The failure of economics, psychology, or any other science to produce nomological generalizations that will underwrite the singular causal judgments of common sense or social science demands explanation. Some explanations—like Durkheim’s, for example—can be ruled out, it seems, on the ground that they undercut statements the truth of which we would preserve against any potential explanation of the failures of social science that was incompatible with them. Equally unacceptable to the empiricist would be explanations which trade on the falsity of empiricism and on the assumption that there are other standards of knowledge besides those reflected in natural science and that social science satisfies these standards. Traditionally, empiricists have sought to slip between these unacceptable alternatives by appeal to the complexity of human behavior and the constraints on our opportunities to acquire controlled and systematic information about it. Since the time of Mill empiricist philosophers have devoted themselves to demonstrating that there are no logical or conceptual obstacles to the existence of laws of human action, but have quite consistently left the actual provision of such laws to practicing scientists. The fact that no such laws have been provided in over a century of empiricist-inspired investigation by social and behavioral scientists can of course be passed off by appeal to these practical difficulties and to the relative youth of the empiricist enterprise in the study of human behavior. After all, a hundred years is not really a very long time on the scale on which the rate of substantial scientific discoveries can be plotted. If no laws connecting reasons to their causal consequences in action have yet been provided, this is only a reflection of the great practical difficulties and is likely to be overcome in the long run, over a period whose length
may not be expected to be much shorter than those which have characterized the great revolutions of physics, or chemistry. After all, humans are much more complicated than anything else studied by the methods of natural science, and we cannot expect more rapid results in this case than in the study of simpler systems.

But while empiricists may console themselves with this perspective, it has failed to convince their opponents, who see in the absence of laws of human action a reflection of their logical impossibility. More important, the explanation of the failings of social science on the basis of the complexity and intractability of its subject matter betrays important disanalogies with the explanation of the early failures and slow progress of nascent physical science. The most important of these disanalogies bears on differences between our knowledge of the truth of a host of singular causal statements about human action and the early natural scientist’s relative ignorance of such statements about the causal determinants of the events he set out to explain. Throughout the history of natural science we have been faced with phenomena that needed explanation, and although such explanations ultimately involved redescriptions of the events to be explained and their subsumption under laws, the first task of the natural scientist invariably involved forming hypotheses about their causes and framing rough generalizations relating these hypothesized causes to their effects. He then attempted to sharpen these generalizations, filling out ceteris paribus clauses, unifying and synthesizing the generalizations with those explaining other related phenomena, and often reaching the point of redescribing the explananda phenomena and the explanans phenomena in terms utterly foreign to their ordinary descriptions. The slowness of scientific progress is a reflection of the fact that very often the hypotheses about what the causal determinants were for a given phenomena were wrong. But such conclusions were reached only after a long, sustained attempt to frame the required generalizations. The failure, after century-long attempts, to frame exceptionless generalizations that would simply and precisely account for the events to be explained in terms of the causal variables then accepted eventuated in what are now fashionably described as paradigm shifts, in which new causal variables were hypothesized and the entire process began again.

The disanalogy between the history of science as thus sketched and the history of social science is that in the latter case we believe that we have been in possession of the relevant variables literally since time immemorial. The conviction that desires and beliefs cause actions was already ancient when Plato expressed it in the Phaedo. If just one of our everyday judgements about the determinants of action in reasons is true, then we are already in a vastly superior position to that of any natural scientist at the outset of his research. For we already know what the causal variables are. Never mind how we know this, whether by introspection or some other process not available
to the natural scientist, just so long as we know it, we must trace back the history of failure to provide the relevant generalization not just to the first self-conscious attempts of the marginalist economists, but to the first instant that the unshakeable conviction appeared that something happened because of someone's reasons. If we were to place natural and social science on a scale permitting reasonable comparison of their rates of progress, their rates would be equal if the technical concepts of Newtonian mechanics (and not just their commonsense reflections) had been known throughout the world to every human being of normal intelligence since the dawn of man and yet still had not eventuated in any of Newton's three laws. Is human behavior that much more complicated than the behavior of natural systems? Of course, the affirmative answer is not logically absurd, but it is equally obvious that this answer is unlikely to figure in an explanation of the failure of social science as reflecting merely temporary empirical recalcitrance that will satisfy someone not already wedded to empiricism. When we add the fact that empirical methods have enabled us to frame powerful general laws and theories about matters vastly more complex than the mechanics of medium-sized objects, and vastly more recalcitrant to observation than human behavior, the implausibility of this explanation becomes proportionately even greater. These successes have convinced us that we have in hand the methods of discovering and confirming powerful laws and theories about all manner of complex and observationally inaccessible phenomena. Thus, the application of such methods over the period of a hundred years and more to a body of phenomena in which we believe we can already identify the important causal variables and their effects makes the empiricist's traditional explanation for the absence of laws of human action little short of totally incredible. Furthermore, if the practical impediments to the establishment of a science of human behavior replete with laws and theories of the requisite power are of these dimensions, then they might as well be logical or conceptual impediments for all their practical force. If the complexities of the subject matter are as great as empiricism requires in order to substantiate its explanation of the failures of social science, then it seems unlikely that the devotion of any finite amount of energy over the reasonably foreseeable future is likely to provide the science it assures us is possible. But the more remote and academic the possibility of a science of human behavior, the less and less force can we accord empiricist prescriptions in the actual practice of social research, for we cannot justify the prescriptions by their probable foreseeable results.

In short, the empiricist explanation of the failures of social science to attain the standing of natural science is either hopelessly implausible or hopelessly pessimistic. For the factors of complexity and observational recalcitrance that it trades on are either too weak to account for the failure to be explained or too strong to sustain the expectation that more industry and a bit of genius will eventually retrieve the failures thus explained. This dilemma
makes the appeal of anti-empiricist philosophies of social science more and more understandable if not acceptable and, when added to the constraints of a theory of human behavior enumerated at the end of Chapter 4, makes empiricism seem untenable as a philosophy of social science. To be saved from untenability, empiricism requires either a law of human action or another explanation of its absence besides the complexities and recalcitrance of human behavior.

In this chapter I shall begin to detail an explanation consistent with empiricism for the failing of social science that does not trade on appeals to complexity and recalcitrance. The explanation also has the advantage that it makes sense of the history of the last hundred years' search for a law of human action—makes sense of it both by showing that the search was not conceptually misconceived or logically fated to failure, and by showing precisely why the search failed. It will also suggest (in the next two chapters) the direction in which, consistent with empiricism, subsequent work in social science must proceed.

Although economists and other social scientists may be accused of over-hasty generalization in their attempts to formulate laws that will systematize all distinctive human behavior by appeal to maximizing principles, philosophers too have attempted to formulate and assess principles of similar generality. The philosopher's aim in the formulation of such principles has been quite different from that of the economist or psychologist. Philosophers have attempted to uncover the expression of a general relation between reasons and the actions they determine in order to expound and assess claims about rights and responsibilities that are accorded to individuals in the light of their powers of action; to make sense of our attributions of praise and blame, freedom and constraint, our distribution of desert and punishment; to make sense of the commonsense singular explanatory claims we make every day about our actions and the actions of others, their consequents and antecedents. In this last connection, quite independent of the empiricist's claim that these singular claims are causal and therefore presuppose laws, philosophers have argued about whether our ordinary explanatory practices commit us to a synthetic general principle or lawlike statement in any case. The camps who dispute whether such a principle is reflected in our true common-sense claims about particular reasons and specific actions have produced many candidates for such a principle, only to see each claimed either to be false or tautological, just as the principles offered by economists seem to have been. Among the principles offered by philosophers as lawlike claims presupposed by ordinary explanations of human action, however, one stands out as more plausibly true and arguably less trivial than the others.

