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Regular-Mail Address:
c/o Prof. Lorenzo Peña
CSIC—Institute of Philosophy
Pinar 25, E-28006, Madrid, Spain
Fax +341 564 52 52; Voice Tph +341 411 70 60, ext 18

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Prof. Manuel Liz
Facultad de Filosofia
Universidad de La Laguna
Tenerife, Canary Islands
Spain
*** ***
Voice Tph Nr. +3422-603166
Fax Nr. +3422-603102
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ABSTRACTS OF THE PAPERS

TECHNOLOGICAL ESCALATION AND THE EXPLORATION MODEL OF NATURAL SCIENCE
by Nicholas Rescher

(1) Our cognitive competence is well accounted for by our evolutionary niche in the world’s scheme of things. (2) The development of inquiry in natural science is best understood on analogy with exploration — to be sure, not in the geographical mode but rather exploration in nature’s parametric space of such physical quantities as temperature, pressure, and field strength. (3) The technology-mediated exploration at issue here involves an interaction between us humans and nature that becomes increasingly difficult (and expensive) as we move ever farther away from the home base of the accustomed environment of our evolutionary heritage. The course of scientific progress accordingly involves a technological escalation — an ascent to successively higher levels of technological sophistication that is unavoidably required for the production of the requisite observational data.

DEONTICS BETWEEN SEMANTICS AND ONTOLOGY
by Carlos Alarcón Cabrera

As an adjective, the term «Deontic» is traditionally used in the sense of «directive», «normative», «prescriptive», «concerning ought». As a noun, «Deontics» is later introduced by Amedeo G. Conte, referring to the analysis of the theoretical and philosophical foundations of Deontic Logic. Within the wide field of Contian Deontics, I am dealing here with five questions: a) the distinction between «categorical constitutivity» and «hypothetical constitutivity»; b) the typology of the concept of validity; c)
the problem of the pragmatic ambivalence of deontic utterances; d) the conception of repeal as an act of rejection; e) the reinterpretation of the «Is-ought question».

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**COUNTERFACTUALS REVISITED**

*by Joseph S. Fulda*

This paper presents an ontologically leaner, mathematically cleaner, and logically keener explication of counterfactuals and possible worlds than the standard Lewis-Stalnaker account.
TECHNOLOGICAL ESCALATION AND THE EXPLORATION MODEL OF NATURAL SCIENCE

Nicholas Rescher

§0.— SYNOPSIS

(1) Our cognitive competence is well accounted for by our evolutionary niche in the world’s scheme of things. (2) The development of inquiry in natural science is best understood on analogy with exploration — to be sure, not in the geographical mode but rather exploration in nature’s parametric space of such physical quantities as temperature, pressure, and field strength. (3) The technology-mediated exploration at issue here involves an interaction between us humans and nature that becomes increasingly difficult (and expensive) as we move ever farther away from the home base of the accustomed environment of our evolutionary heritage. The course of scientific progress accordingly involves a technological escalation — an ascent to successively higher levels of technological sophistication that is unavoidably required for the production of the requisite observational data.

§1.— ACCOUNTING FOR OUR COGNITIVE COMPETENCE

How is it that we humans are actually so competent in coping in the domain of cognitive complexity? How is it that we possess the intellectual talent to create mathematics, medicine, science, engineering, architecture, literature, and other comparably splendid cognitive disciplines? What explains the immense power of our intellectual capacities?

To be sure, at a level of high generality the answer is relatively straightforward. Basically, we are so intelligent because this is our place in evolution’s scheme of things. Different sorts of creatures have different ecological niches, different specialties that enable them to find their evolutionary way along the corridor of time. Some are highly prolific, some very hard, some swift of foot, some difficult to spot, some extremely timid. Homo sapiens are different. For the evolutionary instrument of our species is intelligence — with everything that this involves in the way of abilities and versatilities. Thus if we weren’t so intelligent, we wouldn’t be here as the anatomical creatures we are. We have all these splendid intellectual capacities because we require them in order to be ourselves.

Of course it’s not all just a matter of fate’s lottery bringing intelligence our way. Evolution’s bio-engineering is the crucial factor. Bees and termites can achieve impressive prodigies of collective effort. But an
insect developed under the aegis of evolution could not become as smart as a man because the information-processing requirements of its lifestyle are too modest to push its physical resources to the development of intelligence.

Intelligence are an inherent concomitant of our physical endowment. Our bodies have many more independently movable parts (more «degrees of freedom») than do those of most other creatures. This circumstance has significant implications. Suppose a system with n switches, each capable of assuming an ON or OFF position. There are then $2^n$ states in which the system can find itself. With n=3 there are only 8 system-states, but with n doubling to 6 there are already 64 states. As a body grows more complex and its configuration takes on more degrees of freedom, the range of alternative possible states expands rapidly (exponentially). Merely keeping track of its actual position is already difficult. To plan ahead is more difficult yet. If there are m possible states which the system can now assume, then when it comes to selecting its next position there are also m choices, and for the next two there are $m^2$ alternatives overall (ignoring unrealizable combinations). So with a two-step planning horizon the 3-state system has 64 alternatives while that 6-state system has 4096. With a mere doubling of states, the planning problem has become complicated by a factor of sixty-four.

The degrees of freedom inherent in variable movement over time are pivotal considerations here. The moment one walks upright and begins to develop the modes of motion that this new posture facilitates — by way of creeping, running, leaping, etc. — one has many more factors of physical movement to manage.

Considerations of this sort render it evident that a vertebrate having a more highly articulated skeleton, with many independently operable bones and bone-complexes, faces vastly greater difficulties in control and manipulation — in what military jargon calls «command and control.» Versatile behavior involves more complex management. Physically more versatile animals have to be smarter simply because they are physically more versatile.

We are driven to devising greater capabilities in information acquisition and processing by the greater demands of the lifestyle of our ecological niche. The complexity of our sophisticated surveillance mechanisms in the context of friend-or-foe identification is an illustration. We can observe at a considerable distance that people are looking at us, discriminating minute differences in eye orientation in this context. The

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1 The human skeleton has some 220 bones, about the same number as a cat when tail bones are excluded. A small monkey has around 120. Of course, what matters for present purposes is independently moving parts. This demotes «thousand leggers» and — thanks to fingers, among other things — takes us out of the cat’s league.
At any given time in evolutionary history, the then-current herbivores tended to have smaller brains than the contemporary carnivores. See Richard Dawkin, *The Blind Watchmaker* (New York: Norton, 1986), p. 190.

The complexities of information management and control pose unrelenting evolutionary demands. To process a large volume of information nature must fit us out with a large brain. A battleship needs more elaborate mechanisms for guidance and governance than a row boat. A department store needs a more elaborate managerial apparatus than a corner grocery. Operating a sophisticated body requires a sophisticated brain. The evolution of the human brain is the story of nature’s struggles to provide the machinery of information management and operative control needed by creatures of increasing physical versatility. A feedback cycle comes into play — a complex body requires a larger brain for command and control, and a larger brain requires a larger body whose operational efficiency in turn places greater demands on that brain for the managerial functions required to provide for survival and the assurance of a posterity. As can be illustrated by comparing the brain weights of different mammalian species, the growing complexities and versatilities of animal bodies involve a physical lifestyle whose difficulties of information processing and management requires increasingly powerful brains. How one makes one’s living matters: insect-eating and fruit-eating monkeys have heavier brains, for their size, than leaf-eating ones do.\(^2\)

Here then is the immediate (and rather trivial) answer to our question: We are as intelligent as we are because that is how we have had to evolve to achieve our niche in nature’s scheme of things. We are so smart because evolution’s bio-engineering needs to provide those smarts for us to achieve and maintain the lifestyle appropriate to our ecological niche.

