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NOVELTY AND RATIONALITY

by

WILLIAM B. WILD

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>CONCEPT OF NOVELTY</td>
<td>1</td>
</tr>
<tr>
<td>II.</td>
<td>GRADES OF NOVELTY</td>
<td>28</td>
</tr>
<tr>
<td>III.</td>
<td>SOURCES OF NOVELTY</td>
<td>51</td>
</tr>
<tr>
<td>IV.</td>
<td>LIMITS OF NOVELTY</td>
<td>83</td>
</tr>
<tr>
<td>V.</td>
<td>NOVELTY AND RATIONALITY</td>
<td>119</td>
</tr>
<tr>
<td></td>
<td>BIBLIOGRAPHY</td>
<td>153</td>
</tr>
</tbody>
</table>
CHAPTER I

THE CONCEPT OF NOVELTY

The concept of novelty forms a broad dimension of human thought. The richness and scope of this concept is disclosed by the range of things to which the term "novelty" can be applied. Events, concepts, ideas, people, and experiences can all be called novel. An encounter with a novelty can produce such diverse reactions as puzzlement and insight. Experiences perceived as novel can bemuse, shock, and even require a revision of the familiar concepts of human discourse. Novel experiences often ruffle the security of ordinary circumstances and provoke deep perturbations. A novel thought can transform the banal into the interesting and the cliché into the unusual. The concept of novelty provides a useful framework in terms of which we can mark off all these diverse situations.

1. Vitalists and Emergentists

Since novelty can be applied to a wide range of phenomena, and since novelty plays a certain important role in our experience and language, we should not be surprised that novelty has attracted the attention of philosophers. Vitalists, such as Henri Bergson, and Emergentists, such as C. Lloyd Morgan and Samuel Alexander, used the idea of
novelty to characterize their metaphysical theories of development and ceaseless change in time. The ever fresh appearance of temporal and physical change led them to postulate a cosmic potency to supply constant novelty. Originality and spontaneity were considered fundamental traits of nature. Henry Bergson, and later F. C. S. Shiller, conceived of a ceaseless changing substrate which made nature itself the source of new phenomena.

Thus, novelty took on a connotation of improvement and betterment in connection with emerging novel phenomena. This was a direct influence of nineteenth century evolutionary views. C. Lloyd Morgan and Samuel Alexander viewed the universe as moving toward a goal by means of novel transformations. New developments were thought to exhibit a novelty which transformed, developed, or extended reality. The usual and the ordinary were changed for the better. Thus, the very concept of novelty, according to these thinkers, is forced upon us by the nature of a changing world.

The Emergentists and Vitalists were attempting to deal with novelty by treating it as a metaphysical feature of the universe. Their objective was to focus upon aspects of experience which challenged views of a world that is neat and predictable. Moreover, they believed that the inherent tendency toward novelty makes possible desirable changes in human experience. By utilizing the concept of
novelty and treating it as referring to a special metaphysical dimension, these thinkers were directing our attention toward the potential for change, transformation, and improvement in our individual and collective lives, and toward the possibility of progress is the course of history.

But the large metaphysical ambitions of the Emergentists and Vitalists were overweening. The main reason for this was that they paid little attention to the actual linguistic expressions of the concept of novelty. They would have done well to note that the word "novel" is, in J. L. Austin's characterization, "substantive-hungry." They apply "novel" to a great variety of our experiences, and it is always important to note the differences among the things we call "novel." Talking about "novelty" without these substantive references is similar to talking about "relevance" without substantive references.

2. Novelty as an Adjuster-Word

"Novel" is very much like a group of words which J. L. Austin has called "adjuster-words." These are "words by the use of which other words are adjusted to meet the innumerable and unforeseeable demands of the world upon language." Thus, "novelty" is an adjuster-word because when we call something novel we are alerting others to expect or notice a difference. The circumstances of the utterance, the subject matter, and the speaker's intention
will determine whether the use of "novel" signals a departure which is in some ways noteworthy.

According to Austin, the general function of adjuster words is to add flexibility to language. We never know when a surprise experience "may spring upon us." Adjuster words show that language has built into it this flexibility. But the case of the term "novelty" does not in itself adapt language, but prepares us for the possibility of adapting it. To that extent, "novel" differs from other adjuster words. To announce that "X is novel" is to issue a warning that we might need an adjuster word such as "like," or a new term altogether. We might even be thrown into a temporary dilemma as to the appropriate response. We do know at least that if X is novel, then X is not a straightforward X. Something outside the familiar X's is present, but it is like an X. "Novel" signals this possibility.

"Novel" is thus part of the family of words which marks off differences in human experience. Indeed, novelty might profitably be considered a species of the genus "difference." This is because "novelty" signals differences. But a novel difference is a difference with an interest for us; it does not signal a mere change. "Creative," "rare," "curious," and "unusual" come to mind in this connection. They call attention to the specific character of changes or differences. In some instances,
novel changes have important philosophical consequences. The need to adjust or revise some concepts requires a certain flexibility in language. If human understanding and knowledge are to grow, unexpected facts or situations need to be assimilated in appropriate linguistic ways.

3. Novelty and Newness

"Novel" and "new" are not synonymous, even though we often think of ordinary novelty as meaning "newness" in the sense of "the first time" or "the non-duplicated." "Novelty" does, however, catch the idea of temporal newness and focuses our attention on it. But to allow the matter to rest here would be misleading. Wars are not new, yet World War II was novel. We might say that a certain movie was a novel film, yet movies are certainly not new. When marking something as novel, we are often dealing with familiar particulars that do not quite fit into the class within which they usually fall.

To say that "Sophocles was a novel Greek dramatist" is not to say that Sophocles was the first dramatist. He may well have been the first to humanize the chorus in the way that he did. We may mean, however, such things as that he won the prize for tragedy on occasions or that he had great insight into human motivation and personality. By predicating "novel" of the dramatist Sophocles, we are calling attention to certain special and noteworthy features
rather than making a point simply about temporal newness.

Consider another example. The birth of a child is considered a novel occurrence, but it is certainly not a new occurrence. Still, parents consider the birth of their child both new and novel. (We find ourselves in a novel pose / counting infant fingers and toes--Ogden Nash) Such a new addition to the family can transform the style of life of the parents and lead them to reformulate their goals.

To an obstetrician, the birth of a child may not be novel at all. Yet the birth of quintuplets could certainly be so. Their delivery might teach him procedures he had not been called upon to employ before. The mere statistical rarity of quintuplets would not qualify their birth as a novel event. But when we consider such things as the transformation that such an event is likely to bring about for a family, we are justified in calling such an event novel. In a world where the birth of quintuplets was expected each time a woman gave birth, the birth of only one child would be a novel event.

Further examples show that something more than newness is involved when novelty is encountered. Consider such remarks as "She is a new girl friend but not a novel girl at all," or "My car is new but not a novel car." To say that something is novel is to point to that "thing" as being in some ways unusual. To say that I have had a novel
idea or have had a novel experience, indicates that something has occurred to me which is not just new but also something out of character.

New things, events, or experiences can be novel, but they need not be so. I might never have seen a certain part of Houston or a particular town in Mexico, but I could still claim that, "It's the same old stuff." I mean that the experiences are not novel. The novel thing is often new, at least in the parochial sense that for me it is new. But it is also something more than new. You can always ask of a new idea if it is also novel without being redundant. "That was a new experience for me but not anything novel" seems a very reasonable remark to make about many experiences.

In general, novel things and experiences seem to point obliquely beyond themselves, even when they seem to be generated from a background which is settled and known. Novelty's meaningfulness stands out over against a background; its significance is the result of developing beyond the situation in which it occurs. As contrasted to the familiar background, the novel is obtrusive. Thus, there is more to the concept of novelty than merely marking off the new. It signifies the perception of a particular sort of departure from the ordinary. To call X novel is usually to indicate that it possesses a special type of newness. Something extra carries the novel X beyond a mere
new X. To attribute novelty to something is to prepare a way for a special assessment of departure from the ordinary.

4. "Novel" as Assessment of the Familiar

The "ordinary" is something which fits into a familiar background. "Novel," on the other hand, calls forth such labels as "extraordinary," "abnormal," and "exceptional" when the new item in question is viewed against a familiar background. To understand such ideas as "extraordinary" and "abnormal" it is necessary to have an understanding of the ordinary and the normal. We learn what the extraordinary and abnormal are in contrast to the ordinary and normal.

A background of stability and familiarity is basic to the intelligibility of "novel." A "novel X" calls attention to a departure from familiar X's. Nevertheless, the statement "X is novel" can be meaningful even if one is not familiar with X's. This is because the general concept of novelty can be a part of our way of thinking independent of any particular application. We can apprehend the use of "novel" without knowing the criteria for applying "novel." R. M. Hare makes a similar point about "good" in his book, The Language of Morals, when he claims that the meaning of the word "good" can be learned without knowing the criteria for its application.10 A novel
schmakum is very much like a good schmakum is very much like a good schmakum in this respect. We can understand what a novel schmakum is and we can infer certain things about a schmakum that we are told is novel without knowing what particular characteristics make it a novel schmakum.

It would strike us as very puzzling to find that the X marked off by someone as novel was no different from other previously and subsequently encountered X's. Understanding that something is novel means that we would expect to find a background of ordinary things from which it differs. This is perhaps more obvious in the case of novelty than it is with other adjuster words because "novel" is naturally associated with "unusual," "fresh," "unique," and "new."\(^{11}\)

Since novelty has an evaluative dimension, it can be fruitfully compared with what J. L. Austin calls "verdictives" in *How to Do Things With Words*. This is a class of performatives Austin distinguishes in terms of ". . .giving a verdict. . .estimate, reckoning or appraisal."\(^{12}\) Calling something novel is doing something similar to grading, valuing, locating, or characterizing. We are delivering a finding upon evidence or experience; we are making an evaluative judgment. As novelty grows more extreme, the judgment-making process may grow more conscious and more critical.
When we say that something is novel, we indicate that it exhibits a particular difference. My judgment that "X is novel" indicates that I have assessed X with respect to its context, and have singled out some aspect or aspects of that context. The circumstances and intention of my utterance may show what I am focusing on. The question "Why do you say this is novel?" is a challenge to show why this particular X can be claimed to be novel.

5. The Logic of Novelty

Three characteristics display the general logic of the concept of novelty: (a) being substantive-hungry, (b) having the functions of verdictives, and (c) being an adjuster-word. The substantive-hungry nature of the concept points to the novel thing's connection with this world. Using the term "novel" does not transfer us beyond the objective dimensions of experience. But we need to adjust our account of that experience, to pass a verdict on its special character.

For something to be designated a particular novel thing, it must be a new particular in the sense that it deviates from similar particulars. A novel particular may have unusual epistemological importance, or it may go unnoticed. But in any case the novel particular must vary in relation to the normal criteria used to mark off a class. Judgments about degrees of variation and adjustment
are called for. "This is a novel apple" means that there is something about this apple which you are not likely to find in other apples. This kind of difference is the added nuance that "novelty" contributes over "new." It could be the taste, color, or commercial possibilities of the apple. As noted before, this verdict involves considering the apple in the light of a particular familiar situation with its idiosyncratic characteristics.

To judge that this apple is novel is to assess the apple in a particular way. I may decide that this apple is novel because I have not seen one colored like it before, or because I have seen only a few shaped like it, or because it was unexpected at this time of year, or because it was remarkably nutritious, or it had a remarkable taste. All of these are variations from our ordinary experience of apples.

If a number of pronounced deviations from familiar apples could be noted in the object before me, I might wonder whether to call it an apple. To include in the class of apples the object before me which is visually strange, unexpected, and possesses remarkable characteristics not normally associated with apples requires that I note a range of affinities as well as discrepancies with previous experiences. I do this with the attribute "novel."

One can say, therefore, that "novelty" points to the perception of some sort of unusualness, of something which
strikes us as unforeseen, exceptional, or curious. There may be no empirical difference in what I am judging now to be novel and what I judged yesterday to be banal. But when I come to see that it is not banal but novel, I am re-describing what I see and placing it conceptually in a different relationship with its surroundings.

For example, if a car is novel, then it must have some general variety of the sorts set out above when we were talking about apples. "Novel" denotes a set of unusual characteristics. If a car salesman tells me that the car is novel, he is generating in me an expectation that certain linguistic adjustments may be necessary when discussing the car. That is, I can expect the car to fall somewhere within the normal range of "cars" yet with some anomalous characteristics, such as that it has an unusually low gasoline consumption or some extraordinary safety features.

Sometimes, when I mark something off by calling it novel, I may be calling attention only to a perceptual change. For example, "It was a novel sight because at a distance it looked as though there was water there, but when we got nearer we saw that there was only sand." On other occasions, I may be marking off only a conceptual change. For example, "I thought of species as immutable. A species held no novelties. Now I realize that the species are full of novelties. Species are sets of animals which
change and fade into one another." But there also appears to be a range of cases which involve both perceptual and conceptual changes. An example of this is, "I thought I saw a brown stick lying there, but when you yelled 'Snake!', I realized that it was a novel example of protective mimicry." But regardless of whether it is this perceptual, conceptual, or perceptual/conceptual change I am calling novel, the adjuster, verdictive, and substantive-hungry character of novel can be seen in all of these cases.

6. Novelty as Concept Transformation

The type of change marked off by novelty may have a transforming effect on the way in which we understand things. A new thing takes on a different character when it is novel; we apprehend it differently. This is due to the uneasy relationship mentioned above that arises between particulars and their classes. The novel car or the novel girl does not "fit" comfortably with our ordinary idea of cars and girls. This is not to say that such novelties are always hard to describe. But even when no difficulty of description arises, a significant cognitive change may take place when novelty is appropriately attributed to something. Some potentially constructive conceptual addition may occur when something is called novel. The novel car, woman, or book is lifted above the ordinary; we think of them differently.
A novel sin, for example, is one we would not ordinarily expect to encounter, but it is also more than this. "He considers hard work a sin" could be a new and unusual idea of sin, but it need not be considered a novel idea of sin. When Jesus condemned sanctimoniousness, however, he was directing attention to what can be properly described as a novel sin. Casting stones, as well as patriotism, can be a refuge for scoundrels. In a similar way, novel methods of torture or killing are ways which may unexpectedly accomplish accepted goals. Merely being grotesque or unusual is not enough for something to be novel.

Novelty is thus the recognition of a potentially significant variation from the ordinary. We expect the novel car to have some characteristic which makes it stand out from the ordinary car. If you ask me "What about the car is novel?", and I reply, "I just feel it is novel," you will begin to have suspicions about my use of the term.

I can feel a thrill or excitement coming over me, but this is not what makes a novel situation novel. Something more than feelings is involved in novel situations. This is the reason that a request to explain why I think a certain situation is novel would not likely be satisfied if I replied that "I just felt it was different." Experiences which are spontaneous can be novel, but they need not be so. Impulsive changes in behavior and purpose may
yield thrills or nonsense but seldom novelty. What mere feelings, spontaneity, and impulsive changes fail to do is catch the objective transformations of the situation with which novelty seems to be associated. These objective transformations require a transformation in our conceptual grasp of them.

All of the adduced examples showed that our characterization of novelty as substantive-hungry, and as requiring an adjusting verdict was correct. If something is perceived as novel, it will strike us as significantly different, and it will call for further description. The novel car, for example, may look different, run differently, cost much more or less than we expect, be manufactured in some unique way (e.g., by hand), or have been the vehicle equipped to carry Roosevelt to military reviews. Such a list can go on, but the generic character of all these variations is that they transform our perception of what might be "just another car" into seeing a car with special features, some of which may evoke interest, envy, curiosity. The more fundamental and central the subject of the attribute "novel" becomes, the wider the range of thoughts, feelings, and attitudes which are affected.

If novelty affects some broad features of our universe of discourse (i.e., general concepts, categories, rules of thought), an upsetting inventiveness may penetrate
important areas of our intellectual lives. This occurs in periods of great scientific, cultural, and artistic change. Extreme novelties can connect different matrices of familiar experiences and thus lead us to new conceptions of our world. For example, Copernicus' theory of the planets introduced a revolutionary idea of the earth's movement previously associated only with the other planets. Similarly, Darwin's theory of evolutionary change accomplished an intellectual transformation of far-reaching dimensions. Familiar perceptions and conceptions suddenly called for drastic readjustments. The extremely new conceptual demands at first strike ordinary people as absurd or unintelligible, but in the long run they may lead to new levels of understanding, transforming our entire conceptual scheme.

7. Novelty and Judgment-Making

The adjusting and verdictive functions of language call for intelligence and rationality. They call for insight about the special features of situations. Discriminations must be made to proposed adjustments. Judgments about novelty presuppose a background of varied experiences and bring to the surface the perspective, knowledge, and beliefs of the user.

My judgments about the novelty of something arise in the context of my familiarity with a particular
situation. In this way, "novelty" is a perspective-laden term. The various contexts in which we talk about novelty sometimes expand the range of our experience. If I say, "This man has a novel philosophical position" handing you a book, you would not expect to read it and find it to be a mere restatement of Plato's Theory of Justice. If you found it to be a repetition of Plato, you would say to me with justifiable irritation, "This wasn't a novel position at all. It was just warmed over Plato. You should have known that!"

There is, of course, a subjective dimension of novelty. When I call a restaurant novel, I am telling my hearer something about myself as well as the restaurant. Namely, I am saying that I ate in the restaurant which prepared foods which I found unusual and exceptional in some sense. If you know me well, and know that my wife prepares foods just as the restaurant does, then you will be confused by my remarks. If you ask, "Was the food greatly different from other food that you've eaten?" and I answer "No," you would be entitled to ask, "Then how was it novel?". The question in what sense the restaurant was novel seems natural here.

I might reply, "I mean that it would be novel for you. It is old stuff for me. But you're from Kansas and never had such an experience." Or I might reply, "I meant that with respect to other restaurants in town, this one
is novel."

