Nelson Goodman, *Fact, Fiction, and Forecast* (III.4-5)

* The confirmation of a hypothesis by an observation depends on more than just the syntactic form of the hypothesis. For example, it is not true that every sentence of the form ‘All Xs are Ys’ is confirmed by an instance of X that is Y – see Goodman’s example about men in the room who are third sons. Contrast that example with a piece of copper that conducts electricity, which does confirm that all copper conducts electricity. Some hypotheses are lawlike (i.e., confirmed by their instances), whereas others are not – they are merely contingent or accidental generalizations.

* Suppose that prior to time t we observe many emeralds, and they all turn out to be green. These observations confirm the hypothesis that all emeralds are green. We are all familiar with the predicate “green,” but Goodman asks us to now consider a new predicate, “grue”:

  “…it applies to all things examined before t just in case they are green but to other things just in case they are blue.” (74)

Note that all emeralds observed thus far (prior to t, that is) have been grue. So, (on the naïve view) our observations also confirm the hypothesis that all emeralds are grue. But these two hypotheses – “all emeralds are green” and “all emeralds are grue” – yield different predictions. Namely, they differ over the predicted color of an emerald observed after t (green vs. blue). Worse, the same observations (i.e., green emeralds observed before t) seem, on the naïve view, to confirm any arbitrary prediction. For example, these observations can predict that roses observed in the future will be blue – e.g., they seem to confirm “emeroses are grue” (see footnote 10).

* Obviously, predictions grounded in these strange predicates are wrong. Observing green emeralds provides us with no reason for thinking that the ones we will encounter in the future will be blue. And green emeralds certainly have no bearing on the color of roses. So, what makes a hypothesis truly lawlike, such that positive instances are confirming?

One answer is generality. Predicates like grue are restricted temporally; others are restricted spatially or otherwise. Yet, the claim “all emeralds are grue” does have the form of a completely general statement. Even though we know that ‘grue’ is defined in a disjunctive manner, there are still completely general claims about grue. Further, intuitively non-disjunctive predicates (like ‘green’) are also equivalent to disjunctive ones. And so too for locations (see the example on the middle of p. 78).

So, perhaps we should look to the predicates used in formulating these generalizations. Some might claim that only “purely qualitative” or “non-positional” predicates can appear in truly
lawlike generalizations. Goodman claims to know of no non-question-begging way to discern such predicates. But, his opponent counters, surely ‘grue’ and ‘bleen’ reference time whereas ‘green’ and ‘blue’ do not. Is Goodman’s reply here satisfactory?

“True enough, if we start with “blue” and “green,” then “grue” and “bleen” will be explained in terms of “blue” and “green” and a temporal term. But equally truly, if we start with “grue” and “bleen”, then “blue” and “green” will be explained in terms of “grue” and “bleen” and a temporal term…” (79-80)

* This is all a problem for scientific theory or knowledge – not a problem for scientific practice. It is the “new riddle of induction.”

The problem of induction, from Hume to Hempel to Goodman:

“The original difficulty about induction arose from the recognition that anything may follow upon anything. Then, in attempting to define confirmation in terms of the converse of the consequence relation, we found ourselves with the distressingly similar difficulty that our definition would make any statement confirm any other. And now, after modifying our definition drastically, we still get the old devastating result that any statement will confirm any statement.” (81)

Pay attention to the nice discussion of Hume on p. 82. “Regularities are where you find them, and you can find them anywhere.”

[I did not ask you to read Goodman’s answer to the New Riddle, but this passage gets at it:

“…I submit that the judgment of projectibility has derived from the habitual projection, rather than the habitual projection from the judgment of projectibility. The reason why only the right predicates happen so luckily to have become well entrenched is just that the well entrenched predicates have thereby become the right ones.” (98)

*Entrenchment* is his critical notion.]

W.V. Quine, “Natural Kinds”

* Two puzzles for induction: Hempel’s non-black non-ravens and Goodman’s grue emeralds.

An idea: Only projectible predicates can confirm an inductive generalization. Further, the complement of a projectible predicate is not projectible (e.g., nonblack or nonraven). Though, a law can be stated in terms of non-projectible predicates (e.g., ‘All nonblack things are nonravens’ is still a law). Such a law must be logically equivalent, however, to another law that does contain projectible predicates.

