by statistical trust-busting. One hundred and forty states are made to yield 19,460 cases. To what end? Now, they quote another approvingly:

the number is large enough to make random sampling a sensible approach in the study of 'dyads'. Studies that produce estimates about the population of all dyads from analysis of random samples are statistical in the exact sense.23

22 Charles W. Kegley, Jr. and Richard A. Skinner, "The Case-for-Analysis Problem" in In Search of Global Patterns, p.311.

23 C.A. McClellan, "Two Conceptual Issues in the Quantitative Analysis of International Events Data," mimeo, 1970, p.6, as cited in ibid, p.312. In a footnote on the same page, Kegley and Skinner note that of the 19,469 "directed dyads" (N (N-1)), a small number account for most of the events recorded. Four hundred and fifty-two (452) directed dyads accounted for 81% of the events recorded. They then go on, passing the most significant fact in their paper, to state that we should concentrate on these 452. The 452 dyads are generated from a "population (sic) of only 91 "active" states. The enormous discrepancy between the two figures tells us much of the structure of the state system. If the interactions were random, 91 states should give 91 (91-1) dyads where only 452 are found. Perhaps more evidence that the world is organized along "feudal" lines would be superfluous, but I find it amazing that no study has used the massive events data archives to display and describe...
They continue, but, as Davy Crockett is reported to have remarked during a speech by Andrew Jackson: "It don't even make good nonsense."  

The arguments of this chapter, like those in the previous chapter, are not, in themselves, novel, and the theme is that cliche—theory and method cannot avoid each other. Cliches are what remain of once startling insights: worn smooth and weakened with repetition, they become substitutes for the thoughts they bore. Now they are fit only to serve the lips, where once they served the mind. Praxis, not further repetition, restores strength and the critical edges. In the following three sections I assess particular studies of (1) the relationships between alliance involvement and war, (2) the relationships between industrial growth and war, and (3) the alliance/relative power position nexus and war.

4.2 ALLIANCE COMMITMENTS AND WAR

After they made their seminal contribution to the polarity/stability debate, Singer and Small turned their attention from "the structure of the system" to the relationships among its components. They completed the only empirical study which deals exclusively with national

the structure of the state system over time. I intend to do so.

alliance commitments and war-proneness. Finding that the correlations between various measures of alliance involvement and war hovered near zero during the 1815-1945 cross-section, Singer and Small conclude that behind the minute coefficients, lie larger ones of equal size and opposite signs. That is: the negative coefficients in the 19th century cancel out the positive ones in the twentieth. The basis for this reasoning is that such was the case in the earlier (1968) study of the international system. They state:

what holds for the system must also hold, in general, for the nations since they generate the behavior from which our systematic properties are inferred.  

Wrong. The reasoning is logically incorrect and the inference is empirically inaccurate. The correlation coefficients for the 1815-1899 cross-section, which are supposed to be negative via the "ecological fallacy", are moderate in size but positive in sign. Those for the 1900-1945 cross-section, which are supposed to be positive, are occasionally negative and smaller in size.  

One striking defect of the Singer and Small analysis, and my re-analysis to which I have referred, is the immense width of each of the cross-sections investigated. It is


impossible to determine temporal priority, and to do so is essential to support any causal statement. For example, a state can have all of its alliance activity in one portion of the interval and all its warfare in another. Such a state would contribute to a positive cross-section association between two variables when, in fact, they are inversely related historically. The problem with the cross-sectional statistical analysis—the favored mode of analysis in the quantitative international relations literature—is often thought to be one of sorting out cause and effect, and the solution offered is to build in "time lags". (More often than not, the analyst simply notes a difficulty; falls back upon the assumption that one factor is a cause and the other an effect, and, thereby, renders his argument less corrigible empirically.) This solution serves only to distract one from the congenital problem of cross-sectional analysis.

The problem is not that one point in time is examined. It is that variation across states is assumed to correspond to the variation for each of them through time. Somers labels this tacit assumption "developmental equivalence" and warns that it is often unjustified and the subsequent

27 The case of Turkey during the 1900-1945 period provides a stark example. Ibid., 503-508.

28 For example, see Robert Burrowes, "Multiple Time Series Analysis of Nation-Level Data," Comparative Political Studies, 2 (January 1970), 465-480.
analysis is therefore misleading. The trap is that the assumption cannot be justified unless we know the relationship for each state, yet the purpose of the analysis in the first place is to discover those relationships. If we know them, why proceed? If we do not know them and still proceed, much is ventured and nothing can be gained. We would "know" (by assumption) that the relationships are equivalent, but the relationship for any state (and, following from the initial assumption, all states) would remain a mystery. The trap is a logical one. No amount of empirical battering or statistical teasing of a cross-sectional data base can provide an escape from it.

A longitudinal analysis of the relationships between alliance commitments and war reveals the inaccuracy of the assumption of developmental equivalence. There are significant variations in the strength and direction among

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31 Moul, "The Level of Analysis Problem Revisited," 500.
the most war-prone states. Since the purpose in that study was to illustrate the methodological pitfalls, only four states were examined, the time span was limited to 1900-1945, and some of the peculiarities of the original paper (1968) from which Singer and Small erroneously argued were repeated. That is: unlike ordinary time lagged correlation \((t1-t2, t2-t3...)\) between the number of alliances and war, I calculated the coefficients between alliances in one year and the incidence of war within the next three years \((t1-t2-t4, t2-t3-t5...)\). This procedure may have inflated improperly the modest coefficients I reported. The problem is not simply the existence of autocorrelation (if indeed temporal continuity is, in general, an obstacle to be overcome rather than a welcome fact of life to be accommodated). The problem is the deliberate creation of interdependent observations. In short, this re-analysis displays the methodological points, but the substantive results are suspect. So also are the results of two subsequent re-analyses of the same data.

Harf, Hoovler and James Jr. report modest associations between alliance involvement and interstate war for 31 European and 22 Asian states during the 1900-1964 period. Singer and Small find: "...membership in alliances seems to have had little effect on the historical likelihood of major powers getting into war or remaining at peace" and "...those

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\(^{32}\) Harf, Hoovler and James, Jr., "Systemic and External Attributes," pp. 239-241.
powers which entered into alliances were somewhat more likely to subsequently get involved in war than those major powers which did not. But the association is far from a statistically significant one.\textsuperscript{33}

The discrepancies in the findings can be attributed to the different states and different time periods which were examined and to the differences between "number of alliances", "alliance membership" and joining an alliance.\textsuperscript{34} However, the differences are overshadowed by the identical methods of analysis, and all of the results are unacceptable because of the methods of analysis which generated them. The method is basically the same as the one just met in the discussion of the other alliance/war studies.

The Singer and Small tables and the relevant portions of the Harf, Hoovler and James, Jr. table are reproduced below. A sign that something is amiss is the size of the $N$ in each of them.

\begin{itemize}
\item \textsuperscript{34} Harf, Hoovler and James, Jr. resort to the most tortured numerology in order to fatten the variables for multiple regression. To define "alliance membership" to their satisfaction they count the numbers of alliances each state was involved in during the 13 half-decades; add together the memberships of all the states in each half-decade and take the mean values; and then calculate the deviations from the mean for each state in each of the thirteen slices. Expressed in percentages these deviations from the totals become the "alliance membership" values for each state.
\end{itemize}
Singer and Small examine the great powers, the number of which fluctuated between a maximum of 7 and a minimum of 4, and report the N to be 887. Harf, Hoovler and James,Jr. examine 31 European and 22 Asian states, many of which did not exist for the total time span which they examine, and report N's of 323 and 129 respectively. The state/year, not the state, is the unit of analysis, but the necessary assumption of ordinary cross-sectional analysis remains. It is assumed that the variation across state/years corresponds to the variation for each state through the years. The assumption cannot be justified.

Singer and Small explicitly use the state/year as the unit of analysis in order to resolve the problem of causal priority, and, in doing so, provide an extreme illustration of another liability of cross-sectional studies of international relations. To build the table, they isolate (say) "Germany/1912"; note whether Germany was then in an alliance and whether it entered a war in 1912 or subsequently in 1913 or 1914; and repeat this procedure for all of the years Germany was a great power, and for all of the other great powers.

<table>
<thead>
<tr>
<th>Observation</th>
<th>In Alliance?</th>
<th>Enter War?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Germany/1912</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Germany/1913</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>
Table IV:1

**Some Results Concerning Alliances And Interstate War**

A: Frequencies with which majors belonged to alliances and then entered into war.

<table>
<thead>
<tr>
<th>Entered War?</th>
<th>Yes</th>
<th>No</th>
<th>$\chi^2$</th>
<th>$Q$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>116</td>
<td>44</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>532</td>
<td>195</td>
<td></td>
<td>0.02</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>648</td>
<td>239</td>
<td></td>
<td>887</td>
</tr>
</tbody>
</table>

B: Frequencies with which majors joined alliances and then entered into war.

<table>
<thead>
<tr>
<th>Entered War?</th>
<th>Yes</th>
<th>No</th>
<th>$\chi^2$</th>
<th>$Q$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>31</td>
<td>129</td>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>104</td>
<td>623</td>
<td></td>
<td>0.18</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>135</td>
<td>752</td>
<td></td>
<td>887</td>
</tr>
</tbody>
</table>

C: Alliance and War

<table>
<thead>
<tr>
<th>Region</th>
<th>$r$</th>
<th>$R^2$</th>
<th>$\beta$</th>
<th>$N$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe (all time periods)</td>
<td>0.21</td>
<td>4.4%</td>
<td>0.38</td>
<td>323</td>
</tr>
<tr>
<td>Asia (all time periods)</td>
<td>0.30</td>
<td>9.0%</td>
<td>0.41</td>
<td>129</td>
</tr>
</tbody>
</table>

Germany/1914  x  x
United Kingdom/1912  x  x
United Kingdom/1913  x  x
United Kingdom/1914  x  x

The resulting larger N may be required for reliable statistical analyses, but artificially inflating the N does not permit valid statistical analysis. The problem of interdependent observations noted above is now magnified to an absurd dimension. An elementary assumption of the model of statistical inference employed is that the observations be independent of one another. The choice of one ball from the urn must not influence the choice of the next ball; the first toss of one coin must not influence the second toss or the toss of another coin. If one wishes to accept the results as valid, one must also accept the assumptions from which they come. Strictly speaking, these assumptions include: the assumption that Germany's alliance with Austria-Hungary prior to World War I was independent of Austria-Hungary's alliance with Germany prior to World War I; the assumption that "both" alliances had no influence upon France's alliance with the United Kingdom; the assumption that the United Kingdom's alliance with France was unrelated to France's alliance with the United Kingdom; the assumption that one great power's participation in war in 1914 was independent of all the other great powers' participation in
war in 1914; and the assumption that a great power's participation in war in 1914 had no influence upon its participation in the same war in the following year. Demands that states move about aimlessly, with no ties to others or to their own immediate past, and that they strike at no other in particular at no particular time are prerequisites fatal to a study of interstate conflict.

Let me emphasize that the point is not simply that one should compute tests of statistical significance for a population correlation. Although they do not report tests of statistical significance, Harf, Hoovler and James, Jr. produce results which are as unacceptable as are those of Singer and Small.

To be replicate of a process *, a unit must be independent of other instances of *. If a unit is not independent, no new information about * is obtained by studying it twice, and no additional confirmation of (a theory) T is obtained by counting it twice. 36

35 The contrary position, one which I feel is proper but am convinced is not, can be found in Robert F. Winch and Donald Campbell, "Proof? No. Evidence? Yes. The Significance of Tests of Significance," The American Sociologist, 4 (May 1969), 140-143.


There is also the story of the psychologist who reported that a rat’s speed through a maze improved under the influence of a drug which his colleagues had reported to be a retardant. He then replicated his results, reporting an N of 1000 cases, far more than in all the previous research. To his now astonished colleagues, he extended an invitation to his laboratory so that they might inspect the raw data. When they arrived he directed them towards two file cases and pointed out the still exhausted rat.
Neither is the problem of interdependent observations peculiar to the studies just discussed. As we shall see, it undermines the validity of many statistical studies relevant to the balance of power theories. Nor is this a new problem: it is as old as the method.

The first cross-cultural statistical paper was presented in 1888 to the Royal Anthropological Institute of Great Britain and Ireland. E.B. Tylor read his paper reporting "adhesions" of various customs in a sample of hundreds of "great civilizations and savage hordes" to the meeting. Afterwards, F. Galton suggested that the "adhesions," or correlations, might be due to diffusion rather than to functional or causal connections.

(F)ull information should be given as to the degree in which the customs of the tribes and races which are compared together are independent. It might be, that some of the tribes had derived them from a common source, so that they were duplicate copies of the same original. ³⁷

Henceforth known as "Galton's problem", it has worried anthropologists for decades. Naroll has devised numerous solutions and, repeatedly, has carried the difficulty from the anthropological journals onto the turf of other social scientists, but it has yet to seriously trouble


³⁸ The same is true of the other disciplines. For example, David Harvey in his fine methodological critique of the "new geography", which he pioneered, writes:
statistically-inclined students of politics. 38

While this problem cannot be ignored, it should not be solved in the ordinary sense of that word. Solutions to "Galton's problem", or "spatial autocorrelation" as it is known in geography, exist39 but they are inappropriate in international relations. They would have us eliminate the subject. The problem should be dissolved, not solved. One should eliminate the cross-sectional statistical analysis suited to well-stirred messes of time, places and events, which, therefore, turns alliances, war and other relationships between states into technical distractions. Longitudinal or historical analysis is an essential prerequisite for a valid study of international political processes.

This problem arises at almost every point in work at the interface. It is certainly unresolved, and often it passes unrecognized. It has always seemed strange to me, for example, that multivariate methods of regionalization rely upon correlation measures which, if they are to be judged significant indicators, require independence in the data observations, when the objective of the whole procedure is to group units into regions which have similar (and hence spatially autocorrelated) characteristics. The method and the objective in this case seem to be logically inconsistent or, at best, to generate a set of regions which cannot be judged significant in any meaningful sense.

This is from p.43 of his Social Justice and the City, (London: Edward Arnold, 1973), a remarkable collection of essays.

The Choucri and North analysis of the great powers from 1870 to the start of the First World War is longitudinal and, therefore, avoids the assumptions which crippled the other studies. They report that changes in the number of each power's alliance commitments had very little effect on a nation's external violence. In the context of the 1870-1914 situation (a classical case of the conflict spiral) alignment commitments per se contributed only minimally to the intensification of conflict behavior. (109)

"This finding," they observe, "refers to long term trends and not to crisis confrontations where alliance commitments may be more influential." (109,fn.69) During the conflict spirals of the 1870-1914 period one would expect that the annual changes in the numbers of alliances (Alliance/T--Alliance/T-1), the variable Choucri and North enter into their equations, would have been far less important than the particular commitments and the pattern formed by these ties between states. Alliance groupings defined a major axis of competition and conflict; forced the

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inevitable incidents upon it; magnified them; and, as a consequence, made crises more frequent occurrences and more dangerous ones. To be of greater relevance to the balance of power theories, "alliance commitment" must become less of an attribute of a state and more of a relationship between states.

4.3 WAR AND RATES OF INDUSTRIAL GROWTH

Just as "alliance" in the balance of power theories implies a relationship between states, not simply an attribute of separate states, so also are "industrial growth" and "war" relational variables. With alliance commitments, a state can add to its relative power position and alliances between others may detract from its position. Similarly, a state's relative position may be enhanced by industrial growth and may be altered by the industrial growth of others. In many studies of the relationships between industrial growth and interstate war or conflict, industrial growth is used to define relative power positions. Those studies will be examined in the section following this one. Here I will discuss studies relevant to the relationships proposed between the rates of economic growth and wars.

The modal study is a cross-sectional analysis of a large number of states which searches out interstate violence with predictors such as the rate of change in gross national
product. Important reasons for rejecting the results of this type of study have been discussed above. Rather than cataloguing diverse findings and repeating the same arguments against accepting them, I will point to other, related, faults which prevent many studies, be they longitudinal or cross-sectional, from ever meeting the balance of power propositions. These faults between tables and text result from the handling of the dependent variable.

Strictly speaking, very few studies are relevant. War is a relatively rare occurrence, and its incidence is a discrete and, more often than not, binary variable. As such, the analysis of the incidence of war is ill-suited to the favoured statistical procedures. The dependent variable in many studies, therefore, is "conflict behaviour", a notion which includes diplomatic abuse and military hostilities. Assuming that war is simply more diplomatic abuse, the problem of asymmetric propositions and symmetric data remains. Conflict is made to be something given off in all directions.

As I noted in Chapter 2, Goldmann pointed out that the symmetric data used to test the rank disequilibrium hypothesis were inappropriate. He illustrates that the symmetric war data inflate the relationship with status inconsistency. The use of inappropriate data may also attenuate the "true" correlations. A hypothetical example suggests how this might be so. Figure IV:1 describes the
scatter of the covariation between the rate of economic growth and the amount of foreign conflict for a sample of twelve states. No relationship emerges if we focus upon all twelve. If the non-aggressive parties are ignored, the "true" positive relationship is visible. Exclude A, D, L and I, and tilt the regression line 45 degrees.

Figure IV: 1

Obviously when restricted to a slice of the non-hypothetical world, such a gimmick is impossible. We can stipulate which is which all we want. In the real world the process must be examined, but that is precisely what cross-sectional analysis is unable to do. Dyadic analysis is recommended by some to get out of the difficulty. For example, Rummel, at the conclusion of the study just caricatured, proposes to restore interstate relations by means of dyads of states.41 This is a palliative which, once accepted, only serves to exaggerate the inherent difficulties of cross-sectional analysis.

Longitudinal analysis is a requisite for valid results relevant to the propositions, but it is not in itself sufficient. Choucri and North, in their longitudinal studies of the great powers during the period 1879 to 1914, find significant positive relationships between various

Figure IV: 1

Scatterplot Of Relationship Between Industrial Development And Foreign Conflict: Hypothetical Data On Twelve States
rates of industrial growth and the levels of external violence. However, in a period free from war between the European great powers, they define levels of violence by the annual conflict peaks. Which great power any great power was fighting with was unimportant in their statistical analyses.\(^{42}\) This detracts from it. While the argument could be made that conflict between the great powers was symmetrical, the question remains: symmetry between whom?

After forty years and subsequent statistical studies, A.L. Macfie's modest "The Outbreak of War and the Trade Cycle" has yet to be superseded. In 1938, Macfie examined the 12 large wars fought by the great powers from 1815 to 1914. He found that "the outbreaks of war avoid years of crisis or business panic." "Business panics are unpleasant; but at least they seem to absorb all of a nation's surplus energy." "Sparks fly" not on the slide or in the trough, but on the rise of the economic cycle.

To change the metaphor, it is suggested that the unnatural heats of an excessive expansion are required to germinate the seeds of war—no matter when they are sown. If we can diminish the excess of heat, we shall then diminish the risk of the outbreak. If these considerations are accepted, we may well pray that statesmen may be granted an access of wisdom between now and 1940.

\(^{42}\) See the study listed above and "The Determinants of International Violence," Peace Research Society (International) Papers, XII (1969), 33-63; and Nations in Conflict: National Growth and International Violence (San Francisco: W.H. Freeman, 1975), pp.25, 234-243. In the last mentioned, they state "target nations include not only the six major powers in the study, but all states."
And the unlucky thirteenth case appears to have conformed to the pattern of the other twelve.\textsuperscript{43} However, it did differ in one respect.

Macfie examined fluctuations in the years 1851-1872 and 1893-1914 and as he states "the reason is significant." The years 1815-1853 and 1872-1898 were relatively peaceful and "such unwonted peacefulness stimulates our attention."

Comparing the periods of peace and war he reports that they parallel the rise and fall of the wholesale price series.

- 1820-1849 Prices falling
- 1849-1874 Prices rising
- 1874-1896 Prices falling
- 1896-1914 Prices rising

He concluded that wars break out in the prosperity phase of the business cycle "but only in those which occur in prosperous long periods."\textsuperscript{44} If so, the thirteenth spoils the pattern.

Kondratieff (after whom long waves in prices, interest, trade, agricultural production and industrial production have been named), also contended that "as a rule, the most

\textsuperscript{43} A.L. Macfie, "The Outbreak of War and the Trade Cycle," Economic History (A Supplement to the Economic Journal), No. 13 (February 1938), 93, 96. Since a brief mention in Wright's A Study Of War, which was completed during World War II, there have not been any references to this article in the appropriate literature (save for Blainey's The Causes of War. It is to Blainey that I owe the introduction.)

\textsuperscript{44} Macfie, "The Outbreak of War and the Trade Cycle," 97.
disastrous and extensive wars ... occur"\(^{45}\) on the long upswing. I leave the theoretical, statistical and political objections to his analysis to Chapter V. All that is relevant here is that Kondratieff was more anecdotal than systematic in this part of his analysis and that his critics found to the contrary. Oparin,

studying the list of wars... which, according to Kondratieff, occur most frequently during the upswings... found instead a *clustering around the turning points*. After elimination of the events of the 5-7 years in the neighbourhood of the turning point, important as well as trivial events cited by Kondratieff were found to be *equally distributed* over the different phases of the long waves.\(^{46}\)

More recent and more systematic studies of periodicity in war do not suggest a 50-60 year cycle. Singer and Small record a 20 year periodicity in the amount of war underway in the central state group from 1815 to 1965.\(^{47}\) Denton and Phillips, in an analysis of Wright's data which cover a longer span, also found a 20-25 year periodicity and hint at

\(^{45}\) Kondratieff, "The Long Waves in Economic Life," 536.


\(^{47}\) "Patterns in International Warfare, 1816-1965," The Annals 149-150; and The Wages of War, pp.203-215.

a 80-120 year movement.48

The basic index which Macfie used to reflect economic conditions was the unemployment figures for Britain. Here caution is in order. Macfie himself is cautious; but, aside from prose surveys of business conditions in each state, which he provides and which support his conclusions, other systematic data were not available to him. Better indices and more extensive data are now available, thanks to the labours of other economic historians.

Haas had the advantages of fuller information in his study of social stresses and strains leading to war. Moreover, he carefully distinguished between participation in war and aggressiveness. During the period 1900-1960, he reports, "countries with high unemployment are involved infrequently in war" and "unemployment is correlated with nonaggressive war participation". Although they are in sympathy with those of Macfie's study, these results are based upon a crossectional analysis of ten states, and, therefore, are suspect.49 In a longitudinal analysis Haas discerns "for most countries" (of the original 10) the pattern: upswings in industrial growth followed by upswings in military expenditures and falls in the unemployment


50 Haas's most recent study is cross-sectional and the
4.4 RELATIVE POWER POSITION AND WAR

The studies relevant to the relative power position/war relationship are grouped according to the method of defining and measuring the independent variable, relative power position. There are four types of indices in the literature: (1) the absolute differences in capabilities between pairs of states and/or alliances, or their ratios; (2) the rank order of capabilities; (3) the percentage share of the total capabilities of a group of states; and (4) the percentage deviation from the mean share of the group. Each of these has significant limitations, the common denominator of which is the inability to exploit fully the existing information on the interrelations between states. In addition, many of the studies reviewed suffer from the methodological pitfalls described above and, as we have seen, their common denominator is an inability to analyse international relations.

4.4.1 Pairwise Differences or Ratios

The balance of power theories and Rummel's "social field theory,"51 dressed as they are in different languages,

results are mixed. See his International Conflict (New York: Bobbs-Merrill, 1974), pp. 186-196.

appear to be odd companions; but they share the basic argument that the disparities in power capabilities between states determine the extent of conflict between states. Various empirical investigations of social field theory\textsuperscript{52} suggest there is little to the relationship. Insofar as social field theory "is based on social relations and relative positions" and its underlying premise "is that behavior is the consequence of the total social situation,"\textsuperscript{53} the validity of the findings should be impervious to the critical comments levelled at each of the preceding studies. Such is not the case. When they are similarly pressed, substantive and methodological holes appear, and the cumulative effect of these criticisms lets us place little confidence in the theory and its empirical consequences.

The question of the adequacy of the event data sources of the Dimensions of Nations project, of which social field theory constitutes the theoretical core, has stimulated numerous critical evaluations and reliability studies which are summarized elsewhere\textsuperscript{54} and need not concern us here.


\textsuperscript{53} "A Field Theory of Social Action," 183.

\textsuperscript{54} For example, J.M. Scolnick Jr., "An Appraisal of Studies of the Linkage Between Domestic and International Conflict," Comparative Political Studies, 6 (1974), 485-510.
Factor analysis, the principal research technique, has drawn less voluminous but more telling comment: when using it, theoretical decisions often and easily pass themselves off as merely technical ones, with disastrous results. Although this is not the place to enter into an extended discussion of the technique, some discussion is unavoidable because the factor analysis model is the basis for the theoretical model of social field theory. The factor analysis model is taken "as an actual model with a mathematical structure that describes... reality." If in fact it does, one wonders why "reality" must be mangled by a variety of transformations in order to fit the model. Many variables are beaten into normality with "x", "x^2" and "sine-1" "\sqrt{x}" transforms and they lose their substantive interpretation in the process. Theories, not data, should be beaten. The latter are to be lured and gently coaxed.

The unit of analysis in social field theory is the dyad, or pair of states, and the goal is to account for the type and extent of interaction which couples them in terms of their "distance" from each other on various attribute dimensions, of which "power" is one. To reduce the mathematical complexities, each dyad often is assumed to be symmetric. That is: state A's actions toward state B are assumed to be of the same magnitude and quality as B's toward A. The absolute distances on capability dimensions, 

or the power disparities, are then correlated with the sum of the interactions within a dyad across all dyads. Therefore, following the arguments made above, it would appear that a fanciful picture of the interstate system lies beneath the massive columns of "r", "beta" and "R²" which characterize assessments of social field theory. Unlike in cross-sectional analyses of states, interstate relations, very peculiar ones are found. In thousands of dyads scattered about in N(N-1)/2 spatial dimension, each partner is mutually and exclusively involved with the other. Both behave as one and are disconnected from all others, even though each retains the ability to be in N-1 distinct independent places simultaneously. If the state dyads are considered asymmetric—(A→B) a unit independent of (B→A)—the picture of the interstate system becomes ever more fanciful.56

Two recent papers on the post-World War II period, one by Garnham and one by Weede, appear to add weight to the peace through preponderance proposition.57 However, both papers report analysis of dyads, and display the persnickety technical issues at the expense of substance. Both

56 This, an analysis of "directed dyads", is the recommended procedure according to Kegly and Skinner. See my comments above, pp. 94-96.

"controlled" for geographic position by choosing contiguous pairs of states for cross-sectional analysis. Garnham constructed his pool of cases by selecting all contiguous states which had engaged in "lethal conflict" and then adding all states contiguous to each of them. "Lethal conflict" is defined as hostilities which result in at least one fatality.

The advantage of a low threshold is that it produces a larger number of cases for analysis. This is important because lethal international conflicts are rather infrequent; in fact, in some regions of the world there have been no occurrences in recent years. Garnham finds sixteen lethal conflicts and the common form of lethal conflict, great power intervention in their social and geographical peripheries, is evaluated. Surely to include the North Vietnam/South Vietnam, and the China/North Vietnam dyads and to leave out the USA/South Vietnam, USA/North Vietnam and the USA/China dyads is to miss some things of importance in the 1969-1973 period analyzed. The same is true of Weede's study which is confined to Asian dyads during 1950-1969.

Geographic proximity is important, but states alter political geography with technological changes, alliances and warfare. Maps, rather than a map, are necessary. Consider two more recent studies which are opposites in terms of research design but are similar in that they take geography rather than political geography into account.

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first, another by Garnham, is an analysis of hundreds of dyads. The second, by Svalastoga, is an analysis of a single dyad over one hundreded years.

Garnham, in his study of geographic proximity, power parity and interstate war during 1815-1965, calculated the physical distances between pairs of national capitals with a computer program designed to target missiles from point to point on the surface of the globe. In effect, the political geography of the missile age is imposed upon the ages of horsepower, sail, and steam. Whether a missile travels over water, mountains or desert is immaterial. That the distance through the sky between London and Paris is less than the distance between Paris and Berlin matters in missile technology, but matters not at all given the military technology of most of the period under consideration. Garnham expresses a desire for more accurate maps so as to improve his measure of geographical proximity between pairs of states, but we need only crude maps and crude knowledge of the historical context in order to pick out the salient features. Furthermore, to analyze the distances between pairs of states and to assume for purposes of statistical analysis that the dyads are unrelated to each other, as Garnham does, destroys the spatial arrangement which prompts the argument about geographical opportunities.

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for war: my neighbour is my enemy but my neighbour's neighbour is my friend. Lastly, to restrict the analysis to dyadic war, that is to duels only, eliminates approximately 40% of the interstate wars, including the more bloody of the great power wars.

Two of the twenty wars Garnham excluded—the Franco-Prussian and World War I—are the subject of Svalastoga's study of differential rates of change in power capabilities and war between France and Germany during 1820-1920. Among the reasons these two great powers were chosen is the fact that they are contiguous, but by focusing all his attention on the pair of great powers, Svalastoga loses the geopolitical context and thereby misrepresents some of the quantitative evidence which he presents and renders his argument, initially weak, weaker still.

When discussing the changes in military expenditures for the 1860-1910 period (the only period for which the statistics were available to him), Svalastoga states:

All rates computed were positive suggesting a steady build-up of tension between the two nations. This build-up proceeded at a high speed in 1860-1880 in both nations. The rate for France in 1880-1900 was much lower...whereas the German rate came close to 00.0. In contrast Germany showed a much faster build-up in 1900-1910, when the French rate approached zero. Thus throughout the period the risk of war was on the increase.

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On the contrary, the data do not suggest a steady build-up of tension between France and Germany. There is no monotonic relationship between growth rates and the occurrence of war, and the increases in the rate of growth of military expenditures for France in the 1880-1900 interval and for Germany in the 1900-1910 interval reflect, in large part, the naval arms race each had with the United Kingdom.

Svalastoga argues that if "this theory is correct, the differential rate of change causing Germany to become more powerful than France is the major explanation of the two wars mentioned". The existence of "extreme power differences" is one of the conditions which he specifies will not lead to war, however, much of the documentation which "serves primarily to provide the antecedents of the First World War," illustrates the considerable disparity in power between Germany and France on the eve of that war. For example, the ratio of German to French "potential power" in 1910 (the last date) is 4:1. That is the highest ratio in the table of estimates of "potential power." To my mind, it is an extreme difference.

Germany's power position is less overwhelming if we take into account her neighbour to the east, as well as her neighbour to the west. To describe the antecedents of the First World War, as Svalastoga purports to, we must describe

62 Ibid., 26.
the alliance between Germany's neighbours. In turn, we must then describe the alliance between Germany and Austria-Hungary, and so on.

Whereas Garnham excluded the First World War from his analysis because it was not a duel, Svalastoga included it because he took it to be a duel between two great powers, each of whom had the exclusive attention of the other. Both procedures and the theoretical arguments which prompted them are wanting. When do wars between great powers occur? Why do some great power wars remain duels and some become world wars?

In his book-length study, *The Power Capabilities of Nation-States*, Wayne H. Ferris measures relative power position in the same manner as the others—absolute differences between, or ratios of, the capabilities of pairs of states—but his analysis appears to be more plausible. For one thing, he constructs an elaborate index of potential power. "The purpose of the inquiry," he writes, "is to measure the relative power capabilities of all states in the international system during any given year." For another, his analysis covers 116 years, 1850 to 1965, and many of the many tables in his book suggest considerable experimentation with time lags. I evaluate the index construction in the next chapter. Until then, let us assume that all is well there. The major conclusions and policy implications are:

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Evidence resulting from this study indicates that relative parity in power capabilities does have deterrent value in precluding the onset of intense conflict. Moreover, few wars result between states that are closely balanced in power capabilities available to each. Thus, there appears to be some merit in the policy of statesmen who seek to approximate parity in capabilities relative to specific nations...potential adversaries in military conflict. Yet states that seek to narrow the disparity between themselves and other specific states as well as those that aim at widening an established gap, are to be cautioned. The evidence indicates that such change increases the probability of becoming involved in intense conflict with those nations disadvantaged by that alteration. It seems especially true for states that widen an already existing gap.... Consequently, although parity...promote(s) noninvolvement...in war, states that enjoy a marked advantage...might be well advised to preserve their edge, since change in the direction of parity...(is) associated with the occurrence of intense conflict.64

To continue, following through on the underscored lines, it must also be concluded that the advantaged are, quite literally, to preserve their edge because increasing the edge also leads to war.

These are curious policy implications and conclusions: parity preserves peace but changes, no matter in which direction, towards parity or preponderance, lead to war. How do parity and peace come to be? The balance of power theorists answer: "By means of alliance and counter-alliance." Their critics argue that such delicate balancing is impractical in an era of rapid industrial change. Ferris, by excluding alliances, silently sides with the

64 Ibid., p. 123.
latter. Without alliances, and given the large number of changes in relative positions between one hundred states over as many years, there are not nearly enough wars to permit Ferris to draw a strong implication that change per se leads to war. This could be the case only if the probabilities of war between any two states were bound by specific ratios of relative power. Within a certain distance, A and B "balance" each other; it is the crossing into the "deterrence zone" which is dangerous. Upon leaving, a weakened B may be pushed. Organizations may map the social space surrounding them just as men and other animals divide up the space surrounding themselves.

