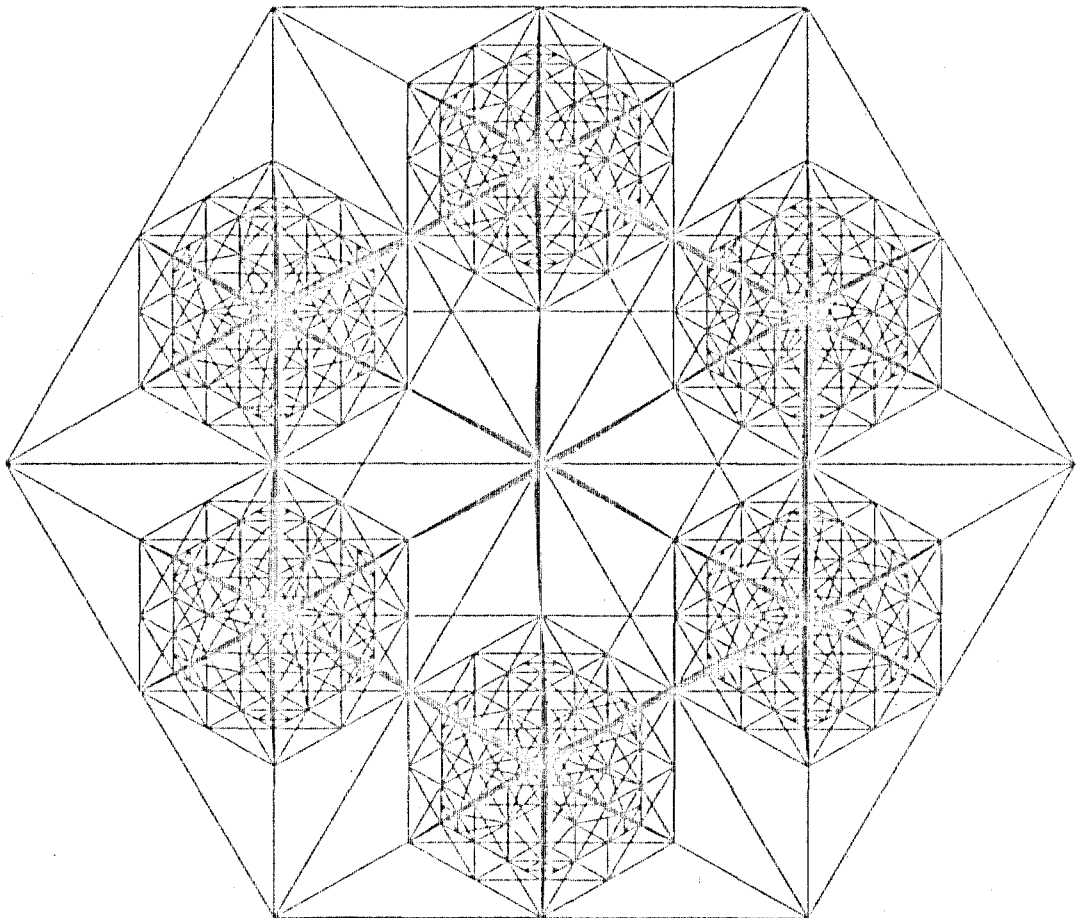


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Large synergetical structure on hexagonal figure
Aerial view

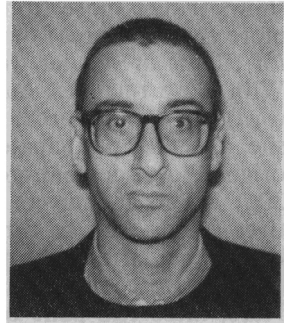
FOR AND AGAINST "DEGREES OF ASYMMETRY"

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"A little knowledge that you carry out in action is more profitable than much knowledge which you neglect to carry out in action."

