Tolstoy's Calculus of History

Jeff Love

Clemson University

War and Peace lays bare and challenges the limitations of narrative. In a complexly ramified pattern of critique and counter-critique the novel by turns embraces and rejects the notion that events cannot be portrayed as they are in their occurrence because the mediation of narrative is both inevitable and constricting, making fast what is inherently fluid. This central struggle, a fundamental ambivalence about the possibility of telling the truth, occupies an appropriately prominent place in the critical reception of the novel especially in the continuing debates over Tolstoy's skepticism.[1] While there is indeed a good deal of evidence for skeptical tendencies in the novel, there are important countervailing tendencies as well. One of the most intriguing of these is the narrator's proposal to apply a method analogous to calculus to historical events as a more effective means of making whole the errant partiality of historical truth. This proposal is intriguing precisely because it marks an attempt to grasp historical events in their flux, thereby creating a new kind of narrative more sensitive to the elasticity of historical becoming.

The purpose of this article is to provide a detailed examination of the calculus proposal within its context in the novel as well as to address briefly the crucial question of its specific impact on the novel's narrative structure. I seek to ascertain both why the narrator advances the proposal in the first place—in response to what kinds of problems—and how the narrator suggests it may give direction for the creation of a new form of narrative. Following this initial review, I discuss two of the strongest arguments for dismissing the calculus proposal as untenable, if not entirely wrongheaded, respectively, those of Sir Isaiah Berlin and Gary Saul Morson. Finally, I proceed to sketch out the possible implications of the calculus proposal for making sense of the generic anomalies critics have perceived in the novel since it was first published in the 1860s. To forestall possible misunderstandings from the outset, I note that I am in no way suggesting that Tolstoy tries to develop an exact narrative "science" based on calculus; rather, my intention is to tease out the salient aspects of Tolstoy's understanding of calculus, however imprecise, distorted or tentative, as a compelling "master figure" for the basic structural patterns that define the narrative form of the novel.

Origin and Scope of the Calculus Proposal

It is not until the end of Book III, between the account of Borodino and Pierre's famous dream, that Tolstoy recommends applying the conceptual apparatus of calculus to historical narrative. The dream is one aspect of a decisive change in the novel's tone from defeat and disintegration under the stress of the great Napoleonic invasion to cautious hope and re-integration, to the creation of a new unity of the Russian people in the aftermath of the battle of Borodino.

> The hardest thing (Pierre went on thinking, or hearing, in his dream) is to be able in your soul to unite the meaning of all. 'To unite all?' he asked himself. No, not to unite. Thoughts cannot be united, but to join all these thoughts together is what we need! Yes, one *must join* them, *must join* them. He repeated to himself with inward rapture, feeling that these words and they alone expressed what he wanted to say and solved the question that tormented him.[2]

The calculus proposal represents a corresponding new striving for integration and unity, a new impetus to create a unifying, all-encompassing historical narrative, that echoes the exhortation to "unite all" at the center of Pierre's dream.

The narrator advances the proposal following a severe critique of contemporary historical writing that stresses its disturbing one-sidedness, its attraction to telling a story from the point of view of one privileged individual or group. Ac-

cording to the narrator, modern historians have transferred the force the ancients once attributed to the gods to privileged groups or god-like men. In doing so, these historians grossly exaggerate the freedom select individuals or groups enjoy as causal agents and thus simply ignore the complexity of causal connections in favour of seeking one great cause at the base of events. In response to these views, Tolstoy's narrator is at pains to show that the causal nexus of historical events is so complex—infinitely so, in fact—that any sense of freedom to influence events must ultimately be illusory; indeed, a naïve belief in such freedom may only be preserved thanks to our ineradicable ignorance concerning the causes that shape *all* human actions.[3] This powerful strand of determinist thinking, traceable in the modern era to Spinoza in particular, allows for the peculiarly deceptive coexistence of freedom and necessity whereby belief in freedom is sustained by human cognitive inferiority or finitude.[4] For a finite being, freedom is as inevitable as it is illusory because the finite mind simply cannot know each and every one of an "infinite number" of causes, a skeptical argument that traces its roots back to Aristotle's *Posterior Analytics*.[5]

In this context the narrator introduces calculus with two principal aims in mind. First, he seeks to correct the disjointed and one-sided character of preceding historical accounts. Second, as the corollary, he seeks to affirm the seamless, continuous nature of the whole as a process of becoming and to find a way in which the parts that the finite mind cannot help but see may be brought together, rescued from their isolation, in a new synthesis, one that reconstitutes the original purity of the whole.

The narrator, having already dismissed causes as a fruitful object of historical inquiry at the beginning of Book III, specifically introduces calculus in the abstract discussion of history that occupies the opening chapter of its last Part.[6] He proclaims that the aim of history is the apprehension of the laws of continuous motion, for the "movement of humanity, arising as it does from an infinite number of human wills is continuous"—if one seeks to write history, one must face the problem of knowing continuous motion, another form of the infinite. After discussing one of Zeno's famous paradoxes of motion, the narrator explains that the moderns have overcome the perplexity of the ancients in regard to continuous motion via calculus[7]:

> A new branch of mathematics, having achieved the art of dealing with the infinitely small, can now yield solutions in other more complex problems of motion, which used to appear insoluble.
>
> This new branch of mathematics, unknown to the ancients, when dealing with problems of motion, admits the conception of the infinitely small, and so conforms to the chief condition of motion (absolute continuity) and thereby corrects the inevitable error which the human mind cannot avoid when dealing with separate units of motion instead of examining continuous motion. (III/3/I)

The narrator then advocates the application of this modern mathematical method to history in the crucial culminating paragraph of these comments: "Only having assumed an infinitesimal unit for observation (the differential of history, that is, the uniform tendencies of men) and having attained the art of integration (taking the sums of these infinitesimals), can we hope to grasp the laws of history." The narrator concedes that the infinite cannot be eliminated; rather it can be mastered as motion, as a process. Yet, just how is one to apply an infinitesimal calculus to history?

This is an absolutely crucial question, and, in my view, there can be no doubt that the narrator intends calculus to be applied analogically as a sort of ideal model of *qualitative* analysis permitting new kinds of narrative organization. For example, in Chapter XI of the Second Part of the Epilogue the narrator clearly indicates that calculus is to be applied analogically in accordance with the specific exigencies of the relevant discipline. He first states that "mathematics seeks out law, that is those characteristics which are common to all unknown, infinitesimally small elements" and, then, concludes that "[a]lthough in another form, the other sciences have also proceeded along the same path of thought."