But there remains the problem of why evolution would take this course. Surely we didn’t need to be *that* smart to outwit the saber toothed tiger or domesticate the sheep. Let us explore this developmental aspect of the matter a little.

The things we have to do to manage our lifestyle must not only be possible for us, they must in general be easy for us (so easy that most of them can be done unthinkingly and even unconsciously). If our problem-solving resources were frequently strained to the limit, often groaning under

\(^2\) At any given time in evolutionary history, the then-current herbivores tended to have smaller brains than the contemporary carnivores. See Richard Dawkin, *The Blind Watchmaker* (New York: Norton, 1986), p. 190.
the weight of difficulty of the problems that they are called on by nature to solve in the interests of our lifestyle, then we just wouldn’t have achieved this modus operandi.

For evolution to do its work, the survival problems that creatures confront have to be by and large easy for the mechanisms at their disposal. And this fundamental principle holds just as true for cognitive as for biological evolution. If cognitive problem-solving were too difficult for our mental resources, we wouldn’t evolve as problem-solving creatures. If we had to go to as great lengths to work out $2+2$ as to extract the cube root of a number, or if it took us as long to discriminate 3- from 4-sided figures as it takes to discriminate between 296 and 297-sided ones, then these sorts of issues would simply remain outside our repertoire. The «average» problems of survival and thriving that are posed by our lifestyle must be of the right level of difficulty for us — that is, they must be relatively easy. And this calls for excess capacity. All of the «ordinary» problems of one’s mode of life must be solvable quickly in real time — and with enough idle capacity left over to cope with the unusual.

A brain that is able to do the necessary things when and as needed to sustain the life of a complex and versatile creature will remain underutilized much of the time. To cope during times of peak demand, it will need to have a great deal of excess capacity to spare for other issues at slack times. And so, any brain powerful enough to accomplish those occasionally necessary tasks must have the excess capacity to pursue at most normal times various challenging projects that have nothing whatsoever to do with survival.

These deliberations resolve the objection that evolution cannot explain our intellectual capacities because we are a lot smarter than evolution demands — that, after all, nature does not quiz us on higher mathematics or theoretical physics. What is being maintained here is not the absurd contention that such disciplines as such are somehow an evolutionary requisite. All that is being said is that the capacities and abilities that make such enterprises possible are evolutionarily advantageous — that evolution equips us with a reserve capacity that makes them possible as a side-benefit. The point is that an intelligent creature whose capacities do not allow of development in these abstract directions just isn’t smart enough to pass evolution’s examinations in other matters — that is, would not be able to make intelligence its evolutionary specialty after all.

The brain/computer analogy once again proves helpful in this connection. Very different things can be at stake with being «simple»: the simplicity of «hardware» involved with comparatively less complex computers is one sort of thing, while the simplicity of «software» at issue with comparatively less complex programs is something quite different. And there are clearly tradeoffs here: solving problems of the same level of difficulty is generally easier to program on more sophisticated (more complex) computing machines. Something of an inverse relationship
obtains: greater machine complication can make the actual use of the machine easier and less demanding. And this circumstance is reflected in the fact that a creature which makes its evolutionary way in the world by intelligence requires a rather powerful brain.

To be sure, evolution is not, in general, over-generous. For example, evolution will not develop creatures whose running-speed is vastly greater than what is needed to escape their predators, to catch their prey, or to realize some other such strictly utilitarian objective. But intelligence and its works are a clear exception to this general rule, owing to its self-catalyzing nature. With cognitive artifacts as with many physical artifacts, the character of the issues prevents a holding back; when one can do a little with calculation or with information processing, one can in principle do a great deal. Once evolution opens the door to intelligence, it gets «the run of the house.» When bio-design takes the route of intelligence to secure an evolutionary advantage for a creature, it embarks on a slippery slope. Having started along this road, there is no easy and early stop. For once a species embarks on intelligence as its instrument for coping with nature, then the pressure of species-internal competition enters as a hot-house forcing process. Intelligence itself becomes a goad to further development simply because intelligence is, as it were, developmentally self-energizing.

The result of the preceding deliberations is straight-forward. Intelligence is the evolutionary specialty of homo sapiens. If we were markedly less smart than we in fact are, we would not have been able to survive. Or rather, more accurately, we would not have been able to develop into the sort of creatures we have become. Intelligence constitutes the characteristic specialty that provides the comparative advantage which has enabled our species to make its evolutionary way into this world’s scheme of things. We are so smart because this is necessary for us to be here at all.\(^3\)

In the course of deploying our intelligence on the world about us we arrived ultimately at the project of natural science. Gradually our natural curiosity got the better of us and we began to push the project of inquiry beyond the level of actual need.

§2. THE EXPLORATION MODEL OF SCIENTIFIC INQUIRY

In cultivating scientific inquiry, we scan nature for interesting phenomena and grope about for the explanatory useful regularities they may suggest. As a fundamentally inductive process, scientific theorizing calls for devising the least complex theory structure capable of accommodating the available data. At each stage we try to embed the phenomena and their regularities within the simplest (cognitively most efficient) explanatory structure able to answer our questions about the world and to guide our

\(^3\) The issues of this section are treated in greater detail in the author’s *A Useful Inheritance* (Savage MD: Rowman & Littlefield, 1990).
interactions in it. But step by step as the process advances, we are driven to
further, ever greater demands arise which can be met only with an
increasingly more powerful technology of data exploration and management.

In theory, a prospect of unending scientific progress lies before us. But its practical realization is something else again. One of the most
striking and important facts about scientific research is that the ongoing
resolution of significant new questions faces increasingly high demands for
the generation and cognitive exploitation of data. Though the veins of
cognitive gold run on, they become increasingly difficult — and expensive
— to mine.

In developing natural science, we humans began by exploring the
world in our own locality, not just our spatial neighborhood but — more
far-reachingingly — our parametric neighborhood in the space of physical
variables such as temperature, pressure, and electric charge. Near the «home
base» of the state of things in our accustomed natural environment, we can
operate with relative ease and freedom — thanks to the evolutionary
attunement of our sensory and cognitive apparatus — in scanning nature
with our unassisted senses for data regarding its modes of operation. But in
due course we accomplish everything that can be managed by these
straightforward means. To do more, we have to extend our probes into
nature more deeply, deploying increasing technical sophistication to achieve
more and more demanding levels of interactive capability. We have to move
ever further away from our evolutionary home base in nature toward
increasingly remote observational frontiers. From the egocentric standpoint
of our local region of parameter space, we journey ever more distantly
outward to explore nature’s various parametric dimensions in the search for
cognitively significant phenomena.

The appropriate picture is not, of course, one of geographical
exploration but rather of physical exploration — and subsequent theoretical
systematization — of phenomena distributed over the parametric space of
the physical quantities spreading out all about us. This approach in terms of
exploration provides a conception of scientific research as a prospecting
search for the new phenomena demanded by significant new scientific
findings. As the range of telescopes, the energy of particle accelerators, the
effectiveness of low-temperature instrumentation, the potency of
pressurization equipment, the power of vacuum-creating contrivances, and
the accuracy of measurement apparatus increases — that is, as our capacity
to move about in the parametric space of the physical world is enhanced —
new phenomena come into view. After the major findings accessible via the
data of a given level of technological sophistication have been achieved,

Further major findings become realizable only when one ascends to the next
level of sophistication in data-relevant technology. Thus the key to the great
progress of contemporary physics lies in the enormous strides which an ever
more sophisticated scientific technology has made possible through
enlarging the observational and experimental basis of our theoretical
knowledge of natural processes. A homely fishing analogy of Eddington’s is useful here. He saw the experimentalists as akin to a fisherman who trawls nature with the net of his equipment for detection and observation. Now suppose (says Eddington) that a fisherman trawls the seas using a fishnet of two-inch mesh. Then fish of a smaller size will simply go uncaught, and those who analyze the catch will have an incomplete and distorted view of aquatic life. The situation in science is the same. Only by improving our observational means of trawling nature can such imperfections be mitigated.4

This idea of the exploration of parametric space provides a basic model for understanding the mechanism of scientific innovation in mature natural science. New technology increases the range of access within the parametric space of physical processes. Such increased access brings new phenomena to light, and the examination and theoretical accommodation of these phenomena is the basis for growth in our scientific understanding of nature.

