



The Ways of Error

BASICS

One can in principle err about pretty well anything. The three prime spheres of human concern are belief, behavior, and evaluation, which correlate with matters of fact, action, and value. And one can manage to err in all three settings. There are three main categories of error: *Cognitive* error arises from failures in the attainment of correct beliefs; *practical* error arises from failures in relation to the objectives of action; *axiological* error appertains to mistakes in regard to evaluation. Where there is cognitive error, one inclines to question the quality of the agent's intellect; with practical error, the quality of the agent's competence; and with evaluative error, the quality of the agent's judgment, if not character. However, in an intelligent being, whose actions issue from beliefs through the mediation of judgments, the three kinds of error are closely interrelated. Accordingly, the children's jingle "Sticks and stones may break my bones but names will never hurt me" does not get matters right. For words are the vehicle of our thought; and where our thoughts go wrong, so

will the actions that we inevitably guide by them; and wrong actions can, of course, prove to be very hurtful indeed.

Error is commonplace in human affairs because *Homo sapiens* are limited creatures whose needs and wants outrun their available capabilities. A liability to error is thus inherent in the very nature of our situation as beings of limited experience in a world of endless complexity. And specifically cognitive error roots in our human need to resolve issues of thought and action in conditions of imperfect information. Such error is common, because for every issue of decision, be it cognitive or practical, there is a multitude of conflicting responses of very different degrees of merit, and to our finite and fallible minds many of those goats seems altogether sheeplike to us—save on the closest and most painstaking inspection.

In the end, error is inevitable for us humans because, being intelligent creatures who act on the guidance of our beliefs, we base our decisions and actions on information, and even the best information available at the time is as often as not inaccurate. Our beliefs are based on our experience, and our experience is an incomplete and imperfect indicator for the generality of things. In shaping our beliefs we conform them to the *available* information, and this inevitably leads us to oversimplify, to generalize, where what is actually needed is qualification and complexification.

Error is a matter of getting things wrong. When intending to do *X*, one does *Y* instead—such as typing *casual* instead of *causal*—one makes an error. Committing an error accordingly involves a counterproductive act, the doing or omission of something one would fain alter. For error is a matter of actions—of *wrongdoing* in the case of practical error and *wrongthinking* (if only such a term were available) in the case of cognitive errors. Errors do not simply happen by themselves; they do not just occur but are made. Thus in his *Rhetoric* Aristotle characterizes a mistake (*hamartêma*) as a mishap that cannot be altogether surprising. For we human agents are prone to er-

ror, and mistakes (unlike misfortunes, *atuchêma*) are always the result of human agency. We say, "John *made* an error," and not, "An error happened to John." A being unable to act voluntarily can indeed do things that are counterproductive to its interests and indeed can even act self-destructively; but it does not commit errors, save when we speak figuratively. Inert devices—machines and instruments—do not commit errors; they malfunction, that is, fail to work as intended by their deviser. But they do not err when this occurs.

Errors generally arise in relation to aims and purposes. They require intention—at least implicitly regarding the sorts of purposes that people *should* have. Error is a fundamental purposive concept that takes the realization of certain objectives into view. With cognitive error the crux is one of failing to realize the truth of things, of answering our questions correctly. With practical error the issue is one of satisfying some need or desire of ours. And with judgmental error we misconstrue the worth of things. But in every case error is the same sort of thing: a matter of counterproductivity, of a shortfall or deficit in regard to success in achieving what are—or should be—our purposes.

Not only individual actions but entire processes and procedures for belief establishment can be erroneous. Just this is the case with those who are enmeshed in fallacies of reasoning of any sort. One can thus err not only in point of some specific belief, action, or evaluation but also in regard to the general way in which one proceeds in these matters. An individual who inclines to a certain generic fallacy in forming his beliefs can eventually come to see "the error of his ways." Such systemic errors are, of course, more serious because, like Shakespearean sorrows, they "come not single spies, but in battalions."