This candidate for a law of human action is generated by Paul Churchland in the course of an argument to show that "there are some fairly sophisticated nomic principles or 'laws' specifically presupposed by our ordinary
Now, if the singular statements that constitute our ordinary action-explanations are true, and if they presuppose specific laws that Churchland has a method of isolating, then the empiricist's laws of human action must be available after all. "That our explanatory practices with respect to human actions are presumptive of what is prima facie a general law," Churchland writes,

can fairly easily be brought to light by a systematic examination of those practices. An adequate theory of the logical character of action-explanations must be able to account for the undoubted propriety of the various types of everyday objections to which they can be subject, and this fact provides us with a strategy for winnowing out the underlying law, if it happens there is one. We need only examine and classify the types of objections which can legitimately be raised against an ordinary explanatory statement of the form 'x A-ed because he wanted $\phi$' in order to bring out the entire set of necessary conditions [i.e., the set of conditions jointly causally sufficient] for the correctness of that explanatory statement (p. 215).

Churchland's strategy for constructing the lawlike statement which he claims is implied by our explanatory practices is particularly attractive because it trades on just those considerations which philosophers have appealed to in order to falsify putative laws, the sorts of countervailing forces which make for exceptions to the truth of these candidates. If Churchland can collect all these counterexemplifying considerations and impound them within an exceptionexcluding clause of a principle connecting reasons and actions, he will have uncovered the lawlike statement presupposed by our commonsense singular claims. In this sense, Churchland's strategy will work, if any strategy will. But of course this does not guarantee that any strategy for detecting and establishing the required general statement will work; and in particular, if there are an indefinite number of different ways in which exception can be taken to the putative law, it will never be open to expression in a finitely long statement, for it will require an indefinitely large number of excluding clauses. And a law that cannot be stated is, presumably, no law at all for the purposes of science. Churchland, however, believes that the number of such exceptions is manageably small.

Churchland begins with the sort of general statement that one might initially generate to sustain the claim that "x did A because he wanted $\phi$" (p. 216):

$$(x) \ (\phi) \ (A) \ (if \ (1) \ x \ wants \ \phi, \ and \ (2) \ x \ believes \ that \ A-ing \ is \ under \ the \ circumstances \ a \ means \ for \ him \ to \ achieve \ \phi, \ or \ contribute \ to \ his \ achievement \ of \ \phi, \ then \ x \ does \ A).$$

It is the content of this general statement that the economist seeks to capture
in a quantitative and highly general way in his hypothesis of maximization; and it is the obvious counterexamples to its truth that also drive the econom­

mist away from the literal interpretation of his hypothesis as a recognizable variant of this one. The first of these objections turns on the fact that sometimes an agent satisfies clauses 1 and 2 in our general statement without satisfying its consequent, because the agent believes that there is some other action besides A-ing which is a means to bring about φ, under the circum­

stances, and that this action is preferable to A-ing. We may insulate our general statement against this sort of case by adding a clause of the following form to its antecedent:

(3) there is no other action believed by x to be a means for him to bring about φ, under the circumstances, which x judges to be as preferable to him as, or more preferable to him than, A-ing.

Notice that the assumption that the agent is correct in his beliefs of this kind is tantamount to the economist’s traditional boundary condition of perfect information about the availability of alternatives among which the agent is to choose the most efficient for attaining his preferred goal or maximizing his utility. Of course when clause 3 is added to the generalization, there is no presumption that the agent’s belief is correct.

Of course, an agent may satisfy all of clauses 1, 2, and 3, and still not do action A. He may, for instance, have another want besides φ which is stronger than φ and overrides it. It is to avoid this sort of problem that the economist appeals to the desire to maximize utility, for this desire is supposed to under­lie or to generate all other more particular wants for particular ends. To avoid this sort of falsifying circumstance we need to add another clause to our principle:

(4) x has no other wants which under the circumstances override his want φ.

By now the strategy has become clear. If we can add a clause excluding each of the kinds of exceptions to the lawlike connection described above, we will have the general statement which underlies our singular causal judgments about reasons and actions. According to Churchland, only two more clauses are required. One excludes cases in which the agent does not perform the action because he is physically incapable of performing the action in ques­

tion. The other circumvents objections based on the supposition that the agent does not know or have true beliefs about how to do the action in question.

If this enumeration of possible objections showing the falsity of our initial general statement is complete, then, according to Churchland, “the following conditional can plausibly be seen as nomological in character” (p. 221):
\( L \) \((x)(\phi)(A)\) if

1. \( x \) wants \( \phi \),
2. \( x \) believes that \( A\)-ing is a way for him to bring about \( \phi \) under those circumstances,
3. there is no action believed by \( x \) to be a way for him to bring about \( \phi \), under the circumstances, which \( x \) judges to be as preferable to him as, or more preferable to him than, \( A\)-ing,
4. \( x \) has no other wants which, under the circumstances, override his want \( \phi \),
5. \( x \) knows how to \( A \),
6. \( x \) is able to \( A \),
then
7. \( x \) does \( A \).

\( L \) is generated from our common beliefs about actions and their explanations, as revealed in the kinds of criticisms we might offer of a statement of the form “\( x \) did \( A \) because he wanted \( \phi \).” \( L \)’s strength and plausibility derive from the completeness of Churchland’s survey of these kinds of criticisms, and from the fact that an overlooked sort of objection can easily be accommodated by adding still another clause to the six antecedents of \( L \). \( L \) has the further virtue, not noticed by Churchland, that aside from reflecting common sense it also provides a full specification of the sort of generalizations that underlie the social scientist’s systematic explanations of actions in terms of reasons. For when he appeals to a principle like the maximization hypothesis, he tacitly assumes that each of the six conditions in the antecedent is satisfied by the explanandum phenomenon and interprets his maximization hypothesis in such a way as to exclude the circumstances that \( L \) excludes explicitly.

Churchland offers arguments to show that \( L \) is plausibly construed as a law, as being “nomological in character.” He does so by attempting to rebut charges that \( L \) is a disguised tautology, or an analytic proposition true by virtue of the meaning of its terms, and by attempting to undercut arguments to the effect that \( L \) is false because there remain as yet undescribed but nevertheless undoubted counterexamples to it in the form of the ancient Aristotelian problem of \textit{Akrasia}, weakness of will. Insofar as we countenance the existence or the causal possibility of such cases in which agents know what the best thing to do is, but in the absence of impediments fail to do it anyway, \( L \) must be false. Churchland has several rejoinders regarding the bearing of this ancient philosophical puzzle on our concerns. But for our purposes suffice it to say that the hypothesis of \textit{Akrasia} is simply the direct denial that human action, as opposed to mere behavior, is causally determined by beliefs and desires exclusively. As such, the objection merely begs the question at issue unless compelling reasons are provided beyond mere intuition for the possibility it envisions. In any case, I shall assume that Churchland can successfully defend \( L \) against both the charges of analyticity and falsity. For my aim here is to show that in spite of the fact that \( L \) is \textit{ex hypothesi}, a true
synthetic general statement, it is not a law of human behavior, and that the explanation of why it is not one plausibly explains, in a way consistent with empiricism, the absence of any laws of the sort on which social science seeks to ground its true singular judgments.

