This paper starts from the premise that the phenomena we behavioral scientists wish to understand, to explain and to evaluate are historical. It responds to Immanuel Wallerstein's challenge that "using the heavily narrative accounts of most historical research seems not to lend itself ... to quantification .... It is a major tragedy of twentieth century social science that so large a proportion of social scientists, facing this dilemma, have thrown in the sponge." It accepts the thesis of Gallie, Ricoeur and others that "history is a species of the genus story." Real, deep understanding of such stories and of their component narrative structures requires knowledge of their possible trajectories and outcomes, i.e., the grammar of their plot possibilites. Hence all genuine, realistic explanations of politically interesting historical episodes must be based on prior, quasi-causal understandings of them and their possible alternatives (Wittgenstein: "Essence is expressed by grammar.")

It is toward the scientific construction of such explanatory, evaluative or emancipatory understandings of world histories, that this paper is directed. Since the scientific literature on story structure may be said to have had its first exemplary discoveries in the analysis of Russian fairy tales (Propp, 1928), we start there and continue through the cognitive science literature on story grammars to Berke's work on the structure of tragedies, and more recent work on philosophical hermeneutics. Given this preliminary, non-exhaustive, but highly suggestive set of qualitative historical narrative/measurement devices, we discuss theorists of world politics in terms of their presupposed, mythic narrative structures: Toynbee, Forrester, Wallerstein and others. To the extent that any one of these illustrations is persuasive, the reader/listener will have accepted the (Wittgensteinian) thesis that the social and behavioral sciences are essentially based on myth.

A fairy tale fulfills the role of a social utopia.

Roman Jakobson

But like any living thing, the tale can generate only forms that resemble itself. If any cell of a tale organism becomes a small tale within a larger one, it is built ... according to the same rules as any fairy tale.

V. Propp

Essence is expressed by grammar.

Ludwig Wittgenstein

Troubled times breed reflective thinkers. As inhabitants of such an era we join those from other ages, other disciplines and even other civilizations in the search for historical understanding. We try to make sense of the world we live in order to distinguish what we
can change and what we cannot. to illuminate the choices we may make, to inspire informed hope and counsel reasoned caution in our descendants, giving dignity to our own brief lives, our contemporaries and those before and after us.

As a teacher of an historically oriented, interdisciplinary course on theories of international relations, I am struck both by the centrality of these purposes in the literature I have recently assigned to me students, and the unsatisfactory nature of the interpretive accounts they provide. Among scholarly studies of our multi-faceted predicament written in the last decade or so, perhaps the most attention catching have been:

a) the global modeling studies evoked by the Club of Rome's amplification of debates occasioned by Jay Forrester's *World Dynamics*; and

b) the Annales style of modern world systems studies stimulated by Fernand Braudel's exemplary writings, starting with *La Méditerranée à l'Epoque de Philippe II*.

Forrester offers a neo-Malthusian picture of the contradictory possibilities of further world growth that both compliments and contradicts the neo-Marxian image of the contradictory development of capitalism out of feudalism (and presumably socialism out of capitalism) offered by Braudel and his followers. Writers following either exemplary study are now exploring Kondratieff cycles (or other structures of long duration) and dynamic mechanisms of capital accumulation, innovation and exhaustion to try and account for the present troubled times of the world economy.

I take it to be one of the reasons for the relative “success” of such studies is the extent to which the authors or their fellow workers have combined drama-like readability with an impression of historical and/or scientific trustworthiness and the quasi-metaphysical,
Almost inevitable grandeur to which seekers after total truths (including myself) are especially susceptible. Forrester's Systems Dynamics methodology provides highly explicit and precise deductive inferencing from hypothetical premises stated as nonlinear integral-differential process models. Unfortunately these often are not or can not be empirically tested against plausible alternatives using empirical data. Braudel's scientific style allusively combines extraordinarily rich, mostly narrative detail with necessarily fragmentary quantitative data on long term ecological and economic rhythms of Mediterranean life. Although the regulating hypothesis of economic determinism often serves Braudel and his followers as a productive positive research heuristic because such movements do often influence or condition the world of macropolitical events, the impacts of the Renaissance, the Reformation and the often associated major wars and dynastic unifications of the early modern period are not given sufficient autonomous credit.

Neither approach appears to leave much room for individual or group responses to the enormous moral, economic and political issues raised by their accounts. Men and women may indeed make history, as Marx said, constrained by the contexts and choices history allows them. How and why they actually do so in many different particular situations is not yet very clear in these accounts.

One is reminded of Arnold Toynbee's monumental A Study of History, which succeeded in capturing the imagination of many throughout the English-speaking world during the decades of the 1940s and the 1950s, characterized in 1956 by one of its critics as "undoubtedly the most widely known work of contemporary historical scholarship." Despite Toynbee's claims to be scientific, and the incredible gathering of evidence presented in his volumes, most critics seem to have found Toynbee's arguments lacking in logical consistency and vulnerable to contrary interpretations. His formula of "challenge and response" and his stages theory of civilizations may be too mythical, too vague adequately to explain or foretell civilizational advances and declines, but at least it suggested important possibilities for heroic forms of human choice.

Life is not a myth or a fairy tale with a guaranteed happy ending; neither is it an inevitable tragedy, one that encompasses all of Western civilization or the human species. Nor are most political or cultural leaders successfully heroic. Should one then refrain from attempting to give meaningful interpretations to world history? Or should one only try to refrain from being "ideological" in making such efforts, if it is indeed possible to do

5) Compare the somewhat similar treatment of the compulsive appeals of communist, democratic nationalist, and fascist "myths" in Chapters 2 and 11 of Harold D. Lasswell's pioneering World Politics and Personal Insecurity, originally published in 1934, reprinted in H.D. Lasswell, C.E. Merriam and T.V. Smith, A Study of Power, The Free Press, Glencoe, 1950. This book is also relevant to the highly dangerous myths about invincibility in total, including nuclear, war. Selected quotes include: "In a war crisis, the flight into action is preferable to treatments of insecurity; the flight into danger becomes an insecurity to end insecurity." (p.75) "The dash into... the war pattern offers supposed opportunities for the... release of the blocked aggressions. The war crisis proceeds by redefining the world in terms of impending dangers." (p.82f.)

so? Can we indeed refrain from mythical, poetic or moralistic and ideological elements in writing scientific histories of the challenges, the limits and the potentialities of our times?

Despite the obvious and lasting value of a certain degree of scholarly detachment, I believe that in the last analysis all social-scientific research paradigms or theoretical traditions do have mythopoetic or moral-ideological elements explicitly or implicitly embedded in their "models of men" and of what they, and women, can or should become. For example, Thucydides' classical "objective" study of the Peloponnesian War can convincingly be interpreted as a morality play in which vengeful gods or goddesses punish Athens for her moral hybris. Like all other great story tellers, Marxists and Malthusians also have their moral and poetic aspects, which are revealed in the ways they try scientifically or unscientifically to interpret consistently, intelligibly and didactically the historical facts they have uncovered.

If some such argument is accepted, then we may ask these questions another way: Is there some improvement possible in the way scientific historical accounts approach value questions, structural constraints and human choice possibilities that seem to give all great world histories the reflective character and dramatic force of a tragic morality play or the ironic happiness of a Russian fairy tale? Can our accounts of the significance of historical events somehow allow or even facilitate the evident ability of the greatest historical writers to catch our moral and political imaginations, and comment profoundly on the choices before us without losing our hard won professional commitment to falsifiable scientific theorizing?

Further reflection on the Braudel, Forrester or Toynbee examples suggests additional epistemological and methodological questions. As Immanuel Wallerstein—the leading American proponent of the Braudelian approach—has provocatively suggested of an important difference in scientific styles:

Using the heavily narrative accounts of most historical research seems not to lend itself...to quantification.... It is a major tragedy of twentieth-century social science that so large a proportion of social scientists, facing this dilemma, have thrown in the sponge.

I do not think quitting is the right response to Wallerstein's challenge, just as I do not find entirely adequate the endless repetition of the often telling criticisms of Forrester's succumbing to neo-Malthusian ideology and his avoidance of superior econometric stan-


8) These arguments are reviewed and supported in my "The Dialectical Logic of Thucydides' Melian Logic," paper presented at the 1980 meeting of the International Studies Association, Los Angeles.