To be sure, error is not always all that serious. After all, errors are commonplace even in relation to mere games. In baseball one speaks of "hits, runs, and errors"; in tennis one speaks of "forced and unforced errors." The point is generally one of plays or moves that

fail in their intended objective—generally, but not always. Suppose that whenever the light turns green you are to throw the left-hand switch, and the right-hand one whenever it turns red. But suppose further that by some quirk of fate you are enmeshed in a red-green and right-left confusion. You will thus nevertheless function perfectly since the errors you make cancel each other out so that you act with perfect success. What we have here is a “comedy of errors” of sorts, for in some circumstances error can be a pretty funny thing.

The ancient Stoics taught the strange-sounding precept that all moral errors (sins, transgressions, *peccata*, *hamartêmata*) are equal: *isa ta hamartêmata*.¹ And in a way this seems correct: once we are off the mark, we are . . . well, off the mark. Wrong is wrong, and false is false. Yet there is something odd about error egalitarianism, something reminiscent of the repugnant stance that one might be hanged for a sheep or for a lamb. The fact of error is there either way. But the *gravity* of error is something else again. For errors are not created equal. The seriousness of error is a matter of degree, of more or less. However, it is important in this context to distinguish between the *extent* of error and its *gravity*. Extent has to do with how wide off the mark a mistake happens to be. When John is in Brussels, do I put him in Paris or in Pago Pago? Gravity, by contrast, is a matter of seriousness of consequences. My failure to put John at the scene of the crime is equally serious whether I put him ten or one thousand miles off.

The magnitude of an error depends on two factors, its *extent* and its *gravity*. Extent is a matter of the range of issues involved in an error: its substantive ramifications. It stands correlative to the scale of the requisite corrections: to the volume and scope of what must be done to put matters right. Gravity is a matter of the magnitude of consequences. A cognitive error is serious to the extent that it carries further errors in its wake, be they themselves practical or merely cognitive. And practical error is serious to the extent that the actions involved result in harm or other misfortune, whence the expression “a

fatal error.” The gravity of error is thus a matter of its consequences: mistaken beliefs in the one case and outright harm in the other.

When people fall into it through some flaw or failing on their part, the error at issue is said to be *culpable*; otherwise it is inadvertent—as, for example, when one misreads somebody’s very poor handwriting. The individual who believes or acts on patently inadequate and insufficient grounds errs culpably, unlike, say, the inadvertence of one who accepts something on the say-so of an otherwise reliable authority. An agent who is deceived by misinformation provided by another will certainly *be in error* about things, but such error is never culpable for that agent—not, at least, as long as the circumstances are not such that “he ought to know better.” Again, the erroneous judgments made by someone in the wake of optical illusions will not in general be considered culpable errors as long as circumstances are not such that the deception ought to be obvious to any sensible person.

COGNITIVE ERROR

Error rears its ugly head in every department of human affairs: our choices can go wrong on every front. Cognitive errors arise in matters of knowledge, evaluative errors in matters of judgment, practical errors in matters of action. The prospect of error lurks throughout the whole landscape of human affairs.

Incorrectness of belief is a matter of outright falsity. Mere insufficiency—imprecision, inexactness, vagueness, indefiniteness, and the like—does not constitute actual error, so not every failure to be faithfully true to reality is an error. Josiah Royce maintained that “The conditions that determine the possibility of error must themselves be absolute truth.”²² Such a contention can bear a generic construal:

The contention “Error is sometimes possible” cannot but be true.

This must be so because if, per impossibilia, the claim in question were not true, it itself would constitute an error. Alternatively, Royce's thesis also admits of a specific construal:

If this particular contention P is to be in error, then this must be so, because certain specific conditions prevent its being true (specifically, the conditions involved in the realization of its denial $\text{not-}P$).

This contention must also necessarily be so, given the involvement of error in untruth. Thus with either construal, Royce's thesis of the inextricable intertwining of error with truth holds good. In acknowledging the reality of error one cannot avoid acknowledging the reality of truth as well.