Although I shall assume that Churchland is correct in denying the analyticity of \( L \), it is important for our purposes to examine how he answers this challenge. He writes:

> The objection that \( L \) is flatly analytic... [and therefore not an empirical general law] may appear to be a serious one given the confessed difficulty of conceiving of a falsifying instance. The objection is highly welcome, however, for its apparent seriousness is readily undermined: on the view being proposed, the appeal of the objection is quite understandable. After all the suggestion is that \( L \) is a deeply entrenched theoretical nomological central to our understanding of human behavior, and of such states as wanting, believing, and preferring—a basic principle of the conceptual framework in terms of which we conceive ourselves. It is difficult, perhaps impossible to deny \( L \) without undermining the conceptual machinery which makes such understanding possible or, better, constitutes it, but none of this entails that \( L \) is 'analytic' in any sense inconsistent with its being nomological in character. One could not deny the principle of mass-energy conservation without threatening similar havoc in the conceptual framework of modern physical theory. . . .

> . . . We can concede that the rejection of \( L \) would entail serious conceptual readjustments, but conceptual change is characteristic of theoretical change, and the status claimed for \( L \) is that of a theoretical nomological. (p. 225)

The cogency of replies of this sort usually turn on denials of a sharp analytic/synthetic distinction (which Churchland does not himself appeal to), but what is more important than the merits of this passage as an argument against treating \( L \) as analytic is its claims about the centrality of \( L \) to a theoretical edifice. For if Churchland's claim that \( L \) is at least a viable candidate for nomological status is to be substantiated, then this centrality will have to be shown to be either actually or potentially of the same character as that of the "entrenched theoretical nomologicals" of natural science.

As we have noted in previous chapters, it is obvious that something like \( L \) plays a central role in our conceptual scheme. Let us make this claim more precise: assuming it is true, \( L \) (and the propositions which follow from it upon the substitutions of particular agents, wants, and actions for its bound variables) provides the only systematic means of determining whether each of the seven types of states mentioned in its antecedent and consequent are in fact instantiated on any particular occasion. \( L \)’s centrality to our conceptual scheme is a reflection of the fact that under their ordinary interpretations its key terms—‘want’, ‘believe’, ‘judge’, ‘prefer’, ‘knows how’, ‘is able to’, performs an ‘action’—are ones for which only functional characterizations
are available. That is, their normal, nontechnical meanings are given by appeal to the causal roles which we believe the items denoted by these terms play. Terms like 'belief' and 'want' or 'desire' seem especially clear examples here. Though there is no explicit noncontroversial definition of these terms, everyone has a rough idea what they mean, and there seem to be clear cases of belief and desire about which no one is seriously in doubt. For example, we ordinarily suppose that nothing could count as a desire unless it led at least on some possible occasions to actions that the agent would not otherwise have performed. Here, desire is characterized by one of its effects. Similarly, nothing could count as a belief unless there were at least some possible circumstances in which the believer would answer yes to the question whether he had the belief in question. Equally, it is supposed that nothing could count as a belief or desire unless an agent's having it could be brought about in certain ways that involve changing his circumstances. And of course, differing beliefs and desires are distinguished by reference to differing causes and effects which reflect a belief's or a desire's (propositional) content and the degree of its strength. These claims about belief and desire express functional characteristics of these two sorts of mental items. It seems undeniable that our knowledge of the doxastic states and preference structures of other agents is based (inductively or not) on our knowledge of the causal conditions and consequences of these states and conditions. It seems fair, therefore, to infer that these conditions and consequences also figure in specifications of the meaning of claims about desires and beliefs. What nonfunctional characterizations can be offered to supplement such characterizations in our account of the meaning of these terms? A physicalist, of course, might say that among a desire's or a belief's nonfunctional characteristics are the physical properties of the neurological item which constitutes its physical realization. Similarly, an opponent of physicalism might cite their private or privileged position with respect to the agent who has the belief or desire in question. But both of these claims are too controversial to figure in accounts of the ordinary meanings of 'desire' and 'belief.' Moreover, one especially striking feature of arguments to the effect that beliefs and desires are brain states or that they are epistemically privileged in a way incompatible with their being brain states is that both such arguments proceed by appealing to the notions in question under functional characterizations. Beliefs and desires qua brain states are to be individualized and identified through the employment of sophisticated scientific instruments whose readings are supposed to be nomologically linked causal consequences of the occurrence of the brain states in question. Similarly, claims to the effect that beliefs and desires are known by their "owners" in a way privileged by contrast with the way others are acquainted with these mental items trades on the assumption that our knowledge of others' mental states is based on criteria of a causal (if not contingent) nature.
In fact, the only noncontroversial conditionals we could offer to characterize explicitly the circumstance under which each of the states described in \( L \) are occasioned take the form of the state in question on one side, and one or more (perhaps all) of the other six conditions of \( L \) on the other side of the connectives. Thus, for example, the meaning of the concept of want is given by an expression of the following form:

\[
W(x)(\phi)(A)(x \text{ wants } \phi \text{ only if clauses } (2), (3), (5), (6), \text{ and } (7) \text{ of } L \text{ obtain}.)
\]

In order to turn \( W \) into a statement of necessary and sufficient conditions for wanting, instead of a statement of necessary conditions, we must add clause 4 of \( L \). But this clause employs the concept of want itself, and so makes a full characterization of want formally circular. Nevertheless, providing a characterization in terms of conditions only necessary for wants is perfectly legitimate and indeed characteristic of the limitations on the introduction of terms in scientific theories generally: typically it is not possible to provide a noncircular characterization of such terms which is also a sufficient condition of its application, for otherwise they could be eliminated from the theory without loss of explanatory power, and this is almost never the case for theoretically significant terms. A similar characterization for each of the key terms of \( L \) is easily constructible, and by virtue of the exceptionlessness of \( L \) these characterizations will be the most complete available. This is because the existence of a further necessary condition for someone's having a want, for instance, not mentioned in \( W \) would reflect an exception which \( L \) would have to be amended to accommodate, in order to remain a true exceptionless general statement.

Definitions like \( W \) proceed by characterizing their definiens in terms of the causes and effects of an agent’s manifesting the predicate defined. This, of course, is the sense in which the terms of \( L \) are all functionally characterized ones. But once the functional nature of the concepts that figure in \( L \) is admitted, the centrality of \( L \) to our conceptual scheme acquires an explicit and clearly understood sense. Functional characterization presupposes causal connection, which on the empiricist’s view, in turn, requires the existence of nomological generalizations (known or unknown). But \( L \) provides the sole available candidate for an exceptionless law in which any of the states and conditions in question figure. Accordingly, its falsity would deprive the terms describing these states of the only noncontroversial characterizations available for them.

These considerations both explicate and underwrite Churchland’s claim that “the rejection of \( L \) would entail serious conceptual readjustments.” Not only would our commonsense attributions of the mental states and actions that figure in \( L \) be rendered seriously indeterminate, if not meaningless, by the repudiation of \( L \); but without appeal to \( L \), both to explain
action and to determine the instantiation of its antecedents and consequent, any social theory that sought to explain action as the effect of desires and beliefs would, so to speak, float on a void. But from these considerations it does not follow that \( L \) is a law after all; indeed, they suggest a crucial difference between \( L \) and general statements in natural sciences which are accorded this status. Because \( L \) not only substantiates the citation of reasons as the causes of actions, but also constitutes the sole available criterion for identifying these causes and effects, it fails to be the "deeply entrenched theoretical nomological" that Churchland describes it as.