Personal perspective, then, often plays a role in applying the idea of novelty. My experience, knowledge, and psychological flexibility are revealed in and are part of my judgments about novelty. This is what I had in mind when I said that there is a parochial sense in which all novelty is new. I may have seen many novel cars, but each will have a newness about it. If I see a particular novel car daily, it will cease being novel for me. But I can still call it a novel car to indicate to you that for cars in general this car is novel. In this case the parochial sense of newness had been lost, but the idea of objective unusualness and difference remains, and this makes the car novel for you.

It is possible to be in error in ascribing novelty to something. This happens when the predication is meant to be objective, not merely a report of a personal impression, and when I make use of general criteria of newness, unusualness, and difference. The fact that novelty arises in some cases simply because of my narrow experience in predicating novelty of something is not to say, however, simply that I find it to be unusual. If this were all that novelty meant, then I could not be wrong about something being novel. Not knowing that Nabokov's books fall into a recognized genre of Russian literature, I might think that
his work is extraordinarily novel, but having discovered that his works fall into this genre, I would have to revise my judgment.

8. Novelty as Teacher

The objective dimension of novelty helps make it an important adjuster-signaling device. Its application can instruct us with regard to what to expect. Such expectations of differences can be limited to empirical data. For example, a claim that a particular car's color is novel, if true, tells me that there is something unusual about a car I am going to encounter. But the usefulness of calling the car novel extends beyond this perceptual characteristic of the car. With the ascription of novelty we can lay the groundwork for the revision of concepts.

I might say, for instance, "After driving this car, your idea of cars will change." I mean that you might have a different concept of cars after this experience. You will say different things, think differently about cars, etc. You might eventually have included different objects in the class of objects called "car." Consider the statement, "After traveling in Europe my concept of poverty changed." It may mean that the rhetoric of some politicians does not affect me now. It might mean that I realize that there are more types of poverty than I suspected, focusing upon such things as the quality of
lives, the limited aspirations and the lack of hope. Material impoverishment, which I once thought of as "poverty" is now too narrow. I might expand "poverty" to include spiritual impoverishment as well. In this way my concept has been altered.

Thus, one of the functions of "novelty" is this extension of concepts beyond the ordinary. Such locutions as "lifted above," "transformed," and "strikingly unique" are indicative of the type extension which can occur. If such an extension does not take place, the novelty is "stillborn." It fails to take effect, remains unknown or unnoticed. Abortive attempts to claim novelty will fade into obscurity or be resuscitated at another time, as the history of science and the history of art amply demonstrate.

Mendel's experiments with sweet peas is an example of this. His work is considered a novel development in genetics, yet decades passed before his work became influential in the scientific community. Part of the reason for this was that Mendel lived in relative isolation from that community. We call his work novel because we make an ex post facto assessment, filling in certain gaps. We place Mendel's work in a context where the implications of his discoveries are highlighted. Part of the novelty of his work was due to his ability to perceive relationships and analogies among familiar entities that were overlooked by his peers.
9. Novelty and Conceptual Change

Perception of novelty can create a problematic situation in which a great deal of deliberation is required. This deliberation may result in an explicit reorganization of the familiar. Yet it would be hasty to claim that a perception of novelty must change completely the concept of something familiar. I may know what X is, yet be in doubt or mistaken as to whether Y is an X. If I learn that Y is an X, it does not necessarily mean that my concept of X is different.

For example, if I am familiar with chickens and think that the offspring of chickens are always chickens and not ducks or some other fowl, I might, when faced with an odd-looking animal, ask what it is. If you say that the strange animal is the offspring of these two chickens, I can say that it does not look like a chicken. But I now know that it is a chicken. My concept of chickens has not changed. I just learn that this animal is a chicken. I still have the concept X (chicken). I now recognize that this Y (strange animal) should fall under it.

I come to know that this strange animal is a chicken. I was puzzled about the animal hopping over the ground. This bafflement was due to my uncertainty as to where I should place it in my taxonomic scheme. But I
learned something about its origin, and my bafflement is lifted. Had I been told that the strange animal was a "chicken" although it was not the offspring of a chicken, I would have realized that I had had some misconceptions about the concept "chicken," namely about the origin of the members of the set of chickens. In this case a familiar concept would be stretched or modified. I would be revising my concept of "chicken."

There is, then, a difference between the force of discovering that this Y is an X and coming to know that this Y is an X. In coming to know, I recognize that Y is an example of X. There is no change in X and no need to change X. It will continue to function as it has functioned before. But to discover that this Y, which I have never related to X, is an X, is not to leave the concept of X unchanged. Discovering something like this about X removes a different sort of bafflement from coming to know that Y is an X.

In the first case we are apprehending something familiar (i.e., concept "chicken") in a new way. In the second case we are apprehending something very strange in a familiar way. Both apprehensions are a result of bafflement. Discovering that Y is an X is to learn that something familiar (i.e., the X), is different from what we suspected. To come to see that Y is an X relates X and
Y in new ways but changes neither. We can learn about people by reading Freud and Shakespeare. We come to see things about people that we did not suspect.

And yet, coming to know and discovering are both novel experiences. The verdictive and adjuster functions of "novelty" are present in both cases. If we perceive a situation as problematic, this means we assess it as such and seek to remove the puzzlement. To get out of the puzzle we search for affinities and differences with other situations. But this calls for decision about relevance and similarity. We build our case for a resolution of puzzlement upon this background of similarities and differences.

The causes and precipitating factors of puzzlement arising from a perception of novelty need not be eccentric. A situation, which is on the surface very ordinary, can be nevertheless assessed as novel, sometimes leading to a series of far-reaching consequences. To perceive the familiar as novel may require the ability to penetrate beneath surface innocence and complacent orthodoxy.

A work of art, anomalous results in a scientific experiment, or a familiar yet strikingly unique example of an object can all bring about novel responses. Our first reaction may be the inability to find an appropriate description of the object or experience. But in time we may
establish connections not previously perceived. Such connections can lead to an expansion of concepts, or to unforeseen linkages of matrices of our thought. Archimedes' experience in his bathtub and Darwin's experience with horse breeders were not unusual experiences for them, but such experiences triggered remarkable scientific novelties.

Novelty, then, may enter many phases of our life when we are led to see old things in new ways. Experience forces us to make judgments as to when an adjustment of the familiar is in order. Imagination and intelligence may be involved in this process of apprehending novelties and adjusting to them appropriately. The perception of novelty may be inventive, creative, and original because it often calls for breaking familiar and habitual patterns and for rearranging our account of the world.

In sum, the concept of novelty is linked with the assessment and readjustment of the familiar. Novelties emerge from the familiar and are understood in relation to the familiar. Novel perceptions stimulate the faculties of the understanding, and in this way the novel is fitted into a context or developed into a reorganization of the familiar.

The flexibility and the self-corrective features of ordinary language allow us to incorporate novelties
intelligently into our experience. We need a certain flexibility in order to adapt to and recognize variations in everyday experience. We must distinguish the relevant from the irrelevant as well as fit the unusual with the familiar. In so doing we are manifesting an important form of human reasoning.
FOOTNOTES - CHAPTER I


3 Ibid., pp. 203-205.


6 Schiller, "Novelty," in Must Philosophers Disagree?, pp. 218-221.


8 Sense and Sensibilia, p. 73. Cf. pp. 74-75.

9 Ibid., p. 17.


CHAPTER II

GRADES OF NOVELTY

The general verdictive and adjuster functions of the concept of novelty may be reasonably clear, but there remains another dimension of the concept which arises in connection with discussions of certain problems in the philosophy of science. We can also speak of grades of novelty, the different strengths and degrees of novelty which are a result of the verdictive and adjuster functions. I wish to discuss three grades of novelty as they might appear in ordinary situations and in science; weak, strong, and extreme. These grades may be somewhat arbitrary, and perhaps a bit too rigid to capture the full richness of "novelty" in our language. Although such a division might involve a departure from ordinary ways of talking about novelty, it can, by means of some examples, clarify further features of the verdictive and the adjuster roles of novelty. I will focus upon actual examples from natural science. Specifically, the examples will come from the works of Darwin which provoked continual and extreme theoretical developments and revolutionary changes in the science of biology.
1. Weak Novelty

We may speak of novelty being weak when there are variations from the familiar which are not especially striking. As we will see, it is always possible to describe such a variation as fresh or unusual, but no special difficulty is posed in understanding novel occurrences in this weak sense. Usually, weak novelty is simply passed over. Yet, such things as a preoccupation with time, or a deprivation of good health can cause people to see novel variety even in unexceptional daily routines. These novel developments within the familiar emphasize such things as the "newness" that is the result of growing old, moving from place to place, and qualitative variation. In the preceding chapter I have pointed out that philosophers such as Schiller and Bergson developed a metaphysics with a certain notion of novelty at its heart. I am now prepared to call this "weak novelty."¹ This putative novelty is transformed into a metaphysical principle in certain philosophical schemes. And the basis for such metaphysical beliefs springs from focusing attention upon novelty in this ordinary or weak degree.

An excellent example of what I call weak novelty is provided by Darwin's correspondence from his travels on the Beagle in 1831-1836. Darwin was exhilarated by the experiences which I call "weak novelty." He gave himself
over to avid collection and observation of specimens. Because he showed little discomfort—what we might now call "culture shock"—and because he was encouraged to deeper thinking by his experiences, it seems that "weak novelty" is an appropriate way to describe his preoccupations and experiences on the Beagle.

An example of the way in which variety assaulted his experiences is provided in this passage from a letter that he wrote during the early months of his trip:

On the coast I collected many marine animals, chiefly gasteropodous (I think some new). I examined pretty accurately a Caryopillia, and if my eyes are not betwitched, former descriptions have not the slightest resemblance to the animal. I took several specimens of an Octopus which possessed a most marvelous power of changing its colors...this fact appears to be new, as far as I can find out.²

Although there are many variations from the expected, Darwin keeps classifying and cataloguing without any cognitive problem. But there is a hint of something incipiently mysterious in this passage.

It is not inaccurate to describe Darwin as having the ability to suspend the rigidity of the taxonomic techniques he had learned and to accept unexpected variety. In fact, he elevates this basic openness into a methodology. Darwin rejects systematization in favor of the patient accumulation of observations. These observations eventually led to conceptual revision, but I am only interested here
in emphasizing the flexibility which he cultivated at this level of development in his work.\(^3\)

What becomes evident as you read Darwin's correspondence is that a tolerance for change is necessary in the face of great variety. Language is frustrated, but this is a natural outcome of encountering such variety. He cannot translate such diversification easily into the language fitted for a more narrow range of experiences. Darwin actually expressed such a frustration in one of his letters. He wrote:

> It is utterly useless to say anything about the scenery; it would be as profitable to explain to a blind man colours, as to a person who has not been out of Europe, the total dissimilarity of the tropical view.\(^4\)

Words begin to fail when constantly confronted with novelty, yet there is no sign that Darwin feels a disquietude about orthodox zoology. However, with the judgment that what he is experiencing is significant, and with his adjustments to accommodate his new knowledge to more familiar experiences, the seeds of the revolution in zoology are being planted. The curious nature of the new animals does not escape Darwin. Consider this remark which appears later in *The Origin of Species*:

> Can a more striking instance of adaptation be given than that of the woodpecker for climbing trees and seizing insects in the chinks of the bark? Yet in North America there are woodpeckers which feed on fruit,
and others with elongated wings which chase insects on the wing. On the plains of La Plata, where hardly a tree grows, there is a woodpecker... which does not climb trees, and it makes its nest in holes in banks! In certain other districts, this same woodpecker... bores holes in the trunk for its nest.5

These varieties and aberrations among ordinary woodpeckers do not seem to give Darwin so much as a pause with regard to classification. That is, he was able to adjust his concept of woodpeckers to include these variations. Such experiences did stimulate him to seek an explanation of how other animals came to behave in the way they do and eventually undermined a concept central to orthodox zoology.

The variations he discovered were not of the sort that would have supported the idea of fixed species. They promoted conceptual revision. Furthermore, they alerted Darwin to clusters of variety rather than long historical lines of variety. He associated such clusters with climate and geography, and later utilized his observations to support his explanation of why changes occur as they do.6

Darwin's flexibility and openness prepared him for the possibility of more pronounced novelty. A tolerance for variety without discomfort characterizes weak novelty, and once we recognize novelty in its weak form, the clues which justify stronger adjustments may begin to appear.
John Wisdom has commented on the virtues of flexibility displayed at such early stages of intellectual development. He pointed out how minor unfamiliarities can create provocations which stimulate deeper thought, calling for a new assessment of hitherto familiar things. Tolerance of some intellectual anxiety and a willingness to employ imagination characterize weak novelty. Without this flexibility, weak novelty would be little more than a nuisance. Wisdom writes:

But thought too will fail us here if we think that all thought which carries us to the truth must be thought on lines as definable or at least as conventional as the thought of an accountant who assesses a firm's financial position, and forget how much it may be a matter of giving our minds to incidents and incidents, whether they are familiar as the fall of an apple or as recondite as the Michelson-Morley experiment, or the disorders of a madman like poor Dr. Schreber.  

This adaptability, this giving oneself over to the situation is one way of adjusting to the unfamiliar. In this way, Darwin apprehended the similarities between unusual and ordinary experiences. He also made judgments about the differences and similarities which such experiences have with expectations. At such times, the verdictive and adjuster-signaling characters of the concept of novelty overlap.

The seemingly innocuous nature of weak novelty is
deceiving. As such novelties accumulate, they can lead to the overturning of conventional standards as they are reflected in ordinary language. In general, it is the flexibility of ordinary language which enables it to absorb changes. The same openness is noticed with regard to some concepts. Weak novelty comes about because there are dimensions of language which lack specificity. Experiences, which might easily be construed as discontinuous, are recognized to be pertinent. Thus, novelties, such as Darwin's varieties of animal specimens, can insinuate themselves into the flow of ordinary language. The tremendous variety of finches that Darwin encountered accumulated to the point of shattering the idea of an immutable species of finches. Thus, seemingly weak novelties can become like the proverbial straws which accumulated and broke the camel's back.

In this way, weak novelty is essential for ordinary intellectual development. Yet it need not proceed beyond a temporary disruption of the ordinary. A shocking event can often be accepted with little concern because it is only weakly novel. When men landed on the moon we were impressed and curious, but was our world changed dramatically? I think not. Perhaps Columbus' voyage had much the same fascination for the ordinary person of his time.
Compare these extraordinary occurrences with an event such as Gutenberg's casual observation of the wine press which he adapted to printing. Pasteur's accidental use of old laboratory solutions which led to the development of attenuated vaccines is another example of an ordinary occurrence deserving attention as novel. Fleming's dripping nose led him to the germ-killing-germ idea of medication. These chance groupings of almost trivial events became turning points in Western civilization because the events were perceived as charged with potential significance. They related to a background of familiar ideas and knowledge, but they also possessed a novel twist. When they were followed up and more fully assimilated, they took on revolutionary importance. They were familiar experiences which were related in new ways to their context.

2. Strong Novelty

A great deal of weak novelty concentrated upon one area can lead to shifts within conceptual frameworks. We can be led to discover relationships among our ideas we never suspected to hold. More important, however, we can come to see that our ideas themselves were in part misconceived. If, for example, we saw a great many chairs in museums (i.e., chairs which were not for sitting but for ornamentation), we might come to have a somewhat different
conception of chairs. They would become more like objects of art rather than objects of utility. The sort of change can be described as coming to see that we are mistaken about what instances of the use of the word "chair" were more frequent and more important. The result is a modification, a revision, rather than a complete change of the concept because the instances of the concept need not all be different, and much of what is said about chairs could still be the same. And yet the perception of such marked changes would be strongly novel.

If such variations are not perceived as qualitatively different, but only as quantitatively different, there would probably be no call for a revision of the concept. But this is certainly not always the case with quantitative changes. A rare butterfly will lose its claim to rarity if too many are discovered. The ingenious can be transformed into the cliché in much the same way.

It is plausible to consider the ascription of strong novelty as a deliberate decision to depart from ordinary classification. This is so because cases of strong novelty call for certain kinds of decisions on our part. Understanding strong novelty requires an effort. Assimilating strong novelty requires some thinking. The role of intentions lying behind such new or fresh introductions will become clearer as this chapter develops.
Darwin's work provides a very good example of strong novelty. One of the concepts that was revised by Darwin was that of "species." First, as noted above, there was a deliberate openness in his approach. He wrote:

With respect to my far distant work on species, I must have expressed myself with singular inaccuracy if I led you to suppose that I meant to say that my conclusions were inevitable. They have become so, after years of weighing puzzles, to myself alone; but in my wildest dreams, I never expected more than to be able to show that there are two sides to the question of the immutability of species, i.e., whether species are directly created or by intermediate laws (as with the life and death of individuals). 8

The seeds for rejecting the idea of immutable species were planted by novelty encountered in nature, but the modification of the concept of species came only after much reflection. Were the types of animals and plants he came upon produced by God or some natural power? This question called into question many contemporary presuppositions. The very heart of the idea of immutability of species was that a cosmic plan was manifest throughout nature, and that this plan's outline could be discerned by the way species were formed and arranged. 9 Thus, calling in doubt the idea of immutable species meant calling in doubt broader theological views. But the suggested conceptual revisions were accompanied by some justified discomforts. The mutability of species idea threatened to cloud the precision
with which nature could be described and explained. This is an example of the destructive threat posed by novel variations. The potential taxonomic problems were a thorn in the side of zoologists. Darwin laid out this implication of the modified concept without flinching. He wrote in The Origin of Species,

Finally, varieties cannot be distinguished from species—except first by the discovery of intermediate linking forms and secondly by a certain indefinite amount of difference between them...but the amount of difference considered necessary to give any two forms the rank of species cannot be defined.  

Darwin was willing to live with some of this anxiety.