To be sure, accepting p can be an error even when p is true. To say "Accepting p on his say-so was an error" will be in order when I discover him to be untrustworthy even if p is true. And someone who accepts something when all the available evidence points in the opposite direction commits a mistake even if what he believes turns out to be so. All this points to the important difference between *procedural* error and substantive error. The former consists of reaching the wrong result, the latter of going about things in an inappropriate way. The person who operates by sheer guessing, or who looks to his garage mechanic for medical advice, is entrapped in a procedural error. This is not undone as such even if the result should chance to be appropriate. While procedural error is apt to issue in substantive error as well, it is not inevitable that it should do so. The flaw of procedural error lies not in the necessarily incorrectness of its result but rather in its total unreliability. This distinction between substantive and procedural error thus functions similarly in both the cognitive realm and the practical realm.

When a correct judgment results despite the commission of a per-

formatory error, we speak of this success as occurring “by a fluke.” To say this is not, however, to say that no error has occurred, but rather to indicate that a successful result was achieved *despite* the occurrence of that (performatory) error. But would one not rather be right for the wrong reasons than err on the basis of plausible ones? That is a complex question that admits of no general answer. It all depends on the conditions and circumstances of the particular case and on the seriousness of the error at issue. Ideally, we would want to err neither in substance nor in process, and deciding on the least of the evils is always complicated.

Some theorists maintain that cognitive error is always the product of the misuse of our faculties. However, optical illusions that invite incorrect judgments regarding the size, shape, or structure of objects represents a source of error that is innocent in this regard. Again, when all the information at our disposal points in the wrong direction—has an inherent bias toward some falsehood or other—there is no cognitive impropriety in “connecting the dots” to a conclusion that happens to be incorrect. We live in a world without absolute guarantees and have no foolproof assurance that trying our best to do the right thing will lead to the right result.

Why does such a thing as cognitive error exist at all in this world of ours? Basically, because there are two fundamental failings in human cognitive capability, namely, *incapacity* in point of access to information and *incompetence* in point of information processing. Our condition in the world is such that we have to answer many questions on the basis of incomplete information, affording an opportunity for haste, carelessness, bias, and a vast array of other factors to lead our beliefs awry.

It is one thing to realize *that* a certain claim is in error and quite another to understand *how* and *why* this is so. You need not know much about the moon to recognize that the assertion that it is

made of green cheese is erroneous. But to grasp the erroneousness of this error—to know *how* it goes wrong—you must know a good deal more about the matter. And, so, as R. G. Collingwood rightly stressed, refuting a false theory does not carry us back to the starting point of ignorance on the matter because we have, or should have, learned something in the process.³ The fact of it is that knowledge can only advance across a battlefield strewn with eliminated errors. As the aficionado of detective stories well knows, at every stage of a complex inquiry there looms a host of plausible possibilities whose truth and falsity can only be distinguished with the wisdom of hindsight. There will, to be sure, be some beliefs that are exempt from error. For one thing, error cannot arise where there just is no objective fact of the matter—as is the case, for example, with the question of just how many grains of sand it takes to make a pile.

PRACTICAL ERROR

Practical error is in general something counterproductive to an agent's *intentions* but not necessarily to that agent's *interests*. If I mistakenly turn right instead of left or say *Jane* where I meant *John*, it is perfectly possible that this slip-up averted disaster and engendered splendid consequences. This advantageous result, however, does not preclude the fact that I acted in error. When an error produces a positive result, this does not alter its status as such.

Is it an error to use a device that malfunctions? In general no. But only when the malfunction occurs in circumstances when it could or should have been foreseen—or where the stake is so great that its mere probability should not have been risked—can one speak of error in real cases. Obviously, the effect can be exactly the same irrespective of whether a human error (not filling the tank) or a mechanical malfunction (the tank's springing a leak) causes a certain

unfortunate result (running out of fuel). The crucial difference lies only in the sort of preventative steps that need to be taken (instruction in the case of humans, inspection in that of machines).