Hermes

"Degrees of asymmetry" refers to the finding of analyses of different aspects of Balinese ideology in western Lombok, Indonesia¹, that two entities may be related asymmetrically to one of four increasing degrees of asymmetry (see, e.g., Duff-Cooper, 1985, 1986, 1987a, 1988a, 1990a). These degrees, which are relative one to another and not absolute determinations, are the first, the second, the third, and infinite degrees; they are represented as $A > A'$, $A \gg A'$, $A \ggg A'$, and $A\alpha > A'$. In these representations, of two entities A and A' , A is pre-eminent in each of the contexts in which a particular mode of asymmetrical relation, so to say, is

¹ The materials upon which the present brief piece is based were collected in the course of about 21 months field research in 1979-81 in Pagutan, western Lombok. This work was supported by awards from the Social Science Research Council of Great Britain, the Emslie Horniman Anthropological Scholarship Fund of the Royal Anthropological Institute of Great Britain, and by the Philip Bagby Fund, University of Oxford; it was done under the auspices of the Indonesian Academy of Sciences. I am indebted to these bodies for their support. Unless it is specified or is otherwise clear from the context, 'Balinese' refers to the Balinese of western Lombok. 'Ideology' refers to ideas and values in social action, not the delusions of or deceptions perpetrated upon social classes however defined.

evinced. In some contexts, though, of A and A' , A' may be pre-eminent (Duff-Cooper, 1991) such that $A < A'$, $A \ll A'$, and so on. Each of these four degrees is a transformation of A/A' in which the solidus (/) represents a symmetrical relation as holding between A and A' . The contexts in which A and A' are symmetrically related are, expectably, far fewer than those in which $A > A'$ etc., for instance.

These findings derive from the social facts that "one should not sell things to one's 'brothers' or to one's 'sisters'; one sells at a price (x), determined by the state of the market, to more distant relations and members of one's own village [*kaklian*]; at price $2x$ to members of one's own realm and 'race'; and at price x increased as much as possible to all other 'races' (cf., e.g., Chegaray, 1953, 82)" (Duff-Cooper, 1985, 30); and concomitantly that "an examination of the payments to wage-labourers shows that ... those from within the ward were paid on average even 50 per cent more (per unit area) than outsiders hired from the open market, and would range for clients or regular workers up to three times the value" (Hobart, 1980, 145). With close relatives, one should give readily and generously (*dharma alus dana goya*), so that they are not paid but participate in what their 'employer' has as he, or she, and they participate in their forebears in their compound temple or in their original local descent group temple, that is symmetrically (cf. Duff-Cooper, 1987a, 206). Sellers and buyers and employers and employees — preferably seen as correlatives rather than as complementaries because correlatives are always opposites, complementaries only may be (e.g. Aristotle, 1963, 31, 32; Needham, 1987a, 99, 179) — are commonly regarded as opposites, as they are in Balinese ideology². Here, these two pairs of terms are in almost all contexts asymmetrically related such that buyer and employer are pre-eminent. This results from them, like all entities in Balinese life participating in *Vidhi*, the high or highest god of the Balinese, to different degrees. Entities, that is, stand in an ideological and often physical relationship to points of reference. The forms such points take depends upon context, but no matter the form, they are all *Vidhi* in one of the multifarious guises that this god can take. When two or more entities are contingent or are juxtaposed in different contexts, they may be related symmetrically in that they are equidistant from a point of reference; but entities are more usually asymmetrically related: more often one entity stands closer to the point of reference than the other(s). What stands closer to the reference point is in that context at least pre-eminent. What the pre-eminence concerns depends upon the context.

Entities may, also, be interchangeable one for another in some contexts; usually they are not. Moreover in some contexts an objective statement may apply to both (or where there are more than two, all) of the constituent entities, but usually it does not. Where entities are interchangeable or indiscernible (in that an objective statement applies to both, or all, of them), a symmetrical relation is evinced; where entities are not interchangeable or indiscernible, an asymmetrical relation obtains among them. In the latter cases: again, sometimes one entity sometimes the other

² Opposites do not necessarily conflict, of course. Gerdin's description of the relationships of employers and employees in Balinese Lombok reported in *The Unknown Balinese* (1982) bears hardly any resemblance to those experienced and observed by the present writer.