The "species" marking off "special essences" was modified to such an extent that it became little more than an indication of a variety which becomes prominent for a relatively short time. This was a shocking conceptual development. Darwin wrote:

On the view that species are only strongly marked and permanent varieties, and that each species first existed as a variety, we can see why it is that no line of demarcation can be drawn between species, commonly supposed to have been produced by special acts of creation, and varieties which are acknowledged to have been produced by secondary laws.  

"Species" was not the only concept which underwent a disturbing revision. Perhaps even more far reaching was the revision of the concept "man." Man had not been as closely assimilated with other animals as Darwin's theories
indicated he should be. Man had many mental and physical similarities with animals which had been overlooked. Demonstrating these similarities was the overwhelming thrust of *The Descent of Man*. That book expressed a sober view of man and a precariousness about his existence and creation which seemed to challenge the theological apotheosis of man. Darwin expressed this with:

> Thus we have given to man a pedigree of prodigious length, but not, it may be said, of noble quality.\(^{12}\)

This conceptual revision followed the same pattern as that of species revision. Darwin first noticed a great variety among men.\(^{13}\) Then there was a great advancement of factual knowledge which allowed affinities, which would have appeared strained before, to be exposed. Plausible relationships between man and nature were established. He wrote that on any other view than his version of evolutionary change,

> ...the similarity of pattern between the hand of a man or monkey, the foot of a horse, the flipper of a seal, the wing of a bat, \&c., is utterly inexplicable. It is no scientific explanation to assert that they have all been formed on the same ideal plan.\(^{14}\)

In these instances where Darwin revised "man" and "species" the critical assessment of familiar concepts occurred. Darwin noticed limitations with regard to the ordinary and technical uses of "species" (e.g., an inflexibility inherent in the concept), and "man" (e.g., a
naivety concerning the origin and nature of men). Having noticed these characteristics of "man" and "species," he set about very deliberately adjusting these concepts in a cautious and timorous fashion. He realized that a great deal was at stake in biology, and that the implications of his work in biology would carry over into many other areas. These examples of careful, studied thought bring out the role of intention in cases of strong novelty.

The scientist who is confronted with varieties deserving to be regarded as strong novelty must adjust the structure of the science within which he is working or ignore the anomalies cropping up around him. A judgment that the variations are relevant and a decision concerning what is to be done about them is called for. Technological developments, especially if they involve recurrent anomalies, require readjustments to be made by the theoretical scientist. This is because providing some account of the anomalies is usually an important part of a theory's job. Since theoretical accounts often require the modification of basic and/or central concepts, they can lead to revisions of an extensive nature. The extensiveness of such revisions can be unsettling.
3. Extreme Novelty

Extreme novelty involves the revision of groups of concepts. A critical scrutiny of individual concepts often leads to the modification of frameworks of concepts. Theories and ontologies change with the emergence of these extreme novelties. Whole areas of cognitive activity are transformed. For this reason, talk of "paradigm shifts" (Kuhn) and "emergent layers" (Alexander, Morgan, Broad) seem appropriate. The shock of extreme novelties is often thought to set civilization off on a new course.¹⁵

Strong novelty, those changes leading to the revision of specific concepts, are connected logically and historically with extreme novelties. What I will call "extreme novelty" is a change that is disturbing and forceful enough to trigger a reordering of the clusters of concepts in a conceptual framework. Something like a change in categories begins to occur. Under the impact of extreme novelties a category may expand to include a greater number of familiar concepts. For example, "living" before the development of the microscope and micro-biology was a much more limited category than it was after such developments. New perspectives of reality began to emerge with the changes of extreme novelty.

"Extreme novelty" is almost too weak a term to
express the shattering sort of changes that may accompany the revision of categories and frameworks of concepts. What occurs because of extreme novelty is much more like a revolution among familiar concepts. Expectations, goals, and ontologies are modified. Darwin's theory of evolutionary change by means of natural selection provides an excellent example of this sort of framework revision. Mechanical forces rather than providential ones shaped the natural world. Animals and plants were brought under the influence of this principle of selection. The values and regularities of the natural world, which were believed to have an unshakable metaphysical security and dignity, were threatened. Human life itself lost some of its lofty dignity. The extreme novelty of Darwin's view was far reaching and transformed thinking in many areas other than biology. Some historians have suggested that Darwin usurped the prerogative of theologians to explain the universe. According to them, "God's purpose" is replaced by "natural selection" as the molding force of change.

B. J. Lowenberg wrote:

The revolution in biology, spurred by Darwinism, was premised on a new way of looking at nature and a new way of looking at life. It was likewise premised on newer concepts of man which remolded the profile of humanity and therefore the cast of society.

Darwin assaulted the familiar concept of "species"
with a collection of facts from embryology, palaeontology, comparative anatomy, biochemistry, and geology. Even those who disagreed violently with his later theories seldom rejected this basic data from which he developed his theories.\textsuperscript{19} Eventually, the informed mind was compelled by the plausibility of Darwin's conclusions. But this was not a compulsion that occurred without disquietude. Lyell describes the effect upon him as being "perverted," but he was drawn toward the theory because of the factual support it was receiving. Yet Lyell was horrified by the implications such views as the mutability of all species and evolutionary change held for uniformist's theories.\textsuperscript{20}

Darwin's work faced many difficulties. Questions from physics and the incompleteness of geological and palaeontological information produced two areas where Darwin's views were not totally supported. His theory made no pretense of having powers of prediction either. Inconsistencies between Darwin's theory of natural selection and his theory of inheritance began to be pointed out. The laws of thermodynamics also made the time span Darwin's theory demanded, if the theory were to be plausible, seem impossible.\textsuperscript{21} Nevertheless, the great scope and reasonableness of the theory were overpowering.

Conceptual revisions were only the second stage of Darwin's revolution. If species were mutable, Darwin began
to wonder what forces influenced their changes. He was led to ask why changes come out as they do. But the "why" was disturbingly non-metaphysical. To begin to answer these broad, new questions required a much more imaginative view of the factual data that was available. Such strategems as drawing out anatomical parallels between living animals and fossil specimens were pursued. Relationships between animals and their environment which might have been considered irrelevant before, took on importance. Darwin "interpreted" the biological data in a very general way so as showing why insects, apes, and roses develop as they have done and as they continue to do. When the Darwinian theory took hold of the scientists of the late nineteenth century certain well known technical locutions (e.g., rudimentary organs, community of type, relationship), were moved from the status of metaphors to the status of literal truths.

4. Darwin and the Orthodoxy

When Darwin began to speculate about changes in general he began to tighten the screws upon the stalwarts of the orthodoxy. Darwin was aware that this was where his own role was the greatest. He wrote:

The only novelty in my work is the attempt to explain how species become modified, and to a certain extent how the theory of descent explains certain large classes of facts; in
these respects I received no assistance from my predecessors. 22

There is an analogy at this point between what Darwin was doing and what Galileo and Newton had done. That is, following up on some specific revisions a general reordering of concepts occurred. Darwin's revision of the concept of "species" and "man" was similar to Galileo's revision of "celestial matter." Galileo introduced methodological changes into astronomy which made it difficult to believe that celestial matter was either immutable or perfect. Thus, he was able to assimilate the idea of celestial matter with that of terrestrial matter. Such an association of concepts was a departure from a long Aristotelian tradition. Galileo was followed by Newton in forcing a reformulation of the questions concerning nature. Metaphysical or occult qualities, for example, were not appealed to in Newton's work. The "What causes gravity?" question (i.e., "what" in the sense of "What metaphysical purpose?") was as uninteresting to Newton as the "What causes variations?" question was to Darwin. 23

It was as though Darwin stepped back and said: "Look, you do not need the guiding hand of God or some preordained structure to understand why animals are as they are. You do not need to seek a vital force at the heart of change. Realize that species are not essences. Realize that the rate of reproduction among individual
animals makes competition for life inevitable. This will be all you need to understand why elephants have long trunks and monkeys long tails." Of course, this called for apprehending affinities between animals and men, animals and plants, and populations of animals and groups of plants and animals. The paradigm for this process of change which Darwin uses to illustrate his theory are like simple stories. But they are structured so as to remove reference to teleological mechanisms of change.\textsuperscript{24} In fact, Darwin spent a good bit of time contrasting his theory of evolutionary change with the providentialist view of change.\textsuperscript{25} The facts were essentially the same for both views (i.e., paleontological data and the results of work in comparative anatomy). Some of the problems were similar as well (e.g., understanding the reasons why certain geological characteristics occur as they do, why animals possess rudimentary organs, why certain animal species are distributed geographically as they are). As I have suggested, what would be a satisfactory answer to "why" in these cases was beginning to change for the Darwinians. But these were still recognized questions. Darwin argued that his theory was more comprehensive, testable, coherent, and fitted the facts better. He worked to show that this was the case.\textsuperscript{26}

The extreme novelty of Darwin's view can be gauged
by the resistance it evinced. Although there were facts to support his views and his conceptual revisions were discursive and explicit, the final step toward adopting a new perspective was resisted by many. At times Darwin accepted this with a great deal of maturity. He did not expect his theory to sway all those fixed within the orthodoxy, but he had hopes for the future naturalists. Their impartiality would assure his triumph. He realized that many would take the first and second steps toward the intellectual revolution (i.e., what I have called weak and strong novelty), but would refuse to take the third step. Such conservativism is a form of blindness induced by orthodoxy. 27

At other times Darwin seemed to be irritated by the resistance he met. He wrote:

When it was first said that the sun stood still and the world turned round, the common sense of mankind declared the doctrine false: the old saying of Vox populi: vox dei, as every philosopher knows, cannot be trusted in science. 28

This seems a more accurate description of his feelings. He was convinced that men such as T. H. Huxley, defenders of his doctrine, were putting forth the sorts of considerations which would persuade a rational man to abandon the older views. The opposition was not being asked to leap into faith or make anything like an irrational
decision at this point.

The result of Darwin's accumulation of natural facts suggested to him and others new ways of conceiving familiar aspects of nature. Since traditional accounts of nature were required to change, or to be outright rejected, there was resistance to his views. More than one critic of Darwin accused him of not doing zoology properly.\textsuperscript{29} He was not proceeding in the proper fashion, they declared. It is a tribute to his genius that he knew how to go on in a way which transcended and rationally supplanted accepted conventions and unsupportable traditional beliefs.
FOOTNOTES - CHAPTER II

1Chapter I, p.


4Letters, p. 54.

5The Origin of Species in Darwin, p. 163. Hereafter Origin.

6Ibid., p. 152.


10Origin, p. 114.

11Ibid., p. 183. Wallace was also aware of this and he wrote that the view of mutable species led to an "absence of identity."

12The Descent of Man in Darwin, p. 263. Hereafter Descent.

13Ibid., p. 222.

14Ibid., pp. 220-221.


17 Walter F. Cannon, "Lamark and Darwin," in *Darwin*, p. 44.

18 Loewenberg, p. 279.


20 Cannon, pp. 41-43.

21 Ruse, pp. 10-11.

22 *Notebooks on Transmutation of Species*, Sir Gavin de Beer, ed. in *Darwin*, p. 72.


CHAPTER III

SOURCES OF NOVELTY

I have given general linguistic reasons for taking novelties to be the result of a certain way of thinking about experiences. Rather than being a particular thing, novelty results from a judgment made about a particular thing or group of facts. To say that something is "novel" is to judge it to have certain specific features with respect to its setting. Namely, the novel X will be disjoined in some manner and to some degree from the members of its class. By "sources of novelty," then, I will mean situations which will call for a judgment, revision, and modification of familiar ideas. These are situations which require novel approaches to their understanding. Just as there are different degrees of novelty, so there is a diverse range of situations which give rise to the judgment of novelty. In this chapter I indicate some of the variety of situations by considering novelty in relation to ordinary and extraordinary experiences. I will also consider the way novelty comes about in science and art. We will see that creativity, puzzlement, imagination, and insight are conceptually connected with novelty. For this reason the similarities between scientific and artistic
enterprises should not surprise us.

1. Novelty and Experience

Undoubtedly, unexpected experiences are among the most common sources of novelty. The sciences provide many examples of new experiences calling for, or originating conceptual transformations. From the very beginning of scientific experimentation (in alchemy, for instance, when heated cinnabar popped into mercury) down to the latest cloud chamber photographs of blurred zigzags of sub-atomic particles, new experiences have provoked people into thinking about reality in different ways. Alchemical speculations led to new ideas of world order and world structure. The latest theories of sub-atomic particles have greatly increased the number and types of entities and events to be expected on the sub-atomic level. Many developments, such as the identification of x-rays, began with startling experiences.

Such unexpected differences in the behavior of familiar things deflect thinking from its accustomed pathways in much the same way that an unexpected rockslide deflects a hiker on a mountain path. The familiar path is no longer secure. Surrounding boulders are no longer the stable points of reference. An uneasiness occurs because the ordinary ways of understanding experiences, the guidelines, and explanations which are ordinarily invoked in
understanding begin to fail or appear limited. More specifically, a dislocation results because a concept, category, or a natural response suddenly seems out of place. At such moments we begin to say, "I thought I knew..." or "Now I really know..." We acknowledge an incompleteness in our previous thinking.

The uncertainty we describe here arises because of the implications which seem to stem from the unexpected character of the experiences. An experience occurs which does not ordinarily occur or is not expected to occur. The stretching dislocation produced is a characteristic of novelty.

Travel generally introduces such unusual experiences into our lives. So does education. If ordinary experience is enriched by travel or education, a break with traditional thought patterns can result. Novelty observed during travel, for instance, brings into new relationships concepts which, although familiar, were not seen in suddenly perceived associations. In such situations it is as though the concepts grow into each other. But for this to occur an act of synthesis is needed. Making these associations the creative, original mind establishes a coherence which has eluded others.

A typical example of such a situation is found in the way Darwin perceived zoological data, resulting in the theory of evolution. At first, Darwin's voyage on the
Beagle merely enriched the existing body of knowledge in zoology and botany. But some of the observed data called for a new explanation. So Darwin struggled to bring order to his vast collection of facts. Eventually he hit upon the idea of connecting certain facts about Malthus' theories of population growth and the domestic breeding of animals with the data he had collected. He must have been elated to discover that seemingly diverse facts began to dovetail, thus leading him in the direction of his ultimate theory.

Darwin's work is instructive because he did not resort to a completely different set of concepts when he proposed his theory. Nevertheless, his use of familiar concepts certainly introduced a profound theoretical change. What happened in this case was not a change of kind in Darwin's concepts of animals, insects, plants, or even evolution. Nor was the nature of his data changed. What was different was the novel way familiar concepts were related. We can say that a theory pulled them together. The variety of birds that Darwin might have found on a group of islands does not change the concept "bird," but the extension of the concept to dozens of variations connects the species of birds in terms of gradual linkages which were not previously suspected. This led to a radical revision of the concept of species, a revision basic enough to set biology off on a new course.
Darwin came to see that his old way of thinking about species of birds was not adequate. He discovered many odd specimens which could not be assimilated in the orthodox zoological classifications. To be sure, a zoologist, or any scientist, has reactions that are to some degree habitual because of the accepted scientific constraints of his discipline. There are ways of handling unexpected experiences, such as seeing an unusually colored bird or a multi-beaked bird. This much flexibility is built into the science of zoology. But there is still room for puzzlement and bewilderment to creep into the discipline.¹

Of course, a bird with an unexpected circulatory system might require a more drastic re-evaluation not only of the concept "bird," but also of the concept of other animals which are like birds. Some degree of cautious, original revising would be called for in such cases. The community of zoologists would have to be consulted. At such times it is not the linguistic fact (i.e., what people would say), nor a linguistic policy (i.e., what ought to be said), that is at stake. It is rather the need to review and reflect upon the similarities, dissimilarities, and relationships between new findings and those previously established.

I have stressed repeatedly that in the discussion
of novelty the judgment one makes is crucial. How we assess and adjust to an unfamiliar experience can lead us to perceive it as novel. But since it is the apprehension of a certain relationship between experiences and its context which reflected in predicating novelty, ordinary experiences also are capable of being a source of novelty on some occasions. At times what is very ordinary can be apprehended as unusual and can lead to a series of events which are unprecedented. But, even though apprehended as unusual, such events need not always be provocative or unsettling. Some variants can be ignored or, at least, absorbed with little effort. On other occasions, however, deviations demand reflection and may lead to an important insight. Coming to see that something very familiar (e.g., concept of species) needs revision is the type of novelty which puts the familiar in a new perspective. There is a sense in which Darwin's studies were firmly within the familiar world of zoology and were available to many other naturalists of the nineteenth century. But only he was struck by the possibility of seeing them in a novel way.

Thus, although unusual occurrences sometimes bring about a constructive restructuring and reshuffling of the familiar, familiar situations may also give rise to such reconstructions and revisions. The familiar, too, may
suddenly appear bewildering or provocative. Both the familiar and unfamiliar may give rise to "problem situations" when they pose for us the need to integrate, re-think, and often re-see. This is the "work" novelties require of us regardless of their source. To understand novel revisions we must make an effort, and this means forming at least some links between the unusual and the most familiar thought patterns.

2. Epistemology of Novelty

There is a pattern or movement from the puzzlement brought about by novelty to its resolution. I will make this process more explicit. John Wisdom has called such a process the move from "provocation to pacification." It is his contention that the apprehension of queer formulations or eccentric propositions produces a conceptual disquietude which can be relieved by reflecting upon the way language is being used. By scrutinizing the usages which produce the provocation, we can uncover the misleading features of the locutions. But according to Wisdom, the provocations in such cases are not a result of error. They represent more constructive deviations (i.e., they are novel). Ignorance, for example, concerning the nuances of a concept's functioning is more likely to be the cause of our uneasiness. Often there is a conceptual inadequacy at the heart of the uncomfortableness.
The outrageous, peculiar, and unorthodox, because they are not merely errors in these cases, are capable of instructing us about our familiar concepts.