Some thirty inches from my nose
The frontier of my Person goes,
And all the untilled air between
Is private pagus or demesne.
Stranger, unless with bedroom eyes
I beckon you to fraternize,
Beware of rudely crossing it:
I have no gun, but I can spit.

65 At the end of his book, Ferris suggests that alliances be included in further research. Ibid., p. 121.
After trial and error, Ferris suggests that the ratio 1.45:1 may be a critical line for states. Here is a table with his interpretation.

Table IV:2

The data indicate that the power capabilities disparity relationship is relevant to the occurrence of war. Few wars are seen to occur when the two sides to the conflict approach equality in power capabilities below the ratio level of 1.45. Once that threshold is exceeded, however, the number of war events increases markedly.  

From this text and table and his subsequent tests of the relationship, the sources of Ferris' curious conclusions are plain. Ferris cannot say, on the basis of this table or on the evidence presented in any other table in his book, that as the ratio of power capabilities between any two states changes, war is more or less likely to occur. There are three reasons for this.

The first objection, and the one which he tries to meet in later pages, is that only the incidents of war are given in Table IV:2. That wars, more often than not, are fought between unequal states cannot imply logically that unequal ratios of capabilities result in war. War may predict to unequal capability ratios, but the more interesting question is whether disparities predict to war. "According to our theory," Ferris writes, "the probability of...war increases

67 The Power Capabilities, p. 76.
Table IV:2

Power Capabilities Disparity Ratios Above and Below the 1.45 Level War Events, 1850–1965

<table>
<thead>
<tr>
<th></th>
<th>High (&gt;1.44)</th>
<th>Low (&lt;1.45)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>War</td>
<td>34</td>
<td>8</td>
<td>42</td>
</tr>
<tr>
<td>Military Hostilities</td>
<td>45</td>
<td>11</td>
<td>56</td>
</tr>
</tbody>
</table>

as...disparity between conflicting parties increases." He concludes:

Hypothesis 4: Given an interstate conflict....
Hypothesis 5: Given an interstate conflict....
Hypothesis 6: In most wars a high level of disparity characterizes the power capabilities relationship prevailing between the two sides prior to initiation of a war.
Hypothesis 10: Most wars are characterized by significant change in the power capabilities relationship...

Whatever force the theory may have is lost when its empirical consequences are pulled off inside out. My objection is not to weak propositions but to the improper inferences drawn from them. Strong policy implications should not be drawn from unexamined theories.

The second objection is to the way in which Ferris attempts to meet the first one. Rummaging through the 1850-1965 period, Ferris generates a "control group" of "105 hypothetical non-conflicts." Years, states, and adjacent neighbours to the selected states are chosen randomly. All of the conflicts and non-conflicts, each wrenched from historical context, are pooled and analysed cross-sectionally. That is the third objection: cross-sectional analysis permits nothing, demands everything and leaves strings of ersatz findings.

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68 Ibid., Appendix, p. 161.
Often the scarcity of lengthy time-series data is used to justify cross-sectional analysis as a last resort. However, Ferris does not lack time series data. He uses data extending as far back as twenty years from each instance of conflict and non-conflict. With this information, Ferris could have, and should have, inspected the power capabilities of a group of conflict-prone states over time. In this way, the changes and trends of which he writes and which his procedures render invisible could be observed. The grounds for rejecting the balance of power propositions would be solid, perhaps too solid.

If it were established that each war were preceded by growing power disparities, a reasonable critic could point to other "changes in the power capabilities between states" which did not result in conflict between them. Which pairwise comparisons should be accepted as potential counterexamples? The question is not an innocuous one. On the contrary, it is crucial to the measurement of relative power position: position relative to which others are to be ranked? If relative power position is defined as a percentage share, which states compose the total? The answer obviously affects its division. If relative power position is defined as deviations from the mean share, the index becomes more sensitive to the composition. The more

69 For example, R. Burrowes, "Multiple Time Series Analysis of Nation Level Data," Comparative Political Studies, 2 (1970), 465-480.
informative the index is about position of a state in a group of states, the more important the determination of the group's members and structure becomes. There is no single way to do this, but some procedures are more arbitrary than others. Certainly, confining the search to randomly chosen adjacent pairs is more capricious than examining relations between great powers in historical, geopolitical context.

Alliances alter the relations among the great powers, and Choucri and North investigated the "responses to differences or gaps between... (each great power)... and close rivals or members of opposing alliances"⁷⁰ during the thirty-five years prior to World War I. Analysing the great powers individually, alliances were counted; the great powers they linked and the subsequent effects upon relative positions were not considered. However, alliance relationships are found in the portion of their paper where the level of analysis is "regional". That is, the two alliances which the great powers formed—the Triple Entente and the Triple Alliance—become the units of analysis. As the leaders of each great power survey a polarized environment in order to assess their relative position, they compare their capabilities plus those of their allies, with those of the opposing alliance. The relative power positions of individual states are, in a tight bipolar context, practically indistinguishable from the relative position of

⁷⁰ Choucri and North, "Determinants of International Violence," 43.
their coalition. There is little danger of the "ecological fallacy" here. Unfortunately, there is another. Choucri and North erred when they tacitly assumed that, since upon the eve of World War I there were two competing war communities, these same two coalitions existed latently during the previous forty-five years. Clearly this is mistaken. Some allies during the war were recent rivals prior to the outbreak. The path diagram presented (55) indicates that the inter-coalition differences in military expenditure played a significant role in accounting for inter-alliance violence, but according to the historical record, the United Kingdom, (the putative leader of the Triple Entente), was involved in naval arms races with France and Russia, (her putative allies), for twenty-one of the forty-five years studied.71

4.4.2 Rank

East, in his article on international mobility and conflict,72 finds "the highly mobile states exhibiting the least conflict...the least mobile states exhibiting the most


conflict" and the upwardly mobile having slightly more conflict than those on their way down (125). To arrive at these results he ranked all states upon two dimensions—prestige (number of diplomatic representatives received) and wealth or power (GNP/capita); computed mobility scores by accumulating the number of annual rank shifts over fifteen years between 1950 and 1964, and correlated these scores with the amount of conflict each state was involved in.

The intermingling of the status and wealth dimensions in the measure of mobility renders East's study less relevant to the balance of power theories than those of Rummel, Ferris, and Choucri and North. And, even if it were more relevant substantively, the cross-sectional mode of analysis would leave the analysis methodologically unsound. Despite this, the study deserves attention for two reasons: (1) it is the only study using rank order to measure relative positions; and (2) it provides an interesting example of how the determination of group boundaries may alter the values on a relative power position index.

Rank, as an index, has an obvious advantage over the absolute difference measure. With a single figure, we know the position of a state vis-a-vis any number of other states. The disadvantage is equally obvious: while we know which is ahead and which is behind, we do not know how far ahead or how far behind any state is from any other. Rank is too gross an index. It is often more rewarding to run
the risk of false precision; especially when, to avoid it, we do toss away valuable information.

East sees a methodological difficulty with his index. There is, he writes, "a basic weakness in the mobility measure."

The way the measure is computed limits the amount of mobility of certain states. Whereas states in the middle of the ordering have an opportunity to move both upwardly and downwardly to a large extent, those at the top (and at the bottom) are limited in their mobility. If a state is ranked one or two, there is little or no opportunity for upward mobility. On the other hand, the largest potential for upward mobility is found in those states ranking close to the bottom of the system. 73

To my mind, the problem is far more substantive and theoretical than technical: what is "the system"? That the top-ranked great power cannot move upward and that the opportunities for advancement of the remaining great powers are few are facts of our number system and world. Insofar as the mobility index East constructed reflects these facts, it provides an accurate picture of international stratification. The difficulty with the index lies not in its stringiness at the top, but in its permissiveness in the middle and lower reaches. To capture the influence, if any, between mobility (defined as rank shifts) and war among the great powers simply requires a longer period of observation (and longitudinal analysis). The question which requires thought is whether the movement in the string of ranks

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73 East, "Rank-Dependent Interaction," 125.
beneath the great powers is mobility in a socially meaningful sense. I suspect that often it is not. Do the leaders of Chile and of Kenya include each other when assessing their security concerns? No. Persistent hierarchical structures, such as the state system, do not consist of elementary parts simply piled on top of one another. They consist of interrelated subsystems, each in turn hierarchical in structure. The dominant great power system ties together not single states, but "subordinate state systems", and mobility within them is meaningful politically because it is within "the Great Power Institution." A measure such as East's, which designates every single Latin American state as downwardly mobile because of the "influx of newer African and Asian states," is not up to assessing theoretically meaningful relationships between interstate mobility and conflict. The world is not string.

4.4.3 Percentage Shares

Stuckey, when measuring relative power position by averaging the percentage shares held by each great power of the total military expenditures and personnel, total and urban population, iron and steel production and energy


75 East "Rank-Dependent Interaction...," p. 123.
consumption, found that there was no predominant pattern leading to warfare between the great powers during the 1815-1965 period. Germany, for example, entered two wars when its composite percentage share of the "war potential" was high and rising, two more when low and falling, and one when low and rising. The relationships between relative position and war differed for the other great powers. Singer undoubtedly had these results in mind when, in an interim report on the Correlates of War project, he summarized the studies which he and his associates (among them, Stuckey) had completed. He wrote:

although major powers do account for a disproportionate share of all war activity, analysis to date reveals no strong relationship between a given war proneness and its power rank, share of resources, or changes therein.

As a measure of relative power position, the percentage share ignores the location of each great power in the hierarchy of great powers. Consider the following hypothetical distributions of decimal percentage shares at times T to T+3.

<table>
<thead>
<tr>
<th>Time</th>
<th>Great 1</th>
<th>Great 2</th>
<th>Great 3</th>
<th>Great 4</th>
<th>Great 5</th>
<th>Great 6</th>
<th>Great 7</th>
</tr>
</thead>
</table>

76 John Stuckey, "Capabilities and Great Power War", Canadian Peace Research and Education (CPREA), Montreal 1972, personal notes. (I believe this is a version of Stuckey and Singer, "The Powerful and the War Prone: Ranking the Nations by Relative Capability and War, 1820-1964", which was presented in Mexico City in the following year.)

Great power A, the relative power position of which we wish
to demonstrate, maintains a steady percentage of the total
war potential but clearly its position \textit{vis-a-vis} the others
varies extensively. It slips from a position of equality to
one of inferiority. Knowing A holds 20% is knowing
something, but is not knowing enough.

4.4.4 Deviation from Average Share

By calculating the deviation of each great power's
percentage share from the average share of all the great
powers, Singer and Small improve the percentage share index
of relative position. Using this index they found, contrary
to Proposition 12, that increases in relative power position
preceded great power war as often as did decreases. They
conclude:

\begin{center}
\begin{tabular}{cccccc}
Power & Power & Power & Power & Power & Power \\
A & B & C & D & E \\
\hline
T & .20 & .20 & .20 & .20 & .20 \\
T+1 & .20 & .50 & .20 & .10 & -- \\
T+2 & .20 & .40 & .40 & -- & -- \\
T+3 & .20 & .80 & -- & -- & -- \\
\end{tabular}
\end{center}

we cannot say much about the likelihood of getting
into war from knowing anything about capability
and direction of change. That is, major powers
seem to be as likely to get into war when their
capability is above the major power average as
when it is below it, and they seem as likely to
get into war when their capability is rising as
when it is falling.\textsuperscript{78}
Singer and Small point out their "composite capability measure is still a tentative ... one whose validity is far from conclusive." Given a valid measure, a combination of military expenditures and personnel, total and urban population, iron and steel production and fuel consumption, what is to be done with the resulting numbers?

Consider now a second set of hypothetical decimal percentage shares.

<table>
<thead>
<tr>
<th>Time</th>
<th>Great Power</th>
<th>Great Power</th>
<th>Great Power</th>
<th>Great Power</th>
<th>Great Power</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>T+4</td>
<td>-20</td>
<td>-20</td>
<td>-20</td>
<td>-20</td>
<td>-20</td>
</tr>
<tr>
<td>T+5</td>
<td>-20</td>
<td>-30</td>
<td>-20</td>
<td>-20</td>
<td>-20</td>
</tr>
<tr>
<td>T+6</td>
<td>-20</td>
<td>-40</td>
<td>-20</td>
<td>-10</td>
<td>-10</td>
</tr>
<tr>
<td>T+7</td>
<td>-20</td>
<td>-50</td>
<td>-10</td>
<td>-10</td>
<td>-10</td>
</tr>
<tr>
<td>T+8</td>
<td>-20</td>
<td>-65</td>
<td>-05</td>
<td>-05</td>
<td>-05</td>
</tr>
</tbody>
</table>

In this array, there are five great powers at each instance and consequently the mean value remains a constant .20. Therefore, according to the mean deviation index, great power A's relative position from T+4 to T+8 is constant, when it is obvious that its relative position is changing. The mean deviation index fails to discriminate between these

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78 Singer and Small, "Foreign Policy Indicators," 289.
79 Ibid., 285.
variations in relative position and is therefore inadequate. A, C, D and E decline from a position of parity with B at T+5. While A is declining, it is also increasing its position. Maintaining its 20 percent share, it is weaker than B; but it is also in a far more advantageous position than C, D and E, all of which steadily sink beneath it as time moves on. A valid index of A's relative position should register these two aspects.

If the indices constructed were not defective and if the findings of the Correlates of War project and the findings of all of the studies examined in this section were, in themselves, beyond reproach, they would not be cumulative. They could not be added together, piled up like blocks, to inductively build a theory and, insofar as they are not interconnected, each is misleading. The relative position/alliance/war nexus is not merely greater than the sum of its parts: it is different.

4.5 CONCLUSION

As few as ten years ago, if asked to depict simply the major cleavage within the North American discipline of international relations, it would have been reasonable to take two points; to label them (say) "Morgenthau" and "Rummel", "Bull" and "Singer", or "classical" and "statistical"; to place them on the opposite sides of a
page; and to erect a vertical line between them. Since then, fatigue with a fray fought under the banners of "Wisdom" and "Science", and the concerns of "geocentric" and "transnational" politics have forced the line on its side and made the points lie upon it. The technical barrier became the substantive connection. The clutch of studies reviewed in this chapter are concrete examples of that connection. Some are also illustrations of the often enormous fault-line between matters of substance and technique; the "virtuosity within monotony" which marks methodological involution. The pattern is set, and technique dominates. Bacon, of all people, in his attack on the scholasticism of his day, is richer in our day.

Surely, like as many substances in nature which are solid do putrify and corrupt into worms; so it is the property of good and sound knowledge to putrify and dissolve into a number of subtle, idle, unwholesome, and (as I may term them) vermiculate questions, which have indeed a kind of quickness and life of spirit, but no soundness of matter or goodness of quality. This kind of degenerate learning did chiefly reign amongst the schoolmen; who having sharp and strong wits, and abundance of leisure, and small variety of reading, but their wits being shut up in the cells of a few authors as their persons were shut up in the cells of monasteries and colleges, and knowing little history, either of nature or time, did out of no great quantity of matter and infinite agitation of wit spin out unto us those laborious webs of learning which are extant in their books. For the wit and mind of man, if it works upon matter, which is the contemplation of the

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creatures of God, worketh according to the stuff and is limited thereby; but if it works upon itself, as the spider worketh his web, then it is endless, and brings forth indeed cobwebs of learning, admirable for the fineness of thread and work but of no substance or profit.81

The procedures to "worketh according to the stuff" are the subject of the next chapter.

Chapter V

METHODS AND THEORY

5.1 INTRODUCTION

"To worketh according to the stuff" of the power politics arguments is to work with a modest number of entities which are arranged and interact in a non-haphazard manner through time; to work with, not against, organized complexity. The studies reviewed in the previous chapter are involving towards disorganized complexity. The stuff of international relations—international relations—is turned into chaos in order to satisfy statistical machinations designed to take advantage of chaos. This is the substantive implication of the technical decisions; when theory and technique met, technique dominated. The remedy is plain: do the opposite of what has been done. Where analysis has been cross-sectional, now make it longitudinal. Where the techniques do not care for temporal order, replace them with those which depend upon temporal succession. When measures ignore organized complexity, ignore them and retrieve relations between states with more appropriate measures. Proper measurement, like proper procedures of data analysis, conserves the available information.
The formal statistical techniques common to much of the existing empirical research compress data; waste, rather than conserve, information; and, therefore, are ill-suited to the problems considered here. Those who are rich in theory can afford precision; whereas my propositions are crude and, furthermore, the data are full of error. The precision formal statistical and mathematical reasoning provides is superfluous, hindering rather than expanding opportunities to further theoretical development. Precise statistical procedures often put us in the place of the naive interrogator who, equipped with a couple of precise questions which are truthfully but deceptively parried by a deft opponent, remains a naive interrogator.

Testing the propositions is the first step in data analysis. The second step, one which rudimentary theory and paucity of evidence require us to take — and to take seriously — is to expose the data. As Tukey and Wilk argue:

Exposure, the effective laying open of the data to display the unanticipated, is to us a major portion of data analysis. Formal statistics has given almost no guidance to exposure; indeed it is not clear how the informality and flexibility appropriate to the exploratory character of exposure can be fitted in any of the structures of formal statistics so far proposed.¹

Consider the following three scatters of points.

A mechanical application of regression or correlation techniques would yield identical low coefficients which would suggest, quite accurately, the absence of linear relationships. More often than not, the facts that the relationships differ and that there are two interesting nonlinear relationships would be suppressed. The pictures on the other hand flaunt these facts. Plotting the residuals from a linear fit or transforming the variables would indicate the "proper relationships." To do so would be to engage in data analysis as opposed to statistical treatment. Graphical displays and transformations are simple, powerful and flexible means of data analysis and I use them extensively.

While my methods are not the usual statistical ones, they are quantitative, and therefore, according to the convictions of some balance of power theorists, they make this study irrelevant. The metaphor "balance of power" is a
generally, a lever which can be described mathematically. The balance of power theorists use the metaphor and invoke 'the law of the balance' in words and pictures, but they continually warn that the law of balance of power is fundamentally different from the law of the lever. The latter is a calculating device. While such things should be sought and can be found in the physical world, they cannot be found and should not be sought in political affairs. This is so, the argument goes, because "power," the central concept, is, unlike mass, a qualitative relationship.

"When we speak of power," writes Morgenthau, "we mean man's control over the minds and actions of other men." It is, he continues elsewhere, a "quality...that can be experienced, evaluated, guessed at but that is not susceptible to quantification."

What can be quantified are certain elements that go into the making of power, individual or collective, and it is a common error to equate such a quantifiable element of power with power as such. It is certainly possible and necessary to determine how many votes a politician controls, how many divisions or nuclear warheads a government disposes of; but if I want to know how much power this politician or that government has, I must leave the adding machine and the computer for historical and necessarily qualitative judgements.²

Deep down, talk of "power as such" and of a "necessarily qualitative" as such can be shallow. By definition, "power as such" is not susceptible to quantitative assessment and,

by definition, the concern in this chapter is with components of national power.

The ability to influence and to control other actors and events depends upon national capabilities, and I evaluate the relative power positions of each great power in terms of these capabilities. The evaluations (note: not determinations) must be both quantitative and qualitative. The qualitative and quantitative need not be "irreconcilable approaches to international politics."³ The hubris of those awaiting wisdom from their factor analysis machines and of those seeking wisdom in spite of machines make the two approaches appear to be opposites.

Relative power position depends, in large part, upon the amounts of capabilities each great power possesses and the types of alliances the great powers are involved in. I will describe and evaluate the index of relative power position which I have constructed and then the measures of power capabilities used to compute the index values. First I will describe the measurement of industrial growth and the means of examining the putative relationships between rates of growth and the incidence of war.

³ Morgenthau, "International Relations," p.67.
5.2 RATE OF INDUSTRIAL GROWTH

After evaluating the accuracy of recent economic observations and the uses to which they are put, Morgenstern trenchantly concludes that "precise uses of 'growth rates' are entirely inadmissible, for comparing either different countries or short periods of time of the same country." The growth rates to which he refers are those commonly computed from gross national product and national income data "whose errors are known to be large, though they are not stated numerically by their makers." The inaccurate series which Morgenstern uses to demonstrate his conclusions are among the most accurate of contemporary national statistics. Any attempt to calculate the growth rate for a great power during the 130 years following the Napoleonic wars would demand extraordinary innocence. I can only attempt to overwhelm the difficulties on the one hand and to evade the most obvious dangers, on the other.

The most straightforward method of computing growth rates is to select two points in time and to compute the average, compound or percentage rate of change between them. In some studies of economic growth and interstate violence, the points are contiguous years, and the rates of change of gross national products and national incomes are compared

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5 For a recent example, see Michael Haas, International
across many states. The weaknesses of the observations which Morgenstern points out are built upon rather than evaded. This is yet another reason to avoid cross-sectional analysis.

By extending the time period beyond a single year, one can reduce the impact of observational error (somewhat) and thereby increase the reliability of the calculated rates. However, as the reliability increases with the length of time spanned, the political significance of the resulting figures declines. Imagine, for example, that the points in the scatterplots drawn above are the tracks left by annual economic activities. Assume that the base year in each case is "correct." Now the best estimates of the growth rates, like the correlation coefficients in the original example, are the same in all cases. They squash information relevant to the propositions about the pattern of growth and the incidence of war. Stating this is not to beg the question of whether or not patterns formed by inaccurate points are mere speculation, but to note that to draw away from Scylla is to be drawn into Charybdis. Relying upon a single series of statistics containing an unknowable amount of error increases the risk of being sucked in.

The advantage of statistics such as "gross national product" and other complex accounting fictions is that they summarize the monetary value of the motley flow of goods and

Conflict, pp. 188-191.
activities through the market place. This is, of course, the major source of their disadvantages. Complexity in and of itself provides room for unavoidable errors of all sorts to lodge, grow and multiply. Given accurate observations, the problem of which activities to include here, and to exclude there, and the problem of choosing the monetary weights to assign to them may destroy comparability.

Fortunately, estimates of gross national product and similar figures are not available for many of the states and years examined in this study. Estimates of the physical materials necessary to industrial activity and basic products of that activity are available, and I will use them. My working assumption is that the more concrete or material the indicator, the more accurate the estimates. As I will show (and as others more knowledgeable than I have shown), caution is still the order of the day.

Macfie, in the most acceptable of the studies of economic growth and war, used estimates of the percentage of the labour force which was unemployed in order to follow the trade cycle. Although this series is simpler and more concrete than estimates of G.N.P., the same difficulties of definition remain; who is to be counted as "unemployed" varies, as do the means of counting them and estimating the numbers of those counted who are "employable." Perhaps it is more crucial to recall that Macfie had a single series

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6 A.L. Macfie, "The Outbreak of War and the Trade Cycle."
for a single state and argued that the cycle in the centre, in the United Kingdom, reverberated in an orderly way towards the periphery. Reasonable estimates of unemployment rates for nineteenth century Europe, which might be used to examine his argument, are not to be found. However, with other series for each great power, the need for the argument is eliminated. We may assume more confidence in the accuracy of other series if the quantities are less complicated conceptually and more stable definitionally than G.N.P. or unemployment rates. Such is the case with estimates of iron and steel production, length of railway trackage, and energy consumption.

Iron and steel are basic industrial products, and the quantities of iron and steel produced from year to year indicate surges or contractions of the economies of the great powers. The growth of the heavy capital goods industries constituted the second industrial revolution as the era of textiles gave way to the era of the railroads in Britain. From approximately 1840 until the turn of the century, increases in the length of railway tracks in use reflect the rapid and fundamental changes in industrial development. However, the growth of the railroads is less apt to reflect short term declines in general economic growth. As the rail network expands and then grows dense, the rate of addition of new lines to old drops off.

Technological improvements (such as the substitution of
steel rails for iron rails) cannot be followed with estimates of length of track in use. Actual declines in the length of track may reflect changes in the modes of transportation and more efficient relocation of labour, markets and productive activities. While the sensitivity of the rail indicator is poor to begin with and drops off rapidly in the nineteenth century, this is not the case with iron and steel production. In these capital goods industries, technological advances led to the ability to increase output, and the major qualitative change—from pig iron to steel—presents no problems because estimates of each quantity are available.

In the Correlates of War data set, the series of estimates of iron production end at 1899 and the estimates of steel production begin at 1900. The statistics compiled in European Historical Statistics allow us to extend the iron series into the twentieth century and push the steel series backwards. More importantly, the two estimates of steel production during the 1900's and the two estimates of iron production in the 1800's permit some investigation of the errors in the data. One expects greater accuracy in the twentieth century than in the nineteenth and the two estimates of steel production coincide. This is not reason to be sanguine because the basic sources of information are often closely related, if not identical. The comparison of

the estimates of iron production during the nineteenth century provides a real, albeit limited, test. Although the sources are related once again, they appear to be distant kin. Marked differences between the estimates for some great powers occur. The estimates of iron and the percentage differences between the estimates for Prussia/Germany are displayed in Figure V:1.

Figure V:1 about here

Three aspects of the figure are noteworthy here and each, save the last, is disturbing. (1) The Correlates of War estimates are lower than those from *European Historical Statistics* for Prussia. (2) The percentage differences between the estimates of IRON1 and IRON2 are not small, although the discrepancies diminish over time. (3) Despite the size and variations in the size of the absolute differences between the two estimates, the curves tend to fluctuate together. As one rises, the other rises; as one falls, the other tends to fall. As long as the concern is with rates of growth, the disturbing signs of large absolute error can be ignored.

The face validity of energy consumption is, I think, as high as that of iron or steel production, but the reliability of the annual estimates cannot be ascertained in the same manner. I have only one set of estimates. However, including energy consumption with railway trackage,
A Comparison of Iron Production:

Figure 8:1

Iron Production (000 Tons)

Percentage Increase

Prussia/Germany

1875-1895
iron production and steel production to form a battery should add to the ability to reliably track economic ups and downs. This is the justification for using the index numbers of the value of industrial productivity reported in *European Historical Statistics*. The arguments against analysis of such things stand strongest against exclusive use of them. To use them in conjunction with other indicators, particularly quantities of physical output, is to attempt to subvert and overwhelm the major difficulties. The extent of success, that is whether or not the curves move together, remains to be seen. Finally, and aside from this group of quantitative measure, I have consulted other, more specialized quantitative studies by economic historians and Willard Thorp's qualitative observations and annual capsule descriptions. The latter include all of the great powers and are reported in his *Business Annals*.

The mechanics of the analysis of the various quantities and the incidence of types of war are straightforward. The absolute values of iron production, steel production, length of railway lines-in-use, industrial index, and energy consumption are re-expressed as logarithms and plotted against time. The slopes of the straight lines joining the points in the series describe the proportionate increase or decrease in the quantity from one year to the next. The resulting curve provides a simple, easy to grasp means to

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see the rates of change. The absolute values per se are in
the way and are compressed, while the rate of change is
drawn out. Compressing the absolute values enables
intelligible comparisons of the rates of growth of very
diverse quantities in a single picture. The virtues of
semi-logarithmic plotting are displayed in the following
figures.

Figure V:2 about here

Figure V:3 about here

In the first figure, the absolute value, twice, four times
and six times the absolute value of iron production in
Germany are plotted from 1855 to 1885. Comparisons of the
fluctuations of different curves and of the same curve
through time are improper. Small absolute fluctuations are
smoothed out in order to accommodate the changes in the
larger quantities. In the second figure, the same values
are transformed into logarithms and then plotted. The
identical patterns of change are now obvious. Incidences of
different types of war and participation in war can now be
superimposed on any or all of the curves.9

9 For a discussion of the virtues of semi-logarithmic
graphs, see W. Bowden, M. Karpwich and A.P. Usher, An
Economic History of Europe Since 1750 (New York: Huvard
Fertig, 1970), Appendix.
Figure V:2

The Use of Log Transformations...I
The Use of Log Transformations II
5.3 **LONG WAVES**

Long periods of high and low industrial growth rates are visible in the semi-logarithmic plots I have constructed, but I have not used them to mark off phases of the so-called Kondratieffs, the long waves of expansion and contraction which are thought to characterize capitalist development. The wholesale price series for the United Kingdom, which Macfie used to identify prosperous times in the 19th century, parallels long term movements in interest rates. Kondratieff found roughly parallel movements in agricultural and industrial production from the late 18th century to the 1920s. His waves were international, and "the timing of these cycles corresponds fairly well for the European capitalist states and ... the United States."\(^{10}\)

The first arose "in the late 1780s or early 1790s" until 1810-1817 and fell to 1844-1851. The second ascended until 1870-1875 and descended in 1890-1896. The third followed, rising from 1890-1896 until 1914-1920 and then falling as Kondratieff wrote in the 1920s.\(^{11}\) Garvy, writing at the beginning of the fourth wave, describes the opposition to the notion of the long waves from Kondratieff's colleagues. In the Soviet Union, his analysis caused "the whole postwar situation to appear in a different light."


\(^{11}\) Ibid.
The leaders of Soviet Russia expected this period to be one of wars and revolutions immediately preceding the final disintegration of the capitalist economy. From Kondratieff's scheme, the world economy would appear to have merely entered into a new phase of the regularly occurring long swings. Since it seems to follow from Kondratieff's analysis that a lower turning point will necessarily follow after two or three decades of a downward movement, the outlook changes significantly.\(^\text{12}\)

Aside from the polemical abuse that some heaped upon Kondratieff, Garvy agrees with what they had to say. Kondratieff's procedures left him vulnerable. First he divided the statistical series by population; then he eliminated the trend from the series according to the least squares criterion. Next he eliminated any short term cyclical movements from the deviations about the trend line with a nine year moving average. The elimination of the trend, that is the level of development, caused the most concern. D.I. Oparin, Kondratieff's most able critic, demonstrated that the trend lines varied depending upon the end point of the series. What was above the trend line computed on a series was below the line when the trend was computed from a longer or shorter series. He noted that Kondratieff's dating of the phases was often arbitrary, and he attached far greater weight than did Kondratieff to the latter's failure to locate long cycles in some series. For example, Kondratieff did not find a long wave in iron production in the United States, while he did find steel

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production in the United States and iron production throughout the world to be cyclical. Oparin concluded that long waves can be observed only in the movement of prices and of the long-term interest rates. The long waves immediately disappear from wage and foreign trade series when changes in the price level are eliminated. The physical series as a whole do not show long swings which could be considered long cycles in economic life.\textsuperscript{13}

Others found that some states grew rapidly as some were stagnant. The debates, with some realignments, continue today as we descend on the fourth wave.\textsuperscript{14} For my purposes much of the debate is not relevant. Those who accept the existence of long waves or cycles, or at least, distinctive periods of growth debate the merits of different explanations. My concerns are closer to the ground and those who doubt the utility of marking off these distinctive periods of economic growth merit more attention here.

Some historians of particular periods, especially the contraction phases, question the homogeneity of the periods Kondratieff identified statistically and contemporary observers and other historians labelled "Great Depressions." Saul, for example, calls the 1873-1896 Great Depression a myth. "The sooner the 'Great Depression' is banished from the literature, the better." "Surely," he writes, "the major outcome of modern research has been to destroy once and for all the idea of the existence of such a period in

\begin{flushright}
\textsuperscript{13} Cited in \textit{Ibid.}, 214.  \\
\textsuperscript{14} For example, see Day, "The Theory of the Long Cycle."  
\end{flushright}
any unified sense." The last phrase is important. He also writes, "we should always remember one point": "The events of the 1870s and 1880s, whatever the factors underlying them, caused a serious decline in business confidence" in the United Kingdom. The same was true elsewhere in the world. Both the pseudo-precision of the label, the putative parallelism of monetary and physical series, and the unsatisfactory explanations of both movements concern Saul. Lewis, in his survey of the years between the two World Wars, shares his concerns. Looking back over the years since 1860, Lewis asks, "can such evidence support a long wave theory?" and answers, "Hardly so." He writes:

All that we can say is that... there have been alternating periods of rapid progress and relative decline. There has been no clear pattern, and not sufficient regularity to justify any expectation of a future pattern.

That is all I wish to say.

But whatever the status of long-term economic fluctuations in the lofty realm of economic metaphysics, from a pragmatic viewpoint they can be useful descriptive devices of historic periodization which help to establish fairly distinct units for investigation.

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16 See, for example, Hans Rosenberg, "Political and Social Consequences of the Great Depression of 1873-1896 in Central Europe," The Economic History Review, Series 1, 13 (1943), 58-73.


18 Rosenberg, "Political and Social Consequences," 59. For the contrary, see David Landes, The Unbound Prometheus:
"Kondratieff" is shorthand for the following historical periods in my analysis. ¹⁹

1823 to 1847
1848 to 1873
1874 to 1896
1897 to 1914
1919 to 1939

Moreover, my method of analysis does not rely upon the impossible exactness which these dates imply.

5.4 ALLIANCE COMMITMENTS

To handle sets of discrete variables which have small ranges, such as "the number of alliance commitments" and "the incidence of war," the graphics necessarily will differ from those just described. The appropriate graphs are easily comprehended and I leave discussion of their construction and evaluation until the next chapter. Now the concerns are to define alliance commitments, to distinguish between the various types of commitment and to describe the data set which I use. I can be brief because the definitions and data have been reported carefully by their makers, Singer and Small.

