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Other Books by Nelson Goodman

*The Structure of Appearance*

*Fact, Fiction, and Forecast*

*Problems and Projects*

*Languages of Art*

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NELSON GOODMAN

WAYS of WORLDMAKING



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*For H. P. G.,*

who makes worlds with watercolors



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## FOREWORD

This book does not run a straight course from beginning to end. It hunts; and in the hunting, it sometimes worries the same raccoon in different trees, or different raccoons in the same tree, or even what turns out to be no raccoon in any tree. It finds itself balking more than once at the same barrier and taking off on other trails. It drinks often from the same streams, and stumbles over some cruel country. And it counts not the kill but what is learned of the territory explored.

For the third time in my life, work on a book has been spurred by an invitation to give a series of lectures. Special Lectures at the University of London led to *Fact, Fiction, and Forecast*. John Locke Lectures at Oxford University became *Languages of Art*. And the first Immanuel Kant Lectures at Stanford University provided the impetus for the present book and the basis for its last four chapters, although most of the final chapter is new. The first chapter was read at the University of Hamburg on the one-hundredth anniversary of the birth of Ernst Cassirer; and the first four chapters have appeared as separate papers.

The list of those who have helped is, as usual, impossibly long and I can mention only Stanford University and its Philosophy Department, especially Patrick Suppes; my colleagues Israel Scheffler, W. V. Quine, and Hilary Putnam; and my Project Zero associates Paul Kolars and Vernon Howard.

Since the seven chapters have been written and rewritten during some seven years and are often variations upon recurrent themes rather than consecutive steps in an argument, repetitions are inevitable and I hope forgivable. My experience with students and commentators has not convinced me that



reiteration is needless. Inconsistencies are less forgivable, and I trust fewer. Obvious inadequacies are for the convenience of critics.

Few familiar philosophical labels fit comfortably a book that is at odds with rationalism and empiricism alike, with materialism and idealism and dualism, with essentialism and existentialism, with mechanism and vitalism, with mysticism and scientism, and with most other ardent doctrines. What emerges can perhaps be described as a radical relativism under rigorous restraints, that eventuates in something akin to irrealism.

Nevertheless, I think of this book as belonging in that mainstream of modern philosophy that began when Kant exchanged the structure of the world for the structure of the mind, continued when C. I. Lewis exchanged the structure of the mind for the structure of concepts, and that now proceeds to exchange the structure of concepts for the structure of the several symbol systems of the sciences, philosophy, the arts, perception, and everyday discourse. The movement is from unique truth and a world fixed and found to a diversity of right and even conflicting versions or worlds in the making.

HARVARD UNIVERSITY

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The following abbreviations are used throughout the book:

*SA* for the third edition of *The Structure of Appearance*, D. Reidel Publishing Co., 1977 (first published 1951);

*FFF* for the third edition of *Fact, Fiction, and Forecast*, Hackett Publishing Co., 1977 (first published 1954);

*LA* for the second edition of *Languages of Art*, Hackett Publishing Co., 1976 (first published 1968);

*PP* for *Problems and Projects*, Hackett Publishing Company, 1972.



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# I

## Words, Works, Worlds

### 1. Questions

Countless worlds made from nothing by use of symbols—so might a satirist summarize some major themes in the work of Ernst Cassirer. These themes—the multiplicity of worlds, the speciousness of ‘the given’, the creative power of the understanding, the variety and formative function of symbols—are also integral to my own thinking. Sometimes, though, I forget how eloquently they have been set forth by Cassirer,<sup>1</sup> partly perhaps because his emphasis on myth, his concern with the comparative study of cultures, and his talk of the human spirit have been mistakenly associated with current trends toward mystical obscurantism, anti-intellectual intuitionism, or anti-scientific humanism. Actually these attitudes are as alien to Cassirer as to my own skeptical, analytic, constructionalist orientation.

My aim in what follows is less to defend certain theses that Cassirer and I share than to take a hard look at some crucial questions they raise. In just what sense are there many worlds? What distinguishes genuine from spurious worlds? What are worlds made of? How are they made? What role do symbols play in the making? And how is worldmaking related to knowing? These questions must be faced even if full and final answers are far off.

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<sup>1</sup> E.g. in *Language and Myth*, translated by Susanne Langer (Harper, 1946).