9) In my terminology here I make reference to Imre Lakatos' impressive "rational reconstruction" of Kuhnian philosophy of science, *i.e.* his "sophisticated methodological falsificationism", as further developed and criticized in my "Logic, Dialectics and Politics," loc. cit.

dards and procedures (which his historical data, however, often cannot support). Nor do I think that "quantification" is the only mode of formalization necessary or appropriate for the logical and empirical rigor and tractability that mathematical representations have given to so many of the natural and social sciences. We must broaden and deepen the universe of scientifically relevant modeling approaches appropriate for the formal analysis of interpretive and theoretical world histories. Historical evidence, much of it textual, should not a priori be reduced to quantitative time series, or otherwise ignored.

In developing novel scientific approaches to the great social scientific quests: the causal explanation of social actions, the interpretive understanding of historical patterns or the emancipatory realization of a higher level of human self-fulfillment, I propose to rely on the more systematic, increasingly formalized but still humanistic, critical and largely qualitative accounts of narrative possibilities suggested by writers like Propp, Jakobson, Breymond, Burke, Campbell, Foucault, Frye, Lukacs, Prince, Ricoeur, Todorov, Schank and Abelson and other contemporary literary critics, cognitive scientists or text linguists.

Rather than argue the view, common among East European scholars, that Marxian theories can also be formalized in ways mathematically equivalent to Forrester's System Dynamics, my emergent proposal is that historical limits and possibilities are better understood in terms of such formal constructs as Schank-Abelson scripts, Lehnert-Ricoeur-White plot summarizations, or the context-sensitive, transformational story grammars of Prince, Todorov, Mandler and Johnson, Berke, etc.

These mathematical constructs have their origins in nineteenth century Biblical criticism — notably the hermeneutics of Von Hahn and Rank — and early structuralist accounts of Russian fairy tales — notably Propp's pioneering work, as well as recent work in logic, philosophy, mathematical linguistics and computer science. And since both qualitative and quantitative causal relationships may be expressed within them, they have the potential of least, of subsuming world modeling efforts within a less deterministic, more choice-oriented, possibilist mode of scientific understanding.

Of course, world history is not reducible to a few qualitative or quantitative essential formalisms. The extraordinary richness of grammatical possibilities within natural human languages denies the adequacy of any such over-simplified account of individual or collective human social actions. So does the rich variety of literary genres, both tragic

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11) Daniel Schneider has in preparation the only adequate bibliography of these subjects I know. A good start, however, is Robert de Beaugrande and Wolfgang Dressler, *Introduction to Text Linguistics*, Longman, London and New York, 1981. It should be added that the most technically sophisticated treatments of normatively relevant, sometimes script-based understanding come from speech act philosophers, social psychologists, experts in cross-cultural communication and computationally-oriented linguists; they are major constituent groups within the new research paradigm complexes of cognitive science and text linguistics. In this introductory review of some of their work, many complexities will not be given their due. Of course doing so is necessary if the scientific promise of these lines of inquiry for history, political science and international studies is to be fulfilled.


13) Also cited by Dundes (and many others), V. Propp's *Morphology of the Folktales*, originally appeared in Russian in 1928. The second edition revised is currently published by the University of Texas, Austin and London, 1977.
and comic, which world literature has given us in our search for context-transcending modes of personal significance.

Nevertheless, several related, relatively new, quasi-grammatical approaches to explanatory, interpretive and evaluative/emancipatory understanding appear promising. Story grammars are currently undergoing intensive investigation in text linguistics, cognitive psychology and artificial intelligence. Their quasi-grammatical constraints are being supplemented by a related set of pragmatically oriented narrative generation and summarization techniques. Because these focus squarely on the realm of human aspirations, intentions, actions and their causal constraints, and because they can encompass both qualitative and quantitative plot-like historical possibilities, my bet is that in the long run the new critical, cognitive and textual sciences will produce better, more open-ended, humanly relevant "world" models using such devices. Focusing on narrative scripts and their underlying plots and grammars not only helps reconstitute international relations within the dialectical-hermeneutic tradition as a reconstructive science of human possibilities, it also reasserts that concept of scientific international theory which grounds itself in practical striving towards world community.\(^{14}\)

I. From Fairy Tale Morphology to "Simple" Story Grammars Consistent with Affectively Relevant Plot Summaries

In his commentary "On Russian Fairy Tales"\(^{15}\) Roman Jakobson recounts various efforts since Pushkin to uncover the essence of Russian prose in the role structures and functional sequences of classic fairy tales. He recounts Propp's "arresting conclusion" that despite an enormous variety of tale plots, "all fairy tales are uniform in their structure." Because Propp's argument prefigures contemporary formal accounts of the components of interpretive scripts and story grammars, let me briefly review the basis for this conclusion, quoting both from Jakobson's essay and from Propp's original monograph.

As seems intuitively plausible, Propp detects seven fundamental dramatis personae in Russian fairy tales, with corresponding spheres of action. These main actor types or roles are: hero, villain, donor (of magical devices), helper (also assisting the hero), princess with her father, dispatcher (of the hero) and false hero (who typically falsely claims the rewards intended for the true hero). Propp's thesis of the unity of all Russian fairy tales is a structural-functional claim, argued in terms of 31 functions of the 7 classes of dramatis personae.

By "function" Propp means "the deed defined from the viewpoint of its signification for the plot." Table 1, a summary of Chapter 3 of V. Propp's *Morphology of the Folktale*, lists what these functions of the dramatis personae might be. Both the function numbers and symbols are his, although at points I have recast or paraphrased his summary descriptions.

Propp's thesis is derived from and tested against Afanas'ev's classic collection of Russian folktales, which was first published in 1855-1864, and has gone through many

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14) For Karl Deutsch's seminal contributions to this alternative to the realist tradition, see Richard Merritt and Bruce M. Russett (eds.), *From National Development to Global Community*. Allen and Unwin, London, 1981, especially the chapter by Arendt Lijphart. By way of productive contrast, see also Johann Galtung, *The True Worlds*, op. cit.

