A JURISPRUDENTIAL PANORAMA OF DEONTIC LOGIC

In this article I shall present an outline of a new area of logic which has greatly engaged the attention of legal theorists and which has supplied tools of thought much needed also by legal practitioners. The following exposition contains some net results of my work in this area.

Deontic logic (DL) is logic in its application to the field of normative relevancy. It is related to, but not identical with, the logic of norms and logic of the Ought. The scope of the latter is narrower than that of the former, for not all norms are ought-sayings; there are also may-norms as well as can-norms. The scope of the logic of norms is again narrower than that of DL, because this relates also to absence of norms.

The basic concepts of DL are *deontic functors* (e. g. "obligatory", "prohibitory", "permissory") and *deontic fungenda* (e. g. "action", " omission", "conduct"). These fungenda are appropriate to all norms of *conduct*. For norms of attitude, as for all norms, "incidence" can be employed as a general fungendum. Often, "deontic operator" is used instead of "deontic functor" and "deontic argument" instead of "deontic fungendum". These terms are, however, objectionable, since the deontic functors effect no logical *operations* and since "argument" (meaning also a line of logical reasoning) is ambiguous in the field of logic, especially in that of legal logic (whose essential task is to deal with arguments in this sense). The combination of deontic functors and deontic fungenda produce *deontic functions* (e. g. "obligatory action", "prohibitory omission", "permissory conduct").

The main task of DL is the determination of logical relations between deontic functions. In this, it is presumed that in any context of logical formulae or operations any symbol standing for an action, omission, conduct, or incidence refers to something constant. There is an isomorphy of logical relations between deontic functions with those between ontic functions (such as "necessary event" and "possible event") and with those between alethic functions (such as "necessary truth" and "contingent truth"). Thus DL can be regarded as a kind of modal logic. Another important task of DL is the determination of logical relations between deontic fungenda.

If "conduct" is symbolized by "*u*", "action" by "*a*" and omission by "*o*", the logical relations between deontic fungenda can be expressed as $u \leftrightarrow (a \vee o)$. On some occasions, also $a \leftrightarrow \sim o$ or $o \leftrightarrow \sim a$ are appropriate, but this relation does not represent a general law of DL. In general, only $a \vee o$ can be regarded as equivalent to u.

Deontic systems can be either normatively closed or normatively open. The closure principle underlying the closed systems is often expressed by the following sentence: Whatever is not prohibited is permitted. There are normative systems conceivable to which the closure principle does not apply. The contemporary international legal order appears to be actually a normatively open system. Thus the closure principle is a contingent material principle and not a universal logical principle, if "permitted" in its formulation relates to a *normative* state of affairs.

In the logical construction of the normatively closed system, the following are necessary: either (1) one deontic functor (e. g. "obligatory") and two deontic fungenda ("action" and "omission") or (2) two deontic functors (e. g. "obligatory" and "prohibitory") and one deontic fungendum (either "conduct" or "incidence"). In the second case, an abbreviated notation can be employed in which the ever-occurring expression "*u*" (or "*i*" for "incidence") is simply omitted. Because of the advantage of formulae thus simplified, this method will be employed here.

Using "*o*" for "obligatoıy" and "*I*" for "prohibitory", the fundamental deontic relationships in the normatively closed system are as follows: (1) $O \rightarrow \sim I$; (2) $I \rightarrow \sim O$; (3) $\sim O \wedge \sim I$; (4) $\sim O \vee \sim I$. $\sim I$ can be expressed by the term "permissory" ("*P*") and $\sim O$ by the term "dispensory" ("*D*"). Thus it can be said that obligatory conduct implies permissory conduct (Formula (1)) and that prohibitory conduct implies dispensoıy conduct (Formula (1)). Formula (3) constitutes the concept "licensory couduct" ("*L*"). Formula (4) expresses that the adjunction of permissory conduct and dispensory conduct embraces the whole deontic universe.

The normatively closed system can be constructed as an axiomatic system with one axiom and one defintion (introducing "L") as follows : CSAx. : $\sim O \vee \sim I$; CSDf. : $L =^{df} \sim O \wedge \sim I$. If the use of "$P$" and "$D$" is desired, their definitions are: $P =^{df} \sim I$ and $D =$ df $\sim O$.

In the logical construction of the normatively open system, the additional concept "neutral conduct" ("N") is necessary. This system can be constructed as an axiomatic system with three axioms and one definition (introducing "N") as follows : OSAx. 1 : $\sim O \vee \sim I$; OSAx. 2 : $\sim O \vee \sim L$; OSAx. 3 : $\sim I \vee \sim L$; OSDf. : $N =^{df} (\sim O \wedge \sim I) \vee \sim L$. If the use of "$P$" and "$D$" is desired in the open system, their definitions are : $P =^{df} \sim N \wedge \sim I$ and $\sim N \wedge \sim O$.