The relation to objectives is accordingly crucial for error, both those objectives we *do* have and those we *should* have, such as physical or psychological well-being. The former sort of error relates to *optional* ends; the latter to *mandatory* ends that people in general ought to have, even though many (perverts and psychopaths included) do not actually have. Some ends and aims are not optional but inherent in the human situation as such. Food, shelter, clothing, safeguarding when young, companionship and mutual aid—these are only a few examples of our needs, that is, objectives that are mandated for us by our mode of emplacement within the world's scheme of things. Other prime examples of these mandatory ends relate to issues of ethics and morality. And here errors stretch across a wide spectrum, from minor transgressions to outright sins.

Are there such things as *unavoidable* errors? Certainly not in cognitive matters, seeing that in this sphere error can always be avoided by simply suspending judgment: in accepting nothing we accept nothing wrong. But in matters of practice things stand differently. For here you can become trapped in a dilemma where you are damned if you do and damned if you don't. But the larger lesson here is that this sort of thing can only occur as the consequence of past error. Thus someone who has undertaken incompatible commitments may find himself in a position where he must either break a promise made to *X* or break one made to *Y*. But this dilemma is the consequence of a past error—namely, making those potentially incompatible promises: having already made a promise to *X*, it was clearly an error—a moral error—to make a potentially incompatible promise to *Y*.

EVALUATIVE ERROR

Homo sapiens is also *Homo valuens*: humans are evaluative animals. We have a natural tendency to take an evaluative stance of pro or con toward virtually everything. Most of the things we see we view in a positive or negative light. When reading a newspaper, every development reported upon strikes us as either good or bad: if we marked those we view positively in green and those we view negatively in red, few items would remain in colorless neutrality (perhaps the table of tides and the shipping news, unless we happen to be sea people ourselves). Our minds tend to spread the coloration of approval-or-disapproval across pretty well everything that they touch.

To be sure, some evaluative questions relate to what is entirely a matter of taste, of sheer subjective preference rather than inherently objective preferability. And here, too, there is no prospect of error. (That *X finds* parts of *Don Quixote* boring is a flat-out fact; but that parts of *Don Quixote are* boring—so that sensible people *ought* to find them so—does not seem to constitute a clear-cut fact one way or the other.) However, with many evaluative matters error is indeed possible, though here we tend to talk of *errors of judgment* rather than errors, flat out.

COMMISSION VERSUS OMISSION

Evaluative errors excepted, errors come in two basic forms: those of omission and those of commission. Errors of omission are failures to accept true facts in the cognitive case and failures to do what is circumstantially required in the practical. Errors of commission lie in accepting falsehoods in the cognitive case, performing counterproductive actions in the practical. Errors of omission are often called errors of the first kind (type I errors), while errors of commission are

referred to as errors of the second kind (type II errors). In cognitive contexts, errors of omission consist in giving partial and incomplete answers to the questions at issue. Most serious here are *misleading* answers, which, while in themselves correct, nevertheless embody suggestions and implications that point in an entirely wrong direction and could or would be corrected if only the omitted information were also supplied.

In practical goal-directed contexts, errors of omission consist in failing, for whatever reason, to do those things required to facilitate realization of the goal at issue. This is, of course, most serious in the case of mandatory goals, be they prudential or moral. It is, or should be, clear that errors (and sins) of omission can be every bit as serious as those of commission.