Table 1
Propp's Fairy Tale Frame

<table>
<thead>
<tr>
<th>α</th>
<th>INITIAL SITUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. β</td>
<td>ABSENTEEATION Family member absents himself.</td>
</tr>
<tr>
<td>II. γ</td>
<td>INTERDICTION An interdiction (suggestion) to hero is made or ordered.</td>
</tr>
<tr>
<td>III. δ</td>
<td>VIOLATION Hero violates interdiction. Villain enters.</td>
</tr>
<tr>
<td>IV. ε</td>
<td>RECONNAISSANCE Villain attempts reconnaissance. (Or hero does.)</td>
</tr>
<tr>
<td>V. ζ</td>
<td>DELIVERY Information about victim delivered to villain</td>
</tr>
<tr>
<td>VI. η</td>
<td>TRICKERY Villain attempts deception of victim to possess him/his belongings.</td>
</tr>
<tr>
<td>VII. θ</td>
<td>COMPLICITY Victim submits to deception. Unwittingly helps enemy including preliminary misfortune.</td>
</tr>
<tr>
<td>VIII. A</td>
<td>VILLAINY Villain causes harm, injury to a family member.</td>
</tr>
<tr>
<td>VIIIa. a</td>
<td>LACK A family member either lacks or desires something.</td>
</tr>
<tr>
<td>IX. B</td>
<td>MEDIATION, CONNECTIVE INCIDENT Misfortune or lack (for victim hero) made known to seeker and others. The latter is approached with request or command. He is allowed to go or is dispatched.</td>
</tr>
<tr>
<td>X. C</td>
<td>BEGINNING COUNTERACTION Seeker/hero agrees to, decides on counteraction.</td>
</tr>
<tr>
<td>XI. †</td>
<td>DEPARTURE Hero leaves home. Optional. Provider, donor appears.</td>
</tr>
<tr>
<td>XII. D</td>
<td>DONOR'S FIRST FUNCTION Hero is tested.</td>
</tr>
<tr>
<td>XIII. E</td>
<td>HERO'S REACTION to the actions of the donor (maybe positive, maybe negative).</td>
</tr>
<tr>
<td>XIV. F</td>
<td>PROVISIONAL RECEIPT OF MAGICAL AGENT Hero acquires its use.</td>
</tr>
<tr>
<td>XV. G</td>
<td>GUIDANCE Spatial transference of hero to whereabouts of an object of search.</td>
</tr>
<tr>
<td>XVI. H</td>
<td>STRUGGLE Hero and villain join in direct combat.</td>
</tr>
<tr>
<td>XVII. J</td>
<td>BRANDING Hero branded, often in and/or before battle by princess.</td>
</tr>
<tr>
<td>XVIII.</td>
<td>VICTORY Villain is defeated.</td>
</tr>
<tr>
<td>XIX. K</td>
<td>LIQUIDATION* Peak of narrative. Initial misfortune, lack is liquidated.</td>
</tr>
<tr>
<td>XX. ‡</td>
<td>RETURN Hero returns.</td>
</tr>
<tr>
<td>XXI. Pr</td>
<td>PURSUIT Hero is pursued.</td>
</tr>
<tr>
<td>XXII. Rs</td>
<td>RESCUE Hero rescued from pursuit.</td>
</tr>
<tr>
<td>XXIII. O</td>
<td>UNRECOGNIZED ARRIVAL of hero either at home or in another country.</td>
</tr>
<tr>
<td>XXIV. L</td>
<td>UNFOUNDED CLAIMS BY FALSE HEROES* Hero at home.</td>
</tr>
<tr>
<td>XXV. M</td>
<td>DIFFICULT TASK This is proposed to false or true hero.</td>
</tr>
<tr>
<td>XXVI. N</td>
<td>SOLUTION The task is resolved: preliminary solution may occur.</td>
</tr>
<tr>
<td>XXVII. Q</td>
<td>RECOGNITION Hero is recognized, often by use of branding (XVII).</td>
</tr>
<tr>
<td>XXVIII. Fx</td>
<td>EXPOSURE False hero or villain is exposed.</td>
</tr>
<tr>
<td>XXIX. T</td>
<td>TRANSFIGURATION Hero is giving new appearance or possessions.</td>
</tr>
<tr>
<td>XXX. U</td>
<td>PUNISHMENT Villain (of 2nd move or false hero) is punished.</td>
</tr>
<tr>
<td></td>
<td>Villain (move 1) punished only if no battle or pursuit.</td>
</tr>
<tr>
<td>XXXI. W</td>
<td>WEDDING Hero is married and/or ascends the throne, etc. rewards.</td>
</tr>
</tbody>
</table>

* My label. Propp uses * and numerical sub/superscripts to further differentiate his action/function types.

ditions in several languages[16]. “The action of all tales included in our material develops within the limits of these [thirty-one] functions.”[17] The functions are said not to exclude

16) Ibid. Unfortunately, the Pantheon edition does not give numbers corresponding to those cited by even the second revised edition of Propp’s study.
17) Propp, op. cit., p. 84ff, p. 105f, p. 126ff. The same source is used for the quotations in the next several paragraphs.
each other, but to develop out of each other “with logical and artistic necessity.” The exhaustive, ordered set of functions in the Table offers a scheme (or, in more contemporary terms, a script or frame) that is “a measuring unit for individual tales.”

One of the simplest examples of such an assessment is of tale number 131 in the sixth Russian language Afanas'ev edition. It also illustrates the kidnapping of a princess by a dragon, which is for Propp a very basic fairy tale. I reproduce here Propp's qualitative measurement, or coding, of the functionally abbreviated text of this tale, as well as his summary formula (1) for it:

A tsar, three daughters (α). The daughters go walking (β^α). Overstay in the garden (δ^α). A dragon kidnaps them (A'). A call for aid (B'). Quest of three heroes (C ↑). Three battles with the dragon (H' - P'), rescue of the maidens (K^4). Return (↓), reward (W°).

\[
\text{β}^α \delta^α A' B' C ↑ H' - I' K^4 ↓ W°
\]  

(1)

The formula consists of a certain number of Greek letters, indicating elements of the preparatory section of the tale, followed by one pass, or move, through the H — I “struggle, then victory” theme. One might want to have a triple repeat of this H — I thematic, but at least Propp considers this a single move tale. The subscripts and superscripts refer to more specific versions of the general functions in Table 1. Thus A' is a particular kind of villainy — the kidnapping of a person — while H' refers to a fight in an open field, rather than a game of cards, etc., and the final W° indicates a monetary or other material gain rather than the full “wedding and accession to the throne,” which would not be possible for a king with three daughters!

Propp tabulates schematizations like (1) above for 46 such stories, many of them with several moves; he also discusses many other stories and challenges his readers to apply his approach to the remaining tales in Afanas'ev’s collection. After his discussion of the preparatory sections, Propp uses a “variable scheme,” formula (2), to reduce all of his analyzed tales to a single structure:

\[
\text{A BEC ↑ DEF G H } \downarrow \text{ JIK Pr — Ps° L } \downarrow \text{ LMJNK Pr — Rs } \text{ QEX TU W*}
\]  

(2)

This formula makes clear that there are two distinctive move classes: those containing a H — I “struggle, then victory” theme or those with a M — N “solution of a difficult task” movement. After preparatory discussions, stories may have zero, one or more moves of each of these types. The simple tsar with three daughters story above, summarized in formula (1), clearly fits within the possibilities of formula (2). Rarely, however, are all or even most of the 31 functional elements present; in his Appendices, Propp also introduces symbols for “leave-taking at a road marker,” transmissions of a signaling device, motivations, positive and negative results of functions, connectives (which can be triply repeated), inessential (non-functional) and unclear or alien forms.

For comparative purposes, we include here two more recent alternative structural accounts of virtually the same story, this time called the King Story and told to contemporary American children as part of a cognitive psychological studies of story structure and recall. The first will be Mandler and Johnson’s “story grammar” approach to identifying
particular story structures and the larger classes of possible stories to which they belong. The second will be Wendy Lehnert's affective plot unit analysis and synthesis of the King story's plot structure.

Table 2 should first be read to see the textual similarity just referred to, as well as its translations, elaborations and contractions. The text associated with formula (1) above does not give details about why the daughters overstayed their walk in the woods, nor how the heroes heard of the daughters' plight.

Associated with the King story of Table 2 we have given in Figure 1 Mandler and Johnson's "grammatical" reconstruction of that story. Immediately associated with each of these elements is a "state" or an "event" node. If they are considered to be "external," states refer to a current condition of the world; internal states indicate emotions or other states of the mind. "External events include actions of characters and changes of state in the world. Internal events, or happenings, include "thoughts and plans, perceptions, and such peculiar phenomena as

Fig. 1  The underlying structure of the King story. Underlying nodes which have been deleted from the surface structure are enclosed in brackets. Violations of canonical structure are enclosed in boxes.

Although they have not further distinguished events and states in their article, Mandler and Johnson do call attention to a kind of event they call an "appraisal," rather like Propp's noticing that the transmissions of a signalling device should be formalized in a particular way.

Moving further into the body of the story tree, we come to what are called non-terminal nodes in such a structure. These must be elaborated upon before terminal events or states, corresponding to observable textual elements, can be accounted for. To understand how these are constructed, it may be simpler to start from the base of the tree, the most general, abstract or "deepest" level of nodal structure. This shift in perspective amounts to thinking about how the fairy tale was generated, or recalled, as a way of understanding its deeper meaning and structure. The first branching of the tree in Figure 1 distinguishes an initial setting of the scene (corresponding to Propp's preparatory section, functionally described with the Greek letters of Table 1) from the body of the tale, called its event structure.

Once the setting, or preparatory aspect of a story is defined, how does it develop, what are the allowable possibilities from which the observed one is realized? Here is where some of the most amazing claims are made by Propp. Both his main story lines in formula 2 develop from villainy or lackings of some kind; either the villain must be overcome or the lack resolved through the completion of some difficult tasks; in multi-move stories both types of resolution are often required. Discussing the ways in which different themes or variants of themes may be selectively composed out of the 31 functional elements, their substitution instances and move sequences, Propp argues that it would be "possible to artificially create new plots of an unlimited number." Moreover, "were we able to unfold the picture of transformations" in themes and their variants, one could show "that all of the given tales can be morphologically deduced from the tales about the kidnapping of a princess by a dragon..." Propp recognizes that this incredible creativity, or generativity, of the fairy tale teller is subject to important dependencies or constraints: 1) the over-all sequence of functions governing move development; 2) story subjects or objects chosen for a particular function may limit substitution possibilities for other story elements, absolutely or relatively; 3) not all personages have attributes appropriate for particular functions; 4) a "certain dependence exists between the initial situation and the functions which follow it." As he puts it earlier:

But like any living thing, the tale can generate only forms that resemble itself. If any cell of a tale organism becomes a small tale within a larger one, it is built... according to the same rules as any fairy tale.