Still, the notion of analogical application is by no means clear. If the narrator advances a straightforward thesis, that a modern method like the infinitesimal calculus should be applied to historical narrative and should in fact constitute a basic approach to historical events, he is much less forthcoming about the details. And it is in this context of specific application that one must be careful to establish exactly what level of specificity is appropriate or warranted based on the narrator's comments. Hence, the key preliminary question is: To what degree *can* calculus apply to historical narrative, a linguistic form of representation whose nature is so different? As a starting point for this investigation, I shall provide a thumbnail sketch of calculus, its central function and concepts.

The revolutionary significance of calculus is that it allows the coordination of relationships of change such that a continuous dynamic process like motion can be measured or described with unprecedented precision. Calculus achieves this precision by coordinating infinitesimally small differences or "increments" of change to define a continuous process in its essential dynamism either at every notional "point" as an instantaneous rate of change or as a whole ostensibly arising from these "points."[8] The definition of a continuous process at every point is called differentiation while the definition of the process as a whole is called integration, the latter being the reverse of the former. This reciprocity is a fundamental aspect of calculus and helps to explain its enormous versatility as a tool to describe all aspects of continuous processes, shuttling from the smallest particular to the most general, subsuming whole. Moreover, calculus can be used to develop general descriptions of continuous processes via differential equations that identify similarities in the patterns of change that govern different kinds of continuous process; indeed, the relevant equations may serve as "laws," as ways of assigning the specifically different to general patterns of behaviour. Both of these aspects of calculus reveal its tremendous underlying strength, its ability to describe and link with maximum precision the particular and the general, the part and the whole, of a process in every changing "instant" of its overall becoming.

The narrator is clearly attempting to take advantage of this versatility in urging the application of calculus to history; he is looking for a means of describing the whole of a historical event or process by grasping the interrelation of its parts in their continuous, and continuously changing, motion. The three central concepts the narrator initially mentions, the infinitesimal, the differential, and integration, reveal both the limits of this approach and the outlines of its more significant implications for narrative form.

The infinitesimal is obviously a fundamental concept, and for the narrator it seems to be a limit of the continuous motion of history, that is, as he remarks, of the continuous motion arising from an infinite number of human *wills* (*beschislennoe kolichestvo liudskikh proizvolov*). It is thus tempting to assume that the narrator means to use the individual human will as the liminal unit for historical investigation. To understand the narrator's approach, we need to examine what he means by will.

The word, "will," is in fact a rather inadequate translation of the Russian word "*proizvol*" which is very broad in meaning encompassing free-will, dominion (to do as one wishes), capacity, and choice. It is similar to the Latin *arbitrium* or German *Willkür*, while it does not have the more restricted acceptation of the Latin term as a choice between alternatives.[9] "*Proizvol*" fundamentally conveys freedom *from* restraint and the capacity to take advantage of that freedom to do as one pleases. It is a capacity-to-act, a pure potentiality, and therefore futural; this capacity-to-act is directed to possibilities which it may actualize under appropriate circumstances. The distinction is important for our purposes because, more precisely defined, the motion of history is a continuous "actualization" [*sovershenie*] "flowing from" [*vytekaia*] this capacity-to-act into the past. When the narrator says in another passage that the continuous motion of history is the sum of these capacities-to-act, [*summa vsekh proizvolov liudei*], he refers to a sum of actualizations of individual capacities-to-act, that is, to a sum of acts having

taken place, having crystallized from future potentiality into past actuality.

Yet what, then, *is* the infinitesimal? Is it a "unit" of actualized potentiality, of this capacity-to-act of individuals? Not exactly—Tolstoy's narrator in fact conceives of the infinitesimal more as a limit of this actualized potentiality, a sort of infinitesimal and irreducible potentiality or *freedom* unknowable in itself. Since freedom as such belongs only to human beings, it would be mistaken to argue that the infinitesimal holds of anything other than the actualization of individual capacities-to-act [*proizvoly*]. It is, then, important to keep in mind as well that the infinitesimal so defined, namely, as a limit of actualized motion, is not a static identity "in itself," not an individual "will" or "cause," but rather the limit of a differential ratio of the central constituents of that motion, distance and time—this ratio is in fact most like an "instantaneous rate of change" describing a smallest pattern of change, indeed, a smallest dynamic point of force in the continuous motion that makes history.[10]

Yet, when the narrator mentions the "differential of history," he immediately qualifies the term by adding that it is the "uniform tendencies of men," and this qualification raises questions about what precise sense the term carries other than to constitute an arguably more exact way of describing the differential as a point relation in a continuous process. Conversely, the narrator also seems to advocate the taking of a sum of "infinitesimals," and this raises yet further questions, for, just as it is unclear how the "uniform tendencies of men" are the product of differentiation, it is also unclear how they may be integrated. What sorts of mathematical tools could help the analogy to survive in these contexts? I doubt that any could because it is in these very contexts that the analogy reaches its limits of exactitude and can only begin to mystify; indeed, these brief discussions show just how difficult it is to construct an exact analogical relation between the main concepts of calculus and historical processes based on the narrator's cryptic suggestions.

But this apparent limitation should not vitiate the general conceptual utility of the proposal—at worst a sort of creative misprision—within the context of the novel. Rather, it seems only more obvious that the narrator applies the conceptual apparatus of calculus to the continuous motion of history with much less precision and far greater conceptual generality. A simple imaginative model may serve as a starting point: if history is a continuous process resulting from the actualization of human capacities-to-act, the latter are motion and can thus be understood as constituting something like linear trajectories that reflect the uniform tendencies of men. These trajectories can be artistically differentiated as well as integrated and, in turn, may also be assimilated into greater combinations that present a more complete description of the dynamic forms relating to a group of processes through the appropriate linking of these constituent processes or "parts." In more general narrative terms, this model suggests that the narrator is advocating a combinatory procedure that may both overcome *and* preserve the partiality of narratives based on the causal hypotheses he dismisses; by spurning the wholly subjective narrative, one assuming that a central character can determine the contour of a story, the narrator promotes in its stead a narrative emerging from combinations of smallest narrative configurations into greater wholes that mimics the central flexibility of calculus, its capacity to negotiate between the part and the whole so that, as a consequence of their inner reciprocity, neither is sacrificed to the other. Moreover, the narrator speaks always of laws as the principal goal of the new approach, and it is quite reasonable to assume that he does so on the conviction that attention to human action on the smallest level will yield similarities and linkages in dynamic, i.e., narrative, structure that in turn reveal the existence of general laws and permit the classification of particular human activities under greater patterns. In this sense, laws are akin to Platonic ideas or *paradigms*; they are a formal *distillation* of truth capturing the essence of the whole, and one can potentially—"in theory"—know the whole through them. To search for these laws, to describe them, is, then, to describe the general forms or paradigmata of human action and their interre-

lation, for that is what history is—the expression in time and space of such paradigmata.