To show this I want to draw a comparison between \( L \) and a principle of Mendelian, or population, genetics, and the relations of their respective terms to other general statements in which they do or logically could figure. Now, this analogy between a statement like \( L \) and a Mendelian law has been mooted before by physicalist exponents of the identity of the mind with the brain,\(^3\) but they have not discussed this analogy in sufficient detail to show exactly what obstacles face their version of materialism, nor have they employed the comparison to show the difficulties surrounding the entrenchment of \( L \) in a scientific theory and the consequences of this difficulty for the pursuit of a scientific theory of human action. We shall see not only that there are disanalogies here which outweigh the analogies, but that the prospects for entrenchment of \( L \) in a scientific theory are bleak in the light of these disanalogies between \( L \) and Mendel's laws.

Mendel originally offered two laws of population genetics, in contemporary versions of which the gene figures as the cause of differential inheritance, mutation, and replication. For our purposes it may be useful to state the following version of one of these laws:

**The Law of Independent Assortment**: The presence of a gene for any particular inherited trait does not determine the presence of any other gene.

Mendel appealed to this law to explain why hereditary traits like the height of a pea plant and the texture of its fruit are transmitted across generations in entirely independent proportions. As stated, however, this law turned out to be shot through with exceptions, rather like versions of \( L \) that omit one or another of its six antecedent clauses. First it was discovered that in some organisms some genes that code for apparently distinct phenotypic traits were constantly associated across generations. Originally this unexplained "linkage" of genes resulted in the interpolation of a clause in the law of independent assortment which excluded such cases. But it turned out that there was an exception to this exception. Subsequent studies showed that occasionally, linked genes which code for distinct phenotypic traits could be separated from one another in their effects if their locations on a particular chromosome were widely separated, and if this chromosome broke during
meiosis. This phenomenon, known as crossover, requires still a further revision of Mendel’s law—indeed, some would argue, an abolition of this law in favor of one stated by appeal to a new concept of gene, or to a concept of different genelike units each of which had different functions with respect to heredity and which could function in exceptionless laws of population genetics. Whether the result of separating these units of inheritance, mutation, and replication is a new law, or part of a new theory, that replaces Mendel’s, is not important here. What is important is that a “version” of Mendel’s law can be stated in which a genelike entity that does not exhibit linkage or crossover can be substituted for the notion of gene as originally understood. This entity is called the “cistron.” It is functionally characterized as the genetic unit responsible for inheritance, but unlike the Mendelian gene, it is not also functionally characterized as the unit of mutation and replication. Thus, we may assert the law of independent assortment as an exceptionless regularity about the independence of the cistrons that play a role in the determination of hereditary traits. If our “law” about reasons and their effects in action is in fact an exceptionless general statement, then it is to the law of independent assortment of cistrons, not of Mendelian genes, that $L$ must be compared. Indeed, we can coin a single term which will encapsule all the provisos of the antecedent of $L$ in the way that “cistron” encapsules the exclusions of linkage and crossovers, and so express $L$ as a law relating actions and a single type of (conjunctive) state of the agent which causes them. But although this artificial reformulation of $L$ may render it topographically similar to a law of the assortment of cistrons, there is another important feature of this latter law that mere inscritional changes cannot bestow on $L$ as well.

The concept of cistron is not the product of discoveries on the molecular level, and was introduced into genetics long before the detailed translation of the genetic code. So it neither raises nor settles questions surrounding the prospects for reducing the theory in which it figures, transmission genetics, to molecular genetics. The appeal to the notion of cistron was founded on purely biological (and not chemical) techniques of breeding and testing for crossing over and linkage. As the notions of linkage and crossing over suggest, however, the notion of the cistron is the product of a progressive localization of the classical Mendelian gene (and its successors) initially to individual chromosomes, and eventually to distinctive regions of particular chromosomes. It was this localization that provided a method independent of the law of assortment for determining whether something is a cistron, and whether its behavior confirms the law. Quite independently of advances in molecular genetics, methods of locating cistrons and maps of the location of cistrons on microscopically visible bands of particular chromosomes of particular species were provided: these methods and maps provided both the identity conditions required for the assertion of the existence of cistrons, and the criteria
of individuation for them required to provide a test of the general statements in which they figure.4

By describing in great brevity the character and methodological situation of the concept of the cistron, I do not mean to suggest that there are no connections between the laws, like that of assortment, in which it figures, and the methods by which we can determine its occurrence. I am merely noting that there is at least more than one general statement available for characterizing cistrons, so that confirming any one of the laws about cistron behavior does not require immediate appeal to itself or to one of its direct consequences. As Churchland notes in defense of L, no universal is testable “independently of the entire framework of principles of which it may be an integral part,” but at least in the case of the law of assortment, there are other principles for localizing cistrons and their resulting maps that in effect provide biconditionals which individuate types of cistrons by their locations on chromosomes. These biconditionals do not provide identities, or decompositions, or structural characterizations, or anything else besides locations for cistrons. It was by the subsequent chemical analysis of the bands of chromosomes at which the cistron is located that their structure, constituents, and the mechanism of their operations that molecular genetics consists in was ultimately provided. It will not be necessary to turn to the relation between the cistron and the DNA out of which it is composed in order to make important comparisons between population genetics at this level of development and our candidate law, L.

The important difference between L and the law of assortment of cistrons is not that we have identities for cistrons in terms of strings of DNA (we do not), nor even that we know what the precise general locations of particular cistrons are. The difference is that we have no independent general characterization of the items mentioned in L that will permit us to determine whether any agent exemplifies one or more of them on a given occasion. This difference is vital to the question of whether a statement like L is or can figure as an “entrenched theoretical nomological,” not just because the absence of such characterizations independent of L precludes noncircular tests of L, but more important, because the lack of these characterizations isolates L from generalizations that might causally explain it and from generalizations and singular statements that it might causally explain. The restriction of cistrons to particular bands of chromosomes enables us to explain the law of assortment as a consequence of generalizations governing the process of meiosis (a process characterized in completely nonmolecular and nongenetic terms), and enables us to employ the law of assortment to explain the consequences of meiosis for the inheritance and distribution of observable detectable phenotypes in general, and in particular cases. Our inability to similarly connect L to laws above and below it in a theoretical hierarchy is a direct consequence of the lack of similar independent characterizations for the items that figure in it.
Whereas the localization of genes to chromosomes enables us to connect a general statement describing their independent assortment with independently established generalizations about the multiplication of chromosomes in meiosis and with independently established generalizations about the distributions of observable characteristics of organisms among their descendants, no such entrenchment is possible for $L$ because of the nature of its terms. To see this, notice that in the case of the Mendelian law, theoretical entrenchment is provided by independent specifications of the law’s terms, because they enable states of affairs described in its antecedents and consequents to be shown to figure as respectively the consequents and antecedents of other independently established generalizations. Now, for $L$ to be similarly entrenched there must be independently establishable generalizations about, for example, the environmental determinants of belief or desire, and about the consequences, either individual or aggregate, of actions. But, of course, these laws must be independently establishable; that is, it must be at least possible to offer confirmatory evidence which does not presuppose or entail the truth of $L$. But from this it follows that these laws cannot employ any of the terms in $L$, such as want, or action, whose meaning, as we have seen, is given by functional characterizations that presuppose the truth of $L$. On the other hand, if they do not employ such concepts, the fact that $L$ provides the sole means for characterizing its own concepts *ipso facto* excludes the establishment of connections between its terms, and the terms of these generalizations about the determinants of wants (otherwise described, of course), and the consequences of actions (also not described as actions).