¹⁹ See Schumpeter, Business Cycles and Ernst Mandel, Late Capitalism.
Alliances are "formal agreement(s) between two or more nations to collaborate on national security issues."\(^{20}\) States involved in a formal military alliance have mutual obligations. Unilateral declarations by one state to protect another may lead towards war or deter a third party, but they are not included here. Quasi-universal declarations of good intentions, even if they are embodied in a formal treaty, are also excluded. They meet the minimal definition of an alliance, but the ties that bind so many are, of necessity, ill-defined.

Alliances are agreements to collaborate against others. Informal agreements may be as potent as formal ones, but, by definition, they are excluded. A practical difficulty in the way of examining the effects of informal military agreements on the incidence of war is that informal agreements leave fewer traces in the written records. For example, Rood, in his study of the European balance of power during the 19th century, compiled a list of formal and informal agreements on military matters.\(^{21}\) He did not record the points at which informal obligations ceased, since his proposition (the incidence of alliance formation followed a Poisson distribution) required only information on the


points in time at which the commitments were made, he did not record the points at which the informal obligations ceased. The points, if indeed they are points, cannot be ascertained with any ease. Furthermore, as Singer and Small report, to determine the termination dates of many formal alliances is very problematic.

Having mined compendia of international treaties and the works of many diplomatic historians, Singer and Small produced a list of formal alliances which I use. The effective dates of each alliance and the type of obligations which were accepted are provided. Each alliance was classified as a defense pact, a neutrality pact or an entente on the basis of the original text and the consensus of diplomatic histories.22

I. Defense Pact: Intervene militarily on the side of any treaty partner that is attacked militarily.

II. Neutrality and Non-Aggression Pact: Remain militarily neutral if any co-signatory is attacked. (The neutrality pact is usually more specific than the more sweeping non-aggression pact.)

III. Entente: Consult and/or co-operate in a crisis, including armed attack.

22 Singer and Small, "Formal Alliances," 5.
I have simply re-arranged the Singer and Small data to provide running records for each great power between 1815 and 1945.

Three of the Singer and Small coding rules should be kept in mind. First, only direct bonds are counted. Second, the categorization of an alliance depends upon the nature of the commitments at the point of formation, not upon subsequent events. Third, allies acquired within three months prior to a war, or during a war, are not included. On this, Singer and Small write:

The effect of this rule was to exclude alliances which were made when the probability of war had approached 'certainty', thus contaminating the assumed independence between the two observations (number of allies and the occurrence of war).\textsuperscript{23}

Although I am uneasy with their reasoning (particularly in the instances of alliances formed within three months of a war), I abide by this rule when examining the alliance commitments propositions. Singer and Small freely acknowledge that the rule may not be suitable for all occasions. One of these occasions is with relative power position.

5.5 RELATIVE POWER POSITION

In the last chapter, four indices of a great power's position relative to the other great powers were considered: (1) the ratio or absolute differences in the capabilities of

\textsuperscript{23} Loc. cit.
any pair of great powers; (2) rank; (3) percent share of the total power capabilities; and (4) the percent deviation about the mean share of resources. Each was rejected. The first limits the analysis of the distances between two actors; the second provides the position of each one vis-a-vis numerous others and discounts the distances between any of them; and the last two indices capture positions and distances accidentally, if at all. Furthermore, not one of the applications of these indices of relative power position takes into account the principal international means of altering relative power positions. The great powers ally in order to augment and to secure their positions in the event of war and to deny allies to potential enemies. Attempts to examine the balance of power arguments without measuring the relative positions as they are modified by alliance commitments are stillborn.

The most straightforward procedure to construct an index more compatible with the balance of power arguments is: sum the differences in resources between one great power or coalition, and those great powers, or coalitions, which have smaller shares of the total resources; then from this sum subtract the sum of the differences between the great power and those which have larger shares of the total. The relative power position of A is

$$\sum(Pa-p) - \sum(pa-P)$$
where Pa-p is the difference between A and a weaker great power, and pa-P is the difference between A and a stronger state. Accordingly, A's relative power position at time T through T+3 is:

<table>
<thead>
<tr>
<th>Time</th>
<th>Great Power</th>
<th>Great Power</th>
<th>Great Power</th>
<th>Great Power</th>
<th>Great Power</th>
<th>Relative Power Position</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>.20</td>
<td>.20</td>
<td>.20</td>
<td>.20</td>
<td>.20</td>
<td>0.00</td>
</tr>
<tr>
<td>T+1</td>
<td>.20</td>
<td>.50</td>
<td>.20</td>
<td>.10</td>
<td>--</td>
<td>-0.20</td>
</tr>
<tr>
<td>T+2</td>
<td>.20</td>
<td>.40</td>
<td>.40</td>
<td>--</td>
<td>--</td>
<td>-0.40</td>
</tr>
<tr>
<td>T+3</td>
<td>.20</td>
<td>.80</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>-0.60</td>
</tr>
</tbody>
</table>

(The numbers in the cells are decimal percentage shares of the total power capabilities. Some cells are empty because that state is not a great power or it is allied with another. In the latter case, the index values of the allies would be identical. When two great powers have a mutual defense pact, their shares are added.)

The index values for A appear to be reasonable from T to T+3. Now, consider A's position at T+4 through T+8.

<table>
<thead>
<tr>
<th>Time</th>
<th>Great Power</th>
<th>Great Power</th>
<th>Great Power</th>
<th>Great Power</th>
<th>Great Power</th>
<th>Relative Power Position</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
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</tbody>
</table>
Here there are five great powers at all times and no defense alliances between any of them. A holds the mean share and the pair-wise differences sum to zero. Clearly A's "real" position varies sharply, and the simple summation procedure is unsatisfactory because it does not pick up any of this variation.

Another fault of this index can be observed in times T+9 through T+14.

<table>
<thead>
<tr>
<th>Time</th>
<th>Great Power</th>
<th>Great Power</th>
<th>Great Power</th>
<th>Great Power</th>
<th>Great Power</th>
<th>Relative Position</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>Great Power</td>
</tr>
<tr>
<td>T+9</td>
<td>.30</td>
<td>.29</td>
<td>.16</td>
<td>.15</td>
<td>.10</td>
<td>0.50</td>
</tr>
<tr>
<td>T+10</td>
<td>.30</td>
<td>.29</td>
<td>.21</td>
<td>.10</td>
<td>.10</td>
<td>0.50</td>
</tr>
<tr>
<td>T+11</td>
<td>.30</td>
<td>.25</td>
<td>.20</td>
<td>.15</td>
<td>.10</td>
<td>0.50</td>
</tr>
<tr>
<td>T+12</td>
<td>.30</td>
<td>.20</td>
<td>.20</td>
<td>.20</td>
<td>.10</td>
<td>0.50</td>
</tr>
<tr>
<td>T+13</td>
<td>.50</td>
<td>.40</td>
<td>.10</td>
<td>--</td>
<td>--</td>
<td>0.50</td>
</tr>
</tbody>
</table>
Great power A's relative position changes during T+9/T+14, but the index value remains at 0.50 in the first five instances and then dips to 0.40 at the last time point. However, it is obvious that A is in a more advantageous position at T+14 than at any other time. Simple summation ignores the composition of the sums of differences, yet knowledge of the pair-wise differences between great powers is necessary for a proper evaluation of relative position. Whether the sum .500 is the distance between A and another great power, or four other great powers is essential to know.

Some of the information can be preserved by squaring the pair-wise differences and taking the square root of the sums of the squares. The index becomes:

$$\sqrt{\sum(p_a-p)^2} - \sqrt{\sum(p-a)^2}$$

When there is an equibalance, all score 0.00. If one great power holds none of the total capabilities, it scores -1.00, the minimum value. The unwelcome feature of the formula is that if one holds all, and N-1 holds none, the maximum value is N-1. By the definition of a great power, the extreme values are unobtainable in fact, but changes in the upper limit (due to alliances between great powers, the rise of some states, and the fall through defeat in war of some great powers) undermine the comparability of the index values. For example, according to the formula, A is in a
better position at $T+13$ (0.412), when it holds 50% of the capabilities, than it is at $T+14$ (0.400) when it holds 70 percent.

Face validity and comparability are restored by dividing each term by the maximum value. The relative power position of great power $A$ is:

$$\text{RPP} = \sqrt{\frac{\sum (Pa-p)^2}{N-1}} - \sqrt{\frac{\sum (pa-P)^2}{1}}$$

where $N$ is the number of great powers and/or coalitions of great powers. The first term is the ratio of relative advantage, the second, the ratio of disadvantage. Relative power position is defined by and gauged with the difference between the two ratios. The range of each term and the difference between them is $-1.00$ to $1.00$ with the mid-point, 0.00, identifying equibalance. \(^{24}\)

The index provides a strong order and this is all that is necessary. The interpretation of any particular value becomes ambiguous. However, the values are reasonable. That is: they correspond with our intuitive ordering of the positions of states relative to each other and over different distributions of capabilities. Such comparisons are the only way to assess validity. The claim is that this index provides more reasonable values than any of the others which have been described. The utility of the index is that

\(^{24}\) However, the midpoint 0.000 could occur when one state is between two others. This is disconcerting but does not cancel the advantages of the index.
it allows us to keep track of the comparisons of relative position.

Alliances alter the distribution of power and the alterations are incorporated into the calculations of relative power position. The manner in which this is done depends upon the type of alliance commitment. Neutrality agreements and non-aggression pacts tie great powers to each other, but they do not bind the treaty partners together against others. These agreements deny allies to rivals and enable each participant to concentrate upon the other great powers. Consider three great powers, A, B and C: if the first ones, A and B, have a non-aggression agreement, the position of A relative to C is calculated. To calculate B's relative position, A is excluded from the distribution of power. According to the index, C, which is unattached, must divide its attention and gauge its position relative to A and B individually. The neutrality pact between A and B enhances their positions and, by definition, does not detract from C's relative position. With a potential ally taken away, C's position may have declined in fact, but this does not mean that the index is therefore inadequate. The index is adequate to assess the argument that increases in relative position increase the likelihood of activist involvement in war.

If A and B have a mutual defense agreement, C, in fact and according to the index, must assess its position
relative to the coalition. The power of the coalition is equal to the sum of the capabilities of the partners. C, therefore, declines in position, while A and B rise together with identical scores. Russett, for one, points out that this addition of capabilities exaggerates the power of the coalition. He goes on to suggest that the extent of the exaggeration is larger in the post 1945 period than in the pre World War years, and when non-great powers are combined with great powers. What is aggregated is as important as who and when, for it is another facet of the problem of measuring international power. That more general problem will be examined below. Here let us wish it away and focus upon some results of simply cranking the percentage shares of "power" through the index formula.

According to the rule of adding the capabilities of members of a defense alliance, there is no distribution when all the great powers are united in a single grand alliance. For example, when France was re-admitted to the great power ranks in 1818 with the Treaty of Aix-la-Chapelle, all of the great powers constituted the Concert of Europe. With each allied with all of the others, the grand coalition held all, and, according to my arithmetic, each was therefore equal to the others. My arithmetic reflects the formalities of the years between the signing of the Treaty and the War of

Spanish Succession in 1823. The formalities hide the realities of great power competition. To compute the relative power positions of each great power I have dismissed defense agreements which bound all of them together.

A great power enhances its position with defense alliances and neutrality pacts, and the index values increase appropriately in most cases. In some cases, the arithmetical gains are deceptive. For example, in July 1902, the Italian government renewed the Triple Alliance, a defense agreement with Germany and Austria-Hungary which was aimed against France. At the same time, the Italian government signed a neutrality pact with France. Therefore, according to my procedure, Italy gains the capabilities of Germany and Austria, excludes France from her security concerns, and vaults ahead of all three. Needless to say, this rapid increase in relative power position, followed by the failure to meet the obligations of the Triple Alliance, is not evidence for or against the argument that increases in power position increase the likelihood of war. The index of relative power position is not sensitive to the patterns of alliance commitments and the patterns do influence relative positions. Because this information cannot be accommodated in a formula is not a good reason to ignore it or to dispense with the formula. We must use the pattern of alliances and the formula when assessing relative positions.
During the decades prior to World War I, ententes became the most numerous of the three types of alliance which linked the great powers to each other and the less powerful to them. Like the pattern of commitments of which they formed a larger and larger part, ententes are not amenable to the simple arithmetic of the relative power position index. Addition and subtraction of capability shares appear to be reasonable operations when the alliance obligations are as rigidly and clearly defined as they are in defense and non-aggression pacts. With ententes, on the other hand, the clarity and precision are reserved for the settlement of past disagreements; the future obligations of the parties are ill-defined. On the basis of the text of the alliance, one cannot add or subtract. To keep to the text, as Singer and Small advise, would be to leave out each and every entente from the calculation of national advantage and consequently to undermine the validity of all calculations of national advantage.

Kann argues that, when there are rigid commitments between states, "there exists a built-in centrifugal tendency toward weakening the ties," whereas "the inherent trend of an entente is...in precisely the opposite direction from that of an alliance."

Where no firm commitments exist between the partners, there should be simple recognition of the fact that agreements between them will make sense only if they serve common interests. Assuming mutual reasonableness to be the raison d'être of accords, one can argue that the partners of an entente or consultation pact will be interested in strengthening their ties.
There are real and obvious dangers in judging the strength
and nature of commitments after the fact (hence the advice
of Singer and Small); however, these dangers are not present
all the time. Let us examine the classic case, the Anglo-
French Entente Cordiale.

Singer and Small state that

even though the Anglo-French entente of 1904 had
taken on the effect of a defense pact in 1914, it
was treated (in their compilation) only as a
limited territorial understanding which it was
during those ten years.27

The quarrel is with the underscored clause. The entente of
1904 was an agreement on the division of French and British
interests in the periphery, particularly North Africa. (The
variety of minor issues dealt with "had significance as
indication of a desire on both sides to liquidate all
outstanding colonial differences." )28 During the eight years
following 1904, the "limited territorial understanding"
included the arrangement of each great power's naval forces
on the Mediterranean and Atlantic as well as joint military
plans for the disposition of ground forces in Europe.

The Entente Cordiale, conceived in part because of
Britain's strategic interests in Moroccan ports,
had progressively evolved into a friendly

26 Robert A. Kann, "Alliances Versus Ententes," World
Politics, 28, (July 1976), 612. See also, Paul W.
Schroeder, "Alliances, 1815-1945: Weapons of Power and
Tools of Management."

27 Singer and Small, "Formal Alliances..." 5.

28 Rene Albrecht-Carrie, A Diplomatic History of Europe
Since the Congress of Vienna (New York: Harper & Row,
partnership with military and naval features directed against Germany.²⁹

The United Kingdom resisted "an honourable undertaking." (that is, a formal defense alliance with France), but it was clear prior to the events of 1914 "that the British were contemplating very seriously war with Germany, while they were making no preparation of this kind with any other state."³⁰

Fixing a date at which the understanding evolved into much more than that is more difficult than demonstrating that the limited territorial understanding did evolve. 1906 is a reasonable choice, as is 1907 or 1912. In 1906, conversations between the French and British military staffs were initiated. These, writes Taylor, were "substitutes for an alliance—and in some ways a more decisive one."

A vital change of emphasis followed, though imperial interests still counted from Morocco to Persia, they had henceforth to be fitted into the framework of relations with the European Powers, instead of determining them, as they had done previously... (N)ow she made concessions outside of Europe in order to strengthen the Balance of Power.³¹

After Morocco, the next major imperial settlement came in 1907 with the Anglo-Russian entente over spheres of interest in Persia. Russia and France maintained a defense pact,


and, because of that pact, the Anglo-Russian entente indirectly linked France and the United Kingdom more closely to one another. From 1907 onwards, the Triple Entente faced the Triple Alliance. While the former arrangement was less solid than the latter, German attempts to break it apart had contrary results. In 1912, an exchange of letters between the French and British governments consolidated their quasi-alliance. From 1912 to 1914, I treat the Entente Cordiale as a defense pact and add the capabilities of France and the United Kingdom, plus, because of the indirect links, those of Russia. Ententes, when and where they are not judged to be other than ententes, are ignored in the calculations of relative power positions.

As I noted above, Singer and Small specifically excluded such alterations in types and instances of alliance from their studies of alliance participation and war. Where my concern was the same as theirs, I followed their advice. Here, where the concern is the relationship between relative position and war, I do not do so. Whether this is of significance can be seen readily in the plots of relative power position. There are three lines traced in each of them. The first traces relative position without any alliances between great powers, the second traces relative position taking into account defense pacts; and the third traces relative position taking all relevant alliances into account.

32 Kann, "Alliances Versus Ententes" and the sources in the footnotes above.
calculation.

Having described the arithmetic performed upon the percentage shares of power capabilities, the questions of what these power capabilities are and how, if at all, they are combined can be put off no longer.

5.6 POWER CAPABILITIES

Like many others, Morgenthau describes components of national power in terms of their stability and change:

On the relatively stable foundation of geography, the pyramid of national power rises through different gradations of instability to its peak in the fleeting element of national morale. All the factors..., with the exception of geography, are in constant flux, in constant flux influencing each other and influenced in turn by the unforeseeable...33

Mixing metaphors:

Together they form the stream of national power.... To chart the course of the stream and of the different currents that compose it, and to anticipate the 'changes in their direction and speed, is the ideal task of the observer.... It is an ideal task and, hence, incapable of achievement.34

Mixing in another metaphor, there is no common currency: "No medium of exchange could be devised which would bear the same relation to estimates of fighting power as monitoring metals (bear) to estimates of economic value," writes

33 Politics Among Nations, p.147.
34 Loc. cit.
Whereas some components of national power fluctuate widely and, therefore, are difficult to assess, others are difficult to assess because they are fixed. National morale and diplomatic quality are examples of the former, and geographic position is an example of the latter. They cannot be combined in a single score with other power capabilities. Grappling with calculations of loss of strength gradients, Russett cautions that it is essential...to avoid an index so subtle, supple, and sophisticated as not to correspond well with the general image that would be possessed by national decision makers with reasonable intelligence capabilities.\(^{36}\)

Rather than that, the essence of the problem is that we need not worry about the dangers of excessive precision.

On the other hand, a measure of power capabilities which excludes numerical estimates of "the crucial intangibles" is not thereby "an illegitimate shortcut."\(^{37}\) White, for example, criticizes the "enthusiastic quantifier" whose "Procrustian axe too often lops off precisely those psychological intangibles that must be understood in order to grasp the meaning of the things he counts..."\(^{38}\) Any measure contains error and indeterminacy, and the error

\(^{36}\) Russett, "Components of an Operational Theory," 293.

\(^{37}\) Morgenthau, "International Relations," 71.

\(^{38}\) Ralph K. White, "Quantification and the Crucial Intangibles" in A Design for International Relations Research, p. 153.
should be built upon if at all possible. This is a theoretical, not a technical, task. When, for example, are "the crucial intangibles" crucial? White's use of the notion in his attack on quantitative scientists merely begs the question.

Following Simmel's paradoxical insight, I argued above that the so-called intangibles would be crucial when assessments of the tangible power capabilities did not distinguish between the stronger and weaker opponents. When states or coalitions are approximately equal, assessments of bargaining power depend more and more upon the "subjective" or "qualitative" factors which, by their nature, invite contradiction and disagreement. Warfare then becomes the means to measure bargaining power. Trying to gauge relative power positions precisely, to sort out the conflicting assessments accurately in order to explain the occurrence of war is to miss the point: contrary notions of relative power may lead to war. War, the argument is, is often about the imprecision in power assessments which many students of war unrealistically seek to eliminate. Others, in the name of realism, avoid measurements with error and, hence, all measurement. Both sorts can learn from modern physics wherein "it was indispensible to recognize the fundamental importance of errors, together with the unpleasant fact that they cannot be made 'as small as desired' and must be

39 Morgenstern, On The Accuracy of Economic Observations,
included in the theory."³⁹

The example above, with its implicit and pretentious allusion to Heisenberg's principle, presupposes accurate information on the important tangible components of national power and a meaningful method of combining these components. Thanks to the labours of others, particularly the members of the Correlates of War project, I have information on some important power capabilities. The method of combining the time series into a single one is simple, and the scores have face validity. Nothing more can be claimed.

Territorial area, population size, military personnel, military expenditures and industrial capacity are basic power capabilities of states. As the European great powers industrialized, war industrialized. Geographic area and population size per se became less important than the industrial capacity of states, the amount of money and the number of men states devoted to preparations for war. Great powers had large populations and territories, but by themselves, large populations and territories did not make for great powers. Population grew rapidly in 19th century Europe; however, increments in population size did not mean necessarily proportionate increments in national power. Germany's population grew rapidly throughout the 19th century and, after 1860, her numbers totalled more than those of France. However, France, with a relatively

p.61.
stagnant population, was able to draw upon as many bodies of military age as Germany in 1914. Total population statistics can be misleading measures of national power when the age structure is ignored. There are not sufficient data on the age structures of the great powers' populations and, instead of attempting to estimate the size of the pool of men the state could draw upon, I use estimates of the numbers in military uniform. Alone, these statistics can be as misleading indicators of national power as the total population statistics. Russia, for example, possessed a massive conscript army of poor quality. The military personnel series must be used in combination with others which reflect fighting capacity.

As Morgenthau writes, while the technology of violence develops, "the competition among nations for power transforms itself largely into competition for bigger, better and more implements of war." "The overall development of heavy industries (becomes) an indispensable element of national power." Progress in heavy industry is

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40 Taylor, The Struggle For Mastery In Europe, pp.xxv-xxvii.

41 The Correlates of War Project index includes total population and total urban population. These components, I think, inflate the position of Russia and, therefore, I do not include them. See the results published in Melvin Small, "Doing Diplomatic History by Numbers: A Rejoinder," Journal of Conflict Resolution, 21 (1977), 29-30 and in Alan Ned Sabrosky, "From Bosnia to Sarajevo: A Comparative Discussion of Interstate Crises," Journal of Conflict Resolution, 19 (1975), 6-12.

42 Politics Among Nations, p.113.
gauged best by the basic outputs, iron and steel, and the essential input, energy. The expenditures of governments on military forces represents the effort to transform the productive apparatus into destructive apparatus. Therefore, I estimate power capabilities with an amalgam of iron production, steel production, energy consumption, military personnel and military expenditures.43

Some series (military personnel and iron production) cover the entire period and the others are available for shorter but still lengthy segments. I discussed the error in the measures of industrial capacity earlier in this chapter and need not repeat that discussion here. There is no doubt that all of the series are full of error. There is no way to tell how much error, and the problem is to avoid increasing the unknown. Some ways of combining the series into an index of power capabilities are more likely than others to magnify the unknown error components. My index is the mean value of decimal percentage shares of the power capabilities held by a great power in any given year. In 1860, when the estimates of energy consumption begin, they are added into the arithmetic. Steel production is added in from 1880 onwards and military expenditures after 1899. The

mean value is a simple, studied confession of ignorance concerning the "true" proportions in which the various power capabilities should be mixed. More complicated confessions of ignorance exist.

The most ambitious attempt to synthesize power capabilities is Ferris' book, *The Power Capabilities of Nation States.* Few of the specific scores he derives are reported in that book. Therefore, detailed comparisons between his index and my own are impossible until the second volume, *Nation-State Power and Economic Variable Data, 1850-1966,* finally appears. The comparisons which are possible suggest that his complicated procedures are more likely than my simple ones to magnify sources of error in the data and that his scores have less face validity. Validity must be assessed in terms of the consensus of historians of the period and statesmen of the times. Ferris declares that

> it is important to recognize that previous judgement by historians and statesmen of the capabilities of particular states in the international system may have been wrong. Power

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45 J. David Singer has stated that "the scores that are shown strike this reviewer as quite reasonable." Presumably he is comparing the scores with those of the Correlates of War Project. See his "War and other problems in the global system: A Review of Kjell Goldmann, *Tension and Detente in Bipolar Europe* (Stockholm: Scandinavian University Books, 1974), and Wayne H. Ferris, *The Power Capabilities of Nation-States* (Lexington, Mass.: Lexington Books, 1973)," *International Organization* 31 (Summer 1977), 574.
My argument is to the contrary. I will examine his procedures and then some of the results.

Ferris begins his index construction with six variables: land area, total population, government revenue, defense expenditures, value of international trade, and armed forces size. Factor analysis of these six variables for all states existing in selected years between 1850 and 1965 demonstrates that they are related to a single dimension.

When factor scores are computed, the six indicators tap a dimension that might more accurately be characterized as size. Countries with large population but low levels of economic development, such as India and China, necessarily score high, relative to other states...because of their numerically higher populations. Such states obtain high factor scores relative to other states even if their peoples are existing at or near a subsistence level.

But power capabilities are reflected by more than absolute size.*6 To reduce the impact of absolute size, Ferris then replaces total population with the logarithm of total population and adds three indicators of technological sophistication to another factor analysis. The three are government revenue per capita, defense expenditures per capita, and trade value per capita. My quarrel with this is both theoretical and methodological.

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*6 The Power Capabilities of Nation-States, p. 55.

*7 Ibid., pp. 37,39.
The choice of the three new variables, the supposed measures of technological development, requires some reasonable explanation. There is none. Ferris claims that the three are suitable surrogates for technological sophistication because "When the three indicators were correlated with gross national product for most states of the world during the post World War II period, extremely high coefficients resulted."\(^{48}\) This justification begs the question and is self-defeating. One of the strongest correlates of gross national product in this period is total population and another is geographic area.\(^{49}\) Surely, then, adding three variables which are strongly related to size will not reduce the impact of size in the power capabilities index.

The lack of quantitative data on the technological development of all states in the 19th century is a respectable, pragmatic justification for using surrogate variables. However, it is not a good reason for using the three specific ones which Ferris factor analyzes. There are good reasons for choosing different ones. First, different, more appropriate measures do exist: iron and steel production and energy consumption which I use are examples.

\(^{48}\) Ibid., p. 39.

Second, data on physical inputs and outputs are probably more accurate than the monetary values and are, most definitely, more comparable across states and over time. There are no problems of converting amounts in various currencies to a common, fixed standard. A ton is a ton, whether counted in 1860 or 1960, in Rome or in London or in Buenos Aires. Dividing questionable monetary values by more questionable population statistics magnifies errors. Third, a more technical point, dividing government revenue, defense expenditures and value of international trade by total population and factor analyzing these new ratio variables plus the variables used to make the ratios, is a procedure fraught with peril. If all of the variables were randomly generated and orthogonal, and if one were used to "percapitize" the others, factor analysis would reveal a couple of wholly artifactual dimensions.50 The variables in Ferris' analysis are not randomly generated and orthogonal, but to use the squared factor loadings in order to assign weights to each of the variables in an index of power

capabilities is suspect nevertheless. At best, to do so lends an air of precision which is not warranted.

Another technical point is that correlation coefficients, upon which the factor analysis routine feeds, require the assumption of bivariate normality. Univariate normality, which Ferris tries to approximate in one case (by the logarithmic transformation of total population values), does not guarantee bivariate normality. Ferris himself notes some of the peculiarities which result. When he reports the squared factor loadings for each variable in each of the 24 half decades he analyzed, he notes that some are erratic over time. For example, area shares 30 percent of its variation with the factor in 1910, but 9 and 8 percent in 1915 and 1920, respectively. By 1950, area shares 55 percent. The percentage share of armed forces size falls from 67 in 1910 to 36 in 1915, the second year of the Great War. Defense expenditure also falls, albeit only 19 percentage points. "The evidence," writes Ferris, "demonstrated that a few extreme outliers were causing the reduced loadings." To compensate, he uses the mean of the squared factor loadings of a variable at the 24 time points as its weight in the index. Once again, Ferris is puzzled, and properly so: "Trade value's high ranking (third) is anomalous, since there does not appear to be any reason why it should score above all of the remaining (six) indicator

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51 The Power Capabilities of Nation-States, p. 41.
variables as a determinant of power capabilities." He continues to compute.

The final steps in his index construction are to multiply the percent share each state holds of the world's total capabilities and to sum the resulting values for each state. Note that the percent shares of the total of the capabilities of all existing states are calculated. According to Ferris, therein is a special virtue of his index.

The utility of the proposed index is that it provides scores on the capabilities of nearly all states in the system relative to nearly all other states. It would be a difficult, perhaps even impossible, task to find evaluations by historians of the capabilities of all states in the world for the (1860-1966) time frame... Generating numbers for all states does not guarantee that theoretically meaningful comparisons follow or that all comparisons are meaningful. Why would one wish to compare the capabilities of, say, Chile to influence China and China to influence Chile in 1880? For good plain reasons, the judgements of historians concerning such a comparison are impossible to find. More to the point, including China and Chile of 1880 in an analysis to determine values for the capabilities of (say) China, Japan and Russia to influence each other in 1890 or France, Germany and the United Kingdom in 1900 or Chile, Bolivia and Peru in 1870 detracts from the

52 Ibid., p.47. Emphasis added.

53 Ibid., p.58.
validity of the values computed. As Ferris points out, extreme outliers often upset his factor analysis. China and the United Kingdom and Russia are the main offenders he names. It would be more appropriate to confine the computations of power capabilities to sets of closely interrelated states. Factor analysis, a technique which demands large numbers of cases, would be unnecessary then. Perhaps that is why all existing states were included. Whatever the reason, the methods in *Power Capabilities of Nation-States* are substantively and technically unsatisfactory. So also are the results.

One simple test of the face validity of the scores which result from this complicated procedure is to see how they move in response to major political events. Consider the rank orders which Ferris determined for the top ten states in 1865 and 1875.54

<table>
<thead>
<tr>
<th>1865</th>
<th>1875</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>RUS</td>
</tr>
<tr>
<td>RUS</td>
<td>FR</td>
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<tr>
<td>FR</td>
<td>UK</td>
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<tr>
<td>GER</td>
<td>IT</td>
</tr>
<tr>
<td>CHINA</td>
<td>CHINA</td>
</tr>
</tbody>
</table>

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Note the advance in France's relative power position from third place in 1865 to second place in 1875 after her defeat in the Franco-Prussian War. Neither this shift nor the shift in the United Kingdom's position from first to third place appears to be reasonable.

Schroeder's comment upon another index which generated similar scores is applicable here:

This index not only flies in the face of France's smashing defeat by Germany in 1870-1871, but renders inexplicable the diplomatic history of the whole succeeding decade.55

The index to which he refers combined 25 power capability measures but Schroeder points to significant exclusions.

Geography does not enter in. A country's size, its topography, the nature and extent of its frontiers, its location vis-à-vis its neighbors, and whether these neighbors were great or small powers--none of these factors are considered. Thus, the power index is unaffected by the fact that Britain was (sic) an island, or that Russia had Generals Winter and Distance on her side, or that France was menaced by a great power only from the Rhine, or that Germany and Austria were surrounded by other great powers.56


These comments apply to all efforts to construct a measure of power capabilities. Mine is no exception.

Generals Winter and Distance, like other important geopolitical influences, easily evade quantification. There is no respectable method to weigh and combine them with other aspects of military capabilities. This should not mean that geography, therefore, must be ignored. We must use maps, our heads, and our formulae when evaluating the propositions. The means and methods of analysis described here allow this. They are less elegant than the more common statistical techniques but they are more appropriate to problems in international relations.
LEAF 191 OMITTED
Chapter VI

ALLIANCES, INDUSTRIAL GROWTH AND GREAT POWER WAR

6.1 INTRODUCTION

In this chapter and in the next, I return to the theoretical arguments and empirically examine the propositions described in Chapter III. First I examine those which relate alliance commitments and the incidence of interstate war. As I explained earlier, the arguments in support of those propositions are weak in so far as, under argument, alliances which are relationships between states are turned into attributes of states. Accordingly, I count alliance commitments and give little attention here to the fabric of international relations which they create and transform. For example, the specifics of who is allied with whom are passed over unless the count of the number of commitments lends sham support to the arguments.

Next I examine the propositions linking economic conditions within each great power to involvement in war. The condition of the economy can fluctuate from year to year; therefore, rather than predict from economic conditions to war, the propositions postdict economic conditions given the occurrence of a war. They are unable to account for peace. That is their weakness. Moreover,
any association between economic fluctuations and war may be due to chance. Each proposition concerning a type of participation in war is vulnerable, and the virtue of the set of propositions is that the set suggests a pattern of associations. They should vary depending upon the type of opponent and the type of participation in war. If, for example, the proportion of instances of non-activist war with a non-great power preceded by high economic growth is the same as the proportion for activist war against another great power, mere chance remains a plausible explanation of the results.

Finally, the last propositions examined in this chapter, those proposing an interaction of short term economic change with long term economic movements and various interactions of alliance commitments with economic fluctuations, are intended to strengthen any findings from the first ones. As stated, the second interaction proposition is an open invitation to the crudest sort of empiricism. Perhaps the enormous number of permutations would not deter the hardened devotee of Automatic Interaction Detection, but how could one make sense of the calculations? The analysis to follow illustrates how the most simple calculations can mislead.

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1 A weakness aggrevated by the use of annual observations. If the temporal unit of observation were the half decade, as in the Correlates of War Project, there would be the same number of wars but fewer instances of peace. See Moul, "The Level of Analysis Problem Revisited," 509-511 for a discussion of this "time level of analysis problem" and an illustration of increasing a correlation between two variables in a time series by expanding the unit mesh.
6.2 **ALLIANCES AND WAR**

The alliance commitment propositions are:

Proposition 1) The more allies, the more likely a great power will become involved in war.

