WARRANT'S CURRICULUM Strategies and Heuristics for Critical Reasoning

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WARRANT's CURRICULUM

Strategies and Heuristics for Critical Reasoning

- Supplement to Final Proposal # 116BH40795 -

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1. Warrant's Curriculum: Logical Components vs. Real-Time Sequence

Warrant is designed to help teach, exercise, and integrate strategies of critical reasoning, reading, and writing. So, to begin with, Warrant's curriculum has three important dimensions, three basic categories of task to organize for the student: critical reasoning, reading, and writing tasks.

We assume, as a matter of pragmatics and commonsense, that these tasks and associated skills are highly interactive and recursive. Thus, that they cannot be readily or practicably separated.

To set a student a reasoning task will normally require that she address some reading matter and that she express the results of her thinking in some written form. Critical reading, for its own part, requires critical reasoning and wants written expression to be evaluated. Analytic and argumentative writing requires critical thinking, often against the background of some studied reading; and revision calls for a critical reading of one's own writing.

But, while it is impracticable to separate these three sorts of task in the context of Warrant (or in any more traditional reasoning/reading/writing assignment), we can selectively emphasize one of the three dimensions over the others at different points in Warrant's curriculum (as we do in setting up real-time course plans and assignments in more traditional settings).

For purposes of describing, provisionally, Warrant's curriculum, it will be convenient to distinguish between two levels of that curriculum:

1. The Macro-Curriculum consists of a logical ordering of topics and generic tasks over the course of an academic term, or that part of a term for which Warrant might be used. For purposes of illustration below, we will assume the term to be one semester and the course to be one that emphasizes analytical/argumentative writing. (We assume that any very substantive analytical/argumentative writing will have to be competent in handling normative/value-laden issues, as these hardly should or can be avoided.)

2. The Micro-Curriculum consists of the specific substantive tasks, strategic aids, and executive options posed for the student in the course of successive
interactive sessions with WARRANT within any of its macro-curricular units. The sample micro-curricular material we illustrate (in the last section of this supplement) represents one provisional unit of WARRANT's critical-reasoning curriculum, highlighting strategies and models for testing normative principles (a crucial task in many critical reasoning/reading/writing contexts).

Roughly, the macro-curriculum describes course units, while the micro-curriculum describes interactive task units within those course units.

The sample macro- or micro-curricula we sketch below represent possible logical units of WARRANT's curriculum, units that can be logically distinguished and ordered as we do below, but whose best or discretionary organization in real-time is a matter for empirical investigation in our project.

No one is yet prepared to say, with confidence or backed by adequate evidence, how many are the crucial strategies of reasoning/reading/writing, exactly what they or their essential logical components are, let alone in what real-time sequences they should be discretely presented or coordinated.

Different real-time sequences of the logical components of WARRANT's curricula will be possible. We propose to investigate both the logic of reasoning/reading/writing strategies and the pedagogical effectiveness of different orderings in real-time. Presumably, various different orderings will be equally sensible. What is best left to students' discretion and discovery requires exploration. Both instructors and students can be given various degrees of control over their real-time progression through WARRANT's curriculum.

2. WARRANT's MACRO-CURRICULUM

2.1. CRITICAL REASONING

The following are sample topical units on basic critical reasoning concepts and techniques. Each unit will contain interactive tutorials and guided, graduated exercises for practice and review.

Critical Reading and Writing assignments will rehearse students in the integration of critical reasoning strategies presented in these units, but WARRANT's curriculum will also contain text-independent instruction and exercise specifically devoted to the basic methods and methodology informing these strategies. This dimension of the curriculum will help reinforce the text-independence of the plans, goals, and strategies that are rehearsed and exercised in the contexts of particular readings later in WARRANT.
We will exploit analogies among the concepts, procedures, and pragmatic methodology of science, law, and ethics in order to demonstrate the generic aspects of our critical-reasoning agenda.

Seeing analogies between the design of scientific experiment and the invention of hypothetical cases in ethics, for example, helps at once to both free and constrain, stimulate and structure a student's imagination; strategies analogous to experimental design are powerful heuristics for invention and critical analysis in ethical reasoning, where students are least apt to know how to proceed once they've exhausted their own store of opinion.

While this approach to our critical-reasoning curriculum is highly innovative (to our knowledge, unique), we mean to imply nothing radically problematic. For example, our appeal to the prime analogue of hypothesis testing in science is not to suggest that there is a science of critical reasoning in normative domains. It is only to suggest a familiar and hence helpful model for strategies that are quite generic and generalizable across different domains of human inquiry, most of which are considerably less precise than our paradigmatic sciences. It is because they are necessarily less precise that they need all the methodical and methodological help they can get.

Explicating critical reasoning norms of science, law, and ethics will allow us to address explicitly the epistemological issues that usually remain hidden, confused, and confounding in critical reasoning, reading and writing tasks. This approach will also allow us to expressly address the problem of distinguishing and relating issues of 'fact' and issues of 'value,' which no substantive reasoning or writing curriculum can hope to avoid.

The following are provisional methodological units for WARRANT's critical reasoning curriculum. (We begin with arbitrary Unit M because this list does not pretend to represent anything like a final sequence of units from A to Z; these are sample units.)

Unit M: Refutation and Justification:  
M.1 In Scientific Reasoning  
M.2 In Legal Reasoning  
M.3 In Ethical Reasoning

Unit N: Finding and Assessing Evidence: Plausibility Testing  
N.1 Observations in Science  
N.2 Precedent and Judgments in Law  
N.3 Hypotheticals and Intuition in Ethics

Unit O: Analogy:  
O.1 Empirical Analogies  
O.2 Analogy in Law  
O.3 Analogy in Ethics

Unit P: Testing Hypotheses / Normative Principles:
Students need not go through the critical reasoning curriculum in its entirety or in this
exact order before proceeding to (at least elementary) reading and writing tasks. And
students can be routed back to a critical reasoning assignment preparatory to a reading or
writing assignment.

Some reasoning tasks will build successively on the same topical material throughout the
above units and, later, relate directly to initial critical reading and writing assignments. Some reading and writing assignments will refer the students for further explanation and
exercise on relevant or cognate reasoning tasks.

Thus, material and tasks in the critical reasoning curriculum can do double duty: initially
standing alone, for basic instruction and exercise; and as preparation or review for some
reading or writing assignment, where either the topical material is the same or the requisite
reasoning tasks are analogous.

2.2. CRITICAL READING

The sample assignments below are really assignment types, any of which could be
repeated on different topical/textual materials. WARRANT will contain several assignments
of each type.

The tasks subsumed under each assignment will often include successive re-readings, with
different goals and strategies to be highlighted and executed on each run-through; for
example: identifying the central argument, the main conclusion and supporting reasons,
evidence or premises; identifying sub-arguments or evidentiary support for premises of the main argument; distinguishing factual from normative claims; assaying the evidence provided for each; locating the most problematic points or sources of disagreement; identifying bias; identifying one’s own biases on the relevant issues. . . .

For purposes of graduating the students from critical reading on factual disputes, through the normative but more familiar domain of legal reasoning, to the more problematic domain of ethical disputes, we will design materials under each unit — factual, legal, ethical — that are directly and topically related; for example: social-scientific facts and controversies regarding the effects of capital punishment, legal and constitutional issues regarding capital punishment, and ethical issues. . . .

We mean to beg no questions here regarding the possibility and neatness of distinguishing between ‘facts’ and ‘values’; rather, this problem will be topical throughout, as it must if one is to teach generic analytical and argumentative skills.

Unit M: Readings on Factual Controversies
Unit N: Readings on Legal Case Studies
Unit O: Readings on Normative / Value-Laden Issues

Assignment 1: Critical Summaries of Short Passages
Assignment 2: Critical Summary of Short Article
Assignment 3: Critical Summary of Longer Article
Assignment 4: Critical Summaries of Related Articles on the Same Issue

2.3. WRITING

Unit A: Critiques of Readings on Normative Issues
Assignment 1: Critical Analysis of Single Article
Assignment 2: Critical Comparison/Contrast of Related Articles

Unit B: Analytical Essays on a Normative/Value-Laden Issue
Assignment 1: Analytical Essay Drawing Upon Background Articles
Assignments 2 - N: Variations in Topic Type, Scope, and Readings

Unit C: Argumentative Essays for One’s Own Position on an Issue
Unit D: Critiques of Other Students' Essays

Assignment 1: Critique of Another Student's Analytical Essay
Assignment 2: Critique of Another Student's Argumentative Essay

2.4. REWRITING

Unit A: Revision of Analysis - Advancing the Inquiry
Assignment 1: Revision in Response to Further Critical Reading
Assignment 2: Revision in Response to Critiques of One's Analysis

Unit B: Revision of Argumentative Essays - Improving the Argument

Assignments under IV-B could assume different forms according to different trade-offs among the possible objectives of argument; for example: Does one want to improve the soundness of one's argument, or merely its persuasiveness? For what audience—student critics? the instructor? an idealized audience (as in the scientific community)? a 'popular' audience? Perelman's 'universal audience'? some other? What difference would it make were one writing for one of these audiences as opposed to any other?