## 2. Versions and Visions

As intimated by William James's equivocal title *A Pluralistic Universe*, the issue between monism and pluralism tends to evaporate under analysis. If there is but one world, it embraces a multiplicity of contrasting aspects; if there are many worlds, the collection of them all is one. The one world may be taken as many, or the many worlds taken as one; whether one or many depends on the way of taking.<sup>2</sup>

Why, then, does Cassirer stress the multiplicity of worlds? In what important and often neglected sense are there many worlds? Let it be clear that the question here is not of the possible worlds that many of my contemporaries, especially those near Disneyland, are busy making and manipulating. We are not speaking in terms of multiple possible alternatives to a single actual world but of multiple actual worlds. How to interpret such terms as "real", "unreal", "fictive", and "possible" is a subsequent question.

Consider, to begin with, the statements "The sun always moves" and "The sun never moves" which, though equally true, are at odds with each other. Shall we say, then, that they describe different worlds, and indeed that there are as many different worlds as there are such mutually exclusive truths? Rather, we are inclined to regard the two strings of words not as complete statements with truth-values of their own but as elliptical for some such statements as "Under frame of reference *A*, the sun always moves" and "Under frame of reference *B*, the sun never moves"—statements that may both be true of the same world.

Frames of reference, though, seem to belong less to what is described than to systems of description: and each of the two statements relates what is described to such a system. If I ask

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<sup>2</sup> But see further VII:1 below.

about the world, you can offer to tell me how it is under one or more frames of reference; but if I insist that you tell me how it is apart from all frames, what can you say? We are confined to ways of describing whatever is described. Our universe, so to speak, consists of these ways rather than of a world or of worlds.

The alternative descriptions of motion, all of them in much the same terms and routinely transformable into one another, provide only a minor and rather pallid example of diversity in accounts of the world. Much more striking is the vast variety of versions and visions in the several sciences, in the works of different painters and writers, and in our perceptions as informed by these, by circumstances, and by our own insights, interests, and past experiences. Even with all illusory or wrong or dubious versions dropped, the rest exhibit new dimensions of disparity. Here we have no neat set of frames of reference, no ready rules for transforming physics, biology, and psychology into one another, and no way at all of transforming any of these into Van Gogh's vision, or Van Gogh's into Canaletto's. Such of these versions as are depictions rather than descriptions have no truth-value in the literal sense, and cannot be combined by conjunction. The difference between juxtaposing and conjoining two statements has no evident analogue for two pictures or for a picture and a statement. The dramatically contrasting versions of the world can of course be relativized: each is right under a given system—for a given science, a given artist, or a given perceiver and situation. Here again we turn from describing or depicting 'the world' to talking of descriptions and depictions, but now without even the consolation of intertranslatability among or any evident organization of the several systems in question.

Yet doesn't a right version differ from a wrong one just in applying to the world, so that rightness itself depends upon and

implies a world? We might better say that 'the world' depends upon rightness. We cannot test a version by comparing it with a world undescribed, undepicted, unperceived, but only by other means that I shall discuss later. While we may speak of determining what versions are right as 'learning about the world', 'the world' supposedly being that which all right versions describe, all we learn about the world is contained in right versions of it; and while the underlying world, bereft of these, need not be denied to those who love it, it is perhaps on the whole a world well lost. For some purposes, we may want to define a relation that will so sort versions into clusters that each cluster constitutes a world, and the members of the cluster are versions of that world; but for many purposes, right world-descriptions and world-depictions and world-perceptions, the ways-the-world-is, or just versions, can be treated as our worlds.<sup>3</sup>

Since the fact that there are many different world-versions is hardly debatable, and the question how many if any worlds-in-themselves there are is virtually empty, in what non-trivial sense are there, as Cassirer and like-minded pluralists insist, many worlds? Just this, I think: that many different world-versions are of independent interest and importance, without any requirement or presumption of reducibility to a single base. The pluralist, far from being anti-scientific, accepts the sciences at full value. His typical adversary is the monopolistic materialist or physicalist who maintains that one system, physics, is preeminent and all-inclusive, such that every other version must eventually be reduced to it or rejected as false or meaningless. If all right versions could somehow be reduced to one and only one, that one might with some semblance of

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<sup>3</sup> Cf. "The Way the World Is" (1960), *PP*, pp. 24-32, and Richard Rorty, "The World Well Lost", *Journal of Philosophy*, Vol. 69 (1972), pp. 649-665.

plausibility<sup>4</sup> be regarded as the only truth about the only world. But the evidence for such reducibility is negligible, and even the claim is nebulous since physics itself is fragmentary and unstable and the kind and consequences of reduction envisaged are vague. (How do you go about reducing Constable's or James Joyce's world-view to physics?) I am the last person likely to underrate construction and reduction.<sup>5</sup> A reduction from one system to another can make a genuine contribution to understanding the interrelationships among world-versions; but reduction in any reasonably strict sense is rare, almost always partial, and seldom if ever unique. To demand full and sole reducibility to physics or any other one version is to forego nearly all other versions. The pluralists' acceptance of versions other than physics implies no relaxation of rigor but a recognition that standards different from yet no less exacting than those applied in science are appropriate for appraising what is conveyed in perceptual or pictorial or literary versions.