Propp's profoundly Leibnizian vision of the monad-like reproduction of tales within tales suggests that the essence of a tale is something like the genetic structures of formulas.

19) Mandler and Johnson, op. cit., p. 115.
20) Propp, op. cit., p. 111. The next quote is from p. 114.
21) Ibid., p. 112.
22) Ibid., p. 78.
1 or 2\textsuperscript{23}. But he admits that he is not yet able to specify how the generative transformations, or rewrites, take place.

Fortunate to be working in a later era when the mathematics of Chomskean transformational rewrite rules is well established, Mandler and Johnson give us some concrete theoretical proposals about what Propp called the "logical and artistic necessity" developmentally connecting setting and event structure with "terminal" nodes or story elements. Looking at the figure again, we see that they break down the body of the single move King story into three episodes. The first corresponds to the preparatory $\beta^0\delta^1$ sequence of formula (1). The second, comprising events 7 through 15, corresponds to the $A^1$, $B^1$, $C^+$, $H^1-I^1$ and $K^4$ sequence at the heart of the story's single "move". Events 16 through 18 correspond to the "return and reward" functions in Propp's characterization. These macro story parts are combined by separately coded AND and THEN connectives, indicated by circled A's and T's respectively.

Roughly, the three episodes give a beginning, a middle and an end to the King story, although the corresponding grammatical rule in Table 3 below sets no limit on the number of episodes possible within a story's event structure. A repetition of this triadic structural pattern occurs in the "beginning causes development causes ending" rule for rewriting episode elements whenever they occur in the elaboration of a story's event structure. Graphically symbolized by a circled C, the causal connective used by Mandler and Johnson to bind episode elements together translates the notion of a prior node providing a "sufficient reason" for the subsequent node to occur. It represents their attempt, probably not the final one, formally to identify just what makes up and distinguishes simple (and certain more complex) stories from other kinds of more open-ended narrative texts.

Since it provides a "story grammar" for our exemplary fairy tale, Table 3 suggests, but does not yet fill out, this section's advertised transition from morphological basic scripts to "simple" story grammars. Several sets of comments are in order. Looking more carefully at the rewrite rules in the table, first note that although the universe of concern, simple stories or "fables," does not exactly correspond with Russian fairy tales, both types of story appear to have "morals" embedded in them. Secondly, getting down a "goal path" appears, at a higher level of abstraction, to be what Propp's H-I and M-N moves have in common; thus it appears that the rules in Table 3 could be used to predict at least the formal sequence of states or events envisioned by Propp's formulæ 1 and 2! Thirdly, the use of either/or type paths, symbolized in the figure by braces enveloping several exclusive alternatives, is also common to this and Propp's formalism. Fourthly, the AND, THEN and CAUSE connectives, amplified by the use of parentheses repeated $n$ times, gives a richer version of Propp's connective ideas. Fifthly, their use of boxed nodes to show exactly where elements predicted by the grammar do not appear gives greater precision to Propp's concern with unclear or alien forms (which he symbolized with the letter X); it also puts this kind of generative and interpretive modeling squarely within the "falsifiable theorizing" tradition of scientific analysis. Sixthly, the infinite variety of possible instantiations of this grammar is associated with a set of rewrite rules that allow events, states and episodes to reoccur, theoretically without limit, within themselves: here we

\textsuperscript{23} On the role of this Leibnizian perspective in communitarian theory, see my "From Political Cybernetics to Global Modeling," in Merritt and Russett (eds.), op. cit.
Table 3

Summary of Rewrite Rules for a Simple Story Grammar*

<table>
<thead>
<tr>
<th>Rule</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FABLE → STORY AND MORAL</td>
<td></td>
</tr>
<tr>
<td>STORY → SETTING AND EVENT STRUCTURE</td>
<td></td>
</tr>
<tr>
<td>SETTING →</td>
<td>STATE* (AND EVENT*)</td>
</tr>
<tr>
<td>STATE* → STATE (AND STATE)*</td>
<td>AND EVENT* . EVENT (THEN EVENT*) (AND STATE)*</td>
</tr>
<tr>
<td>EVENT STRUCTURE → EPISODE (THEN EPISODE)*</td>
<td></td>
</tr>
<tr>
<td>EPISODE → BEGINNING CAUSE DEVELOPMENT CAUSE ENDING</td>
<td></td>
</tr>
<tr>
<td>BEGINNING →</td>
<td>EVENT*</td>
</tr>
<tr>
<td>DEVELOPMENT →</td>
<td>SIMPLE REACTION CAUSE ACTION</td>
</tr>
<tr>
<td>SIMPLE REACTION → INTERNAL EVENT</td>
<td>(CAUSE INTERNAL EVENT)*</td>
</tr>
<tr>
<td>ACTION → EVENT</td>
<td></td>
</tr>
<tr>
<td>COMPLEX REACTION → SIMPLE REACTION CAUSE GOAL</td>
<td></td>
</tr>
<tr>
<td>GOAL → INTERNAL STATE</td>
<td></td>
</tr>
<tr>
<td>GOAL PATH →</td>
<td>ATTEMPT CAUSE OUTCOME</td>
</tr>
<tr>
<td>ATTEMPT → EVENT*</td>
<td></td>
</tr>
<tr>
<td>OUTCOME →</td>
<td>EVENT*</td>
</tr>
<tr>
<td>ENDING →</td>
<td>EMPHASIS</td>
</tr>
<tr>
<td>EMPHASIS → STATE</td>
<td></td>
</tr>
</tbody>
</table>

* See text for definitions of STATE and EVENT and for the connections AND, THEN, and CAUSE.


have a more adequate formal way, through the use of what are called recursive or self-calling logical functions, of generating an infinite variety of thematic variations, as well as tales within tales within tales... as Propp had desired.

A second set of comments concern the adequacy of the Mandler-Johnson proposal in particular, and the more general idea of story grammars. Despite the greater technical sophistication of the Mandler-Johnson approach, it clearly is only an intermediate step in an ongoing field of contemporary research. Beyond the need to better understand the ways in which story functions or grammatical elements might be meaningfully surpressed, there is the need to discover the deeper meanings affecting the moral force of such stories. Thus the grammar seems better at conveying text composition syntax than the semantic or pragmatic "dependencies" among story elements that Propp noted. Intuitively speaking, somehow the next-to-terminal elements in the story tree of Figure 1 do not have much
of the richness of a similar translation of formula 1, even using the restricted set of labels in Table 1. As Mandler and Johnson have elsewhere argued\textsuperscript{24}, the meaning and use of particular terminal story elements is context-sensitive; technically, then, more adequate rewrite rules for generating (or interpreting) surface texts in terms of more basic deep semantic structures should also take such interdependencies into account. Just as Propp tried to introduce motivations and positive or negative function results, one is tempted to recast their way of summarizing story structure in the Schank-Abelson "conceptual dependency" tradition along lines developed either by Meehan or Lehnert\textsuperscript{25}. After all, motivationally appealing deep semantic structures are what move men and women interpretively to constitute or reconstitute the political realm.

Coming from an interest in narrative summarization, Wendy Lehnert has developed affective plot unit analysis and synthesis procedures partly as a reaction to the psychological inadequacies of story grammars like those proposed by Mandler and Johnson.\textsuperscript{26} Her concern has been access higher levels of affectively charged and central concepts that are somehow composed into the plot summaries we are readily able to recall, and from which story tellers can regenerate elaborated story forms as well. Indeed some evidence\textsuperscript{27} suggests that such representations of story structure are more readily remembered than the deepest, but rather abstract nodal structures typical of story grammar representations like the one in Figure 1. Because her plot unit methodology is highly suggestive of qualitative ways of formally analyzing certain basic concepts in political texts, and because it should be possible some day to combine valid elements of the story grammar approach with plot unit analyses, I shall briefly summarize and illustrate it here.