Proposition 2) The more non-great power allies, the more likely a great power will become involved in war.

Proposition 3) Non-defense commitments are more likely than are defense commitments to lead to non-activist war. Defense commitments deter would-be-attackers while non-defense commitments tend to invite them.

Proposition 4) By implication, non-defense commitments to non-great powers lead to non-activist war.

The series of graphs below contain the evidence from the history of each of the great powers during the 131 years from 1815 to 1945. To simplify the discussion of the evidence, the graphs have been split at 1885, a point of substantive significance as well as one of technical convenience. The symbols indicate the type of alliance commitment, and solid ones draw attention to the number of allies prior to war. The vertical lines indicate the occurrence of war; activist participation is indicated by a dashed line.

6.2.1 **1815 to 1885**

A glance at Figures VI:1 and VI:2 reveals no relationship between the number of allies, great power allies or not, and war for the United Kingdom and

Figure VI:1
Figure VI:1

Alliance Commitments and War Involvement: United Kingdom, 1815-1885
France in the 1815-1885 period. Allied with France and Russia, the United Kingdom defeated Turkey at Navarino Bay in 1827 and, allied with Turkey and France, defeated Russia in the Crimean War. Her Crimean alliances were formed after the war had begun and are excluded from Figure VI:1. If they were included, all that could be said is that war predicts to alliance involvement. So also would many other events because the United Kingdom maintained alliance commitments for a majority of the years described here. When the proportion of years in which a great power had allies is smaller, as it is in Figure VI:2, this meagre predictive ability disappears.

Figure VI:2

France, although in alliances for fewer years than the United Kingdom, fought eight wars, entering three of them (excluding the Crimean) when she was without allies and six of them when she had no formal commitments to non-great powers.

Russia entered all four of her 19th century wars when allied with a pair of her peers: with France and the United Kingdom in 1827 and 1828 against Turkey; with Austria and Prussia (later Germany) in her next wars against Turkey.

Figure VI:3
Figure VI:2

Alliance Commitments and War Involvement: France, 1815-1885
Figure VI:3

Alliance Commitments and War Involvement: Russia, 1815-1885
Once again the more often a great power is allied, the more often it is found in alliance prior to war. However, contrary to Propositions 1 and 2, Russia did not enter wars when allied with non-great powers or when the total number of allies was high.

Figures VI:4 and VI:5, the graphs for Austria and Prussia, illustrate the same pattern, but it is possible to draw some evidence from them in support of the propositions. Aside from a brief, but telling, break in 1849-1850, Austria and Prussia were allied to each other and to the smaller German states for 50 years in a loose confederation, the Bund of 1815.

Figure VI:4

The House of Habsburg, with more extensive interests than the Hohenzollerns, added Parma and Modena to Austria's non-great power allies in 1847 and 1851. These commitments to small states were basic to the rivalries between Prussia and Austria and between France and Austria which led to five of the seven wars recorded in these figures. The numbers of Austrian and Prussian allies fell as the opportunities to gain allies fell with the absorption of the small central and southern European states into the great powers. Italy was unified in 1860. Prussia, after forcing out Austria in 1867, came to dominate Germany, and in 1871 incorporated the remaining German states into her empire. Thereafter, and in
Figure VI:4

Alliance Commitments and War Involvement: Austria, 1815-1885
accordance with Propositions 1 and 2, there were fewer states, fewer alliances and a period of peace. However, caution is in order.

Compare, for example, the years 1848 and 1849 in the figures describing Prussian and Austrian alliance involvement. Prussia with eight non-great power allies, all German states, fought Denmark over the Germanic duchies Schleswig and Holstein in 1848. Austria, with interests on the Italian peninsula, her alliance with Modena plus interests and alliances in Germany, fought Sardinia in the same year. In 1849, after the break in the German confederation, Prussia, now with no allies, was at peace; but Austria, still allied with Modena, was at war in Italy once again. Hence the contrary point 1849. Instead of the number of formal allies leading to increases in the chances of involvement in war, we could conclude that the number of independent states increases the field of friction and that the number of formal commitments is a poor reflection of the opportunities for inter-state conflict. Moreover, rather than alliances giving "additional momentum to the anarchic forces in international society" (the basic contention from which the propositions follow), we could conclude that the German alliance created order in the nation of many states

2 Schwarzenberger, Power Politics, p.166.
Figure VI:5

Alliance Commitments and War Involvement: Prussia, 1815-1885
and that the alliance was broken apart by the momentum of anarchic forces in the national society.

Compare the wars in which both Austria and Prussia fought. In 1864 and 1866 they formally shared the same non-great power allies. In accordance with Propositions 1 and 2, Austria joined Prussia against Denmark in the second war over Schleswig and Holstein. "Alliances are concluded with war or the bluff of war in view," to repeat Schwarzenberger's words. However, the Seven Week War in 1866 between Austria and Prussia meets the letter rather than the spirit of Propositions 1 and 2.

Figure VI:6

Figure VI:7

No small doses of historical sense are required when we turn to Prussian and Austrian involvement in defense and non-defense alliances. The proposition that non-defense commitments increase the chances of non-activist involvement and that defense commitments deter attack finds little support in Figures 6 and 7. Four of the five Austrian wars occurred when Austria had defense alliances only, and three of the four Prussian wars (in all of which Prussia was the activist party) occurred when Prussia was in the same position. True, most of the years in defense alliances were
Figure VI:6

Defense Alliance Commitments and War: Austria, 1815-1885
Figure VI:7

Defence Alliance Commitments and War: Prussia, 1815-1885
years of peace, but so also were the years without such alliances. These defense alliances did not deter; recall 1866.

The non-defense alliance in which Prussia and Austria were involved in 1848, the year they both fought, was not with a small state. This entente, a revival of the "Holy Alliance" with Russia in 1833, can be seen in Figure 8 which describes Russia's alliances from 1815 to 1885. The preceding entente linked Russia, France and the United Kingdom in 1827 and the succeeding one in 1873 re-united Prussia, Austria and Russia in the Dreikaiserbund.

Figure VI:8

Propositions 3 and 4 find no support here. Instead of non-defense commitments leading to non-activist involvement in war, as Proposition 3 contends, we find them leading to activist participation. Instead of non-defense commitments to small states leading to non-activist war, as Proposition 4 contends, we find non-defense commitments to great powers just prior to activist war against a non-great power. Furthermore, the wars appear to bring an end to these alliances shortly after they are formed. Clearly, these wars were not instances when a great power was dragged by alliances into combat to protect ill-defined interests.

France's history, as pictured in Figure VI:9, suggests this same inversion of Propositions 3 and 4. Note once
Figure VI:8

Defense Alliance Commitments and War: Russia, 1815-1885
again the entente with the United Kingdom and Russia followed by the Battle of Navarino Bay and ended in 1830. Note the entente with the United Kingdom and Spain, followed in 1862, the next year by the Franco-Mexican War. The Sino-French war in 1884 is the exception.

The evidence in favour of Proposition 3 is slight; that which appears contrary is often not and that which appears in favour is suspect more often than not. French intervention in Spain in 1823 is contrary in appearance, but not necessarily unfavourable to the argument that defense agreements deter. The Concert of Europe united all of the great powers and, in 1823, designated France to restore order in her neighbour, Spain. While the United Kingdom opposed this action and "had an itch for war" against France, her isolation within the defense alliance did not allow her to object with military means. The United Kingdom broke with the Concert, and the alliance fell apart.

Figure VI:9

The second defense alliance in Figure VI:9 is the Quadruple Alliance between France, the United Kingdom, Spain and Portugal, ostensibly directed at the alliance between Prussia, Austria and Russia. During this time, France did

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Figure VI:9

Defense Alliance Commitments and War: France, 1815-1885
not fight. After the alliances were terminated, France came close to war with Austria in 1849, fought with Russia in 1854, and with Prussia in 1870. Appearances are deceptive here. Consider the case in 1854: France intervened in the five month old Russo-Turkish war and, with the United Kingdom, brought that war to the Crimea. France was not protecting her interests which the absence of a defense alliance had made vulnerable.

Consider the case in 1849: France intervened in the Papal states in order to crush the newly formed republican government and to restore the Pope's temporal powers. Here her interests were threatened far more directly, but the threat came from within the Roman Republic and from competitive intervention from Austria. A defense alliance was not needed to prevent the interventions from escalating to war between great powers. When war did occur between France and Austria in 1859, a defense alliance was formed to facilitate war.

Figure VI:10

Figure VI:10, the graph for the United Kingdom and the last one in the 1815-1885 series, reinforces the conclusions regarding the Propositions drawn from the other figures. Furthermore, serendipity seems to have waned. The United Kingdom did not fight a smaller state when in an entente with her peers.
Figure VI:10

Defense Alliance Commitments and War: United Kingdom, 1815-1885
6.2.2 1885 to 1939

After unification in 1860, Italy entered into the great power group. Her history of alliance involvement and interstate war during the 19th century conforms to the pattern, or rather the lack of pattern, just described for her new-found peers. That is there is little to support Propositions 1 and 2 in the left hand portion of Figure VI:11. In 1866 Italy allied with Prussia in preparation for the Seven Week War (hence, following the Singer and Small criterion, that alliance is not marked in the figure) and remained unaligned until she joined the Triple Alliance in 1882. We see some regularities as we move along Figure VI:11 towards the right, into the 20th century, and move ahead to Figures VI:12, VI:13, VI:14, VI:15 and VI:16 to scan the total numbers of allies, and the number of non-great power allies, and the incidence of war for the other great powers.

Figure VI:11

To speak of regularities and a pattern is of course to speak loosely, but such talk is more reasonable when describing the post 1885 period than when describing the earlier period. There are numerical regularities, all be there are exceptions and variations. Each great power entered each of its wars when in alliance, but, with few wars and each in alliance for most of the years, perhaps
Figure VI:11

Alliance Commitments and War Involvement: Italy, 1860-1945
this is unremarkable. What is of interest is that the number of allies had grown in the years prior to each war. While in some instances, the numbers dropped (particularly before entry into the Second World War), the numerical evidence is not as clearly contrary to the first two propositions as it was in the 1815-1885 graphs. There I illustrated that the numerical evidence should be tempered with a modicum of historical and relational sense. The same is true here. Let us examine Figures 11 and 12 and discuss the wars with non-great powers marked in them.

Italy and Russia, unlike the other European great powers, fought on occasions other than World Wars. The first occasion, the Russo-Japanese War in 1904, provides an instance contrary to propositions 1 and 2. The number of Russia's allies dropped from 1902 through 1904, and none of those remaining in 1904 were with non-great powers. The USSR fought Japan in 1939 and, in the same year, attacked Finland; but in 1939 the USSR had more alliances than any other great power. An inspection of the list of her allies weakens any evidence in support of the first two propositions. Latvia, Lithuania, Estonia, Poland and Finland were among the 'allies' of the USSR in 1939.

Figure VI:12

By the secret provisions of the German-Soviet non-aggression pact, Lithuania was taken by Germany; Latvia and Estonia
Figure VI:12

Alliance Commitments and War Involvement: Russia, 1885-1945
went to the Soviet Union; Poland was dismembered once more; and Finland resisted the Soviet Union in the Winter War. The logic of the two alliance propositions — the logic which proceeds from many alliance commitments, through the many opportunities for conflicts with others trying those commitments, to increased chances of war against those doing so -- does not fit at all. Nor does it fit the Italian wars in 1911 and 1935. In 1911 and 1935 Italy maintained numerous alliances, but the alliances were carefully concluded in order to fight Turkey and Ethiopia without disturbance from the other great powers. Rather than many alliances and, therefore, varied interests to protect, Italy had many alliances and a specific interest in expansion in Africa.

Before Italy entered the World Wars, the numbers of her allies fell. This is not in accord with the propositions and, when placed in historical context, remains contrary. Formally, Italy was allied with Austria, Germany, France, Russia and Rumania in 1914; but her obligations to the second two great powers were incompatible with those to the first two, her partners in the Triple Alliance. The failure to join her partners in war ended their alliance. A year later, when Italy entered the First World War against her former partners in defense alliances, her links to France and Russia were all the alliances which had survived. Instead of many alliances dragging Italy into war, they
afforded her time to choose the side most likely to win. The circumstances were similar prior to the Second World War.

Figure VI:13

Figures VI:12 and VI:13 also show a rise and fall in the number of Soviet and French allies before the Second World War, the results of maneuvering and sorting out of positions in response to a resurgent Germany and, as the conflicts of interest became conflicts of arms, to the demise of some states. The numbers are higher on the right hand side because the number of states, most of which were created out of the empires of the defeated, increased after the First World War.

---Figure VI:14, VI:15 and VI:16---

Therefore, the lower numbers before the First War are not contrary to the propositions because the numbers are higher before the Second War, when the political geography was very different. There is no need to pile on Propositions 1 and 2 with dubious evidence. There is more than enough against them.

Figures VI:17 through VI:21, which describe the defense and non-defense commitments for 1885-1945, are more difficult to sort out than the comparable ones for the 1815-1885 period. Far more than any others, they draw out
Figure VI:13

Alliance Commitments and War Involvement: France, 1885-1945
Figure VI: 14

Alliance Commitments and War Involvement: United Kingdom, 1885-1945
Figure VI:15

Alliance Commitments and War Involvement: Austria-Hungary, 1885-1914
Figure VI:16

Alliance Commitments and War Involvement: Germany, 1885-1945
the limitations and ambiguities of the alliance propositions. Whereas in the earlier period there were many wars involving one or two or three great powers and few alliances, here there were few wars, two involving all great powers and many alliances. Alliances are related to war, but the number of allies one state had was less relevant than who the allies and the allies of one's allies were.

---Figure VI:17---

The Figures separate: they indicate individual alliance profiles, not relations between states and positions within alliance systems. They, therefore, are appropriate to the alliance propositions, and, as noted and illustrated again and again, the propositions are unsuccessful. Some fare better than others and are better in the second time period than in the first, but there are many counter examples. The graphs, clumsy as they are, inhibit culling.

Consider the pre-World War 1 portions of Figures VI:17, VI:18 and VI:19, the graphs for the United Kingdom, France and Russia. According to Proposition 3 non-defense alliances make non-activist war more likely. On this side of that "d___d system of alliances," it is supported.

---Figure VI:18 and VI:19---

On the other side, in the comparable portions of Figures VI:20 and VI:21, it is not. The spirit of the argument is
Figure VI:17

Defense Alliance Commitments and War: United Kingdom, 1885-1945
Figure VI:18

Defense Alliance Commitments and War: France, 1885-1945
Figure VI:19

Defense Alliance Commitments and War: Russia/USSR, 1885-1945
there when the figures are examined in conjunction with each other, not individually. Inspection of the remaining portions of the German and Russia figures leads to the

---Figure VI:20 and VI:21---

more familiar situation: where the numerical evidence supports one of the alliance propositions, in this instance Proposition 3, to ask who was allied with whom turns it to the contrary. Where the evidence is unfavourable, as it is in the British and French figures, it is simply unfavourable.

According to the logic which underpins the alliance propositions, threats to the 'balance' must be met with a clearly defined counter-action, a firm aggregation of power to 'right the balance'; if not, war is made more likely. Threats are managed by an alliance against a rival in order to define interests clearly and to aggregate capabilities to protect those interests; hence, the proposition that defense alliances deter and non-defense alliances invite testing. Schroeder argues that such balance of power thinking has led to a lack of appreciation of co-optation as an exercise of power, one that is far more subtle than the confrontations which the balance of power assumes to be ever present. The possibility I have neglected, then, is alliance with, not against, a rival — managing conflict by means of pactum de contrahendo, an alliance of restraint. Non-aggression
Figure VI:20

Defense Alliance Commitments and War: Germany, 1885-1945
Figure VI:21

Defense Alliance Commitments and War: Austria-Hungary, 1885-1914
agreements and ententes are *pacta de contrahendo* and may restrain an opponent rather than invite his attack. The balance of power thinking, Schroeder continues, leads to a focus on the causes of war and away from a focus on the causes of peace. However, the findings here suggest that *pacta de contrahendo* are associated with war, albeit great power war with weaker states.

### 6.2.3 Pacta de Contrahendo

The single regularity over the 131 years is the association between activist war against a smaller state and the existence of an understanding, an entente or a neutrality agreement, with another great power. Russia invaded Finland in 1939 after the non-aggression pact with Germany. Italy grabbed Tripoli from the Ottoman Empire after France had agreed in 1902 to the establishment of an Italian sphere of influence in north Africa. In 1935 Italy conquered Ethiopia after securing an entente with France.

This association is stronger in the 1815-1885 series than in the 1885-1945 series of figures. In the earlier period, many cases suggest that the formation of an entente between great powers is a signal for activist war by one of the entente members against a weaker state. Great powers do not need the extra weight which allies can provide, but may require the toleration of other great powers in order to

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throw weight around. If a great power seeks to alter the status quo, alliance with other great powers is a prudent step to help to ensure that they do not forcefully oppose the alteration or to ensure that still other great powers are put in a minority. Understandings among great powers permit changes and set limits upon the extent of the changes. From this perspective, the discrepancies I noted above, (that is, the instances when all of the great powers in an entente did not fight) are not discrepancies at all. They constitute the norm. My argument is that pacta de contrahendo restrained and provided opportunities for war.

The difference in the association between them and activist war in the 19th and 20th centuries can be explained simply.

Political changes involving non-great powers are matters of concern to all great powers. In the 19th century, as in our own century, the 'balance' of power was influenced by shifts in the political leanings of small states, the absorption of some of them into new great power empires, and the creation of new states as old empires fell apart. The impact of these changes depended upon where they took place and upon the relative positions of the great powers or their coalitions. Changes in the periphery had less impact than changes in the European center, alongside a great power. At the center the impact would be largest if the relative power positions of the great powers were approximately equal.
The center of the international system in the 19th century contained the European core and the Ottoman fringe. At the beginning of the century, the Ottoman fringe stretched along the southern shores of the Mediterranean—eastwards to Egypt, the Levant and the Persian Gulf; northwards around the Black Sea and the Danube; and westwards to the Adriatic. Within this area, the great powers kept the non-great powers in order by collusion, and, if need be, by military action. If one wished to change the status quo, it did not do so without some form of agreement with another interested great power. Too large an alteration could lead to war between great powers. On the periphery, such agreements were not always necessary because the interests of the great powers did not intersect everywhere until late in the century. After the United Kingdom occupied Egypt in 1883 and the Congress of Berlin in 1884–1885 accelerated the scramble for empire in Africa, the empires of the European great powers confronted one another in Africa, Asia and the Pacific. Competition among the great powers became more fierce; there was little toleration for changes in the periphery and still less in the center. For these reasons, agreements stronger than ententes and agreements from both sides in an increasingly divided great power world were necessary. Therefore, Italy after 1900 sought and secured ententes and neutrality agreements with her opponents, France and Russia, before pressing her claims.
against the Ottoman Empire in 1911. In 1935 the great powers were less rigidly divided, and Italy formed an entente which involved military co-operation with France before attacking Ethiopia. That war hastened the divisions among the European great powers, and the German war against Poland became World War II.

Let us examine the ententes which linked the great powers during the 1815-1885 period, from the Congress of Vienna to the Congress of Berlin. They are arrayed in Figure VI:22 and the figure is constructed in order to bring out, rather than to suppress, the relations between the great powers.

---Figure VI:22---

The vertical lines indicate an entente between great powers, and the solid symbols indicate activist war against a non-great power. Reading from left to right these wars are: Navarino Bay in 1827, the first Russo-Turkish War one year later, the First Schleswig-Holstein War in 1848, the second Russo-Turkish War in 1853 which in 1854 became the Crimean War, the Franco-Mexican War in 1862, the Second Schleswig-Holstein War in 1864, the final Russo-Turkish War in 1877, and the Sino-French War in 1884. One entente which was not included in the graphs above is included here. This is the entente between Prussia and Austria, struck shortly before

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Figure VI: 22

Great Power Ententes and Activist War Against A Non-Great Power, 1815-1885
war in 1864. Singer and Small did not include it in their list of formal alliances because the alliance was formed when "the probability of war had approached 'certainty', thus contaminating the assumed independence between the two observations which were to be correlated." The argument here is that such ententes should be "contaminated" by the prospect of war. Therefore, unlike before, the coding rule does not apply and should be broken.

Except for France in 1884, in all instances of war the activist great power had ententes with interested peers. Whether by imperial design or because of the inherent strength of the Thai monarchy, Thailand remained independent and a buffer between British and French interests in Asia. France had no reason to reach an understanding with the United Kingdom before she advanced into Tongkin and met resistance from Chinese troops. In the Americas this was not the case.

The United Kingdom, France and the former imperial power, Spain, formed an entente to recover damages suffered in the Mexican civil war from the new Mexican government. They tried to bring in the United States but the United States was in civil war. All three great powers landed troops to support their claims, but France, contrary to the entente,

6 Singer and Small, "Formal Alliances," 5.

7 For a detailed discussion, see Lloyd E. Eastman, Throne And Mandarins: China's Search For A Policy During The Sino-French Controversy, 1880-1885 (Cambridge: Harvard University Press, 1967).
landed an army and placed Maximilian of Austria on the throne of Mexico. The United Kingdom sought to restrain France by agreement and, once that had failed, war was contemplated.⁸

Turning from the wars in the periphery to the wars along the Ottoman fringe, we come to the three Russo-Turkish wars. At Navarino Bay all parties to the entente fought. As I noted, this is not the norm but the exception to be explained. All were involved because there was no choice not to be involved. The Turkish garrison bombarded the European fleet blockading the harbour when it advanced inside. How could one alone (say the British vessels whose admiral was in command of the fleet) return the fire. Russia fought Turkey alone and on land in 1828, and her allies supported both Russia and Turkey in order to limit Russian gains.

Russian gains in 1853 were larger and the United Kingdom and France intervened on the side of Turkey. What is of interest is that Russia had ententes with Prussia and Austria and with the United Kingdom. Fixing an accurate termination date to the latter agreement is as difficult as fixing the nature of the understanding which was agreed upon. After the initial and secret text had been formulated Russia had it altered. Where the document read, "If it (the

Ottoman Empire) crumble" the text was changed to read, "If we foresee that it must crumble." Russia wanted to keep the prerogative to decide when the partition of the Ottoman domains should take place. The policy of the United Kingdom remained the same: to preserve Turkey, if possible; if Turkey crumbled from within, to preside over the division of the remains, if possible; to prevent Russia shattering Turkey from without, by alliance, if possible and if necessary, by force. The Eastern Question was a conundrum, but the solutions conform to the argument. So do they in 1877, the year of the final Russo-Turkish war, of the "benevolent neutrality" agreement with Austria which was a prerequisite to the fighting, and of the continuation of entente between the three emperors.

In the European core there were two activist wars against a weaker state. The first occurred in the year of revolution in Europe. While Russia was militarily occupied with rebellion in her Polish territories and Austria was fighting a civil war in Hungary, Prussia acquired territory from Denmark. The second war over Schleswig-Holstein occurred under a very different 'balance of power'. Prussia and Austria were now serious rivals within Germany, and Prussia, under her new chancellor, Bismarck, sought to involve and to entangle Austria. "The Austrians dared not

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stand aside and leave Prussia to act alone; this, they believed, would lose them the leadership of Germany."¹⁰ Austria joined Prussia because she could not afford to not do so.

To conclude, not one of the four alliance commitments propositions is accurate; three are confusingly inaccurate and one, Proposition 4, is more consistently inaccurate. Instead of non-defense commitments to non-great powers leading to non-activist war, I found such commitments between great powers associated with activist war against non-great powers. The explanation of this association is that alliances were formed with, not against, rival great powers; the alliances constrained, restrained and provided opportunities for war. How others would act in the event of war is a fundamental concern of a predatory great power and non-defense alliances are a means to make outside intervention less likely. Alliances, like Janus, have more than one face, but the faces identified here are different than those identified in the 'balance of power' thinking of Chapter III. The inversion of Proposition 4 is less sharp in the 1885-1945 period, but the interpretation which I offer is no less satisfactory.

If the activist wars of the extra-European great powers are considered, the pattern is even less sharp and the interpretation of non-defense agreements between great

¹⁰ Taylor, The Struggle For Mastery In Europe, p. 145.
powers and activist war against non-great powers is less satisfactory. In 1931 Japan, without benefit of an alliance, attacked China. Perhaps this case could be put in the same category as the Sino-French War of 1884; an alliance was not necessary, for there were no serious rivals at the time or place. That category could not reasonably include the Sino-Japanese War in 1937. The USSR, the only Eurasian great power, proposed an entente concerning spheres of influence in Asia, but Japan refused this alliance and joined Germany in the Anti-Commintern entente in 1936. Germany had no interest in East Asia; her interests were in eastern Europe. With her rival in check, Japan advanced over China until the USSR and Japan met along thousands of miles of ill-defined frontier.

My interpretation of the pattern I found is not an explanation of why particular great powers were predatory. Unfortunately, the next set of propositions can provide a clue at best.

6.3 RATES OF ECONOMIC GROWTH AND WAR

Two chains of reasoning link economic growth rates to war. One, usually the longer one, links war with economic depression through a breakdown of normal political and social relations -- an economic disorder to internal and

external political disorder. In the second, war is taken to be a normal consequence of the state system -- the result of rational calculations, decisions and actions. The power politics calculus is as simple as it is ancient.

It is laid down (in Kautilya's Arthashastra) that the invading monarch should set out for conquest when the enemy is slack and his own state is in a condition of prosperity.\textsuperscript{12}

Prosperity and danger are related, because \textit{ceteris paribus} increases in economic growth mean increases in relative power position. The general proposition and specifications are:

Proposition 5) Great power wars are most likely to occur when its rate of economic growth is high rather than low.

Proposition 6) Activist participation in interstate war is more likely than non-activist participation when a great power's rate of economic growth is high.

Proposition 7) The association between activist participation in interstate war and high growth rates is stronger when the opponent is another great power and weaker when a great power attacks a non-great power.

Proposition 8) There is no association between economic growth in a great power and non-activist involvement in war with a non-great power.

The evidence from the great powers, including the United States and Japan, is contained in Figures VI:23 through 35. While these graphs are eloquent in comparison with the

stumbling figures of the previous section, some peculiarities require comment. Examine, for example, Figure VI:23, France 1815 to 1875. The vertical axis are logarithmic beginning at $10^2$ and ending three cycles later at $10^6$. If you will recall that the industrial price index was calculated with the base year 1913=100 and that the iron production statistics record thousands of tonnes, their positions in the plot may seem baffling. To contain all of the series within the same figure and to position them so that one does not interfere with another, I have overlaid some series on axis calibrated for a different series. In effect, I have multiplied by various powers of ten for aesthetic purposes. The scales are the same, and no damage has been done to the rates of change, for each curve retains its shape whether it is multiplied by $10^{-5}$ or $10^5$. The propositions concern rates of change. The absolute values are distractions which may be suppressed.

To assess the propositions, fix upon the symbols marking the occurrence of each type of war involvement and examine the slopes and changes in the slopes of the curves shortly before war. Where the vertical lines cut the curves, the times before the lines are important, not the intervals bounded by the lines and the symbols. The data are annual observations and some wars started early in the year. Without a lag we run the danger of reversing the 'causal' direction. For example, note the reversals in the rates of
growth after 1869 in Figure VI:23. The Franco-Prussian War began in July 1870 and the dips in the curves are due to the victory of Prussia and the losses of French territory.

The final peculiarity I will comment upon here lies not in the construction of the figures but in the world they portray. Often the series do not move in the same manner and occasionally this is troublesome. Length of railway lines open, the accumulation of kilometres of track over the years, is the least sensitive to the state of the economy. Severe disruptions, such as followed defeat in the Franco-Prussian War, are visible whereas less disasterous fluctuations are obscured. To rely upon this series would be to provide sham support to the propositions in the 19th century and ersatz evidence to the contrary in the 20th. With this series I disregard the slope and pay attention only to the changes in the slope. Disagreements between the more sensitive series are more troublesome, and to resolve them I have searched, where possible, other sources of information. The instances which remain ambiguous are discussed and noted in the tabulations beneath each figure.

Figure VI:23
Figure VI:23

Economic Growth Rates And War: France, 1815-1875.
6.3.1 1815 to 1875

The first war indicated in the first figure in this sequence -- France, 1815-1875 -- provides the first bits of conflicting evidence. The value of industrial production, according to the index, declined prior to the Franco-Spanish War, while, according to the tonnes of pig iron produced, the French economy was rapidly recovering from the post-Napoleonic War depression. Appeal to the components of the industrial index reflects, rather than resolves, the problem. Crouzet, the maker of the index, notes that until 1835 the number of industries included is "quite small, which results in giving relatively heavy weight to the chemical and metallurgical industries." Chemical production fell sharply in 1822, while mining and metallurgy continued to expand. Pushing the evidence once again (and perhaps pushing it this much) increases confusion, but Proposition 8 leads us to expect confusion. Europe, that is the great powers in concert, met at Verona in 1822 to resolve the situation which rebellion in Spain had created. France was the neighbour and "if Europe was to intervene in Spain, her mantle would logically devolve on France." The political situation in Rome in 1849 was somewhat similar. However, in that case of non-activist involvement in the affairs of a


14 Albrecht-Carrie, A Diplomatic History of Europe, p.28.
non-great power, there were two rival neighbours, France and Austria -- hence, competitive intervention and no association between high economic growth and war. As Proposition 5, the general one, receives contrary evidence, Proposition 8 gathers the evidence in support of the specified argument that there is little reason to expect such an association with such wars.

The two other more specific propositions also fare better than Proposition 5. Activist participation in 1827, 1859 and 1862 and wars with great powers are preceded by upward slopes in most series and increasingly upwards slopes in some of them. Again, the iron series and the industrial index are contrary. As the index rises in 1859, iron production falls and as the rate of iron production rises in 1861, the overall industrial production falls. Thorp describes business conditions in 1859 as recovering before the start of the war to unify Italy and as lapsing into "general dullness" on the eve of the French expedition in Mexico.\textsuperscript{15} Because of this, I have placed question marks in chit to indicate doubtful cases. The evidence for the other instances -- 1854, and 1870 -- is unambiguous.

In contrast to Figure VI:23, Figure VI:24, the plot for Prussia, presents no difficulties in interpretation. Prussia entered her first war over Schleswig-Holstein with

\textsuperscript{15} Business Annals, p.187.
high and increasing rates of economic growth. The slopes are also very steep prior to the second war, the Seven Week War and the Franco-Prussian War. Thorp's qualitative observations match the quantitative observations. For example, he notes that during 1869 Prussia enjoyed "continued prosperity until war" and war brought a "brief recession" in 1870. The dips in the iron production series and the industrial index are plainly visible in the figure. The break in the rail series in 1870 is the result of the change of borders after the quick victory over France.

Figure VI:24

Prussia was the activist party in all four of her wars. With non-great power opponents in two of them, the evidence in this figure does not support the contention that activist wars against non-great powers are preceded by high economic growth rates more consistently than are activist wars against non-great powers (Proposition 7). However, that proposition, like Proposition 8, concerns great power participation in war, and the evidence should be garnered over all of the figures rather than only within each of them.

Figure VI:25

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16 Business Annals, p.207.
Involvements in War | Activist Party | Activist Party | Activist Party | Non-Activist Party
| | | Great Power | Non-Great Power | Non-Great Power
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Figure VI:24

Economic Growth Rates And War: Prussia, 1815-1875.
Economic Growth Rates And War: Austria, 1815-1875.
Austria was Prussia's ally in the second war with Denmark and Prussia's opponent two years later, in 1866. The evidence in Figure VI:25 is far less compelling than in the previous one. Energy consumption rises steeply until the depression of 1873. On the other hand, the rate of rail construction slackens and iron production falls before the Second Schleswig-Holstein War, and iron production continues to decline until a twelve year low point is reached in 1866. When Prussia and Austria fought, Prussia's economy appears to be booming and Austria's was not.

Figure VI:26

Figure VI:26 describes the five economic series available for Russia, but only two of them reach back to her wars with Turkey. Iron production increases by approximately 12% in 1827 and declines slightly in the following year. After the Battle of Navarino Bay, Russia declared war in April 1828. Therefore, there is the lag indicated by the vertical line through 1827 and two instances favourable to Proposition 5. We should be wary of them. The second war was a continuation of the first. The course of the wars and the struggle for Greek independence, the root of both wars, were more important than the state of the Russian economy in 1826-1827.

Although additions to the rail system in Russia fell off after 1851, iron production increased substantially prior to
Figure VI:26

Economic Growth Rates And War: Russia, 1815-1875.
war in 1853. Thorp's chronology of business conditions contains no observations for this time slice, but the only evidence I have found describes increases in most industries and in overall manufacturing.  

The United Kingdom participated in two of Russia's wars with Turkey, as an ally in 1827 and as an enemy in 1854. In both cases the quantitative and qualitative evidence conforms to the relevant propositions. The lines in Figure VI:27 indicate high growth rates; higher in iron production than the value of total industrial production. Thorp describes British business conditions in 1827 as a "revival" from "depression" in 1826. "Prosperity" is his judgement for 1828, the year Russia fought without her partners of 1827, and for 1853, the year prior to their entry into the next Russo-Turkish war against her. A comparison of these years in Figures 26 and 27 plus a cursory look at the relations between the United Kingdom, Russia, and the Ottoman Empire — at the tangle hidden "under the easy name 


18 Business Annals, p. 158, 163.

19 So begins a standard account.

That shifting, intractable, and interwoven tangle of conflicting interests, rival peoples, and antagonistic faiths that is veiled under the easy name of the Eastern Question.