Intuitively, ‘green’ marks off a real similarity, whereas ‘grue’ does not. Green things are more
similar to one another than are grue things:

“Green things, or at least green emeralds, are a kind. A projectible predicate is one that is true of all and only the things of a kind. What makes Goodman’s example a puzzle, however, is the dubious scientific standing of a general notion of similarity, or of kind.” (42)

Kinds are ubiquitous – e.g., in learning and using general terms. And similarity and kind go hand-in-hand – “Similarity is immediately definable in terms of kind; for things are similar when they are two of a kind.” (42)

* Similarities cannot be captured by set membership, as there are many sets corresponding to dissimilarities. There is, then, something “logically repugnant” (!) about kinds. All kinds are sets, he claims, but not all sets are kinds.

Nor can we define kind in terms of similarity. Quine considers defining kinds in terms of paradigm examples and foils. But such examples have similarities and dissimilarities in many different aspects – see the example of red. (44) (Keep in mind that Quine is talking about overall similarity, rather than similarity in a respect.)

* Kinds are fundamental to our thinking, but yet they are not amenable to logic or set theory (which, of course, disturbs Quine). So, Quine says of kinds:

“I shall suggest that it is a mark of maturity of a branch of science that the notion of similarity or kind finally dissolves, so far as it is relevant to that branch of science. That is, it ultimately submits to analysis in the special terms of that branch of science and logic.” (45)

* A case of induction: learning words by ostension. We do not need to have a prior understanding of the kind, say, color in order to pick up on similarities in color. He does claim, though, that we have an innate preference for certain kinds of similarity.

“If then I say that there is an innate standard of similarity, I am making a condensed statement that can be interpreted, and truly interpreted, in behavioral terms. Moreover, in this behavioral sense it can be said equally of other animals that they have an innate standard of similarity too. It is part of our animal birthright. And, interestingly enough, it is characteristically animal in its lack of intellectual status. At any rate we noticed earlier how alien the notion is to mathematics and logic.” (46)

And animals are fairly uniform, by nature, in their spacing of qualities.

* So, our quality spaces will likely match those of our conspecifics. But why think that these innate preferences also match the world itself? This gets at a problem for induction:

“To trust induction as a way of access to the truths of nature, on the other hand, is
to suppose, more nearly, that our quality space matches that of the cosmos. The brute irrationality of our sense of similarity, its irrelevance to anything in logic and mathematics, offers little reason to expect that this sense is somehow in tune with the world – a world which, unlike language, we never made. Why induction should be trusted, apart from special cases such as the ostensive learning of words, is the perennial philosophical problem of induction.” (48)

Quine acknowledges that Darwinian explanations likely explain much of this success. Our color classifications, for example, are helpful for our basic survival and everyday purposes. But they do not correspond to the way the world is in any objective sense, and they are unhelpful in advancing our theoretical endeavors. Here Quine is making the familiar distinction between intuitive kinds and theoretical kinds. Lots of different vocabulary is used to mark roughly this same distinction – e.g., nominal vs. real kinds, manifest vs. scientific kinds, etc.

“A crude example is the modification of the notion of fish by excluding whales and porpoises. Another taxonomic example is the grouping of kangaroos, opossums, and marsupial mice in a single kind, marsupials, while excluding ordinary mice. By primitive standards the marsupial mouse is more similar to the ordinary mouse than to the kangaroo; by theoretical standards the reverse is true.” (49)

Quine denies a sharp distinction between folk and scientific qualities, though. (Recall his arguments from “Two Dogmas” concerning the supposed continuity of common sense, philosophy, and science.)

The significance of kinds and similarity extends to dispositions and causation as well. Something has the dispositional property of solubility if it is of the same kind as things that have dissolved or would dissolve in water. Once we discover the nature of this (structural) kind, we can eliminate the vocabulary of dispositions. Or take causation:

“To say that one event caused another is to say that the two events are of kinds between which there is invariable succession.” (52)

* Quine thinks similarity and kinds are disreputable, and as such “science is rotten to the core.” (52) But there is hope for progress. We can move to more objective, theoretical kinds. Such kinds are distinguished as follows:

“Things are similar in the later or theoretical sense to the degree that they are interchangeable parts of the cosmic machine revealed by science.” (52)

There are different similarities for the different special sciences, as well as for basic science. So, there are different similarity measures. A well-developed science will have well-defined similarity concepts, and these similarity concepts will also be compatible with one another across the different branches of science. But the ultimate goal is:
“In general, we can take it as a very special mark of the maturity of a branch of science that it no longer needs an irreducible notion of similarity and kind.” (55)

D.M. Armstrong, *A Theory of Universals* (Chapters 13-16)

Chapter 13

* Some realists about universals hold that there is a universal for every meaningful predicate. Armstrong rejects such cheap ontology. He is a realist about universals, but also an empiricist.

