cial or political order, without this second-order dilemma of who is to do the ordering and how. This is not to claim that A2 is a sufficient condition for solving the world's regulatory problems. A2, though hardly an original principle, is still an origin of all *principled* change.

LYLE V. ANDERSON

Columbus, Ohio

A SOLUTION TO FORRESTER'S PARADOX OF
GENTLE MURDER*

P ARADOXES both irritate and stimulate deontic logicians. The paradox of the good samaritan is probably the best-known example, but its traditional versions depend on scope confusions. Such confusions are supposed to be absent from a new version, called the *paradox of gentle murder,* which was presented recently by James Forrester.[†] I will argue that Forrester's paradox also depends on a scope confusion and that the paradox can be avoided by analyzing the logical form of the action sentences inside the scope of the deontic operator. Thus, Forrester's paradox reinforces the importance of logical form.

Forrester's paradox is roughly that, even if murders occur, it seems obligatory for the murders to be gentle, but, on standard deontic logic, if it is obligatory to murder gently, it is obligatory to murder, and that seems wrong. More precisely, Forrester presents his paradox by deriving a contradiction from a situation and plausible principles of deontic logic. The situation is specified by two legal rules and an action sentence:

(1) It is obligatory$_1$ (Read: obligatory under the law) that Smith not murder Jones.
(2) It is obligatory$_1$ that, if Smith murders Jones, Smith murder Jones gently.
(5) Smith murders Jones.

The first principle that Forrester assumes is

(3) $[O_r(p \supset q) \supset . p \supset O_r q]$

where the subscript 'r' indicates that the obligation can derive from any source, including the law. (3) plus (2) yields

(4) If Smith murders Jones, it is obligatory$_1$ that Smith murder Jones gently.

(4) and (5) imply

(6) It is obligatory$_1$ that Smith murder Jones gently.

But it is necessary that

(7) If Smith murders Jones gently, then Smith murders Jones.

and standard deontic logics include a rule

(8) $$\frac{\vdash (p \supset q)}{\vdash (O_r p \supset O_r q)}$$

and (6), (7), and (8) imply

(9) It is obligatory$_1$ that Smith murder Jones.

The final principle that Forrester assumes is

(10) $\qquad\qquad O_r p \supset \sim O_r \sim p$

and (1), (9), and (10) yield the contradiction

(11) $\qquad\qquad O_1 \sim p \ \& \sim O_1 \sim p$

The contradiction can be avoided only by rejecting at least one step of the argument. Forrester says, "steps (1), (2), and (5) are the basic facts of the case: there seems no reason to consider them mutually inconsistent" (195). (4), (6), (9), and (11) are validly inferred from previous steps. (7) can be supported by any plausible theory of adverbs. Forrester argues for (3) in this case, and he says "giving up (10) will not be enough" (196). Forrester concludes that (8) should be rejected, i.e., that truth is not always preserved when a logical implication of a sentence is substituted for that sentence inside the scope of a deontic operator.

This argument can be generalized. Forrester's example concerns legal obligations, but the crucial steps (3), (8), and (10) use the subscript 'r', which applies to any deontic operator; so similar arguments can be formulated for moral obligations and for what agents legally or morally ought to do. Thus, if Forrester's argument works, no deontic operator allows substitution *salva veritate* of logical implications.[1]

This conclusion should be very disturbing. Forrester sees that, if

[1] Because the argument applies to every deontic operator, I will henceforth drop subscripts.

(8) is rejected, most of standard deontic logic must be reconstructed, and this is "a large task" (197). Furthermore, many arguments that seem obviously valid could not be justified without some rule like (8). For example, if I both mow and water your grass, I mow your grass, so, if it is obligatory for me to mow and water your grass, it is obligatory for me to mow your grass. Such arguments cannot be justified if (8) is rejected, unless some other rule or principle is substituted. Forrester gives no substitute for (8) in his article, and it seems that any substitute would have to be very complex and unintuitive in order to justify all such obviously valid arguments.[2] Thus, it is preferable to avoid the paradox without denying (8).