The well-known controversy between William James and William Kingdon Clifford yields an instructive lesson for epistemology through leading us to recognize that as regards the theory of knowledge (as in other ways) we live in an imperfect world. The ultimate ideal of absolute perfection is outside our grasp: the prospect of proceeding in ways wholly free from the risk of error is not attainable in this epistemic dispensation where there is an inherent trade-off between errors of commission and omission. They stand in inseparable coordination: any realistically workable mechanism of cognition can only avoid errors of the first kind (excluding truths) at the expense of incurring errors of the second kind (including untruths). The situation is as portrayed in figure 1.1. As the situation of point (1) indicates, if we insist upon adopting an epistemic policy that allows no type II errors and admits no untruths at all, then we are constrained to all-out scepticism: we can accept nothing and are thereby involved in a total exclusion from the whole realm of truths. The situation of point (3), on the other hand, indicates that, as we insist with increasing stridency upon reducing the exclusion of truths so as to curtail

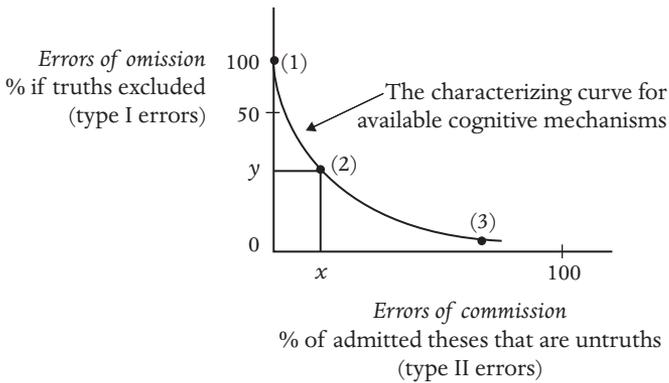


Figure 1.1. The trade-off between the two kinds of error

type I errors, we are compelled to an increasingly gullible policy that allows the goats to wander through the gate alongside the sheep. It is the happy medium of point (2) that we must strive to realize.

What we confront here is clearly a calculus-like minimax problem where we strive for the optimal balance of truths attained relative to errors excluded. However, the idealized schematic of achieving the whole truth (no errors of omission) and nothing but the truth (no errors of commission) is simply not part of the achievable realities of the human situation. As we become more enterprising and reduce our involvement in errors of omission, we are unavoidably bound to become involved in more errors of commission. In the conduct of our cognitive affairs, as in other departments of life, we must do the best we can in the circumstances: what one might abstractly think of as the absolute ideal is simply not attainable in this mundane dispensation.

There is an extensive and diversified terminology of cognitive error. There are misjudgments and misunderstandings, over- and underestimates, misestimates, and so on. A comparable situation prevails on the performatory side, where we find mispronunciation in speaking, misspelling in writing, mis-hits in tennis, and mis-throws

in baseball. Many errors of this general sort acquire special nomenclature—"double faults" in tennis, over- or undercooking in cuisine, Freudian-slips in communication, and the like. Benjamin Franklin the printer looked on the mistakes of his life as so many errata and wished he could add corrigenda to his life history.

MORE ON COGNITIVE ERROR

Cognitive error becomes common because truth is comparatively rare. After all, every true belief stands coordinate with not only its unique false contradictory but also a myriad of equally false contraries. When was Napoleon born? Why did he leave Elba? With such questions there is but one correct answer with a profusion of incorrect alternatives. And this means that the opportunity for error is limitless.

The quest for information exempt from the possibility of error—for absolutely certain knowledge—has been on the agenda of philosophy at least since Plato's day. The following are prime candidates for error-proof belief:

Elemental logical facts, such as "If p -and- q obtains, then p does."

Elementary mathematical facts, such as " $2 + 2 = 4$ " or "A sphere has no corners."

Definitional facts that either form parts of definitions or are obvious consequences of them.

Elementary observable facts, such as "Orange resembles red more than it does blue."

Reports of personal experience and subjective impression: "That leaf looks green to me," or "I am under the impression that that is a cat over there." (Note that all such

statements are subjectively about oneself rather than objectively about how the world is constituted.)

The drawback of all such error-proof facts is that none of them is able to provide substantial information about how things stand in the world. Such error-proof facts are also often characterized as being “foolproof” subject to the idea that the facts at issue are sufficiently simple to be at the disposal of the simple considered as being “things that any fool knows.” They pay the price for their error-resistant certainty in terms of a sacrifice of substantial informativeness.