Thus, if $L$ is truly exceptionless and is the sole candidate for a law about the causal determinants of human action, then the fact that its terms are functionally characterized entails that $L$ cannot be connected with other generalizations in a way that nomological entrenchment requires.

In the face of this conclusion, the most promising line of defense for $L$’s status as a law seems to lie in finding some new characterization of the terms in $L$ which will be independent of $L$ in the way required.

The demand that independent characterizations of the items mentioned in $L$ be provided, together with the assumption that $L$ is in fact an exceptionless truth about the causal determinants of action, places certain significant restrictions on the form that such independent characterizations can take. In particular, it effectively restricts such characterizations to physical, and specifically, neurophysiological ones. If the terms in $L$ are, as I have argued, functional ones, and if $L$ reflects the *sole known* exceptionless general statement relating them to their causal concomitants, then, given present knowledge, the possibility of providing other general *functional* characterizations of any of these same terms *ipso facto* excluded. Any characterization of the beliefs, desires, and preferences mentioned in $L$ that trades on their propositional content, for example, or on their strength as measured in behavior trades on the implicit or explicit employment of $L$, and will therefore not
provide a characterization of the required sort: one that is independent of $L$. This leaves, as the only source of acceptable characterizations, the physical structure or the physical concomitants of these items. I say physical structure or concomitant because the issue here is not (yet) one of reduction or identification that materialism hopes for. It would be enough to provide the required characterizations if we could provide a principle of systematic isomorphism for the states mentioned in $L$. Such a principle would take the following form: for each of the types of states mentioned in $L$, there is a type of physical state such that for every $x$ and for every time $t$, $x$ manifests one of these $L$-states at $t$ if and only if $x$ manifests the relevant physical state at $t$. Reduction is not at issue here any more than it is in connection with the systematic isomorphism implicit in the localization of (but not identification of) cistrons to bands of chromosomes. In and by themselves such principles give us no guide to the structure of items otherwise functionally characterized, though they would provide independent means of determining whether an agent manifested any one of them. But suppose, as seems reasonable, that there is no single type of neurophysiological state uniformly associated with the states mentioned in $L$. If the number of such states is manageably small, then the prospects are good that industrious pursuit of the neurophysiological basis of mental activity will provide at least a manageable disjunction of states which are jointly isomorphic with $L$'s states. Of course, the larger the number of distinct types of neurophysiological states which are jointly isomorphic with $L$'s states, the harder it will be to provide the required characterizations, and the more impractical will become appeal to such characterizations to connect $L$ to other laws about agents, or to particular instantiations of $L$.

Here again, it is worth recalling the analogy with Mendelian genetics and its successor. In effect, the transition from employment of the concept of Mendelian gene to employment of the concept of cistron in the statement of the law of assortment reflected just this situation. Through localization it was discovered that the Mendelian gene, defined as a unit of hereditary transmission, mutation, and replication, is concomitant to three different sorts of items. It turned out that there was not just one thing which performed the functions ascribed to the Mendelian gene, but three, and furthermore, that each of them performed a different one of the three functions hitherto attributed to the gene. The cistron is the one which performs the function accorded to genes in the original version of the law of independent assortment, and it was for this reason that it was substituted into the original law (qualified by the exclusion of linkage and crossover) in place of the gene classically defined (thus permitting the deletion of the qualifications). In other words, it was just because a limited number of items were found to correspond to the Mendelian gene that this concept was replaced in the course of the development of genetics. Similarly, I suggest, if neurophysiology disclosed a limited number of types of states disjunctively concomitant
with states like beliefs, desires, and actions (in otherwise normal bodies), then these concepts are likely to be replaced by such neurophysiological ones in the strict versions of laws that govern human behavior. If $L$ is an exceptionless truth, as we have assumed, and if the occurrence of types of states mentioned in its antecedent and consequent and the causal connection between these states is assured by virtue of the systematic isomorphism between these states and a finitely long disjunction of brain states which are causally connected by one or more neurological laws, then $L$ will become theoretically dispensable (just as the heavily qualified law of the assortment of genes became); and it will be dispensed with, just because of the complications that attend the determination of whether its antecedent and consequent are fulfilled by particular agents engaged in particular bodily movements. The upshot is that unless there are relatively simple correspondences, appealing to only a very small number of alternative neurological specifications of the items $L$ mentions, $L$ has no hope of figuring as a "deeply entrenched theoretical nomological." Moreover, it can be shown that $L$'s pretensions to nomological status are incompatible with the conjunction of (1) the supposition that there is no finitely long list of neurophysiological items associated with each of the terms of $L$, and (2) the altogether unshakeable belief that at least some of our singular causal claims about the relations of particular wants, beliefs, abilities, and their consequences in actions are true. To see this, suppose that none of the relevant correspondences are available, because for any particular type of want, $\phi$, for a particular action, $A$, and for any particular types of beliefs with respect to $\phi$ and $A$, no two interpersonal or intrapersonal instantiations of these types of states are correlated with the same type of neurophysiological state. (Anyone who believes that this supposition is too restrictive, and therefore implausible, may increase the number of interpersonal or intrapersonal instantiations of the same type of mental event from two up to any finite number without affecting the argument to be broached.) If we add to this supposition the assumption that one version of materialism is correct, that every particular mental state or event is identical with some particular brain state or event, then the supposition can be shown to be consistent with the truth of any singular assertion that some particular set of states of belief and desire caused a particular action. If the particular mental states are identical with particular brain states, and the action is identical with a particular bodily movement, then they may be causally connected by virtue of the existence of a neurophysiological law subsuming the physical events which they happen to be identical with, even though it is false that the types of states of belief, desire and action exemplified on this occasion are uniformly exemplified by physical states of this (or some other finite number of) type(s). The upshot of this argument is that particular desires and beliefs may be the causes of actions. Nevertheless, it will not be by virtue of
their being desires and beliefs of any type that these particular states of an agent cause his actions, nor will the actions be effects by virtue of their being actions of any type. Particular mental states of agents and their actions are causally related because they are also types of physical states of the agent, and for no other reason. But this conclusion is tantamount to the claim that there is no constant conjunction of types of desires and beliefs with types of actions, or, in other words, that there is no law relating reasons and actions. Accordingly, on the assumption of materialism, the further supposition that there are no correlations between types of mental states and finitely many disjunctions of types of physical events implies that $L$ is no law.

Nor will the suspension of the assumption of materialism help preserve $L$. On the supposition that beliefs, desires, and actions are not correlated with a finite disjunction of physical states, $L$ turns out to be either no law at all or else a law that no finite number of scientists could ever have grounds to call a law. If each of the types of states that figures in $L$ is correlated with an infinite number of different types of physical states (provided, of course, that it makes sense to speak of correlation in such a case), then naturally any characterization of these terms of the sort required to entrench $L$ in a scientific theory will be impossible to express, because of their infinite length. What is more, $L$ would itself be deducible from nothing less than an infinite number of laws about the causal relations between these infinite numbers of different types of physical states. On the assumption that a proposition of infinite length which independently characterizes each of the items in $L$ cannot be discovered by a finite number of scientists, it follows that $L$ will never be known to be entrenched in a scientific theory, since independent specification of its terms is not forthcoming. If it is further assumed that a general statement cannot be a law if its truth is known to turn on the truth of either an infinite number of other general propositions, or on propositions of infinite length, then $L$ is no law at all.