John Morley, as cited in J.A.R. Marriott's, 4th ed. The
of the Eastern Question" --19 underscore the limitations of the propositions I am evaluating and the limitations of the evidence I am evaluating them with. These limitations are worthy of further discussion here.

Figure VI:27

Russia fought alone in 1828. The United Kingdom and France let Turkey fight Russia for five months in 1853 before formally declaring war on her, then took as many months to mount a military force in the Crimea. The questions are why the United Kingdom intervened in 1854 and not in 1828 and whether the difference was influenced by short term economic conditions. Volumes of controversy are available to answer the first question. To answer the second an inspection of Figure VI:27 is sufficient. The curves move in the same manner prior to 1828 and to 1853. The course of the economy was irrelevant to the different policies; the course of the Russo-Turkish conflict was crucial.

The objective of the United Kingdom was to maintain the integrity of the Ottoman Empire if possible, and, as nationalistic fissures at the base of the empire and rigidities of an anachronic administration at the top made maintenance impossible, to prevent Russia from becoming the

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Economic Growth Rates And War: United Kingdom, 1815-1875.
exclusive arbiter of the empire's disintegration. To contain Russia and to keep the Ottoman demise orderly, the United Kingdom allied with one, then the other, and fought each of them. The Greek rebellion brought about the entente with France and Russia, intended to prevent exclusive meddling in the affair, and brought the allied fleets to Navarino Bay, where they unexpectedly destroyed the Turkish fleet in four hours. "This untoward event" with "the naval forces of an ancient ally" led to the war in the following year, 1828.

Turkey was...encouraged to persist in her attitude towards Greece, and to renew her quarrel with Russia. Russia was permitted, and even compelled, to engage singlehanded in war with the Turks.  

As Russia faltered on the battlefields, the United Kingdom and France displayed their military forces against Turkey, kept to their entente with Russia, and, thereby, participated in the settlement after the exhausted Russia's victory.  

In 1853 the Russian gains were quicker and her initial claims were more extensive. Russia occupied the Ottoman vassals of Moldavia and Wallachia; destroyed the Turkish Black Sea fleet at Sinope; and claimed to be the protector of Christians in the Ottoman domains. War with the United Kingdom and France was the result.

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6.3.2 Summary

How many coincidences make a clue? The question is not a technical one to be answered by the mechanics of statistical tests. The theoretical argument, as base as it is, did suggest where mere coincidence is more likely. Table VI:1 which accumulates the chits beneath each of the figures, lends

Table VI:1 about here

some support to that argument. Perhaps, given the capacity of the Propositions, it would be more accurate to state that Table VI:1 does not tell against that argument. Economic conditions were prosperous before 18 of the 23 great power involvements in war and the proportion increases when we distinguish activist participation from non-activist participation. The proportion of activist wars against another great power preceded by prosperous times is large in Table VI:1; the proportion for non-activist wars against non-great powers is the smallest. However, the distinction between the type of opponent -- great power or not -- in activist participation makes little difference: 4 of the 4 instances of activist war against another great power and 8 of the 9 instances of activist war against a non-great power occurred in prosperous times. Therefore, Proposition 7 recieves little, if any, support. If economic conditions provide a clue, it is a very modest clue.
Table VI:1

Economic Growth Rates And Great Power War, 1815-1875

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The propositions allow 'predictions' from war to economic conditions and not the other way around. Moreover, as the remarks above suggest, this meagre ability may be fortuitous. The number of instances is small and of those instances a number remain ambiguous. Few of the economic series stretch over the entire length of the figures. Those which do are less sensitive to the economic moods of the less industrialized great powers (e.g. Russia) than they are to those in the industrial leaders (e.g. the United Kingdom). Where qualitative descriptions, such as those in Business Annals, are needed most, they are often unavailable. When the wars are examined, their occurrence on a high point often appears to be incidental to the course of the relations between states.

6.3.3 1875-1945

The first war marked in Figure VI:28 is the Sino-French War which grew out of the French-Indochinese imperial war of 1882. As the French moved northwards into Tongkin, formally a Chinese tributary state, they met resistance from Vietnamese who were covertly supported by China. In 1883 China recognized French interests with the Li-Fourier convention, and Tongkin became a French protectorate. Part of the convention called for the withdrawal of Chinese troops.

Figure VI:28
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Figure VI:28

Economic Growth Rates And War: France, 1875-1939.
When the French pressed a contingent at Bac-Le to withdraw quickly without awaiting orders from Peking, violence resulted. The undeclared war and diplomatic confusion ended in 1885. These details deserve attention, not because they point to a possible anomaly in the list of interstate wars, but because they do not suggest a plausible connection between economic fluctuations in France and the trials of her distant army in Southeast Asia. The economic series are contrary: energy consumption and steel production increase until 1883 but iron production and the industrial index are relatively stationary. Fortunately, the Business Annals are available to resolve the ambiguity. According to Thorp, the economic activities in the relevant years were:

1881 Moderate prosperity
1882 Recession then panic
1883 Depression
1884 Depression

The next wars are the two World Wars. They present problems of interpretation in Figure VI:28 and in the Figures to follow. Note the dip in the industrial index in 1913 in Figure VI:28. It reflects the judgements of contemporary observers recorded in Business Annals: "prosperity" and then "gradual recession into dullness" in

21 Eastman, Throne And Mandarins.
22 Business Annals, p.191.
1913, and "growing depression becomes complete suspension with war" in 1914. The two Balkan wars (1912-1913) undoubtedly concerned French businessmen as did the assassination of the heir to the Austrian throne, Archduke Francis Ferdinand, on June 28, 1914. The case is ambiguous but 1914 was not 'a very good year' economically or politically.

Neither was 1939 'a very good year'. Recovery in iron and steel production in France, as elsewhere, was stimulated by preparations for the war which appeared to be inevitable. Not a good year but 1938 was a poorer one in economic terms.

Economic conditions in France's neighbour to the east, described in Figure VI:29, support the power politics argument.

Figure VI:29

Germany was the activist party in World War I and World War II, and her economic series point upwards prior to each of them. Although the prosperity in the years after 1910 was interrupted by a "mild depression in the early months of 1914, there were signs of improvement to War." The reversal of 1937, in Figure VI:29, is slight when compared to the curves for the other great powers. Furthermore, the rates of change of the industrial index and iron production

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23 Ibid., p.196.
24 Ibid., p.215.
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</tbody>
</table>

**Figure VI:29**

**Economic Growth Rates And War: Germany, 1875-1939.**
increase during 1937-1938.

Austria-Hungary was also an activist participant in the First World War, but unlike her ally, Germany, Austria was in a depression before 1914.

Figure VI:30

The industrial index for 1912-1913 in Figure VI:30 falters with the Balkan wars, and iron and steel production fall. The Balkan war "plunges industry into deep depression" in 1912. The depression becomes a "panic" in 1913, and, when Austria-Hungary is dismembered and expelled from the great power ranks after defeat, the economy is in "chaos."²⁵

The final Russo-Turkish war is marked on the left side of Figure VI:31. The trajectory of the economic series

Figure VI:31

suggests, quite mistakenly, that the war was beneficial. In the year before the outbreak of war, the only indicator with a high rate of growth is the length of rail lines. This enormous expansion had military potential, and military and political changes, not economic fluctuations, influenced the timing of the war in 1877. The "Sick Man of Europe" once

²⁵ Thorp, Business Annals, p. 230.
Figure VI:30

Economic Growth Rates And War: Austria-Hungary, 1875-1914.
Involvements Activist Activist Activist Activist Non-Activist
In War Party Party Party Party Party

- Great Power Non-Great Power Non-Great Power

<table>
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Figure VI:31

Economic Growth Rates And War: Russia/USSR, 1875-1939.
again looked as if he would collapse from domestic political convulsions.

Political and military changes also dominated the timing of the Russo-Japanese War. By 1904 a single trans-Siberian rail line had been pushed part way across Russia's Asian hinterland towards Japan's sphere of influence. Japan took advantage of her local superiority and attacked Port Arthur in February. Russia was militarily weak in Asia and economically weak in Europe. Energy consumption increases slowly. The industrial index and iron indicator sag. Steel production increases rapidly, but this is not a good sign.

Heavy industry was now suffering from overproduction, for the growth of steel output was supported only by railway demand and by the industry's own demand for steel.26

The slight revival late in 1903, partially visible in front of the vertical line and noted in *Business Annals*, is not enough to support the argument that prosperity precedes war.

Such is not the case before the First World War. Extremely rapid increases in energy consumption, iron and steel production, and the industrial index continue from 1910 to 1913. Allowing for the gradual slackening of activity towards August, 1914, the time prior to the war was prosperous economically even if dangerous politically. This case supports the contention that prosperity and danger are related.

---

The last wars indicated on the Figure are the Russo-Finnish War, in which Russia was the activist party and the second Russo-Japanese War, (an unofficial, bloody conflict in and around Mongolia) in which Russia was not the activist party. The vertical line denotes the lag prior to the Winter War against Finland, but it appears to be of no practical importance: the economic series flatten out after 1936. Only iron production and the industrial index display modest increases in the 1937-1938 interval. The official index numbers of the value of industrial production, provided by the government of the Soviet Union, show a less modest increase. The official statistics on physical volumes, like the lines in Figure VI:31, are steady from 1936 to 1939. The quantities that increase are capital goods (e.g. machine tools, forging and pressing machines) devoted to arms production. Any relationship between the volume of economic growth and participation in war appears to be a happenstance.

Figure VI:32 describes economic growth in the United Kingdom.

Figure VI:32

---

Figure VI:32

Economic Growth Rates And War: United Kingdom, 1875-1939.
The rates of growth prior to both wars are ambiguous. All of the series increase during the 1912-1913 interval, but with the two which continue through 1913-1914, iron production and steel production, the latter falls and the former levels off. According to *Business Annals*, the "recession" began in the last quarter of 1913 and became a "mild depression" which "deepens with war" in 1914. The situation before 1939 is different. Unlike the Soviet Union, the United Kingdom recorded increases in the quantities of iron and steel production and, like the Soviet Union and the other great powers, much of the increase was for arms.

The final figures in this series, Figures VI:32, VI:33 and VI:34, describe economic conditions in the three latecomers to the great power rank: Italy, Japan and the United States.

The Seven Weeks War was Italy's first fight as a great power and while she was beaten by Austria on land and sea, Prussia, her senior partner, defeated Austria. According to the industrial index, 1864-1865 was the most prosperous year since unification, but the rise in value is slight. The length of railway lines increased by 10%, but the insignificant iron production expanded minutely and energy...
Economic Growth Rates and War: Italy, 1860-1940.
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consumption declined sharply. If we turn from the industrial statistics to the agricultural statistics, they suggest that the year prior to 1865 was better than many but not exceptional.\textsuperscript{29} If economic fluctuations were related to Italy's participation in 1866, the fluctuations in Prussia would be the relevant ones because Prussia managed the war.

Thorp notes "a slow improvement" in the Italian economy "checked by (the) Turkish war," but as the lines in Figure VI:33 indicate, the depression which began three years earlier continued in 1911.\textsuperscript{30} The "very rapid growth" of 1896-1908 was much reduced in 1908-1913.\textsuperscript{31} Compare the picture before the Ethiopian war in 1935. There the rates of growth jump upwards and then deteriorate in the year following the beginning of the revenge of Adowa.

The economic conditions before Italy's involvement in the two World Wars are as different from each other as they are from conditions before her involvement in Africa. Pig iron production remained constant in 1913-1915 whilst steel production increased along with railway lines and energy consumption. The first industrial index (base=1913) is not available in 1914. However, a second one (base=1937)

\textsuperscript{29} For example, the see the statistics on output of wine and Mediterranean crops in Mitchell, \textit{European Historical Statistics}, pp. 279, 284.

\textsuperscript{30} \textit{Business Annals}, p.271.

indicates prosperous times:

<table>
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<td>71.0</td>
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<tr>
<td>1916</td>
<td>71.0</td>
</tr>
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</table>

Thorp reports "uneven depression" in 1915,\(^{32}\) but if we recall that he describes business conditions in general and that most of Europe was at war already, his assessment need not conflict with the rise in industrial production denoted by the index numbers. The fact that Italy took the opportunity to bargain with both sets of combatants, and to weigh carefully each sides chances of winning before joining the more promising coalition, makes her participation in World War I somewhat peculiar and her economic condition, perhaps, somewhat irrelevant. The events surrounding her decision to join in World War II strengthen this interpretation. In 1940 the Italian economy was stagnant while the course of the war to her north was changing quickly and dramatically. France collapsed in June, 1940, and Italy, "feeling that it would be injurious to Italian interest to let the war be won by Germany alone, now that no risks seemed to be left...declared war on both Britain and France."\(^{33}\)

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\(^{32}\) Business Annals, p.272.

\(^{33}\) Albrecht-Carrie, A Diplomatic History of Europe, pp.548-549.
Japan became a great power after her victory over China in 1895, and soon afterwards attacked Russia, her rival in the northeast triangle. Economic conditions before the Russo-Japanese War were "prosperous," and most of the lines in Figure VI:34 slope steeply up over the interval before the attack on Port Arthur. The rates of economic change are also high before activist participation in the First World War, the Sino-Japanese War in 1937, the second Russo-Japanese war two years later, and the war in the Pacific two years after that. The Manchurian War in 1931 is a significant exception.

Figure VI:34

In 1931 the Japanese economy was in the pit of a severe depression. The war, an unexpected action from a power politics calculus, was provoked by officers in the Japanese army who sought to undermine their government. On September 18, 1931, officers of the Kwantung Army bombed the Japanese railway near Mukden and then 'retaliated' in full force against the Chinese garrison. While the government in Tokyo ordered its soldiers to cease hostilities, the Kwantung Army advanced. "The Japanese government was unable to stop the aggression. After each army advance it was forced to eat its words, and little by little it became an apologist for

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34 *Business Annals*, p. 346.
<table>
<thead>
<tr>
<th>Year</th>
<th>Activist In War</th>
<th>Activist Party</th>
<th>Activist Party</th>
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Figure VI:34

Economic Growth Rates And War: Japan, 1895-1939.
the deeds of the military."

Figure VI:35

There are no exceptional cases in Figure VI:35, the United States from 1895 until 1945. The rates of growth are high, and many are increasing before war. However, a connection between the rates of economic growth in the United States and the Japanese attack on Pearl Harbor is hard to imagine. The economic policies of the United States government towards Japan, not the rate of growth of the United States' economy, were more important. While I argued that we should risk the Type II error and see if the coincidences continue, to add this last on to the heap invites distortion. I exclude it and the other cases of involvement after 1939 from the tabulations which follow.

6.3.4 Summary: 1815-1945

The results of the analysis of the rates of economic growth and participation in war for all the great powers during the 131 years are summarized in Table VI:2.

---Table VI:2---

---Table VI:2---

### Involvements in War

<table>
<thead>
<tr>
<th>Year</th>
<th>Activist Party</th>
<th>Great Power</th>
<th>Non-Great Power</th>
<th>Non-Activist Party</th>
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**Figure VI:35**

**Economic Growth Rates And War: United States, 1898-1941**
Table VI:2

Economic Growth Rates And Great Power War, 1815-1939

<table>
<thead>
<tr>
<th>Involvements In War</th>
<th>Activist Party Great Power</th>
<th>Activist Party Non-Great Power</th>
<th>Non-Activist Party Great Power</th>
<th>Non-Activist Party Non-Great Power</th>
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<tr>
<td>1875-1939</td>
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<tr>
<td>High Economic Growth</td>
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<td>6</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
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<td>12</td>
<td>5</td>
<td>7</td>
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<tr>
<td>1815-1945</td>
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</tr>
<tr>
<td>High Economic Growth</td>
<td>31</td>
<td>18</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
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<td>25</td>
<td>9</td>
<td>16</td>
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</table>
The top third of Table VI:2 contains the proportions for all of the great powers (including Italy) during 1815-1875. The middle row accumulates the proportions reported beneath the 1875-1939 Figures just discussed.\textsuperscript{36} The difference between the pre and post 1875 periods is apparent. While the numbers at the top tend to conform to the pattern predicted by the propositions, those in the middle row often are nearer what one would expect of a string of coincidence. The ability to 'predict' the state of the economy from the type of involvement in war during the 1815-1875 period is a meagre ability, and the inability to do so little during the 1875-1945 period is clear. According to Proposition 6, activist participation in war should be preceded by prosperity more often than simple involvement (that is, column 2 greater than column 1). In the earlier period this is so; whereas, in the later period the proportion in column 1 is larger. The proportion of total involvements preceded by prosperity is larger in the 1815-1875 period than in the 1875-1945 period where it is nearer to one half.

Proposition 7, the contention that of the activist involvements in war, those against other great powers are more likely to be preceded by high economic growth rates, finds stronger support. In the 1815-1875 span, there were no clear exceptions, and in the later span there is one -- Austria, the junior partner in a war between coalitions in

\textsuperscript{36} Italy in 1940, Japan in 1941, the United States in 1941, and the USSR in 1941 are excluded from the tabulations.
1914 is deviant.

Given the difficulties in gauging annual growth rates, the ambiguities created by different rates depending upon the particular indicator, the quality of the data, the large amount of room for judgements to which all might not agree, and the apparent differences in the two time periods, the percentages at the bottom of Table VI:2 must be treated very cautiously. Let me describe the findings starting from the indisputable and proceeding towards the inconclusive.

Macfie's finding, that "in no case does war break out decisively after a clear peak" in prosperity, cannot stand. Nor should any dispute that Proposition 8, the contention that there is no relationship between economic growth rates and non-activist involvement in war with non-great power opponents, receives firm support. When the expectation is mere coincidence, as it is with Proposition 8, we find mere coincidence. When we do not expect mere coincidence, the question remains of how much of what we find is merely coincidental. 88% appears to be more than happenstance; therefore, high economic growth rates do precede activist participation in warfare against another great power. However, associations between economic conditions and involvement in war, and in activist participation in general, are meagre and disputable.
6.4 **ripples, waves and ententes**

6.4.1 **Waves**

Macfie found short bursts of prosperity, upon long waves of prosperity, preceding 'important' wars, and Kondratieff, after a more cursory survey of wars, also found them upon the rise of a long wave. Neither continued analysis beyond 1914. Writing in 1938, Macfie omitted the Manchurian War (1931), the Sino-Japanese War (1937), and the Italo-Ethiopian War (1935). The first ones were omitted because no European state participated and the last one was omitted for no obvious reason. The 1920s, the years in which Kondratieff wrote, were years of interstate peace. He became a victim of the terrible dimensions that peace took in the Soviet Union during the 1930s and did not live to try to account for the cases that are most clearly contrary to his argument.

Figure VI:36 about here

These cases are at the bottom of Figure VI:36, a simple listing of the years between 1815 and 1945, yet sufficient to examine the first interaction proposition.

Proposition 9) Relationships between high rates of economic growth and participation in war vary with the long term phases of economic expansion and contraction.
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Figure VI:36

*Great Power War on Kondratieff Waves, 1815-1939*
Each great power war is marked: on the left hand side if it started during an expansionary period, and on the right, if it started during the descent of the wave. Until the 1930s, there is a definite affinity between great power warfare and periods of prosperity and expansion. Fourteen of the 19 great power wars are on the ascent, and, of the 5 which are on the descent, one (Franco-Spanish, 1823) was non-activist and 4 were fought on the periphery (Navarino Bay in 1827, Russo-Turkish wars in 1828 and 1877, and the Sino-French War in 1884). Over the whole period, there is a tendency for great power wars to cluster in the transitional years: the Napoleonic Wars; 3 wars in 1848-1849, years of revolution all over Europe; the First World War in 1914; 4 wars plus a Second World War in 1937-1939. In fact, most 'phases' begin or end with major political changes.37

All of the wars between great powers, except for the largest and smallest in terms of military fatalities, occurred in the more prosperous periods. Therefore, Proposition 9 has some merit in improving the relationship between high economic growth rates and attacks upon another

37 Suggesting to Rose that major war,

like the industrial innovation which competes industries out of existence, serves to compete whole nations out of existence, and in so doing changes the entire economic complexion of an interrelated world.

great power. If one great power attacks another, it is more likely to do so in "good years in good times." But the relationship is not, thereby, made strong enough to be turned so as to predict from the state of the economy to the state of war. The reason is not simply that there are two exceptions in 1939. There are few great power/great power wars and many ripples of prosperity upon waves of prosperity.

Indeed, the sparseness in the top part of Figure VI:36, the 19th century, is noticeable. A similar table for the 18th century would be much more crowded with major, longer wars, and the 20th century saw two long wars involving all the great powers. The problem is to explain the interaction, the deviant instances in the 1930s, and the peace. Kondratieff's suggestion, that wars are more likely in the expansionary phases because competition is more intense, is not satisfactory. It is a conjecture about war, but the problems are peace in the 19th century and wars on the contraction phase in the 20th century. Moreover, the presumption that competition is more intense in periods of expansion does not ring true. Consider the 1873-1896 period of depression: arms races were frequent; many governments instituted high tariffs to protect industry and agriculture from competition; the scramble for empire in Asia and Africa, in part a rush for unprotected markets, started and

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38 Wright, A Study of War, p. 650.
It is not difficult to follow Polanyi, one of the few puzzled by one hundred years of relative peace between great powers— to turn the problem completely upside down; to search for something that made the peace interest so effective. "Trade had become linked with peace" in the 19th century argues Polanyi.

Trade was now dependent upon an international monetary system which could not function in a general war. It demanded peace, and the Great Powers were striving to maintain it. But the balance-of-power system, as we have seen, could not by itself ensure peace. This was done by international finance, the very existence of which embodied the principle of the new dependence of trade upon peace.39

Strains in this new international economic system appeared with the depression of 1873-1896 and, Polanyi argues, World War was the result. His argument is not that profit ruled. "Power had precedence over profit," he states, 40 but as such the problem that interests me is unanswered. When did power command? When did great powers fight each other, and why were most of the fights duels? Proposition 16 provides one answer, but before turning to the adjacent rank explanation of war between great powers, let us consider the wars against non-great powers. The activist wars against non-great powers are spread equally on either side of the turning points marked off in Figure VI:36. Hence,


40 Ibid., p.12.
Proposition 9 is of no help.

6.4.2 Great Power Ententes

None of the alliance propositions could stand up to empirical scrutiny; therefore, possible interactions involving the numbers of allies, non-great power allies, defense agreements, and non-defense agreements with non-great powers and economic growth are not worth pursuing. (Nothing) times (Something) equals nothing. The only consistent association, an unanticipated one, was between activist war against a non-great power and the formation of ententes between concerned great powers. In the 19th century, the large proportion of activist wars against non-great powers which were preceded by high economic growth rates was also unexpected. The second interaction proposition, left open to serendipity now becomes:

Proposition 10). Non-defense agreements with great powers in combination with high rates of industrial growth lead to activist war against non-great powers.

Why would this be so?

Parts of the argument in support of this are already in place. Ententes between great powers functioned as pacta de contrahendo, restraining, on the one hand, and, on the other, providing an opportunity for conflict. Great power A, which wants to alter the status quo, seeks an agreement with an interested great power B, and, following the logic of striking when strongest, will strike when prosperity increases.
In order to see if the meagre 'predictions' from the dependent variables to the independent can be turned the proper, stronger way around, I have constructed the following stem-leaf displays. Each contains a stem of great power ententes from which leaves of various lengths and thickness extend. The length indicates the percentage rates of change in iron production from one year to the next, and the thick leaves mark activist warfare against a non-great power. Let us start with the most impressive of the Figures and work through to those which demonstrate the limitations of the propositions in this Chapter.

---Figure VI:37---

In Figure VI:37, Russia 1815-1885, the ability to locate the incidents of activist war against a non-great power with the interaction term is considerable. The thick leaves are long, and where the stem is thick (that is, the years in an entente), they are among the longest. To illustrate the advantages of this interaction in another way, let ALLIANCE = 1, if there is an entente, and 0, if not; score each year with (ALLIANCE) (PERCENT CHANGE); and list the years starting from the highest value. The years of war are among the first four years listed.

---Figure VI:38---
ANNUAL PERCENT CHANGE (IPCM)

RUSSIA

Figure VI:37

Economic Growth, Ententes, and Activist War Against a Non-Great Power: Russia, 1815-1885
Economic Growth, Ententes, and Activist War Against a Non-Great Power: Prussia, 1815-1885

Figure VI:38
Using the data in Figure VI:38, Prussia's activist wars with non-great powers would be included in the first six years listed. If we were to consider history to be a set of containers, the urns at a carnival show, and each year to be a ball in each of the great power urns, the chances of picking a prize, a war year, from one would be low, without knowledge of alliances or rates of economic change. With knowledge of both, the probability of catching a prize leaps in the urns of Russia and Prussia to near 0.90.

Figure VI:39

The room for improvement in the French urn, Figure VI:39, is less, and at the same time one war, the Sino-French of 1884, would remain elusive. France was in two ententes and the ententes ended with the start of activist war against a non-great power. The years in which the wars began were not years of very high growth rates: the rate in 1861-1862 is two thirds that of 1862-1863, and in 1826-1827 the rate is less than one third that of 1829-1830. In terms of choosing balls from an urn, the interaction term lowers the chances of picking the prize.

The odds are lower still in Figures VI:40 and VI:41, Austria and the United Kingdom, the two great powers who fought less often than the others.

Figure VI:40 and VI:41
Figure VI:39

Economic Growth, Ententes, and Activist War Against a Non-Great Power: France, 1815-1885
Figure VI:40

Economic Growth, Ententes, and Activist War Against a Non-Great Power: Austria, 1815-1885
Figure VI:41

Economic Growth, Ententes, and Activist War Against a Non-Great Power: United Kingdom, 1815-1885
Just as at a carnival, there is a catch: once you pick the correct urn, the trick is easy. There are two steps and the proposition presumes one.

As I noted above, it is reasonable that one party to the entente fights and the others do not. The purpose of the entente for the party seeking to alter the status quo is to co-opt and constrain interested others, to get their toleration of change. From the perspective of the second party, usually the stronger of the parties, the purpose is also to restrain, if possible, and to limit possible gains, if not. Such need not require fighting; it can be done during the fighting and at the peace table. All parties fought at Navarino Bay because of very peculiar circumstances. The circumstances were different in 1828 when only Russia fought. The actions of her entente partners depended upon the course of the war, not upon economic conditions at home. In 1854 the United Kingdom joined against Russia. The Crimean War was exceptional, and the reason it was so is not a part of Proposition 10. In 1864 Prussia increased iron production by 20% and then fought Denmark, and Austria with a decrease in iron production fought along her side. The Proposition cannot predict which will fight.

The successful predictions depend upon treating history as a set of urns, and the failures suggest the limitations of pulling the great powers from the historical context,
from international relations. Finally, the successful predictions are flimsy. If the second estimate of iron production had been used to make the leaves in Figure VI:37, Russia, for example, would have appeared to be in far poorer economic straits.*

6.5 CONCLUSION

Data are made.42 We purposefully pull bits of information from historical context. To claim some insight into the etiology of great power war, we should be able to return the evidence, with some sense, to the historical context and, in this case, to relations between states. The propositions are made to pull data and should tug gently -- coaxing, not wrenching. Much of the evidence favourable to the first set of propositions, those concerning alliance commitments, was wrenched from the relations between states. That is: where the evidence fitted a proposition, it often belied the arguments which prompted the proposition in the first place. More often than not, the evidence was plainly contrary. Therefore, Propositions 1 through 4 are without merit. In so far as they follow from the 'balance of power' reasoning, that reasoning is without empirical support. The difficulty here is that much, too much, can be made to follow from that

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* According to the estimate in European Historical Statistics, Russian pig iron production fell from 443,000 tons in 1876 to 400,000 tons in 1877. See p. 394.

jumble of ambiguity.

The one relationship I found, a result of serendipity, is difficult to fit into the balance of power reasoning. In the pre-1885 period, there is an association between ententes among great powers and activist war against non-great powers. Alliances in the balance of power thinking are formed against rivals and not with them. These ententes, to use Schroeder's distinction, were tools of management rather than weapons of power. But contrary to Schroeder's emphasis on *pacta de contrahendo* preserving peace, they served to provide an opportunity for one party to wage war against a non-great power and to restrain the rival party with the alliance. Rivals were brought into a formal understanding, not deterred by an alliance with another great power.

Morgenthau notes that rivals may compensate one another in an alliance and that territorial compensations were a common device in the eighteenth and nineteenth centuries for maintaining a balance of power which had been, or was to be disturbed by the territorial acquisitions of one state.*3

Ententes in the post-1885 period were sometimes used to compensate but there the threat came from a great power outside the agreement. For example, the ententes between France and the United Kingdom in 1904, the United Kingdom and Russia in 1907, and France and Italy in 1935 involved territorial divisions. However, the territorial

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*3 *Politics Among Nations*, p.173.
Compensations were made to subordinate one rivalry to another rivalry. I argued that the association between great power ententes and activist war changed in the 20th century with the rivalry at the top of the great power hierarchy. When the competition at the top is fierce, adjustments to the status quo and territorial acquisitions have serious consequences for the 'balance' of power. Activist wars against non-great powers occurred at the periphery, and when fought at the European center, became wars between great powers.

The next set of propositions, Propositions 5 through 7, concerned rate of economic change and great power war. The general contention that high rate of growth preceded involvement in war received little support over the 131 years. The association was stronger in the 19th century than in the 20th and my interpretation of the difference is the same as my interpretation of the difference in the relationship between great power ententes and activist war against non-great powers. The general Proposition 5 was specified according to the type of opponent and the type of participation in war. The 'errors' of Proposition 5 followed the pattern suggested by the more specific propositions and, therefore, lent some support to the crude power politics calculus which prompted them. In particular, activist wars against a great power were preceded by economic prosperity in all but 1 instance. However, as I
have reiterated, the propositions are weak. That is: they can postdict the condition of the economy, given participation in war against a specific type of opponent, but they cannot predict a state of war from the state of the economy. At the very best, the findings provide a modest clue.

The third set of propositions were intended to enhance any clues that the weaker ones uncovered. Proposition 10 was left open to serendipity and, when reformulated, proved to be a good predictor to the occurrence of activist warfare against non-great power opponents during the 1815-1885 period. However, it proved less powerful for those great powers which did not engage in such warfare. The prediction problem has two steps, and Proposition 10 was of no help with the first step - which great power fought against non-great powers.

The question of which great powers fought is not answered by the other interaction proposition, Proposition 9, because the Kondratieff describes economic conditions for all of the great powers. There is a modest interaction between high short-run economic growth rates and long periods of relative prosperity and great power versus great power war, all be there a significant exception. World War II began in and ended a long period of depression. Proposition 9 proceeds from comparisons over periods of time and the exception
suggests that comparison over great powers are more important. What are poor times for one great power may be less poor for another. That is: relative power position is of more importance than economic conditions *per se*.
Considerations of the balance of power underlay the formation and examination of the relationships between alliance commitments, rates of economic change and involvement in the various types of great power war. Here those considerations are brought to the surface and become centres of attention. By definition, balance of power theorists are concerned with the 'balance': with the distribution of power and the positions of states in that distribution of power. However, as I pointed out in Chapter III and as many others before me have pointed out, the ambiguities in the use of the term 'balance of power' often lead to fuzzy talk and contradictory statements. Where the arguments appear to cohere because the words 'balance of power' are used again and again, repetition muffles inconsistencies.

Inconsistencies remain when those words are avoided. For example, in an aside in On War, Clausewitz wrote that "the would-be-conqueror (i.e., as we would say, aggressor) is  

always a lover of peace."¹ Gallie quotes the passage to support his interpretation that Clausewitz saw war "as occasioned and kept in being chiefly by ... the relatively weaker, 'the harmless defenders', with whom we all feel an immediate and proper human sympathy."² Blainey quotes the identical words to support his argument that Clausewitz "believed that a clear ladder of international power tended to promote peace."³

My concern here is not with an exegesis of Realist scripture but with an empirical examination of Realist arguments on relative power position and involvement in interstate war. Sorting through the ambiguous and contrary claims and interpretations, I described the merits of six propositions.


Whoever gives even moderate attention to human affairs and to our common nature, will recognize that there is no man who does not wish to be joyful, neither is there anyone who does not wish to have peace. For even they who make war desire nothing but victory—desire, that is to say, to attain to peace with glory. For what else is victory than the conquest of those who resist us? And when this is done there is peace. It is therefore with the desire for peace that war is waged...

² Gallie, Philosophers of Peace and War, p.63.
Proposition 11: The predominant power is more likely to fight than are the less powerful.

Proposition 12: Increases rather than decreases in a great power's relative power position are more likely to lead its involvement in war.

Proposition 13: Activist participation in war is more likely than non-activist involvement to follow an increase in a great power's relative power position.

Proposition 14: The association between activist participation in war and increases in relative power position is stronger when a great power attacks another great power and weaker when the target is a non-great power.

Proposition 15: Therefore, there is no association between changes in relative power position and non-activist involvement in war with a non-great power.

Proposition 16: Non-separated great powers fight as they approach parity in power capabilities.