Knowledge is inherently coordinated with truth claims. It makes no sense to say “ p is true, but I don’t know it to be so” with any specific proposition p in view. Nor, again, to say “I know that p , but it may possibly not be true.” Note, however, that this differs from “I know that p is true, but it *could* possibly not be so (if the world were different).” To claim knowledge is to maintain truth. All the same, with regard to our knowledge claims, as with pretty much everything else, we may well be mistaken. We do, and must, recognize all too clearly that much of what we claim as knowledge is merely *putative* knowledge, and that much of our putative knowledge is in fact error.

In speaking of a cognitive error one must be very specific about just what the issue at hand is. Take the case of an optical illusion, such as the straight stick that looks bent when held under the water at an angle. While it is certainly an error to say that it *is* bent, to say that it *looks* bent is not. The issue of being versus appearing is thus crucial for the correctness of the issue of straight versus bent.

Some systemic failings are linked specifically to cognitive errors: a tendency to jump to conclusions, for example, or gullibility. Others will operate adversely across the whole range of error, cognitive and practical alike: carelessness, heedlessness, or forgetfulness. Persons who exhibit such failings to a more than ordinary extent are said to be error prone.

Can one regard one's own beliefs as being in error? Certainly not in specific cases. If I regarded p 's acceptance as an error, then I ipso facto would not—and coherently could not—also include it among my beliefs. All the same, at the level of generality we realize full well that we are not perfect in cognitive matters. We have no choice but to acknowledge our fallibility. One cannot coherently say or think "I believe p to be the case but am mistaken about it." Categorizing what one accepts here and now as erroneous is infeasible in view of the fact that "acceptance" here means acceptance *as true*. The retrospectivity of a wisdom of hindsight is, of course, something else again. There is no problem with "I believed p to be the case but was mistaken about it." This sort of thing is all too common. We realize *that* we succumb to error despite the inability to pinpoint *where* we do so.

Thus it is nowise absurd or incoherent but the very reverse to think that *some* of one's beliefs could turn out to be mistaken. It is in fact impossible that I should be mistaken about this. For if (per impossible) I were mistaken here, then this very fact would establish the correctness of my belief. Someone who deems herself fallible in that some of her beliefs might be wrong cannot possibly err in all of those beliefs. (By contrast, as long as one acts at all, it becomes possible that all of one's actions could be practical error in that *everything* one does will be counterproductive vis-à-vis one's perfectly appropriate ends and objectives.)

That an error has been made is something that often only comes to light with the wisdom of hindsight, since what was done "seemed like a good idea at the time." (A classic instance of this was turning the Titanic to miss that iceberg: hitting it head-on would only have caused a large dent in its prow, whereas sideswiping it created a long underwater gash across several watertight compartments. But who could have known?)

The most extensive and longstanding discussion of error in philosophy has revolved around fallacies, a discussion that has flourished

since the days of Aristotle's *Sophistical Refutations*.⁴ Most of this material falls into the realm of epistemology, because what is involved pivots on misreasonings that extract *unwarranted* conclusions from actually or assumptively available information. Fallacies are generic processes of reasoning that are liable to lead to erroneous results (even if not inevitably bound to do so).⁵ A paradigm instance of a formal fallacy is the fallacy of affirming the consequent—a course of reasoning whose format stands as follows:

$$\begin{array}{l} p \rightarrow q \\ q \\ \hline \therefore p \end{array}$$

Such reasoning is clearly fallacious, seeing that it uses such obviously unacceptable arguments as the following:

If you are in New York, you are in America
You are in America.