These views resemble Schopenhauer's platonizing conception of history that was to have great importance for Tolstoy during the completion of the Second Part of the Epilogue:

> Therefore, a real philosophy of history should not consider, as do all these [Hegelians—author's note], that which is always *becoming* and never *is* (to use Plato's language), and regard this as the real nature of things. On the contrary, it should keep in view that which always is, and never becomes or passes away. Thus it does not consist in our raising the temporal aims of men to eternal and absolute aims, and then constructing with ingenuity and imagination their progress to these through every intricacy and perplexity. It consists in the insight that history is untruthful not only in its arrangement, but also in its very nature, since, speaking of mere individuals and particular events, it always pretends to relate something different, whereas from beginning to end it constantly repeats only the same thing under a different name and in a different cloak. The true philosophy of history thus consists in the insight that, in spite of all these endless changes and their chaos and confusion, we yet always have before us only the same, identical unchangeable essence, acting in the same way today as it did yesterday and always. The true philosophy of history should therefore recognize the identical in all events, of ancient as of modern times, of the East as of the West, and should see everywhere the same humanity, in spite of all difference in the special circumstances, in costume and customs. This identical element, persisting under every change, consists in the fundamental qualities of the human heart and head, many bad, few good. The motto of history in general should run: *Eadem, sed aliter* [the same things, but in a different form].

Schopenhauer reveals what lies under a conception of history as the expression of immutable paradigmata; namely, that history is a continual *return* of the same in different guise, it is a continuous *repetition*. If this were not true, history would be a chaos (1966, 2: 444).

The narrator's concern to define laws of history, to determine those greater paradigmatic patterns historical events characteristically express by linking the part to the whole in a more precise and perspicuous way, is the fundamental thrust of the calculus proposal and the core of the analogy. In this sense the calculus proposal becomes a governing figuration or metaphor in the novel evincing the desire to create a grand metanarrative of general patterns that combines all the smallest constituent parts together into something approaching but not necessarily achieving a seamless whole—in Jakobsonian terms, the narrator expresses the search for a narrative capable of bringing about the completely harmonious integration of its paradigmatic and syntagmatic axes. Accordingly, the combinatorial art allowing for construction of such a narrative has an absolutely crucial role. Yet, the narrator's reticence about details is especially problematic here: he provides no guidance concerning how one may attain to the art of integrating the smallest constituent parts of the narrative. Attaining to this art, a purely formal one, becomes paramount and reveals itself as a central striving behind some of the most interesting narrative characteristics of *War and Peace*. But, as we shall see, there can be little doubt that this striving cannot overcome the distance between the ideality of the mathematical concepts and the essential errancy of time-bound narrative, that ineluctable gap in precision the analogy neither conceals nor rectifies other than by a somewhat palliative reference to figuration or metaphor.

Two Arguments Against the Calculus Proposal

Negative judgments of the narrator's proposal have appeared several times in the reception of the novel (Eikhenbaum 341-385). I would like to respond to two important negative views, each of which holds that the analogy is half-hearted and false.

View 1: Berlin

Sir Isaiah Berlin argues that Tolstoy simply could not have been serious about applying calculus to history. For Berlin, the narrator's proposal is but

another variant of a central paradox arising from the conflict between thought and art in Tolstoy. As a thinker, Tolstoy's strives to unify or integrate; while as an artist he is enthralled by and defends the particular. Berlin writes specifically (48-49) about the application of calculus to history that

> [h]ere the paradox appears once more; for the 'infinitesimals,' whose integration is the task of the ideal historian, must be reasonably uniform to make this operation possible; yet the sense of 'reality' consists in the sense of their unique *differences*."

Berlin uses the example of calculus to point out the flaws that undermine Tolstoy's thought as opposed to the surpassing quality of his art. He maintains that the theoretical aspect is weak because the infinitesimals must be "reasonably uniform." It is not clear what Berlin means by this criticism. He seems to imply that infinitesimals are *representative* of uniform quantities—perhaps even the "uniform tendencies of men." But this is surely misguided. An infinitesimal is not representative of any uniform quantity because uniformity is the result of a mathematical operation and not of empirical inquiry. Although Tolstoy does seem to hold that infinitesimals are representational, he stipulates that they represent motion, an essentially dynamic relation, and *not* static individuals as such.

Even if one accepts Berlin's tendency to view infinitesimals as representational (or his suggestion that this is what Tolstoy does), the notion of unique differences he advances is by no means clear; indeed, Berlin seems to go farther than Tolstoy, making infinitesimals into *objects* of some kind. If this means that infinitesimals derive their "reality" from their difference from each other, it is necessary to determine what this difference is. Obviously, if they are completely different from each other, they cannot be referred to by the same term "infinitesimal." This should be a highly unlikely interpretation, but Berlin does seem to oppose uniformity to difference while failing to consider the consequences of advocating difference without a prior uniformity. This leads to the ironic conclusion that the "reality" of the infinitesimals consists in their not having the uniformity on which their difference must depend.

Berlin offers up these ambiguous arguments so as to assert that Tolstoyan reality lies in particulars and not in generalizing categories. This assertion ultimately serves Berlin's thesis that Tolstoy is not a "sincere" thinker but an artist, that the narrator's proposal to apply calculus to history is a feeble attempt to impose uniformity on what is ineluctably different. But Berlin seems to ignore the intimate dialectical relationship that first permits identification of universal and particular, a peculiar avoidance his own recondite opposition between hedgehog and fox tends to foster. For works of art are very much works of thought—in this regard, it bears repetition that the particular is mute without the universal and, likewise, the fox is also mute without some unifying principle that permits multiplicity and prevents multiplicity from exploding into chaos.[11]

Behind these criticisms, I think, lurks Berlin's distaste for Tolstoy's holism which has a strongly Platonic tendency and, thus, continuously wavers between the all-too-neat extremes of hedgehog and fox. And this distaste is perhaps only natural for a cautious empiricist like Berlin. He senses that Tolstoy's novel conceals a sweeping metaphysics of which he, not Tolstoy, is instinctually mistrustful.[12]

View 2: Morson

If Berlin casts doubt on the seriousness of Tolstoy's proposed solution, there is another rather tempting negative view represented by Gary Saul Morson who finds complementarity rather than antagonism in the relation of causes to calculus. This view arises from the apparent ease with which the analysis of continuous motion might seem to apply to the problem of causation precisely as a sort of description of the causes.