Thus, given materialism without expressible isomorphism of brain states and mental states, we may preserve the truth of our singular causal judgments about reasons and actions, but only at the cost of surrendering $L$ as a (knowable) law that underwrites them. On the other hand, without materialism both the possibility of laws connecting reasons and actions and the truth of singular statements they sustain are undercut. The incompatibility of $L$ and the truth of any of the singular causal statements it was constructed to underwrite surely constitutes a reductio ad absurdum of the claim that $L$ is a law in the absence of infinitely expressible isomorphism between its terms and neurophysiological ones. But the possibility of such expressible isomorphism beyond the simplest types also leads to the same conclusion: that $L$ has no hope of nomological entrenchment.

$L$ is, in fact, in important ways unlike both the exception-ridden law of the assortment of genes and the law governing the assortment of independently
specified cistrons. Because of its exceptionlessness we are not motivated to search for (exceptionless) substitutes, and because of the absence of independent specifications for its terms, we are in no position to test its putative exceptionlessness or to entrench \( L \) in a scientific theory. Moreover, the prospects that advances in neurophysiology will provide manageable methods of independent specification are extremely small. Neurological correspondents of states of belief, desire, preference, etc., will have to be several orders of magnitude more complex than the molecular correspondents of the cistron. But we already know that any attempt to stipulate the latter sort of correspondence is almost unmanageably difficult. The degree of redundancy and the number of different functional roles of even the smallest strands of DNA suggest that although we have excellent reason to believe that cistrons are "nothing but DNA," it seems neither likely that we will ever have full statements of the required correspondences nor useful to attempt to provide them.\(^7\) It is sufficient that we know that such correspondences are in principle possible to construct. By comparison, we have no assurance that the parallel correspondences for \( L \)'s terms are even in principle available; after all, the number of neurophysiological realizations may be infinite. And in any case we have the best of reasons to believe that these correspondences are vastly if not infinitely more complex and unattainable than for the cistron.

Insofar as the possibility of entrenchment as a theoretical nomological statement, whether deep or shallow, is a necessary condition for a proposition's being a law, \( L \) is not a law, even if it is, as assumed, a true synthetic general statement. Notice that the requirement for a statement's being a law is not actual entrenchment but possible entrenchment, and not clear centrality to a vast theoretical edifice but only integral connection with one, either at its periphery or at its center or between the two. Our argument has shown that the exceptionlessness of \( L \), coupled with the duty it performs in characterizing the items that it cites, deprives it even of the possibility of such integral connection with other nomological generalizations. But this conclusion raises serious questions. How can a true synthetic general statement fail to be a law? If \( L \) is no law, how can the singular causal statements which seem to presuppose it be substantiated as true claims themselves? And finally, how can such a conclusion figure in an argument that preserves the empiricist program in social science, with its demand for generalizations? The answer to all these questions follows from the hypothesis that \( L \) is no law because the classes of items that it cites in its antecedent and its consequent are not *natural kinds*.

Consider the concepts of "phlogiston," or "fish," or "race." These notions do not designate natural kinds—that is, they are not satisfied by sets of objects whose behaviors are homogeneous with respect to causes and effects in a way that finds reflection in detectable natural laws. In fact, our attempts to couch laws in these terms have not only failed, but in some cases have led to
the discovery of causally homogeneous classes of objects among the items they designate that can be described by discovered general laws. We do not believe that there is any such thing as phlogiston. Why not? Because hypotheses that appealed to this substance in order to explain phenomena of combustion turned out to be superseded in the course of scientific development by hypotheses that appealed instead to the existence and operation of another kind of substance, oxygen. It was concluded therefore that there was no such thing as phlogiston: the terms did not designate any distinct kind of substance at all. General statements that cited absorption or liberation of phlogiston to explain combustion and its consequences came to be deemed to be false; true singular statements in which particular events were correctly cited as the causes of other particular events, but were referred to by descriptions implicitly or explicitly attributing the liberation of phlogiston to objects that took part in them, were accordingly deemed to be misleading, on the ground that although they correctly specified singular causes and effects, they did so by appeal to a concept which designates no real property of things. The hypothesis that the substance oxygen was incorporated during combustion and liberated during reduction enabled us to substantiate the truth of these true singular claims, while explaining their misleading character. They also enabled us to give alternative equivalent descriptions of the particular causes and effects cited in these misleading statements, which showed them to be consequences of and not incompatible with a law that implicitly denied the truth of the general statement about phlogiston that they presupposed. The term “phlogiston” disappeared from the description apparatus of language because it did not designate a natural kind, a class of causally homogeneous objects. And we discovered this fact through the failure to frame a well-confirmed hypothesis in which the notion figures.

The ordinary concept of “fish” designates no natural kind either, even though it continues to function in our everyday descriptive vocabulary. As we ordinarily use this term it means something like “a legless aquatic animal,” and this includes, along with bass and flounder, sharks, whales, octopus, jellyfish, and starfish. Now it is obvious that this class is biologically heterogeneous, for it includes mammals, whose physiology and behavior are utterly different from members of the phylum Pisces, who in turn are different in behavior and physiology from lower forms of aquatic animals like the shark, or mollusks or crustaceans, or coelenterates. Any attempt to frame a small number of general laws about, for example, the anatomical respiratory mechanism of the class of objects satisfying our ordinary meaning of “fish” is bound to fail. For there is no anatomical mechanism common to whales, trout, crayfish, jellyfish, and coral. Insofar as the class of objects that we normally call fish is not homogeneous with respect to nomologically significant properties, the notion of “fish” simply drops out of biological classification and biological theory. It is replaced by a set of other notions which
divide up the class of objects that "fish" lumps together into distinct natural kinds. It is about these natural kinds that simple and precise true universal general statements stand the chance of being discovered. Our guide to this new typology has been our eon-long investigation of the class which satisfies our ordinary notion of "fish" and our discoveries of scientifically significant differences among them. Our continued employment of the term "fish" in the expression of true singular statements (about, for example, which particular object we ate for dinner last night) is a reflection of the fact that for many practical, nonscientific purposes, terms that do not pick out natural kinds are perfectly serviceable, and indeed, dispensable only at the cost of great inconvenience and much irrelevant typological study.

Again, the notion of "race" current in biological and social science does not represent a natural kind; that is, there are no groups of traits common and peculiar to subsets of Homo sapiens that figure in general laws that will enable us to make theoretically significant distinctions between them, or to deterministically predict and explain the features and properties of behavior or structure of any individual Homo sapiens from a knowledge of his "race." One way of making this point is to say that there are no races. And clearly, what is meant by this claim is not that we cannot distinguish rough classes of geographically located, biologically related groups, but that there are no well-confirmed empirical generalizations about invariable differences between members of these classes. The continued employment of such notions as "race" to make invidious comparisons among individuals and to determine differential treatment of them is condemned as racism and explained as a reflection of irrational and immoral prejudice in part because of our belief that scientific study has shown the concept to be nomologically sterile, to individuate no natural kind.