So long as contrasting right versions not all reducible to one are countenanced, unity is to be sought not in an ambivalent or neutral *something* beneath these versions but in an overall organization embracing them. Cassirer undertakes the search through a cross-cultural study of the development of myth, religion, language, art, and science. My approach is rather through an analytic study of types and functions of symbols and symbol systems. In neither case should a unique result be anticipated; universes of worlds as well as worlds themselves may be built in many ways.

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<sup>4</sup> But not much, for no one type of reducibility serves all purposes.

<sup>5</sup> Cf. "The Revision of Philosophy" (1956), *PP*, pp. 5-23; and also *SA*.



### 3. How Firm a Foundation?

The non-Kantian theme of multiplicity of worlds is closely akin to the Kantian theme of the vacuity of the notion of pure content. The one denies us a unique world, the other the common stuff of which worlds are made. Together these theses defy our intuitive demand for something stolid underneath, and threaten to leave us uncontrolled, spinning out our own inconsequent fantasies.

The overwhelming case against perception without conception, the pure given, absolute immediacy, the innocent eye, substance as substratum, has been so fully and frequently set forth—by Berkeley, Kant, Cassirer, Gombrich,<sup>6</sup> Bruner,<sup>7</sup> and many others—as to need no restatement here. Talk of unstructured content or an unconceptualized given or a substratum without properties is self-defeating; for the talk imposes structure, conceptualizes, ascribes properties. Although conception without perception is merely *empty*, perception without conception is *blind* (totally inoperative). Predicates, pictures, other labels, schemata, survive want of application, but content vanishes without form. We can have words without a world but no world without words or other symbols.

The many stuffs—matter, energy, waves, phenomena—that worlds are made of are made along with the worlds. But made from what? Not from nothing, after all, but *from other worlds*. Worldmaking as we know it always starts from worlds already on hand; the making is a remaking. Anthropology and developmental psychology may study social and individual histories of

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<sup>6</sup> In *Art and Illusion* (Pantheon Books, 1960), E. H. Gombrich argues in many passages against the notion of 'the innocent eye'.

<sup>7</sup> See the essays in Jerome S. Bruner's *Beyond the Information Given* (hereinafter *BI*), Jeremy M. Anglin, ed. (W. W. Norton, 1973). Chap. I.

such world-building, but the search for a universal or necessary beginning is best left to theology.<sup>8</sup> My interest here is rather with the processes involved in building a world out of others.

With false hope of a firm foundation gone, with the world displaced by worlds that are but versions, with substance dissolved into function, and with the given acknowledged as taken, we face the questions how worlds are made, tested, and known.

#### 4. Ways of Worldmaking

Without presuming to instruct the gods or other worldmakers, or attempting any comprehensive or systematic survey, I want to illustrate and comment on some of the processes that go into worldmaking. Actually, I am concerned more with certain relationships among worlds than with how or whether particular worlds are made from others.

##### (a) *Composition and Decomposition*

Much but by no means all worldmaking consists of taking apart and putting together, often conjointly: on the one hand, of dividing wholes into parts and partitioning kinds into sub-species, analyzing complexes into component features, drawing distinctions; on the other hand, of composing wholes and kinds out of parts and members and subclasses, combining features into complexes, and making connections. Such composition or decomposition is normally effected or assisted or consolidated by the application of labels: names, predicates, gestures, pic-

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<sup>8</sup> Cf. SA, pp. 127-145; and "Sense and Certainty" (1952) and "The Epistemological Argument" (1967), PP, pp. 60-75. We might take construction of a history of successive development of worlds to involve application of something like a Kantian regulative principle, and the search for a first world thus to be as misguided as the search for a first moment of time.

tures, etc. Thus, for example, temporally diverse events are brought together under a proper name or identified as making up 'an object' or 'a person'; or snow is sundered into several materials under terms of the Eskimo vocabulary. Metaphorical transfer—for example, where taste predicates are applied to sounds—may effect a double reorganization, both re-sorting the new realm of application and relating it to the old one (LA: II).