> According to Tolstoy, the only principle that might lead to a real understanding of history is the obviously impossible one of describing everybody and everything—"histories of all, absolutely *all* those taking part in an event" (1421). At one point

> in *War and Peace*, Tolstoy raises the possibility that a generalizing principle might be discovered someday that would enable the historian to take *everything* into account. Perhaps a "calculus" could be invented that would "integrate" history's infinitely numerous and infinitesimally small causes. Even then, however, historiography would be doomed to failure for other reasons. (107)

In Morson's opinion, Tolstoy's narrator means calculus to apply to causes, "infinitesimally small causes," as a response to the demand that every single individual be described in some fashion. If that were the case, then one would have little choice but to infer that the narrator's alleged solution to the problems of correct, i.e., holistic, historical narrative is empty, perhaps even deliberately so. Alternatively, one could simply hold that the narrator entertains contradictory points of view in regard to the possibility of knowledge of historical events.

While the narrator clearly advocates the impossibility of obtaining knowledge by means of the causes of a historical event, he just as clearly does not leave the matter at that—instead, he maintains that the proper object of history is the discovery of the laws that govern history. The unadorned nerve of the issue is that calculus *applies to motion without regard to an enumeration of the relevant causes*—the emphasis is on "how" not "why." Chapter XI of the Second Part of the Epilogue (from which I have already quoted) provides direct evidence of the narrator's position:

> From that standpoint from which the science of history now regards its subject, on that path, on which it proceeds, seeking out the causes of phenomena in man's will, a formulation of these laws appropriate for science is impossible; for, however we may limit man's freedom, as soon as we recognize it as a force not subject to laws, the existence of all law becomes impossible.
>
> Only by limiting this freedom to infinity, that is, by regarding it as an infinitely small quantity, can we convince ourselves of the utter inaccessibility of causes, and then, instead of seeking causes, history will set for its task the search for laws.
>
> The search for these laws has long been begun and the new methods of thought which history must adopt are being worked out simultaneously with the self-destruction toward which—ever dissecting and dissecting the causes of phenomena—the old history is proceeding.
>
> All human sciences have followed the same path. Arriving at infinitesimals, mathematics, the most exact of sciences, abandons the process of dissection and enters on the new process of the integration of unknown infinitesimals. Abandoning the conception of cause, mathematics seeks law, that is, the property common to all unknown, infinitely small elements.[13]

In this passage, the narrator develops even more clearly the opposition between two kinds of knowledge that is implicit in his advocating calculus as a superior narrative model. The first kind of knowledge is derived from traditional Aristotelian science; it demands to know the internal nature of the object, the occult forces that move and shape it. This is the standard of knowledge the narrator seems to impose in regard to causes, for causal chains are not knowable precisely because they cannot be completely known —we cannot describe every cause in itself because to do so we would have to describe every cause; we would have to end time or, in other words, be like God. The second kind of knowledge represents a liberation from these restrictions, being very much a product of the modern mathematical revolution inspired by Descartes, and its object is the laws that govern change.[14] Here the full import of laws may become somewhat more explicit, because it is the *formality* of laws that allows them to apply to diverse situations regardless of *specific content*. If the laws arising from formal relations provide the most basic objects of knowledge that permit knowledge, as it were, then these laws are in turn the basic formal conditions of objects. This is the beginning of a great epochal shift from knowing "the object itself," as substance, to knowing the object as a multiplicity, a characteristic *nexus* of formal relations that permit it to be known and of which the causal relation is merely one.[15]

In terms of narrative, this shift is of fundamental importance. The narrator not only rejects the cherished principles of narrative construction derived in one way or another from Aristotle's *Poetics*, but also proposes what is in essence a new narrative poetics based on a mathematical model whose main building blocks are formal multiplicities.

A Final Objection to Calculus

There is arguably another, oblique critique of calculus in the text itself. I am referring to the antagonism between mechanical and organic kinds of being that plays a significant role in the novel from the very beginning. The narrator, in a justly famous simile, likens Anna Pavlovna's soirée to a machine shop over which she is the foreman; Prince Vasilii speaks "like a wound-up clock," and a machine-like predictability and monotony of operation not only dominate the atmosphere of the soirée, they are of its essence: Anna Pavlovna's invitations are all the same, Helen smiles at everyone with the same unchanging smile, and even the little Princess addresses the guests "in general" and speaks in the same tone about clothing and her husband's immanent departure for the war.

In this benumbing atmosphere, Pierre's appearance constitutes somewhat of an event:

> Anna Pavlovna greeted him with the nod she accorded the lowest hierarchy in her drawing-room. But in spite of this lowest grade greeting, a look of anxiety and fear, as at the sight of something too large and unsuited to the place, came over her face when she saw Pierre enter. Though he was certainly rather bigger than the other men in the room her anxiety could only have reference to the clever, though shy, but observant and natural expression which distinguished him from everyone else in that drawing-room. (I/1/II)

The key adjectives in this description are "large" and "natural," and they have interesting implications. They suggest the presence of an energy that cannot fit within the petty confines of Anna Pavolvna's salon; a natural vitality, perhaps even a hint of the infinite that contrasts sharply with the listless and exaggerated limitedness of the main characters at the salon.

Pierre's brash behaviour—he gaffes the ritual greeting of "ma tante"—causes even greater anxiety; namely, that he will disturb the hum of the machinery, that he will throw it out of whack. And Anna Pavlovna is quite right about this, as she soon finds Pierre in a lively argument with the Abbé Morio. This argument leads to a subsequent breakdown in the careful order of the soirée that is only repaired by Prince Hippolyte's idiotic joke. Tolstoy's point is not subtle. He contrasts Pierre's spontaneity and naturalness with the stiff and unnatural choreography that Anna Pavlovna seeks to impose on the soirée.

Why is this relevant to the calculus proposal? Within the context of the distinction between organic and mechanistic interpretations of the world, calculus clearly belongs to the latter; it is its very essence—the world functions like a machine whose operations are completely regular and calculable.[16] In short, one of the fundamental aspects of calculus is its generality. This is the key to its utility as a method. In principle one could discover the differential equations defining every possible law of motion.

The contrast between the mechanistic and organic that Tolstoy develops in the opening sequence at Anna Pavlovna's implies a criticism of calculus as a mechanistic interpretation of the world. The application of calculus to motion imposes the same kind of stifling uniformity that we witness at Anna Pavlovna's soirée because calculus aims at describing the various kinds of motion and, to do so, assumes that the laws it finds apply without exception.