(or another when more than two are implicated) may be pre-eminent. Formally this is always the case; empirically it may not be so for two or more entities.³

At this juncture, the etymologies of 'symmetry' and 'asymmetry' and some definitions of 'symmetry' should be noted. 'Symmetry' is an adoption of obsolete French *symétrie* or Latin *symmetria*, adoptions from Greek *symmetriā* (συμμετρία), formed on *sūmmetros*, commensurable, proportionable, in due measure, symmetrical formed on *sūn* (SYM-) and *métron*, measure (the latter being formed on Indo-European **mē-*, measure). The 'a' of 'asymmetry' is the prefix of negation or privation in terms of the arts and the sciences having a Greek basis but coming (here into English) through a form of Latin (Onions, 1966, 895-896, 573, 1). 'Asymmetry' thus means without symmetry, 'absence of symmetry' (Shubnikov, Belov, and others 1964, 171). The *Oxford English Dictionary* gives (*s.v.*) various meanings of 'symmetry', the strictest of which is the use in such subjects as geometry: "exact correspondence in position of the several points or parts of a figure or body with reference to a dividing line, plane, or point (or a number of lines or planes)"; "the essential feature of a symmetrical object is that it can be divided into two or more identical parts: and furthermore that these parts are systematically disposed in relation to one another" (Lockwood and Macmillan, 1978, 1). There are exactly seventeen ways in which this can occur (Weyl, 1952) and include operations such as reflection, rotation, reflection and rotation, glide reflection, inversion rotatory inversion, and screwing (as in a spiral staircase).

When it is said of two or more entities that they are interchangeable, indiscernible, equidistant from a point, correspond in position to a line or plane, or that they are identical and are systematically disposed relative one to another, the differences are of idiom not of substance. This may be represented in formal notation as $(ARA') \sim (A'RA)$.

Empirically, however, especially in the case of social facts, two entities are usually only sometimes interchangeable; they are only sometimes indiscernible; are only sometimes equidistant from a point of reference; and are not always identical and/or systematically disposed relative one to another. Here, $(ARA') \sim (A'RA)$.

But consider now Figures 1-8.⁴ Allowing for the figures having been drawn by hand on palm-leaf (see Hooykaas, 1980, 12), Figures 2 and 8 are symmetrical; Figures 1

³ The terms older/younger, for instance, are related only as $A > A'$; superior/inferior may be related as $A > A'$ or as $A < A'$ depending upon the context — which has over-riding importance (it has been very often stated) in the determination of a relation holding between opposed terms.

⁴ Figure 1 is a drawing which "alone promises a clear sky". Figure 2 is one of a number of drawing against various ailments and diseases used mainly for adults. Figure 3 depicts the god *Linggha Bhuvana*, *Token of the World*, protector against illness. Figure 4 reverses a curse when it is drawn on the skin of a frog which lives in the rice-fields and is then bound up with three coins of a black thread and thrown into the water in the fields. Figure 5 is one of six 'curse reversers' (*pamalik sumpah, pang-ulih-ulih*); Figure 6, too, is one of a number of drawings that reverse curses. Figure 7 is one of several drawings that kill thieves, kidnappers, and rogues (*dusta*). Figure 8 is one of two drawings that together destroy 'dark forces' in the courtyard of a compound.

and 3-7 are by the definitions just given all asymmetrical. Yet Figure 1 is for all intents and purposes symmetrical; Figure 3 is clearly less symmetrical than Figure 1, but more so than Figures 4 and 5; but Figure 5 is more so than Figure 4; Figures 6 and 7 are clearly less symmetrical than Figures 4 and 5, though it is hard to say which, if either, is more or less symmetrical than the other. It is submitted that the remarks in this paragraph (made excessively brief by limitations of space) make perfect sense to anyone considering the figures under the aspects of symmetry and asymmetry.

Degrees of asymmetry, analogously, have been invoked to describe the relations holding between two entities when they are more interchangeable (indiscernible, equidistant from a point, more alike and/or systematically disposed one to another) than two others. Degrees of asymmetry are invoked where $A > A'$ and, for instance, $B > B'$ do not express an identical relation but where $A > A'$, say, expresses greater interchangeability etc. of A and A' than of B and B' : $A > A'$, for instance, and $B \gg B'$. Sometimes A and B will be identical: a seller or an employer may sell to or employ more than one other person. Then $A = B$, so that for example $A > A'$, $A \gg B'$ or $B > A'$, $B \gg B'$.