As in the critical reading assignments, a student could be led through the writing or revision of an argumentative essay highlighting and rehearsing different tasks on successive run-throughs; for example: defining one's audience, its presuppositions, rights and likely demands; identifying one's central issue and argument, subsidiary issues and arguments; marshalling and assessing one's evidence; marshalling one's evidence and arguments for different assumed audiences, to see how one might take different audiences into account (with WARRANT providing typical profiles and constraints for different audiences); reviewing the evidence, critiques and arguments presented by others on the issue(s) (from student critiques, critical readings) . . . .

Basic strategic issues could be made explicit, for example: How does an analytical essay differ from an argumentative one? Do their various objectives (advancing inquiry, sharpening understanding, expanding perspectives, informing one's viewpoint vs. defending or convincing someone else of one's present views) complement or compete with one another? What objectives assume priority when objectives conflict?

Types of assignment that would be appropriate and instructive here will be explored in our protocol study. We will be able to experiment with different assignment types in sections of the core Strategies of Writing course and, at closer quarters, with volunteer
This is a provisional sample of curricular units and assignment types. The sequence of curricular units, the number and definition of specific assignments, the time to be devoted to each are arguable and matters for investigation in our protocol studies with experts and novices.

3. WARRANT'S MICRO-CURRICULUM

We expect that there will be two valuable dimensions to what a student learns from WARRANT's micro-curriculum:

1. Executive scheduling and management skills for coordinating the generic tasks and specific strategies rehearsed throughout WARRANT's substantive curriculum.

2. Substantive skills in applying specific critical reasoning/reading/writing strategies to generic reasoning/reading/writing tasks.

We expect that the executive and substantive skills gleaned from the variety of WARRANT's exercises and instructional units will prove to be quite generic, topic- and text-independent, and transferable to critical reasoning/reading/writing tasks beyond the WARRANT environment. Part of the burden of the illustrative material (in the next sections of this supplement) is to show the generic bearing of WARRANT's substantive curriculum — in this case, sample strategies and heuristics of WARRANT's critical reasoning curriculum.

3.1. The Executive Dimension

The execution of specific assignments and exercises throughout WARRANT's curriculum will be guided and facilitated by certain generic executive aids built into WARRANT's screen-, window-, and frame-management system.

The top-level executive facilities of WARRANT's micro-curriculum are graphically illustrated in our Screen Mock-Up (sent under separate cover, with narrative), a 'snapshot' of a hypothetical point in a critical reading summary assignment.

For example, the screen will typically be divided into four interactive windows:

1. an Activity Box, where material is presented for the student to work on and where the student does most of her work;
2. A Note-Management Box, where the student can make and review notes on the task at hand, which WARANT helps her label, organize, search or integrate into work in progress;

3. A Plan Box, in which a sequence of goals and sub-goals for the task at hand is outlined and the student's progress through the task is graphically tracked;

4. An Advice Box, in which different sorts and levels of assistance in performing the task at hand can be provided. The top-level menu of advice available will typically include:
   a. Explanations of given tasks, a strategic overview and rationale for the hierarchical relation of sub-goals to goals, within the architectonic of an assignment.
   b. Strategies or heuristics for how to proceed in a given task, ranging from general methodological prescriptions to more specific procedural suggestions, clues of invention, aids to the imagination, helpful hints for achieving given goals.
   c. Models, abstracted from protocols and professional practice, of how given strategies might well be carried out in the present and similar contexts.
   d. Examples of the sorts of end-products that could result from following given strategies or models, in the present or analogous contexts.
   e. Assessments of how well given models or examples achieve their putative goals.

The executive level of WARRANT's micro-curriculum includes the organization of material and activity on the screen as well as the management of a student's progress through WARRANT's instructional material and tasks in real time.

3.2. The Substantive Dimension

For convenience, we will refer to WARRANT's procedural models and strategic advice, applied to topical material and specific tasks, as the substantive dimension of WARRANT's micro-curriculum.

In illustrating some of the strategies and heuristics included in WARRANT's substantive curriculum below, we present the sample material in narrative form, in some sensible logical and pedagogical order. We hope that this will illustrate the logic and pedagogy of the sorts of strategic instruction and assistance provided by WARRANT, and provide a more concrete picture of what a student can expect to experience and learn in the WARRANT environment.
First, some rationale for our selection of sample material on critical reasoning.

3.3. The Importance of Critical Reasoning for Teaching Writing

We select model strategies and heuristics of Warrant's critical-reasoning agenda to illustrate the complexion of its micro-curriculum for two reasons:

1. Critical-reasoning strategies/skills are fundamental to writing about substantive (let alone value-laden) issues; hence, they will be called upon throughout Warrant's reading and writing tasks. It would be difficult to start towards the other end of Warrant's curriculum, in medias res with exemplary reading or writing tasks that presuppose a familiarity with certain critical reasoning strategies. It seems better to use some of these prerequisite strategies themselves to illustrate the sorts of strategic instruction and heuristic aids Warrant will provide.

2. We believe that we have some original angles on the critical-reasoning agenda and how it can be exploited for purposes of teaching critical reading and substantive writing skills. We believe that our procedural models and rationales are epistemologically more explicit, methodologically more pragmatic and tractable, and pedagogically more powerful than conventional textbook treatments of critical reasoning (whether in rhetoric, composition, or philosophy). In particular, procedures crucial for critical inquiry into common social/value issues prove to be good invention heuristics for audience-based (rather than writer-based/ego-centric) writing; that is, epistemologically self-conscious reasoning heuristics prove to have transfer value for critical reading and writing. By illustrating the former, we can indicate an important part of what is innovative about our approach to teaching the latter.

To provide some rationale and context for the sample critical-reasoning strategies below, let's reason backwards, from one of the ultimate objectives of a writing course or Warrant's writing curriculum -- that a student learn to write an 'original', critical essay to argue his own considered position on an issue; in particular, a value-laden issue of widespread concern, like whether abortion is right or wrong. What are some of the prerequisites, in the way of reasoning skills, for carrying out such a writing task?

Certainly, one is the ability to define precisely -- and remain clearly focused on -- the issue one is addressing. This is non-trivial. For example, the issue of whether abortion is right or wrong is often translated into a conflation of the following very different issues: whether abortion is morally permissible, whether it is morally bad, whether it is morally neutral, and whether abortion ought legally to be permitted. Further, gradations in these issues are typically obscured: Say, whether abortion is, carte blanche, permissible as opposed to permissible under certain conditions. Or, what might it mean -- practically -- to hold that abortion should not legally be permitted: what sorts of sanctions, penalties, or punishment should be attached to abortion? Shall federal support simply be withheld, to discourage the practice? Or should abortion be aggressively prosecuted and
positively punished, as tantamount to first-degree murder?

To mount a thoughtful argument on any such issue—and to keep it clearly in focus—one wants two things: the tools for inquiring critically into one's own beliefs and their grounds; and a critical acquaintance with the thinking of a wider community, a grasp of considerations that weigh in the ever evolving, hardly consistent social wisdom on the issue—on all sides. The latter would entail a growing sensitivity to basic distinctions required for probing normative issues.

Both the crucial skills and critical understanding can be cultivated through critical reading, but not without some express attention to the procedural models and evidentiary standards that one needs for critical, autonomous thinking; in particular, models and standards needed to advance inquiry and argument about elusive, subjective, controversial issues of morality, social values and policy.

Student writing breaks down or fails to shape up effectively on value-laden issues of wide social concern for many reasons. Many are difficulties generic to the—to any—writing process. But many writing difficulties are endemic to articulating our thinking about, advancing our thinking about, or critically assessing our thinking about normative issues themselves.

3.4. The Pragmatic Import of Epistemology in Teaching Critical Reasoning

In normative domains, writing often breaks down or fails to advance because students bog down internally in their ability to negotiate what, at bottom, are common epistemological quandries: How, after all, can we possibly argue convincingly or communicate effectively about value-laden disputes? Aren't these, at bottom, subjective matters on which people simply either (serendipitously) agree or not? How can effective appeals be made to an audience with whom one disagrees in principle or basic values? Aren't normative issues, in the end, undecidable? Teachers typically demand that students provide evidence to back up their assertions, but what ever could count as evidence in support of ethical, moral, or value judgments?

Writing and communication on elusive value disputes cannot advance where critical inquiry itself is boggled, where students have no idea how to proceed to advance their own questions and thinking, let alone in community or effective dialogue with a wider, often anonymous audience.

This is hardly an academic problem, but rather a pragmatic and widespread one, endemic to intellectual and ethical development. Critical normative inquiry does not create its
quandries gratuitously. Its issues are not born and confined in the 'ivory tower.' Nor are
they practically remote from the uninitiated. In nearly every student lurks an inchoate
ethical 'relativist.' And, in confounding schizophrenic fashion, a dogmatic 'absolutist:' This is.
well known to teachers of ethics. We think it is a phenomenon that ought to concern and
be expressly addressed by teachers of higher literacy more generally:

A thoroughgoing ethical relativism is...a common starting point for
many...students at the beginning of an ethics course. But paradoxically,
many...students are ethical absolutists, although they share the relativist's
assumption that there is no rational basis for comparing ethical positions, and
they are unwilling (and/or unable) to present any arguments in defense of their
own principles. (Hastings Center Report on Teaching Ethics, Vol. VII, p.12.)