Thus we have a conflict of sorts. Tolstoy seems both to advocate calculus as a solution to skepticism and to criticize its generalizing energies, once again displaying an unmistakable skepticism about generalizations. One might argue that Tolstoy at once supports both sides of the bargain. On the one hand, he sees that skepticism lies in partiality, the inability of the finite mind to grasp the whole as such, and tries to remedy that partiality as a problem and fault through calculus.

On the other hand, he is always suspicious of general solutions that do not respect the particular; while advocating calculus as an ideal, he seems to realize that its application can only be imperfect.

> To study the laws of history we must completely change the subject of our observation, must leave aside kings, ministers, and generals, and study the common, infinitesimally small elements by which the masses are moved. No one can say in how far it is possible for man to advance in this way toward an understanding of the laws of history; but it is evident that only along that path does the possibility of discovering the laws of history lie; and that as yet not a millionth part as much mental effort has been applied in this direction by historians as has been devoted to describing the actions of various kings, commanders, and ministers and propounding reflections of their own concerning these actions. (III/3/I)

With calculus, Tolstoy wishes to find a means of writing history capable of aspiring to the comprehension of the whole available to a divine intelligence. But striving remains just that—Tolstoy recognized that realization of this ideal would neither be easy nor *desirable*. In the First Part of the Epilogue, the narrator clearly expresses this latter point: "[i]f we concede that human life can be governed by reason, the possibility of life is destroyed."

Calculus and the Novel

The broader significance of the calculus proposal is realized in the structure of the novel. The proposal provides a useful explanation for the way in which extremely varied and complex kinds of juxtaposition of smaller narrative configurations, the essence of the "montage" style, rather than an overarching causal progression dominate the linear formal organization of the novel. Such juxtapositions compel attention to the many ways in which *relations*—essentially ones of difference and similarity—integrate parts and wholes of tremendously varied specific content in the novel. These relations are themselves emphatically not causal, not mere connections of cause and effect (though the latter of course do make up an essential stratum of the novel), but form the bases for a dynamic network of content-based linkages that reveal patterns and intricate interrelations of patterns defining general types of human action in the novel.

The battle scenes provide a useful example here, since it should be obvious from even a cursory examination of the famous battle sequences at Schön Grabern, Austerlitz, and, especially, Borodino that Tolstoy makes a considerable effort to embed in the narrative an anti-heroic and anti-linear account of events. While I suggest that Tolstoy's narration of these battles tends to undermine a narrowly causal account of them as the fulfillment of the governing will of one man or group of men, the crucial question remains as to what new ordering principle is implied. Obviously there is one, and I think it is far more substantial and complex than the purely negative desire to prove that causal accounts are false.

In this regard, I would like to refer to a famous letter Tolstoy wrote to Nikolai Strakhov in 1876 while working on *Anna Karenina*. Although this letter was written six years after the completion of *War and Peace*, I think it admirably expresses the fundamental contours governing the practical application of the calculus proposal in the structure of the novel:

> In everything, in almost everything that I have written, I was guided by the need to bring together thoughts linked among themselves, in order to express myself. But every thought expressed by itself in words loses its meaning, becomes terribly debased when it is taken alone, out of the linking in which it is found. This linking is based not on thought (I think) but on something else, and to express the essence of that linking in any way directly by words is impossible, but it is possible indirectly, with words describing images, actions, situations. (*PSS*/62/269)[17]

With these words Tolstoy describes an ideal: to avoid a narrative based on one isolated thought in favour of one linking thoughts together in a grand mesh. This ideal is clearly similar to what the narrator outlines in the calculus proposal. Moreover, the "essence of the linking" is that purposive

inner rationality to which we have no direct access; we may only describe the relations or linkages of the phenomena among themselves and, in doing so, we in fact reveal the phenomena as reflections of that deeper rationality, of its essential forms.

If I return to the always crucial question of what is to be integrated, it now seems that two answers incorporating a rather flexible notion of "smallest narrative configuration" are possible depending on the level of the text. On the one hand, it is a likely if trivial truth that the characters to some extent "result from" a process of integration of individual traits; in this sense they are paradigmata of a group or class, and they act in representative ways in a series of characteristic situations of life. On the other hand, the novel is structured to reveal them as such only through a wider process of integration involving specific images, actions, and situations. White hands, for example, are associated with Napoleon and his gallery of lesser epigones in the novel, including Speransky and Rastopchin. In these cases, a repeated characteristic or image—and these are legion in the text—brings together a number of diverse characters and implies an underlying commonality to their personalities and to their *type* of personality. There are many other examples; important situations include, of course, battles, but also balls, dinners, and other social and familial events like the hunt; in each of these situations characteristic actions and *attitudes* emerge. This kind of grouping together seems to be a much more liberal procedure than the strict application of the concepts of calculus might admit. But, in this regard, it is important to note that Tolstoy is writing history as an *artist*, and this allows him to take liberties to portray the whole person and not merely a historic personage:

> An historian and an artist describing an historic epoch have two quite different tasks before them. As an historian would be wrong if he tried to present an historical person in his entirety, in all the complexity of his relations with all sides of life, so the artist would fail to perform his task were he to represent the person always in his historic significance.[18]

Even so, Tolstoy's approach still follows the basic rhythm of the calculus—that is, to bring together a diversity of complexly imbricated parts within the ambit of a single law or set of laws that establishes more general patterns.

It is, then, hardly surprising that, as the foregoing example of the "white hands" suggests, the central basis or principle of integration is repetition, the intricate and insistent play of relations of difference and similarity, that has been noticed by many students of the novel (Christian 122-47; Sankovitch). This is where Schopenhauer's claim that history is a repetition of "the same, but in a different form" has such resonance for an understanding of *War and Peace*. It reveals not only a central aspect of the novel's structure, but an essential postulate: history, like nature, is the repetition of fixed patterns and human beings are but another part of this process whose lives unfold in certain characteristic ways. This is a view of human nature as essentially invariable. Tolstoy writes about Vera Rostova that she "as people of limited intelligence are fond of doing" imagines that she has "discovered and appraised the peculiarities of 'our days' and that human characteristics change with the times" (II/3/XXI).