Similarly, suppose that the notions of 'desire', 'belief', 'preference', and their other mentalistic cognates—'fear', 'hope', 'anticipation', 'expectation', 'want', 'suspicion', 'action'—do not describe natural kinds. That is, suppose that the events, states, and conditions that involve human beings, and that we describe by the use of these terms, do not constitute causally homogeneous classes—sets of events, states, and conditions that can be subsumed under a manageably small number of stateable general laws. If this is the case, then the singular statements that social science and ordinary practice commit us to about the causes and effects of particular mental and bodily states, events, and conditions may be true even though we shall be inevitably frustrated in our attempt to formulate general theories relating these states, events, and conditions. If there are no causal relations in which desires, beliefs, and actions figure, by virtue of their being desires, beliefs, and actions, then all of our singular statements referring to them could be true, even though there is no law that refers to them under their descriptions as desires, beliefs, and actions. In documenting the failures of economics, psychology, or the other
social sciences to provide specifications for desire, belief, and action independent of the maximization hypothesis that cites these causal variables, we have revealed the failure hitherto to substantiate empirically the belief that desire, belief, and action do constitute natural kinds. The exceptionlessness of the general statement presupposed by these subjects and by our ordinary explanatory practices limits the potential specifications of L’s variables to ones which are independent of behavior, and therefore restricts these specifications to neurophysiological ones. But the stupefying complexity, redundancy, and interconnection of brain states finely enough structured to be localized and credited with identity to particular states of belief and desire at particular times, together with the equally myriad bodily movements any one of which could constitute a particular action, make the provision of the specifications required for a mental notion’s being a natural kind as unlikely as an empirical possibility can be.

How is it possible for the singular claims of everyday life and social science to be construed as true causal claims about particular reasons and actions, if the terms which we hit upon for describing these causes and effects have no foundations in general laws, do not provide descriptive predicates that figure in nomological relations, do not describe the cited causes and effects under descriptions that reveal their powers to be the causes and effects we credit them with being? The explanation turns on the fact that we can use predicates attributively and referentially, that we can correctly designate the cause or the effect of an event, state, or condition even though we designate it by attributing to it properties which it does not have at all, but which we merely mistakenly believe it has, or believe are its properties causally relevant to its actual antecedents or consequents. Thus, we may correctly pick out a receptacle containing the products of combustion as the one and only one containing (we falsely believe) phlogiston. Of course, we are wrong to attribute to the beaker or test tube the property of containing phlogiston, but we may nevertheless be correct, by accident or not, in our referential claim that one particular item in the laboratory and not any other contains the products of the combustion. Similarly, we may say truly of a beached whale that the large fish died because it was out of the water for too long. Here our causal claim may be true even though both the descriptions employed to make our causal claim and the grounds of the claim are mistaken: mistaken because the animal in question was not a fish, but a mammal, and because, though the lack of water did lead to its death, it was not, as we suppose, through the process of asphyxiation but for some other reasons relating to thermoregulation. Or again, we may causally “explain” a particular person’s failure to manifest the genetic sickle-cell trait by noting that he is not a member of the black race. Our use of the notion of “black race” may in fact cut us off from a correct understanding of the causal connection between this genetic trait and persons whose ancestry is traceable back to a spatially localizable area of western sub-Sahara Africa, but our claim is not, for all
that, a false one. In these three sorts of cases the singular claims are true, so to speak, by accident. In each case we can correctly cite an individual event’s causes or effects because the events we bring together on the strength of false general beliefs, or no general beliefs at all, are in fact related by nomological generalizations that we are ignorant of. And it is because we are ignorant of them, ignorant of the descriptive concepts that figure in them, and that are in fact satisfied by the particular events we pick out, that we wrongly or misleadingly characterize the events in the ways we do. Indeed, since most of our ordinary vocabulary for describing the phenomena with which we are acquainted has been superseded in the development of science, since very little technical description of even readily accessible phenomena in physics, chemistry, or biology employs the predicates of ordinary language in their ordinary meanings, it must be inferred that most of our ordinary descriptive-kind terms do not pick out natural kinds: words like “table,” “chair,” “boy,” “cloud,” “paper,” “metal,” “liquid,” “light,” do not figure in natural laws and do not designate natural kinds. Of course, this does not make the vast number of statements that employ these terms false; it only makes their nomological justification difficult, and poses traditional problems for the analysis of causation into nomic subsumption. It is equally clear that since our practical purposes in the employment of these terms are well enough served by such terms in spite of their nomological isolation, we are unlikely to dispense with them except for the explicit explanatory and predictive purposes of science, with its special standards of rigor, precision, simplicity, unity, depth, and systematization.

Now, when we describe a particular event as an action or explain its occurrence by citing a particular agent’s mental states in terms that attribute to the agents both beliefs and desires, we may in fact be referring to the states which are in fact the causes of the event in question, even though there are no laws relating desires and beliefs to actions, and the laws that do relate the states and the events correctly brought together in the singular statement may be both so large in number and so complex in expression as to make filling out the justificatory details of the explanation practically—indeed, physically—impossible; and these details may be so foreign to our ordinary or social-scientific conceptual scheme as to make the attempt to connect systematically the singular relation in question with other such phenomena theoretically and practically sterile. This in fact will be the case if the neurophysiological correlates of states of belief and desire are as complex as I have suggested. The quick way to describe such a state of affairs is to recognize that terms like ‘belief’, ‘desire’, and ‘action’ do not pick out natural kinds. For purposes of the scientific study of human behavior, for the descriptive tools needed to uncover laws of human behavior, they are otiose.

The hypothesis that the terms in which we describe and explain human action are not natural-kind terms will explain why we have not found any laws of human action even though we have detected many pairs of particular
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causes and effects in human behavior correctly. We know from the history of
science that entrenched classificatory schemes and misleading descriptive
vocabularies have impeded scientific advance as much as or more than the
complexities and observational inaccessibility of the subject matter. Equally
important, breakthroughs in the discovery of new laws and theories of the
most powerful kind have turned on the establishment of new typologies as
much as on the provision of new research technologies, more powerful tele­
scopes, energy sources, and so on. The best example of such development
is perhaps the Mendeleevian table of the elements, which brought the ele­
ments together in new classificatory groupings so suggestive that they pro­
vided not only the descriptions needed for the development of the atomic
theory of matter, but much of its motivation in the discovery of new ele­
ments. Even more simply, reflection on the notion of simultaneity, and on its
conceptual position in mechanics, is more responsible for the special theory
of relativity than the empirical findings about the speed of light which
antedated the theory by some twenty years. Perhaps the obstacle to a social
science, to the laws that empiricism demands that we seek but which we have
not found, is not to be attributed to complexity and recalcitrance of subject
matter but to a well-entrenched typology which reflects no natural kinds and
in which, therefore, no laws can be expressed.