One way to do so is to deny (3). Forrester does not defend (3) in all cases, but he does argue for (3) in the present case. His arguments are inconclusive,[3] but (3) still seems plausible in this case. Furthermore, even if (3) is denied, a contradiction still seems to be derivable from (1), (4), and (5), so some paradox remains. Consequently, I will grant (3) in this case for the sake of argument.[4]

Another way to avoid the paradox is to deny (10). (10) is denied on independent grounds by advocates of the possibility of legal and moral dilemmas. Instead of defending (10), Forrester says, "giving up (10) will not be enough, for even if we end the argument with step (9), the conclusion, although not a paradox, is pretty unwelcome" (196/7). However, (9) is not unwelcome if the situation in

[2] In "Aspectual Actions and the Deepest Paradox of Deontic Logic" (delivered at the Davidson Conference, Rutgers University, April 28, 1984), Hector-Neri Castañeda proposes a limited substitute for (8) which does escape Forrester's paradox. Castañeda's solution depends on a complicated ontology of various kinds of acts. However, such complications are unnecessary, since my solution works with only quantifiers and scope distinctions. In spite of such difficulties, I owe much to Castañeda's discussion.

[3] Forrester's arguments for (3) come down to the claims that it is plausible to infer 'Smith ought to kill Jones gently' from (2) and (5), but "only something like (3) can sanction such a move" (196). However, according to Davidson's theory (see below), 'Smith ought to kill Jones gently' can be interpreted as (6.2): '$(\exists x)(Mxsj \ \& \ OGx)$', and the move from (2) and (5) to (6.2) can be sanctioned by
(3.2) $O[(\exists x)Mxsj \supset (\exists x)(Mxsj \ \& \ Gx)] \supset [(\exists x)Mxsj \supset (\exists x)(Mxsj \ \& \ OGx)]$
Thus, Forrester's arguments fail to support (3) over (3.2). If (3) is replaced by (3.2), no contradiction can be derived from (1), (2), and (5).

[4] In his comments as referee for this JOURNAL, James Higginbotham showed that (3) and (8) lead to absurdities. If we put '$p \supset q$' for 'p' in (3), we get (i): '$O((p \supset q) \supset q) \supset ((p \supset q) \supset Oq)$'. But (ii): '$p \supset ((p \supset q) \supset q)$' is a tautology; so (8) yields (iii): '$Op \supset O((p \supset q) \supset q)$'. (i) and (iii) imply (iv): '$Op \supset ((p \supset q) \supset Oq)$' which implies (v): '$(Op \ \& \ \sim p) \supset Oq$'. This is absurd, since it means that, if anything is obligatory but is not done, then everything is obligatory. Thus, anyone who defends (8) must reject (3) as a general principle. Nonetheless, a restricted version of (3) might still warrant the inference from (2) to (4) in this case, as Forrester claims, and we still need to solve the paradox that (1), (4), and (5) seem to imply a contradiction.

Forrester's paradox is seen as a legal dilemma [relative to laws (1) and (2)]. Nonetheless, the situation does not seem to be a dilemma, since Smith can follow both laws by not murdering Jones. Consequently, (9) is unwelcome in this case, so some paradox remains even without (10).

The best solution to Forrester's paradox is not to deny (3), (8), or (10) but instead to claim that (1), (2), and (5) are jointly inconsistent. Forrester says only that "there seems no reason to consider them mutually inconsistent" (195). However, the reason to consider them inconsistent is that they imply a contradiction if otherwise acceptable principles are assumed. What better reason could you want?

Forrester would probably respond that (1), (2), and (5) seem consistent, so any principles of deontic logic that allow us to derive a contradiction do not accord with our common ways of speaking and reasoning with deontic operators. However, it is easy to explain why (1), (2), and (5) seem consistent when they really are not. We should suspect that the problem lies in (2), because (1) and (5) are more common than (2). If some other principle is similar to (2) but consistent with (1) and (5), then anyone who confuses this other principle with (2) will think that (2) is consistent with (1) and (5).