Repetition in the novel is extremely various. One of its familiar forms is manifested in the novel's structural tendency to bring wholes together by juxtaposing diverse accounts of certain basic events. In this regard, the battle scenes are conspicuous. We see the same event through a number of different eyes. Hence, if we group the battle scenes together, we note that each contains numerous smaller narratives that provide different perspectives on the same battle. Prince Andrei's view of Austerlitz differs from that of Nikolai Rostov or Kutuzov. The mere juxtaposition of these views establishes a synchronous unity of three different levels of seeing the battle and, in this sense, they create a more comprehensive account than any single, linear narrative could. Further, these ways of seeing a battle all differ from Pierre's at Borodino. Yet, if we "attain to the art of integrating" this diversity, each element of which is arguably a summation of the perspective of a certain group, like concentric circles—

Kutuzov at the centre of command, Prince Andrei the adjutant near to command, Nikolai Rostov, the cavalry officer farther from command, Pierre the civilian farthest from command, or Tushin and his crew on the outer limits of command as a command unto themselves—we begin to see the greater panorama of both the particular battle and what a battle essentially is as a recurring historical event. We are thus led to a greater objectivity that through a series of layers defines the common elements or characteristics of all battles. And this is the significance of calculus as an *artistic* structuring principle in the novel, since it both allows and directs one to integrate different perspectives within a greater whole that becomes a sort of paradigm of that situation and the characteristic ways of human thought and action within it.[19]

This example features a linkage based on an event, a common one in the novel that R. F. Christian has referred to as a situation rhyme, but there are many others of different sorts. Both Christian and Sankovitch in their painstaking taxonomies examine several categories of repetitions; these include, among others, the constant repetition of a word, of a kind of relationship between two characters or groups of characters, and of certain kinds of experience, mundane or epiphanic. Viktor Shklovsky, who in typical fashion discerned this aspect of Tolstoy's narrative well before anyone else, maintains that not only repetition but other devices, namely parallelism, gradation (by which he means the way in which different characters evince a "graded" quantity of a certain quality), and antithesis, are crucial semantic elements of the narrative.[20] While I completely agree with Shklovsky's observations, I prefer to consider these devices as species of repetition since they all depend on linkage through a similar element from which distinctions and differences, like an antithesis, flow. In other words, it is obvious that parallels are predicated on the repetition or possession by each instance of a similar element such that the parallel may be established. There is, for example, a famous parallel between Nikolai Rostov's behaviour in battle and at the hunt. The fruitful comparisons that emerge through this parallel are based on the repetition of similar elements in both Nikolai's behaviour, the charge, etc., and of course the violent nature of both activities no matter how different that violence may be.

All these kinds of linkage work to establish paradigms—either of a kind of character or event or theme—which arise out of the temporal flow of the novel. As I have said before, none of this may be particularly different from what happens in any novel, and it is an anticipation of modernist techniques (indebted to Tolstoy in any event) aptly described by the notion of "spatial form."[21] And yet this qualification is perhaps too cautious, thereby doing an injustice to the daring of Tolstoy's narrative innovation. For in *War and Peace* we have a narrative that completely ignores some of the most influential aspects of Aristotelian poetics, the careful prescriptions as to the causal coordination of action, in favour of a mathematically governed narrative in which formal relations of similarity among smaller strings of action tie together the great variety of the novel, its cunningly un-Aristotelian discontinuity, to create a vast, multi-leveled network of interlocking wholes that are themselves parts as well. This network, supported by a formidable series of linkages, functions to reveal the *timeless*—indeed, almost mythic—patterns behind time-bound narrative progressions thereby evoking a continuous present, an epically unified reality far beyond, while entrenched within, the subjectivity of the novel, its peculiar celebration of polyphony—in brief, limited points of view are continually displaced in a more capacious narrative that surrounds and engulfs them all. And here we have paradox; a narrative against narrative that strives to overcome temporality in order to offer a synoptic view of the whole, a vision not unlike that vouchsafed to God alone.[22]

But what counters and complicates this impulse so extraordinarily is Tolstoy's unparalleled respect for the particular, for the everyday nuances of experience bound by time. In this sense, *War and Peace* is fundamentally neither a novel nor an epic in the traditional sense but a peculiar hybrid, a *sui generis* creation that opens up a struggle between and beyond these generic ab-

stractions in its striving to embed the part within the whole, to differentiate and integrate, with complete fidelity to both. The calculus proposal captures this essential rhythm of struggle, a movement at once to preserve and overcome difference that is always tense and never untroubled.

Notes

1. The literature that has grown about this skeptical argument is of course enormous and reaches back to the first reviews of the novel. Yet, Isaiah Berlin's little book, *The Hedgehog and the Fox*, is probably most responsible for entrenching the notion that Tolstoy was primarily a skeptic about historical knowledge in modern scholarship. Indeed, since publication of that book in the early 1950s, there has continued unabated a lively discussion about the exact nature of Tolstoy's historical views. This discussion has generally led to a taking of sides for or against Tolstoy's skepticism. In the wake of Berlin's book, some of the most interesting treatments of the novel's skepticism can be found in the Bocharov, Christian, Gustafson, Morson, and Orwin.

2. Lev Nikolaevich Tolstoy, "Voina i mir" in *Sobranie sochineni v dvadtsati tomakh*, Vol. 6, 300 (III/3/IX). This edition prints the text of the novel edited by E. E. Zaidenshnur who conducted an exhaustive examination of published editions and manuscript variants in an effort to eliminate the many problems in the text. (For more information on the editorial principles involved, see Zaidenshnur's article, "Istoria pisania i pechatania," in Vol. 7 of this edition, 395-437.) Despite the high quality of Zaidenschnur's text, I have also referred from time to time to the two different texts (of 1933 and 1936) and the draft variants printed in the Jubilee Edition, *Polnoe sobranie sochinenii* 90 vols. All translations are based on the following English translations which I have not hesitated to modify where necessary for the sake of greater accuracy and literalness: Leo Tolstoy, *War and Peace* trans. Aylmer and Louise Maude and Leo Tolstoy, *War and Peace* trans. Ann Dunnigan. The locations of quotations are given by the relevant Book, Part and Chapter to facilitate reference for those using other editions of the novel. Books and Chapters are designated by Roman numerals, Parts by Arabic numerals.

It is also worth noting that the word for "join" used here is the verb *sopriagat'* which also can mean to join in marriage (see Orwin 116). This connection offers another perspective on calculus as participating in the figuration that marriage provides in the novel for creating unity in the face of disorder.

3. See especially Chapter 1 of Book III in which Tolstoy advances the argument that knowledge of a historical event is not possible because there is an infinite number (*beskonechnoe kolichestvo*) of causes for that event.

4. See *Ethics* I. propositio XXXIII, scholia I. Newtonian physics also became a standard resource of modern determinist thought.