We paraphrase here a typical example of this phenomenon from a Wall Street Journal
feature, "When Values Are Substituted for Truth," by William J. Bennett (I've lost the issue
and date):

Student: "I don't think you can teach ethics because there really aren't any in
any real sense. Each person's values are as good as anybody else's. Values are
subjective."

Teacher: "No, that's not true. Some people's values are better than others."

Student: "No, they're subjective. No one can impose his values on somebody
else."

Teacher: "Well what do you think of this? I say values are not subjective
and, if you don't agree with me, then I'll flunk you."

Student: "You can't do that! Are you crazy?"

Teacher: "No. And I can do that: Why not?"

Student: "Well...er...because it's...it's not fair!"

Inchoate, naive, and often inconsistent normative and epistemological views can wreak
havoc with any individual or group's attempt to pursue rational inquiry or to resolve
normative disputes in practice. The existence of unexamined epistemological views is a
practical obstacle to progressive controversy or dialogue in any would-be normative
community. It can be detrimental to individual development as well:

William Perry's studies at Harvard of the patterns of intellectual and ethical development in
the college years suggest that, whatever may be students' tacit commitments to ethical
relativism, learning to operate within a pragmatic framework of 'contextual relativism' is a
difficult but crucial phase in their social-intellectual development.

Certainly the ability to handle contextual relativity -- to assess the plausibility of concepts
and values relative to different contexts of belief and purpose -- is prerequisite for
advancing cooperative and critical inquiry. And the ability to negotiate disagreements about what is right and what is wrong -- or whether it's even possible to decide on rational grounds -- are not readily acquired in the absence of explicit procedural models and pragmatic evidentiary standards: 'the inevitable disagreement among students about which normative ethical theory is correct...bogs down, almost always, because students lack the means for working it out' (Hastings Center Report on Teaching Ethics, Vol. IX, p.38).

What order of epistemological reflection, then, is necessary to address the practical problem—in life and in the classroom—of how critical inquiry in normative matters might be advanced and taught? We agree with Robert Baum in his assessment, and think that what goes for the teaching of ethics in particular must go for the teaching of critical thinking more generally:

It is imperative that the instructor work through the whole set of epistemological presuppositions—doing almost a minicourse in the philosophy of science as well as meta-ethics—in order to even begin to communicate with students concerning the possibility of doing ethics in any sense that involves the resolution of ethical conflicts or disagreements. (Hastings Center Report on Teaching Ethics, Vol. VII, p. 12.)

We think, moreover, that this prescription is less daunting than it sounds; that, with the help of WARRANT, crucial strategies for advancing critical inquiry -- in the service of critical reading and writing -- can be taught with express attention to their epistemological dimensions.

WARRANT's critical reasoning agenda will consequently import some explicit and pragmatic epistemology; and it will trade explicitly on the pragmatic models of science and law that inform the accepted practice (if not the ideologies) of philosophers and others when they engage in critical normative inquiry. Our protocol studies of 'experts' will help us get beyond the academic quibbles and ideologies ('rationalism,' 'relativism' whatever) to the pragmatic issue of how experts reason when they reason critically, analytically, and well about normative matters.

It is their own pragmatic standards of evidence, their own procedural models that teachers, in the final analysis, expect students to satisfy in their written work; the problem is that these standards and procedures are usually neither articulated nor taught explicitly. It is no wonder if the demand for evidence in written argument (especially on normative issues) mystifies students: How or where are they to find this elusive commodity? In classical rhetorical terms, this is the deeper problem of invention, and a problem that philosophers and composition teachers need address in collaboration. The WARRANT project represents just such collaboration. The sample material that follows illustrates how a bit of explicit, pragmatic epistemology might be imported into the critical thinking agenda.
to enhance critical reading and writing skills.

4. SAMPLE STRATEGIES: Dialectical Analysis as Hypothesis Testing

The following narrative illustrates certain critical reasoning strategies at work in the context of analyzing a line of argument on the abortion issue: strategies for testing the plausibility of a normative principle. These dialectical strategies for testing a principle against a set of evidence are common in the practice of critical analysis in philosophy, and analogous to experimental and hypothetical reasoning in science and law. We briefly discuss the analogy to 'scientific' or empirical hypothesis testing.

In Section 5 we elaborate upon more specific heuristics associated with these strategies. Heuristics are aids to discovery, tactical aids for carrying out a strategy. While it is possible to distinguish heuristics (roughly, the tactical level) from strategies, and to distinguish among specific strategies and heuristics (generalizing vs. testing principles, inventing vs. deploying counter-example), it is difficult to separate these dimensions in actual critical reasoning tasks. Hence, the narrative form of our illustration.

It is also difficult to introduce them without a certain amount of argle-bargle about how they work. So, we resort to narrative descriptions that reflect on the methodology (Section 4), epistemological issues and pedagogy (Section 5) implicated in the deployment of these sample strategies and heuristics. Section 4 is, in effect, an extended model protocol of basic strategies at work in the critical analysis of a line of argument, its strategy and plausibility.

Section 5 is a discussion of heuristic protocols we employ in teaching the application of these strategies, with some reflection on the epistemological presuppositions involved in our pedagogy. Together, Sections 4 and 5 provide an abstract, a cross-section of some of WARRANT's critical reasoning protocols, on the strategic and tactical levels, with examples.

While we cannot provide in narrative form a picture of interactive frames as they might proceed in WARRANT, the following sketch of strategies that inform WARRANT's micro-curriculum has some substantive dimension, a degree of both closure and open-texture, and fits within several pages. Unpacking the dialectical strategies illustrated below -- providing interactive exercises, pathways through different levels of advice -- would require many times the space we've taken here for this extended model of dialectical hypothesis testing.

WARRANT's critical-reasoning curriculum would start with more basic concepts and
simpler material, but the argument analysed is a prototype of a major line of argument on which we have a set of gradually more difficult readings and writing assignments. Exercise with prototype arguments and issues in WARRANT’s critical-reasoning units would be followed by reading and writing exercises that build and elaborate on the earlier experience. Any line of argument such as the one below would be balanced with alternative and opposed lines on an issue like abortion, drawing upon popular readings, general-audience philosophic articles, and legal cases.

Testing the Plausibility of Normative Principles

(In the Context of Critically Analyzing An Argument on Abortion)

We might liken our ethical judgments about particular actions (this or that abortion), types of action (abortion generally), or policies (allowing or subsidizing abortion) to observations we make about physical phenomena in our commonsense perceptual experience or in scientific investigation. Our practice at least is to speak as if, in making an ethical evaluation of a case, we are observing something about the case.

For example: We read in the newspaper about a medical research facility throwing out frozen human in vitro embryos. I observe that this is the destruction of human beings, a violation of their right to life. You rather observe that it is merely a case of a laboratory disposing of some human cells.

We read that the rich donors of the sperm and eggs from which these embryos were formed in a laboratory dish, the ‘parents’ of the embryos, were killed in an airline crash. I observe that the embryos were not only murdered but robbed of their rightful inheritance. You observe that the embryos are simply the property of the laboratory that cultivated them, now that their ‘parents’ are dead.

I observe that it is an awful day; you, that it is delightful . . . .

I observe that women are too emotional to hold high political office like the vice presidency; you observe that I am a blind bigoted bafoon. I observe that there are too few examples in this manuscript; you observe that it is too long anyway. I observe that observation is observation; you observe that there’s observation and there’s observation. What’s in a word? Is there method to be found in this metaphor?

Science typically, and among other things, attempts to formulate general hypotheses that explain what we observe in our experience of the physical world -- to explain why, for
example, we observe that boats that venture far from shore disappear (from sight, in the eyes of those standing on shore) at some point. One hypothesis that explained this phenomenon was that the boats eventually fell off the edge of the earth, that the earth was 'flat'. Another, more complex hypothesis holds that the boats disappear from our line of sight because of the curvature of the earth's surface, that the earth is curved, indeed roughly spherical in shape. These hypotheses acquire different degrees of plausibility relative to different frames of reference, as a function of what all else we are privileged to have in the way of relevant evidence, shared conventions, background knowledge and beliefs. From some points of view, in some contexts of knowledge and belief, the 'flat earth' hypothesis is at least plausible, albeit false.

Scientists -- as well as commonsense -- typically refute empirical hypotheses by citing counter-evidence -- (complexes of) observational instances in which the hypotheses in question are indisputably or arguably false. It may be a boat that evidently sailed beyond what was considered the edge of the earth and yet safely returned. Somewhat similarly, philosophers standardly refute putative definitions of important concepts (like justice, knowledge, etc.) or general normative principles (such as purport to determine what is right and wrong), by citing counter-examples, instances in which we confidently judge or 'observe' that a definition or principle is clearly incorrect. Arriving at a satisfactory definition or principle by a series of successive formulations and counter-examples is one of the most characteristically philosophic and one of the most commonsensical of reasoning techniques. Attributed paradigmatically to Socrates, it is often called dialectical analysis.

There is more to the dialectical game than mere refutation by counter-example, since every counter-example is evidence for some alternative or contrary principle(s). Constructive if critical inquiry through refutation and reformulation is the larger enterprise. Thus, one function of dialectical analysis in philosophy is to explicate, test, and refine the normative principles that underlie or inform our intuitive judgments, immediate observations, and unreconstructed arguments. The concern here is not unlike that of scientists seeking so-called scientific 'laws'; or that of our jurisprudential courts in seeking to interpret and refine fundamental principles for the regulation of society.