The philosopher's enigmatic utterance (e.g., "Robots have feeling." "All men are guilty."), and the artist's views of reality (e.g., the Cubists' sliced presentations and Expressionists' twisted figures), are often the first to bring to our attention the limitations of familiar concepts. Indeed, Wisdom maintains that it is the attempt to expose these conceptual limitations that is the rationale behind creative philosophy, art, and science. The bewilderment caused by the novel is resolved by making evident the grounds for discomfort, by pulling together experiences heretofore separated, and revising many familiar ways of thinking.

The movement from puzzlement to understanding, which must accompany the experience of novelty, suggests a range of epistemological problems. The sign that these epistemological problems are present is the existence of a certain tension which develops between the novel particulars and their familiar classes. The way I believe such problems can best be dealt with illustrates again the working of the adjuster-signaling and verdictive functions of "novelty."

Consider the following: I presuppose that "X is
the case" when I make the judgment that "X is novel."
Often, I am making a judgment about facts with which I am
already familiar. This is to be expected because for me
to judge that X is novel I must recognize X, know the
concept X, and know the circumstances appropriate for
applying the concept X. Such abilities are presupposed
when I judge "X is novel." But sometimes there may be
a need to form a new concept or revise an old one. Indeed,
we are most likely to face just this sort of thing in
cases of eccentric experiences. If this is so, how am I
to recognize the eccentric X as a type of X, or know it
to be an X? It is yet more problematic perhaps, to say
how I know the correct circumstances for the application
of "X." One must provide some way to bridge these con-
ceptual difficulties. In these cases, too much flexi-
bility could be counter-productive. I must recognize
the exception but still see that it falls under an old
rule, or I must recognize that although what I see falls
under an old rule, it is really an exception.

The puzzlement seems to find its locus in the
characteristic of novelties which makes them ill-fitting
with their class. The recognition that X is novel is
both a recognition that X falls within a certain class
but also that X should not be placed within that class
without caution or perhaps some revision. A revision of
the concept or a revision of the schema of the concept seems to be called for.

A slightly different analysis of this situation reveals how a resolution might be effected. In cases where novelty occurs we do not know the concept X or recognize X \textit{per se}. We recognize that what we experience is like X, bears a similarity to X, falls within the family of X's. We must also recognize the situation in which X is experienced, and know that certain types of concepts are applicable in such situations. We know that what we experience is like an X, and this helps us locate it among more familiar experiences. For example, concepts about minds or concepts about material things can be used in certain situations, but do not seem applicable in others. Thus, Darwin knew that concepts about animals were still appropriate when faced with many novelties in South America.

If we are in a situation in which some of our familiar concepts do not fit, or do not seem appropriate, we must either innovate (i.e., do some adjusting), or set aside the experiences, or deny the veridical nature of the experiences. Reflecting about the situation or the discipline within which the puzzle comes about may dictate the approach we should choose. For example, an unexpected result in an experimental situation within an established
science is not dismissed as cavalierly as an unusual experience occurring after heavily drinking wine. We recognize that the eccentric experience in one case was important and in the other it was merely strange.

The judgments we make and the adjustments we recommend determine whether we come to regard such situations as novel, disastrous, or to be dismissed as insignificant. Had Jenner not apprehended the significance of certain familiar phenomena of peasant life, it would have been a disaster for all mankind. Had Kepler been contented with a well-known eight minute error in planetary movement, astronomy would not have progressed as it has. Something significant is noticed in such cases that leads to old concepts being revised or new ones being created.

It is sometimes the function of genius to recognize that significant adjustments are in order. What is perplexing, bizarre, absurd, or obvious for the ordinary man becomes the basis for novel insight for the genius. The faculty to weave a knot of new connections around ordinary empirical experiences is creative because it entails originality and inventiveness. The creativity and originality are responsible for the apprehension of relationships and connections not yet seen by others.

Such intellectual maneuvers help us to see familiar
things, as well as unusual things, related in new ways to ordinary backgrounds of experience. The transition from puzzlement or epistemological anxiety to the forging of unorthodox connections within a given framework is largely a process of making connections explicit. Even unusual occurrences are endowed with a tacit cognitive status. The unusual already appears to have a loose "fit." The question is how and why it fits. The steps unpacking the relationship between the unusual and familiar are needed. The temporary dissonance created by the novel is smoothed by a process of integration. A kind of harmony unfolds as we "understand" or "see" what is going on.

Thus, the perplexities brought about by the perception of novelty are met by trying to discover what routine elements underlie the situation. This is an attempt to link experiences with habitual thought patterns.

Every perplexity has a setting, and the problems of novelty arise within a context. A general background of resources, goals, and skills is part of the perception of the problems which arise out of novelty. The strategy for integration and bringing the unusual into some relation with its surroundings must be developed within this context.

The process of establishing a relationship between the novelty and the familiar is evident in many maneuvers which allow us to go outside ordinary habits of thought.
For example, metaphor and analogy are vehicles of linguistic creativity by which we step beyond our present linguistic frameworks. One of the characteristic ways of facing a situation of uncertainty which is brought on by the failure of reliable ways of thinking is to resort to picture thinking or metaphorical thinking. By resorting to metaphors and picture-models, it is easier to set up relationships between the familiar and the unusual. When we are thwarted, we may try to return to a more basic level of experience, such as familiar visible objects, and try to work out the uneasiness on such a level. By analogy, we can go on to apply the concepts taken from a basic level to more complex levels. A more sophisticated articulation follows the simplification, but the move away from the literal seems necessary to break the boundaries which inhibit understanding.

Novel phenomena challenge our understanding and frustrate ordinary conceptual devices. Metaphors borrow from diverse conceptual areas, and for that reason they help bridge conceptual blind spots. Analogies between the new and the familiar bring out affinities and facilitate assimilations. We can elaborate analogies into models or expand our vocabulary to include the anomalies. These attempts to understand by way of analogies and metaphors push ordinary experience in the direction of forming new
capacities.

Conceptual variants often enter language as metaphorical expressions. For example, the unusual conditions of space exploration produced a flurry of metaphorical expressions. "Space walk," "moon rover," "space docking" are some examples. The "walk" in space is much more of a swimming or hopping. The "rover" had a carefully programmed itinerary. The "docking" was hardly the connecting up of a moving object with a stable one. Both ships were floating at great speed. Although certain linguistic conventions are violated by such metaphors, the new linguistic turns suggested both affinities and dissimilarities between the floating spacement and the ordinary man. There may be no word for what these men in space are doing as they flounder from one spot to another, but we can combine and manipulate familiar ideas in such a way as to place those eccentricities in revealing relationships with ordinary walking, roving, and docking operations. To devise such linguistic variants a dint of creativity is required, enabling people to make unfamiliar situations comprehensible. Ordinary language has to catch up with new experiences, so to speak. In such cases, the unspeakable can be conveyed by the use of metaphors. But metaphors demand the context of the ordinary to do their work. The metaphor is linguistically odd in this way. It breaks
into the progress of literal thoughts and relates such thoughts to the familiar in new ways. This is most clearly seen in the language of poets.

Scientific thinking, in developing its conceptual models, also calls for imaginative analogizing and picture thinking in response to the problem of pulling together experiences that have an unclear relationship with what is ordinarily expected. Developing a model is one way of responding to certain of these problems, and it can serve to facilitate an eventual understanding and integration of the new phenomena. Darwin composed short episodes that were very much like short stories to provide paradigms for how nature "selected" the progeny of living organisms. Darwin's stories are remarkably simple and carefully honed to illustrate his theory. Of course, he also discussed his use of metaphors explicitly with regard to such locutions as "struggle for existence" and "natural selection." It disturbed Darwin that many of his critics and disciples had failed to notice that he was specifically introducing metaphors.

The metaphorical and analogizing nature of scientific models explains why they can be seen from different points of view. A tinker toy construction can be a molecular model, the model for the solar system, or a model for an atom. Such models function almost too well, for
they can be reified in ways contrary to the original intent of those who proposed them. When a model has proven very successful (e.g., Bohr's atomic model), some further adjustments to it are usually needed as experience and use expose its limitations. Some models, such as Ben Franklin's model of electricity as a flowing liquid, remain popular even if no longer regarded as accurate by scientists.

In sum, the construction of analogies, models, and metaphors calls for acts of imagination which synthesize relations, uncover similarities, and bring together what can appear to be prima facie disparities. The creation of productive symbols of this sort is an important way in which human knowledge advances. And yet the proposing of a model or the use of a metaphor often appears counter-intuitive in relation to common sense. A suspicion of paradox may hover over many of these maneuvers.

3. Paradox and Novelty

To resolve the bewilderment that is associated with the unexpected and unorthodox, especially that produced by cases of strong and extreme novelty, far-reaching adjustments to language and thought may be needed. This often makes the attempt to express a novelty intellectually suspicious. Sometimes the suspicion is justified, but sometimes it is a sign of non-productive conservatism.

In a perceptive article, "The Ways of Paradox,"
W. V. O. Quine distinguishes among different types of paradoxes. The insights of this article notwithstanding, the intellectual conservatism mentioned above is present in Quine's essay. For Quine, a paradox is a symptom that something is going wrong. He sees that paradoxes result from linguistic and conceptual muddles, but he pays only passing notice to the positive effects that paradoxes can have. Such cognitive affronts can often uncover unnoticed aspects of the ordinary. For Quine, the paradox must be attacked and dissolved.

In contrast to Quine, John Wisdom is one philosopher who sees the virtue of paradoxes. He advocates an exploitation of paradoxes rather than the kind of dissolution of them which too often satisfies a destructive linguistic status quo. Paradoxes, he claims, can reveal deep significance. To approach them only as though they were linguistic muddles requiring correction would de-emphasize in a harmful way non-methodical ways of knowing by imposing the restraints of current conventions. To say something strange in poetry, for instance, is not a question of a poetic statement being untrue. No logical or verbal impropriety is involved. But it is not the introduction of a new logic either. Poetry can reveal things that are hidden, and it reveals precisely because it is "wrong" in the ordinary sense.
Wisdom wrote, "A paradox is a flag which declares a discovery. . . ." The discovery characterizable as coming to see the familiar in a new light. We dig out what brings us to accept and what brings us to reject the paradox. We come to see old things in a new way because latent aspects of both a linguistic and non-linguistic sort are uncovered. There is a limited assault on ordinary linguistic rules. John Wisdom expresses this by saying that it is not a case of the rules being wrong, but a case of the rules being old.

This is often true not only in literature and philosophy, but in science as well. Newton's manipulation and development of the concept of attraction, as well as Galileo's treatment of causation, are examples of the kind of stretching and bending of language which occurs among scientists. Similar examples can be found in the work of many other "interpreters" of nature, from Thales to Einstein.

Psychoanalysis modified and made more sophisticated some very familiar concepts. Love, hate, envy, jealousy, and responsibility are just a few of the ordinary concepts they revised. As in the scientific cases mentioned above, conceptual alterations are carried off in order to help us better understand certain features of human experience. Familiar concepts and words may be employed, but the
applications are provocative. The new uses affront the accepted, but not out of disrespect or ignorance. The linguistic innovations represent attempts to make sense out of extraordinary experiences and carry language beyond received conventions.

Although science, philosophy, and art are different realms of human activity and discourse, the appearance of novelty in each of these areas follows the kind of pattern referred to above. That is, a type of perplexity arises with the perception of novelty. Novelty produces an anxiety to understand and may lead to revision and discovery. We are moved toward a more explicit apprehension of the familiar through a recognition and assimilation of the novel.

Poets and philosophers, for example, sometimes notice new things about experience and recommend a fresh use of words which suggests a new way of viewing the familiar. Comparison, contrast, and exaggeration are devices used to bring out affinities and disanalogies. The queerness of a poetic expression may provide just the vehicle to help us apprehend a well-known situation from an unexpected perspective. Art and science have this power to reveal what we have looked at often but failed to see clearly. Art utilizes caricature, metaphor, and paradox to expose unsuspected dimensions of language and
life. In this way, the complex things are more easily grasped and brought into focus.

In theoretical science there are areas in which intense hypothesizing is cultivated, but this is more true of a corner of the scientific world rather than of science in general. Deliberate testing at the fringes of ordinary experience is characteristic of literature and the other arts. And we are all familiar with the informal linguistic deviations that result in humor. But the artist, especially the poet seems to be most suited to continually subvert the linguistic status quo.

A poet may resort to abuses of common syntax and semantics. His abuses may have been meant to emphasize a new point of view, to bring out an overlooked nuance, or to create a new image. The artist may be striving only to bring about something beautiful, because the beautiful is an exception to the ordinary. That is, to be striving toward beauty carries the artist outside of orthodox realms of expectancy and action.

Recognizing that this departure from the ordinary is an important part of artistic production explains why Plato linked artistic creation with enthusiasm or divine madness. He blamed the artist for traducing important traditional beliefs, and felt that it is necessary to keep the artist under surveillance and censorship. Art played
too important a role in Greek culture to be allowed an
unsupervised existence. Customs, moral precepts, and
knowledge of the ancients were often conveyed by poetry,
drama and sculpture. As the importance of art in our
culture has decreased the need for censorship and sur-
veillance has also decreased. But this freedom was pur-
chased at the price of the diminishing importance of art.

Art encourages icon shattering, so it has always
been viewed as a threat by political or intellectual
totalitarians. The subject matter of literature is often
an example of the sort of adjustment to novel experiences
that I have been discussing in connection with science.
Characters in literary works often confront novel ex-
periences. They pass through the discomforts of puzzle-
ment which accompany the novel. Adjustments are required
of these characters often resulting in new insights.
Frequently, the protagonist is the only one in the story
to detect the novelty. Faust comes to see that what he
thought he wanted and what he valued in human experience
was not what he really wanted and valued. Wagner's dense-
ness is very characteristic of the other people in the
play with regard to apprehending the disquietude of Faust.
Ivan Illich thought differently about life at the end of
Tolstoi's story. But this came after days of agonizing
reflection, and he was alone in his understanding. He
came to see the world and people he had known in a
different light. The mother, in contrast to the uncle,
in D. H. Lawrence's "The Rocking Horse Winner" is
brutally slapped into a different conception of value.
She is last pictured as being enveloped in a numb
thoughtfulness. These are just a few of the characters
from literature who re-evaluate and re-order and sometimes
become wiser because of their novel experiences.

4. Novelty and Intuition

Artistic creativity is often associated with
intuitions or unstructured insights. Of course, there
are many examples of intuitions in science too, and we
would do well to consider the relationship of intuitions
to novelty in science and art. Intuitions, visions, and
flashes of insight occur in situations which signal the
presence of novelty in philosophy, science, and art. In
such situations one may be inclined to regard creativity
as an irrational process.

Consider Poincaré's description of a mathematical
solution which had eluded him for weeks, but then
suddenly struck him with great clarity:

Having reaches Coutances, we entered an
omnibus to go somewhere or other. At
the moment I put my foot on the step the
idea came to me, without anything in my
former thoughts seeming to have paved
the way for it, that the transformations
I had used to define the Fuchsian functions were identical with those of non-Euclidean geometry. I did not verify the idea. . . . I went on with a conversation already commenced, but I felt a perfect certainty.\textsuperscript{15}

He describes another similar episode:

One morning, walking on a bluff, the idea came to me, with just the same characteristics of brevity, suddenness, and immediate certainty, that the arithmetic transformations of indeterminate tertiary quadratic forms were identical with those of non-Euclidean geometry.\textsuperscript{16}

Coleridge's description of his composition "Kubla Khan" is another example of this intuitive creation.\textsuperscript{17} Poincaré's theorem and Coleridge's poem are products of this startling type of event which changes a person in a flash from a state of ignorance to a state of knowing. Suddenly these men perceived clearly what was unknown, vague, or mysterious only a short time before.

The tendency to call such experiences irrational is due to the fact that they are apparently not connected to conscious thought processes. They are not considered irrational in the sense of contradictory or absurd. On the contrary, novel insights such as the ones mentioned above are regarded as penetratingly accurate and helpful. They are thought irrational primarily because their appearance is unorthodox.

Something, it is argued, must reason out the
problem or there cannot be a rational solution to it. So an unconscious mind is what "thinks out" the solution. In the nineteenth century there were many voices praising the unconscious sources of novelty. Nietzsche claimed that Thus Spake Zarathustra was delivered completed to him. Originality and creativity were thought to spring in such a way from unconscious sources. These claims deserve further attention. A certain picture of rationality, which I will question in a later chapter, seems to lie behind the idea that intuitions are a type of irrationality. For the moment, however, I only wish to acknowledge that the way we deal with novelty makes the notion of intuitions very attractive.

One problem with intuitive insights is that there are difficulties in communicating them to others. To be communicated they must be put into a setting, for they claim to answer a problem or solve a puzzle. It is not enough to say, "This is the theorem I have been searching for. It came to me as I strolled through the park." The theorem has to be shown to fit with the particular system in question. A poem dashed off spontaneously, such as "Kubla Khan," has to be touched up in such a way so that others can understand it. Coleridge and Poincaré had this task to perform, but Nietzsche denies this was necessary for him. Neither Poincaré nor Coleridge were
satisfied with the stamp of subjective certainty. The feeling that they had accomplished something was not ignored or irrelevant to them, but this feeling was not sufficient. An integration with other conceptual schemes was carried out. 18

Communicating intuitions is usually more difficult than communicating other eccentric experiences because intuitions have a less obvious connection with the public dimension of discourse than other examples do. Flashes of insight are not presented as integrated. This is what makes them intuitions. Whether in science or art, intuitions require that we puzzle out on a more public level how they are related to present and antecedent conditions. If they are solutions to problems, as in the case of Poincaré, then the intervening axioms and postulates must be supplied. If they are more or less complete, such as Coleridge's poem, then they are part of a class of recognized objects. Meaning will be attached to them accordingly. But either way there must be an integration. They must be pulled into a familiar system of concepts. This is essential, for otherwise, the intuitions will remain mysteriously significant, like the Oracles of Delphi or Cassandra's abortive prophecies.