5. See *Posterior Analytics* 72b7-16; 83b5-9; 86a4-10; *Metaphysics* 994b16-27. Also see Sextus Empiricus, *Outlines of Pyrrhonosm* I. 165-177. Of course, these Greek sources do not assert the notion of infinity (*to apeiron*) within the Christian context that underlies Tolstoy's arguments—the finite mind is only intelligible in relation to the infinite mind of God.

6. See again Chapter 1 of Book III.

7. This is the so-called "Achilles paradox" which Aristotle first mentions in the context of his analysis of the infinitely divisible continuum in Book VI of the *Physics* (at 239b14-29). The actual form of the paradox, as the race between Achilles and the tortoise, comes from another ancient source, Simplicius, in his commentary on the *Physics*.

8. I use the term "infinitesimal" in this explanation because that is the term Tolstoy uses in the novel. The concept is troubling (how can one obtain a "sum" of infinitesimals?) and was in fact eliminated by the innovations of Cauchy and Weierstrass in the nineteenth century, although it was revived in the twentieth century by Abraham Robinson's non-standard analysis. Generally speaking, modern calculus employs in place of an infinitesimal difference (equivalent to zero) the complex notion of a limit; there are no more mysterious infinitesimal quantities to ponder. Tolstoy seems to have been unaware of these developments or the problem itself—this may be the fault of his sources. See Eikhenbaum 351-388.

9. See Arendt, II: 89. Arendt maintains that arbitrium is to will as a faculty whose choices are set (arbitrium) is to one that sets its choices (will).

10. This interpretation arguably does violence to the

notion of infinitesimals as commonly understood and, of course, one could object that the term "differential" merely denotes one of the infinitesimal differences (*differentiae* as Leibniz originally called them) that forms an element of the differential relationship, the differential co-efficient or derivative in modern terminology. This is a plausible argument suggesting that Tolstoy conflates the differences, notionally infinitesimal measures of change, with motion, a "product" of the differential relation between these infinitesimals, specifically, between distance and time. The key distinction between the two possible interpretations is that one suggests Tolstoy understands that motion is essentially relational, while the other does not, assuming that the infinitesimal segments simply need to be added up to get to laws of motion. Among other difficulties, it seems to me that this latter thesis renders the notion both of a limit to activity (apparent exercise of freedom) and of attaining to an "art" of integration incoherent, since, in the latter case, one has only to add a series of "units." Hence, I suspect that Tolstoy is loose with his terms and assumes a relation when the narrator mentions the differential and not an infinitesimal difference of some kind, e.g., distance or time. Having said that, I do not wish to glide over the difficulties a detailed interpretation of the narrator's notion of the infinitesimal has to address. Perhaps the danger of incoherence here only reveals more clearly that a different approach, one that assumes much less precision, is not only warranted but necessary. Indeed, the lack of precision on Tolstoy's part may also be a nod in this direction.

11. Hegel provides a most penetrating modern treatment of this relation in the chapter entitled "Sense Certainty" ["Die Sinnliche Gewißheit"] of *The Phenomenology of Spirit*. In that chapter Hegel reveals the weakness of the opposition of the particular and the universal by affirming their necessary prior grounding in the universal ("das Allgemeine"). Hegel also asserts that language expresses that generality without which indeed no expression of any kind would be possible. See Hegel, *The Phenomenology of Mind*.

12. Berlin's view can also give rise to suspicion about the sincerity of the narrator's claims. That Tolstoy may be exercising a form of esoteric writing seems particularly relevant in this regard if only to those who believe that the narrator cannot be serious about calculus. By esoteric writing, I mean the ostensibly ancient practice of concealing unacceptable meaning under an acceptable cover as brought to light in this century by Leo Strauss. In *Persecution and the Art of Writing*, Strauss makes the case for the widespread practice of this writing of concealment whereby dangerous truths may be transmitted to those worthy of them. Strauss claims that one of the characteristic ways in which writers have diverted the attention of the "vulgar" is to commit "such blunders as would shame an intelligent high school boy" (30). In the present case, one might make the claim that the narrator's proposal to use calculus conceals a dangerous skepticism. But if that were so, it is difficult to understand why the narrator would directly express skepticism in regard to causation and only later mute that expression.

13. The narrator affirms this view in similar terms earlier in the novel, in the Third Part of Book III:

> There is, and can be, no cause of an historical event except the one cause of all causes. But there are laws directing events, and some of these laws are known to us while we are conscious of others we cannot comprehend. The discovery of these laws is only possible when we have quite abandoned the attempt to find the cause in the will of some one man, just as the discovery of the laws of motion of the planets was possible only when men abandoned the conception of the fixity of the earth. (III/3/I)

14. Another argument Morson advances to combat Tolstoy's determinist outlook suggests that a greater number of laws is somehow not supportive of determinism, since more laws means uncertainty. I can only assume that this argument means to say that an infinity of laws runs against determinism. But this is not clearly the case, since to deny our ability to know the deterministic structure of the world is not to deny the reality of that structure; such a position is in fact based on the assumption, a distinctly problematic one, to the effect that only what we can know is real. After all, how can we be sure that we can know what we cannot know?

15. Ernst Cassirer sums up this shift with his usual precision and elegance:

> The development of the scientific view of nature of the modern era is guided and determined by opposition to the Aristotelian system of 'substantial forms.' If Aristotle was concerned to reveal the inner source of all change, if he sought to lay bare the first beginnings, from which all becoming arises, modern science starts from the recognition that we are given nothing more than the *appearances* themselves in their various relationships,

and that the task of theory is restricted to tracing them back to, and "understanding" them in the form of, generally applicable statements of law. Not the absolute, inner essence of things and changes, but only the immanent rules of their disposition in space and recurrence in time are regarded as worth understanding. See Buchenau and Cassirer. Also see Heidegger 49-86, and Blumenberg 195-204.

16. Leibniz writes in one of his German texts:

> Mathematics or the art of measuring can elucidate such things very nicely, for everything in nature is, as it were, set out in number, measure and weight or force. If, for example, one sphere meets another sphere in free space and if one knows their sizes and their paths and directions before collision, one can then foretell and calculate how they will rebound and what course they will take after the impact. Such splendid laws also apply, no matter how many spheres are taken or whether objects are taken other than spheres. From this one sees then that everything proceeds mathematically—that is, infallibly—in the whole wide world, so that if someone could have sufficient insight into the inner parts of things, and in addition had remembrance and intelligence enough to consider all the circumstances and to take them into account, he would be a prophet and would see the future in the present as in a mirror.