The procedure of philosophic dialectic, in rough outline, is: (1) to try to capture in explicit principles the intuitions and tacit conventions informing our unreflective observations and generalizations about particular cases; (2) to support these principles with clear paradigm cases, cases that are relevantly similar to the case at issue and where we are especially confident of our judgments and their grounds; (3) to adduce the logical consequences of our principles, testing them against putative counter-examples; (4) to
reformulate these principles in order better to articulate and accommodate our intuitions about both the counter-examples and paradigm cases before us.

We repeat this process until, ideally, we have rendered our arguments about the matter manifestly valid and provided them with fully explicit normative principles, principles that are logically consistent among themselves, that accommodate and articulate our observations about all the cases so far before us. Our endeavor here is not unlike that of the scientist who wishes his working hypotheses to be consistent with his background knowledge and over-all theoretical framework and to fit or explain all the relevant data or evidence at hand.

When this dialectical process takes place within the framework of manifestly valid deductive reasoning, revision of our principles will most clearly force revision of either our conclusion or our strategy and line of argument. Similarly, hypothesis-testing and revision in science will have the clearest impact on our theory so far as the structure of that theory is logically explicit and perspicuous. We will illustrate dialectical method at work within the frame of an expressly valid argument to show how criticism of a principle/premise can force rethinking of an argument's structure and strategy.

Consider the following already explicit argument, apparently in behalf of the permissibility of abortion:

I have a right to keep people off my property. But you don't violate that right by crossing my land unless I want you not to cross it.

In general, A's doing X doesn't violate any of B's rights unless B wants A not to do X. Now no fetus wants anyone not to fatally abort it. (Fetuses just aren't capable of having desires of that sort.)

Hence, fatally aborting a fetus doesn't violate its right to life.

The argument as given is virtually valid, and in this minimal sense its conclusion surely 'follows.' It can be readily reconstructed in its formal essentials:
(A-1) For any things A and B and any action X,
    A does not violate any of B's rights by doing X
    unless B wants A not to do X.

(A-2) No fetus wants anyone not to fatally abort it.

Therefore, no one violates a fetus' right to life by fatally aborting it.

If we wish to take issue with the argument, our task is now clearly targeted on either of
the two premises. The validity of the argument spares us any vague worries about the
'logic' of the analogy between me and a fetus: we can focus on the substantive issues
provoked by the premises.

The illustrative case about my property (to which the unreconstructed argument appeals) is
logically gratuitous to the deductive reconstruction above. If premise (A-1) is true, then
the claim about my property follows as true. (And if we do not wish to dispute the claim
about my property, we can still dispute the premise/principle on any clearly objectionable
consequences that we may find in yet other cases.)

But in the original argument there was more involved than the essential deductive
argument framed above. There was a dialectical stategem, an appeal to a paradigm case
in support of the general principle (A-1).

If this principle had not been expressly stated in the original argument, we would want,
for purposes of philosophic inquiry, to formulate something like it, some general principle,
in order to venture some hypothesis about the grounds for the confident observation about
my property rights. The following analogical argument is neither valid nor explicit about the
philosophic principle specifically at issue:

(B-1) You do not violate my property rights by walking across my land
    unless I want you not to do so.

(B-2) No fetus wants anyone not to fatally abort it.

Therefore, no one violates a fetus' right to life by fatally aborting it.

We opt here for explicit arguments from explicit general principles in order to promote
critical inquiry beyond loose analogy or unreconstructed intuition, in order to advance a
more general hypothesis about the case at issue, and in order to test that
principle/hypothesis further. By abstracting general principles from putative paradigm cases, we aim not merely to persuade (by analogy, say), but, further, to capture our tacit, presumably shared convictions about what conditions are necessary or sufficient for deciding other 'like cases alike.' The observation made about property rights cannot be generalized to the case of fetal rights unless some general principle is found that applies to both these and other cases of rights violation.

(B-1) states a paradigm case in support of (A-1) insofar as the case clearly represents those general features that we take to be necessary or sufficient for deciding all relevantly similar cases in the same fashion. (A-1) attempts to explicate what the relevant features are in general. Once we have a general principle for determining which features of a case provide the relevant grounds for deciding it one way or another, we have, in effect, a hypothesis about our shared norms that we can test against yet other cases. In this way we seek to explicate, extend, and test the analogy posited by (B-1) and (B-2).

A case in which we are uneasy or disagree about the judgment entailed by our principle is a problem case, similar in effect to empirical observations that are difficult to interpret in science or to what are called 'hard cases' in the law. A case in which we are confident that the judgment entailed by our principle is incorrect stands as a putative counterexample against the principle. No principle is adequately specified or acceptable until any pending problem cases or counter-examples have been either accommodated or explained away.

On the other hand, insofar as we can intuitively agree on the disposition of clear paradigm cases, we presumably agree in principle on the disposition of all relevantly similar cases. Critical inquiry, at its most modest, aspires at least to make explicit those features of cases and those shared conventions that allow us to agree in our observations. Any number of persuasively similar cases might be posited in support of principle (A-1):

You do not violate any of my rights by crossing my property, driving off with my car, helping yourself to a beer out of my refrigerator, or even putting me out of my irremedial misery from some terminal disease (Is this case perhaps less clear?) -- unless I want you not to do any of these things.

The vague intuition or tacit conviction that is purportedly common to all these cases, the intuition that (A-1) purports to capture, is that there is some connection between our desires and the violation or non-violation of our rights. Presumably we would all agree, and eventually find good reason to agree, that whether or not someone's right is violated
has something to do with what he wants others to do or to refrain from doing. Premise (A-1) formulates a putative connection, in effect, as follows: Someone's having certain desires is a necessary condition of the violation of any of his rights.

This may seem plausible enough in the given cases, but any discomfort about the consequences of this principle (in, say, the case of abortion) may signal that it is not a correct hypothesis regarding the presumed connection between rights and desires. But mere discomfort is not sufficient to remove the principle from contention or show the argument to be unsound. What is wanted is a counter-example that would in turn point the way towards a more adequate principle.

The principle in question is, however, easier to dispute than a mere analogy. We know exactly what would be formally required to refute premise (A-1) because we know formally what a counter-example would look like, namely, a case in which we could agree that: For some person A and B and some action X, B's right was indeed violated by A's doing X, even though it was not the case that B wanted A not to do X --- say, a case where B in fact wants A to do X but A's doing X is nonetheless a violation of B's right.

By analogy, it is easier to test a specific hypothesis than it is to argue with vague hand-waving. The more specific the hypothesis/principle regarding the conditions to be investigated, the easier it is to test, the easier it is to see what would count as confirming or disconfirming evidence. The effort at formulating hypotheses/principles is simply a way of making more explicit what we want to investigate—whether in science, ethics, literary interpretation, whatever.

In posing the following putative counter-examples I am in effect conducting a thought experiment by which to advance alternative hypotheses regarding the presumed connection between rights and desires. Consider:

B hates A with a passion and wishes for any excuse to do A in.
A one day viciously assaults B with every apparent intent of killing B. B successfully defends himself, killing A in the process — and thinking all the while that, notwithstanding his fear for his life, he never wanted anything more than to be so viciously attacked by A as to remove all qualms about killing him.

(Are none of B's rights violated by A's murderously attacking him?)
B is a child of nine months who has inherited a large estate. Of course, B knows nothing of wills or estates and consequently has no desires respecting what anyone does with her estate. A is the trustee of B's estate and manages with a bit of illegal but clever finesse to steal considerable sums from same.

(Are none of B's rights violated?)

To the extent that we suspect that rights are indeed violated in either case we want a reformulation of the original principle (A-1), one that better explicates and renders consistent our judgments about all the cases now before us (while perhaps leaving the issue in the abortion case, the case at issue, open). The following principle would at least accommodate our presumed observation about the original paradigm case and would be consistent with our presumed observations about the putative counter-examples (while leaving the abortion issue open). This principle thus provides a better fit with all the cases before us and, to this extent, a more plausible alternative hypothesis respecting the presumed violation or non-violation of rights in those cases:

Revised Principle (A-1*):

Express or tacit consent is a sufficient condition for the waiving or non-violation of a right. If B expressed or otherwise gave consent (perhaps because he lacked certain desires or concerns), then A could cross B's property, or drink his beer, or whatever without violating any of B's rights.

We might also try here to construct a more comprehensive principle, a more complete account of our sense that while rights are not violated in the original paradigm instance(s), rights are indeed violated in the putative counter-example cases. Perhaps we have a sense that some factors besides or other than the presence of certain desires are necessary or sufficient to the violation of a right. Can we construct a plausible and perspicuous principle to such effect? Were we to give it a shot, using any of the following elements, suitably quantified and connected, we would be advancing the inquiry after the fashion of Socratic dialectic or the cycle of empirical hypothesis testing/revision.
Revised Principle (A-1**):

B's rights are/are not violated by A's doing X
B has a/has no right against A that A not do X
B does/does not consent to A's doing X
B has an/has no 'interest' in A's not doing X

(One might reflect here if rights and their violation are not more appropriately connected with our 'interests' than with desires.)