The last mentioned proposition is, in Popper's sense of the word, more improbable than the other five. That is so because Proposition 16 is richer in theoretical implications and in empirical content; hence, in ways that it may be proved false. The adjacent rank argument predicts which great powers will fight and when war between them will occur. Unlike the other propositions, Proposition 16 accounts for peace and war. Let us examine the more probable propositions, then examine whether or not the last, and most improbable, of the six is simply false.
7.2 **PREPONDERANCE AND WAR**

Two lines of argument from the balance of power literature lead to the contention that the dominant great power is more likely to be involved in interstate war than the great powers further down the hierarchy of states. First, it is argued that the dominant state keeps order among those states below and war is one means of keeping order. War is a means to maintain the *status quo* therefore, the dominant great power's participation in war is frequent and non-activist. Second, it is argued that a balance of power prevents empire and the dominant great power, unless checked or balanced by a coalition, threatens other states. The warfare of the dominant great power is activist, and alliances reduce the position of the dominant state; equilibrium preserves peace. Both arguments are reasonable and, as they converge, they suggest different tests of Proposition 12. The tests are crude but sufficient.

The appropriate evidence is described in the two histograms of frequency of involvement in interstate war within equal intervals of values on the index of relative power position. If the proposition that the dominant great power is involved in war more often than the other great powers has some merit, the area enclosed to the right of the midpoint would be larger than the area on the left side, and the distribution would be skewed towards the lower scores. This is not the case in either Figure VII:1 or VII:2.

Figure VII:1
Figure VII:1

Relative Power Position (No Alliances) and War Involvement:
Great Powers, 1815-1945
In Figure VII:1, the first histogram, the relative power positions upon entry into war are computed with the percentage shares of the total capabilities held by each great power. Following the first line of reasoning to the proposition, alliances are not considered in the calculations of the index, and non-activist involvements in war are given more prominence than activist participation. (Non-activist involvements are contained in the shaded area and cases at the extremes are identified in order to facilitate discussion.) The proportions of the cases of involvement in war and non-activist involvement only are larger for the great powers in inferior positions.

The dominant great power (RPP>0.200) on the far right of the Figure fought interstate war to preserve the status quo on only two occasions. These two non-activist involvements, the United Kingdom's intervention in the Crimea and the Anglo-Iranian War in 1856, are identified at the right hand side of Figure VII:1. While the United Kingdom was predominant throughout most of the 19th century, the United Kingdom participated in fewer interstate wars than any of the other great powers and, aside from the suspect case of Navarino Bay in 1827, was not an activist participant in

* This does not mean that pax Britannica was not bloody; only that the blood was spilled in the periphery. During the period when the United Kingdom was predominant, she fought 11 extra-systemic, or imperial, wars in Africa and Asia (by Singer's and Small's count in The Wages Of War). Peter Wallensteen, employing a much broader definition of war, also finds the predominant great power fought more
interstate war.*

The third involvement in interstate war, identified at the far right hand side of Figure VII:1, is Germany's entry into World War I. The difference between the actions of the United Kingdom and Germany when each was predominant (one activist, the other non-activist) was not due to the United Kingdom having been contained by a coalition of those in less advantageous positions, or to the failure to balance Germany, as the second line of reasoning would have it. Figure VII:2 assembles the involvements in interstate war depending upon the relative power positions of the participants, with the consequences of alliance formation upon the distribution of power are taken into account. In this Figure, the shaded area contains the cases of activist participation in interstate war.

Figure VII:2

If this line of argument (from the formation of alliance to reduce the advantage of the predominant great power and from equibalance to peace) were tenable empirically, the second histogram would be bimodal as was the first one. Such is not the case. The valley at the mid-point in Figure VII:1

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Figure VII: 2

Relative Power Position (All Alliances) and War Involvement: Great Powers, 1815-1945
is filled in, in Figure VII:2. As the shift of "Germany 1914" from the right hand side of the first figure to the center-left of the second figure indicates, there is a tendency to equilibalance, and with equilibalance, to war between great powers.

The cases indentified in the Figures illustrate how alliances can catapult a great power into a very advantageous position (Italy 1911) or push it into a less advantageous one (Italy 1866), and can pull the preponderant great power towards equilibalance (Germany 1914) or leave it in much the same position (United Kingdom 1856). The next task is to examine whether or not changes in relative power position are related to interstate war.

7.3 CHANGES IN RELATIVE POWER POSITION AND WAR

Proposition 12 is a more general version of Proposition 5 -- the proposition that great powers are more likely to become involved in interstate war when the rate of economic growth is high, rather than when it is low -- which I tested in the previous Chapter. The argument in support of that proposition is not that "economic" factors lead to war. Rather, the reasoning is that wars are questions of power and that prosperity or good economic conditions, increase the power of a state. Great powers fight more often in "good" times than in "bad" times. The specifications of Proposition 12, like those of Proposition 5, follow simply
from this simple argument. Activist participants, who, far more often than not, are the initiators of military action, are able to choose the time when they are better prepared than their opponents. If the opponent is another great power, that choice is more consequential than if the opponent is a non-great power. Hence, the relationship between increases in relative power position and activist war against a great power should be stronger than the relationship between relative power position and activist war against a non-great power. There should be little association between increases in a great power's relative power position and non-activist war against a non-great power.

These propositions are not very informative in that not one of them can predict to involvement in war. Relative power positions fluctuate from year to year, but wars are few in number. Because of this and the quality of the data, there is much room for the play of mere coincidence -- the same problem encountered when evaluating the more narrow propositions relating economic growth rates to the incidence of war. The solution to the problem is the same as it was earlier. While the results for any of the propositions may be due to chance and, therefore, could be misleading, together all of the propositions predict a pattern of error. If the pattern is as predicted, we can place more confidence in the power politics reasoning which suggested Propositions
However, the ability of these propositions is more to deny rather than to affirm.

The basic element in the power politics reasoning is relative power position. The decision to go to war depends upon relative position, upon the capabilities of each great power in comparison with other great powers, and upon estimates of how each great power will act in the event of conflict. Those estimates depend, in large part, upon the alliances between the great powers and the geopolitical situation which alliances influence. The relative power position index allows us to compare the capabilities of the great powers individually and/or as coalition members. When great powers have a defense agreement, they are treated as one. When a great power has a neutrality or non-aggression pact with another, each is excluded from the calculation of the RPP score of the other. The effects of the third type of alliance - the entente - are more variable and less precise than those of defense and neutrality pacts; therefore, ententes are not considered in the RPP calculations.

Nor are geographic positions included in the RPP calculations. While the consequences of geographic position are usually clear, the method to incorporate geopolitical facts into a formula is not clear at all. Because they are not readily quantifiable is no good reason to disregard the existence of ententes between great powers, the pattern of
alliances, and the location of states when examining the
evidence which the formula describes. To test the
propositions properly, we must use our formula and our
heads.

The following series of figures trace the changes in
relative power positions of each great power during the
1815-1945 period. They contain three lines (which are in
some places identical).

Relative power position, ignoring all alliances
between great powers. (Short dashed line.)

Relative power position including defense
alliances between great powers. (Long dashes.)

Relative power position considering defense
alliances and non-aggression and neutrality pacts.
(Black line.)

Unless stated otherwise, when I refer to the RPP scores I am
referring to the index values computed taking into account
all of the relevant alliances — the black line. The
measure of power capabilities varies over the 131 years. In
the first segment, 1815-1859, iron production and numbers of
military personnel are combined. At 1860, energy consumption
is combined with them. Steel production is added after
1879, and military expenditures, after 1899.

The propositions do not suggest any particular length of
time to observe changes in relative power position. While I
will have something to say about trends in power position, I
take the time immediately prior to the occurrence of war to
be most crucial. To assess the evidence, I examine the change in relative capabilities over the year before war or, if there is a vertical line, the change over the year before the line. The vertical line indicates that the RPP score for the war year reflects the consequences of the war, not the power position before military action. Let us examine Figures VII:3 and VII:4, the relative power positions of Prussia/Germany during the 19th century.

7.3.1 1816 to 1899

The victors in the Napoleonic wars were united in a defense alliance in 1816. When France joined them in 1818, the relative power positions within the Concert of Europe became more important than the domination of Europe by all of the great powers. From 1816 onwards, Prussia was allied with Austria and a number of small Germanic states. In 1840 the great powers formed a coalition against France in order to curb French influence in Ottoman affairs in Egypt. Before that alliance, Prussia's position had declined because of the formation of the Quadruple Alliance between

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5 Alliances concluded within the year before war complicate the interpretation of the Figures. I deal with such complications one by one as they arise. Otherwise, the footnotes have been kept to a minimum.
Relative Power Position and War: Prussia, 1815-1860
the United Kingdom, France, Portugal and Spain in 1834. The Quadruple Alliance was in reaction to the Munchen gratz agreement, an entente between Prussia, Austria and Russia. With the breakdown of the Quadruple Alliance in 1846, Prussia, still allied in a defense alliance with Austria, was left in a more advantageous position. War with Denmark over Schleswig-Holstein followed in 1848.

The specific value of the RPP index is not important: Prussia's score in 1848 is similar to her score during 1820-1834, before the war, and in 1850-1859, after the war. We cannot predict from changes in relative power position to war, but the activist involvement in 1848 does support the more precise argument that increases, rather than decreases, in power position precede war.

Figure VII:4 about here

Figure VII:4 continues the description of Prussia's power position. The lines tracing the RPP scores calculated with defense alliances and the scores calculated with all alliances are identical until 1863 when Prussia, under Bismarck, the former ambassador to St. Petersburg, agreed, contrary to the other great powers, to assist Russia in putting down the Polish insurrection. "Scarcely had the Polish crisis been settled when Bismarck reaped the first fruits of his friendship with Russia"6 the Second Schleswig-
Figure VII:4

Relative Power Position and War: Prussia, 1860-1900
Holstein War in 1864. France and the United Kingdom were at odds in Europe and America, and Austria joined Prussia, her formal ally and principal rival.

The situation described in Figure VII:4 prior to the Seven Week War requires comment. Prussia's alliance with Russia ended after the war with Denmark, and the RPP score based on that alliance falls from to . However, this should not be taken as evidence contrary to the propositions. The RPP scores based upon defense alliances alone increase but, we should be wary. The sole defense alliance between great powers at the time was the Austro-Prussian agreement; but after 1859, that is, after Prussia was slow to aid Austria in her war with France and Sardinia, the alliance was a dead letter. The RPP calculated without alliances, the bottom line in Figure VII:4, is the appropriate one. It shows an increase in relative power position before war with Austria.

If any alliance is relevant in 1866, it would be the defense alliance between Prussia and Italy concluded on April 8.

The treaty of 8 April turned the diplomatic situation upside down. Until then the question had been whether war could be made; thereafter, whether it could be avoided.7


The last war marked in Figure VII:4 is the Franco-Prussian War in 1870 and it is clear Prussia's relative power position increased considerably beforehand. The result of Prussia's wars was Germany, and during the remainder of the 19th century Germany advanced rapidly among the great powers. In 1879, a defense pact with Austria-Hungary was formed, and in 1881, Russia, Austria-Hungary and Germany signed a non-aggression agreement. Italy then joined Germany and Austria-Hungary in 1882 to form the Triple Alliance, which faced the Dual Alliance of Russia and France in 1894.

Figure VII:5 about here

The findings for France are less uniform than they are for Prussia. After regaining her place amongst the great powers in 1818, France's relative position increased until she faced, once again, a coalition of her peers in 1840. Between the low points of 1816 and 1840, France fought in Spain and at Navarino Bay. Prior to 1823 the RPP scores in Figure VII:5 rise, but before 1827 they fall. There is a similar decline before the Roman Republic War in 1849. The opponents were non-great powers but, contrary to Proposition 13, the activist participation at Navarino Bay was preceded by the fall in RPP. When great powers were the opponents -- in 1854 and, in particular, in 1859 -- the evidence also appears contrary to the power politics calculus.
Relative Power Position and War: France, 1815-1860
The Russo-Turkish war of 1853 was five months old before France and the United Kingdom declared war on Russia at the end of March, 1854. The alliances of the Crimean War were complicated but, given that they were formed during the war, a description of them is not necessary here. What is significant is that France's RPP scores increase before her involvement. Compare the situation before the War of Italian Unification. According to the lines in Figure VII:5, the RPP scores, with and without alliances, drop sharply from 1857. However, the alliances in 1859, unlike those in 1854, do require some attention.

Two coding rules used in the calculation of the RPP values determine the downward slope of the lines at the right hand side of the Figure. My intention is not to bend or break the rules because they produce evidence contrary to the propositions, but, because they are ill-suited to a proper test of the argument. The difficulty is the same one raised above with respect to Prussia's involvement in the Seven Week War.

In January 1859, France and Sardinia formed a defense alliance. This alliance added to France's relative position, but because Sardinia was not a great power until 1860, the alliance does not alter the RPP scores. Shortly after the Franco-Sardinian alliance and shortly before war in April, France negotiated a neutrality agreement with

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6 See above Chapter V.
On March 3 1859 France and Russia finally signed a secret treaty in the vaguest terms. In the Italian war Alexander II 'would adopt the political and military attitude most suited to display a benevolent neutrality towards France.'

So far as it went, the treaty was a triumph for Napoleon; indeed it alone made possible the liberation of Italy. Though it did not hold much prospect of Russia's support, it secured him against her opposition. He was free to overthrow the existing settlement in Italy if he felt himself strong enough to do so—

A calculation of France's RPP score with Russia no longer a potential threat, would lead to an increase in relative power position. Therefore, and despite the lines in Figure VII:5, the activist participation in 1859 does conform to the power politics calculus. Indeed, it may be taken as an extreme example of real politik.

Figure VII:6 about here

There are three wars marked in Figure VII:6: the Franco-Mexican War in 1862, the Franco-Prussian War in 1870, and the Sino-French War in 1884. In the first case, a case of activist war against a non-great power, the RPP scores

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9 Taylor, The Struggle for Mastery in Europe, p.106. Lobanov-Rostovsky in Russia and Europe, (pp.219-221) provides a different interpretation. According to the former, Napoleon III tricked Russia. According to the latter, the Russian diplomats took advantage of Napoleon III. Sullivan, in his study of alliances, classifies the agreement as a neutrality pact. See Chapter 2 in Ole R. Holsti, P. Terrence Hopmann and Jack D. Sullivan, Unity And Disintegration In International Alliances.
Relative Power Position and War: France, 1860-1900
increase. In the third case, another activist war against a peripheral state, France's relative position appears to be static. During the short interval after 1866 and 1870, France increased her relative position. Hence, the third case conforms to Propositions 12, 13, and 14.

Figure VII:7 about here

Because of the mutual defense arrangements between Austria and Prussia, the RPP values in Figure VII:7 are, for the most part, identical with those in Figure VII:3. However, some of the values suitable to her ally are less suitable for Austria and Austria fought in different wars from Prussia.

The first of them was the war with Sardinia in March, 1848, and the increase in RPP favours Proposition 13. The second was the intervention in the Roman Republic in April, 1849, and the increase in RPP also favours Proposition 13. The picture is deceptive. Notice that in the 1847-1848 interval the RPP scores calculated excluding alliances rise sharply. Compare the values with those for Prussia.

<table>
<thead>
<tr>
<th>Year</th>
<th>RPP (No alliances)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1847</td>
<td>-.265</td>
</tr>
<tr>
<td>1848</td>
<td>-.215</td>
</tr>
<tr>
<td></td>
<td>-.399</td>
</tr>
<tr>
<td></td>
<td>-.400</td>
</tr>
</tbody>
</table>
Figure VII:7

Relative Power Position and War: Austria, 1815-1860
The rise in the scores for the Austro-Prussian coalition is due to the increase in Austrian capabilities.

My contention is that the RPP scores for Austria in 1848 exaggerate considerably her relative power position. To assess her position before the Roman Republic War on the basis of those scores is a mistake. If nothing else, an illustration of the mistake will be a reminder of the quality of the data and of the measures. The increase of Austria's RPP values from -.265 in 1847 to -.215 in 1848 is mainly due to an increase in her military personnel (by 92,000 men, approximately 30%). The fall to -.238 in 1849 is mainly due to the expansion of Russia's army. The two increases were connected. The connection was the Hungarian revolt that began in late 1848 and, in less than a year, became the most bloody civil war in 19th century Europe. After the Austrian armies were pushed out of Hungary and the Habsburgs deposed there, Russia assisted Austria in restoring order. Civil wars require large numbers of armed men, but near defeat in civil war should not suggest an increase in military might. Quite the opposite, and contrary to the lines in Figure VII:7, I judge Austria to have declined in relative power before she entered Rome.

10 60,000 military fatalities according to the Singer and Small estimate. The Wages Of War, Tables 4:4 and 5:2.
The final war in Figure VII:7, the War of Italian Unification, presents no difficulties here. The complications were discussed above when assessing France's position in 1859. The Franco-Sardinian alliance and the Franco-Russian agreement were to Austria's detriment. They reinforce the picture of decline after 1857 in Figure VII:7.

Figure VII:8 about here

Austria was in a less favourable position than her formal ally, Prussia, before the second war with Denmark in 1864. Prussia, alone, had the neutrality agreement with Russia and, without alliances, held her position from 1862-1864. Figure VII:8 shows that Austria, on the other hand, underwent a slight decline in terms of the RPP values calculated on individual shares and a steeper decline in terms of RPP values calculated with alliances.

The mere formality that the defense alliance between Austria and Prussia had become was demonstrated in 1866. The RPP values for Austria without allies are the appropriate ones and they indicate a slight increase in relative power position before the Seven Week War. Recall, however, that the Prussian alliance with Italy is not included in the calculations. The position of Austria decreased before the war. After her defeat, Austria was treated less severely than France, after 1870 and, in 1879,
Relative Power Position and War: Austria, 1860-1900
Austria, now reorganized as Austria-Hungary, and Prussia, now Germany, formed another defense alliance.

Figure VII:9 about here

The contents of Figure VII:9 differ in two ways from the contents of the others of 1815-1860. First, Russia's RPP scores decline over the period. Second, the RPP scores without alliances trace a line far more jagged than the lines for the other great powers. The size of the armed forces weighs heavily in the calculations, and Russia's army was superior in numbers, not in quality. Moreover, the numbers expanded and contracted with major military actions undertaken to maintain order in the empire; not a sign of strength, but one of weakness. All of Russia's wars were fought to expand the empire at the expense of the Ottomans. Before the three Russo-Turkish wars marked in Figure VII:9, the relative position of Russia increased.

Figure VII:10 about here

With the fourth one, in April, 1877, there does not appear to be a similar increase. If we follow the course of the Sick Man of Europe, we see that Russia reacted to Ottoman weakness and the opportunities that weakness
Figure VII:9

Relative Power Position and War: Russia, 1815-1860
Figure VII:10

Relative Power Position and War: Russia, 1860-1900
provided. The Balkan or Serbo-Turk war, an uprising of Ottoman vassals, began in 1875 and "ended" with the Russo-Turkish war two years later. Russia's RPP scores are steady from 1874 to 1876. They suggest that Russia's position relative to her frequent opponent mattered more than her position relative to her great power peers. In fact, the RPP values drop from -0.256 in 1876 to -0.281 in 1877. The drop cannot be attributed to the fighting: note that the values calculated without alliances and with defense alliances are identical and do not drop in the same manner. What accounts for this peculiar situation and how does it bear upon the argument?

Recall the effect of neutrality agreements in the calculations of RPP: neutrality agreements lower the score for the stronger party. The reasoning behind the arithmetic is that neutrality pacts with weaker states are concessions to them by the stronger; they are unnecessary for the stronger party if the stronger party is contemplating war against another. The strong would have little need to commit the weak to stand aside. If the weaker of the two states is contemplating war, the neutrality agreement would be an advantage and the RPP scores reflect that advantage (for example, the effect of the Russo-Prussian agreement before the war in 1864.) Therefore, in terms of the RPP index, the rational strategy for a great power is to seek neutrality pacts upwards in the hierarchy and defense alliances downwards.
In the instance under discussion, the rational strategy for Russia would have been to form a neutrality pact with the United Kingdom or Germany and defense alliances with Austria-Hungary or Italy. Simply said, what is rational in the index was impossible in the Eastern Question. The diplomacy of the Eastern Question, particularly the Balkan component, was complicated and became more so as the political map changed. However, we need to recognize the crude features: a neutrality agreement between Russia and her rival the United Kingdom was impossible; an agreement with Germany proved to be illusive; and a defense alliance with Italy, a great power outside the region of conflict, was not relevant. Austria-Hungary was the great power with the most immediate interests. Russia sought a defense alliance but had to settle for a neutrality convention stipulating limits on Russian gains and assigning Ottoman territory to Austria-Hungary. While Austria-Hungary, in terms of power capabilities, was in a poorer position than Russia, she occupied a stronger geopolitical position and exploited it fully.

For Russia, of course, the actual piece de resistance of the Convention was Article II which provided for Austro-Hungarian benevolent neutrality and bound Austria likewise to work diplomatically against the intervention or mediation of any other power.12

11 See Rupp, A Wavering Friendship: Russia and Austria, 1876-1878, pp. 183-231 on Russia's attempts to fix an agreement with Germany.

12 Rupp, Ibid., p. 292. The text of the treaty of Bucharest
In short, Russia was weak in 1877 and her weakness accounts for her concessions to Austria-Hungary, but, and this is the point of importance to the propositions under discussion, Russia improved her power position by striking the bargain and was "free to act." The bargain had political and military advantages above neutrality. After Turkey rejected a joint protocol from the great powers, "the suitable season for military operations arrived and Russia declared war." 13

Figure VII:11 about here

Figure VII:11 traces the power position of the dominant great power during 1815-1860. The United Kingdom remained predominant for 30 years more but fought no interstate wars during that time. Hence, no Figure is shown for 1860-1899. The wars in which the United Kingdom did become involved illustrate the importance of the Eastern Question and rivalry with Russia. Russia was involved directly in two of the wars marked in Figure VII:11, and the third occurred in an area of constant competition, Iran and Afganistan.


13 Albrecht-Carrie, A Diplomatic History of Europe, pp.170-171.
Figure VII:11
Relative Power Position and War: United Kingdom, 1815-1860
The United Kingdom and Russia fought Turkey at Navarino Bay, and the relative positions of both increased prior to the war. In the Russo-Turkish war which followed, the United Kingdom supported one side, then the other. The result was Greek independence, but Russia did not become the arbiter of the Ottoman disintegration. In 1853 the situation was different. Russian military gains were quick; the position of the United Kingdom declined. The United Kingdom intervened. Her position increased after the Crimean War, and a war to restore the status quo, upset by Iran's march into Afghanistan, followed in 1856.

This completes the presentation of the evidence from the 19th century. Now I can summarize the findings and compare them with the findings concerning economic growth reported in Chapter VI. Then we can turn to the evidence from the 1900-1945 period.

7.3.2 Summary 1815-1875

In Chapter VI, the 131 years were split at 1875. In order to make the findings comparable, Table VII:1 gathers the findings from 1815 to 1875. The percentage of involvements which were preceded by increases in relative power position are reported in the lower right hand corner of each cell. Proposition 12, the general contention that increases rather than decreases are more likely before war, is weakly supported. Approximately 70% of the cases conform. The
percentage conforming to the narrower Proposition 5 was higher, but the difference is small. Furthermore, as you recall, there were some questionable decisions in Chapter VI which were counted in favour of Proposition 5. Such is not the case here.

Table VII: about here

Proposition 13, like Proposition 6, specifies that the contrary instances are more likely to be non-activist rather than activist involvements. Therefore, the proportion in column 2 should be larger than the proportion in column 1. The numbers are 11/13, or 84%, versus 16/23, or 69%. Proposition 13 is supported. "Austria 1864" and "France 1827" are the deviant instances: the first is understandable; the second, a very peculiar event. Furthermore, the reasoning that led to the contention that increases are more likely to precede activist war against another great power than non-activist war against a non-great power, Proposition 14, accounts for the deviant instances. Proposition 14 is more firmly supported than are 12 and 13.

The Tables summarizing the results for Propositions 5 through 8 and 12 through 15 are similar because relative power position and the condition of the economy are related conceptually and operationally. They are related, not
### Table VII:1

**Increases in RPP and Great Power War, 1815-1875**

<table>
<thead>
<tr>
<th>Involvements in War</th>
<th>Activist Party</th>
<th>Activist Great Power</th>
<th>Activist Non-Great Power</th>
<th>Non-Activist Party</th>
<th>Non-Great Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>16</td>
<td>69.6</td>
<td>4</td>
<td>100.0</td>
<td>7</td>
<td>71.8</td>
</tr>
<tr>
<td>11</td>
<td>84.6</td>
<td></td>
<td></td>
<td>3</td>
<td>60.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>23</td>
<td>13</td>
<td>4</td>
<td>9</td>
</tr>
</tbody>
</table>

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identical. Economic growth is one component of national power, but power depends upon comparisons of the industrial, military, and diplomatic capabilities of each great power with the capabilities of the other great powers and/or coalitions. Ceteris paribus, we should expect a high rate of economic growth to increase power position. The calculations of the RPP index and attention to the security agreements open the ceteris paribus clause to inspection. Often things were not equal. For example, the French economy was growing in 1827, but the French power position was falling. The same was true of the United Kingdom before the Crimean War.

Consider the two wars I discussed above but did not include in Table VII:1. French interests in Indo-China were not shared by other great powers, and France's economy and power position were the same -- stagnant. The Russo-Turkish war of 1877, on the other hand, provides a fine illustration of economic decline inhibiting activist war and of the importance of increasing relative power position by means of alliances.\footnote{For example, see Rupp, A Wavering Friendship, pp.239,260.} Many great powers had interests in the Eastern Question, and there all things could not be considered equal.

More generally, the areas of great power conflict expanded in the last quarter of the 19th century. Therefore, I expect that considerations of relative power
position are more important than the state of the economy to activist participation in interstate war in the 20th century. Propositions 5 through 8 fared poorly in the post-1875 period. Do the comparable relative power position propositions fare better?

7.3.3 1900 to 1939

Figure VII:12 about here

The BPP scores for Germany and Austria-Hungary, bound together in the Dual Alliance, are traced in Figures VII:12 and VII:13. Both sets of scores increase before World War I. After defeat in 1918, Austria-Hungary ceased to exist and the Austrian portion, excluded from the great power ranks, ceased to exist as an independent state with the Anschluss in 1938.

Figure VII:13 about here

Germany's recovery from defeat was rapid and, as the closeness of all three BPP scores indicates, was not hampered by a coalition of her peers. The sharp drop in the values calculated with all alliances occurs with the termination of the German-Soviet neutrality agreement, first signed in 1926. The following extremely sharp rise to the
Figure VII:12

Relative Power Position and War: Austria-Hungary, 1900-1914
Figure VII: 13

Relative Power Position and War: Germany, 1900-1939
last point, 1938, underestimates Germany's position before World War II. The German-Soviet non-aggression pact of August, 1939, is excluded from the Figure. On the other hand, the French-Soviet defense agreement, signed in 1935, shortly thereafter, emptied of any force it may have contained and effectively terminated in 1938, is included.

The influence of the French-Soviet alliance is obvious in Figure VII:14, the graph of the RPP scores of France. Whilst the lines in the previous Figure underestimated Germany's position, the lines in this Figure overestimate France's position. As the RPP values indicate, France declined before 1939, but the calculations cannot record the impact of the German-Soviet agreement of 1939.

Figure VII:14

The jostling for advantage in the decade before the First World War was less disorderly than before the Second. As I argued above, the Entente Cordiale became more than an understanding and settling of imperial accounts by 1912, but the position of the Triple Entente fell, relative to the Triple Alliance. Each of France's RPP values falls over the 1912-1913 interval.

Figure VII:15 about here
Figure VII:14

Relative Power Position and War: France, 1900-1939
Figure VII: 15

Relative Power Position and War: United Kingdom, 1900-1939
In contrast, the United Kingdom was in a better position prior to the World Wars. The RPP scores which do not include her ententes with France and Russia decline from 1900 to 1913, whereupon they rise. The RPP scores which compare the two coalitions fall after 1912.

During the 1930s, the United Kingdom had no alliances with great powers, and while her RPP scores fall with the advent of the French-Soviet defense alliance, they increase before 1939. However, to conclude that the United Kingdom was, therefore, in a better position in 1939 than in 1938 is questionable. The advantage of the guarantee of Poland and the subsequent defense alliance was time:

What better way to gain time, given that war was considered inevitable, than to direct the German military machine against the Poles? The German Soviet agreement followed in August, and war, in September. At best, the instance is an ambiguous one.

The 1930s portion of Figure VII:16, Russia/Soviet Union, is also problematical. Russia was allied with France after 1894 and the RPP values calculated with defense alliances drop slightly before the Russo-Japanese War in January 1904. The other RPP values increase until the war. The

Figure VII:16

Relative Power Position and War: Russia/USSR, 1900-1939
discrepancy and the difficulty it creates can be dealt with quickly, for they are more apparent than real. The Anglo-Japanese defense alliance (for the United Kingdom, another of her attempts to limit Russian expansion in Asia, and for Japan, significant recognition of her status as a great power) caused Russia's position to fall before the war. This alliance is not included in the Figures, which are limited to the European great powers. Before World War I, there is no discrepancy and no difficulty: Russia's power position fell.

In 1935, each of the three calculations goes its own way, and changes in Russia's position are difficult, if not impossible, to follow. The highest of the three is highest because of the French-Soviet defense alliance directed at Germany, and falls with the inclusion of the incompatible German-Soviet agreement in 1939. The ratification of the defense agreement with the Soviet Union by the French National Assembly provided Germany with a formal justification for the re-occupation of the Rhineland. The values then fall beneath those calculated with defense alliances alone, because of the Italo-Soviet non-aggression treaty which was ended, effectively if not formally, in 1937 when Italy adhered to the Anti-Commintern Pact. In turn, the Anti-Commintern entente was ended by the German-Soviet agreement in August 1939. The German-Soviet alliance also delivered the formal blow to the French-Soviet alliance.
In contrast to the two BPP scores which include alliances, the third score, the one which does not include alliances, increases over 1937 to 1938, the last point in the Figure. Note, however, that the discrepancy does not occur in the 1936-1937 interval: all move down. In part, the rise after 1937 reflects an undeclared war with Japan; and that is the rub. The task is to assess relative power position prior to, not during, war, and the Soviet-Japanese 'quasi war' started in 1937 and continued until 1939. Singer and Small date the war from May, 1939 "when Japanese units resumed action on the Mongolian border." During 1938, over 2500 border incidents were reported. In the most serious incident, at Chang Kufeng on the Korean border near Posel Bay on the Sea of Japan, "unmistakable, mechanized warfare" developed. The official battle fatalities in July and August of 1938 approached the 1000 mark Singer and Small used to distinguish war from other deadly quarrels. A Scots verdict -- neither guilty nor not guilty -- would be proper for Russia before the second Russo-Japanese war.

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The next incident in Figure VII:16 is far more simple to decide. The German-Soviet non-aggression treaty was contrary to a secret provision of the Anti-Commintern Pact between Germany and Japan. The provision provided that should either of the signatories become the object of an unprovoked threat of attack by the U.S.S.R., the other would do nothing which would have the effect of relieving the position of the U.S.S.R..

Diplomatically shunted aside and losing the war along the Mongolian border, Japan negotiated an armistice with the Soviet Union in September, 1939. Freed from the complications of warfare on two fronts, the Soviet Union attacked Finland in November.

Figure VII:17 about here

Japan's relative power position following World War I is plotted in Figure VII:17. The first Russo-Japanese war is not shown, but, as I stated above, Japan's position improved with the Anglo-Japanese alliance of 1902. Although that alliance was a defense agreement, action by one of the signatories was made dependent upon another great power's joining "in hostilities against the Ally."

Figure VII:17

Relative Power Position and War: Japan, 1915-1940
If Great Britain or Japan, in the defense of their respective interests as described above, should become involved in war with another Power, the other High Contracting Party will maintain a strict neutrality, and use its efforts to prevent other Powers from joining in hostilities against its Ally.  

The identity of 'another Power' was clear. The alliance provided Japan an opportunity in East Asia against Russia whose ally, France, now would be unable to assist, except to provide coaling stations in Madagascar and Indo-China.

The conditional 1902 alliance was replaced at the end of the Russo-Japanese war in 1905 by another alliance which lasted until 1921. The increase in Japan's position before she played tertius gaudens or, to use a more Oriental image, the fisherman who grabs the fish while the waterbirds fight, can be seen in Figure VII:18.

After 1921 Japan did not enter an alliance until the entente with Germany in 1936. As an entente, this alliance is excluded from the RPP calculations, but the secret provisions created much the same conditions as did the Anglo-Japanese alliance of 1902. The difference in the lines at 1935 is a result of the Franco-Soviet defense alliance. Notice that all the RPP lines increase from 1936 onwards. The difference in absolute values presupposes that France was committed to the Soviet Union in all regions. This was not true: the alliance was exclusively European and

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shortlived. In short, Japan increased her relative power position before the Manchurian War in 1931 and the Sino-Japanese War in 1937.

The situation in 1937-1939 is ambiguous and another Scots verdict is the prudent decision.