To make this point clear let us go back a moment to Poincaré and Coleridge. Both men described their
intuitions as being within a context with which they were familiar—the mathematical problem and the poem. For Poincaré, the context was a mathematical theorem that was sought. For Coleridge, the context was reading the history of an opulent Chinese dynasty. So while the intuitions sprang upon them and were in many ways unconnected with their flow of thoughts, there was still a vast range of very clear connections with familiar things. Of course, both men acknowledged such connections to have been present. Their intuitions can be described as novel because the intuitions pulled together disparate, yet familiar elements. And this led to some profitable future products (i.e., the theorem and the poem).

There is an obvious analogy between this integration of an intuition and the *ex post facto* analysis of scientific discoveries. In many such instances we are forced to supply the conceptual setting to describe the discovery. For example, Lavoisier and Priestley are associated with the discovery of oxygen. But only Lavoisier can be plausibly said to have had the concept. A similar revision of events lies behind a locution such as "Columbus discovered America" or "Darwin was the first ecologist." We recognize that what happened can be described in these fashions, yet we are re-interpreting and re-integrating concepts and events when we speak in this
fashion. These men grappled with phenomena they sensed to be important. It may be long after they have done their work, made their contributions, that we decide whether it was novel or not.

The way the integration is carried off depends to some extent on the types of situation and the type of person involved. There is room for considerable idiosyncratic development. This is most noticeable in art, but French and English biological sciences, for many decades, provided an excellent example of this idiosyncratic element expressing itself as a national temperament. A common set of problems faced these biologists. Such mysteries as the control of growth and metabolism of the cells were probed by each. But the French had a tendency to approach their research through models with organismic features. The English favored a more mechanistic representation. To an important extent these differences of theoretical conceptions grew out of intellectual traditions and life styles within the respective cultures. They linked up the study and conception of the biological mysteries with their respective traditional predilections.20

Similarly, a writer's literary style is often the result of trying to convey to other people his vision of life or reality. The force, quality, and poignancy of the insight may be communicated with some stylistic innovation.
James Joyce reveals his visions of the flow and ebb of life in a style of writing which seems a perfect example of this fluidity. Faulkner's stream of consciousness writing grows out of the South's obsession with tradition, family, and history. Kafka's and Becket's peculiar literary style draws us into a world of absurdity and paradox.

In some literary cases these are new ways of seeing old truths. But sometimes even the truths are new. A new view of life might be communicated. This may be done by going beyond familiar situations, tracing out hints of significance, and developing a fully articulated picture.

Thus, the idea of an anomaly brings out an affinity between science and art. As the arts and sciences develop, they move beyond some of the conventions which bind them to the familiar. They stretch and shock, and they lead us towards perplexity. Neither experiences in themselves nor the situation per se are sufficient to yield novelty. Reflection about experiences and situations produce the judgment that they are novel, and this may lead to conceptual revisions. At any rate, the perplexity, which the perception of novelty evinces, calls for a response the nature of which is neither clearly determined by antecedent experience nor clearly guided by institutional orthodoxy.
We naturally tend to assimilate the unusual with the ordinary. This is not so much an innate conservatism as it is a sign that structures of thinking tend to assert themselves. Novel reform, creative response, and even revolution all can be provoked by an estrangement produced by unusual situations. Such responses are constructive human reactions to the confrontations of beliefs that are certain. Common sense naturally asserts itself to block disrupted equilibriums, but it also nurtures innovations.

In the situations I have been labeling "sources of novelty," we find forms of thought which go beyond mere understanding. This is why such experiences are often described as being "insightful," or as "based on hunches." We start with a vague but nonetheless compelling clue that there is further significance beneath the surface of a given experience. Something remains to be exploited. A slight tipping of the balance indicates the need for cognitive revision. If this constructive step is not carried off, we may have newness, perplexity, and unusualness, but we do not have novelty. So the purpose of discussing the sources of novelty is to expose more clearly what novelty is and to show what role reason plays in its production.

Although I have made clear that novelties have a dislocating, and hence destructive side, this chapter has
stressed the constructive side of novelty. That is, I have stressed the way novelties grow out of and go beyond perplexing circumstances and lead to modification of familiar situations which are positive in nature. This is accomplished by recognizing a legitimate cognitive worry and attempting to ease it by opening a different intellectual direction. The more novel a situation is, the less likely are we to fall back on a habitual pattern in order to deal with it. Yet we may recognize that an attempt to make an assimilation is unavoidable. The degree of originality required and the eccentricity characterizing the situation make the task of assimilation difficult. Creativity and originality need to be enlisted to overcome difficulties, to restore a tolerable level of harmony in our comprehension, and to satisfy our desire to set things straight.
CHAPTER III - FOOTNOTES


3 The problem, in general, is as old as Plato's Meno where it is asked of Socrates by Meno:

But how will you look for something when you don't in the least know what it is? How on earth are you going to set up something you don't know as the object of your search? To put it another way, even if you come right up against it, how will you know that what you have found is the thing you didn't know? (80-d)


5 Origin, pp. 128-132.

6 Ibid., pp. 116, 120-121.


CHAPTER IV

LIMITS OF NOVELTY

The capacity to be adaptable to new situations is an important feature of natural language which accounts for some of our success in articulating changes which ordinary living forces upon us. But all change, and certainly novel change, must come within certain boundaries or parameters if it is to be intelligible. Novelty meets resistance when variety is too innovative or too frequent.

This chapter will deal with the frontiers of conceptual innovation. These frontiers are areas of our conceptual frameworks where we encounter resistance to conceptual variation. At these epistemological points "lines are drawn," "patience is exhausted," and balking begins. These points of resistance show up in science, art, and ordinary life.

One reason I wish to inquire about the limits of novelty is that in my previous chapter on "sources," I pointed toward the idea of a background by focusing upon types of contexts or situations from which novelties emerged and to which novelties become attached. We go from a perplexity towards a resolution in these cases of novelty. A novel conception is sometimes the vehicle for
such resolutions, and sometimes it is the result of resolution. The background is that from which the novel arose and with which the novel must be connected. In this chapter the probing of the limits of novelty will clarify another important aspect of background. I will stress the role of backgrounds as boundaries or setters of standards for thinking.

In my previous chapter, novelties were treated as positive developments which resolve problems inherent in change. In this chapter I will deal with more extraordinary situations where the destructive side of novelty is dominant. Since extreme novelty creates associations within heretofore incompatible contexts, we seem often to be flirting with the sirens of psychopathology. The queerness of the madman is somewhat similar to the queerness of the great poet or scientist because both sometimes depart from the ordinary and familiar experiences in disturbing ways.

1. Cognitive/Physical Background of Novelty

Two general conditions seem necessary for novelty to develop, namely, a general physical and a general conceptual readiness. Novelty depends upon change. The novel change, whether in the form of an event, a thing, or an experience, becomes reintegrated with its context. This
context can best be understood as a cognitive/physical background. Concepts form the cognitive dimensions of the background. Such a framework of concepts must be present to provide the foundation upon which changes can be built. This is because all experience, including the experience of novelty, presupposes certain conventions without which we may have a premature, confusing, and non-productive misfiring or dislocation.

A creative artist, scientist, or businessman, who is premature in this fashion is described as being "ahead of his time." Often the "times" seem to catch up within the lifetimes of such people. Then the creators are heralded as leaders. Chopin, Pasteur, and Henry Ford are examples of this type of innovator. Quite often the times lag and such innovators are isolated, sometimes cruelly, from their own cultures. Their works inspire a later age. Van Gogh, Baudelaire, and Mendel come to mind here. Bach, Beethoven, and Wagner were "hard to hear" in their time. The product of originality can slip away if it does not connect with the *Zeitgeist*.

At any rate, there has to be a readiness among the familiar network of concepts for the unusual to be understood, articulated, and assimilated. This conceptual maturity can be something like a responsive community of peers who are flexible enough to draw out and recognize the similarities existing between the unusual and the
familiar. A population of concepts must exist, ready to
deal with such recognitions and absorptions. If the basic
condition of conceptual readiness is not satisfied, the
strikingly new and unusual will likely be rendered "ir-
relevant" or "absurd." I mean here the French sense of
"absurd"—that which is so out of place as to be rendered
incomprehensible. This sort of newness not only fails to
develop, but it cannot even catch on.

The physical condition which is a prerequisite for
novelty is more difficult to specify, yet it is crucial.
I have in mind the physical and technological conditions
which allow for developments to come about. Advanced
theories of astronomy are built upon a developed science
of optics. Modern physics uses complex technological
equipment, and the very existence of the science as we
know it presupposes this technology. A thinker cannot
propose an acceptable and comprehensive theory about
planetary bodies or microentities before we develop the
skills and technology for its articulation and understand-
ing. Understanding, testing, and utilizing what is pro-
posed would be blocked.

Since novel developments have a conceptual and
functional relationship with aspects of their contexts,
various sorts of connections can be expected to turn up.
A certain readiness or maturity of context is also to be
expected. This maturity allows for the novelty to develop. But it is not clear that there is always a logical connection between novel developments and their contexts.² Often novelties just appear. Then a logical connection must be invented.

Physical aspects of the background manifest themselves clearly in technological areas. The development of the microscope was essential to the development of a sophisticated biology of micro-organisms. The telescope was essential for advanced astronomy. Technological developments enabled us to formulate concepts which assure that there will be an exploitation of various discoveries. Concepts central to all sciences demand this. To see something with the naked eye, with a microscope, or in a cloud chamber indicates the ways the term "see" has undergone changes which reflect technological changes.

Conceptual innovations which do not touch base with any physical background are very likely to be rejected, ignored, or dismissed. Such ideas as the "atom" of Greek philosophy, Descartes' "vortices" and "passions," and Leibniz's "monads" are examples of brilliant conceptual innovations aimed at resolving many puzzles which did not appear as convincing to subsequent thinkers as they did to contemporaries.

A connection with the cognitive/physical background
is required for such conceptions to be useful. Yet, the cognitive/physical background is to a great degree an abstraction. Neither the physical aspects nor the cognitive aspects can be said to have a "pure" existence, and although they overlap, I have described them separately. To identity colors, feelings, and ideas requires a certain degree of cognitive sophistication. Many types of concepts are involved. But colors, feelings, and ideas are phenomena which presuppose a circuitry of nerves, light waves, and sense organs. There are physical things correlated with such experiences. So there is an intimate relationship between the cognitive and physical aspects of experience.

I have tried to describe these two general aspects of backgrounds in such a way that their prereflexive and a-theoretical status is made clear. Backgrounds are composed of a reservoir of common experiences, phenomena, and entities. These things transcend epochs, theories, and frameworks of theories. In this sense we can speak of common experiences as being transcendent. We grow into these backgrounds of common needs and problems before we learn theories or paradigms. For this reason, the cognitive/physical background has an "elastic" nature. It accommodates shifts in ideology, theory, and circumstances. Remarkable transmutations can thus be carried off without
specific affronts to the background.

The cognitive/physical backgrounds I have described are not things which can be spelled out with an aseptic, neutral vocabulary. Even a common human experience, such as love or hunger, can be seen to reflect accretions of cultural and historical developments. But because of the reservoir of common experiences and possibilities a "family" of responses and expectations are developed which form a fundamental similarity among human cultures. This is one reason why we can understand what the Greeks are talking about in Plato's *Symposium* even though the concept of "eros" is much different from our concept of "love." This same reservoir of needs and goals helps bridge cultural and scientific theory changes. It is true, for example, that after Copernicus different objects will be grouped under "planet" and the sun's movement will be only apparent. But men, whether Ptolomaic or Copernican, would still expect to see the sun "move" across the sky, still think of the moon as a beautiful celestial body out there in the night sky. The existence of such a background of common experiences allows for less traumatic transitions between scientific theories. Some ontological and epistemological changes are encountered at such times, but not all of what is expected fails to come about, not all possibilities must be revised. It is the background
of common experiences which generates expectations and possibilities which make plausible the conceptual constructions and revisions of scientific, artistic, and philosophical history.

A. N. Whitehead, among others, develops a notion similar to this cognitive/physical background in Adventures in Ideas. When he cites regularities in nature and human experience, he has in mind such things as birth, death, hunger, separation, disease, and cold. These regularities serve to anchor the great varieties of life. Thinking and living move about within and develop from such backgrounds. Backgrounds are "taken for granted." Physical facts seem to hold firm behind theories, paradigms, and conceptual matrices. People, for example, die, are born, cannot walk through walls, do feel pain, must eat, etc. The "facts" form a trellis upon which experiences and theories bloom. These conditions are here before we get here, and they form a "world" within which there is enough common experience that the multifaceted manifestations of our cultures cannot isolate us. The limitations of novelty grow out of affronts to this background.

2. Resistance in Science

A certain intolerance and conservatism are characteristic of the various scientific professions and
enterprises. These features help to ensure that new developments meet established criteria. Because novel changes can be orthodox enough to cause resistance to grow, it is only after these conservative forces are won over that a new idea becomes accepted. The limits of tolerance and the suspiciousness with which innovations are met function as checks upon fads and opportunism in the sciences. Those sciences which are most flexible about conceptual and methodological innovations (e.g., psychology) tend to be subject to more fads.

Many new ideas are inhibited and thwarted by orthodoxies. Copernicus held back publication of his major work for fear that his colleagues would ridicule him. Galileo angered the Aristotelians long before he angered the Catholic Church. Harvey, Darwin, and Freud also felt the wrath of the orthodoxy.

Many good ideas in the sciences were rejected because they did not fit the ruling orthodoxy. Galileo is usually mentioned as an example of a scientist who was a victim of such a rejection. Yet his experiences do not exemplify this as well as they might because of the political factors which undoubtedly had a bearing upon the ignoble decisions concerning his theories. There are better examples from the history of science which demonstrate resistance to new ideas which later turned out to be
correct and useful.

There is the example of Dr. I. Semmelweiss who tried to establish minimum levels of cleanliness among physicians in clinics of obstetrics. His theory of germs and the data showing lower infection rates among physicians who washed their hands before operations were rejected, and Dr. Semmelweiss was ostracized by his colleagues. The high rate of infections continued, and the image of the physician as incorruptibly pure was maintained a bit longer.\(^4\)

A more contemporary example can be found in the emergence of acupuncture as a method for medical treatment. A few years ago no reputable physiologist or anesthesiologist would have even suggested an investigation of acupuncture, much less that something significant could come from such an investigation. Only after certain undeniable events in surgery and treatment were published did professionals begin to take notice. Now there are studies and theoretical treatment to account for acupuncture. The science of acupuncture is very much a historical echo of what happened with hypnotism.

The conservative elements of a profession resist new ideas which threaten their authority, power, and/or intellectual security. And yet, a general skepticism with respect to new developments seems a rational procedure,
protecting professions from dangerous and destructive changes. In many cases questioning proved to be wrong because good ideas were blocked or impeded, but without such resistance astrology or chiropractic medicine might have an even greater following than they have today. We are better off that these "sciences" met with resistance. This prudential factor is one reason for considering resistance a rational strategy.

There are other ways in which resistance can be activated. For example, if a scientist proposes a theory which invalidates all current testing procedures and which is incompatible with any of the technological capacities of the age, he is likely to arouse the hostility of his colleagues. He will have stepped beyond the boundaries of reasonableness. There would not be a way of relating or checking his proposals within established areas of his science. Even if an idea were to prove correct a few decades later, we would still understand why it had been rejected and think such a rejection justified.

Resistance can come about for the wrong reasons (e.g., prejudices) as well as good reasons (e.g., failure to expand explanatory power). In either case, transitions are inhibitory with respect to new developments. Overall, resistance is judged as rational if all available factors and conditions are noted and a certain fairness is exercised in judging the new developments. This requires
openness and an amount of disinterestedness. Reflection, argument, and criticism have a role in evaluating new ideas.

But scientists are human, and this introduces a range of petty and patently irrational influences with respect to resistance to new ideas. The psychologist who suggested the hypothesis that intelligence might be genetically transmitted was greeted with hysteria by the members of his profession. He was literally threatened with death because of his hypothesis. Most social scientists showed a startling ignorance about what sort of things a hypothesis is, but they also showed an unwillingness to use the statistical methodologies they had accepted uncritically for many years.

Another example of passion, rather than reason, being a principal factor in scientific controversy is that of the reception of Velikovsky's *Worlds in Collision*. This book challenged astronomical views of the 50's. Velikovsky discusses such things as the temperature of Venus and the composition of its atmosphere in a manner at odds with orthodoxy. Velikovsky's method used historical descriptions, intuitive leaps, crossed interdisciplinary boundaries, and speculated in ways which irritated the dominant members of the profession. His hypothesis struck them as perverse.
Velikovsky's views were incredible to many of his peers. Their reaction to him was more like a group of astrologers than astronomers. They exercised pressure to keep his book from being published and reviewed, had distinguished members of the profession who showed tolerance fired, boycotted his publisher, and refused to read his work. There was little reason and much passion in this case.\textsuperscript{5}

The hostility of Velikovsky's colleagues grew out of his unorthodox theories and methods. The intolerance directed at his views was unjustified in that misrepresentations were employed. Sneers of intolerance died a slow death in the cases of Darwin and Freud also.

New practices, new ideas, and new technological developments pull current ideas into evaluation. Whether new ideas are resisted because of sound practices or because of prejudices, the resistance is activated because of the strangeness of new ideas with respect to orthodoxy. Not fitting with orthodoxy is the clue to their reception. If the new can be connected to orthodoxy by theory modification, conceptual revision, or simple reflection upon the familiar, then an assimilation will likely be judged as novel as well as an innovation. Otherwise, the newness will be considered an accident with no importance.

The work of scientists who are faced with potentially
novel ideas (i.e., developments which are not integrated with the orthodoxy yet suggest valuable extensions of the current practices) must make an evaluation which integrates the novel with orthodoxy. This is not unlike what the art critic attempts to do with novel works of art. A madman's locutions do not catch on as do those of a great poet. But many poets are considered mad. One of the critic's jobs is to sift through works and indicate why certain works are not the product of mere madness. The critic relates the works to our familiar conceptual schemes. A madman's writings fail to get a grip on us because they do not connect with a background of familiar ideas. They cannot teach us, guide us, or expand our frames of reference as works of true poets or dramatists. This ability to deepen our experience is the mark of the great artist and the great scientist.