Therefore: You are in New York

Fallacious reasoning is not, of course, the only avenue to epistemic error: sheer conclusiveness, reckless conclusion-leaping, and foolish credulity are other prime prospects. But the prominent role of logic in philosophy has brought fallacy into the forefront here. In actual practice formal fallacies are often enthymemes that tacitly assume certain plausible-seeming but possibly false substantive presuppositions. For example, in the preceding case one may be tempted to see that indication as holding in reverse as well. And should this prove to be so, that argument would be salvageable. Formal fallacies illustrate the point that error avoidance can be inadvertent. Thus if you reject p but accept q and thereby also accept $p \vee q$, while q is in fact false but p true, then you manage to avoid being mistaken in regard to $p \vee q$.

But this is entirely accidental, being the result of two now mutually canceling errors.

Is error always corrigible? Certainly so in the case of substantive cognitive error where the issue is simply one of information mismanagement. For here there is, by hypothesis, a fact of the matter, and the error at issue can be corrected by indicating this fact. However, practical error is something else again. For it relates to counterproductive actions occurring on the world's stage. And such occurrences can be overtaken by the course of events so that the counterproductivity involved can no longer be corrected because a point of no return has been reached. For example, although sins can be regretted and atoned for with contrition, they generally cannot be erased nor undone.

FURTHER ASPECTS OF ERROR

Can we frail mortals ever be exempt from error? Can we become literally infallible? Here, again, distinctions need to be made. The ancient Greeks differentiated between that which is so by nature (*phusis*) and that which is so by human convention (*nomos*). Now, by convention we can certainly become infallible—as with any court of final appeal in matters of law. But authentic and natural infallibility is not for us; at this level infallibility is the exclusive preserve of an omniscient God. Making mistakes is certainly something people rarely intend to do. But all the same, as long as there is such a thing as self-deception, it will not be entirely inappropriate to say that people can err deliberately in certain sorts of circumstances—in particular, those in which being in the right would simply be too painful.

Can someone err deliberately? Can a person knowingly and deliberately believe and endorse something that he deems to be false? After all, if by “believe” one means believe *to be true* and by endorse we mean “endorse as being true” (and it is surely this that is at issue

here), then deliberate error becomes something altogether problematic. And this is so not so much because we deem people to be rational but rather because we ourselves propose to behave rationally. It is this rationality *on our own part* that precludes our maintaining, on the one hand, that

X believes *p* to be true (or *X* accepts *p* as a truth),

and, on the other hand,

X deems *p* to be false (or *X* regards *p* as a falsehood).

For were we to say this, it would transpire that there is nonconsistency all right—but on *our* part, not on *X*'s.

ERROR AND THE PURSUIT OF KNOWLEDGE

The risk of error is unavoidable throughout the cognitive enterprise, and the control of error is a key aspect of rational inquiry. Since error cannot be eliminated from human affairs, we have little choice but to make the most of it. Our only route to cognitive progress proceeds along a pathway paved with error—we are creatures to whom truth becomes available only by risking error.⁶ Our knowledge grows only by eliminating error. Nevertheless, the elimination of error need not do much in and of itself to grease the wheels of knowledge. “What did you think about while you were waiting for her?” “Well—not George Washington; not the Treaty of Versailles; not the square root of two.” All this is true enough, and each item eliminates a possible mistake. But none of it brings us any closer to obtaining the real answer.

The role of error-correction in the theory of scientific method was initially explored by Charles Sanders Peirce.⁷ It is stressed throughout the work of Karl R. Popper and it has more recently been instructively developed and amplified by Deborah Mayo,⁸ whose work

elucidates the fruitful and substantive linkage between traditional philosophical approaches and the error-gearred reasoning of contemporary statistical theory. Clearly, the *via negativa* of error elimination is not the most promising way to knowledge acquisition. But, nevertheless, one of the best and most effective standards by which to test any proposed method or process of knowledge production lies in its capacity to minimize the chances of error.