This notion was meant to capitalise upon the utility of employing formal notions in the analysis of social facts that has in very large measure been propounded and demonstrated by Rodney Needham in numerous publications (e.g. 1962, 1969, 1971, 1973, 1983, 1987a, 1987b); and upon their demonstrated helpfulness in elucidating aspects of Balinese ideology in particular. Needham's pronouncements and demonstrations have usually involved the representation of such relational notions as symmetry, asymmetry, and transitivity by "conventional signs or formulas" (Needham, 1987a: 90; cf., e.g. 1983, 94): thus he gives the absolute formal definition of a transitive relation as $(aRb) \cdot (bRc) \supset (aRc)$. This is the notation of symbolic logic, of course; and Needham has more than once (e.g., 1983, 15, 93; 1974, 16) explained why he has recourse to this notation: it promises "to evade the difficulties and uncertainties consequent upon using the terms of common English in comparative analysis"; while resorting to such formal constructs has achieved a great deal of clarity in the study of prescriptive marriage systems (e.g., Needham, 1973). Nonetheless, "what most calls for methodical doubt, an insistent scepticism [are] the categories in which we frame our analyses" (Needham, 1980, 76).

A standard textbook on symbolic logic, now in its fourth edition, has it of symmetrical and of asymmetrical relations that the former is a relation "such that if one thing has that relation to a second, the second *must* have that relation to the first" and that in the latter case (an asymmetrical relation) "the second *cannot* have that relation to the first" (Copi, 1973, 130-131; original emphases). But we have seen that these assertions do not hold in Balinese ideology: here, one thing may be related symmetrically to a second but not always; and one thing may be related asymmetrically to a second, but that second thing may be related identically (i.e. may be pre-eminent) to that first thing also.

As for transitivity, a transitive relation is one in which if one thing has it to a second, and the second to a third, the first must have it also to a third (above; Copi, 1973, 131). But Waismann shows (1968, 191-196) that this is not inevitable (when 'equal' is taken as the transitive relation in question): it is not necessary (sc. inevitable) that 'equal' should be used transitively, 'we can decide otherwise'.

Finally the phrase 'is an ancestor of' in English usage designates a relationship that is irreflexive: one cannot be one's own ancestor. But in Balinese ideology it designates a reflexive relationship in certain circumstances (Duff-Cooper, 1988b, 242-243).

Add to all this that Balinese epistemology and other 'philosophical' ideas have a very different history and take very different forms from 'ours' (as Hobart (1985, 1986), and Duff-Cooper (1987b) suggest quite independently) and the case for the adoption of conventional symbolic logic and the ideas it encapsulates appears to be less convincing. This is especially so when there are now a practically uncountable number of systems of logics from which to choose (cf. Barth and Krabbe, 1982, 24), and when classical (two-valued) logic was not found useful in such areas of investigation as quantum mechanics. It begins to look, indeed, as though the espousal of conventional or classical logic and its formulas may be rather arbitrary.

An advocate of its employment might, though, respond: Perhaps it is, but it has worked to facilitate comparison and its employment has brought clarity where before there was confusion. This is so: Needham's own work and the work of others (e.g., Yoshida and Duff-Cooper, 1989) demonstrate as much (and incidentally show that Holy's critical remarks (1987, 14) have no purchase).⁵

But not everyone considers clarity something to be sought after: Waismann, for instance, thinks that it can have a detrimental effect on constructive thinking (1968, 16); and while Overing (1987, 81) admits that clarity is an aspect of the end result of successful investigation, she suggests that it too may not be helpful to scientific progress which she asserts is "much more dependant upon imagination and knowledge ...". This is not to suggest that clarity is worthless or anything of the kind (though Howes (1988, 110, n. 10) points out that "the idea of 'clear and distinct' conceptions of things as superior to 'obscure and confused' ... impressions of them dates from the Enlightenment ..." and 'the Balinese mind' according to Geertz (1980, 196) does not regard clarity as a virtue; is thus relatively recent); but it is not all that counts.