Figure VII:18

Figure VII:18 contains two odd instances of activist participation: 1911 and 1935. The first is odd because Italy's intentions towards Turkey, as shown in her alliance building, were extremely clear and proved successful but Italy delayed her war. The delay is enough to place the war on the wrong side of the operational criterion of one year that I have employed thus far. The Italo-Turkish War accords with the spirit of the argument under examination. However, if I were guided by the spirit alone, empirical evidence and rules would be superfluous. The second is odd because the Franco-Italian agreements transformed an entente into something more than an entente, and the consequences of the entente transformed it into something far less than an entente within a year.

Why did Italy delay until 1911 when the lines flatten out from the increase to 1909-1910? The large gap between the scores earned by Italy alone and the two which included Italy's allies illustrates her weakness and the source of
Relative Power Position and War: Italy, 1900-1940
her power position. Italy allied with Germany and Austria-Hungary in the Triple Alliance of 1882 and the price of her continued membership was support to gain Ottoman territory in North Africa. When the Triple Alliance was renewed in 1887, a separate treaty with Germany was concluded. The most important provision was Article III:

If it were to happen that France should make a move to extend her occupation, or even her protectorate or sovereignty, under any form whatsoever, in the North African territories...and that in consequence thereof Italy, in order to safeguard her position in the Mediterranean, should feel that she must undertake action in the said North Africa, or even have recourse in French territory in Europe, the state of war which would thereby ensue...would constitute ipso facto, on the demand of Italy...the casus foederis...21

This article remained in the renewals of the Alliance in 1891 and 1902. Within days of the last mentioned renewal, Italy concluded a non-aggression treaty with France, the target of the Triple Alliance. Regarding North Africa, the agreement was that

if a modification of the political or territorial status of Morocco should result therefrom, Italy would reserve to herself, as a measure of reciprocity, the right eventually to develop her influence with regard to Tripolitania-Cyrenaica.22


The final step in preparatory alliance building was an entente with the second target of the Triple Alliance, signed at Racconige in 1909. Italy and Russia agreed "to consider with benevolence, the one, Russian interests in the question of the Straits, the other, Italian interests in Tripoli and Cyrenaica."\(^{23}\)

The dispute between Italy and Turkey in Libya was occasionally violent during 1910, but, with cheques in hand, Italy "hesitated"\(^{24}\) until France had acquired Morocco and the serious Anglo-German confrontation which that provoked had diminished. A weak great power, and Italy was the weakest of all, must seek the support or acquiescence of the stronger, and wait for an opening if the stronger quarrel. Italy owed her position to great power rivalry. The actions of her superiors, not changes in her relative capabilities, determined the timing of her war in 1911. In the 1930s Italy once again received a cheque from a superior great power to be cashed against territory in Africa. This one was more surreptitious than the others.

A close look at the RPP score in 1935 shows a minute rise in Italy's relative power position. It is too small to be trusted. The significant event is not visible. This was the entente between Italy and France signed in January,


\(^{24}\) William C. Askew, *Europe And Italy's Acquisition of Libya, 1911-1912* (Durham: Duke University, 1942), p.23.
1935. The commitments of ententes are more ambiguous than those of defense alliances and non-aggression agreements, and normally are not included in RPP calculations. Occasionally ententes develop into something more clear-cut and lend themselves to arithmetic. This was one of those occasions, albeit a brief one, and, therefore, the arithmetic leaves no tracks.

Contemporary diplomatic observers recognized the French-Italian entente as an historical landmark, since it signified the termination of an Italian feud with France which had been one of the principal dangers in the European political arena since the morrow of the Armistice of 1918.25

As such, it was akin to the Entente Cordiale. Both agreements dealt with extra-European differences, but in the text of the Rome agreement, the European concern of the participants was addressed explicitly:

In the event of Germany wishing to free herself unilaterally from the treaty and reserving to herself complete freedom to rearm, the two governments, animated by the desire to act by common agreement, will consult together on the attitude to be adopted.26

More significantly, and unlike the Entente Cordiale, military agreements and military co-operation followed swiftly. French troops moved from the Italian border;


Italian troops were stationed in France at the German-Swiss border; and Italian airforces encamped at fields in southern France. France and Italy obtained an ally against Germany, and Italy gained French 'disinterest' in Italian actions towards Ethiopia. In September 1935, the Italian-Ethiopian dispute became war. The military co-operation in Europe did not endure beyond 1936.

Whether or not Italy's relative power position increased before she joined the Second World War is a moot question. On the one hand, Italy and Germany had an alliance of mutual support; therefore, as Germany defeated France, their relative positions increased together. On the other hand, Italy, although obligated to support Germany in war, did not do so, and her relative position fell as it became clear that her military support was not needed. The lines in Figure VII:18 stop at 1938. Rather than go beyond them and become entangled in a mess of argument without data, I have left aside the problem of assessing the relative power positions of the late entrants into the World Wars. Italy in 1915 and 1940, Japan in 1941, and the United States in 1917 and 1941 are not included in the tabulations.

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7.3.4 Summary 1815-1939

Table VII:2 summarizes the evidence for the relative power position propositions during 1875-1939 and enables a comparison with the results of the analysis of rates of economic change. The percentages of the number of cases of the types of involvement in war which were preceded by increases in relative power position or by high rates of economic growth are provided in the lower right corners of the cells.

The percentages in column 1 are approximately equal and are not large. Proposition 12, the contention that increases, rather than decreases, in relative power position are more likely to lead to war, is supported weakly at best, like its counterpart in Chapter VI. Sixty percent is not large enough to rule out chance variation. What is of more interest is whether the pattern of 'errors' conforms to the more specific propositions. Except for two instances, the Sino-French War and the Italo-Turk War, all of the instances contrary to Proposition 12 are wars between great powers. As the numbers in column 2 suggest, and as Proposition 13 led us to expect, most of these 'errors' are for the non-activist parties. The contention that activist participation is more likely than non-activist involvement
Table VII:2

Increases In BPP And Great Power War, 1875-1939

<table>
<thead>
<tr>
<th>Involvements In War</th>
<th>Activist Party Great Power</th>
<th>Activist Party Non-Great Power</th>
<th>Activist Party</th>
<th>Non-Activist Party Non-Great Power</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>12</td>
<td>11</td>
<td>60.0</td>
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<tr>
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High Economic Growth

<table>
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<th>%</th>
<th>N</th>
<th>%</th>
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<td>88.9</td>
<td>62.5</td>
<td>60.0</td>
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<td></td>
</tr>
</tbody>
</table>
to be preceded by increases in relative power position is supported. This is in contrast to the finding for the rate of economic growth.

With the six instances of activist war against another great power, and with five of the seven instances of activist war against a non-great power following upon increases in relative power position, Proposition 14 is supported, albeit weak support. Once again, the relative power position proposition fares better than its rate of economic growth counterpart. In the post 1875 period, there are no instances of non-great power activist war against a great power; therefore, Proposition 15 has no place here.

Table VII:3 about here

The findings from the total period are presented in Table VII:3. It is plain to see that the propositions are supported and that the pattern of 'errors' conforms to the power politics calculus which prompted them. Reading from left to right, the percentages increase from column 1 to 2 and from 2 to 3, and then decrease, as they should, from column 3 to 4 and from 4 to 5. Once more let me emphasize that, while the argument is strengthened by the results, it is a weak argument. Given war, we can 'predict' that activist involvement, far more often than not, follows upon an increase in relative power position. But given knowledge
Table VII:3

Increases In BPP And Great Power War, 1815-1939

<table>
<thead>
<tr>
<th>Involvements In War</th>
<th>Activist Party Great Power</th>
<th>Activist Party Non-Great Power</th>
<th>Activist Party Great Power</th>
<th>Non-Activist Party Non-Great Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
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<tr>
<td>43</td>
<td>28</td>
<td>10</td>
<td>16</td>
<td>5</td>
</tr>
</tbody>
</table>

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293a
of changes in relative power position, we cannot predict when and where activist participation in war will occur.

7.4 RANK AND WAR

Proposition 16, the proposition that non-separated great powers fight one another as they draw near in terms of national power capabilities, is built upon the inability of decisionmakers and of those who study them and the consequences of their actions to measure power precisely. There is no metric. The scale of international power is something between interval and ordinal. When there is a wide disparity in material capabilities, the scale is ordinal and that is all it need be. There is no need for finer calculations involving and combining the material with the less tangible elements of national power. Crude measurement makes for peace. When there is little disparity in material capabilities, fine calculations are needed in order to determine who is ahead and by how much. A crude calculation is the result. War becomes the measure, a crude measure because it ends when the combatants agree on the ordered categories 'winner' and 'loser'.

International power is most clear at the outbreak of peace, as Blainey points out. As for the distribution of power before war, he suggests:

It is not the actual distribution or balance of power which is vital: it is rather the way in which national leaders think that power is distributed. In contrast the orthodox theory assumes that the power of nations can be measured
with some objectivity. It assumes that, in the pre-nuclear era, a statesman's knowledge of the balance of international power rested mainly on an 'objective comparison of military capabilities.'

To focus on the perceptions or misperceptions held by national leaders of the distribution of power, especially on the perceptions of power immediately prior to war can mislead. Proposition 16 is of the orthodox school: knowledge of the balance of power rests mainly on objective comparisons of capabilities, but occasionally such objective comparisons are insufficient. War occurs then. I described the difficulties of reliably and validly comparing power capabilities in Chapter 5 and illustrated some of them in the preceding analysis. Here I will draw out some of the implications for assessing the adjacent rank theory.

First: in most cases, the accuracy of the estimates of power capabilities increases over time and therefore errors in prediction are expected to diminish over time. Second: estimates of iron production underestimate the capabilities of the larger empires, Russia and Austria. Therefore, given the quality of the iron production data and the weight of iron production in the overall measure in the 1815-1859


period, errors in prediction involving Russia and Austria in the early part of the 19th century may be errors in measurement, rather than in the argument. Third: the number of military personnel underestimates the power capabilities of the United Kingdom, a naval power with an empire sprawling over the seas, and overestimates the power of Russia, a land power with a huge contiguous empire. Fourth, a related point: the numbers of armed men tell little of the quality of armed forces or the ability to deploy them. War results in an increase in the numbers of armed men, but the relationship between the increases generated by fighting and increases in power capabilities is not obvious. Unsuccessful combat requires troops. For example, Russia's army increased in size to fight against Turkey and, more often than not, the fighting revealed a lack of military depth unbecoming to a great power. "The essence of their recurring wars was the inability of one side to defeat the other decisively." Armies also fight to maintain order within a state or empire, but civil war is a sign of weakness, not strength. Although the adjacent rank proposition does not deal with wars fought with non-great powers or extra-systemic wars or civil wars, we must still be concerned with the impact of these wars upon the power position of the great powers.

30 Blainey, The Causes Of War, p. 183.
Fifth: the combination of military personnel, military expenditure, iron production, steel production, and energy consumption time series is more reliable and valid than each of them alone or a combination of any pair of them. We expect errors when the iron production and military personnel pair is all that there is. However, it would be foolish to discount all that there is prior to 1869. Following from the earlier points, the implication is that errors involving the United Kingdom and Russia are more likely than errors involving other great powers. Sixth: four of the five capability indicators are estimates of annual flows through the economy and state. There is nothing in the arithmetic to account for the stock of capabilities accumulated over the years. Assuming that the great power which is stronger accumulates more than the one that is less strong, we would expect war between them after the lines tracing their power capabilities have crossed. Parity in annual flows is reached before parity in accumulated stocks.

Seventh: geography does not enter into the estimates of power capabilities but geography excludes. Who are the great powers or which of them should be included in the estimation of the relative power capabilities? The United States, already a major industrial state, joined the European great powers in the 1890s. One could argue that the economic realities and the decisive intervention of the United States
in 1917 speak for her inclusion in the assessments of the
d power capabilities of the European great powers. To do so
would be to err, I think. Prior to the First World War,
Taylor argues,

the statesmen of Europe looked at political
appearances more than economic realities. The
United States seemed to them not merely on another
continent, but on another planet. 31

Important differences in power capabilities among the
European states would be compressed by including the
capabilities of the United States in the calculations.
Therefore, I excluded the United States from the Figures.
Japan, the other non-European great power, also is excluded
from the Figures. However, the two Russo-Japanese Wars are
considered when assessing Proposition 16.

7.4.1 1815-1875

Figure VII:19 describes the positions of the great powers
measured by the mean of the percent shares of iron
production and military personnel, from 1815 to 1875. The
four great power versus great power wars are marked at 1854,
the Crimean War after the United Kingdom and France
intervened in a Russo-Turkish

Figure VII:19 about here

31 Taylor, The Struggle for Mastery in Europe, pp. xxxii-
  xxxiii.
Figure VII:19

Power Capabilities: European Great Powers, 1815-1875
war; at 1859, the War of Italian Unification between France and Austria; at 1866, the Seven Week War in which Italy, now united, joined Prussia against Austria; and at 1870, the Franco-Prussian War. A glance at Figure VII: 19 is all that is needed to recognize that Proposition 16 is refuted. Note, for example, the Crimean War in 1854 and the positions of Russia and Germany after 1870. A close analysis of the errors may suggest why. Let us examine the wars and then turn to the wars which, if Proposition 16 had more merit, should have occurred but did not.

Starting at the right hand side of the Figure and moving backwards in time, the Franco-Prussian War and the Seven Week War occurred when the protagonists were near parity in power capabilities. France and Prussia and Austria and Prussia were within three percentage points of each other. Italy's participation in 1866 is easily explained by the adjacent rank argument: in a fight over rank, defense alliances with lower ranked states are sought to ensure victory. Prussia allied with Italy, and Austria mobilized the smaller members of the German confederation (Hanover, Bavaria, Baden, Saxony, Wuerttemberg, Hesse-Electoral, Hesse Grand Ducal and Mecklenberg-Schwerin) against Prussia. Alliances with higher ranks are sought to insure that the more powerful do not intervene. In 1870, Prussia, then the leader of the North German Confederation, allied with Bavaria, Baden and Wuerttemberg in southern Germany and
gained assurance of Russian neutrality. The adjacent rank argument finds strong support here but less support in the 1859 case and still less in the 1854 case.

The diplomatic preparations for war in 1859 conform to the argument. France and Sardinia formed an alliance against Austria, and France obtained a neutrality agreement from Russia which served to check Prussia. In 1858, the year before the war, Austria and France are within 8 percentage points of one another. However, France and Austria are closer to one another ten years earlier in 1848-1849. Then they intervened separately and competitively in the Italian states without a major war. A year of revolutions and revolts is a poor time for major war or perhaps a poor year to gauge power capabilities with military personnel weighted so heavily in the calculations. Another difference between 1859 and 1849 was the power and ambition of the third party, Sardinia.

The adjacent rank argument does not account for Sardinia's bid to enter the great power ranks. Sardinia allied with those who were stronger, and the stronger limited her gains. The war altered the power positions of the great powers, but it added to, rather than altered, the rank order. It was not a fight over rank in general; indeed, to speak of rank order in general is to point to the mistake. The war was the War of Italian Unification. Austria was the dominant great power in Italy. Sardinia,
with her ally to the west, challenged Austrian hegemony there.

The circumstances of the first war between great powers after 1815 illustrate the importance of geographic position, physical distances, and the role of non-great powers in a war between great powers. According to Proposition 16 and Figure VII:19, France and Russia or France and Austria should have been in conflict but should not in war. However, a war occurred and the United Kingdom, contrary to Proposition 16, fought. If we consider the United Kingdom and Russia to have been joined, rather than separated, by the seas, the question is why they did not fight in 1825–1835 when they were near parity.

France and Russia were the principal combatants in the Crimea; but the war was fought in the Crimea because Austria, the best situated potential ally against Russia, remained neutral. Austria occupied the Danubian principalities of Wallachia and Moldavia as Russia, in the face of threats from the United Kingdom and France, withdrew from them. Austria secured her interests without war and, without Austria, a decisive defeat of Russia was difficult for the two great powers who, on paper, were far stronger than their opponent. The Crimean peninsula, jutting out into the Black Sea and surrounded, save a tuck, by water, was the place where France and the United Kingdom could get at Russia; a place where two land powers, separated by
central Europe, could meet and a place where a naval power and a land power could fight.

The opponents were evenly matched in the Crimea -- the course of the war is an accurate measure of that. The problem is to account for the occurrence of the war, in the first place, and for the periods of peace where the lines tracing the positions of the combatants in Figure VII:19 near intersection. According to Figure VII:19, Russia and the United Kingdom were near parity during 1820-1833; France and Russia were near parity around 1839-1841. These periods coincide with wars in the Ottoman Empire, and periods of intra-empirical disorder provided opportunities for conflict among great powers.32

During the Greek rebellion, 1821-1828, the United Kingdom and Russia formed an entente with France and fought at Navarino Bay. In 1828, when Russia responded to the Sultan's declaration of a holy war and took Adrianople, after considerable difficulty, the United Kingdom permitted Ottoman troops in the Peloponnese to join the war against her recent ally. Although the Russian army was in reach of the Straits and victorious, it was exhausted.

Like the Russo-Turkish war, the First Syrian War, the next intra-imperial war, grew out of the war for Greek independence. Egypt was an Ottoman vassal state. When her

32 Aside from the studies of the Eastern Question cited above, I found Gerald David Clayton, Britain And The Eastern Question: Missolonghi to Gallipoli (1971; rpt. London: Lion Library, 1974) to be very helpful.
demand for Syria as a reward for assistance in the Peloponnese was rejected by the Sultan. Egypt declared war. The United Kingdom refused a defense alliance to Turkey in 1830, and, after military defeats at the hand of Egypt, Turkey turned to Russia for protection. "As the Turks said, 'a drowning man will seize hold even of a snake.'" Russia occupied Constantinople in alliance with Turkey, rather than in war against her. Turkey, in effect, became a Russian protectorate, and Russia, through a secret clause in the Treaty of Unkiar Skelessi, gained control over access to the Straits. The hegemony of the United Kingdom thereby was threatened; but, unlike 1854 and contrary to Proposition 16, there was no war in the 1830s. A war by the United Kingdom against Turkey and Russia was not practical, especially not practical for a naval power without an eager land ally. Hegemony preserves peace, but in this arena encroachments upon hegemony were not sufficient to lead to war against another great power.

In 1838 the Sultan attempted to recover the territories lost to the Khedive. Egypt proved to be the military superior in the Second Syrian War. France, Russia's equal according to the arithmetic in Figure VII:19, opposed the Sultan and his protector, Russia, and supported the Khedive. The United Kingdom came to Turkey's side with naval assistance, which control of the Eastern Mediterranean

allowed her to provide, and lined Russia, Austria and Prussia into an alliance with Turkey in 1840. The outcome was the Straits Settlement of 1841. The United Kingdom replaced Russia as Turkey's protector, and it was agreed that non-Ottoman warships would not be allowed to pass through the Straits while Turkey was at peace. If Turkey were at war, she could allow passage to foreign ships, that is, warships of her allies. Twelve years of peace followed.

If approximate parity between France and Russia made conflict between them likely, the political geography of the Eastern Question made specific alliances a prerequisite to such great power war. The considerations of allying upwards to exclude intervention by a stronger great power and allying downwards to insure victory were less relevant than finding an arena and combining land and sea power. France and Russia could not confront one another physically in Europe, and, around Europe, the United Kingdom predominated. The United Kingdom could confront Russia at sea, but could not meet her with force upon land. The Ottoman Empire could separate Russia from her enemies or open her to them.

Compare the circumstances in 1839-1841 and 1853-1855: France and Russia, according to the dubious but instructive arithmetic in Figure VII:19, were near equality in power capabilities at both times. However, in 1839-1841 the United Kingdom opposed France and came to dominate Turkey. In wake of the Turco-Montenegrin war in 1852-1853, Russia
and Turkey fought. Unlike the first Russo-Turkish war, the second saw quick Russian victories. The most dramatic was the destruction of the Turkish fleet at Sinope. The hegemony of the United Kingdom was threatened, and France was an eager ally.

The Crimean War was not a good war from Napoleon III's point of view; a war in Poland, in Italy, or on the Rhine, would have been much better. But it was better than no war at all.³⁴

Let me summarize the findings and arguments I have drawn from Figure VII:19 and then turn to Figure VII:20 which contains better estimates of the power capabilities for the 1860-1875 period during which Germany and Russia were expected to fight. Proposition 16, is not supported. Three of the four wars between great powers in the 1815-1875 period do conform to the adjacent rank argument, in varying degrees. One, the first, is contrary. The accuracy of the predictions from Proposition 16 increases over time, as expected, but to rescue the proposition because of this would be foolhardy. Similarly, it would have been foolish to record a 75% success rate of prediction and simply move along. The difficulty would not have been that such a success rate might prove to be illusory once further wars were considered but that it is illusory. The virtue of the adjacent rank theory, as a theory, is that it is an

explanation of war and peace. Proposition 16 predicted more than four wars and the adjacent rank argument has little to say concerning the 'non-events', the wars which did not occur.

Some of the 'non-events' 'involved' Russia and the United Kingdom and, as I pointed out, the measurement of their power capabilities is less than satisfactory. My argument is that the difficulty is not technical; it illustrates a substantive error in Proposition 16. The substantive error is the assumption of the rank order, a rank order independent of geographic position and the source of conflict between great powers. The political geography of Proposition 16 is too simple.

7.4.2 1860 to 1899

Figure VII:20 describes the positions of the European great powers in terms of energy consumption, iron production, military personnel and, after 1879, steel production. It contains further troubles for the adjacent rank argument. Three slices of the figure deserve attention: the 1860's; the eight or so years following France's recovery from defeat; and 1883 to 1890. The distances between specific great powers are shorter in these slices than in the remaining portions, but the wars predicted by Proposition 16 did not occur. Moreover, the pattern of alliance formation runs contrary to the adjacent rank argument.
Some indications of the problems in assessing Russia's position can be seen by comparing the tail end of Figure VII:19 with the front portion of Figure VII:20. The portions overlap the 1860-1875 period. When the power capabilities arithmetic includes energy consumption, Russia drops beneath France and Germany from a position above them, when military personnel and iron production are all that are counted. No matter where Russia stood in any specific time, however, her secular decline across Figure VII:19 and Prussia's rise over Figure VII:20, and the absence of war between them in the 19th century are completely contrary to Proposition 16. Assuming, quite reasonably, that the lines in Figure VII:20 are the more accurate assessments of power capabilities, what accounts for the absence of war between Prussia and Russia during the 1860's? Parity provided opportunity for conflict and geography offered opportunities for war: an arena at a common border.

Namier states the general rule and an exception to the rule which fits here.

A common frontier between two independent States is as a rule a disputed frontier (unless it runs across the partitioned territory of a third nation, in which case the two States are neighbours, but not the two nations, which, moreover combine to keep down the interposing third.)\textsuperscript{35}

\textsuperscript{35} Louis B. Namier, "From Vienna To Versailles," in his
Figure VII:20

*Power Capabilities: European Great Powers, 1860-1900*
Poland was the partitioned third between Russia and Prussia. As mentioned above, when the Poles revolted in 1863-1864, Prussia and Russia co-operated militarily to suppress them. The common frontier provided an arena, but there were few areas of conflict between Prussia and Russia. Or, more accurately, the areas of conflict which were of greater concern lay elsewhere: for Russia, to the south-east in Turkey, and for Prussia, in Germany, a nation divided into many states which were tied together in a confederation. The rank of Austria and Prussia within Germany was a source of conflict. Once more, to speak of rank in general is not helpful.

The political boundaries and jurisdictions within Germany and the question of the boundary around it, *grosseutsch* oder *kleindeutsch*, provided many opportunities for conflict. For example, Austria and Prussia were close to war in 1849-1850, after Hesse-Electoral, situated between eastern Prussia and Rhenish Prussia, and through which ran the military road connecting Prussia, appealed for federal intervention. Prussia claimed the right to assist militarily, and both Austria and Prussia mobilized against one another. According to the lines in Figure VII:20, Austria was predominant in Germany, and Prussia backed down. By 1866, as the lines in Figure VII:20 indicate, Prussia had more than caught up, and a dispute over the administration

of the duchies of Schleswieg and Holstein led to war. In 1867, Austria was expelled from Germany, and Prussia dominated a Northern Confederation of German states. The southern German states allied with Prussia in the Franco-Prussian War (which occurred at the point of intersection between the lines tracing French and Prussian power capabilities in Figure VII:20); thereafter, Germany was predominant in Europe.

This power transition, to use Organski's term, was the result of two Prussian wars with neighbouring great powers and the non-occurrence of a third one with a third great power neighbour, Russia. Instead of war, and in order to fight a war, Prussia sought Russian neutrality in 1870; not because Russia was above her in rank, as the adjacent rank argument would have it, but because Russia lay along Prussia's eastern border and along the northern border of Austria. Likewise, in 1866 when Prussia and Italy allied: Italy's prowess was the product of position, not military might. "This is the 'sandwich system' of international politics," the simple system of odd and even numbers, and the double policy basic to Kautilya's marvellously complex mandala system. Their essence is the enmity of neighbours, and the essence of Germany's situation was three great power neighbours, two of whom had a common border. Germany was

united and preponderant after 1871, but her position was precarious because it was the geopolitical centre of Europe.

This was particularly so in the 1870's, as the lines in Figure VII:20 illustrate. The power capabilities of Russia, exhausted after the third war with Turkey, are exaggerated; but Germany was vulnerable to a combination of Russia and France, or of both of her defeated great power neighbours. France, near parity with Germany in terms of power capabilities, was the main threat; Germany sought to isolate her and to tie Austria and Russia to herself. To repeat, a map and Figure VII:20 are all that are needed to grasp the situation. Once more, the political geography of Proposition 16 is too simple.

The map is missing from the only detailed quantitative study of the decade under discussion. Healy and Stein, in an article titled "The Balance of Power in International History: Theory and Reality," analyzed "982 international events involving 23 nations" from 1870 to 1881. One of the things which they examined was the last of the six rules of the balance of power system formulated by Kaplan: to wit, that essential actors defeated in war be permitted to remain in the system of great powers and, if not, another state be brought from the inessential to the essential category of


39 Morton Kaplan, System and Process in International
actors. France, after her defeat, initiated less than 10% of the international events according to their count.

Therefore we may conclude that in contrast to Kaplan's proposition, during the decade following the Franco-Prussian War the international system experienced de facto decrease in the number of essential actors. There appeared to be no desire to raise French status nor to offer her position to a more deserving nation. The remaining actors seemed oblivious to any anti-balancing effects incurred by the demise of French major power diplomacy.*

The international politics of one side of the Franco-Prussian War differed from the international politics on the other, but France, minus Alsace-Lorraine, remained, and remained a great power. Poland, to chose the best example of the elimination of an essential actor, was partitioned, and the Polish state ceased to exist. Poland's demise was literally that, while the hyperbolical "demise of French major power diplomacy" was the result of the non-demise of France as an essential actor. Prussia was "a more deserving" state, deserving because of military force, and took France's position in the first rank. Once there, Prussia was anything but oblivious to any "anti-balancing

* Politics, p.23.

40 Healy and Stein, "The Balance of Power", p.44. To alter Schopenhauer's phrase (cited in Peter J. Katzenstein, Disjointed Partners: Austria and Germany Since 1815 (Berkeley: University of California Press, 1976), p.54.) -- events data "are the second hands of history... they rarely give the right time." See also the criticism of Schroeder ("Quantitative Studies") in Journal of Conflict Resolution 21 (1977) and the responses by Small ("Doing Diplomatic History by the Numbers") and the Cornell group in the same number.
effects" of a vengeful great power on its borders. "Too great, indeed, for German peace of mind during the coming forty years," but they were forty years of peace between the great powers.

Germany allied with Austria and Russia in the Dreikaiserbund, an entente formed in 1873, and in a neutrality pact in 1881; with Austria (and later Italy) in the Dual Alliance of 1879; and with Russia in the Reinsurance Treaty of 1887. These alliances served to deny allies to France in the west and to restrain Germany's acrimonious neighbours in the east. There is no need to mug up on the intricacies of this alliance system: the strategy was plain, and the tactics are best left to the historians of the Bismarckian period.

The third slice marked off in Figure VII:20 suggests the difficulties with Proposition 16. Austria and Russia could not agree on their respective spheres of influence in the Balkans, and their relative equality in power inhibited a peaceful allocation. In 1887, Austrian and Russian shares of the power capabilities neared parity; the lines in Figure VII:20 are near intersection. 1887 was a year of acute crisis over the enlarged Bulgaria, a Bulgaria enlarged in the wake of the Serbo-Buglarian War of 1885-1886, which also had divided Austria and Russia, and a year of expected war.

between France and Germany. Contrary to Proposition 16, the Austro-Russian war did not occur and, according to it, neither did the Franco-German "war in sight". German predominance and the geographic precariousness of that predominance favoured peace. A Mediterranean entente, excluding France and linking the United Kingdom and Italy to Austria and to the status quo, was brought to bear against Russia in 1887. The German-Russian Reinsurance Treaty was signed in the same year, as was the renewal of the Dual Alliance. A web of alliances now covered a welter of interests, conflicts and obligations. It could not last and did not.

As Germany appears to close in on the United Kingdom at the top of Figure VII:20, the Anglo-German naval arms race begins in 1898. We can now turn to the last figure, Figure VII:21, and the World Wars, wars between the top-ranking great powers.


\[\text{\textsuperscript{43}}\text{Ibid., p.383.}\]
7.4.3 **1900 to 1939**

The competition of the top two great powers should fit more closely to the adjacent rank argument and Proposition 16 than did the cases of conflict further down in the great power hierarchy. The geography is the same, but geography *per se* has far less effect than political geography. When ranks 1 and 2 conflict, the political geography is simplified. Areas of conflict with potential allies are subordinated to the main area of conflict with alliances, and alliances link arenas and areas of conflict. The distinction between forming alliances upwards to restrain intervention and forming alliances downwards to augment or aggregate power capabilities (a distinction of some importance in conflicts between lower ranked great powers) is unimportant here. By definition, all potential allies are weaker: alliances function less as *pacta de contrahendo* and more as pacts of aggregation. Two coalitions form, and, when they near parity, a general war is likely to occur.

*Figure VII:21 about here*

The First World War fits. The Second World War fits with some difficulty. The reason can be found in the chain from the adjacent rank argument to Proposition 16, specifically in the presumption that one great power challenges one other great power and that the others are arrayed in a clear
Power Capabilities: European Great Powers, 1900-1940
hierarchy. In the decade before 1914, two great powers stood above the rest, and two coalitions formed and fought; in the years before 1939, the clear hierarchy, established at Versailles, rapidly tangled. Three stood near the top, a triangle rather than a pair. The differences are described in Figure VII:21. Both arrangements have been considered the paradigmatic balance of power.44

In Figure VII:21, military expenditures have been combined with the estimates contained in Figure VII:20. Following the reasonable assumptions that the estimates of the various quantities are more reliable in more recent times, and that five components are better than four, the lines in Figure VII:20 are more accurate guides to the relative positions of the great powers than those in all the previous figures. However, this does not guarantee that they cannot mislead. Notice, for example, the jump of Russia from 16.9% in 1903 to 17.9% in 1904. The percentage drops back in 1905 but continues to exaggerate Russia's position. Russia lost the Russo-Japanese War decisively and revolution followed. The British won the South African War but only after considerable effort. The rise in the United Kingdom's percent share from 32.2 in 1899 to 34.0 in 1901 and back to 32.2 in 1902, therefore misleads. Germany's power position is also exaggerated because of her

geographical position and the prospect of a two-front war. How much is a good question, to which I have no ready answer. The significant point is that the United Kingdom no longer predominated; Germany was catching up at the turn of the century, and had more than caught up shortly thereafter.

Although the Anglo-German naval arms race began in 1898, the great powers did not polarize until approximately ten years later. The Franco-Russian alliance, aimed at Germany in Europe, was directed contrary to the United Kingdom outside of Europe. The United Kingdom was involved in an arms race with her future partners, and quarreled with one in Africa and the other in central and east Asia. The Anglo-Japanese alliance of 1902, an alliance between islands off the Eurasian land mass, was an extension of the sandwich system rather than the beginning of bipolarity. After Russia was checked in east Asia, the series of ententes, military agreements, peripheral wars and crises led to two relatively equal coalitions by 1912. As the lines in Figure VII:21 indicate, Germany was advancing over the United Kingdom, and as the arithmetic below indicates, the two coalitions were drawing closer to parity.

<table>
<thead>
<tr>
<th>Year</th>
<th>Triple Entente</th>
<th>Central Powers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1908</td>
<td>.567</td>
<td>.384</td>
</tr>
<tr>
<td>1909</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1910</td>
<td>.570</td>
<td>.391</td>
</tr>
<tr>
<td>1911</td>
<td>.569</td>
<td>.386</td>
</tr>
</tbody>
</table>
The arithmetic favours the Triple Entente over the Central Powers. When we consider the sources of error, especially for Russia, I think that the arithmetic exaggerates the imbalance: Generals Winter and Distance were very defensively minded. One last point: it would be naive to expect six great powers to divide precisely. States are indivisible units; their shares can be added, but they cannot be split. That is why Italy, her treaty loyalties divided between the two alliances, is excluded from the arithmetic. Coalitions are lumpy. Therefore, while it would be more pleasing if the gap between the two coalitions were narrower, the evidence does support the adjacent rank argument.