§3.— TECHNOLOGICAL ESCALATION: AN ARMS RACE AGAINST NATURE

Natural science is fundamentally empirical, and its advance is critically dependent not on human ingenuity alone but also on the ongoing enhancement of our technologically facilitated interactions with nature. The days are long past when useful scientific data could be had by unaided sensory observation of the ordinary course of nature. Artifice has become an indispensable route to the acquisition and processing of scientifically useful data. The sorts of data on which discovery in natural science nowadays depends can be generated only by technological means. The discoveries of today cannot be made with yesterday’s equipment and techniques. To conduct new experiments, to secure new observations, and to detect new phenomena, an ever more powerful investigative technology is needed.

The pursuit of natural science as we know it embarks us on a literally endless endeavor to improve the range of effective experimental intervention, because only by operating under new and heretofore inaccessible conditions of observational or experimental systemization — attaining extreme temperature, pressure, particle velocity, field strength, and so on — can we realize situations that enable us to put knowledge-expanding hypotheses and theories to the test. As one acute observer has rightly remarked: «Most critical experiments [in physics] planned today, if they had to be constrained within the technology of even ten years ago, would be seriously compromised.»5

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This situation points toward the idea of a «technological level,» corresponding to a certain state-of-the-art in the technology of inquiry in regard to data-generation and processing. This technology of inquiry falls into relatively distinct levels or stages in sophistication — correlatively with successively «later generations» of instrumentation and manipulative machinery, which are generally separated from one another by substantial (roughly, order-of-magnitude) capacity improvements in regard to such information-providing parameters as measurement exactness, data-processing volume, detection sensitivity, high voltages, high or low temperatures, and the like.

Physicists often remark that the development of our understanding of nature moves through successive layers of theoretical sophistication. But scientific progress is clearly no less dependent on continual improvements in strictly technical sophistication:

Some of the most startling technological advances in our time are closely associated with basic research. As compared with 25 years ago, the highest vacuum readily achievable has improved more than a thousand-fold; materials can be manufactured that are 100 times purer; the submicroscopic world can be seen at 10 time higher magnification; the detection of trace impurities is hundred of times more sensitive; the identification of molecular species (as in various forms of chromatography) is immeasurably advanced. These examples are only a small sample.... Fundamental research in physics is crucially dependent on advanced technology, and is becoming more so.

Without an ever-developing technology, scientific progress would cease. The discoveries of today cannot be advanced with yesterday’s instrumentation and techniques. To secure new observations, to test new...
hypotheses, and to detect new phenomena, an ever more powerful technology of inquiry is needed. Scientific progress depends crucially and unavoidably on our technical capability to penetrate into the increasing distant — and increasingly difficult — reaches of the spectrum of physical parameters in order to explore and to explain the ever more remote phenomena encountered there.

The instrumentalities of scientific inquiry can be enhanced not only on the side of theoretical resources but preeminently on the side of technology of observational and experimental intervention. Pioneering scientific research will always operate at the technological frontier. For revealing here further «secrets» nature inexorably exacts a drastically increasing effort in to the acquisition and processing of data. This accounts for the recourse to more and more sophisticated technology for research in natural science.

No doubt, nature is in itself uniform as regards the distribution of its diverse processes across the reaches of parameter space. It does not favor us by clustering them in our accustomed parametric vicinity: significant phenomena do not dry up outside our parochial neighborhood. And phenomenological novelty is seemingly inexhaustible: we can never feel confident that we have got to the bottom of it. Nature always has fresh reserves of phenomena at her disposal, hidden away in those ever more remote regions of paramative space. Successive stages in the technological resources of scientific inquiry accordingly lead us to ever-different views about the nature of things and the character of their laws.

The salient characteristic of this situation is that, once the major findings accessible at a given level of sophistication in data-technology level have been attained, further substantial progress in any given problem area requires ascent to a higher level on the technological scale. Every data-technology level is subject to discovery saturation: once the potential of a given state-of-the-art level has been exploited, not all our piety or wit can lure the technological frontier back to yield further significant returns at this stage. Further substantive findings become realizable only by ascending to the next level of sophistication in data-relevant technology. But the exhaustion of the prospects for data extraction at a given data-technology level does not, of course, bring progress to a stop. Rather, the need for enhanced data forces one to look further and further from man’s familiar «home base» in the parametric space of nature.

The requirement for technological progress to advance scientific knowledge has far-reaching implications for the nature of the enterprise. For the increasing technological demands that are requisite for scientific progress means that each step ahead gets more complex and more expensive as those new parametric regions grow increasingly remote. With the progress of science, nature becomes less and less yielding to the efforts of further inquiry. We are faced with the need to push nature harder and harder to achieve cognitively profitable interactions. The dialectic theory
and experiment carries natural science ever deeper into the range of greater costs. We thus arrive at the phenomenon of technological escalation. The need for new data forces us to look further and further in parametric space. Thus while scientific progress is in principle always possible — there being no absolute or intrinsic limits to significant scientific discovery — the realization of this ongoing prospect demands a continual enhancement in the technological state of the art of data extraction or exploitation. Given that we can only learn about nature by interacting with her, Newton’s third law of countervailing action and reaction becomes a fundamental principle of epistemology. Everything depends on just how and how hard we can push against nature in situations of observational and detectional interaction. As Bacon saw, nature will never tell us more than we can forcibly extract from her with the means of interaction at our disposal. And because this extraction can only be realized by ever deeper probings, this state of affairs has far-reaching implications for the perfectibility of science. The impetus to augment our science demands an unremitting and unending effort to enlarge the domain of effective experimental intervention. That there is «pay dirt» deeper down in the mine avails us only if we can actually dig there. New forces, for example, may well be in the offering, if one able physicist is right:

We are familiar, to varying degrees, with four types of force: gravity, electricity, the strong nuclear force that holds the atomic nucleus together and the weak force that brings about radioactive decay by the emission of electrons.... Yet it would indeed be astonishing if . . . other types of force did not exist. Such other forces could escape out notice because they were too weak to have much distinguishable effect or because they were of such short range that, no matter whether they were weak or not, the effects specifically associated with their range were contained within the objects of the finest scale that our instruments had so far permitted us to probe.8

But, of course, such weak forces would enter into our picture of nature only if our instrumentation were able to detect them. This need for a constant enhancement of scientifically relevant technology lies at the basis of the enormous increase in the human and material resources needed for modern experimental science. Frontier research is true pioneering: what counts is not just doing it but doing it for the first time. Aside from the initial reproduction of claimed results needed to establish the reproducibility of reproducibility of results, repetition in research is in general pointless. As one acute observer has remarked, one can follow the diffusion of scientific technology «from the research desk down to the schoolroom»:

The emanation electroscope was a device invented at the turn of the century to measure the rate at which a gas such as thorium loses its radioactivity. For a number of years it seems to have been used only in the research laboratory. It came into use in instructing graduate students in the mid-1930's, and in college courses by 1949. For the last few years a cheap commercial model

has existed and is beginning to be introduced into high school courses. In a sense, this is a victory for good practice; but it also summarizes the sad state of scientific education to note that in the research laboratory itself the emanation electroscope has long since been removed from the desk to the attic.\(^9\)

In science, as in a technological arms race, one is simply never called on to keep doing what was done before. An ever more challenging task is posed by the constantly *escalating* demands of science for the enhanced data that can only be obtained at the increasingly costly new levels of technological sophistication. One is always forced further up the mountain, ascending to ever higher levels of technological performance — and of expense. As science endeavors to extend its «mastery over nature,» it thereby comes to be involved in a technology-intensive arms race against nature, with all of the practical and economic implications characteristic of such process.