Recall that Mandler and Johnson distinguished external and internal states. Similarly, Lehnert starts from a gross taxonomy of external events positively or negatively evaluated by a particular actor (symbolized + or - respectively), and distinguishes all of these from internal mental states (symbolized by M's) which can be goals, perceptions or other cognitions. She exhaustively defines a set of atomic or primitive plot units on the basis of five types of links among these events and states: motivation (m), actualization (a), termination (t), equivalence (e) and affective or communicative causality between two characters, symbolized by diagonally slanted dashes. Table 4 lists the twenty primitive plot units that may be defined in her system using these elementary components.


Table 4
Primitive Plot Units

A. Monadic

\[
\begin{align*}
&\text{SUCCESS} & \text{FAILURE} & \text{PROBLEM} & \text{ACTIVATION} & \text{MOTIVATION} \\
&M_a & -M_a & M_m & +M_m & M_m \\
&+ & - & - & + & + \\
&\text{PERSEVERANCE} & \text{MIXED BLESSING} & \text{HIDDEN BLESSING} & \text{COMPLEX NEGATIVE} & \text{COMPLEX POSITIVE} \\
&M_e & +e & -e & -e & +e \\
&- & + & - & - & + \\
&\text{RESOLUTION} & \text{LOSS} & \text{POSITIVE TRADEOFF} & \text{NEGATIVE TRADEOFF} & \text{CHANGE OF MIND} \\
&t & t & +t & -t & t \\
&- & + & - & + & - \\
\end{align*}
\]

B. Dyadic

\[
\begin{align*}
&\text{NEGATIVE REACTION} & \text{POSITIVE REACTION} & \text{EXTERNAL PROBLEM} & \text{EXTERNAL ENABLEMENT} & \text{EXTERNAL MOTIVATION} \\
&? & ? & -M & +M & M \\
&- & + & - & + & - \\
\end{align*}
\]

Source: Lehnert, Alker, Schneider, 1983.

According to a number of reasonable coding conventions, Lehnert is able to code the affective structure of simple stories with moderate reliability. Figure 2 illustrates what one of these looks like, the King story again. Notice immediately that actors are not treated as abstract role types (which for Propp may have several, changing incumbants); rather those actors or classes of actors (such as the three daughters and the three heroes) are distinguished only when their action patterns are different. Notice also that only one arrow of each type may go into an M or + or − state, and that each such event or state is separately identified and associated with a textual summary of its significance.

Figure 2 illustratively completes the analysis of affective relationships in its story; it only hints at the synthetic, computer-assisted summary interpretations that Lehnert's procedures suggest. To appreciate these synthetic possibilities, one needs to define more complex sets of molecular plot units on the basis of the primitive ones in Figure 2. Our own subsequent analysis is based on a set of 47 of these, on the basis of which 40 nonprimitive plot units were found in Figure 2, 15 of which were unsubsumed by any others, hence considered top level units. Others, with different interpretive perspectives could define their own more complex meaning units (as well as giving the primitive plot units in
Table 4 different names). What Lehnert's computer programs do is to uncover all such pre-defined plot units in the affect state graph, find the "top-level" plot units in such a complex interpretive structure, represent them and their interconnections, and discover which units are most connected to others, the structure of narrative centrality and cohesion, etc.

Two results of such computations are given in the figure, from which we may derive a third. The most highly connected top level plot unit is the heroes' sequential subgoals of rescuing the king's daughters, while the most pivotal top level plot unit is the heroes nested subgoal structure for doing so, where pivotal plot units are those whose omission would disconnect a sizeable body of top plot units. Connecting up such central or pivotal units suggests plot summaries very much like those human subjects actually recall. In the present case, the top level plot units most closely connected the maximal and pivotal units start with a COMPETITION between the heroes and the dragon, followed by the overlapping, SEQUENTIAL and NESTED SUBGOALS just referred to, concluding with the heroes' ENABLED SUCCESS and their subsequent REWARD by the king. The closeness of approximation of this sequence, highlighted as formula 3, to the semantic content of Propp's original functional frame (in Table 1) is highly gratifying!
Finally, granting that the above illustrations make plausible the possibility of constructing partial world history grammars that look something like story grammars built around semantically and motivationally suggestive plot units, one is entitled to know what thoughts scholars like Propp, Jakobson, Mandler and Johnson or Lehnert say about why their relatively simple formulae, graphs or grammars work so well. What really is going on?

Briefly put, one could argue that simple tales are such a pervasive part of many different cultures because they are especially meaningful, and structured so as to be especially easy to remember. Table 1, as well as formulae (2) and (3) and Figures 1 and 2 show different versions of the extremely simple and memorable structures involved. Such structures were probably necessary for such tales to survive and be transmitted by an oral story-telling culture.

But that still leaves the issue open as to why? the tales have been such a pervasive feature of even highly literate cultures. With an implicit link to Jung-like discussions of unconsciously grounded archetypes, Propp makes the suggestion that “the basic, vivid moments of our essentially very simple scheme also play the psychological role of a kind of root.” But he also recognizes that the majority of the Russian fairy tale’s elements — “miraculous births, interdictions, rewarding with magical elements, flight and pursuit, etc” — “are traceable to one or another archaic cultural, religious, daily, or other reality” which must be used contextually for the fuller, comparative understanding of the significance of a particular tale.

Jacobson goes further. Citing authorities on both sides of the Russian Revolution, he argues that “A fairy tale fulfills the role of a social utopia.” Thus Lenin is quoted as saying “he could write from this material beautiful studies about the hopes and longings of our people.” Under this influential materialist reading, one might treat Propp’s schema as utopian grammatical essences. And Jakobson recalls Trubetzkoy’s comments on Afanas’ev’s collection of tales as attempts to delineate heaven or Paradise, another realm, “a better place” with “easy bread.” “In pursuit of this aim the good fellow has to master a ‘cunning science’, or, maybe, simply to ‘follow his eyes.’”

28) Propp, op. cit., pp. 112-115 for this and the remaining quotations of this paragraph.
29) Jakobson, op. cit., p. 650f for each quotation in this paragraph.
30) In a chapter on “Holism and Internal Relations,” Nicholas F. Gier argues (p. 89) that “Wittgenstein believes that all necessity is ‘grammatical’ and is not tied to formal logic.” Unlike logical proportions, grammatical propositions are always synthetic a priori. He then goes on, frontispiece to next chapter, p. 91. to provide quotes that convey much of the Leibniz-Propp-Jakobson perspective of the present paper:
   “So in philosophy all that is not gas is grammar.”
   “Essence is expressed by grammar.”
   “Philosophy as the custodian of grammar can in fact grasp the essence of the world, only not in the propositions of language, but in the rules for this language which exclude nonsensical combinations of signs.”

Jakobson tells of efforts after the Soviet revolution to collect new and authenticate old fairy tales on the basis of peasant judgments. This methodology is justified by the argument that the folk tale is typically collectively owned. "The socialized sections of the mental culture... are subject to much stricter and more uniform laws than fields in which individual creation prevails." If collective cultural products are structured according to discoverable grammatical laws, can the various "meanings" attributed to world histories by Toynbee-like communitarians, neo-Marxians, neo-Malthusians (or modern liberals) be far beyond?

II. Tragedies and Comedies About the Weak and the Strong

What gives Forrester's neo-Malthusian mathematics, Marxist world histories or Toynbee's vision of civilization development and decay their dramatic character, the grandeur of heroic quests that succeed or fail with quasi-metaphysical inevitability or necessity? Can we somehow partake scientifically of the tragic or comic force of great histories while still leaving open constrained possibilities that the world we make will really be different because of what we have done, might do, or somehow failed to do? Is there a contextually sensitive, yet possibilist science of ecological, historical, political development? Can it apply to ordinary people, both the weak and the strong, not just the heroic, the magical and the mythical?