One area of growth in the field of alternative logical systems is in 'fuzzy logics'. "A fuzzy logic, *FL*, may be viewed, in part, as a fuzzy extension of a nonfuzzy multi-valued logic which constitutes a base for *FL* The truth-value set of *FL* is assumed to be a countable set *T* of the form

$$T = \{ \text{true, false, not true, very true, not very true, more or less true, rather true, not very true and not very false, ...} \}$$

(Zadeh, 1975, 409-410).

⁵ At the place cited, Holy has it that "stripped of their respective cultural guises, it is difficult to imagine what might be achieved by comparing 'symmetry' ... cross-culturally or indeed how 'symmetry' ... could at all be compared". It is of course instances of the relation itself. If Holy had perhaps tried to carry out the comparisons rather than just imagining them, he would have discovered what can be achieved, indeed how one compares.

Fuzzy logic and some of the connections of fuzzy sets theory with other subjects, including the history and ethnography of science, are discussed by Gaines who reports that studies of fuzzy systems rose from almost none published in 1965 to more than 150 ten years later (1976, 625-626, Fig. 1). This, and the importance fuzzy sets theory has demonstrably had in other fields of enquiry shows that this is no five-minute wonder. It may, indeed, be an alternative (if one were needed) to 'degrees of asymmetry'. What is noteworthy here is the way in which the truth-value set T of FL contrasts with standard or classical bi-valent logic in which true and false are absolutes such that a proposition with a determinate meaning is either true or false and never both.

Similarly, it is contended that "a relation is either asymmetric or it is not, without the possibility of further qualification"; and that "for any instance of any kind [e.g. translation, reflection, rotatory] of symmetry, it is either symmetric or it is not" (Needham, 1988a, 1988b).

Haack has a test for deciding whether a predicate is absolute or is one of degree: the latter can be qualified by 'quite', but the qualified predicate cannot be further qualified by 'not' if it is one of degree (1978, 168-169). 'Quite symmetrical' and 'quite asymmetrical' sound odd, it is true, though if by 'quite' are meant 'exactly', for instance, the phrases do not sound so strange. Nonetheless 'quite' meaning 'somewhat', say, is not happy – so that one might want to agree that our predicates are absolute. However, 'not quite symmetrical' sounds perfectly all right and is consonant with the usages above in reference to Figures 3 and 5 for instance. 'Not quite asymmetrical' is not an expression of standard English though. Either, therefore, Haack's test does not work; or (more likely) our predicates are not both absolute: 'symmetrical' is a predicate of degree. If this is so, and if, as in Balinese ideology (Duff-Cooper, 1987c, 1990b), asymmetrical derives from symmetrical, then we might simply over-ride the limitation imposed upon us by grammar, as Waismann decided not to use 'equal' transitively. This might be considered a legitimate move given that "the notion of 'asymmetry' is very wide indeed ..." (Barth and Krabbe, 1982, 34).

Perhaps, still 'symmetrical' and 'asymmetrical' are closed descriptions of the relations in question. A description is 'closed' when whatever else is added to it is either entailed by or contradicts the description. An example of such a description is the three sides of a triangle, which determines it. However, $A > A'$ neither entails A/A' and $A < A'$, nor do A/A' and $A < A'$ contradict $A > A'$. 'Asymmetrical' is thus not closed. Similarly, while A/A' entails $A > A'$ (because A and A' are interchangeable etc. in only some contexts when they are not devoid of content), $A > A'$ does not contradict A/A' . It would appear that neither of our predicates is 'closed'.

In any case, 'symmetry' and 'asymmetry' are often quite intelligibly qualified. Chiang, for instance, talks about 'rigid symmetry' and 'balanced asymmetry' in the context of Chinese calligraphy (1938, 167), and Komparu, in discussing aspects of Noh, has a section called "Dynamic Symmetry" (1983, 21); while symmetry in crystals may be of various grades according to the number of radiating or non-parallel lines or planes about which the figure or body is symmetrical.

The sceptic will not be convinced by these adducions. All they show, our critic might respond, is that the relations can indeed be qualified – as ‘true’ and ‘opposite’ can be qualified for instance – but that in each instance what is qualified is still the absolute relation symmetry or asymmetry – rather as in composite terminologies of social relationship, that is in systems of categories composed of both like and unlike prescriptive relations, the preponderance of symmetry or of asymmetry can be gauged but the relations in question are in each individual instance either symmetric or asymmetric without qualification. (Some proposition is either true or false, something is either opposite something else or it is not.)