Nietzsche's madman running through the streets yelling "God is dead!" is something like the Mexican curandero who suggested mushrooms as a guide for life. Both suggestions have a prima facie implausibility about them. Yet both became insightful commentaries dealing with some crucial human concerns. One, in the realm of philosophy, triggered novel theological speculations. The other, in the realm of pharmacology, stimulated the development of tranquilizers. In both cases, an unorthodox
idea with a *prima facie* implausibility gained a foothold because there was a willingness to tolerantly consider a potentially beneficial suggestion. But the ranges of tolerance and the flexibility in matters of interpretation require judgments that the orthodoxy does not clearly determine.

3. **Drawing the Line**

When scientists draw the line and recoil from certain suggestions, they think they recognize the destructive potential that can accompany change. Evaluations need to be made to help us decide about the importance of the changes (i.e., whether novel or not), and the type of adjustments required if the change is to be assimilated. But there needs to be some clarification of "drawing the line," "balking" and "running out of patience."

Besides giving us a general indication that resistance is being registered, these locutions are vague. I want to examine further some examples from Darwin. The purpose is to find in such examples a type of limitation which I believe will expose the special normative dimensions of cognitive/physical backgrounds.

Consider Darwin's reactions when he experienced the surface variety on his *Beagle* trip, especially the variety among the Galapagos finches (weak novelty). No doubt he grew excited. He entered the specimens of his
finds in his collection, and he invented new names for them. But the procedures for doing this were laid out fairly clearly for him by the disciplinary structures of zoology. The finches with strange beaks and unusual food habits (strong novelty) were a more serious matter. Perhaps he felt some uneasiness with the classification scheme, but this uneasiness did not spill over into other areas of zoology. The uneasiness was limited to puzzles concerning taxonomy. Whether he had done the proper thing by cataloging these birds as a variety of species rather than as a genus was typically the focus of this worry.

If he had encountered a third type of finch with an extraordinary circulatory system (extreme novelty), it would have raised all these taxonomic worries, but it would also have led to something even more disturbing. The existence of a group of birds resembling ordinary finches except that they possess a circulatory system that appears only in different animal classes begins to threaten the theory of gradual evolutionary change, the theory of natural selection, and the standards of expectancy which are developed within zoology. A bird with the circulatory system of a mammal would be an unexpected scion of the evolutionary tree. Such a bird would not be adapted to flight or to the tropical forest, as other birds which he resembles might be. His evolutionary
connection with reptiles would be severed. Such a zoological find would send tremors throughout the profession because it is not clear that such an animal could be a relative of other birds at all.

But consider for a moment an admittedly fanciful example. What would have been the effect had Darwin encountered a bird--this bird could be unexceptional physically--which began to deliver Shakespearean soliloquies. The bird's mouth moving slightly, the tongue darting in and out, and beautiful speeches from Hamlet pouring from him. This is where the zoologist would "draw the line" and begin to balk.

"The heat of the tropics can do strange things to people," he might say as he talked with his friends about the incident. "If I had not been so taken back I would have noticed whether he had a proper accent or not." The zoologists could joke about the experience because they had drawn the line. The bird playing Hamlet pushes against a limit beyond which a zoologist dare not go.

A zoologist reasonably refuses to consider the soliloquizing bird a veridical experience. If Darwin had begun to talk with the bird, he would begin to feel an uneasiness about himself. That night as he discussed the matter with his colleagues, he might begin to fall into a melancholy thinking of all the birds he had skewered and
stuffed. "How many Shakespearean scholars are among my collection!" he laments. The jungle might be alive with many literate tongues. It is no longer a forest teeming with zoological specimens but a vast arboreal stage for eloquent productions of classical literature.

In a word, there is a gamut of possibilities for developing unusual and perplexing experiences and situations. But there are implications that we dare not follow seriously. If we do, principles totter, clusters of concepts begin to slide. An epistemological earthquake, no less terrifying than the earth opening beneath our feet begins to occur. A madness sinks upon us.

A case in point is Wittgenstein's funny chair mentioned in his *Philosophical Investigations*.6 The chair has the disturbing characteristic of going in and out of sight. Wittgenstein's example presents not only a dilemma concerning the appropriateness of the concept "chair" to designate such an object. It does this of course. But chairs are material objects, have functions, and both of these characteristics are neither logically nor physically compatible with a "chair" going in and out of sight. A distress deeper than a mere linguistic disquietude is registering here.

Consider another example suggested in J. L. Austin's "Pretending."7 The setting is a party. A man
announces that he will pretend to be a hyena. "I am a very good actor," he says, "my performance will be so convincing that you may want to have me vaccinated." He falls upon his hands and knees and begins to bark and scamper about. This is an ordinary party situation and Austin wishes to demonstrate some dimensions of the concept of "pretending" in his article.

As Austin correctly observed, we would ordinarily stop saying and thinking that the man is pretending to be a hyena when he begins to actually bite people's legs. This is not pretending anymore, Austin argues. The man is doing something else—we are not quite sure what—but he is not pretending to be a hyena any longer.

This is an instructive example because Austin is showing the linguistic boundaries of the familiar concept "pretending." We balk at calling it "pretending" when a man begins to bite people. But it is still a mild sort of hesitation. There is still room here for a laugh if we know the man and know that he has stepped out of character. In fact, the example is highly entertaining as Austin gives it, and for this reason it fails to make the point I wish to make. It does not have the incipient dislocating potential that I am trying to capture. In short, it lacks a quality of epistemological terror which I believe accompanies violations of cognitive rules.
If the man, who started out pretending to be a hyena begins to bite off hunks of flesh and swallow them voraciously as a hungry dog might, then we feel a deeper sort of uneasiness. This is no longer a linguistic uneasiness. If the would-be actor vomited the bits of human flesh and began to lick them off the rug, just as a hyena might, then we would sense even more clearly the slide that is going on. We are shocked, repulsed, and frightened. We scream "Enough! You quit pretending long ago, and you were wrong to think you were pretending. But this is madness now." It is madness. What is to count as "human," "hyena," "pretending," "play," "real," and "appropriate" have all slipped away from this poor man. The transition is from playing or acting, to bad manners, and then to madness (i.e., from mere shock to terror). He has pulled down the scaffolding of his thought and thrashes pitifully among its remnants. This is the sort of terror from which the loosely-organized and overlapping structures of concepts and phenomena I have called the background protects us. Our standards for appropriateness, correctness, and plausibility fail to function in these cases of background transgression.
4. Art as a Prober of Limitations

Works of fiction are very helpful in developing a sense of a conceptual framework's limitations. This is because part of the convention of fiction is to adopt a "let's pretend that certain things are not the case" attitude. This is something like a scientific hypothesis, only it occurs within a different language game. We pretend that gravitation, death, and time are non-existent in a science fiction story and see what sort of plot can be woven. The inherent inconsistencies of the pretending are overlooked so that the story can develop. In a work of fiction the practical effects of pretendlings are restricted and played out within the story. That is, beliefs are framed within a non-threatening arena of activities.

There are degrees of subtlety in this "game" of pretending. Consider the bluntness of Franz Kafka's opening line in Metamorphosis, "As Gregor Samsa awoke one morning from a troubled dream, he found himself changed in his bed to some monstrous kind of vermin." Now someone might wish to pick at the point that humans do not turn into vermin, offsprings of humans are humans regardless of physical appearance, that the Samsas just thought that poor Gregor was a cockroach, etc. But this would be a very pedestrian way of reading his work of fiction. Human beings often do become transformed into things that
are much more terrifying than a giant cockroach. We call them "monsters," "brutes," or, if you are being clinical, "sadists." In such cases we focus upon behavior, not on physical appearance. Yet, Kafka's story can plausibly be read as an attempt to raise in a very agonizing fashion questions about the concept "human being." What do we mean by it? When should we feel obliged to apply it? All these questions lead inexorably to puzzles in morality and epistemology. Kafka is often disturbing because he draws out the consequences of overstepping the limits of our conceptual and physical backgrounds. He lays the jagged pieces of a fragmented world view at our feet.

Another book which is no less terrifying but much more humorous is Phillip Roth's The Breast. This is the story of a man who turns into a breast. He is not presented as a breast at the beginning of the story. He becomes a breast. The metamorphosis is from the ordinary to the grotesque. Many of the Kafka-type questions are more explicitly posed. The protagonist himself must face the question of whether he is a breast or a man.

His friends must have puzzled over the question too. "I am certain he is a man, you think it is a breast. Strange man! Strange breast! No doubt about that." They might give their reasons. For example, "It looks like a breast, feels like a breast, secretes like a breast, is
not ambulatory, etc." But a reply is easy to imagine. "He talks, remembers, feels a wide range of things such as fear, guilt, pleasure, doubt." A confusion begins to grow. "He once was a man, but I am not sure now."

There is no way to be sure about David Kepesh in this story. Empirical claims clash; language begins to give out. The breast is given the benefit of the doubt. Almost nonchalantly it is accepted as a man/breast by the hospital staff. No one wants to destroy it or see it suffer. A funeral home will undoubtedly be called when it is no longer alive. The terror which this situation holds potentially is kept at arm's length by the hospital staff. They ignore their bewilderment so that they can keep functioning. But this is a different sort of ignoring from ignoring a child's pain or a death which is not noticed or reacted to. Pain and death are real, they are what we expect to find in a hospital. Their presence may be uncomfortable, but they are part of a world of ill human beings. But a man/breast leads to another sort of worry. The world itself begins to be unstable.

This pervasive threat is confined to the hospital room of The Breast just as the giant cockroach is confined to his bedroom in Metamorphosis. Both are locked away from our ordinary world in much the way insane relatives used to be locked in the attic. Our language has these
protective "attics" too. This is where talk of irrationalities, absurdities, hallucinations, fantasies, and delusions occurs.

The protagonist of The Breast is allowed no such luxury. He is gripped by the terror which the practical consequences of the man/breast metamorphosis must bring. It is a terror much like that which first might have gripped Darwin had he come upon a soliloquizing bird. The zoologist, of course, could deny the veridical nature of his experience. It was aberrant, unconnected to the structure of his thought. Davis Kepech, however, cannot do this. His denial that he is a breast leads him into insanity. He can see the ordinary world slipping out from under him in massive chunks. But accepting that he is a breast is just as shattering. This leads to madness too. How is a man/breast supposed to act, think, be? These are the epistemic pivots upon which David squirms in spiritual agony.

In all these examples doubts have been raised in areas of our thinking about social conventions, material objects, and self-identity. These are some of the areas in which Wittgenstein says doubts do not ordinarily arise. When doubts do arise here, such as in war, art, and psychopathic disorders, we become alerted. We stand back, re-examine, or rethink the situation. But sometimes there
is no opportunity for this, or the doubt arises at so fundamental a level that we cannot cope with it. At such times we are numbed into acquiescence or catapulted into insanity (e.g., people ravaged by natural catastrophes or war).\(^1\) What we trusted, the matrix of concepts lying behind our world of activities, what has molded our beliefs and held like a scaffold beneath the ravages of ordinary living, begin to crumble beneath us.

5. **Peyote Wisdom**

Certain "gut" reactions seem both appropriate and characteristic of the rational man when he bumps against the struts which compose the background of our thinking. These responses are symptoms that rational limits have been touched. But nothing like deduction or induction seems to be occurring. Shock, perplexity, fear, and a cognitive blindness are all familiar responses to such radical conceptual variances. Yet these gut responses are a sophisticated level of reaction. They can be rationalized (i.e., given a logical form). But this is not the way they came to us. Paul Ziff describes a similar response in his article, "About Ungrammaticalness."\(^1\) Certain types of linguistic deviants cause us to "balk."

A more interesting reaction to such affronts is that of skepticism. In skeptical responses the refusal to implement the adjuster functions of novelty are very clear.
Skepticism is a type of response evoked not only upon having some experiences but also upon hearing the description of certain experiences. That is, the mere hearing of some tale provides enough basis for us to "draw the line."

Darwin would have been skeptical, and reasonably so, about his experience with a soliloquizing bird. If he had taken the experience with the bird seriously, his world would have taken on a much different shape. He would be like a user of psychedelic drugs who takes his hallucinations seriously. Carlos Castañeda seems to be doing just this sort of thing in his book, The Teachings of Don Juan, about a Mexican Indian named Don Juan.13

Castañeda's book provides an interesting example which I wish to discuss briefly because the experiences he reports purport to be true. The stories are a very conscious effort to call into doubt many preconceptions about ordinary life. There is also an attempt to disguise the consequences which I believe follow when a cognitive/physical background is manipulated cavalierly.

At one point, Don Juan and Castañeda believe that a man has turned into a crow and back into a man.14 They believe this happened, but not in the sense that Darwin might have believed he heard a bird quoting Hamlet. Darwin would have admitted he had had such an experience as this,
but he recognized it to be a hallucination probably precipitated by tropical heat. Carlos Castañeda believes and wishes to persuade others that the man-crow-man metamorphosis is something with an important reality. The man-crow-man transition is not only connected with our ordinary world and in that sense genuine for Castañeda, it is also supposed to reveal to us deep truths about our world. That is, the knowledge produced by this man-crow-man change reveals possibilities and characteristics about the familiar world we had not known or expected. In Castañeda's work the giant cockroach of Kafka and the man/breast of Roth are no longer confined to the world of fiction. They are realities and thought to contain revelations of great truth. Since Don Juan and Castañeda are serious about the genuineness of the man-crow-man change, a variety of practical consequences follow. E.g., they are gripped by a frightening opaqueness about what is and what is not happening in many ordinary situations.\(^{15}\) When they can draw an inference, all types of inferences are thrown into confusion.\(^{16}\) An outrageous perversity creeps into such terms as "reason," "wisdom," "reality," and "truth." Whole dimensions of human life begin to slip away. It is as though suffering, death, and hunger are no longer functioning concepts.\(^{17}\)

In a word, what we are presented with in these
books of Castaneda is a glorified insanity. Too many concepts central to human life and activity are undermined. Too many deviancies are considered seriously. The result is insanity. Perhaps it is an ambulatory, vaguely quaint sort of insanity, but an insanity nevertheless. Skepticism is the natural and appropriate reaction to the story of the man-crow-man metamorphosis.

It is not the small number of times we have seen and heard of soliloquizing birds or men turning into crows that compels us to resist and reject such things. It is the deep and pervasive consequences which follow the acceptance of such things as though they were connected with our ordinary world. To believe in soliloquizing birds and men turning into crows pulls us toward doubting things we would ordinarily consider certain. As Wittgenstein wrote in On Certainty, "Here a doubt would drag everything with it and plunge us into chaos." The wisdom of the peyote button encourages precisely this destructive sort of doubt.

6. Conceptual Limits

Another limitation which is associated with novelty is of a straightforward linguistic sort. Certain concepts themselves seem to preclude the application of "novelty" to them. That is, something about ideas themselves precludes the sorts of changes which novelty entails.
For example, we would not say that each moment of a person's life is novel except in the way those early philosophers of metaphysical novelty might have meant it. They held that each moment is passing, becoming a future. We grow and change each moment of our life. In this sense novelty touches each moment with a "tang of newness." But this is to elevate newness to novelty, and some of the reasons this assumption is best avoided have already been discussed. Of course these philosophers were after more important metaphysical views than these few remarks do justice to, but this is what Herbert Mead and C. F. S. Shiller would have had in mind — by saying that each person has a novel life.

A man could not have a life of extreme changes because such a life would leave no time for living. There would be only the changes and adjustments. Such a person, in the continuous grips of this ceaseless changing, would be like a compulsive neurotic who cannot walk through his own bedroom without a multitude of doubts and fears pre-occupying him. A man proceeding with extreme caution through a booby-trapped jungle can only maintain this constant alertness for short periods. Such intensive deliberations would soon exhaust anyone. So we hesitate to attribute novelty in this sense to life. There is an overall structure to life, and strong and extreme novelities
especially threaten that structure's reliability.

This does not mean that we cannot come to see that life is different from the way we thought it was. Life often changes in this sense. But living presupposes the continuities and regularities that already have been discussed above. Because novelty requires that habits be abandoned, orthodoxies replaced, and rigorous doubting of accepted certainties, it cannot be lived continuously.

Someone might ask if Picasso's many periods do not represent the sort of variety that we would expect from a man living an extremely novel life. Are his works not testimony to a sort of constant changing that would justify us calling his life style novel? Perhaps this is true of Picasso, but it would be well to remember that there are common themes running throughout the many periods of his art work. There were overlaps of periods too. But more important there is Picasso's preoccupation with certain human feelings, with human anguish. And Picasso appeared to intend the changes. He decided to add more hues of blue, take liberties with linear forms, etc. There is an overall purposiveness and control in his work. If one could imagine Picasso all his life constantly changing from one period to another, we would, it appears, have a version of a novel life.
6. Backgrounds as Criterial

I began this chapter by describing limitations to the introduction of novelty due to the resistance of existing cognitive/physical backgrounds. Backgrounds inhibit conceptual variants. It is not that a variant cannot be conceived. This has been done repeatedly in art and science. But the adoption of some variants is resisted by the reasonable man. Norms and standards of a very general and important type have their basis in the background of inherited concepts. The deracinating nature of some beliefs is exposed if they threaten to drag apart such backgrounds. To accept something seriously such as the man-crow-man change, or the soliloquizing birds, as veridical cuts us loose from rationality. Things that once seemed indubitable guides through our world prove to be meaningless. Yardsticks and standards become elastic. Men change to crows, insects quote Shakespeare, men feel no passions, people do not have parents, etc. An epistemological earthquake is unleashed, and there is nothing to which one can cling. The reasonable man holds back from such beliefs.