To know just how an alternative principle like (A-1*) or (A-1***) applies in the given cases we may want more facts, as well as further definition of key terms like 'consent' or 'interest.' And the mere fact that such a principle renders plausible (or neutral) but in any case consistent judgments among the given cases does not mean that the principle is indefeasible. But it does put us onto some new notions (like consent, interest) that may play important roles in the analysis of rights and their violation.

We have come far enough in this dialectical foray to make a telling strategic observation about the original line of argument, supposing that we wish now to reject the original principle (A-1), to wit: the revised principle (A-1*) respecting the violation of rights would not be serviceable in the original argument; hence, this line of pro-abortion argument is now at a loss for philosophic grounding. This is apparent as much from our formal as from our dialectical analysis of this line of argument, so far as the correspondingly revised argument is clearly invalid:

(A-1*) For any things A and B and any action X,

If B somehow consents to A's doing X, then
A does not violate any of B's rights by doing X.

(A-2) No fetus wants anyone not to fatally abort it.

Therefore, no one violates a fetus' right to life by fatally aborting it.

We could of course make the argument valid by adding a premise like:

(A-3) For any A etc. . .

If it's not the case that B wants A not to do X,
then B consents to A's doing X.

But, even without resort to any particular counter-example, this premise seems obviously
to violate our intuitions about what constitutes consent. If there's any question, counterexamples should be found.

If one is nonetheless convinced that abortion violates no rights of a fetus (or that, further, it is permissible), he apparently must -- for the sake of plausibility and philosophic grounding -- find grounds other than (A-1) or (B-1) for so doing. And if one wants still to appeal to certain incapacities of the fetus in support of abortion, as in premise (A-2), he evidently must -- for the sake of validity -- appeal to some principle other than our reformulations of (A-1). He has, in any event, to start anew. In the meantime, he and we have presumably learned some interesting things about the raw intuitions and observations that originally motivated this line of argument. Critical analysis and counter-example have at least served as vehicles for inquiry and discovery. The original observation about property rights is perhaps now better explained, albeit not in a way that saves the original argument.
5. SAMPLE HEURISTICS: Counter-Example as Thought Experiment

The counter example is a venerable strategem in the history of Western philosophy; it is, after all, the trade-mark of Socrates and the Socratic method. Counter-example is the locomotion of the more Socratic of the Platonic dialogues.

Counter examples, while venerable devices, have also given philosophy a bad rep. To many cynical observers of the contemporary philosophic scene, counter-example is too much the trade-mark of analytic philosophers, nit-pickers who make it a point of professional pride to gainsay the earnest deliverances of their colleagues. The popular image is often one of a professional smart-ass. This is, often enough, students' impression of the classical paradigm himself, Socrates.

A classic anecdote: The nervous young candidate stands before his audience of senior scholars at a major eastern university. He introduces his thesis, some abstruse thing-a-ma-gig in the philosophy of language, with a seemingly plausible observation: Curious, is it not, that all known languages employ double negations to affirm, but none that we know resort to double affirmatives to deny? From the back of the audience comes a loud, disdainful drawl: Yeah, yeah!

Refuted — nay, devasted — in a single shot! A neonate career crushed in a single, deft blow! That counter-example will live forever; the candidate was dead in his tracks.

Good counter-example men are the gunslingers of our philosophical frontiers. Counter-examples are to the history of modern philosophy what singular, revolutionary discoveries are to the history of modern science. In science we learn of 'laws'; in philosophy we learn of the law-breakers — the famous exceptions that disproved the rules.

Refutation by counter-example has its appeal. It tends to be easier to come by than proof positive. It is more decisive, often more elegant and more dramatic. In the murky domains of metaphysics and values, disproof may be better than no proof. But, like put downs, refutations can be cheap shots. Yet the appeal is obvious: Refutation is power.

The danger is obvious too: that the point and proper business of philosophy be confused with its most salient and accessible achievements: 'proofs' of what's false. Socrates taught that what's true is ever elusive; he also seemed to teach, by example, that what's false is easy prey. 'Whatever may be the practical value of a true philosophy,' Mill intones, 'it is
hardly possible to exaggerate the mischiefs of a false one.' What's false may well be a
worthy target and not always an easy mark, but the virtue and ingenuity of the venerable
counter-example hardly lies in its negative results.

If proof of what's false were the be-all and end-all, the game plan and end-game of
counter-example, Plato would have written a compendium of conjectures and refutations
rather than dialogues. While the outcome, particularly of the early 'Socratic' dialogues,
seems relentlessly negative, we like to think that we know better.

Students, however, may not; and they may be forgiven if they find the art of counter-
example superficially fascinating but deeply demoralizing. Student papers invariably regard
'Socratic method' as tantamount to refutation. And why not? Who ever came away from
a Socratic dialogue with an apodictic vision of the True, the Beautiful, or the Right?

What we think we know better is that counter-example is merely an engine of inquiry.
This is hard to teach. To do so requires that we help the student see and advance beyond
the end-product of the Socratic dialogue -- proof of what's false, doubt if not despair
-- to internalize the dialectical process that the dialogue dramatizes, that animates the
inquiry.

Textbooks tell us that the dialogues of Plato are the objective correlatives of Platonic
dialectic, dramatizations of the inquisitorial struggle that we each need to internalize in our
individual and communal gropings after truth, beauty, wisdom. What the textbooks don't tell
us is how this is done, or how -- proof failing and disproof prevailing -- anything
approximating the truth can be discovered in normative affairs.

One ambition of WARRANT is to help students internalize the dialectical process.
Counter-example is one singularly portentious and pregnant strategem in dialectic. There
are three aspects of counter-example that we will address, teach, model, and exploit using
WARRANT:

1. *What they're good for:* The constructive as well as refutative function of
counter examples in critical inquiry, including counter-example as

   a. A heuristic for *invention*, for thought experiment, for advancing the
      process of critical inquiry;

   b. A heuristic for *audience-sensitivity*, for engendering audience-based
      thinking and writing (keeping one's audience, its presuppositions and
      evidentiary needs clearly in mind) and to help overcome ego-centric,
      writer-based thinking (preoccupied with one's own ideas and merely
      subjective perspectives).

2. *How you find and deploy them:* Heuristics for inventing counter examples,
   for discovering evidence, as it were, in normative inquiry.
3. What makes them count: What makes a counter example count as counter
evidence? What are the roots, the sources of a counter example's force?

The third issue — Why counter examples count — is intimately enough related to the
other two that we will deal with it in those contexts rather than separately.

5.1. Counter Examples as Inventional Heuristics for Critical Reasoning

Counter-example may be the game of philosophers who would be kings, but it is also a
prosaic ploy, the common property of any who deploy common sense.

Someone spouts that women aren't objective enough to be fit for high political office.
What about Sandra Day O'Connor? comes the reply. Counter example is as commonplace
as generalization.

Nothing remarkable or mysterious is involved where publicly observable examples are used
to counter generalizations about matters of observable 'fact'.

What is less clear is how counter-example is deployed in normative disputes: to what
effect, with what authority can counter instances be given in disputes about norms and
values?

The pragmatist takes heart from practice: Where there's a well-established practice,
there's a way. Even in normative affairs, and despite our skeptical airs, examples are
commonly employed and acknowledged by common sense as correctives to normative
generalization — just as if there were a fact of the matter. Just as if value judgments
could admit of falsity, which evidently implies that they also admit of some relative
semblance of truth or plausibility.

The pragmatist observes that we act as if there were some standard of truth and falsity
in normative affairs, if only because we do deploy and acknowledge counter examples to
normative claims as if this activity meant something. Moreover, we act on our conclusions,
we constrain our own and others' behavior accordingly, and with tolerable confidence, as if
we were justified in this judgmental circumspection and intervention.

It behooves us to look closely at our practice, for insight into how it is possible. If
fancy, high-flown theories of justification can be invoked, fine; meantime we need to
understand how it's possible to proceed.

The classical model provided by Socrates is as instructive as any. Socrates was fond of
stopping people in the midst of their business and asking embarrassing questions about what they thought they were about. He had a special fascination for normative issues.

Are you about to bring action against your own father for impiety? This is fascinating. You must, then, have a notion of what this good thing, piety, is. Tell me, please. Give me your definition.

This is a set up. Woe the ingenuous interlocutor who sallies forth with his definition. We know he's begging for come-uppance. We know an earnest definition will be offered. We can imagine the heavens parting and, from on high, the inevitable rebuke to human hubris, a resounding Yeah, yeah!

If the point of the Socratic set up is not put down, what is it? Take the case of an initial definition of justice or the right offered at the beginning of Plato's Republic. It is guessed that justice is giving to each his due. This is surely a good guess: We can think of countless confirming instances, cases where the right thing to do is to give what is due. This definition fits many imaginable cases; it's plausible. If I've lent you my gun for hunting, it is still mine. If I want it back, the gun is my due. It would only be right to give it back to me on demand. If a perfect score on the exam merits an A and I get a perfect score, I am due an A and it would only be right to give me an A.