Which principle is confused with (2)? Forrester writes, "the legal system might have stated (4) as its principle in place of (2)" (194). However, the contradiction follows from (4), assuming (8) and (10), so (4) provides no escape.

(4) and (2) are the only alternatives Forrester considers, and the reason is clear. Forrester uses propositional constants and avoids quantifiers "to simplify matters" (194); so the deontic operator can have only two scopes. Its scope can be wide if it includes the whole conditional, as in (2), or narrow if it includes only the consequent, as in (4).

An even narrower scope becomes available if we analyze the logical form of the action sentences within the scope of the deontic operator. Following Donald Davidson's theory,[5] we can analyze (5) as

(5.1) There is an act of murder by Smith of Jones.

or symbolically as

(5.2) $(\exists x)Mxsj$[6]

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[5] "The Logical Form of Action Sentences," in *Essays on Actions and Events* (New York: Oxford, 1980), pp. 105–122.

[6] (5.2) could be broken down further into '$(\exists x)(M^*x \ \& \ \text{BY}(x,\text{Smith}) \ \& \ \text{OF}(x,\text{Jones}))$', but a complete analysis is not necessary for my purposes.

The antecedent of (7)

(7a) Smith murders Jones gently.

can then be analyzed as

(7.1a) There is an act of murder by Smith of Jones and it is gentle.

or symbolically as

(7.2a) $\qquad\qquad (\exists x)(Mxsj \text{ \& } Gx)$

This analysis shows why (7) is true. More relevantly, it allows several interpretations of (6), because the deontic operator can apply at several places or take several scopes, including

(6.1) $\qquad\qquad O(\exists x)(Mxsj \text{ \& } Gx)$
(6.2) $\qquad\qquad (\exists x)(Mxsj \text{ \& } OGx)$

Roughly, (6.1) says the occurrence of an act is obligatory, whereas (6.2) says the act occurs and its character as gentle is obligatory.

These distinctions allow various interpretations of (4). Taken strictly, (4) can be interpreted with (6.1) as its consequent:

(4.1) $\qquad\qquad (\exists x)Mxsj \supset O(\exists x)(Mxsj \text{ \& } Gx)$

or with (6.2) as its consequent:

(4.2) $\qquad\qquad (\exists x)Mxsj \supset (\exists x)(Mxsj \text{ \& } OGx)^7$

Since (4.1) and (4.2) are so similar, they are easily confused. However, (4.2) avoids the paradox.

No contradiction can be derived from (1), (4.2), and (5), because (6.1) does not follow from (4.2) and (5). All that follows from (4.2) and (5) is (6.2). However, if (7) is analyzed as

(7.2) $\qquad\qquad (\exists x)(Mxsj \text{ \& } Gx) \supset (\exists x)Mxsj$

then the rule (8) warrants only the conclusion

(8.1c) $\qquad\qquad O(\exists x)(Mxsj \text{ \& } Gx) \supset O(\exists x)Mxsj$

and the antecedent of (8.1c) is (6.1) rather than (6.2). Since (6.1) cannot be derived from (4.2) and (5), neither can (9). Therefore, (1), (4.2), and (5) are consistent. Their consistency plus an understandable scope confusion of (4.2) with (2) or (4.1) explains why (1), (2), and (5) seem consistent when they are not.

(4.2) also serves all the legitimate purposes of (2) or (4). Forrester

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[7] Someone who says (4) probably means to say (4.3): '$O(x)(Mxsj \supset Gx)$' or (4.4): '$(x)(Mxsj \supset OGx)$', because these avoid the absurd implication of (4.1) that, if Smith murders Jones roughly, it is obligatory for Smith to return and murder him gently. In any case, my solution is unaffected, because the contradiction follows from (4.3) but not from (4.4).

says that the purpose of a law such as (2) or (4) is to show that the legal system "considers murdering violently to be a worse crime than murdering gently" (194). (4.2) serves this purpose as well as (2) or (4), because murdering violently violates (4.2), but murdering gently does not violate (4.2).