The cognitive/physical background, which is traduced in these cases, is often thought of as inherited, and this is a cogent observation. We are the inheritors of these standards. We grow into them. They are bequeathed
to us by our culture. The scientist, artist, philosopher, each in his own way, test, describe, try to understand and expand this cognitive/physical inheritance. This is one of the jobs of creative thinkers. But they work within the very frameworks they expand. This "taken for granted" world is the source of the presuppositions behind their probing, doubting, testing, and adjusting.

A reservoir of abilities is developed in us as we absorb this inheritance. The categories with which we make fundamental distinctions are part of it. Standards which guide us in value decisions are also its contributions. A vast repertory of responses appropriate for various occasions from which we can select to carry on the day-to-day living are part of the background. This is why the metaphor of a scaffold is so appropriate. A great deal of what we think and do depends upon such a background.

Novelty can gently or starkly probe aspects of the background. Through novelty we are led to question and revise these "taken for granted" aspects of experience. For this reason novelty within conceptual schemes may be unsettling. This is its destructive potential. The disequilibrium caused by extreme and strong novelty is indicative of friction among our conventions. But resorting to novel ideas is at least an attempt to deal with a
problematic situation. This chapter has tried to spell out the nature of the threats novelty can pose as well as some of the protective measures which are activated as unusualness, unexpectedness, and newness within the intellectual enterprise arise. Hesitancy, incredulity, rejection, balking, and reflection are all responses to this affront. There is also a particular sort of epistemological terror associated with some of these novelties.

In the extreme and bizarre cases of novelty, a reluctance to go along arises. Beliefs to which we are unwilling to commit ourselves get a grip. They are beliefs which undermined the cohesiveness of cognitive/physical backgrounds. At these times the general cognitive/physical background provides a basis for shifting out and deciding which beliefs and experiences to take seriously.

Are we to conclude that doubt, conceptual variants, daring speculations are to be avoided? Is this chapter an attempt to protect a deep epistemological orthodoxy? Is a sterile conservatism meant to shield from critical assaults some bedrock fundamental epistemic structures? None of these is my intention. In cases where the limits of novelty are explored, I am trying to point out the types of resistance which are mobilized to preserve a world in which truth and falsity, correctness and incorrectness,
confirmation and disconfirmation are possible. This is the sort of world in which we can have certainty and have an appeal to reason. The limitations to innovation must be recognized, because without them beliefs become plausible which radiate extensively throughout our life. They turn comfortable certainty into vague indecision. The foundations of our thought begin to give way. Assaults and changes among the background concepts can be rational because there are rational grounds for suspicion and such suspicions can lead to reform of the matrices of concepts which form our representations of the world. The nature of these rational grounds is the topic of the next chapter.
CHAPTER IV - FOOTNOTES


2 Even philosophers who were preoccupied with novel change, such as Samuel Alexander, respected the idea of a background. The emergent philosophers wrote at times as though what was recognized as novel sprang into being in a fashion essentially unconnected with the existing body of conceptions, yet their writings continually belie such an interpretation. In the first place, the background of categories and fundamentals of thought and existence were unaffected by the emergent novelties. No matter how shattering the emergents were thought to be, they were not sufficiently profound to affect the *a priori* features of reality.


4 The Act of Creation, pp. 239-240.


11. Thucydides, Peloponnesian War, Sir Richard Livingston, ed. (Oxford University Press), bk. 3, sections 82-83.


15. A Separate Reality (Pocket Book, 1972), pp. 31-34.

16. Ibid., p. 9.

17. Ibid., pp. 20-21, 80.


CHAPTER V

NOVELTY AND RATIONALITY

It is not difficult to see that the discussion of the previous chapters pointed toward an implicit relationship between the concept of novelty and the concept of rationality. It was understood all along that some sort of intellectual effort (i.e., reasoning and evaluating) is involved in the recognition and assimilation of novel developments. Novelty and rationality touch when the verdictive or adjuster signaling occurs. But philosophy, both ancient and modern, has been ambivalent toward the importance of novel ideas. Many philosophers regard strong and extreme novelty as examples of irrationality and therefore, as things to be avoided. Even philosophers who sang paeans to novelty, such as Henri Bergson, considered it irrational.¹ And Bergson is certainly not the exception. In many ways he represents a culmination of traditional thought.

In this chapter I will give brief sketches from the history of philosophy which point to the tendency to view strong and extreme novelty as irrational. I will argue that many of the views of novelty as irrational spring from a conception of rationality according to which rationality
deals with the immutable. If my analysis of novelty in terms of verdictive and adjuster function is cogent, then no conception of rationality as dealing with the immutable is seriously askew. My discussion, as well as an examination of the experiences of scientists and artists, shows that rationality and novelty are drawn toward each other rather than driven apart. The last passages of this chapter spells out a more adequate conception of rationality by considering grades of rationality. If there is a relationship between rationality and the recognition, the assimilation and production of novelty, we may see more clearly the error of associating novelty with ir-rationality. Perhaps as a result of this discussion we will see the concept of rationality in a different light.

1. Rationality and the Immutable

Plato's warning against the madness of poets has already been mentioned. For a thinker who considered a communion with immutable ideas the triumph of philosophy, such a warning appears natural. Novelty leads to and forces upon us change, and change in a philosophical system such as Plato's will be suspect. The philosopher who considers immutability the most essential characteristic of rational perfection is not likely to find wisdom in those who constantly invoke change. It is not surprising
that Plato considers those committed to change not only "chained" but also most likely to lead others into "chains."

The immutable nature of rational truth carries over into Aristotle's philosophy. The ideas of fixed species and of the harmony of the heavenly spheres are examples of this view of reality as fundamentally stable and unchanging. And if reality is immutable, so is truth.²

For the seventeenth century philosophers, such as Spinoza, truth and certainty result from a deductive process explicitly conceived along the lines of geometry. All relations are internal. The system within which all parts dovetail forms an a priori static ideal. Any apparent duality, such as Mind-Body or God-Nature, is taken up into this overall system. Spinoza's deductive truth merges with the idea of necessity. The result is a determinism which makes novel change seem inconceivable. An event which is not a rearrangement of already existing things is not possible. The a priori ideal, the immutable God cannot undergo transformations which are not mere rearrangements. The deductive chains have a necessity which cannot be short-circuited by qualitative uniqueness.³

Kant's philosophy is also an attempt to locate rationality in a fixed structure. He developed an elaborate system of concepts and categories to which all
experience must necessarily conform. Variety could slip into this conception of human knowledge, but changes were possible only if they came within the a priori structures. Changes which could lead to new a priori structures were not possible. A limit to novel change was imposed by the immutable structures of thought. These structures were also the basis for rationality.⁴

The Romantics seized upon Kant's insights concerning the limits of rationality. Hegel and Schelling led the rebellion. Even though for these thinkers the concept of rationality was still associated with immutable structures of thought, their conception of knowledge was broadened. Intuition and immediate knowledge of change became as important in human life as a logical proof of immutability. Philosophical systems which claimed to encompass all actual and possible change were soon under attack. Time and change, which had for so long been signs of weakness and instability in philosophy, took on a new importance.⁵

When early twentieth century philosophers, such as Bergson, followed the Romantic tradition and praised the virtues of intuition, they were accused of opening the sluice gates of irrationality. Intuition, for Bergson, was a way of knowing that was not limited, as was the intellect, by rules of logic, unchanging structures, and truncated ideas of change. Intuition, although not subject
to these limitations, nevertheless produced knowledge.6

Bergson elaborated the earlier Romantic theme that change is both a fact and a virtue. For Bergson, a man could be intelligent yet not wise if he ignored the discontinuities in and irreversible flow of reality. Such a man only knows half the truth, and at times Bergson suggests that it is the least important half.7

This long philosophical tradition, which distinguishes intuitions and feelings from reason, and associates rationality with logical rules, is still alive in some contemporary philosophy. Of course, it is difficult if not impossible nowadays to see rationality as the pursuit of an immutable ideal.8 Instead, the idea of the rational is more likely to be conceived as relative to an epoch, a context, or a paradigm.9 But a conviction still lingers that a sharp contrast can be drawn between unstructured, non-methodical thinking (i.e., the irrational), and precise, clear-cut reasoning (i.e., the rational). In some instances contemporary philosophers bite the bullet and sing a low key paean to irrationality.10

T. S. Kuhn, Karl Popper, Hans Reichenbach, and Richard Braithwaits have considerably exacerbated the tension between "creative thinking" and "rationality" in the area of science by claiming that there is no "logic of discovery." They mean by such claims that the role of
creativity in science does not fit the deductive-nomological model of science. Systematicity epitomizes rationality in this conception of science. When novel ideas compel a scientist to make fundamental changes among the concepts of his discipline, the compulsion cannot be construed as "logical" according to these thinkers.

In the case of Kuhn, for example, we are taught that during the process of scientific theory change the traditional idea of rationality (i.e., following logical rules), has very little place.\textsuperscript{11} This is why there is no "logic" of discovery. As a scientific theory changes, the rules of reasoning are modified. What will count as logical and rational also undergo transformation. To be following rules through such a fundamental theory change would be as impossible as taking off your shoes while standing in them. Such fundamental theory changes come upon a scientist, Kuhn says, in a manner similar to a political conversion or a Gestalt switch. That is, they are sudden and apparently unmediated apprehensions.\textsuperscript{12}

Kuhn, then, is an example of a contemporary philosopher who does not reconcile the idea of rationality with the idea of revolutionary changes (extreme novelty).\textsuperscript{13} In general, thinkers such as Kuhn have confused "rationality" with the idea of following rules of a specific system. This mistake leads them to miss the sense of
"rational" which can be appropriately applied to the process of theory changes and the process of producing novelties.

2. Rationality as Following Rules

Behind the philosophical views concerning novel insights and changes in scientific theory there lies a picture of rationality which I now wish to draw out. Rationality is conceived as the activity of methodically following rules and/or making deductions or inductions. The rational man is the one who proceeds in this fashion.

A brief consideration of the distinction between a "rational person" and a "rational activity" will show, I believe, that following rules, even the rules of deduction, is not nearly sufficient to make a man rational. The misconceptions that a rational person is one who follows rules methodically is readily exposed. While an activity which is rational might well be one which is governed by a structure of rules, we know that a madman can follow rules. Indeed, the predictability and boring repetitiveness of the behavior of the insane is testimony to the structured nature of their activity. We balk at calling the behavior of a madman, no matter how rule-governed it may appear, rational. Taking other steps with regard to the rules (i.e., whether they are appropriate for the
task or situation, need modifying) brings in considerations of the person's rationality. 14

The idea of rational activity does raise the question of competence, however. And competence seems to introduce the question of intelligence. But I can ask whether a person is able to follow certain procedures without introducing questions of rationality. So neither following rules nor competence in following rules is sufficient to characterize our ordinary idea of rationality.

Another way of showing the difference between questions of rationality and questions of following rules is to consider the fact that a rational person can make mistakes (i.e., fail to follow a rule) because of fatigue, insufficient data, or limited resources. Any of these things might prevent him from performing a rational activity, but we would nevertheless consider the person a rational person. A scientist or artist can make mistakes about any number of things (e.g., grammar, syntax, calculation, observation), and still be considered a "wise" man. That is, we realize that he is capable of guiding us to a deeper understanding of experience.

Poets, for example, deliberately abuse language. They stretch it and twist it in order to illuminate the shadowy regions of experience. But this sort of departure
from linguistic expectations and conventions notwithstanding, the poet can be wise and have a remarkably penetrating intellect. Their non-conformity is one of the sources of the poet's contribution to our cultural progress. In the same way, a creative scientist can depart from stereotype methods and conceptions to lead us to a more complete understanding of various aspects of our world. So even though a rational action may be one which is systematic and governed by criteria of coherence, consistency, and entailment procedures, violating these very rules may be the rational thing to do in order to accomplish the goal of the particular enterprise.

The recognition that radical departure from conventions and expectations may possess the virtue of deepening understanding helps explain why there has been a change of attitude with regard to the idea of "irrationality." Plato, Spinoza, and Kant were opposed to irrationality. Knowledge was thought to be threatened and humanity little served by the irrational. The Romantics, on the other hand, such as Nietzsche and Bergson, conceived of the irrational as a way of knowing. And contemporary philosophers, such as Paul Feyerabend, think of irrationality as an escape from status and as a source of certain kinds of scientific development. Although these philosophers disagree about the merits of the irrational,
they conceive of irrationality in much the same way. They formulate their idea of the irrational largely in opposition to their idea of the rational (i.e., the immutable which is the goal of truth).

The rational, for them, is thought to have the sequential consistency of a deductive or inductive argument. Since poets or scientists inspired by intuitions, following a hunch, or taking a chance do not seem to operate in the sequential fashion associated with rationality, these poets and scientists are considered irrational. It seems an unavoidable, yet paradoxical, conclusion that scientists and artists who are responsible for creative and significant changes are behaving irrationally. Yet the importance to science and art of such "irrationality" (i.e., creativity) is indubitable. Such approaches to art and science seem worth encouraging. So the "irrational" gradually has lost its pejorative overtones through the centuries from Plato to Feyerabend. But rationality, as the discernment and articulations of an unchanging and coherent system, is still a common idea implicit in this conception of irrationality.

Kuhn and Feyerabend have seen that the idea of the immutable is an illusion, and a rather fragile one at that. In many ways, they have carried the Romantic rebellion to the philosophy of science. But Kuhn and Feyerabend, like
many Romantics,\textsuperscript{15} do not see that there is still a time and a place for one to evaluate rationally and judge the pervasive, accepted rules themselves. They fail to see that the decisions to adopt and create new orthodoxy and refashion old or current orthodoxy has a basis in rationality. Such rational production and appraisal is not so much a result of perplexities as a creator of perplexities.\textsuperscript{16} The production and assimilation of these processes can be faulty or cogent, novel or faddish, degenerative or progressive. But more to the point, the innovations can be rational or irrational. The fact that such far-reaching decisions fit no deductive model and that they go beyond unaccepted context does not mean that they are irrational.

There are times when it is "rational" to be irrational in the sense that Plato and Kuhn would attach to "irrational." This paradoxical statement is meant to describe thinkers, such as Nietzsche or Bergson, who see the limitations that older views of rationality carry with them. They reject such a burden of cognitive constraints. In doing so they say, "If this be rationality, I must be irrational. It is the only thing left for me as a man." And having evaluated in a very discursive manner the older idea of rationality, they proceed to consider themselves as irrational.
What Nietzsche and Bergson recognized was that a time comes when the guidelines and rules that are accepted and being followed by one's peers must be reassessed. New rules may be needed. What they failed to see was that recognizing these situations in itself requires a dimension of rationality. A great deal of skill and competence lies behind such recognitions. I have shown that such crucial decisions are present in many familiar intellectual activities. The examples of Darwin are illustrations of a natural scientist applying rules, altering rules, and initiating new rules. Darwin is also required to judge when a rule revision is unnecessary. He does all of these things. Skills, intelligence, and sagacity are evident throughout his activities. At no point does he appear to be behaving irrationally, and yet he is not being governed by a clear set of rules either.

The rational and honest scientist, however, does not proceed pointlessly. He evaluates and discards parts of theories and assumptions when he is called upon to do so by the evidence. His research programs are chosen. He has control over their direction. He must decide on the course of his research and on which aspects of his research are significant. He decides on when to apply the rules, when to modify them, and what the rules are to be. Such decisions are neither straightforward deductions
nor inductions, but more extensive evaluative judgments which come about through reflection upon goals, methods, standards, evidence, and possibilities. Regardless of their fundamental nature, these decisions and judgments can still be assessed as rational or irrational. To decide which is the case, we need to be familiar with the goals, theories, and methodologies of the science. Given this sort of background, we can make some evaluation of the course that is finally chosen.

Thus, when a person reflects upon an experience and recognizes that it brings out features of the world not noticed or known before, he may be forced to use non-methodical means to communicate this to others. Rather than following an accepted methodology, he may use metaphor, comparison, contrast, or exaggeration. Although such a procedure may move him outside the guidelines of his orthodoxy, he may still be accomplishing something which requires a highly sophisticated mind. In other words, he seeks to expand the scope of rational comprehension. One may say that rationality is capable of reaching new levels and that the higher the degree of novelty to be dealt with, the higher the degree of rationality is required.
3. Weak Novelty--Ordinary Rationality

In cases of weak novelty we found that accepted rules were applied to a great variety of cases. So "chair," a class concept, can be applied without difficulty to a folding chair, or a cafeteria chair. The idea of rationality as following rules catches on at this level. A wide range of selections and applications is possible in using "chair." However, classification is not a straightforward semantic activity. Some imagination and creativity are needed in order to classify, and certain conventions must be followed for this to be done. The open texture of many concepts makes unlikely a neat fit between the rules and situations of their application.

Knowing how to select instances of concepts and apply concepts in various situations might be taken as the lower levels of rationality. The symbol, the tool, and their sophisticated employment are present. Sorting and arranging in this basic fashion are very ordinary forms of reasoning. Yet such activity, although a minimum requirement of rationality, is incomplete as a characterization of rationality. Using "chair" requires being able to acquire a skill or group of skills and to apply them successfully. This marks off higher animals from others. And at this level "rational" and "intelligent" begin to overlap. However, there is no question of changing rules or evaluating
rules when classification is the objective. Classification is rather the application of rules.

Under "Weak Novelty" in Chapter II, the example of Darwin was cited. Although he was assaulted and thrilled by an unsuspected variety in nature, he kept on classifying, he kept looking, and he reeled with bafflement created by this variety. Facts, which fitted only eccentrically with his expectations and experiences, were accumulating. Darwin's reaction was to register his bewilderment but at the same time plunge onward. The activity of classifying was exposing the limitations of the scheme of classification. Making an effort to follow the rules led to the realization that if they are to deal effectively with the variety the rules must be changed. These decisions about the appropriateness of applying a taxonomic system are examples of the verdictive function of the concept of novelty. Decisions concerning revisions of the system that are in order are an example of the adjuster signaling function of the concept of novelty.