What's going on here, where we can acknowledge with fair confidence that we know what's right and what's wrong (to withhold the gun or the A)? We recognize certain norms -- perfect scores merit A's, whatever -- that have proved to be rather useful and agreeable; we share certain general conceptions of what counts as conformity to these norms; and we are consequently able to agree to the disposition of certain cases of what is right or wrong on these bases.

A definition strikes us as plausible so far as it harmonizes with our shared norms, concepts, and practice -- which are shared partly because our mutual if tacit compliance resonates with agreeable consequences, suits our common purposes. A definition causes us to attend to, to be impressed with some common sense we have of our tacit but agreeable conventions -- much as a general observation about observable physical reality causes us to tap into our store of experience for the resonance or dissonance that signals either confirmation or blocks on some contrary instance.

Are the November leaves in Vermont (always) glorious? Are (all) women incapable of objectivity? Do (no) languages employ double affirmatives to deny? Is it (always) right to give a person her due?
We may well have only a vague and slippery sense of what we mean by *glorious*, *objective*, *right*, *just*, whatever; when invited, we may at best have only a good guess about what we mean; we may have imperfect recall about what our 'observations' have been.

But, when a definition or general observation is offered and some chord is struck, we at least have an inkling, a guess, a notion, an impression, a sense, an intuition — of two things: how that observation squares with our own individual, *intra-*subjective frame of reference; and how it is likely to square with some *inter-*subjective frame of reference, some *common* sense of the matter.

Some definitions and observations will leave us cold, where we have no language or experience to match. But where there is resonance or dissonance, however vague, we've tapped a store of data, of givens, of experience and observation that can be further explored and articulated; we're in touch with something bigger than the present moment; we're generating guesses about a world of experience and convention beyond our present conscious horizon.

Can we not nod in assent with Socrates' interlocutors and agree that the notion is plausible: justice is giving to each his due, it's only right to give a person what he merits or owns? If we can, we're in touch with some common sense, however vague and elusive, some common understanding that we can then explore further. We have, as it were, a hypothesis to test about what further fishing will bring up from our reservoir of shared notions and experience.

It may be that the best we can do after this fashion is to explore where we do and do not agree, and count as a mere approximation to the truth whatever we can expressly agree about. This may not be a satisfying outcome, but it does allow us to proceed; it is a sufficient condition for advancing the inquiry.

Regarding our definitions and normative judgments as guesses — hypotheses, say, about what we or others will find on further fishing expeditions in the langorous lagoon of our tacit consciousness — has its limitations. But let's see how far the analogy might take us in demystifying the counter-example game.

We have a hypothesis before us: that giving each his due will be found to be the right thing to do. Socrates introduces a problematic piece of data: Consider the case of the borrowed weapon. I have lent you my gun for hunting. I show up at your doorstep demanding that you give it back to me. I am visibly distraught, mad with jealousy, imagining that my wife is in love with another man. You know that this is nonsense, a
misunderstanding straight out of a Mozart opera. But I want to kill the other man. I want to kill my wife. I want to kill myself. I'm raving. Ah, you notice too, I'm raging drunk. What, now, is the right thing to do? Give me my due, my gun?

We are expected to demur. If we confidently observe that in this case it would not be right for you to give me my gun, then we seem to have found an instance in which our definition of justice does not hold. And we must conclude that our hypothesis is, as it stands, incorrect.

Now, the point of this exercise in hypothesis testing cannot be taken to be simply the dismissal, the rejection of our hypothesis. Strictly speaking, the proposition that it is always right to give a person his due may be found 'false.' But at this point in our reflection, it's unlikely that anyone really has in mind such an unqualified, rigid criterion of rectitude. Socrates example shows that it's possible to imagine cases such that it isn't always right to give a person his due under just any circumstance. But who would have thought otherwise?

The force of Socrates example may be counter to complacent acceptance of the definition of 'justice' originally offered and simplistically construed. But so what? Something like it may still be a plausible contender for our assent. Students will readily point out at this point that the definition is ambiguous: Does it really mean always and invariably? Does right mean permissible or, rather, obligatory? If the former, well, we wouldn't take it seriously perhaps. If the latter, then we really have two issues to decide and the matter isn't settled.

So what is the force and utility of Socrates' example? At least this: Whether or not it's taken to count decisively against a given definition of 'justice,' we have already reformulated our sense of the issue. We've tapped our store of intuition on the matter and articulated further conditions and possible meanings for 'justice.' We can now say that we wouldn't take a given rigid definition of justice seriously, but only because that rigid sense has been made explicit, forced out by Socrates' example. We have, in any case, advanced, if we think that Socrates' example shows anything at all about what we think is involved in the notion of what's right.

We haven't advanced very far, to be sure, but enough to know that there's more to our notions of right or justice than first met the eye. What have we learned? Something more about our notions, ground we share. This is the least we would expect from argument and inquiry, and perhaps the best we can expect (although that certainly remains to be seen).
The metaphors that quite naturally crop up here — we talk quite naturally about what we observe about Socrates' case, about what remains to be seen — are telling: the model of perceptual observation and hypothesis-testing is a compelling and natural analogy. Analogous at least in one respect: there is an inter-subjective dimension to what we 'observe' or 'see' in the give-and-take of the counter-example game.

A definition is on the table, we find it plausible: that is, it fits any number of cases where we think and could agree that giving someone his due is the right thing to do. Lest we be tempted to think that this is always or invariably the case, Socrates offers us putative evidence to the contrary. Where did he find this putative evidence? He made it up, pulled it out of his head, told a story, fabricated a fantasy. Its source was, on the one hand, quite subjective.

But, on the other hand, it is a story, a scenario we can all 'relate to,' one that any of us might have concocted to the same effect: to generate discomfort with the idea that it's invariably right to give a person his due on demand. Which is to say that the observation made about this fictional or hypothetical case is somehow accessible to each of us. Nevermind whose imagination gave subjective birth to it, it's a case open to inter-subjective examination. We can each appreciate and share the observation, just as, in some analogous sense, we could each turn to the last page of this document to gainsay the claim that it is 87 pages long.

The effect and utility of Socrates' example, a putative counter example, is not so much that it allows us to reject a definition, as that it provokes us to look further and discover more than we may have seen at first glance, when the definition in question was first offered. It is of no account to say that we knew all along that the definition offered was inadequate, because what's of interest (in an argument or inquiry) is what we know or can assert and defend explicitly. Until we've said and shared what we think we know or have known all along, we've, literally, nothing to show for all our supposed knowledge. And that is the point and necessity of critical thinking/reading/writing, is it not -- to enhance the clarity and scope of what we think we know or can agree to affirm?

In normative matters, the knowledge and plausible beliefs in question happen to lie in the often murky reservoir of our collective experience, tacit conventions, and common sense and require a lot of dredging up. Pragmatists would say that it's no different in so-called factual matters; it's just that many facts seem to require much less dredging, and less complex (or more habitual) conventions of agreement.

The source of counter examples and of their force lies close to hand: our own subjective observation, inter-subjectively confirmed. Counter-example is a process of
searching one's imagination or experience for observational instances about which to rally
the observations of others. Counter examples work only so far as others can see the
same lessons in them as their authors. As with perceptual observations: sense perceptions
are radically private, subjective phenomena; perceptual observations acquire 'objective' status
only so far as they admit of inter-subjective confirmation. Just how this confirmation
business works is not obvious, but neither is it hopelessly unfamiliar. We do somehow
manage it, to a point, everyday, in the realms of value as well as fact. . . . it is rather
the essence of our investigation that we do not seek to learn anything new by it. We
want to understand something that is already in plain view. For this is what we seem
in some sense not to understand. (L. Wittgenstein, Philosophical Investigations, a propos
of many philosophical investigations.)

Whether the process of invention is unconscious and purely intuitive or highly deliberate
and artificial (like the design of an experiment), the process of counter-example must have
'in mind' the likely experience, perspectives, and convictions of others, the audience whose
own confirming observations the counter example is meant to invite or evoke. Else the
inventional process is — and will be judged — pure whimsy. The imagination engaged in
or engaged by counter-example is perforce an other-regarding, audience-oriented
imagination.

If there is method to the invention of counter examples, there are methodical aids to
make the imagination more inquisitive and sensitive respecting the commonalities of
experience and convention that make communication itself possible.

5.2. Heuristics for Inventing / Deploying Counter Examples

The invention or deployment of counter examples is no more mysterious than the
invention or deployment of examples and analogies generally, although it may require more
precision at times. It is, in effect, an experimental process, albeit one that, in normative
inquiry, can take place in thought: a thought experiment, as it were -- or, in more
pedantic terms, a gedanken experiment.

As with experiments with more publicly observable apparatus and phenomena, a thought
experiment attempts to manipulate the conditions of a situation in order to test for certain
consequences. In a thought experiment, the situation may be a figment of imagination, the
conditions manipulated may be abstractions from reality, and the consequences or results
may be purely logical; but the game plan is analogous to the experimental manipulation of
physical, perceptually observable phenomena: certain factors are controlled and held
constant, so that others can be varied to see what results.
In an experiment, one has a notion of what he wants to learn or prove. We need to know, in effect, what are to be the independent and dependent variables. Suppose we, like Socrates, want to test the plausibility of the preferred definition of *justice* or the *right*. Suppose we want to try to show that giving someone his due can be wrong.