The exploration of nature’s parametric space confronts us with the reality of physical limits: particle velocities in accelerations are limited by the speed of light, temperatures in low temperature research are limited by absolute zero, vacuums are limited by condition of emptiness, temperatures by the cosmic boiling point of the big bang. And such limits amount to resistance barriers. With every step we take towards them every time we move from where we are to 10% closer yet — we find it exponentially more difficult to take yet further steps as the technological demands for further progress grow increasingly massive.

The enormous power, sensitivity, and complexity deployed in present-day experimental science have not been sought for their own sake but rather because the research frontier has moved on into an area where this sophistication is the indispensable requisite of ongoing progress. Nature’s inherent complexity means that in science, as in war, the battles of the present cannot be fought effectively with the armaments of the past.\(^10\)

\begin{center}
Nicholas Rescher
University of Pittsburgh
Department of Philosophy
\end{center}


E-Mail: <Rescher@vms.cis.PITT.EDU>
DEONITCS BETWEEN SEMANTICS AND ONTOLOGY

Carlos Alarcón Cabrera

§1.

The term «Deontics», with its current meaning, constitutes a remarkable contribution to the Philosophy of Normative Language by Amedeo G. Conte. Going back to Aristotle, Conte defines «Deontics» as «theory of ‘Sollen’ qua ‘Sollen’», as «theory of ‘ought’ qua ‘ought’». The same way Metaphysics, as «theory of ‘Sein’ insofar as ‘Sein’», studies Sein in its «constitutive onticity», Deontics studies Sollen in its «constitutive deonticity».¹

Unlike the term «Deontics», the expression «Deontic Logic» was first used before, with its current meaning, by Georg H. von Wright (1951) when he mentioned the deontic modal concepts (what is obligatory, what is permitted, what is forbidden) together with the alethic modal concepts (necessity, possibility, contingency — concepts which are studied in modal logic), the existential modal concepts (universality, existentiality, emptiness — concepts which are studied in the theory of quantifiers) and the epistemic modal concepts (what is verified, what is undecided, what is falsified).²

As an adjective, the term «Deontic» became more common in the philosophical lexicon. As Tecla Mazzarese points out, it was particularly used both in a pragmatic sense and a semantic sense: a) Pragmatically, as a synonym for «directive», «preceptive», «prescriptive», «normative», as opposed to «descriptive», «declarative», «assertive»; b) Semantically, in the sense of «concerning ought», to designate what constitutes the scope of ought or what describes the scope of ought.³


² Georg H. von WRIGHT, «Deontic Logic», 1951, pp. 1 ff..

As a noun, «Deontics» concerns the formal systems of deontic calculus from the point of view of their theoretical-philosophical foundations, in virtue of which Deontic Logic analyzes technical problems peculiar to those calculi.

In this paper I will focus on five of Amedeo G. Conte’s main contributions to the Philosophy of Normative Language:

In section 2, on the distinction between «categorical constitutivity» and «hypothetical constitutivity».

In section 3, on the typology of the concept of validity.

In section 4, on the notion of «pragmatic ambivalence» of deontic utterances.

In section 5, on the conception of repeal as an act of rejection.

In section 6, on the reinterpretation of the «Is-ought question».

§2.

2.1. In Contian Deontics, the Philosophy of constitutive rules plays an essential role. These rules have been defined by Conte as the «prius» of what they deal with in the threefold sense of being (eidetic) conditions of conceivability, (alethic) conditions of possibility and (noetic) conditions of perceptibility for what they deal with. Constitutive rules deal with neither chronologically preexistent nor with ontologically independent acts, situations or entities, but they do constitute by themselves the activity they deal with and, in it, their praxis. ⁴

The distinction between «categorical constitutivity» and «hypothetical constitutivity» is parallel to the distinction between the notions of «constitutive rule» and «hypothetic-constitutive rule», a distinction which Conte expresses in ontological terms and semiotic terms. ⁵

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a) In ontological terms, constitutive rules are conditions for the activities with which they deal: «X counts as Y», «X has the value of Y»; hypothetic-constitutive rules pose conditions for an act or circumstance to have a particular value: «X must be N to count as Y», «X must be N to have the value of Y». Thirdly, technical rules neither are a condition nor pose conditions, but they presuppose conditions: they prescribe behaviours under the subjective condition of pursuing an aim and insofar as these behaviours are an objective condition of obtaining the aim which is being pursued.

b) From a semiotic point of view, constitutive rules determine the connotation of those terms which designate the praxis that the rules constitute. Hypothetic-constitutive rules do not determine, but they presuppose the connotation of those terms which designate the praxis that the rules constitute; that is, hypothetic-constitutive rules establish the denotation of these terms by posing conditions of validity for the entities designated by them.

2.2. In «Deontic Logic and the Theory of Conditions» (1968), von Wright does not consider deontic logic an immediately analogue to modal logic, but a fragment of the Logic of Sufficient and Necessary Conditions, so that saying that something ought to be amounts to asserting that something is a necessary condition of something else.6

In this system of conditional logic, the notion of necessary condition is explained like this: «the truth of the proposition that p is a necessary condition of the truth of the proposition that q». Its formal representation may be one of the following:

\[ \text{[1]} \quad \text{Nc} (p, q) \]
\[ \text{[2]} \quad \text{N} (q \rightarrow q) \]

In fact, saying that «p» is a necessary condition of «q» means that if «~p», then «~q», or, likewise, that if «q», then necessarily «p». In terms of necessary condition, deontic operator O can be defined:

\[ \text{[3]} \quad \text{Op} = \text{Nc} (p, I) \]

That something ought to be the case means that the thing in question is a necessary condition of a certain thing (proposition, state of affairs) I, which is presupposed in that context. I is not a variable but a propositional constant.

Moreover, the notion of sufficient condition can be explained like this: «the truth of the proposition that p is a sufficient condition of the truth of the proposition that q». Its formal representation can be one of the following:

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[4] Sc (p, q)

[5] N (p → q)

In fact, saying that «p» is a sufficient condition of «q» means that if «¬q», then «¬p», or, likewise, that if «p» then necessarily «q». Sc (p, q) is equivalent with Sc (¬q, ¬p), with Nc (q, p) and with Nc (¬p, ¬q). In terms of sufficient condition, deontic operator P can be defined:

[6] Pp = Sc (p, I)

That something may be the case means that the thing in question is a sufficient condition of a certain thing I which is presupposed in that context.7

2.3. Neither the deontic category of constitutive rules nor the deontic category of hypothetic-constitutive rules is homogeneous from a conditional point of view. In an impressive essay, Giampaolo M. Azzoni made the Contian classification of constitutive rules and hypothetic-constitutive rules explicit by taking the type of condition into consideration:8

a) (Constitutive) rules which are a necessary condition for what they rule (eidetic-constitutive rules).

b) (Constitutive) rules which are a sufficient condition for what they rule (thetic-constitutive rules).

c) (Constitutive) rules which are a necessary and sufficient condition for what they rule (noetic-constitutive rules).

d) (Hypothetic-constitutive) rules which pose necessary conditions for what they rule (anankastic-constitutive rules).

e) (Hypothetic-constitutive) rules which pose sufficient conditions for what they rule (metathetic-constitutive rules).

f) (Hypothetic-constitutive) rules which pose necessary and sufficient conditions for what they rule (nomic-constitutive rules).