The deontic functions can be employed in order to formalise norms in all areas of regulation. They are particularly important in the field of law, where the distinction between normatively closed and normatively open legal orders plays a fundamental role. There are the following kinds of legal norms : (1) "Y is an obligatory conduct for X" (or "X ought to ... Y"), (2) "Y is a prohibitory conduct for X" (or "X ought-not to ... Y"), (3) "Y is a licensory conduct for X" (or "X may ... Y"), (4) "Y is a permissory conduct for X" (or "X can ... Y"). What is permissory includes not only what is licensory but also what is obligatory; in other words, what one "may" or "ought to" that one also "can" (in the sense of permissibility and not, of course, in the sense of physical or mental capability). Note that the sentence "Y is a neutral conduct for X", which is meaningful in relation to a normatively open system, does not express a norm but only a normatively relevant state of affairs. The sentences (1) to (4), too, express normatively relevant states of affairs, but beyond that they also express norms.

DL has produced various paradoxes, whose solution (or resolution) has been one of the main preoccupations of deontic logicians. As examples, the following two may be mentioned : (1) The paradox of Normative Adjunction : From "It is obligatory for X to mail this letter" it follows "It it obligatory for X to mail this letter or it is obligatory for X to burn this letter. " ($Ou_1 / \therefore Ou_1 \vee Ou_2$). The impression of a paradox arises in this case due to the difference of the meanings between "or" in ordinary language and in the language of logic. The conclusion does not import the claim that its second adjunct holds, but that at least one of its adjuncts (possibly both) holds. Only when one adjunct is excluded does the other follow. This exclusion, however, is not expressed by the premiss of the inference. (2) The Paradox of Derived Obligation : From "The compliance with law is obligatory for X" it follows "The compliance with law or shooting the policemen is obligatory for X" ($Ou_1 / \therefore O(u_1 \vee u_2)$). A source of this paradox is that the deontic functor in the conclusion relates here to the deontic fungenda constructed as deontic adjuncts. Such application of deontic functors is not warranted by general logic. It is admissible only on the basis of special deontic principles which establish a connection between internal and external operations with deontic functions. They can be postulated only if they are required, or at least tolerated in a special area of normativity. The Paradox of Derived Obligation indicates, above all in the light of legal experience, that the postulation of these principles overtasks DL.

In the above construction of DL, the deontic fungenda were conceived as referring to a conduct (or an incidence). They can also be conceived as referring to sentences (e. g. "It is obligatory that X behaves in the manner M"). Through this construction nothing of importance is achieved; on the contrary, it produces clumsy expressions. Seemingly, the advantage of such a construction is that it enables internal operations in deontic functions to be performed by means of propositional operators. Insofar as these operations are required at all, they can also be carried out by means of the logic of concepts. In this treatment, the operators receive their fundamental meaning from a basic ("protological") calculus; their specific meanings are determined by the requirements of the semantic field to which they belong. The iteration of deontic functors is possible in both above mentioned constructions. Thus "obligatory obligatory conduct" is not less meaningful than "It is obligatory that it is obligatory that X behaves in the manner M".

The truth-values ("true" and "false") can find application in the construction of DL here preferred only to normatively relevant sentences (such as "Y is an obligatory conduct for X"), provided that these sentences are understood as normative meta-sentences. However, if these sentences mean norms, truth-values are not appropriate to them; the corresponding values could then be "valid" and "not valid". In the normatively open system, where both norms and their absence are contained, "tenable" and "not tenable" are appropriate. The problem of logical values in DL can be side-stepped by the application of the axiomatic method or the method of natural deduction. Where the application of tabular methods is required, the protological values "plus" and "minus" yield the same results as the truth-values. Because it is possible to deal with DL without being tied to the latter, it is not necessary to resort to artificial constructions by which reduction of DL to alethic logic is attempted.

The analyses and operations enabled by DL are useful wherever self-consistent thought is a desideratum in the normative area. They have a particular significance in the field of law, where the contemporary development of DL has made important contributions in order to identify, avoid, and remove antinomies and gaps in law. On the other hand, work on specific legal problems has promoted the development of DL, notably elaboration of the systems accommodating the phenomenon of normative openness in a logical construction. Efforts to solve actual legal problems have also drawn attention to the fact that some systems of DL contain theses which cannot claim universality. This has had a beneficial effect on the tracing of sources of paradoxes of DL by showing that postulation of certain deontic principles means smuggling into legal theory natural-law assumptions which are inconsistent with the ways in which law actually works today.

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