Identification rests upon organization into entities and kinds. The response to the question "Same or not the same?" must always be "Same what?"<sup>9</sup> Different soandos may be the same such-and-such: what we point to or indicate, verbally or otherwise, may be different events but the same object, different towns but the same state, different members but the same club or different clubs but the same members, different innings but the same ball game. 'The ball-in-play' of a single game may be comprised of temporal segments of a dozen or more baseballs. The psychologist asking the child to judge constancy when one vessel is emptied into another must be careful to consider *what* constancy is in question—constancy of volume or depth or shape or kind of material, etc.<sup>10</sup> Identity or constancy in a world is identity with respect to what is within that world as organized.

Motley entities cutting across each other in complicated patterns may belong to the same world. We do not make a new world every time we take things apart or put them together in another way; but worlds may *differ* in that not everything belonging to one belongs to the other. The world of the

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<sup>9</sup> This does not, as sometimes is supposed, require any modification of the Leibniz formula for identity, but merely reminds us that the answer to a question "Is this the same as that?" may depend upon whether the "this" and the "that" in the question refer to thing or event or color or species, etc.

<sup>10</sup> See *BI*, pp. 331–340.

Eskimo who has not grasped the comprehensive concept of snow differs not only from the world of the Samoan but also from the world of the New Englander who has not grasped the Eskimo's distinctions. In other cases, worlds differ in response to theoretical rather than practical needs. A world with points as elements cannot be the Whiteheadian world having points as certain classes of nesting volumes or having points as certain pairs of intersecting lines or as certain triples of intersecting planes. That the points of our everyday world can be equally well defined in any of these ways does not mean that a point can be identified in any one world with a nest of volumes and a pair of lines and a triple of planes; for all these are different from each other. Again the world of a system taking minimal concrete phenomena as atomic cannot admit qualities as atomic parts of these concreta.<sup>11</sup>

Repetition as well as identification is relative to organization. A world may be unmanageably heterogeneous or unbearably monotonous according to how events are sorted into kinds. Whether or not today's experiment repeats yesterday's, however much the two events may differ, depends upon whether they test a common hypothesis; as Sir George Thomson puts it:

There will always be something different.... What it comes to when you say you repeat an experiment is that you repeat all the features of an experiment which a theory determines are relevant. In other words you repeat the experiment as an example of the theory.<sup>12</sup>

Likewise, two musical performances that differ drastically are nevertheless performances of the same work if they conform to

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<sup>11</sup> See further SA, pp. 3-22, 132-135, 142-145.

<sup>12</sup> In "Some Thoughts on Scientific Method" (1963), in *Boston Studies in the Philosophy of Science*, Vol. 2 (Humanities Press, 1965), p. 85.

the same score. The notational system distinguishes constitutive from contingent features, thus picking out the performance-kinds that count as works (*LA*, pp. 115–130). And things ‘go on in the same way’ or not according to what is regarded as the same way; ‘now I can go on’,<sup>13</sup> in Wittgenstein’s sense, when I have found a familiar pattern, or a tolerable variation of one, that fits and goes beyond the cases given. Induction requires taking some classes to the exclusion of others as relevant kinds. Only so, for example, do our observations of emeralds exhibit any regularity and confirm that all emeralds are green rather than that all are grue (i.e. examined before a given date and green, or not so examined and blue—*FFF*, pp. 72–80). The uniformity of nature we marvel at or the unreliability we protest belongs to a world of our own making.

In these latter cases, worlds differ in the relevant kinds they comprise. I say “relevant” rather than “natural” for two reasons: first, “natural” is an inapt term to cover not only biological species but such artificial kinds as musical works, psychological experiments, and types of machinery; and second, “natural” suggests some absolute categorical or psychological priority, while the kinds in question are rather habitual or traditional or devised for a new purpose.

*(b) Weighting*

While we may say that in the cases discussed some relevant kinds<sup>14</sup> of one world are missing from another, we might perhaps better say that the two worlds contain just the same classes sorted differently into relevant and irrelevant kinds.

<sup>13</sup> Discussion of what this means occupies many sections, from about Sec. 142 on, of Ludwig Wittgenstein’s *Philosophical Investigations*, translated by G. E. M. Anscombe, (Blackwell, 1953). I am not suggesting that the answer I give here is Wittgenstein’s.

<sup>14</sup> I speak freely of kinds here. Concerning ways of nominalizing such talk, see *SA:II* and *PP:IV*.