2.4. In «Norms, Truth and Logic» (1983), von Wright distinguishes between «technical ought» («must») and «deontic ought» («ought»). The technical

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Ought expresses that something has to be done in order for something else to be attained. That is, the technical Ought is usually elliptic, when explicitly referring to an end which will not be attained if what «must be» — in a technical sense — «is» not. The deontic Ought is what arises directly from a norm; it is categorical, it is not a means, but an end in itself.9

The distinction between «must» and «ought» is taken up again in «On Conditional Obligation» (1994): in the same way it is necessary to differentiate the norm which pronounces a certain state of affairs obligatory, from the statement of practical necessity concerning what the agent to whom the norm is addressed has to do in order to satisfy his obligation, it is essential to distinguish the deontic Ought («ought») relative to the state which the norm pronounces obligatory, from the technical Ought («must») relative to what the agent has to do in order to satisfy his obligation.10

2.5. Anankastic-constitutive rules stand out because they exemplify the anankastic «Deon», as opposed to the deontic «Déon» («Déon», ‘δέον’, neuter participle of the Greek impersonal verb «Deî», ‘δέι’, is, when nominalized, the term Aristotle used when referring to normative necessity). This opposition is basic to Deontics because, according to Conte, it goes deeply into a crucial question related to the foundation of Deontic Logic: the difference between «non-normative» necessity (and those non-normative modal concepts of possibility, impossibility and contingency) and «normative» necessity (and those normative modal concepts of prohibition, permission and indifference): anankastic Deon is an example of non-deontic normative necessity, of adeontic «Deon».11

The relevance of the distinction between deontic «Deon» and (adeontic) anankastic «Deon» is shown in the fact that, as Conte stresses, deontic indifference has no anankastic counterpart, since anankastic indifference is self-contradictory. What is more, in the same way the mere existence of a formal theory relative to anapophantic entities proves that logic goes beyond apophantic language, the mere possibility of a formal theory relative to adeontic rules (for example, anankastic-constitutive rules) proves that deontics goes beyond deontic language.12

§3.

3.1. In «Minima deontica» (1988), Conte sketched out the «deontic triangle of validity», whose three apexes represented syntactic deontic validity, semantic deontic validity and pragmatic deontic validity. To some extent, he answered this way the question he himself had posed in «Studio per una teoria della validità» (1970) eighteen years before: Of what thing can the validity which is precisely the object of the theory of validity be predicated?. At that time, Conte simply developed a tetrachotomy of the term «norm» parallel to the distinction, peculiar to the theory of speech acts, among four meanings of the term «proposition»:

- as «sentence» («enunciato linguistico», «Satz»), as «utterance» («enunciazione d’un enunciato», «Äusserung»), as «proposition» in its strict sense («ciò che un enunciato esprime, ... proposizione ’strictu sensu’»), and as the state of things with which the sentence deals.

The tetrachotomy of «norm» was the following:  

a) «norm» as a deontic sentence («behaviour B is obligatory», «behaviour B is forbidden», «behaviour B is permitted»).

b) «norm» as act of deontic utterance of a deontic sentence.

c) «norm» as deontic proposition expressed by a deontic sentence.

d) «norm» as deontic status, as extralinguistic fact with which a deontic sentence deals (an obligation, a prohibition, a permission).

In «Minima deontica», Conte develops this conceptual delimitation regarding the problem of validity.

3.2. Syntactic validity, predicable of deontic status, is the validity «relative to the constitutive rules about validity, to the constitutive rules of a legal order which (conditioning the validity of deontic status in and by the legal order) determine the syntax of validity of that legal order».

Syntactic validity is therefore relative a) to a legal order (since it is validity in and by


a legal order); b) within the legal order, «to the noetic-constitutive rule called Basic Norm (Grundnorm)».\textsuperscript{15}

Syntactic validity can be «thetic» or «athetic», depending on whether the deontic status of which they are predicated are produced or not, respectively, by valid deontic acts. For Azzoni, syntactic thetic validity, as opposed to athetic syntactic validity, is relative, in a legal order, not only to the Basic Norm, but also to the hypothetic-constitutive rules about the validity of «norm-positing acts» («atti di normazione»).\textsuperscript{16}

Semantic validity, predicatable of deontic sentences, depends on the correspondence between a deontic sentence and a deontic status. The syntactic validity of a deontic status is a sufficient condition for the semantic validity of the corresponding deontic sentence. The deontic sentence «Smoking is forbidden in the university» is semantically valid if it is true that smoking is forbidden in the university; that is, if the deontic status «Smoking is forbidden in the university» is syntactically valid.\textsuperscript{17}

The concepts of «thetic semantic validity» and «athetic semantic validity» reflect the theoretical controversy which confronts iuspositivism with iusnaturalism: the thetic semantic validity of a deontic sentence depends on how it corresponds with a deontic status (thetically) constituted in a legal order and by a legal order. The athetic semantic validity of a deontic sentence depends on how it corresponds, in Kalinowski’s words, with «deontic reality».\textsuperscript{18}

However, the expression «semantic validity» is, according to Conte, posterior to the concept of «semantic validity». In «In margine all’ultimo Kelsen» (1967), Conte referred to the applicability of logical principles to the validity of «prescriptive propositions» as truth (to use a later expression, to the (semantic) validity of norms as deontic sentences). He began with the


\textsuperscript{17} Amedeo G. CONTE, «Minima deontica», 1988, pp. 446-448.

\textsuperscript{18} For Azzoni, the concept of athetic semantic validity as athetic deontic truth is defined, following Kalinowski, by means of two theses: a) the thesis of «La designatività delle norme»: norms designate normative states of things; b) the thesis of «L’apofanticità delle norme»: norms may be true or false (Giampaolo M. AZZONI, «Validità semantica in deontica», 1992, pp. 171 ff.).
following hypothesis: «Prescriptive propositions can be either true or false, since they are either true or false (ab esse ad posse valet consequentia); they are either true or false, since they are true (a disjunction is true if one of its terms is true); they are true because they are necessarily true».'

Ten years later, in «Aspetti della semantica del linguaggio deontico» (1977), Conte rejected the incompatibility between truth and performativity of a deontic sentence. The fact that the performative utterance of a sentence is neither true nor false, but valid or invalid, does not mean that the sentence that is performatively uttered can be neither true nor false. On the contrary, a performative sentence is true precisely insofar as it is used in a performative way, insofar as the one who utters it, when uttering it performatively, does what he/she says: «the performativity of the utterance is a necessary and sufficient condition for the truth of the sentence».

Pragmatic validity, predicatable of deontic acts, either depends on the conditions of validity (thetically) posed in a legal order by hypothetic-constitutive rules («thetic» or «praxeonomical» pragmatic validity), or on the (athetic) conditions inherent in the concept of deontic acts, in their intrinsic constitution («athetic» or «praxeological» pragmatic validity).

For Conte, the pragmatic validity of a deontic act is a sufficient condition but not a necessary condition for the syntactic validity of the produced deontic status. Conte points out explicitly that «the pragmatic validity (in and by a legal order S) of the thetic utterance of a deontic sentence is a sufficient condition for the syntactic validity (in and by a legal order S) of the deontic status of which the deontic act is thésis. The syntactic validity (in and by S) of the deontic status is, likewise, a sufficient condition for the semantic validity (in and by S) of the deontic sentence».