This is quoted in Cassirer. Cassirer comments that the "same infallibility that discloses itself in mathematical thought and inference must obtain in nature, for if nature did not possess this infallibility it would be inaccessible to mathematical thought. In this mode of argument there is expressed the characteristic subjective fervor that inspired the first founders and champions of classical rationalism." It is worthwhile to add that the essence of the modern striving to mathematize nature is an overcoming of the reticence of Greek and Christian culture in regard to the possibility of obtaining true knowledge, the prerogative of the gods or God. Hence, the narrator's juxtaposition of the ancients and the moderns, as it were, in his discussion of continuous motion, seems entirely consonant with this interpretation of modernity. See Cassirer 11-12.

17. Translation by George Gibian. Note the similarity between the statements made in the letter and the passage quoted above in note 2 from Pierre's dream after Borodino. Goethe, whose closeness to Tolstoy is no secret, being one of those unusual artistic affinities that emerge in the course of our tradition, writes in a similar vein that the "truth, identical with the divine, never allows itself to be known directly, we see it only in its reflection (*Abglanz*), in example, in symbol, in individual and related appearances; we perceive it as incomprehensible life and yet cannot relinquish our wish to understand it" (13: 305).Elsewhere, in the great fragment, *Pandora,* Goethe writes that man is "fixed to see what is illuminated and not the light" (5: 362).

18. *"Neskol'ko slov po povodu knigi 'Voina i mir'" Sobranie sochinenii* 7: 385.

19. Nietzsche writes (5: 365) in a Goethean vein: "...the *more* affects we allow to speak about one thing, the *more* eyes, different eyes, we can use to observe one thing, the more complete will our 'concept' of this thing, our 'objectivity' be." ["...je *mehr* Affekte wir über eine Sache zu Worte kommen lassen, je *mehr* Augen, verschiedene Augen wir uns für dieselbe Sache einzusetzen wissen, um so vollständiger wird unser 'Begriff' dieser Sache, unsre 'Objektivität' sein."].

20. See Shklovsky 61-65; Todorov 22.

21. See Frank. Calculus is indeed the key to grasping the spatial form of *War and Peace—eadem, sed aliter*—and, in my view, the calculus proposal advocates reading the novel in a way that also reflects very closely in its basic outlines the principles of modern structuralism. It is, after all, fair to say that the techniques of structuralism represent a formalization of literary analysis inspired by mathematical formalism as so many other areas of modern inquiry. Moreover, with its emphasis on a system outside the subject, on discovering the laws of that system and on viewing individual literary works as manifestations of those laws, I think structuralism is remarkably close in intent and execution to the calculus analogy. Indeed, even the basic question of the infinitesimal or minimal unit is vital and vexing both in regard to structuralism and the calculus proposal.

22. This hostility to time, to history, has not gone unnoticed in the critical reception of the novel. See Orwin 101.

Works cited

Arendt, Hannah. *The Life of the Mind.* San Diego, CA: Harcourt, Brace & Company, 1978.

Aristotle. *Metaphysics*. Ed. Sir David Ross. Oxford: Oxford University Press, 1924.

_____ *Physics*. Ed. Sir David Ross. Oxford: Oxford UP, 1936.

_____. *Posterior Analytics*. Ed. Theodor Waitz. 1846. Aalen: Scientia, 1965.

Berlin, Isaiah. *The Hedgehog and the Fox*. Harmondsworth: Penguin, 1956.

Blumenberg, Hans. *Die Legimität der Neuzeit*. Frankfurt a. M.: Suhrkamp, 1966.

Bocharov, Sergei. *Roman L. Tolstogo « Voina i mir »*. Moscow: Khudozhestvennaia literatura, 1987.

Cassirer, Ernst. *Determinism and Indeterminism in Modern Physics: Historical and Systematic Studies of the Problem of Causality*. New Haven, CT: Yale University Press, 1956.

Christian, R. F. *Tolstoy's "War and Peace."* Oxford: Oxford University Press, 1962.

Eikhenbaum, Boris. *Lev Tolstoi*. 1928/31. Munich: Wilhelm Fink, 1968.

Empiricus, Sextus. *Oulines of Pyrrhonism*. Trans. R. G. Bury. 1933. Cambridge, MA.: Harvard University Press, 1993.

Frank, Joseph. *The Idea of Spatial Form*. New Brunswick, NJ: Rutgers University Press, 1991.

Goethe, Johann Wolgang. *Werke, Hamburger Ausgabe*. 14 vols. Munich: DTV, 1988.

Gustafson, Richard. *Leo Tolstoy: Resident and Stranger*. Princeton, NJ: Princeton University Press, 1986.

Heidegger, Martin. *Die Frage nach dem Ding*. Tübingen: Max Niemeyer, 1962.

Hegel, G. W. F. *The Phenomenology of Mind*. Trans. A. V. Miller. Oxford: Oxford University Press, 1977.

Leibniz, G. W. *Philosophische Werke in vier Bände*. Eds. A. Buchenau and E. Cassirer. Leipzig: Felix Meiner, 1922.

Morson, Gary Saul. *Hidden in Plain View: Narrative and Creative Potentials in* War and Peace. Stanford, CA: Stanford University Press, 1987.

Orwin, Donna Tussing. *Tolstoy's Art and Thought, 1847-1880*. Princeton, NJ: Princeton University Press, 1993.

Nietzsche, Friedrich W. *Kritische Studienausgabe*. Eds. Giorgio Colli and Mazzino Montinari. Munich: DTV, 1988.

Sankovitch, Natasha. *Creating and Recovering Experience: Repetition in Tolstoy*. Stanford, CA: Stanford University Press, 1998.

Schopenhauer, Arthur. *The World as Will and Representation*. Trans. E. F. J. Payne. 2 vols. New York : Dover, 1966.

Spinoza, Baruch. *The Ethics*. Trans. Samuel Shirley. Indianapolis: Hackett, 1992.

Shklovsky, Viktor. *Theory of Prose*. Trans. Benjamin Sher. Norman: Dalkey Archive Press, 1991.

Strauss, Leo. *Persecution and the Art of Writing*. Chicago: The University of Chicago Press, 1952.

Todorov, Tzetan. *The Poetics of Prose*. Trans. Richard Howard. Ithaca, NY: Cornell University Press, 1977.

Tolstoy, Lev Nikolaevich. *War and Peace*. Trans. Ann Dunnigen. New York: Penguin, 1968.

_____. *War and Peace*. Trans. Aylmer and Louise Maude. 1933. Oxford: Oxford University Press, 1983.

_____. *Polnoe sobranie sochinenii* 90 vols. Moscow: Gosuzdat, 1928-1953.

_____. *Sobranie sochinenii v dvadtsati tomakh*. 20 vols. Moscow: Khudozhestvennaia literatura, 1962-63.