Some relevant kinds of the one world, rather than being absent from the other, are present as irrelevant kinds; some differences among worlds are not so much in entities comprised as in emphasis or accent, and these differences are no less consequential. Just as to stress all syllables is to stress none, so to take all classes as relevant kinds is to take none as such. In one world there may be many kinds serving different purposes; but conflicting purposes may make for irreconcilable accents and contrasting worlds, as may conflicting conceptions of what kinds serve a given purpose. Grue cannot be a relevant kind for induction in the same world as green, for that would preclude some of the decisions, right or wrong, that constitute inductive inference.

Some of the most striking contrasts of emphasis appear in the arts. Many of the differences among portrayals by Daumier, Ingres, Michelangelo, and Rouault are differences in aspects accentuated. What counts as emphasis, of course, is departure from the relative prominence accorded the several features in the current world of our everyday seeing. With changing interests and new insights, the visual weighting of features of bulk or line or stance or light alters, and yesterday's level world seems strangely perverted—yesterday's realistic calendar landscape becomes a repulsive caricature.

These differences in emphasis, too, amount to a difference in relevant kinds recognized. Several portrayals of the same subject may thus place it according to different categorial schemata. Like a green emerald and a grue one, even if the same emerald, a Piero della Francesca *Christ* and a Rembrandt one belong to worlds organized into different kinds.

Works of art, though, characteristically illustrate rather than name or describe relevant kinds. Even where the ranges of application—the things described or depicted—coincide, the features or kinds exemplified or expressed may be very dif-

ferent. A line drawing of softly draped cloth may exemplify rhythmic linear patterns; and a poem with no words for sadness and no mention of a sad person may in the quality of its language be sad and poignantly express sadness. The distinction between saying or representing on the one hand and showing or exemplifying on the other becomes even more evident in the case of abstract painting and music and dance that have no subject-matter but nevertheless manifest—exemplify or express—forms and feelings. Exemplification and expression, though running in the opposite direction from denotation—that is, from the symbol to a literal or metaphorical feature of it instead of to something the symbol applies to—are no less symbolic referential functions and instruments of worldmaking.<sup>15</sup>

Emphasis or weighting is not always binary as is a sorting into relevant and irrelevant kinds or into important and unimportant features. Ratings of relevance, importance, utility, value often yield hierarchies rather than dichotomies. Such weightings are also instances of a particular type of ordering.

*(c) Ordering*

Worlds not differing in entities or emphasis may differ in ordering; for example, the worlds of different constructional systems differ in order of derivation. As nothing is at rest or is in motion apart from a frame of reference, so nothing is primitive or is derivationally prior to anything apart from a constructional system. However, derivation unlike motion is of little immediate practical interest; and thus in our everyday world, although we almost always adopt a frame of reference at least temporarily, we seldom adopt a derivational basis. Earlier I said that the difference between a world having points as pairs of lines and a world having lines as composed of points is that the

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<sup>15</sup> On exemplification and expression as referential relations see *LA*, pp. 50–57, 87–95.

latter but not the former admits as entities nonlinear elements comprised within lines. But alternatively we may say that these worlds differ in their derivational ordering of lines and points of the not-derivationally-ordered world of daily discourse.

Orderings of a different sort pervade perception and practical cognition. The standard ordering of brightness in color follows the linear increase in physical intensity of light, but the standard ordering of hues curls the straight line of increasing wavelength into a circle. Order includes periodicity as well as proximity; and the standard ordering of tones is by pitch and octave. Orderings alter with circumstances and objectives. Much as the nature of shapes changes under different geometries, so do perceived patterns change under different orderings; the patterns perceived under a twelve-tone scale are quite different from those perceived under the traditional eight-tone scale, and rhythms depend upon the marking off into measures.

Radical reordering of another sort occurs in constructing a static image from the input on scanning a picture, or in building a unified and comprehensive image of an object or a city from temporally and spatially and qualitatively heterogeneous observations and other items of information.<sup>16</sup> Some very fast readers recreate normal word-ordering from a series of fixations that proceed down the left-hand page and then up the right-hand page of a book.<sup>17</sup> And spatial order in a map or a score is translated into the temporal sequence of a trip or a performance.

All measurement, furthermore, is based upon order. Indeed, only through suitable arrangements and groupings can we han-

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<sup>16</sup> See *The Image of the City* by Kevin Lynch (Cambridge. Technology Press, 1960).

<sup>17</sup> See E. Llewellyn Thomas, "Eye Movements in Speed Reading", in *Speed Reading: Practices and Procedures* (University of Delaware Press, 1962). pp. 104-114.



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