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22 Amedeo G. CONTE, «Minima deontica», 1988, pp. 446-448. The thesis that the pragmatic validity of a deontic act is not a necessary condition for the syntactic validity of the produced deontic status seems acceptable to me: there may be valid deontic status (athetically valid) which are not produced by deontic
§4.

A deontic sentence is pragmatically ambivalent because it is subject
to heterogeneous utterances: it is deontically uttered if it is a prescriptive
deontic sentence (if it is a deontic sentence «in suppositione deontica»), or
it is adeontically uttered if it is a descriptive deontic sentence (if it is a
deontic sentence «in suppositione adeontica»). Classic examples of deontic
sentences «in suppositione adeontica» are, for Conte, the Kelsenian
«Sollsätze», apophantic sentences on «Sollen».

Conte explains that his thesis of the pragmatic ambivalence of
deontic sentences (deontic utterance of a deontic sentence vs. adeontic
utterance of a deontic sentence) does not imply the thesis of the semantic
ambiguity (depending on whether it is uttered by a lawmaker or a
sociologist) of adeontic sentences of the kind «Action A is punished with
sanction S». Both the lawmaker and the sociologist can utter, for example,
the sentence «Manslaughter is punished with twenty years imprisonment», and
in neither case the sentence would be semantically ambiguous. In the
first case, the lawmaker constitutes a rule, assuming as thesis the relation
between manslaughter and the punishment of twenty years imprisonment,
prescribing that sanction for that act. In the second case, the sociologist
verifies a regularity, analizes the relation between the norm which punishes
manslaughter with twenty years imprisonment and the social reality
describing a situation.

Different from the thesis of the pragmatic ambivalence of deontic
sentences (deontic utterance of a deontic sentence vs. adeontic utterance of
a deontic sentence) is the thesis of the adeonticity of descriptive sentences
of the kind «The norm ‘Manslaughter is punished with twenty years
imprisonment’ is (deontically) valid». From the adeontic character of
sentences such as the one mentioned, Conte draws an important conclusion:

acts. However, the thesis that the pragmatic validity of a deontic act is a sufficient
condition for the syntactic validity of the produced deontic status seems to me
questionable; in fact, may there not be deontic status, produced by deontic acts,
which are invalid (athetically invalid)? (Vid. Carlos ALARCÓN CABRERA,


25 Amedeo G. CONTE, «Deontica aristotelica», 1992, pp. 228-234. About the
paradigm ‘deontic regularity’ vs. ‘adeontic regularity’ (‘following a rule’ vs.
15; «Minima deontica», 1988, pp. 457-459; «Validità athetica», 1990, pp. 166-
if Deontic Logic is conceived as logic of deontic sentences, it cannot be a logic of adeontic descriptive sentences about (deontic) validity.\textsuperscript{26}

§5.

Conte explains the conception of repeal from a perspective that is not strictly normativist, taking as a basis Alchourrón and Bulygin’s theses, \textit{Sobre la existencia de las normas jurídicas} (1979): Sentences of the kind «Norm n is repealed», when performatively uttered, are not norms, they are «verbal expressions of acts of rejection», «\textit{thetic acts} of invalidation of deontic status».\textsuperscript{27}

As opposed to «\textit{rhetic}» performatives, which mean the execution of a linguistic act which as such does not act on the truth of the sentence (that is, of a «\textit{rhetic}» linguistic act which is a «\textit{rhesis}»; for example, communicating, commenting, replying, …), \textit{thetic} performatives mean a position of truth, a «\textit{thesis}», by means of a linguistic act, of the truth of a sentence.\textsuperscript{28} «To repeal» is a «\textit{factitive}» \textit{thetic} verb which means the position of nontruth, \textit{in} a convention and \textit{by} a convention, of a sentence that is supposed to be true.\textsuperscript{29}

The deontic validity which supresses a repealing act is syntactic validity. As Conte points out, «\textit{obiectum affectum}» of repeal is the syntactic validity of a deontic status in a legal order; «\textit{obiectum effectum}» of repeal is its syntactic invalidity.\textsuperscript{30} The deontic validity predicated of a repealing act is «\textit{thetic}» or «\textit{praxeonomical}» pragmatic validity, a validity conditioned by

\begin{itemize}
\item \textsuperscript{26} Amedeo G. CONTE, «Deon in Deontics», 1991, p. 351.
\item \textsuperscript{30} Amedeo G. CONTE, «Tre domande sull’abrogazione», 1987, pp. 42-43.
\end{itemize}
the hypothetic-constitutive rules which (thetically) pose the conditions of validity of a repealing act in a legal order and by a legal order.  

Insofar as it provokes a transition from the syntactic validity of a deontic status to its syntactic invalidity, every repealing act has, following Conte, a «diascronicità costitutiva». Thus, the diachronic phenomenon of repeal requires, regarding the general theory of legal order, to go beyond the tridimensional Kelsenian model. It requires for dynamic normative systems a tetradimensional model, a space-time model.

§6.

As regards relations between what is deontic and what is adeontic, there is a triple risk of naturalistic fallacy. In Conte’s words, there may be a «noetic» naturalistic fallacy relative to concepts, a «dianoetic» naturalistic fallacy relative to sentences, and an axiological naturalistic fallacy relative to the truth of sentences:

a) Defining a deontic concept by means of adeontic concepts is a «noetic» naturalistic fallacy.

b) Deriving a deontic sentence from adeontic sentences is a «dianoetic» naturalistic fallacy. The fact that a norm is dianoetic or inferentially valid does not imply that such norm is deontically valid in the legal order in which the norms from which it derives (the norms in respect of which it is dianoetically valid) are deontically valid. The deontic validity

31 Amedeo G. CONTE, «Tre domande sull’abrogazione», 1987, pp. 41-42. Nevertheless, in «Minima deontica», Conte points out that the pragmatic validity predicated of a repealing act can also be athetic or praxeological (dependent on conditions which are not posed by rules, on conditions inherent in the concept of an act, in its intrinsic constitution). Thus, a repealing act of syntactically invalid norms would lack praxeological validity, since the act of repeal presupposes the (syntactic) validity of the norm being repealed (Amedeo G. CONTE, «Minima deontica», 1988, pp. 431-433). In my opinion, it would be better to use, in that case, the expression ‘praxeonomic-eidetic validity’ (pragmatic validity determined by eidetic-constitutive rules), with a meaning that would oppose that of ‘praxeonomic-anankastic validity’ (pragmatic validity determined by anankastic-constitutive rules. (Vid. Carlos ALARCÓN CABRERA, «Validez pragmática. Una discusión con A. G. Conté», 1993, pp. 341 ff.; Normas y paradojas, 1993, pp. 37 ff.).


of a norm is not relative to those norms on which its dianoetic validity depends, but to the constitutive rules which, in and by a legal order, condition such deontic validity.\footnote{Amedeo G. CONTE, «Deontico vs. dianoetico», 1986, pp. 490-491. Cf. Amedeo G. CONTE and Tecla MAZZARESE, «Regole fondate su regole», 1985, pp. 283-288.}

c) Deriving a \textit{deontic truth} of a deontic sentence from its \textit{adeontic truth} is an axiological naturalistic fallacy.\footnote{Amedeo G. CONTE, «Minima deontica», 1988, p. 467.} Referring to those divisionist contradictions about the rejection of an «ought-sentence», incompatible with a suppostedly necessary transcultural law, Conte had already denied, in «Su Carcaterra» (1976),\footnote{Amedeo G. CONTE, «Su Carcaterra», 1976, pp. 101-105.} an absolute nonexistence of logical relations between «is-sentences» and «ought-sentences», although that did not mean to refute those divisionist arguments, but to repose them in linguistic terms (not as division between two \textit{worlds}, the world of «is» and the world of «ought», but as division of two moods of language: the truth (\textit{the deontic truth}) of «ought-sentences» and the validity (\textit{the adeontic truth}) of «ought sentences»).