Sabrosky, in his study of the 1900-1914 period, reaches conclusions very different from mine. He argues that

the period 1905-1910 marked a transition from a major-power subsystem characterized by two coalitions possessing approximately equal power, to a system marked by a significant imbalance between those coalitions.

In 1905, the major-power subsystem was still in a general state of equilibrium. By 1910 that equilibrium had been upset and the balance altered in favour of the Entente coalition.\textsuperscript{45}

\textsuperscript{45} Sabrosky, "From Bosnia to Sarajevo," 11-12, 18.
The inferior position of the Dual Alliance, "a deterioration of the balance which had obtained at the beginning of the century," led to war. Parity, Sabrosky contends, preserves peace.

Matters of measurement and argument are in dispute. The measurement question is crucial. Note here that three of the six indicators Sabrovsky uses -- total population, total urban population and total military personnel -- inflate the share of Russia, generally, and, for 1905, severely inflate her position. (Russia lost a war to Japan in 1905 and revolution followed. Both led to increases in military personnel but not, thereby, to increases in power.) Sabrosky's index scores lead him to the conclusion that Russia and the United Kingdom were equal in 1905 and that the latter fell beneath the former by 1910. I think the conclusion is wrong, very wrong.

The problems of measurement wished away, the problems of argument remain. If there were an equibalance between the United Kingdom, the Dual Alliance, and the Franco-Russian combination at 1900, why did the United Kingdom join with France and Russia? Why not with Austria and Germany, if a coalition was desired? The adjacent rank argument provides one explanation and Sabrosky, by his explicit separation of the study of coalitions and the study of individual great

46 Ibid., 19.

47 The Russo-Japanese Wars are discussed in the next section.
powers, misses the opportunity to combine the two and explain combinations of states. If inferiority leads to war and balance, to peace, why have there been few wars between great powers, few of them general wars, and little equality between them? The answers Sabrosky provides go beyond his data, are more complicated than need be, and raise more questions than they answer.48 A real virtue of the adjacent rank argument is that it is simple in the abstract and a good approximation on the ground. The defect of the argument that parity preserves, and preponderance undermines peace between the great powers, is that the evidence is very much to the contrary, so far. However, when we move along to the right hand side of Figure VII:21, the picture is ambiguous.

The "twenty year crisis" between the Peace of Versailles in 1919 and war over Poland in 1939, as described in Figure VII:21, is unlike any segment of the previous figures. One difference, one that catches the eye immediately, is the magnitude of the changes in shares of power capabilities. The United Kingdom, a victor in World War I and by far the dominant power in Europe briefly thereafter, plunges from over 60% of the power capabilities to slightly less than 20% before her next war with Germany. France, her ally in both

48 Complications arise when Sabrosky tries to reconcile his results with those of Singer and Small in their study of "Alliance Aggregation and the Onset of War" and of Singer, Bremer, and Stuckey in their study of "Capability Distribution, Uncertainty, and Major Power War." Compare with my discussion below in Chapter VIII.
German wars, was devastated in the first one and falls 25 percentage points before the second. The vanquished, except for Austria-Hungary, are phoenix-like. Germany, territorially reduced and restricted, obliged to pay substantial reparations and to remain militarily weak, but permitted to re-enter the great power ranks in 1925, regained her pre-war volume of industrial production in 1927. Russia, fundamentally transformed by military defeat against Germany, the subsequent revolution in 1917, and civil war involving great power intervention into the Union of Soviet Socialist Republics, regained her pre-war volume in 1926. The fall in the share of the power capabilities held by the U.S.S.R. from 1922-1923 is the result of the end of the civil war, therefore, a sign of increasing strength rather than weakness. From the low point in 1925, the U.S.S.R. reaches 20 percentage points higher in the ten years which follow. The rate of growth in Germany's share, an advance of 15 percentage points from the low point in 1932 to the end point in 1938, is equally impressive. More significantly, Germany's share of the military expenditures of the European great powers increased from 7.7% in 1932 to 18.0% in the next year, and to 37.5% in 1938.

The second remarkable feature of Figure VII:21 is the large number of intersections. Prior to World War I, the hierarchy is clear and there is a single intersection. Prior to World War I, all the lines, except for Italy, twist around each other. Contrary to Proposition 16, there were no wars between the European great powers. The carnage was contained within the European states and at the periphery: the starvation and terror in the U.S.S.R., civil war in Spain, imperial wars in China and in Ethiopia are examples. The Versailles Treaty was undone, but by unilateral renunciation and the threat of force, not by war.

The third feature of Figure VII:21 is less obvious than the other two and requires some rough arithmetic to be seen completely, but it is not less important. The lines tangle on each side of the worst years of the world depression to form two triads which could well be labelled "reconciliation" and "balance of power". The last mentioned is the more proper triad, for all the European great powers were pulled into it; thence, into war.

From 1925 to 1930, France, Germany and the United Kingdom stand close to one another, above Italy and the U.S.S.R. Germany -- minimally armed, paying reparations and the Rhineland occupied by French forces -- was restored to great power status at the Locarno Conference. There Germany accepted her new western border, and was reconciled with France. With regards to her eastern neighbours, Germany
declared the frontiers with Poland and Czechoslovakia to be open to future revision, but recognized the French defense alliances with those states. The Soviet Union was isolated, and, if the relations between France and Poland and Czechoslovakia were to be directed, they would be directed towards the Soviet Union. The response was the German-Soviet non-aggression agreement of 1925, another reconciliation.

After 1929, this triad falls apart and the re-arrangement which followed in 1936 was the consequence of the different responses to the world depression. The German share of the power capabilities falls more sharply than the share of France or the United Kingdom, because the military components (military expenditures and personnel, both limited by the post war settlement) are the smallest of all the great powers. With rearmament, Germany's share increases dramatically from 1933 onwards. So also, does the share of the U.S.S.R., the great power least integrated into the world capitalist economy and, hence, the best insulated from it. In contrast, the share of France drops by half from 1933 until 1938; and the share of the United Kingdom falls from 23.0% to 17.1%. According to the lines in Figure VII:21 and Proposition 16, a war between the two strongest European great powers, the U.S.S.R. and Germany, should have occurred around 1938. However, after German remilitarization of the Rhineland in 1936, there was not a
duo of competing great powers, but a triad and, if you will, rather than a duel, a truel\textsuperscript{50} was the result.

The defense agreement between France and the Soviet Union aimed at preventing German remilitarization of the Rhineland depended upon French action. France was weak and no action was forthcoming. Instead, the ratification of the treaty in France served as the official reason for remilitarization. Although ratified, the agreement was moribund. The second triad was formed with the United Kingdom's guarantee to France in 1936 and Italy's movement towards Germany. The arithmetic on the mean percentages shares plotted in Figure VII:21 yields the following 'weights'. They should be treated roughly.

\begin{tabular}{ccc}
  & Germany & USSR & United Kingdom \\
  Italy & & & \\
  1936 & .348 & .328 & .325 \\
  1937 & .345 & .322 & .331 \\
  1938 & .384 & .320 & .290 \\
\end{tabular}

Many qualifications could be made in an interpretation of this political arithmetic, but they do not concern me here. What is important is that the rank order conforms to the

\textsuperscript{50} I am certain that I have seen the term "truel" in the gaming literature. Exactly where I do not know.

\textsuperscript{51} Hillman, "The Comparative Strengths of the Great Powers."
most detailed investigation of relative strength\textsuperscript{51} and that any coalition of the three parties would be a winning coalition.

This arrangement of power capabilities is one of the simple arrangements dubbed "balance of power."\textsuperscript{52} The most simple balance of power is the dyad, equibalance between two great powers or two coalitions of great powers. Both balances of power lead to war. The task at hand is to explain how balance in a triad, like balance in a pair, leads to war. Balance of power theorists offer one explanation; the adjacent rank argument poses a different one.

Consider Caplow's discussion of the balance of power in a triad. In his typology, the triad after 1936 in Figure VII:21 is an example of Type 5, wherein $A > B > C$ and $A < (B + C)$. Investigations of behaviour in triads often take place around a pachisi board, and when playing pachisi, the minimum winning coalition, $BC$, is preferred. Caplow distinguishes this conflict situation from the conflict in "terminal" situations. "Sovereign nations poised in a massive balance of power exemplify" the terminal situation.

Under terminal conditions no coalition is likely to be formed in the Type 5 triad since every possible coalition would have a weaker member who would be helpless after the opponent had been

\textsuperscript{51} Caplow, \textit{Two Against One}, p. 151-152.

\textsuperscript{52} For a contemporary account, see "War and Post-War Economics," \textit{The Economist}, vol. CXXXVI, no. 5010 (September 2, 1939), pp. 434-436.
A precarious stability is the result; precarious, because one may "pre-empt" another and form a coalition or one may attack another, forcing the third to 'right the balance'. It is the absence of the formation of the winning coalition which preserves the peace, and

when circumstances do not permit either the establishment of an imperium or the merger of contending powers into a unified superstate, the only form of peace attainable is a balance of power.\(^5^4\)

The adjacent rank explanation is opposite: the absence of the winning coalition leads to war. In the portion of Figure VII:21 which is under discussion, neither the adjacent rank explanation nor the balance of power explanation can explain which great powers will fight first, but the latter better describes the course of the conflict in 1939.

Caplow argues that war in 1939 resulted from the destruction of the balance of power by the alliance between the Soviet Union and Germany. The point may seem to be pedantic, but the German-Soviet agreement in August, 1939 was not a coalition in Caplow's sense of a joint use of resources against the third party. That alliance was a non-aggression agreement, \textit{a pacta de contrahendo}, not an aggregation of power. As it destroyed balance in a triad,

\(^{53}\) \textit{Ibid.}, p. 7.

\(^{54}\) \textit{Ibid.}, p. 151.
it created balance in a dyad and balance in a dyad led to war. The balance was in Germany's favour, and the Anglo-Polish defense alliance, an alliance in Caplow's sense of the word, did not tilt the scales in favour of the United Kingdom and France. Without the alliance, however, they would have been in a more disadvantageous position. The Anglo-Polish alliance was less an attempt to restore the balance, and, thereby, preserve peace, than it was an attempt to prevent a far more unfavourable imbalance and "a deliberate challenge."

That it would be provocative to Germany and cause Polish intransigence on the question at issue between the two countries, thereby increasing the probability of war was expected.\textsuperscript{55} War, with the United Kingdom and France on the one side and Germany on the other, followed within a week of the formal alliance with Poland.

7.5 \textbf{SUMMARY}

The arguments tested in this Chapter concern the balance of power -- the nexus of power capabilities, alliances, relative power position -- and great power war. The findings, for the most part, are contrary to persistent balance of power notions. Where they are consistent with balance of power notions, the findings are also consistent with other notions and are weak predictors to the occurrence

\textsuperscript{55} Newman, March 1939: \textit{The British Guarantee To Poland}, p.219.
of great power war.

Great powers increase relative power positions before war more times than not and far more often if the opponent is another great power. Proposition 12 and Propositions 13 through 15 are supported but they are as limited. These propositions, like many power politics arguments, do not account for peace and, consequently, are inadequate explanations of war. Germany, for example, increased her capabilities before each of her six wars but peace followed increases in RPP more often than war.

In the balance of power explanations, the predominant great power is the one to be feared. The largest, unless balanced by a coalition, threatens the independence of the small. While there is no correlation between RPP and warfare, the predominant great power fought fewer interstate wars than those further down in the great power hierarchy. The reason was not that the weak balanced the strong and, thereby, preserved peace. Indeed, the World Wars occurred when there was a general equilibrium and balances within the great power distribution increased the likelihood of war between pairs of great powers.

The virtue of Proposition 16 is that it predicted that balances within the balance or the distribution of power would lead to war. However, a number of great power wars predicted by Proposition 16 did not occur and one, not predicted, did occur. The adjacent rank argument which prompted the Proposition is flawed. Proposition 16, dwells
on positions in the hierarchy, a single hierarchy, and ignores interests on the ground, interests in specific areas.

Consider two wars between great powers which I did not discuss -- the Russo-Japanese wars of 1904 and 1939. Position in the great power "pecking order" did not matter. Position in Asia did matter. On paper, the disparities in power capabilities between Japan and Russia/USSR in 1904 and 1939 are large and Russia/USSR appears to have predominated. In Asia, this was not the case in 1904 or 1939. Russia's strength was in Europe and her strength diminished east of the Urals. I cannot estimate the loss of strength gradient within the Russian empire. What is clear is that the Russo-Japanese wars are not cases clearly contrary to the general conclusion that parity between non-separated great powers is more likely than predominance to lead to warfare.
Chapter VIII

CONCLUSION

When you wander about in libraries and conversation, you come across many explanations of war and peace. Some people hold explanations close with conviction, some keep them at a distance with skepticism and some put one on for an occasion and take it off for the next. Explanations are couched in prose, light verse, epics, epigrams and equations, yet, oftentimes, they are similar in content. Notions recur. "Balance of power" is one -- a notion of little novelty and enormous bulk, difficult to ignore and difficult to untangle. Much quantitative rigor has been applied to sort out the mess, yet, more often than not, the quantitative rigor has been mis-applied. When argument and technique met, technique dominated. Contrary propositions are pulled out and bent to fit a favored, elegant but unsuitable technique. Consequently, the results are not to be trusted. My methods in comparison, may appear to be stodgy but my conclusions, thereby, are sturdier stuff.

8.1 CATALOGUE AND CODA

The specific findings are catalogued in Table VIII:1 at the end of the chapter. Now I describe them broadly and
briefly illustrate how my findings can be related to the findings of studies of the balance of power system, specifically to the findings of two Correlates of War Project papers — "Capability Distribution, Uncertainty, and Major Power War, 1820-1965" and "Alliance Aggregation and the Onset of War, 1815-1945." These results are at different levels of analysis — groups of states. According to some, an attempt to combine the results from different levels or units of analysis is preordained to confusion. Confusion can result but the injunction to keep different levels of analysis from one another is wrong-headed. There is no danger of the so-called "ecological fallacy" here. The results at both levels of analysis are known; therefore, there is no temptation to infer from one level to another. Indeed, what is of interest is that the relationships at one level differ from those at the other and many differ depending upon the time period.

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1 The first is by Singer, Bremer, and Stuckey and the second is by Singer and Small.


3 Robinson, "Ecological Correlations and the Behavior of Individuals."
There is little to say concerning great power warfare in general. The great powers tended to go to war when their economies were prosperous and after relative power position had increased but the strength and direction of the associations vary according to the type of participation — activist or not — and the type of opponent — great power or not. Economic prosperity preceded activist involvement against another great power far more often than non-activist involvement against a non-great power. The same was true of increases in relative power position. For example, 10 of 10 activist involvements in war with another great power followed upon an increase in relative power position while an increase in relative power position preceded 3 of 5 nonactivist wars with non-great powers. Similarly, wars between great powers tended to occur on the ascending portions of the Kondratieff waves whereas wars with non-great powers were found on both the ascending and descending portions. However, these findings are of limited significance. High rates of economic growth and increases in relative power position may precede great power war but they are not harbingers of war. They are not helpful with the theoretical problem of explaining peace.

The slight associations between economic conditions and great power war also vary over time. High rates of economic growth preceded fewer involvements in war during the 20th century than during the 19th century and during the 20th
century wars between great powers occurred in the long period of depression. Therefore, the interaction of prosperity in the short and long terms — a very modest predictor of war between great powers in the 19th century — is a non-existent one in the 20th. The same is true of the interaction between prosperity, an entente between great powers, and activist war against a non-great power.

These changes in size and sign are not unusual. They occur in many of the Correlates of War Project studies, including the two that concern me here. Singer, Bremer and Stuckey, in their analysis of two conflicting balance of power propositions, report that each has merit depending upon the century. In the nineteenth century parity in power capabilities among the great powers led to less warfare and, in the twentieth century, preponderance, or high inequality, led to less warfare.* In their study of alliance aggregation and the onset of interstate war, Singer and Small report that the correlations observed for the nineteenth century are "diametrically opposed to" those observed for the twentieth century.5

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* Singer, Bremer, and Stuckey, in a footnote, suggest the contrary. See "Capability Distribution, Uncertainty, and Major Power War," p.41 and my comments upon their puzzling footnote above in Chapter II.

Do these findings mean that there is little to say broadly concerning specific types of great power war? I do not think so. There is a fundamental sameness in inter-state relations.

Each of the associations that varies in strength and direction over the centuries concerns attributes of states or a group of states rather than relations between states. In my analyses of economic growth rates and of alliances international relations are subsumed in a *ceteris paribus* clause. Where they are not, the findings are consistent over time. All things being equal, an increase in the rate of economic growth results to an increase in relative power position. All things being equal, the addition of an ally adds to relative power position. However, a high rate of growth for another great power and an alliance between two other great powers could result in a loss of position. The index of relative power position was designed not to depend upon these things being equal. It was designed to register changes in relations between states — alliance formation — and changes in the balance of power — shifts in capabilities. The associations between increases in relative power position and various types of war are consistent over time. However, while increases in relative power position preceded some types of great power war, predictions from particular values of the RPP index to great power war are not possible. Moreover, the significant
changes in the balances of power elude the RPP index in the same way they elude the most subtle of the indices of the distribution of power.

For most balance of power theorists, "the balance of power" designates the overall distribution of capabilities in a set of states (usually the great powers) and/or the position of a state relative to the rest. The RPP index was built to correspond to the latter designation and various indices of inequality are applied to quantify the former. Both sorts of indices emphasize the overall balance of power. My findings are that the emphasis on the overall distribution is misplaced. Changes in the overall distribution are less significant than changes within the distribution. I found that the relationship between changes within the balances of power and wars between the great powers does not vary over centuries. The relationship between the distribution of capabilities and great power war varies depending upon the century but the reason that it does is found in changes within the distribution.

Recall that Singer, Bremer and Stuckey argument hinges upon "decisional uncertainty": parity increases uncertainty and preponderance decreases it. They talk of the "pecking order" but the CON, the index they use, measures concentration and and, CON, being a measure of concentration, obscures conditions within the "pecking order." Consider the following hypothetical distributions
of decimal percentage shares of power capabilities and the values of CON computed for them.\(^6\)

<table>
<thead>
<tr>
<th>Great Power</th>
<th>Great Power</th>
<th>Great Power</th>
<th>Great Power</th>
<th>Great Power</th>
<th>CON</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>.400</td>
<td>.300</td>
<td>.300</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2.</td>
<td>.500</td>
<td>.300</td>
<td>.150</td>
<td>.050</td>
<td>---</td>
</tr>
<tr>
<td>3.</td>
<td>.600</td>
<td>.200</td>
<td>.200</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>4.</td>
<td>.500</td>
<td>.300</td>
<td>.100</td>
<td>.050</td>
<td>.000</td>
</tr>
<tr>
<td>5.</td>
<td>.650</td>
<td>.150</td>
<td>.150</td>
<td>.050</td>
<td>---</td>
</tr>
<tr>
<td>6.</td>
<td>.505</td>
<td>.495</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>7.</td>
<td>.505</td>
<td>.495</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
</tbody>
</table>

State A predominates in distributions 1 through 5 but CON misses differences between the distributions. Note also that the values of CON for distributions 1 and 6 are identical (CON = .01) but whereas A dominates in the former, in the latter A and B are nearly equal. A and B are also equal to one another in distribution 7 but the value of CON is .32 rather than the .01 calculated for distribution 6. On the other hand, the CON values in distributions 2 and 3

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are equal (0.39) but in 3 the hierarchy is blurred -- there is a tie between B and C -- and in 2 there is no ambiguity. The concentration of capabilities is slightly higher in distribution 5 than in distribution 4 but what is far more important is that B and C are equal once again.  

How do the opposite correlations between concentration and great power war come to be? Singer, Bremer and Stuckey speculate that in the 19th century diplomatic "professionals might be uncertain as to exactly who ranked where, but nevertheless fairly confident as to general behavior patterns." In the 20th century, in contrast, diplomacy is less professional and domestic politics added to the uncertainties of the balance of power. Thus, they continue, "the probability of war could only be kept within bounds when power configurations were exceptionally clear and the

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7 Duvall points to the problem of the CON index and suggests that "a more adequate index of capability concentration" be used in subsequent analyses. However, no index of overall concentration can remedy the problem. The problem is the emphasis on the overall distribution. Raymond Duvall, "An Appraisal Of The Methodological And Statistical Procedures Of The Correlates Of War Project," Quantitative International Politics: An Appraisal, Ed. Francis W. Hoole and Dina A. Zinnes (New York: Praeger, 1976), p.87.

8 "Capability Distribution, Uncertainty, and Major Power War," p.47. Singer presents another interpretation in "The Correlates Of War Project: Continuity, Diversity, And Convergence," Quantitative International Politics: An Appraisal, p.36. In a more recent essay which I came across after this Chapter was written, Singer appears to dismiss the CON-war correlation for the reasons I have outlined. However, he continues to explain the differences in the centuries in terms of "diplomatic culture." Instead of the CON-war correlation, he
pecking order was quite unambiguous.\(^8\) Distributions 6 and 7, where the ambiguity is at the top, are of the sort which occurred in the 20th century; 1 through the 5, where the ambiguity is not at the top, are of the sort which occurred in the 19th. When great powers are equal war between them is likely whether or not the distribution of capabilities is equal, no matter the century.

When the relative equals are located at the top of the hierarchy, the CON values are lower than when the relative equals are in the middle or at the bottom. Thus the CON values are lower, on average, in the 20th century than in the 19th (0.244 versus 0.257).\(^9\) A large source of the co-variation in the 19th century is the decline in concentration of capabilities after the cluster of wars between the great power in the 1859-1870 interval. The CON values Singer, Bremer and Stuckey computed fall from .280 in 1860 to .203 in 1890. Germany had overtaken France after 1870 but remained a considerable distance from the United Kingdom, the dominant great power, until 1885. For 1885 a CON value of .208 is reported and the identical value is

transfers his interest to the \(\Delta\text{CON}-\text{war}\) correlation. The former has the same limitations as the latter. See J. David Singer, "System Stability and Transformation: A Global System Approach," British Journal Of International Studies, 3 (1977), 229-230.

\(^9\) The standard deviation of CON in the 20th century is three times the standard deviation in the 19th century. Singer, Bremer, and Stuckey incorporate two other indices in their models -- \(\Delta\text{CON}\) and MOVE. Both have the same limitations as CON.
reported for 1913. The index cannot capture the change within the balance of power at the turn of the century — Germany overtaking the United Kingdom.

In a like manner, the identification of periods of economic growth and decline — the Kondratieff's — misses the unevenness of growth within the great power group. Some rise and some decline. Wars between great powers occurred in the expansionary periods until 1914 and thereafter, in the period of depression which followed World War I. The timing of the wars was due less to the overall rate of economic change and more to the changes in the levels of economic production among the great powers.

The balances within the distribution influence alliance formation. In large part, the alliances formed among the great powers depend upon where the relative equals are located in the hierarchy. If they are at the bottom or middle range, they attempt to form defense alliances with those beneath them and neutrality pacts with those above. If the top great power is challenged the group of great


11 For relationships between rates and levels of economic growth and political changes see the references in the footnote above and James R. Kurth's excellent "The Political Consequences of the Product Cycle: Industrial History and Political Outcomes," International Organization 33 (1979), 1-34.
powers tends to polarize into competing coalitions. The correlations between alliance aggregation and the incidence of war in the central system tend to fit my findings. Singer and Small report moderate positive coefficients for the various indicators of alliance aggregation and the incidence of war in the 20th century. For the 19th century, the co-efficients are near 0.000.\(^{12}\)

This is my interpretation of their results. Singer and Small, as mentioned above, conclude that there is a strong negative correlation between the "onset" on war and alliance aggregation in the 19th century.

In sum, whether we measure the amount by numbers of wars, the nation months involved, or battle deaths incurred, alliance aggregation and bipolarity predict strongly away from war in the nineteenth century and even more strongly towards it in the twentieth.

They emphasize the moderate negative coefficients obtained with the four measures of duration and battle deaths. Two indicators of the "onset" of war -- "battle deaths for all" and "battle deaths for majors" — generate the strongest correlations and those correlations dominate the table and Singer and Small comment upon "the extraordinarily low probability of such correlations occurring in such consistent form by sheer chance..."\(^{13}\) The probability of

\(^{12}\) Singer and Small, "Alliance Aggregation and the Onset of War," pp. 280-281. Singer and Small distinguish between the "central system" and the "total system." I am discussing the results for the more restrictive central system (Tables 9 and 11).

\(^{13}\) Ibid., pp. 283.
such a large proportion of the correlations being so consistent is not so low. As Singer and Small point out earlier in their paper, the correlations between the battle deaths indicators are 0.99. The weakest correlation among the indicators of duration and severity of war is 0.95. The correlation coefficients for the incidence of war and the measures of severity and duration are much lower — around 0.50 for the total system and 0.30 for the more restrictive central system.

The coefficients for the index of bipolarity and the incidence of war which Singer and Small report are more puzzling. According to the findings I have summarized, the coefficient for the 1815-1899 period should be near 0.000 and the coefficient for the next period should be moderate and positive. Instead, the coefficients Singer and Small computed are -0.20 in the 1815-1899 period and -0.05 for the central system in the 1900-1945 period. The reasons for

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14 Singer and Small construct and use two indices of bipolarity. The two differ in the treatment of targets of alliances. The -0.20 coefficient is for the index in which targets were identified. In one third of the cases there was no consensus on the target among diplomatic historians and the second index ignored alliance targets. The coefficient for the second index and the incidence of war is near 0.000. For alternative measures of polarity see Michael D. Wallace, "Alliance Polarization, Crosscutting, and International War, 1815-1964: A Measurement Procedure and Some Preliminary Evidence," Journal of Conflict Resolution 17 (1973), 575-604; Bruce Bueno de Mesquita, "Measuring Systemic Polarity," Journal of Conflict Resolution 19 (1975), 187-216; and Michael Haas, "International Systems: Stability and Polarity," American Political Science Review 64 (1970), 98-123.
this turnabout underscore the importance of differentiating between types of great power war and of an appreciation of the political geography of interstate conflict.

The bipolarity scores describe the configuration of formal defense alliances among the great powers. Formal defense alliances exclude ententes which evolve into defense arrangements and include defense alliances which degrade over the years. The polarity scores are then correlated to all incidents of war in the central state system. This means that 13 wars entered into the computations for the 1900–1945 period. Three were wars between great powers; 6 pitted great powers against non-great powers; and 4 were fought by non-great powers. This variety of warfare easily could overwhelm any strong association between polarity and warfare among the great powers. Furthermore, the bipolarity index would miss the triads in the 1930s and the non-aggression alliance which reduced the triad to a dyad in 1939.

The largest source of the modest covariation between polarity and the incidence of war in the 19th century is due, more likely than not, to the isolation of France by Germany after the Franco-Prussian War, the last great power versus great power war of the century. The subtleties of Bismarck's diplomacy were rooted in a crude geographical reality: Germany was stronger than her neighbours but among her neighbours were three great powers. Geographic arrangements condition political conflicts.
Consider another source of the negative covariation: the years 1834-1846 were years of peace and formal divisions over the Eastern Question, a conflict that cannot be understood without maps. Maps, rather than a map, are necessary because states alter and adapt to the political terrain. Studies of the international system — where the unit of analysis is a group of states — are fundamentally limited because they leave no room for maps. They cannot handle the geographic arrangements of the component parts. This inability, rather than the inability to make valid inferences from the collectivity to the individual, merits the label "ecological fallacy."

Changes in the political terrain make the alliance formations before great power activist warfare with non-great powers more understandable. When a great power fought a non-great power, the great power, far more often than not, had an entente and/or neutrality agreement with another interested and rival great power. Ententes and neutrality agreements functioned as pacta de contrahendo -- alliances of restraint. They restrained and, at the same time, provided a more favourable opportunity for war against smaller states. Great powers do not require the weight which alliance with a peer could provide in such conflicts with a smaller state but they do require some peer toleration to alter the status quo. Whether or not peer toleration was forthcoming and the kinds of diplomatic
preparations which were required depended upon the rivalries in the great power ranks and the location of the non-great power target. The two factors are interrelated and the interrelations can be summarized crudely in a 2 X 2 table.

<table>
<thead>
<tr>
<th>Parity in Top Ranks</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-aggression</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>(eg. 1939)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entente</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(eg. 1864)</td>
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<td></td>
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</tbody>
</table>

When the target was located far away on the periphery of the European state system and one great power was predominant, no alliance or an entente, the weakest *pactum de contrahendo*, was sufficient. When the target was closer to, or in the European core, ententes or neutrality agreements were formed. If the hierarchy of great powers was blurred at the top, the great powers polarized and more firm *pacta de contrahendo* — neutrality and non-aggression pacts — were formed. The peripheries, in effect, disappeared.
The isolation of the small by the collaboration of the large is, at best, a partial theory of international relations. What are missing are explanations of why particular great powers press their advantage and why the weak fight. The common claim that the strongest swallows the weak unless balanced by a coalition has little empirical merit. Perhaps it is obvious why the weak fight. Kennan, for one, argues so:

So obvious is this that a study of the behavior of governments in the face of a large disparity in military power would probably reveal that as a general rule the smaller and weaker the country, the more sensitive its government to any hint of military pressure being applied against it, and the more ready its resistance to anything that smacks of pressure or blackmail from the stronger power.16

15 I have borrowed from the title of Harold Guetzkow's article "Isolation And Collaboration: A Partial Theory of International Relations," Journal of Conflict Resolution, 1 (1957), 281-313. The contents are on another subject entirely.

16 George Kennan, "Europe's Problems, Europe's Choices," Foreign Policy, No. 4 (Spring 1974), 14-15. Cited in Peter Karsten, "Response To Threat Perception: Accomodation as a Special Case," in Historical Dimensions of National Security Problems, p. 136. Karsten finds "some support for Kennan's hypothesis" in a study of international accomodation. However, his collection of 35 cases is an odd one -- ranging in time from 300 B.C. to 1940, and in types of entities, from pirates and tribes through hordes, factions of governments, to states and empires. Furthermore, this diversity was sampled in a catch-as-catch-can manner. For example, among the twelve instances of a strong party accomodating a weaker one, is "Prussia/Austria, 1866." Far better to keep to a more homogeneous list of conflict such as found in K.J. Holsti, "Resolving International Conflicts: A Taxonomy of Behavior and Some Figures on Procedures," Journal of Conflict Resolution 10 (1966), 77-95; and Quincy Wright,
The evidence is not clearcut and, if it were, the question of the actions of great powers would remain. What is clear is that the logic of wars between the great powers does not apply here. Great powers fight one another when they are roughly equal and wars with non-great powers are decidedly unequal contests.

The causes of the different types of war vary but the relations between the great powers varied little over the years. The dynamics of the nineteenth and twentieth centuries do not appear to differ— the terrain changes and the consequences, now more dreadful than ever, differ.

Table VIII: 1

A Summary of Propositions and Findings

Proposition 1) The more allies, the more likely that a great power will become involved in inter-state war.

Finding: No support.

Proposition 2) The more non-great power allies, the more likely that a great power will become involved in inter-state war.

Finding: No support.

Proposition 3) Defense commitments deter. Non-defense commitments are more likely than defense commitments to lead to non-activist war.

Finding: Little support.

Proposition 4) Non-defense commitments to non-great powers are more likely than defense commitments to lead to non-activist war.

Finding: No support. On the contrary, a tendency towards non-defense alliances between great powers and activist war with non-great powers.

Proposition 5) A great power is more likely to become involved in war when its rate of economic growth is high rather low.

Finding: Weak support -- weak in the 19th century and weaker in the 20th century.

Proposition 6) Activist participation in interstate war is more likely than non-activist participation when a great power's rate of economic growth is high.

Finding: Supported -- strong in the 19th century and weaker in the 20th century.

Proposition 7) The association between activist participation in interstate war and high growth rates is stronger when the opponent is another great power and weaker when a great power attacks a non-great power.

Finding: Weak support.

Proposition 8) There is no association between economic growth in a great power and non-activist involvement in war with a non-great power.

Finding: Supported.

Proposition 9) Relationships between high rates of economic growth and participation in war vary with the long term phases of economic expansion and contraction.

Finding: No support with all great power interstate wars. Weak support with wars between great powers -- strong until the 1930s.

Proposition 10) Great power participation in interstate war depends upon a combination of alliance commitments and high rates of economic growth.

Finding: Reformulated on the basis of findings from tests of Propositions 4, 5, 6, and 7. Strong
association between the existence of a great power entente and activist war with a non-great power and short term economic growth for some great powers. Why particular great powers fought remains an open question.

Proposition 11) The predominant power is more likely to fight than are the less powerful.

Finding: No support.

Proposition 12) Increases rather than decreases in a great power's relative power position are more likely to lead to its involvement in war.

Finding: Modest support.

Proposition 13) Activist participation in war is more likely than non-activist involvement to follow an increase in a great power's relative power position.

Finding: Supported.

Proposition 14) The association between activist participation in war and increases in relative power position is stronger when a great power attacks another great power and weaker when the target is a non-great power.

Finding: Weak support.

Proposition 15) Therefore, there is no association between changes in relative power position and non-activist involvement in war with a non-great power.

Finding: Supported.

Proposition 16) Non-separated great powers fight each other when they approach parity in power position.

Finding: Moderate support. Great power parity increases the chances of war. Geo-political barriers tend to preserve peace. Some great power wars "predicted" did not occur and the participation of some great powers is not accounted for.
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