Furthermore, the justification for (4.2) is simple and intuitive. Forrester defines "'doing A to person m at time t gently' as 'doing A to m at t in such a way as to cause m the least amount of pain consistent with the agent's doing A to m'" (194). If a legal system wants to make it obligatory to cause the least pain consistent with doing an act of any kind, then the legal system can include a general rule that

$$(12) \qquad\qquad (x)OGx$$

which implies a general rule that, for any kind of act, A,

$$(12.1) \qquad\qquad (x)\,(Ax \supset OGx)$$

which implies that, for any kind of act, A,

$$(12.2) \qquad\qquad (\exists x)Ax \supset (\exists x)(Ax \mathbin{\&} OGx)$$

(4.2) is an instance of (12.2); so (12)–(12.2) can justify (4.2). No general rationale for (2) or (4.1) is this plausible.

Thus, there are several reasons to interpret any actual law like (2) or (4) as (4.2) rather than as (4.1) and to prefer (4.2) to (2) or (4.1) as a moral rule. If anyone insists on (2) or (4.1) as a law or moral rule, and they also accept (1) and (5), then their views are inconsistent. Such inconsistency is not a paradox.

Critics might respond that this solution assumes Davidson's theory of the logical form of action sentences, but that theory is questionable, and there are alternative theories of adverbs and action sentences on which no scope solution to Forrester's paradox is available. The most plausible alternatives[8] analyze adverbs as operators on sentences, so

(7a) Smith murders Jones gently.

is analyzed as

(7a*) Gently (Smith murders Jones)

(6) must then be analyzed as

(6*) O(Gently (Smith murders Jones))

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[8] Cf. Romane Clark, "Concerning the Logic of Predicate Modifiers," *Noûs*, IV, 4 (November 1970): 311–335, and Terence Parsons, "Some Problems concerning the Logic of Grammatical Modifiers," *Synthese*, XXI, 3 (October 1970): 320–334.

and the contradiction follows. Such operator analyses do not allow a scope where a deontic operator applies to the adverb 'gently' but not to the verb 'murders', so they do not allow any solution to Forrester's paradox except denying (3), (8), or (10). I cannot here discuss all the pros and cons of various approaches to adverbs. However, if a theory of adverbs or action sentences does not allow a plausible solution to the paradox of gentle murder, so much the worse for that theory. One advantage of Davidson's theory is that it solves the paradox of gentle murder.

A second possible objection is that the quantifier over acts in (4.2) lies outside the scope of the deontic operator, so the quantifier ranges over actual or performed actions, rather than over acts which are obligatory but which might not be done. This is admittedly unusual, but it does not cause any problems in the context of the paradox. The quantifier over actual acts occurs only in the consequent of a conditional or as the conclusion of an argument where the antecedent or premises guarantee that some act of murder is actual. Thus, the consequent of (4.2) will never stand alone unless there is an actual act for the quantifier to range over. If someone does judge that 'It is obligatory that Smith murder Jones gently' before Smith actually murders Jones, then the judger must be assuming that Smith will murder Jones, so the judgment is elliptical for a conditional judgment. In such cases, nothing is wrong with quantifying into deontic contexts.

In the absence of further objections, I conclude that Forrester's paradox depends on a scope confusion of (4.2) with (2) or (4.1). The moral is clear. Paradoxes can arise from inadequate attention to the logical form of action sentences inside the scope of deontic operators. In order to avoid such paradoxes, one must use not only propositional constants but also more complicated analyses where the logical form is explicit.

WALTER SINNOTT-ARMSTRONG

Dartmouth College