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Carlos Alarcón Cabrera

University of Seville (SPAIN)
A plausible theory of counterfactuals should distinguish between the following four propositions:

(1) If I am rich, then I shall tour the world.

(2) If I were to marry Lorena Bobbitt, I’d have a perfect life.

(3) If I were to marry Lorena Bobbitt, I might not have a perfect life.

(4) If I saw a ghost, I’d be afraid.

(1) and (4) are vacuously true, (2) is false, and (3) is non-vacuously true. Yet the standard semantics used for counterfactuals developed by Lewis and elaborated on by both him and Stalnaker, the possible-worlds account, does not distinguish between (3) and (4). As Joseph Melia has argued,1 the ontology necessary for Lewis’ theory is qualitatively unparsimonious: It «is committed to the unicorns, to the gods, to the ghosts and to the qualia which occur in other possible worlds.» That is to say, it is committed to that which in the actual world would be regarded as impossible. The complexity of Lewis’ theory, requiring multiple quantification and spheres of possible worlds from which close possible worlds are to be picked out via the existential quantifier — a Skolem function, in effect — or via a selection function à la Stalnaker, is a direct result of the plurality of possible worlds and its qualitatively unparsimonious ontology.

In this paper, we present an alternative truth-functional semantics for counterfactuals which is (a) qualitatively parsimonious in its ontology, (b) requires neither multiple quantification nor a selection function, and (c) gets the truth values of (1)-(4) right. This semantics does not provide an adequate grounding for modal logic, where concerns of necessity and possibility are concerns of logical necessity and possibility, but it serves

very neatly for the explication of counterfactuals and, more particularly,
subjunctive conditionals.

First, let us classify counterfactuals into three groups: indicative
counterfactuals such as (1), subjunctive conditionals such as (2) and (3), and
what we shall call — extending a term from metaphysics —
counteressentials, such as (4). We and others have already defended the case
of indicative counterfactuals as a simple and defensible instance of material
implication with a false antecedent. A counteressential, as here intended, is
any state of affairs that could not have arisen from the actual world by
natural laws. Thus our ontology allows blue swans, for mutation and natural
selection could have produced such, but does not allow ghosts, for there is
no way for them to have arisen from the actual.

Perhaps this explication is more nearly a «possible world,» meaning
one that could have arisen rather than one that can be imagined, but to
distinguish our conception from Lewis’ we will refer to it as a timeline. The
key distinction between a timeline and a possible world à la Lewis is that
a timeline is rooted in the actual world at some time in the past after which
a change consistent with natural laws occurs and the result, projected into
the future indefinitely, is a new timeline. It is clear that there is no timeline
that could satisfy the antecedent of (4), and equally clear that there are
many timelines that could satisfy the antecedent of (2) and (3). (One can,
for example, imagine going back and making a significant intervention
during Lorena Bobbitt’s childhood, among many other possibilities.) Hence,


3 Often it will not be possible to decide what is or is not counteressential
because of our imperfect and incomplete knowledge of natural laws. But we are
concerned here with truth, not knowledge of truth, and if research into paranormal
phenomena indicates that ghosts do or could exist, that will not touch the theory,
only the particular example. As long as one grants that not everything could arise
from the actual world via natural laws, we can accept the distinction between
counteressentials and subjunctive conditionals, while conceding that there are
some, perhaps a great many, counterfactuals of whose classification we may be
uncertain or incapable.
if we accept indicative counterfactuals as defensible instances of vacuous truth represented by the material conditional, we can do so with equal assurance for counteressentials. The real task we face, of course, is explicating the middle case — subjunctive conditionals such as (2) and (3) which have non-vacuous truth values — and to this the remainder of this paper is devoted.

We treat subjunctive conditionals as universally general propositions quantified over timelines. Thus (2) is represented \((\forall x)(Mx \rightarrow Px)\), where \(x\) ranges over timelines. We then treat the universal quantifier as an (implicit) conjunction of indicative conditionals (each in its timeline) and it becomes quite clear why (2) is false: At least one of its conjuncts — the indicative conditional using that substitution instance of \(x\) which represents the timeline in which we actually live — is false, making the conjunction and hence the universal generalization — i.e., the subjunctive conditional — false. It is also now clear why (3), represented as \(\sim(\forall x)(Mx \rightarrow Px)\), is non-vacuously true: It is simply the negation of a proposition that is false, with «might not» clueing us in to its proper representation.

It remains only to show that this explication of subjunctive conditionals prevents Lewis’ «counterfactual fallacies.» We will not consider strengthening the antecedent here, since, as Lewis notes, it is subsumed by the transitivity fallacy, which follows:

(5) If Ronald Reagan had been born a Russian, he would have been a Communist.

(6) If he had been a Communist, he would have been a traitor.

Therefore,

(7) If Ronald Reagan had been born a Russian, he would have been a traitor.

If (5) and (6) are taken as material conditionals, we would have a sound argument with a false conclusion, a straightforward instance of the failure of transitivity. But taken as universally general propositions, we do not have a sound argument, since (6) is false, for only in some timelines in which Reagan had been a Communist would he have been a traitor.

The third and final fallacy that Lewis points out is the failure of contraposition. Consider:

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4 The idea that universally general propositions can be used to represent some conditionals originates with Russell. One example of such — in the indicative — is «If it walks like a duck, talks like a duck, and looks like a duck, it is a duck.» The «it» here is surely not pronominal (semantically), and the proposition ranges over the universe of discourse.

(8) If John had gone to the party, Jane would still have gone. Therefore,
(9) If Jane had not gone, John would still not have gone.

In the presence of (10)-(12) below, the apparently valid argument fails, since (10) & (11) makes (8) true and (11) & (12) makes (9) false.

(10) Jane likes John.
(11) John wants to go to the party.
(12) John avoids Jane.

Yet, if (8) and (9) are taken as material conditionals, the validity of the argument turns on no contingent propositions such as (10)-(12). Taken, however, as universally general propositions, we again do not have a sound argument, since there are timelines in which the instantiation of (8) is false (~(10) is a good start), making (8) itself false.

The central idea is simple enough: Instead of an existential quantifier or an explicit function, we allow natural laws to act as an implicit selection function, with the result being a mathematically cleaner, ontologically leaner, and logically keener theory of counterfactuals.6

Joseph S Fulda
701 West 177th Street, #21, New York, NY 10033, USA
E-mail: <kcla@csulb.edu>

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6 Professor Michael Levin made some very helpful observations on two early drafts of this paper, as did an anonymous referee on one. The perceptive, patient, critical comments of Professor J. Michael Dunn were of central importance to this paper. Nevertheless, the idea and its development with all its deficiencies remain mine. The author would like to dedicate this essay to the memory of his beloved teacher, Dr. Arthur Spier, a man of science and learning alike.
NOTES TO POTENTIAL CONTRIBUTORS

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How to submit?

(1) We will be thankful to all contributors who submit their papers in the form of [I.B.M.-PC] WordPerfect 5.1 files. There are several convertors which can be used to turn docs from other word processor formats into WP5.1 format. (Notice that with WP5.1 you can write not only almost all diacritically marked characters of any language which uses the Latin script, but moreover all of Greek and virtually all symbols of mathematical logic and set theory.)