Nevermind *why* it might be wrong; we may not know why or even *that* it is, although we may well have an inkling. For example, we may suspect that giving someone his due is only one way of respecting his interests that in certain circumstances is inconsistent with safeguarding those interests. That is, there may be a conflict between the principle that enjoins us to respect the interests of others and the principle that requires that we give each his due. We may think the former takes priority over the latter. But we may be only vaguely aware of these considerations, only vaguely uncomfortable with the original definition/principle as stated.

Where the abstract reasons for discomfort elude us, a concrete case can help crystalize them. In a case like Socrates', where giving someone his due may cost him his wife, liberty, and even his own life—presumably contrary to his own considered preferences—we may feel strongly that it's wrong—on balance, a greater wrong than the alternative—to give him his weapon back.

In searching for a case to crystalize our doubts we can let our feelings be our guide, since we intend only to follow them for experimental purposes, to see what additional, possibly relevant factors we can dredge up out of our imagination, to observe how these factors affect the case.

The *reason* that it's wrong in some case to give someone his due need not be identified for purposes of thinking up a counter example to the principle *Always give each his due*. Indeed, the function of counter examples can be to serve as vehicles, heuristic aids for experimenting with different cases in order to discover new factors in a moral equation: Just try to think of a case where it would evidently be wrong to give someone his due.

Let your imagination play the field; just be sure to keep one factor constant: let it be a case where it's clear (would be clear to anyone) that the person is due the item in question. Don't worry about why exactly it would be wrong to hand over the item. Let your discomfort with the idea of handing over the item be your guide. When you have a case in which you would clearly feel hesitant to hand over the item due on moral grounds, and in which you could well expect others to concur and not blame you for hesitating, ask: What it is about that case that makes you hesitate?

Then explore the possible reasons for hesitating. Ask which reasons you would feel
most comfortable giving others for refusing to hand over the item. Put yourself in a concrete situation: A friend asks you for the keys to his car that he gave you earlier to get more beer for the party. Your friend is now wildly drunk. Etc., etc. In trying to invent reasons for refusing his demand, you're effectively searching after more adequate principles for assessing what should be done, principles that are more satisfactory than *Always give each his due*. The reasons allowed by the principle must be ones that you expect others would accept from you, and ones that you would accept from others.

In this way, the counter instance -- say, the case of the drunk friend -- not only provides evidence *against* the adequacy of the original principle, but motivates inquiry and insight into relevant factors that this principle left out of account. Adducng a counter example to test the adequacy of a principle, a hypothesis regarding our moral notions, *impli#ates* additional factors that we need take into account and thereby *impli#es* a new or revised principle/hypothesis (which can in turn be tested against further counter examples). Counter-example is thus not only refutative, but *inventive* of further 'experiment' and inquiry.

But just as putative counter examples can give us clues for finding more adequate principles/definitions/hypotheses, so can the proposition under interrogation provide clues for generating counter examples.

In attempting to generate a counter example to some definition, principle or normative hypothesis, we may encounter ambiguities. The attempt to test the principle against putative counter examples may gives us our first indication that the target principle is unclearly formulated.

One telling question to ask is: What would it take to falsify the statement?

Consider:

(1) All bachelors are male

Whether we agree with the proposition or not (one would, of course, be inclined to agree if he thought a bachelor, by definition, to be an unmarried male), we can still ask what it would take to falsify it: Find a person whom we affirm is a bachelor but who is *not* male. This, by definition, is not a logical possibility: being male is presumably a necessary condition of being a bachelor. This case is deceptively simple. The *presumption* is so obvious as to go without saying.

However, consider:

(2) All unmarried males are bachelors.
This may seem, if anything, more acceptable than the previous statement, because it seems more complete: being unmarried is, by definition, also part of being a bachelor.

But (2) is false (or, at least, not precisely true). How could we discover or show this? Apply our heuristic: What would it take to falsify (2)? We take our clue from the statement in question: Find a person whom we affirm is male and unmarried but affirmatively not a bachelor. Where do we look? In what city, county or country?

Clearly, we need look imaginatively to our own store of experience, letting the logical features of the desired case be our guide. We know what basic features the case, a putative counter example, must have: we thereby limit the search space in our imagination to males and look for a male who is unmarried but definitely not a bachelor. We're probably confining our search to male humans. The statement may imply but does not expressly demand this. But let's allow this imprecision: unmarried male fish and other non-humans we discount. Wanted: A male human, who is unmarried, but would not be regarded a bachelor. . . . ?

What about a two-year-old male child? Certainly there are no two-year-old bachelors. If this is nit-picky, the statement is at least shown to be imprecise. It serves to illustrate the procedure: one can at least parse the case, specify the conditions one needs to satisfy for falsification. In falsifying (2) we discover the need to define bachelor more precisely, as does the dictionary, as an unmarried man, a male of marrying age.

This may seem a trivial result, perhaps because the statement is of no consequence. We can imagine contexts of dispute (legal, ethical) where such oversights are worth detecting and correcting. The exercise would be similar: Think of a case where a similar technicality has more momentous implications. The heuristic is also similar: A case where a point of definition is taken for granted but not spelled out, which, if misconstrued, could have serious consequences.

How about a case in the basic issue of what has a right to life? Consider the statement:

(3) Living things have a right to life.

Does this mean:

(3a) All living things have a right to life, life itself being sacred?

Or:

(3b) Only living things have a right to life?
(3b) seems safe and rather unininteresting: what's the use to claim a right to continued living for something that isn't living? And who would want to question it? (3a) is more controversial: is it true or plausible?

(3a) is true or plausible only so far as it's safe from counter-example. To test it, we ask: Can we think of a case of a living thing that we are confident should not be extended a right to life? Easily: cancer cells, viruses, hair follicles, finger-nail cells. . . . Cases are countless; the statement careless: if taken at its word, the principle would have absurd consequences.

Statement (3) is still a pretty simple-minded example. But the method is the message here, and (3) illustrates a method for framing counter examples: Specify the conditions for falsifying the statement in question and you have the features required in a counter example; this limits your search space and stimulates the imagination.

A second heuristic is helpful for deciding whether or not you've found a counter example and for fleshing it out: Not only must you be convinced by the case, but you need ask whether others would be convinced and have reason to be convinced.

This is a rather indeterminate test, but better than no constraint whatsoever on what you allow to count in evidence. It requires a bit of role reversal with your audience.

Students will often generate counter examples out of real cases from their own personal experience where the relevant features of the case are unknown and, so, un compelling to others. But haven't we allowed that we can mine our own experience and imagination in generating counter examples? Sure, but not heedless of the perspective, experience and information needed by others who must confirm our observations.

To take a more difficult case, suppose the issue is whether paternalism (interference in another's affairs or action in order to prevent harm to the person or to prevent his doing harm to himself) might ever be justified. Suppose we have before us a principle that holds that paternalism is justified on certain conditions:

(4) Coercive interference with a person A is justified

when [nevermind only when]

(i) A is under duress or otherwise incompetent to assess the consequences of his action

(ii) A's action will prove seriously harmful to A

(iii) We have good reason to presume that A would consent to our interference with his action or be glad for it,
Condition (iii) is similar to the justification provided by so-called Ulysses contracts: consent to constraint in the event one becomes unable to consent under some predictable duress (like the Sirens), on the basis of which one presumes that this consent will be retrospectively given once one's aberrant state of mind has passed. The conditions for such interference -- for a person's own good, but against his will -- are very problematic, and momentous in medical practice, education, child rearing, suicide intervention, and countless other contexts.

Specifying the criteria for interference is important, but there is also the problem of evidentiary standards for assessing when those criteria are satisfied in any given case. What counts as 'competence,' 'good reason,' 'serious harm,' etc.? These are all matters of degree. Sufficient facts must be given to take their measure.

Counter examples or supportive cases on this sort of issue require judicious attention to relevant detail, for the benefit of the intended audience. Sensitivity to audience, a sense of what sort of 'evidence' or 'observation' would be accessible from some others' point of view, is required to calibrate and compose the story one tells by way of counter-example.

Let's see how our first heuristic readily proves insufficient; then we'll illustrate briefly the sort of additional heuristic exercises Warrant would introduce to stimulate greater sensitivity to audience and the demand for inter-subjectively accessible evidence.

Applying our first heuristic, to test the tenability of (4), we look for a putative counter example with these features: A case where conditions (i), (ii), and (iii) are clearly met, but where we are nonetheless moved to say--and could expect others to be moved to say-- that paternalistic interference was not justified.

Here it will not do for the student to simply posit the case of some friend -- say, Barney. For the obvious reason that we, the audience, don't know what the case was with his friend Barney.

So we suppose that some story is told, some detail offered in evidence. . . . Barney likes to get drunk; when Barney gets drunk he gets maudlin; when Barney gets maudlin he gets suicidal. Once he tried to shoot himself, but his brother interfered and took away his gun. This was clearly not justified, because Barney has never forgiven his brother and still wishes he were dead whenever he gets drunk.

The student may evidently be convinced both that conditions (i) -- (iii) were clearly satisfied
and that the regrettable interference in Barney's suicide was nonetheless not justified. But the facts as told need not convince someone else of this, let alone that principle (4) is therefore an incorrect hypothesis regarding the conditions for justified paternalism.