At this point, it may be that it should be said that, yes ‘degrees of asymmetry’ is a new coinage, to express the matters related above. After all, there is nothing wrong with coining new expressions to express some idea that language constrains us from expressing; quite the reverse: “a departure from the beaten track may not only not be anathematized, but may be the *very thing* to be striven for ...”; “not only should the scientist be free to deviate from common language, when the need arises, but he is bound to do so if he is to convey a new insight not in conformity with the ideas dominant of the time” (Waismann, 1968, 175, original emphasis, 183).

But ‘degrees of asymmetry’ is not in fact at all new. In mathematics it is done to speak of degrees of asymmetry in connection with commutators, a nineteenth century invention; and in molecular biology and chemistry, there appears to be a statistical sense in which one can speak correctly of ‘slight asymmetry’ (e.g., L-amino acids outnumber D-amino acids by 1 part in 10 to the power of 17) and the difference (‘asymmetry’) between concentrations of the two enantiomeric forms of a molecule can be measured (Hegstrom and Kondepudi, 1990, 104)⁶. It does not matter that both the materials upon which commutators are employed and those of molecular biology and chemistry are on the face of it radically different from the social facts that form the materials of the social anthropologist. What does matter is that ‘degrees of asymmetry’ are correctly spoken of and are employed in analysis. It could be argued, moreover, that traditional logic is applicable to data that are far removed from the social facts that properly occupy social anthropologists – Russell (1923) noted that all traditional logic is only applicable to “an imagined celestial existence” – but this has not prevented anthropologists from employing it in analyses of their data.

Needham’s case for the employment of relational constants has a strongly pragmatic flavour: thus he writes, for instance, that the recourse to formal analysis, in which the details of cultural reality are reduced by abstraction to relational notions such as symmetry and transitivity or to certain forms of logical possibility, “has at once deepened analysis and has facilitated comparisons” (1972, 221). This cannot be gainsaid.

‘Degrees of asymmetry’, as used in social anthropology also can be justified pragmatically: they delineate more finely the relations holding among the constituent entities of the various aspects that together compose Balinese ideology; and more

⁶ Rodney Needham pointed out these two usages to me and I am very grateful to him for the friendly interest he is showing in my work.

particularly they tend to refute the burden (and are thus a step forward) of de Josselin de Jong's contention (1977, 26) that structuralists have been unable to find a suitable approach to 'economics'.

In the end, though, whether degrees of asymmetry are taken to be correctly spoken of and helpfully employed in sociological analysis may not depend upon arguments and examples, but upon temperament. This is not to evade the issue (which a monograph being prepared on the topics implicated by the notion will show is not evaded). It is to recognise that as Needham puts it (1985, 10; cf., e.g., 1971, xviii; 1987a, 236) "the temperamental inclination toward boldness or prudence that will color an entire theory and also the opposition to it ... is a particularly unmanageable factor ...: it may render both [writers and their critics] impervious to argument".

No critic has come forward publicly to challenge the notion of 'degrees of asymmetry' yet, so perhaps this very short piece should conclude by setting out, in the barest outline only, two major drawbacks to the notion as it has been employed in analysis. First, there may not be enough degrees: if, as seems likely, a degree corresponds to a 'tier' of the structure of Balinese ideology, then there should probably be ten (each tier corresponds to one of the modes of classification by division, which go from two to eleven (Duff-Cooper, 1991) evinced by Balinese ideology). Second, in the determination of the degree to which asymmetry is evinced in a particular relationship, the judgement of the analyst plays a rather too prominent role; and a certain amount of forcing is often required of the analyst. Neither is very acceptable or desirable in analysis, of course.

Still, these drawbacks are what might be called technical. Further employment of the notion should lead to their resolution or dissolution; and they do not in any case affect the fact that a cogent case can in principle be made for the notion. The case provided above cannot be proved right (or wrong), though it suggests that it is too soon to consign the notion to the sidelines of an analytical vocabulary. But the reader cannot be bullied into acceptance of the notion; as Waismann says in another connection (1968, 18), when all is said and done, it is the reader's (and writer's) decision.

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