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¹ Unfortunately we cannot yet handle TeX or LaTeX files. The convertors we’ve tried have proved useless.
(2.2) When WP5.1 format is not available and we have been unable to use the original file, a good ideal is for the author to have their doc converted to a .html file (there are lots of HTML editors and document-to-HTML converters from a great many formats — PC-Write, [La]TeX, MS-Word and Windows-Word etc). We expect HTML files to bear the extension ‘.htm’.²

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(2.4) Another alternative (which is in itself worse, but which nevertheless may be more practical in certain cases) is to use the DOS text format, with no character outside the range from ASCII_32 through ASCII_126, no hyphenation, a CR at the end of each line and two CRs separating paragraphs. Such files will be here called ‘text files’; we expect them to bear a ‘.txt’ extension.

(3) In cases (2.2) and (2.4) the contributor can include their paper into an e_mail message sent to our editorial inbox (<sorites@fresno.csic.es>)

(4) Before sending us their file the contributor is advised to compress it — except in case they are sending us a text file through procedure (3) above. Compression reduces disk-storage and shortens transmission time. We can extract and expand files archived or compressed with Diet, ARJ (both warmly recommended), Tar, Arc, Zip (or PKZip), GZip, Compress (i.e. .Z files), LHA, Zoo, RaR, and some versions of the MAC archivers PackIT and StuffIT.

(5) The most expedient way for contributors to send us their submitted paper is through anonymous FTP. At your host’s prompt, you enter ‘ftp ftp.csic.es’; when you are prompted for your username, you answer ‘ftp’ or ‘anonymous’; when you are next prompted for your password, you answer with your e_mail address; once connected, you enter ‘cd pub/sorites/incoming’, then ‘binary’, and then ‘put xxx’ — where xxx is the file containing your submitted paper and a covering letter. (If the file is an archive, the extension must reveal the archiving utility employed: ‘.gz’, ‘.Arj’, ‘.RAR’, etc. (DIETed files needn’t bear any special denomination or mark; they will always be automatically recognized by our reading software.)

(6) Whenever a paper is submitted, its author must send us a covering letter as an e_mail message addressed to one of our editorial inboxes.

(7) If a contributor cannot upload their file through anonymous FTP, they can avail themselves of one of the following alternatives.

(7.1) If the file is a ‘.htm’ or a ‘.txt’ file (i.e. in cases (2.2) and (2.4)), simply include it into an e_mail message.

(7.2) In other cases, an 8-to-7 bits converter has to be used, upon which the result can also be included into an e_mail message. 8-to-7 bits converters «translate» any file (even a binary file) into a text file with short lines which can be e-mailed. There are several useful 8-to-7 converters, the most popular one being UUenCODE, which is a public domain software available for many different operative systems (Unix, OS/2, DOS etc). Perhaps the most advisable at this stage is PGP ['Pretty Good Privacy'], which also allows authentication (signing). Another good such convertor, very easy to use, is Mike Albert’s ASCIIZE. We can also decode back into their binary original formats files encoded into an e-mailable ASCII format by other 8-to-7 bits convertors, such as: Mime, TxtBin, PopMail, NuPop, or University of Minnesota’s BINHEX, which is available both for PC and for Macintosh computers. Whatever the 8-to-7 bits encoder used, large files had better
be previously archived with Arj, Diet or any other compressor, the thus obtained archive becoming the input for an 8-to-7 bits convertor.\(^3\)

(7.3) An alternative possibility for contributors whose submitted papers are WordPerfect 5.1 or WordPerfect 6 docs is for them to use a quite different 8-to-7 bits convertor, namely the one provided by the utility Convert.Exe included into the WordPerfect 5.1 package. (WordPerfect corporation also sells other enhanced versions of the convertor. WordPerfect 6.0 has incorporated a powerful conversion utility.) A separate e_mail message is mandatory in this case informing us of the procedure. The result of such a conversion is a ‘kermit-format’ file.\(^4\)

(8) You can also submit your manuscript in an electronic form mailing a diskette to the Submissions Editor (Prof. Prof. Manuel Liz, Facultad de Filosofia, Universidad de La Laguna, Tenerife, Canary Islands, Spain). Diskettes will not be returned.

(9) Such submitted papers as are neither WordPerfect 5.1 files nor files in HTML format require some preparation.

(9.1) Ours is not a logic journal, but of course one of the glories of analytical philosophy is its rigour, which it partly owes to auxiliary use of symbolic notation in order to avoid ambiguities, make matters of scope clear or render arguments perspicuous. ASCII translations of symbolic notation are problematic, especially in cases of nonclassical logics, which may use sundry negations, disjunctions, conjunctions, conditionals, implications and also different universal and particular quantifiers (e.g. existentially and nonexistentially committed quantifiers, a familiar dichotomy in Meinongian circles). While using WordPerfect 5.1 you can represent a huge variety of such nuances, it is impossible to express them within the narrow framework of text or even ASCII files (i.e. even when the 224 printable [extended] ASCII characters can be used). Still, for some limited purposes, a translation of sorts can be attempted. You are free to choose your representation, but the following translation is — for the time being — a reasonable one: ‘(x)’ for universal quantifier, ‘(Ex)’ for existential quantifier; ‘&’ for conjunction; ‘V’ for disjunction; ‘->’ for implication (if needed — something stronger than the mere ‘if … then’); ‘C’ for conditional; ‘=’ for an alternative (still stronger?) implication; ‘_pos_’ for a possibility operator; ‘_nec_’ for a necessity operator.

(9.2) In ASCII or text files all notes must be end-notes, not foot-notes. Reference to them within the paper’s body may be given in the form ‘\n’, where n is the note’s number (the note itself beginning with ‘\n’, too, of course). No headings, footings, or page-breaks. In such files, bold or italic bust be replaced by underscores as follows: the italized phrase ‘for that reason’ must be

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\(^3\) For the time being, and as a service to our readers and contributors, we have a directory called ‘soft’ hanging from our home directory /pub/sorites at the node ftp.csic.es. The directory contains some of the non-commercial software we are referring to, such as archivers or 8-to-7 encoders (or 7-to-8 decoders).

\(^4\) In the case of WordPerfect 5.1, the procedure is as follows. Suppose you have a file called ‘dilemmas.wp5’ in your directory c:\articles, and you want to submit it to SORITES. At your DOS prompt you change to your directory c:\articles. We assume your WordPerfect files are in directory c:\WP51. At the DOS prompt you give the command ‘wp51convert’; when prompted you reply ‘dilemmas.wp5’ as your input file whatever you want as the output file — suppose your answer is ‘dilemmas.ker’; when prompted for a kind of conversion you choose 1, then 6. Then you launch you communications program, log into your local host, upload your file c:\articles\dilemmas.ker using any available transmission protocol (such as Kermit, e.g.). And, last, you enter your e_mail service, start an e_mail to to <sorites@fresno.csic.es> and include your just uploaded dilemmas.ker file into the body of the message. (What command serves to that effect depends on the e_mail software available; consult your local host administrators.)

With WordPerfect 6 the conversion to kermit format is simple and straightforward: you only have to save your paper as a ‘kermit (7 bits transfer)’ file.
represented as ‘_for that reason_’ (NOT: ‘_for_that_reason_’). A dash is represented by a sequence of a blank space, two hyphens, and another blank space.\textsuperscript{5}

\textsuperscript{5} Those devices are temporary only. Later on we’ll strongly advise and encourage those of our contributors who can use neither WordPerfect format nor one of the other word-processor formats our convertors can handle automatically to resort to HTML, with certain conventions in order to represent Greek characters as well as logical and set-theoretic symbols.
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Madrid. April 10, 1995
(Updated February 27. 1996)
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