The implication of Propp's, Jakobson's and Wittgenstein's views cited above is that "necessity" and "dramatic force" come from something like story grammars, grammatical internal relations that constitute the identities of the actors, sentences, stories, dramas or histories they help generate. Fairy tales following the scheme of formula (2) somehow must have happy endings; tragedies too convey a haunting inevitability of failure despite the valiant efforts of their protagonists to avoid such tragic endings. Somehow, motivationally, comedies make us happy, restore our faith in life, while tragedies provide also a kind of emotional purging or catharsis, the need for which should be better understood.

What then is the "formula" or scheme that seems to underly valiantly resisted, but somehow "inevitable" tragic failure? Is there a similar mythic or poetic deep structure engendering the expectation of success? Why do such formulae move us so?

Since mathematical deduction also carries with it an air of inevitability (at least for those who feel the premises in use are secure and that standard deductive logic is the only appropriate mode of valid inference), we might look to systematic and formal theories of poetic genres (which include romances and epics as well as comedies and tragedies) for answers.

Northrop Frye has made a strong case for distinguishing comic from tragic plots on the communitarian basis of whether "the hero becomes isolated from his society" (a tragedy) or "he is incorporated into it" (a comedy). Thus comedies, like fairy tales, have

socially happy endings, tragedies sad ones. Bradley Berke gives a more active version of the same distinction, which will help answer the above questions:

The tragic thinker "stages" the destruction of the social order in the imaginary realm of myth. We shall call this destruction of the social order by the individual 'self-annihilation'... Whereas the 'Hero' represents the active, antisocial aspect of the mythical self-annihilator, the other actants represent, jointly, the passive social aspects of this imaginary figure.34

Citing many of Chomsky's early writings on transformational grammars, as well as Todorov's book-length grammatical treatment of Boccacio's Decameron, Berke shows how the tragic structure of many of Sophocles, Racine's and Shakespeare's dramas can be understood as the "inevitable" or necessary consequence of a large, possibly infinite variety of possible rewrites of the same basic tragic formula, given in Figure 3. The core idea is volitionally or actively induced self-destruction: a typically mythical self-annihilator (MSA) annihilates (A) him/herself with an instrument of self-destruction (ISA). Figure 3 suggests that this act of self-destruction involves society as well—for Berke, Propp plus Mandler and Johnson, the self is an abstract role, an actant, not just a particular individual. Berke redefines his MSA as made up of a desirer (D), its desired object (DO), and a legitimate authority (LA) regulating access to the desired object. Internal Id, Ego and Superego components of the same individual's personality are also suggested by this

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34 Bradley Berke, Tragic Thought and the Grammar of Tragic Myth, Indiana University Press, Bloomington, 1982. Berke's most general remarks on tragic thought, which I shall refer to on several occasions, occur in his first chapter, "Tragic Thought." The quotation reproduced above is from page 9.
rewrite of the direct object in the basic tragic plot sentence.

Before commenting on the various world histories we have discussed, let us illustrate Berke's "tragic story grammar" approach with one of his most elaborated examples, the major (but not the only) plot of Shakespeare's *Romeo and Juliet*. Actually, this play also includes comic elements (Romeo does marry his love, but only for one night) which are tragically overwhelmed by their adolescent impetuosity and the intense hostility of Montagu-Capulet Verona.

As possible sources for the tremendous identity we feel with these beautiful, heroic, but star-crossed lovers, one might suggest our own adolescent experiences along the same self-destructive lines, or our identification with an age of great tragic output and self-awareness, such as fourth century Athens or the early modern era, when an old ruling order (or aristocratic class) has lost its power inevitably to bring happiness to us. Less exalted, but pervasive self-defeating tendencies are familiar to us all. Existentially, Berke views tragedy's cathartic power as due to its promise of release from such traumas, of Nirvana, of peace and death. The basic mythical and poetic forms of comedy and tragedy, of heroic epic and endearing romance, clearly appeal to deep levels of our conscious and unconscious experience.

The identifications in Figure 3 may be used, and should be reviewed, before trying to make sense of the abbreviated summary of Berke's reconstructive analysis in Figure 4. Looking at this figure, it may best be understood as a partially explicit portrayal of the grammatically permitted transformations which turn the basic tragic plot sentence at the top into the four key instances of self-annihilation at the bottom (S1, S7, S9, S12), which together provide an important plot summary of *Romeo and Juliet*. Each of the five rows in the table represents a stage in this process; the numbered R's, associated with the corresponding rewrite arrows when they are not too complicated to draw, refer to explicit grammatical rewrite rules given in Berke's text (his Chapter 3, fifty pages long). As in the Mandler and Johnson story grammar of Table 3, these rewrite rules are possibilistic, not deterministic; grammatical theory puts constraints of possible instantiations, but does not pre-determine them.

Not to get lost in the details, some of which are suggested by the content and notation of these two figures, the main thrust of the rewrite rules involved is to elaborate the basic tragic plot sentence into a twelve sentence long basic plot type (at the middle of Figure 4), and then to delete and complete these sentence forms to give the concrete particulars of self-annihilation characterizing a particular plot. In his text, Berke spends approximately 9 pages elaborating 27 possible variants of the 12 sentence plot types, all generated by different possible variants of the subject and object actants in the basic plot sentence. Near the bottom of the figure, possible completions are suggested involving large numbers.

35) Berke's analysis of *Romeo and Juliet* is centered around the technical analysis summarized my Figures 3 and 4 below, derived from his pp. 66-73. Tzvetan Todorov, *Grammaire du Decameron*, Mouton, the Hague, 1969, is obviously one of Berke's exemplars. Todorov's earlier work cites Propp, Greimas, Breymond and J.Harris (a transformational grammanian and teacher of Chomsky) as relevant studies earlier than his own. The most thorough review and extension of this post-Propp, largely French literature is probably still Claude Breymond, *Logique du Récit*, Editions du Seuil, Paris, 1973.

36) Berke's reference to Nirvana occurs on p. 14f.
Fig. 4 Aspects of a Romeo and Juliet Plot Generated by Berke's Tragic Grammar

Key: See Figure 3 for initial identifications. Dashes (−) concatenate elements of sentence forms; ampersands (&) concatenate whole forms. Primes indicate functional partners. Boxed symbols are rewritten according to grammar rules indicated by Rs next to arrows. Dotted lines indicate omitted transformational details. S1 & S7 & S9 & S12 is Berke's final plot summary.

of deletions as well as specific proper names for subjects and objects and one or more concrete variants of annihilation ("banishing" or "disturbing" are formally as good as "killing") and of instruments therefor (e.g., a sword or dagger or knife, poison, grief).

At this point we should note that story grammars often downplay realistic or sensible constraints of a semantic or pragmatic character. Clearly someone can not banish someone with grief or poison them with a non-dipped dagger; and the relevant actor needs to be enabled or capable of undertaking the chosen annihilating act. The relevant repertoires must be there, possibly having been suggested by one's surroundings; situational constraints should not be overpowering. The same kinds of problems might have been raised concerning both the Propp and Mandler-Johnson examples. True action possibilities in life, like in drama, can only be appreciated adequately when the context of conditions surrounding them is well understood. If the motivating power of poetic forms comes in part from their ability to appeal to our deeper selves, abstracted from our everyday contexts, the scientific promise of those forms must be realized through these contexts.

Can historical, non-mythical self-annihilators be the actants of Berke's formulae? Can poetic forms, with their many unrealistic features, apply to everyday life? Here again, Northrop Frye has a very helpful typology that both distinguishes and related literary forms to ordinary people. Recall his distinction between the tragic and the comic in terms of the hero's separation from or integration into society. Add to this a five fold distinction in terms of whether the hero's power of action is greater than ours, less, or roughly the same37. Frye's ten types of comedy and tragedy (with subvariants and illustrations) are given in Table 5:

These categories are immensely suggestive. To see our reality as mostly of the "low mimetic mode" corresponds in a way to the recent rise in literary works about ordinary, middle class people, who may be no weaker or stronger than ourselves. Like the rise to maturity of each individual, the stages of our civilization have been increasingly democratic, but not exclusively identified with the lower literary modes in this array. Eras of

<table>
<thead>
<tr>
<th>hero's power vis a vis ours</th>
<th>tragic fictional mode</th>
<th>comic fictional mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>superior in kind to others and their environments, e.g. divine</td>
<td>myths, death of Dionysias</td>
<td>mythical comedy of assumption or salvation, Christ or Apollo</td>
</tr>
<tr>
<td>superior in degree to these</td>
<td>romance, legends, folk tales</td>
<td>romantic comedy, as in elegiac, idyllic past</td>
</tr>
<tr>
<td>superior in degree to us but sharing our environments (hero as leader)</td>
<td>high mimetic mode of most epics and classical tragedies (leader falls)</td>
<td>high mimetic comedy, as those by Aristophanes; blends heroic and ironic</td>
</tr>
<tr>
<td>they are on our level</td>
<td>low mimetic tragedy, pathos</td>
<td>low mimetic comedy, new comedy; humorous breaking of irrational or absurd</td>
</tr>
<tr>
<td>they are beneath us</td>
<td>everyman as ironic or hapless victim; close again to myth e.g. Charles Chaplin</td>
<td>ironic, with driving out of scapegoat</td>
</tr>
</tbody>
</table>

radical optimism concerning social and political developments also may be more frequently or deeply linked with happy, associative, comic outcomes; or they may be driven by deeply sensed tragedies of the lonely human condition, only alterable when basic scripts or plot possibilities, or our appreciation of them, are changed\(^{38}\). Conservative orientations allow similar complexities, with less hope of realistic ameliorative change.