ERROR AND CREATIVE THINKING

Correct thinking characterizes what is the case; error misrepresents this by affirming what is not. But does not error thereby engender something new and different, over and above what really is? Is error not in a way creative? This question is part of a broader issue. Can thought—veridical or not—create objects? Is there anything deserving of the name *thing* or *object* that can be created by thought? The plausible candidates here are listed in table 1.1.⁹

In scrutinizing table 1.1, a significant omission comes to view. For the idea emerges that *thought creates no authentic, identifiable, concrete*

Table 1.1. Objects created by thought

Concrete items (located in space time)

The specific episodes of thinking by particular individuals.

The general collectivity of thinking by members of a group (a society or culture, etc.).

Abstract items

The thought-items (theses, propositions, theories, hypotheses, ideas, plans, plots, etc.) that figure in the aforementioned concrete acts of thinking.

The thought-artifacts (languages, words, alphabets, norms) that constitute the machinery that figures in the aforementioned acts of thinking.

objects apart from those episodic events of thinking themselves and their concatenations. But what then of the objects that figure in hypothesis, dreams, and delusions: the Easter Bunny and present king of France? Are these not creatures of thought? In fact they are not. For what thought creates in not such objects but merely the *ideas* of such objects. The putative objects at issue do not exist in themselves. Of course those ideas exist, but they are something abstract. The objects themselves are among the missing. After all, putative concreteness is not the real thing. The tabulation accordingly reflects what is an appropriate conclusion: Acts of thinking themselves apart, thought creates no concreta, only abstracta.

I tell my class, “Imagine a fat man in that doorway.” The students obey my instruction—all proceed to think as it demands. But now how many imaginary men are there in the doorway? Thirty of them—one for each imagining student? Or just one of them, each imagining the same fat man? What if they are imagined differently—sometimes with a shirt and tie, sometimes with just a turtleneck? Does being imagined differently make them different? Does being imagined alike make them one and the same? All these questions are nonsense. You cannot count imaginary men because they lack individualized identity. The imagining of a man does not yield a definite item—an imaginary man. Unlike any actual man whatsoever, that “imaginary man” does not answer to a completely detailed description: what is at issue is schematic and is no particular individual with a definite identity of its own.

Consider the contrast between something real and something merely putative—say, between Napoleon (*N*) and Napoleon-as-*X*-thinks-him-to-be (*N/X*), that is, Napoleon as he was and *X*’s conception of him. Obviously, the things that are true of the *real* object (Napoleon) need not be true of the *putative* object (Napoleon-as-*X*-thinks-him-to-be). A discrepancy will occur whenever *X* is in error (be it in omission or commission). We cannot equate the two: they

have different properties. The actual *N* just may not answer to *X*'s conception of him. And yet the individuals at issue are identical—were they not, there would be no error. So complications arise here.

Worse yet, what if what is at issue is not a “mere misconception” but actually a case of mistaken identity? In particular, what if *N/X* is some nonexistent *M* and thus something altogether different from *N*—say, “the Man in the Iron Mask”? Clearly, *N/X* may not be identical with *N* at all. We would be well advised here to speak not of “*X*'s conception of *N*,” but of “*X*'s altogether mistaken impression that *N* is the Man in the Iron Mask.” In the end, *X*'s conception of Napoleon is a creature of *X*'s. Were there no thinkers, the world's reals would still exist; but misconceptions about them would not.

Yet while thinking—however deluded—is undeniably a part of reality, nevertheless, what is at issue will often as not be more products of thought's own activities and thus not real things as such but at most and best only ideas of things. And these ideas will always have an element of schematic abstraction about them and fail to be concretely identified items! Its own proceedings apart, thought is inert with respect to substantive reality. In and of itself it does not produce definite objects—or at least not objects different from those thoughts themselves. And since the thematic content of our thinking remains schematic, it does not, cannot, create a definite object. Authentic objects are by nature individuals. Those putatively thought-created so-called objects are no more than mere ideas of objects that, as such, are mere abstractions rather than substantial objects. Yet even here error can make inroads, since even thought-objects such as Alexius Meinong's round square can be enmeshed in inherent mistakes.