Our hypothesis that the explanatory terms of ordinary life and social
science are not natural-kind terms renders empiricism consistent with the
truth of the singular statements we are constrained to preserve, and makes
both of these commitments compatible with the view that though the social
sciences have as yet produced no general laws, given a more fruitful typology
they are capable of doing so. And it does all this without any implausible
appeal either to the comparative complexities of human behavior or to our
inability to objectively observe or experiment with it. But despite these
evident advantages our hypothesis must meet several significant challenges
and objections. The first of these, already noted when our hypothesis was
first broached, is the question of the status of $L$, our general statement
connecting actions with reasons. It was denied standing as a law on the grounds
that it cannot acquire the theoretical entrenchment whose possibility is a
necessary condition for nomological status. We have the potential explanation
for this in our hypothesis that reasons and actions are not natural kinds. But
how can we square this finding and its explanation with $L$’s truth? It will be
recalled that in my argument against $L$, I allowed that $L$ is a true and synthe­
tic general statement. Accordingly, I cannot defend $L$’s truth consistently
with the claims made about its variables by arguing that it is an analytic
proposition, a consequence of the meanings of its variables. Is there any
alternative but to admit that $L$ is a law? Yes, for there are many propositions
that are true synthetic statements which are universal in form and which are
not laws. Such statements are often called accidental generalizations, and it
remains a traditional problem for the empiricist to show how such statements are to be distinguished, in ways consistent with empiricist stricures, from nomological generalizations. It is universally admitted that there is a real difference between the laws of physics and chemistry and statements to the effect that every twentieth-century president elected in a year ending in zero died in office or that all the apples in a given basket were Golden Delicious apples. Although statements of the latter kind are true synthetic statements of universal form, they are clearly not laws, and the problem for empiricism is to explain why in ways that do not appeal to empirically inaccessible modalities, for example. Although this problem has not yet been solved, we may still appeal to the accepted distinction and preserve our explanatory hypothesis against any embarrassment produced by $L$’s truth and its synthetic status by classifying it as an accidental general statement.

The category of accidental generalization is a convenient pigeon-hole in which to cache $L$ in order to avoid the embarrassment of a true synthetic general statement about reasons and actions, but it is clear that independent grounds must be provided for so characterizing $L$; otherwise, our argument will be accused of circularity. Moreover, such independent reasons are also needed to explain why terms like ‘belief’, ‘desire’, and ‘action’ do not designate natural kinds. After all, so far our only argument for the claim that reasons and actions are not natural kinds is the failure to discover any laws couched in terms referring to reasons and actions; and our explanation of this latter fact (consistent with the truth of empiricism and the singular judgements we insist on preserving) is based on the hypothesis that these terms do not designate natural kinds. Because the consistency among other independent commitments that is effected by the explanation makes for an asymmetry in the grounds of these two claims, the relationship between them is not plainly circular; rather, it has the character of a highly controversial inference to the best explanation. It is a highly controversial inference because its plausibility rests on commitments to empiricism and because of the existence of an alternative explanation for the same phenomena—the absence of laws—which has not been excluded to its own proponents’ satisfaction. Consequently, what is required for a really convincing explanatory argument is some independent reason to accept the explanation, such as one which explicates the accidentality of $L$ independent of our failure to entrench it in a nomological network. If we can give independent reasons for the accidentality of $L$, we shall also thereby provide independent reasons for denying that beliefs, desires, and actions are natural kinds, and therefore provide a more fundamental, more general explanation for the failure to find laws of human action, one which does not trade on our commitments to preserving empiricism and to our singular judgements.

The explanation that will be provided rests on showing that the terms of $L$ have the character which is distinctive of the predicates of an accidental
generalization: they fail to be "purely qualitative," and their meaning involves reference to spatiotemporally localizable particular objects. Having predicates of this character is widely recognized as being a sufficient condition for the nonnomological status of a general statement. For statements that make implicit or explicit reference to particular objects, places, and times do not reflect the sort of universality associated with the notion of "law" and cannot be employed to explain and predict the infinite class of objects to whose existence the meaning of the law commits it. Thus, the death of John Kennedy can hardly be explained by citing the fact that he was elected in a year ending with a zero, even though it is a true generalization that all such twentieth-century presidents died in office. It cannot be so explained in part because the considerations which explain this accidental generalization are of great heterogeneity, and in part because their very diversity reveals the happenstantial, coincidental character of the generalization itself. It is characteristic of general statements which are couched in terms not purely qualitative and designate spatiotemporally particular items that their own explanations are inchoate and unsystematic; and this is, of course, just a reflection of their nomological isolation. Their truth is explained by explaining the truth of each of their finite number of instances, each of which appeals to a different explanatory principle or law. On the other hand, a law ipso facto provides an explanation of its instances, and does so both because it follows from more general laws in a direct way not involving appeal to its instances, and because its force transcends the finite number of instances of the law with which we might be acquainted and whose explanation we seek.

One hint that $L$ may have this status of accidental generalization appears in its genesis. For the method by which it was formulated reflects $L$'s contingency on the singular judgements that are its instances. $L$ is formulated by considering particular circumstances and the propriety of everyday objections to proffered explanations of actions by the citation of belief and desire. Its form, and the fact that its antecedent contains just six, and not five or seven, clauses, is a reflection of our merely conjectured inability to imagine other potential objections and the supposition that this inability reflects the nonexistence of further factors. This is one respect in which $L$ lacks nomic force. Moreover, the acceptability of $L$ is in part a consequence of the fact that if further actual or possible particular falsifying circumstances should occur (or occur to our imagination) we may simply formulate a new lawlike general statement just like $L$ which takes our new exception into account by adding the appropriate excluding clause to its antecedent. But this sort of foundation in unsystematic intuition and preservability is the mark of an accidental generalization par excellence. The strength accorded our singular causal claims about reasons and actions is a product of this introspective intuition that through them substantiates $L$. This immediate
self-conscious access to particular states which we have characterized as states of belief and of desire, and which we somehow directly know in our own cases and inductively infer in other cases to be the particular causes of those bodily movements and forbearances that we call actions, has been erected by some social scientists into an entire methodology, under the name of Verstehen. The unshakeable recognition of what the particular causal determinants of actions are in individual cases is what confers upon them the inviolability reflected in the common assumption of social science and everyday life, and it demands that an acceptable version of empiricism be rendered consistent with it. It also explains how we can consistently sustain the truth of so many singular causal claims in the absence of any law to underwrite them.

In the next chapter we shall find more than just a hint that \( L \), and any alleged law that mentions desires and beliefs, is an accidental generalization. So far, we have come halfway in our effort to preserve empiricism from untenability, for we have sketched an explanation for the absence of laws in the social science that does not merely reflect lack of industry or genius, that makes sense of four generations of empirical search for a law of human action, by showing that the search was not conceptually misconceived, but was bound to fail because of a commitment independent of empiricism. That commitment determines a typology which frustrates any attempt to discover general laws and which therefore must be surrendered in the description of human events that can find its way into such laws. But just because the description must be surrendered for nomological purposes, it does not follow that we must surrender our confidence in the occurrence of the events which that typology has been used to describe. And this is an important concession for the defense of empiricism as a prescription in social science. For without it, the adoption of empiricism could be claimed to have consequences so intuitively implausible as to make it practically inconceivable. But, as I have said, we have only come halfway in our defense. Although we have found a way to pass formally between the dilemma of an implausible defense of empiricism and the embrace of an even more implausible nonempiricist philosophy of social science, we must execute the actual passage, both by substantiating independently the claim that reasons and actions are not natural kinds, and by showing exactly what sorts of laws empiricism can lead us to expect in the social sciences. For it will be a hollow defense of empiricism as the correct method in social sciences if the result merely renders this philosophy of science formally consistent with the existence of a nomological wasteland, instead of showing how the concerted application of such a philosophical commitment can provide generalizations for subjects hitherto lacking them.