To see the human possibility of occasionally heroic transcendence of our natural environment need not suggest that we all follow hopeless causes. That there are transcendent, symbolic or even mythical social or political purposes, social utopias, in search for which we collectively and legitimately are willing to kill or die, dramatically constitutes the most essential political actions. When we describe political or social actors in terms of laughable inadequacies or ironically criticize them for redeemable failures, we place them beneath us. We suggest the possibility of improving on our lot by taking our collective destiny in our own hands. Hence ironic criticism as well as heroic leadership and mythic interpretive forms have social roles to play, if properly disciplined, in motivationally suggestive critical and constructive historical analysis.

Finally, now we can see some important sources of Forrester's or Braudel's or Toynbee's historical appeal. (We shall leave to a concluding section some thoughts on improving the scientific character of their kinds of world historical analysis.) Highly aggregated, abstracted or impersonal forces (heroic saviours founding new religions, classes, forces and relations of production, macro-ecological shifts) are like mythical actants. Whether the interpretive stories they tell are comedies preservative of existing society's virtues or tragedies about alternative developments, motivational appeal comes both from the reader's identification with such decontextualized and at least partially mythical actors. Deeper explanations, more moving and satisfying interpretations, sociopolitical change productive of emancipatory fulfillment all come more fully when the shared insights of multiple perspectives are uncovered and the real differences among them more accurately explored\(^{39}\).

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38) Compare Frye with the complementary views of Joseph Campbell.

Occidental judgment is founded on a total misunderstanding of the realities depicted in the fairy tale, the myth, and the divine comedies of redemption. These, in the ancient world, were regarded as of higher rank than tragedy, of a deeper truth, of a more difficult realization, of a sounder structure, and of a revelation more complete.

The happy ending of the fairy tale, the myth, and the divine comedy of the soul, is to be read, not as a contradiction, but as a transcendence of the universal tragedy of man. ... Tragedy is the shattering of the forms and of our attachment to the forms; comedy, the wild and careless, inexhaustible joy of life invincible.


For example, Forrester's studies almost invariably support the conservative moral that liberal reform efforts are self-annihilating (because of the unanticipated consequences of nonlinear feedbacks, etc.) The confrontation of multiple computerized thought models of the same phenomena must be encouraged, even if populist technocrats might wince at the loss of certainty such openness implies. Neo-Marxist writers somehow must identify Capitalism as the most basic, quasi-mythical self-annihilator; the working class, or its vanguard, somehow must play an heroic role; only the most skeptical can see the vanguard party as a possible self-annihilator. Toynbee's discussions of the joint effects of internal and external proletariats on imperial decline are enormously suggestive, but his call for super-human saviours (or the belief in their existence) as the price of the renewal of civilizations in crisis may be too optimistic or pessimistic as futurology. Imposing logical rigor or overwhelming historical evidence add necessity and inevitability to mythic appeal. Each author enriches our understanding of how the individual, the group and larger social and ecological forces interact and "inner-act" with each other. To challenge these basic features of each historical interpreter is not to disallow the research generating possibilities of research heuristics that are not directly falsifiable; it is to call attention to alternative possibilities and the need on occasion seriously to explore, to convert to, and to synthesize among them.

III. How Interpretive Story Grammars May Discipline the Writing of Theoretically Informed World Historical Narratives

This paper has assumed that improved efforts at writing world histories are in order, efforts that will not be falsely restricted to merely the descriptive and explanatory functions of supposedly non-interpretive, objective history. It has been based on the additional recognition that the primary but not exclusive materials of the historian are textual, and that historical works, when completed, are narrative in form. A deeper, more controversial homeomorphism has been the one assumed to exist between the forms of fictional texts — stories or dramas — and of scholarly historical narratives. This correspondence has been elsewhere justified, and will here be briefly reviewed as a way of recapitulating the argument so far. Then some new steps toward more rigorous historical studies, based on some politically suggestive historical scripts, will be briefly proposed. Thus the above path from basic scripts to possibilist historical grammars incorporating affectively suggestive comic or tragic plot structures may reproduce itself in subsequent work, even if the exercise involved in only partially or hypothetically realized.

As philosophical commentators about historical writing, both Paul Ricoeur and Hayden White have made a strong case for essential correspondences between fictional and historical narrative forms40. A synthesis of their arguments generalizes to a conception of scientific historiography consistent with and rationalizing of the previous emphases of this paper.

One may acknowledge with Gallie that "history is a species of the genus story," about major achievements or failures of people living and working together, in societies or nations. Moreover, one may think about narrating history as a Wittgensteinian language game, which must be constituted or reconstituted grammatically. Clearly some degree of interpretation is involved in the generation of such narratives. Nonetheless fitting historical evidence into a coherent narrative qualifies as an objective contribution, a "narrativist" explanation, "because it is empirical and subject to techniques of verification and disconfirmation in the same way that theories in science are." At the same time the art of narrating, like the corresponding art of following a story, requires that "we are able to extract a configuration from a succession." But history, although it shares with fiction interpretive patterns consistent with facts, works toward the appropriate unifying form of narrative, that poetic activity which consists precisely in the construction of plots. "Just as there can be no explanation in history without a story, so too there can be no story without a plot by which to make of it a story of a particular kind." However the informing pattern of the historian's book, which is his mythos or plot, is secondary," a constructed achievement on the basis of available evidence, while for the poet, detail is secondary.

Interpretation occurs both at the historical and the meta-historical level. Just as interpretation consists of providing a plot structure appropriate to a sequence of events so that their nature is revealed as a "story of a particular kind," the historian at a more fundamental level needs to identify and choose the "kind of story" he or she wishes to tell from among those types (comedy, tragedy, romance, epic, satire) and modes of explanation (idiographic, contextualist, organicist or mechanist) available to him or her in our culture. Additionally, different formal argument types (deductive positivist or more open-ended, dialectical inferences) and contrasting world hypotheses (such as Pepper's formism, organism, mechanism and contextualism) may be implicit or explicit in one's historical practice. "Emplotment" may be thought of as embodying all four of these choices.

If scientific history writing is thus admitted to be a poetic, fictional activity, the mimetic character of fiction must be emphasized as applying to scientific history as well. Mimesis is a metaphoric or "iconic augmentation of the real," imitating not the effectivity of events, but their logical structure and meaning. Tragic mimesis (or what Frye would call the high mimetic mode) seeks, as Aristotle said, to represent human action in a magnified way. Thus the world of fiction leads us to the essential heart of the real world of action by playing the unreal, while true histories of the past open up buried potentialities of the present or future.

I shall just briefly mention two projects illustrative of the further work suggested by the present line of inquiry. The reader should be able to think of many more "story-oriented" studies in popular media or in the foundational works of any major tradition of sociopolitical theory. The first area of application is still partly folklore, but also partly history: the interpretation of the Biblical story of Jesus and its comparison with similar and different heroic "life and death" stories of his era. The second example bridges Marxian and Malthusian discussions of long wave thinking, with more than a hint of serious quantifiable relationships, but still a strong narrative character.