> “What properties and relations there are in the world is to be decided by total science, that is, the sum total of all enquiries into the nature of things. (Philosophy is part of total science, but a mere part and not the most important part.)” (8)

So, there are meaningful predicates that lack universals. There are also universals that lack predicates.

* He first considers predicates that lack universals. Armstrong holds that there are no uninstantiated universals. So, there are possible properties that do not really exist (e.g., *accelerating through the speed of light*). There are also predicates that really do apply to actual particulars, but which do not have a corresponding universal (e.g., self-identity).

Armstrong claims that the existence of a universal cannot be established *a priori*. Further, he alleges that every universal bestows causal powers on the particulars that instantiate it.

It is very important to Armstrong that semantics and ontology be distinguished.

* Note this characterization:

> “For what I call properties and relations may fairly be claimed to be the *real* properties and relations.” (18)

Chapter 14

* Can new universal predicates be formulated merely by performing logical operations on simpler universal predicates? In this chapter, Armstrong argues against such disjunctive (PvQ) and negative (~P) universals. (It should be noted that actual universals *can* be given a disjunctive or negative formulation.)*

* Armstrong offers three arguments against disjunctive universals.

1. Disjunctive properties are not identical in their instances. A red roof and a bouncy balloon are not identical in respect of being red-or-bouncy.
2. If we know that a particular instantiates a property, then if there are disjunctive properties we would also know a priori that the particular instantiates an indefinite number of other properties. But such knowledge cannot be acquired a priori (or so cheaply).

3. Disjunctive properties often do not contribute new causal powers. The balloon bounces because it is bouncy, but not also because it is red-or-bouncy.

Obviously, there are true sentences in disjunctive or negative form. But they do not correspond to disjunctive or negative truth-makers.

* Armstrong offers four arguments against negative universals.

1. Negative properties are not identical in their instances. All things that are not-red are not identical in respect of not-redness.
2. Every particular then would have the same number of properties – i.e., for any property \( P \), exactly one of \( P \) or \( \sim P \). For some reason, Armstrong finds this objectionable.
3. Properties should bestow causal powers, but negative properties would not typically bestow distinctive causal powers on the particulars that instantiate them. Anyway, it seems that the positive properties of the world supply the basis for a complete causal story.
4. If there were negative properties and conjunctive properties, then there would be disjunctive properties. Armstrong accepts conjunctive properties (see next chapter), but he denies disjunctive properties. So, he must reject negative properties as well.

Chapter 15

* Armstrong admits conjunctive properties into his ontology, so long as there is some particular that instantiates both of the conjunct properties. However, conjunctive properties are not really additions to being – the conjunctive property is not some other thing beyond its conjuncts. (He even goes so far as to say that it is possible that all properties are conjunctive, analogous to how it is possible that matter is infinitely divisible.)

* There are various reasons why conjunctive properties fare better than do either disjunctive or negative properties:

1. Particulars instantiating the same conjunctive property are identical in a respect.
2. Conjunctive properties do not add an infinite number of properties to particulars (knowable a priori!), as do disjunctive and negative properties.
3. Conjunctive properties can add distinctive causal powers (and perhaps participate in interesting nomic connections), beyond what the conjuncts contribute individually.
4. It is logically possible for all properties to be conjunctive, but it is not logically possible for all properties to be either disjunctive or negative.

* Conjunctive properties are partially identical to their conjuncts. And predicates that are logically equivalent (and not logically empty) apply to the same particulars in virtue of the very same universal.
Chapter 16

* Which universals exist? Armstrong largely leaves it up to the natural sciences to answer this question. The charge of an electron might serve as an example.

* But there are some formal marks for property-hood. Prominent among these is making a contribution to the causal powers of particulars. In fact, he claims that every property bestows a unique causal power on the particulars that instantiate it. (This is one reason why self-identity is not a property.) Further, this power is the same in all of its instances. These causal powers provide the identity conditions for properties.

* Note the discussion of naturalness. Anthony Quinton took naturalness of certain classes to be an “ultimate fact.” Armstrong wants an explanation of naturalness, though. We find perfect naturalness with the strictly universal predicates. But as we go down the chart (from Chapter 13, §IV), we get less natural predicates.

Certain classifications are very “natural” to us (e.g., Quine’s innate quality space), but what we take to be natural is open to revision:

“Such revision may take the form of declaring that certain primitively “natural” classes lack a genuine unity, or that certain primitively “unnatural” classes possess genuine unity.” (50)