Clues for fleshing out the further 'evidence' needed can be taken from one's intended audience. It's a cinch that if one has no audience in mind other than one's own applauding intuitions, a compelling case is not apt to be made. It's also a fair hunch that the student, any person, has some good sense of what an audience would want to know about Barney to be persuaded that this was a case of unjustified paternalism:

The student could start by asking himself what he himself would want to know, if he weren't already familiar with Barney's case. And he needs to keep in mind the conditions needed to falsify the principle: it is not enough to show that Barney's case was one of unjustified paternalism; it must be shown that this is so in spite of conditions (i) - (iii) being satisfied. Thus, our first heuristic, keeping in mind what it would take to falsify (4), remains a relevant control on this thought experiment:

The first step would be for the student to ask what he himself would need to know about an anonymous person to be convinced that conditions (i) - (iii) were indeed satisfied. These are the sorts of clues he must provide for his audience in Barney's case.

In our experience, this heuristic of role-reversal can take a student a long way in priming his description of the case for the benefit of his audience, once the student is well practiced in its use. WARRANT would exercise the student in this heuristic by putting the student in the role of audience, posing gradually elaborated cases, and prompting the student to specify what further information or evidence is needed to satisfy the conditions for an effective counter example.

To take Barney's story as a case in point: Would we not need to know, for example, whether Barney wished himself dead in his sober moments? If the true case of Barney does not satisfy the conditions of the principle in this regard, a hypothetical case is wanted, a thought experiment rather than reportage.

WARRANT would provide analogous exercises in the determination of problem cases and the formulation of principles generalized from those cases. Putting the student in the role of needing to know more about a case to make a determination rehearses the student in imagining the sorts of things any person would need to know in such a case.

This exercise takes different forms: asking whether a given principle applies to given cases, and what more is needed to assess whether and to what effect the principle
applies; and asking what determination the student would make in a case, what more he needs to know to make a more confident determination, and what general principle would allow us to dispose of similar cases in similarly acceptable ways, with equal confidence.

Richly provocative examples we've used are paternalistic decisions, right to die decisions, and decisions to grant the use of dialysis machines. The student can be led through a dialectical process of weighing and balancing the importance of different conditions as WARRANT provides or withholds certain data in eliciting the student's assessment of a case.

For example, one might start by supposing there are seven people about to die unless they receive dialysis, but only three dialysis machines. The patients are briefly described by age and sex. WARRANT asks what else the student needs to know to decide who gets the life-saving treatment. Options as to types of information are given, and the cases elaborated accordingly. In the final analysis, the student is asked to assess which from an array of principles best accommodates the student's determination. After comparing his assessments with WARRANT's models, he's asked to formulate a general principle for making determinations of the kind. He's then asked to test this principle against possible counter examples.

Alternately, WARRANT gives different determinations of the cases and asks the student, first, to formulate a principle that would sanction that allocation of treatment, and then to counter-example the principle. He is given model principles and assessments and is asked to formulate a principle for deciding such cases in general. An array of model counter examples is provided, to assure that telling cases have not been overlooked in his formulation of candidate principles. Later critical reading assignments would confront the student with other analyses, and later writing assignments will build on these critical-analytical exercises in turn.

Alternately, the student is asked to consider a general principle and to assess the relative merits of putative counter examples to it, with model assessments provided for comparison. For example, when it's argued that a human fetus is not a person, a common rejoinder is that a fetus has a right to life nonetheless, because it is in any case a potential person. The right to life is here taken to cover and protect the continued existence of potential persons: Something has a right to life if it is a potential person.

There's clearly a problem as to how we ought to construe potential person. We can tease out tacit conditions of the relevant sense of potentiality by counter-example: Positing living entities that in some sense are indeed potential persons but that do not have a serious right to life. In assessing the features of these cases and how or whether they count against the potentiality principle, we get a better idea of the sense and tenability of
candidate potentiality principles. We are also led to question the practical force, the bottom line in what it means to extend something the right to life.

One counterexample advanced in the pro-abortion literature seems calculated to offend; this case poses interesting questions for what makes counterexample compelling. We're asked to imagine a case where an artificial person has been assembled in a laboratory, similar to Dr. Frankenstein's monster. Unlike the Frankenstein case, this artificial would-be person needs no intervention on our part to be 'sparked' into life and consciousness. Rather, the artificial person is in deep-freeze and will come to consciousness—complete with desires and feelings and the requisites of a full adult mental life—if only we do nothing and allow him to thaw. That is, if a certain natural process is allowed simply to take place without interference, this piece of biochemical and plastic artifice will become a living, breathing adult person.

Nevermind how on earth this state of affairs has been managed. (Whether this matters must be discussed.) The question posed is: Is this entity not a potential person? At least as much so as any fetus? The argument presumes so, and concludes that nonetheless we would be perfectly within our rights to grind this meat up for burgers. If this is acceptable, the potential to become a person is not a sufficient condition for having a serious right to life.

This case draws a lot of predictable fire from any audience. The question is whether, logically, it counts as a counterexample—in spite of its (intentionally) off-color composition. Could such a case be constructed that would be logically equivalent but rhetorically more appealing or agreeable? This case tests our ability to assess what features any case must have to gainsay the potentiality principle. This in turn forces the issue of what precisely the conditions of potentiality are meant to be.

Relevant similarities and disimilarities between this bizarre laboratory creature and a fetus need to be delineated, so far as they are both, in some sense(s), potential persons. This highly artificial counterexample is then compared to

1. Another more realistic if futuristic kind of case—that of arbitrary cells of our own bodies that are in the process of growing clones, also potential persons;

2. other real cases and putative counterexamples to the potentiality principle, other potential persons like: an in vitro embryo, a frozen in vitro embryo, and—lower down the developmental scale—zygotes (fertilized human eggs), or human eggs themselves, or—most preposterously—human spermatozoa.

The exercise is to determine what features make any of these cases better or worse counterexamples to the potentiality principle. Relevant critical readings build nicely on this
critical reasoning exercise in the critical assessment of counter examples.

Thus, a variety of complementary heuristic exercises are available for the judicious, reflective invention and deployment of the counter-example strategem.
6. Projected Multi-Disciplinary Uses of WARRANT

As we mentioned in the project proposal, we plan, before the expiration of the funding period, to be using the WARRANT environment in the freshman writing and the freshman and other philosophy courses. However, we also plan to be working with the director of the freshman literature course and the director of the sophomore history course to help them adapt the WARRANT environment for their core (multi-section) courses.

We describe briefly here how we expect teachers of literature and history to use WARRANT in their core courses:

**FRESHMAN LITERATURE.** Many freshman literature courses focus on teaching students "accepted" readings of literary texts. Focusing on critical reading and writing, the freshman literature course at CMU aims to give students articulate methods for constructing (and defending) their own readings so that they may compete for acceptance.

The freshman literature course strives to give students an awareness of the multiple points of view, cultural interests, and biases that can inform a reading of a literary text. It seeks to demonstrate to students the illusions of thinking of reading as a passive, theory-free, activity. On the contrary, it seeks to show that reading is an active thinking and reasoning process, requiring readers to formulate and test hypotheses about their own as well as the author's assumptions in order to construct a reasonable interpretation. It also seeks to show the inextricable ties between literary reading and writing in the sense that every interpretation of a literary text must in subtle ways 'rewrite' that text.

The director of freshman literature thinks WARRANT a unique environment for structuring these educational lessons. He plans to take several readings (short stories and poetry) that he normally uses in the course and to use our critical reading and writing plans, goals, advice, models, etc. as ways to show students that the reading of literature, no less than the reading of expository or argumentative essays, requires careful hypothesis-testing.

He also plans to make use of a facility of WARRANT that we have not yet discussed in detail. That is WARRANT's annotation system. WARRANT will allow the teacher to make annotations (notes) "behind" any word of the text in the activity box (see the mock-up). All a student need do is select an "annotation" option and words with annotations behind them will be shaded. The student will then be able to move a cursor to any shaded word and, with a click, will be able to read the annotation for that word in a pop-up window. The
director of the literature course feels this annotation system will be a very powerful
device for allowing teachers of literature to explain or raise questions about particularly
difficult, challenging, or controversial passages.

**SOPHOMORE HISTORY.** Many history courses focus on teaching students historically
interesting explanations of human events. Focusing on critical reading and writing, the
freshman history course at CMU aims to give students explicit methods for constructing
their own historically interesting explanations.

Commonly buried in a mountain of primary facts, the historian must use sound hypothesis
development and testing strategies to find patterns for interpreting these facts that are
meaningful (or interesting) to the professional historian.

The staff of the sophomore course in social history employs data from surveys on
perceptions of the quality of life taken at different points in the development of middle
class American society in this century. This data is rich in suggestive correlations, and also
fraught with pitfalls (sample bias, etc.)

We will make WARRANT available to the staff of this course for purposes of developing
historiographic reasoning units and critical reading and writing assignments employing
strategies of hypothesis generation and testing in social history.

The history course also makes use of a cross-tab program for elementary cross
(tabulation exercises from which students argue causal hypotheses in their papers. The
cross-tab program is an example of the sort of auxiliary facility that can be called up in
one of WARRANT's windows, juxtaposed with discussion of the context, data, or strategies
for analyzing it in adjacent windows.