Surely a suggestive research strategy based on the insights of the present paper is one
leading to more explicit characterizations of basic, motivationally important plot structures in major political narratives. Figure 2 and formula 3 pointed briefly in that direction, since they suggested how one might go about identifying centrally connected top level plot units, the already interconnected building blocks of Lehnert’s affectively suggestive summary plot structures.

Table 6 gives one of Toynbee’s more suggestive arguments for the equivalence of heroic saviors in the Graeco-Roman world: numerous, sequentially organized, corresponding elements in recorded versions of the life and death of Socrates and Jesus. It cries not only for detailed, hermeneutic investigation of sources, translations, purposes, but also for plot unit analysis. The motivating question for such investigations would be the nature of the emotional appeal, its molecular structure, if you will, that has so engaged many millions throughout the last two millennia, but which now seems to be on the decline.

Table 6
Shared Elements in the “Lives and Deaths” of Jesus and Socrates

1. Before reaching the age of manhood the hero wins his spurs in a disputation with some of the foremost living wits of an older generation.
2. The hero is recognized and accepted by a forerunner as the latter’s successor and superior.
3. The hero is proclaimed by the voice of God to be unique among Mankind.
4. The hero inveighs against the powers that be.
5. In his domestic life the hero takes hardship and good cheer as they come, and shows himself capable of standing extremes of either of them without turning a hair.
6. By his refusal to go to extremes of asceticism—which he combines with a readiness to keep company with people of all sorts and conditions—the hero causes scandal.
7. The hero is publicly declared by one of his disciples to have within him something divine.
8. The hero claims to be divinely inspired.
10. The hero is brought to trial.
11. A true saying of the hero’s is dishonestly twisted by his enemies into a misrepresentation which is extremely damaging to him.
12. The hero on trial is reproved by the jurors for contempt of court.
13. When a question is put to the hero which offers him a possible line of retreat, the hero does not take the opening, but gives, instead, an answer that is calculated to exasperate the Court more than anything else that he could conceivably have said.
14. On the strength of the hero’s answer the Court immediately passes sentence of death upon him.
15. A tableau of the hero holding a death-cup, with a small party of intimate companions grouped round him.
16. When the hero is in articulo mortis, the friends who are with him weep—not for the hero, but for themselves because they are losing him—and then the hero tells them to restrain their tears.
17. In laying down his life, the hero demonstrates, by a triumphant response to the severest possible ordeal, that Righteousness has a supreme intrinsic value.
18. The hero is better appreciated by foreigners than by his own countrymen.

Source: Toynbee, op. cit., Vol. 6, pp. 486-495.

leading to more explicit characterizations of basic, motivationally important plot structures in major political narratives. Figure 2 and formula 3 pointed briefly in that direction, since they suggested how one might go about identifying centrally connected top level plot units, the already interconnected building blocks of Lehnert’s affectively suggestive summary plot structures.

Table 6 gives one of Toynbee’s more suggestive arguments for the equivalence of heroic saviors in the Graeco-Roman world: numerous, sequentially organized, corresponding elements in recorded versions of the life and death of Socrates and Jesus. It cries not only for detailed, hermeneutic investigation of sources, translations, purposes, but also for plot unit analysis. The motivating question for such investigations would be the nature of the emotional appeal, its molecular structure, if you will, that has so engaged many millions throughout the last two millennia, but which now seems to be on the decline.

4) Arnold Toynbee, A Study of History, Volume 6, Annex entitled “Christus Patiens.” An 87 element scripted account of the heroic Jesus story, not closely fitting to Propp’s list, but inclusive of almost all elements in Table 6, has been analyzed in Lehnert, Alker and Schneider, op. cit., on the basis of suggestions contained in an earlier version of this paper. Lehnert’s plot unit summarization techniques appear to work well, suggesting Toynbee’s Jesus to be radically political, revolting against authorities seen to be departing from the laws of God.
Table 7
Analysis of Long Waves Rhythm in Causal Sequence

<table>
<thead>
<tr>
<th>“Depressive” long wave</th>
<th>“Expansionary” long wave</th>
<th>“Depressive” long wave</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prolonged underinvestment has led to abundance of money capital available</td>
<td>Accelerated research for new labor-saving and rationalization inventions</td>
<td></td>
</tr>
<tr>
<td>Positive outcome for capital in intensified class struggles impeding introduction of new labor processes tied to new techniques</td>
<td>Massive upsurge of investment allows technological revolution (first phase)</td>
<td></td>
</tr>
<tr>
<td>Strong environmental changes inducing a sudden upturn in the rate of profit (several elements of a, b, c, d, and e over a period of time)*</td>
<td>Increase in relative rate of surplus value and technological rents give additional spur to rate of profit</td>
<td></td>
</tr>
<tr>
<td>Emergence of hegemonic capitalist power on world market underwriting relative monetary stability</td>
<td>Sustained economic growth favors huge international migration, which enables reproduction of reserve army of labor in spite of increased and heavy accumulation of capital</td>
<td></td>
</tr>
<tr>
<td>Long-term upsurge in rate of profit and in rate of capital accumulation</td>
<td>Spread of new labor processes leads (with time lag) to new forms of resistance and organization of proletariat</td>
<td></td>
</tr>
<tr>
<td>Increase in organic composition of capital begins to flatten out rate of profit at relatively high plateau</td>
<td>Increase in organic composition of capital begins to flatten out rate of profit at relatively high plateau</td>
<td></td>
</tr>
<tr>
<td>Strong increase in employment strengthens labor and flattens out increases in the rate of surplus value</td>
<td>Strong demand for raw materials upsets relative price relationship to manufactured goods</td>
<td></td>
</tr>
<tr>
<td>Monetary stability shaken by credit explosion necessary to maintain pace of growth in spite of growing contradictions</td>
<td>Monetary instability increases</td>
<td></td>
</tr>
<tr>
<td>Intensification of class struggle</td>
<td>Rates of investment and accumulation decline</td>
<td></td>
</tr>
<tr>
<td>Intensification of international competition</td>
<td>Search for new sources of raw materials and new ways to reduce labor costs, but without immediate important results</td>
<td></td>
</tr>
<tr>
<td>World hegemony of given hegemonic power undermined; further erosion of monetary stability over accumulation</td>
<td>Sharpened crisis of capital valorization spreads into prolonged social and political crisis</td>
<td></td>
</tr>
<tr>
<td>Beginning of long term decline in rate of profit</td>
<td>Devalorization of capital accentuates</td>
<td></td>
</tr>
<tr>
<td>Attempts to increase the rate of surplus value further sharpen class struggle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rationalization investments (second phase of technological revolution: vulgarization of innovations, disappearance of technological rents further saps average rate of profit)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monetary instability increases</td>
<td></td>
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</tr>
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* a, b, c, d, and e refer to the five processes counteracting the decline in the rate of profit indicated on pp. 74-75 of Mandel’s book.
being replaced by other "savior myths," either Marxian or Islamic or nationalistic in character. Of course, such investigations need supplementing, just as this methodology itself could be augmented significantly to incorporate recognition of a greater variety of non-western dramatic forms.

Similarly, the Marxian account of Kondratieff long cycles in Table 7 is especially intriguing because it suggests in narrative form, against a quantitative pattern of fluctuations, a typical historical pattern of interpretation that could be used as a basis for much more substantial comparative research\textsuperscript{42}. As one might expect, Mandel's argument appears to save capitalism because of exogenous features in the situation, not any endogenous, self-renewing power. This translation of the idea of capitalism's tragic self-destruction into its \textit{contingent} or exogenous renewal bears further reflection. But the available of non-Malthusian alternatives to Forrester's arguments, phrased in somewhat comparable, concrete terms, is a step forward in the search for emancipatory ecological self-understanding.

In conclusion, although the last example does suggest multiple models of possible historical development, and the previously one at least explicitly contrasts one basic hero myth (Jesus-Socrates) with another (Propp's), it is not claimed that story grammars will soon replace or become the world models of the future. Rather, I have argued that measuring actual historical sequences and thinking of possible world historical developments in terms of alternative story grammars can enlighten and orient us toward a better future of constrained, but multiple possibilities.

\textit{(Received June, 1986)}

\textsuperscript{42} Ernest Mandel, op. cit.

This paper is discussed comparatively in Joshua Goldstein, op. cit.