I have indicated that something like following rules has been the core of the concept of rationality for a great period of Western civilization. And perhaps this gives ordinary rationality (i.e., following a set of rules) a dignity it might otherwise lack. Classifying, however, can easily be thought of as a limited and stilted
activity. The grand nature of creative intuitions and inspirational jumps of knowledge often overshadow the prosaic spade work of science. This accolade seems unfair because the advancement of human knowledge owes much to the careful observer and classifier who, as we are sometimes inclined to say, "merely" follows rules.

Recall for a moment Wittgenstein's discussion of "knowing how to go on" in the Philosophical Investigations and Remarks Concerning the Foundations of Mathematics. His discussion of what following rules consists in, or does not consist in, reveals that the rules do not explicitly set out the scope for all their possible applications. Such vagueness about the application of rules leaves the possibility for a broad range of variants to enter during their application. Wittgenstein stressed that there was a decision-making role present throughout the task of following a seemingly obvious formula such as counting.

If, for example, someone is asked to call off the natural numbers in order and he calls out the following sequence "97-98-99-100-102-104-106," we realize that there has been a change. By our conventions this person is not proceeding in the same way after 100 as he was before 100. We are tempted to say that counting off by ones just is going on in a certain way, observing a particular
convention. Even though his error may be obvious to us, the person counting may be following the rule as he interprets it.

A deviation from conventionally established practices, such as the example of deviant counting just described, would appear surprising. This would be especially so if the person shared with his linguistic community a form of life, has learned a similar set of rules, has a similar background of purposes. If all of these things are true of the person and he still counts in this peculiar fashion, our surprise would turn to perplexity. We might ask an explanation of the aberrant behavior. We would have something like the case of a competent zoologist who insisted upon establishing a new family or order when he saw the multi-colored bird (weak novelty) rather than classifying the bird as a species or genus. An even more extreme case would be someone's reading T. S. Eliot's line "April is the cruelest month..." and then going on a search of history books to see if this statement is true. This would be failing to go on in the correct way.

In the case of the person who does not count in the expected way, we might suspect that he does not yet grasp the correct way to count. We thought he knew, but something has gone wrong. Things need to be explained to him.
He may have made a certain judgment about the rules when he reached 100, or he may not. At any rate, here is a case of eccentric behavior with which we must deal.

We may regard the student's failure to be the result of misunderstanding a rule. He thought that after 100 he must double the additions. The formula's meaning would be explained to him, hoping that he will see the source of his error. But if he understands the explanations and still claims that there is nothing incorrect or strange about counting in this fashion, we begin to search for words to describe him. Surely, "irrationality" is appropriate in this case.21

If following the rules were sufficient to make someone rational, then this person would be so. And he would be rational even though he was outside our conventions. Being rational in this instance would come to something like being competent to follow certain procedures. There is no question in this example of being able to follow the rules of the system. He is following them. What has occurred is the result of interpreting the rules in a way we find eccentric. If Wittgenstein's analysis is correct about the nature of following rules in this case, there was a process of interpretation and deliberation present throughout the counting. And the eccentric inferences the counter makes do not reflect upon
his competence. Yet it is counter-intuitive to call this person "rational." One of the reasons for this is that to make a judgment about the rationality of someone goes beyond theory or framework. We could say to the person in our example such things as the following: "We understand why you are counting like this. You think that perhaps having been taught that certain divisions of the natural numbers are significant, that this is the way to proceed. You think that 100 is a significant place among the natural numbers and that changing the procedure of counting is called for at this place. We realize that it is possible to go on in this way, but you lose the point of counting if you do." And we could show him the consequences of his decision, the sort of mathematical chaos that is produced by progressing in such a manner. This ability to apprehend the point, to see that the novelty of encountering 100 as a number in the series does not call for a change of procedure is involved with our judgment of his rationality. The eccentric way of counting does not strike us as novel. Counting 98-99-102-104 is far too destructive for that. It is unusual, but very counterproductive. Reaching 100 is "too weak" to call for an adjustment in procedure, for changing the way which one is going on. The rationality and irrationality in this case does not have a basis in being able to go on (i.e., follow
rules) but in being able to go on in a way which recognizes the point of the activity. The relationship between the formula, its conventional application, and the context are all apprehended by the rational person. So although, as Wittgenstein claims, we may be unable to give sufficient reasons within our logistic system to compel a person to draw the inferences we have in mind, a judgment concerning his rationality can be made in terms of the background of the activity of counting. Beneath the habits and unreflective appearance of weak novelty, there are decisions of the verdictive and adjuster sorts being made.

The choice for Darwin, as discussed in "Weak Novelty," was that between going on in the same way or becoming innovative. This does not call for a deduction, but is more like sizing up the situation or seeing that something new needs to be done. Darwin would not have been as rational if he had failed to see the implications for his taxonomic system that resulted from finding the variety of finches. Making a decision to revise the rules goes beyond the question of competence, for there may be no question at all as to his qualification as a zoologist.

The situation facing Darwin is like a paradox in which S and -S seem to hold. The birds with the thin
beaks can go among the Caimarhynchus or among the Pinaroloxias. The color and general anatomy justify the former; the food habits and beak justify the latter. The zoologist pauses naturally at this bewildering situation. He recognizes that something is not consonant with the ordinary way of going on. Only a critical decision about the adequacy and correctness of the classification system can get him through this difficulty.

4. **Strong Novelty—Critical Rationality**

Darwin's experiences described under "Strong Novelty" are examples of grappling with these sorts of bafflement. Darwin was drawn toward a change of fundamental concepts as words and classification systems began to fail him. The relationships among ideas also began to take on new shapes. He knew that many crucial judgments had to be made concerning the system within which he was working, and he proceeded to look for some clues as to the direction which these judgments should take. He was thrown into a puzzlement, but not the sort of puzzlement which can be pacified by deductions or inductions. Reflection about basic concepts and sizing up of received conventions were in order.

Wittgenstein pointed out that defining the correct application of the rules is not a function of the rules themselves. If it were, then we only push the problem
back a step. We then need the definition for applying the definitions of the rules. In the cases of empirical and conceptual eccentricity there is a call to make decisions about the correct application of the rules. As we have seen, in some cases, failing to go on in the appropriate way leads some to suspect a strange insanity. I suggest that "strange irrationality" would be more accurate to describe this situation. Of course, insane people often behave irrationally, so there is an overlap of these concepts. As Wittgenstein suggests, we would not call the boy who could calculate well except for the strange deviancy noted above "insane." He is not de-ranged generally, just in this one area. This is what makes his blindness to the appropriate way to proceed hard to understand. He might have a brain tumor; perhaps it is a congenital brain abnormality. These things would help us understand why he is this way. There is a craziness in these cases, but it is not a distortion of reality in the sense of a hallucination or delusion. The craziness is due to the irrationality of behavior that results from failure to apprehend similarities and differences to see the point.

The limits of the idea of rationality where immutability and/or fixed principles are central becomes more obvious. In Darwin's case of encountering a strong
novelty the rational way to go on calls for reconsidering the rules. Some assessment of rules is necessary, and only a sophisticated reasoner can bring it off. Here we may speak of superior rationality, rationality calling for effective reappraisal. When superior rationality is carried off over a broad range of concepts, as was the case with Darwin, then something like "wisdom" is the result.

5. Extreme Novelty--Wisdom

When we are showing broad new ways of seeing familiar things, we are in the presence of wisdom. We are "compelled" to adopt innovative perspectives because we realize that they are more accurate, fit the facts better, or satisfy our goals more effectively than the perspectives adhered to up to now. This is the sense in which extreme novelty calls forth and makes a demand on wisdom. We feel the pull away from the conventional toward the original.

Coming to think and speak of something in new ways can mean that we ask new sorts of questions about it. Some of these questions might have been unintelligible before. But after the occurrence and assimilation of extreme novelty, vocabularies are stretched and changed. Stephen Toulmin has a good example of hitting upon a fruitful reassessment of the familiar in his The Philosophy
of Science. When physicists suggested that light "travels" in straight lines, they introduced the idea of light traveling. This was a novel way of thinking about light.

Undoubtedly, many phenomena may suggest this way of thinking about light (e.g., shadows appearing on the wall when a light is turned on). Nevertheless, although nothing empirically new seems to be added, our attention is directed to unnoticed features of light. The decision to conceive of light in this fashion is neither deductive nor inductive. We see the sagacity and significance of the new way of thinking about light even before its scientific usefulness becomes manifest. Similarly, the introduction of "electrons" into the theory of electricity led to novel ways of thinking about electrical phenomena. Lightning, for example, could be explained in a fashion more rational than talk of angry gods or imbalanced fluids.

In cases of extreme novelty, where groups of concepts are involved, large areas of the intellectual landscape may be revised, questioned, recreated, and redescribed. The example of Darwin, who was forced toward a revision of biological theories because he encountered an unsuspected variety of animals, illustrates how strong novelty can result in an important intellectual revision.
Again, "going on" for the wise man is not perceiving that a slight revision is necessary, but recognizing that a major revision is called for. Extreme novelty involves us in a disturbing yet exciting, because promising, endeavor.

Darwin, who dealt intelligently with extreme novelty, introduced into his discipline new insights and new wisdom. These conceptual revisions were supported and justified by the novel facts he so patiently collected. His theory of natural selection pulled together those facts in ways which even his opponents could be expected to accept. It was no longer plausible to stick to the theological explanation of such facts. Many of his contemporaries came to recognize and understand the previously unsuspected relationships in the animal and vegetable kingdoms.

Newton, Pasteur, Freud, Einstein, Van Gogh, and many other thinkers and creators exhibit in their works a kind of rationality which is akin to "wisdom" rather than to logicality or deductive reasoning. They are responsible for grand intellectual strides made in the modern age. The abilities of wise men are broader and more complex than those of the merely competent or intelligent. They have taught us how to see the world, outer and inner, in new ways.
Imagination and insight are required for wisdom. Without them the breaking of linguistic and conceptual boundaries would be merely arbitrary. A novel way of thinking does not become established because it is neater, simpler, more consistent, although these features may certainly be relevant. It becomes established because it helps us to be more rational in the sense of being "wise" or "sagacious." It removes our perplexities and opens our horizons.

The wise man develops the fertility inherent in novel and familiar settings. Facts which seemed arbitrary to the young Darwin take on a new meaning as his theory develops. A similar transition can be seen in the history of astronomy from Kepler to Newton. Newton was able to say why certain facts were as they were. Kepler was satisfied with saying that they were a certain way, with offering a more accurate description. Newton's theory enabled scientists to relate facts and events not suspected of being related, such as the tides, and falling apples, and moving heavenly bodies.

These wise men "go on" in a novel way which bears out the old saying that "Wisdom consists not so much in knowing what to do, as in knowing what to do next." Knowing what to do next is particularly crucial during periods of intellectual change when the guides of the
orthodoxy begin to fail. Wisdom is required at these times because the relationships between the practices, forms of life, and orthodoxies get "out of joint." "Knowing how to go on" becomes more difficult. The permutations clash more obviously with an orthodoxy, and only in retrospect does it become clear that rationality is on the side of the innovator.

There is a telling scene in Bertold Brecht's play *Galileo* in which Galileo is trying to persuade the young Medici to look through a telescope. Two scholars chatter in opposition to the suggestion. They reject what Galileo is doing, claiming that it is not astronomy. Even if one saw what Galileo claims they will see through the telescope, it would not be important because it is not the way to do astronomy. Galileo was not going on as they thought he should. The young son of Galileo walks out in disgust, muttering, "These people are so stupid!" His reaction was more rational than that of the court intellectuals.

Consider a more recent example of "going on in the correct way." Some philosophers criticized Wittgenstein's work as not being philosophy. Careful analysis of word usage was not what a philosopher was supposed to do, they argued. Wittgenstein's reply was that what he was doing was a "legitimate heir" to philosophers of the past. He
was going on with philosophy but in an unorthodox manner. It is now recognized that Wittgenstein was developing philosophy in a new direction. He, just as Galileo, pointed in a direction which, when explored, turned out to be revealing and fruitful.

Darwin received a great deal of criticism from his contemporaries. Some attacked him as not doing biology correctly. They charged that either his conclusions were invalid or that his methods and facts were incorrect, leading to distortions and unjustified revisions. They were unwilling to test new ideas, to hear out new theories. But rational behavior calls for openness to change. A creative openness is what Darwin appealed to after he stated his case along empirical grounds. He realized that it was not the facts alone which would lure people away from theological views in science. The orthodoxy can blind and bewitch. But he was certain that the openness and forthrightness of scientific impartiality will ultimately carry the day.

Darwin accepted the vocabulary and categories of the orthodoxy, but he did not consider them sacrosanct. Faced with novel phenomena in the animal kingdom, he did not hesitate to attack the idea of the immutability of species, and to propound the revolutionary theory of natural selection with its startling phrases such as
"survival of the fittest." Before him, Copernicus and Newton performed a similar work in physics. Neither they nor Darwin changed vocabularies or categories gratuitously or without warning. But the novel changes they introduced expanded our understanding of the world in which we live. In this way, they extended mankind's wisdom.

We may say, then, that to each grade of novelty there corresponds a parallel grade of rationality. In the weaker forms of novelty and ordinary rationality, the rules and the ability to follow them are closely relevant if not central. But as we move toward extreme novelty and wisdom other features, such as decisions about fairness, appropriateness, and flexibility become important. Deciding how to make appropriate novel moves is "knowing how to go on" in a deeper and grander sense, thus calling for a revision of the concept of rationality. 30

As the concept of rationality is revised in the light of the concept of novelty, it begins to lose some of the connotations associated with it in the past. To be rational meant to be able to enunciate absolute propositions or indubitable truths. But connecting rationality with immutability impoverishes the concept of rationality. One dimension is left out, namely, the capacity to formulate new concepts or rules from which, in connection with newly discovered facts, further true propositions can be derived.
There is also an even broader sense of rationality, namely, the ability to devise a general strategy for formulating new concepts and rules. This latter sense of rationality is very much like wisdom. It is constructive rather than passive, and original rather than imitative. It enables us to deal intelligently with novelty as it enters our lives.
CHAPTER V - FOOTNOTES


6 Creative Evolution, pp. 182-185.

7 Ibid., pp. xx, xxii, 24.

8 The deductive-nomological model of science comes close to articulating an immutable standard for science. The deductive-nomological conception becomes what science is. The hypothetico-deductive model provides the way science is.

9 When pushed far enough, this allows even radical conventionalists to claim they are rational while disdaining the pursuit of the ideal.


11 Kuhn approaches changes of scientific theory in terms of paradigm switches which involve breakdowns in rationality and appearances of crisis states. This is partly the result of his conception of paradigms as the
cradles of epistemologies and ontologies (The Structure of Scientific Revolutions, op. cit., pp. 41, 94, 103, 117, 129. All further page references are to this volume). When a dilemma grips the practitioners of a particular discipline, an appeal to experience is ruled out because of the paradigm dependent ontology (pp. 111, 109). A deduction is ruled out because of the epistemological trauma of the change (pp. 109-110, 149-150, 194). Therefore, Kuhn argues, a rational transition of theories is blocked (pp. 103, 158, 199, 200). What justifies inferences and thresholds of generalization is dictated by the theory or framework (p. 109). What will count as evidence is also dependent upon the theory. As Kuhn conceives of such extraordinary periods, the disciplines themselves begin to disintegrate. A thinly disguised romanticism which deprecates reason is introduced into the discussion of theory changes (pp. 150, 158, 208). Rationality is thought of as a stultifying influence which holds together orthodoxy. Only with the rejection of challenges and affronts (i.e., anomalies), can the beach heads for important change be established in normal science.

Kuhn attempts to counter this description of his work by claiming that he never intended to be taken as meaning that "good reasons" could not be given for such extreme scientific changes. He insists that he is not apothesizing the irrational, Popper's, Feyerabend's and Toulmin's interpretations to the contrary notwithstanding. But with the idea of extraordinary science at odds with the orthodoxy and the idea of an epistemological and ontological gulf separating such epochal changes, a basis for reasons being good seems to evaporate.

12 Revolutions, pp. 111-112.

13 In fairness to Kuhn he seems to be aware in his later writings that the picture of scientific transitions he presented in The Structure of Scientific Revolutions was misleading or at least has misled. Feyerabend, a great admirer of Kuhn, still clings to the views generally believed to have been put forth in Kuhn's book. And Karl Popper, a perennial enemy of Kuhn, still interprets Kuhn as Feyerabend does. So, although Kuhn remonstrates against them, his admirers and enemies continue to understand him in the manner I have set forth. Notwithstanding this wavering, Kuhn would still join with Feyerabend in considering radical theory changes "irrational" or at least "a-rational." There would be no orthodoxy with rules to guide such transitions. A "logic" of discovery would
demand such rules.


16 By failing to keep "new," "anomalous," and "novel" distinct, Kuhn has perhaps unwittingly portrayed theory changes as more discontinuous and traumatic than need be the case. By not noticing the pervasive role of novelty in intellectual enterprises, such as sciences, Kuhn has focused on the most spectacular manifestations of novelty (i.e., extreme novelty). The result, again, is to emphasize the trauma of changes rather than the cognitive basis of novelty which is rooted in intellectual habits. Finally, Kuhn empties the concept of novelty of importance by making the emergence of novelty depend upon the disintegration of a background of concepts rather than conceiving of novelty as the development of insights formed by the imagination and honed by the intellect as a tool for reshaping portions of the cognitive landscape.


18 This reveals the manner a deductive-nomological model clashes with the concept of novelty. Novelties throw the explicans and the explicaanda out of harmony.


22 Chapter II, p. 50.
23 Chapter II, p. 52.


25 Hutchinson's University Library: London (1953), pp. 63-64.

26 Ruse, pp. 8-9.

27 Chapter II, p. 30.

28 Chapter II, p. 32.

29 Chapter II, p. 52.

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