are kinds of people, as are child viewer and Zulu. People of these kinds can become aware that they are classified as such. They can make tacit or even explicit choices, adapt or adopt ways of living so as to fit or get away from the very classification that may be applied to them. These very choices, adaptations or adoptions have consequences for the very group, for the kind of people that is invoked. The result may be particularly strong interactions. What was known about people of a kind may become false because people of that kind have changed in virtue of what they believe about themselves. I have called this phenomenon the looping effect of human kinds (Hacking 1995).

Looping effects are everywhere. Think what the category of genius did to those Romantics who saw themselves as geniuses, and what their behavior did in turn to the category of genius itself. Think about the transformations effected by the notions of fat, overweight, anorexic. If someone talks about the social construction of genius or anorexia, they are likely talking about the idea, the individuals falling under the idea, the interaction between the idea and the people, and the manifold of social practices and institutions that these interactions involve: the matrix, in short.

Chapter Two

TOO MANY METAPHORS

The metaphor of social construction once had excellent shock value, but now it has become tired. It can still be liberating suddenly to realize that something is constructed and is not part of the nature of things, of people, or human society. But construction analyses run on apace.

Looking at their many titles makes one wonder what work the phrase “social construction” is doing. Take the entry for *L: The Social Construction of Literacy* (Cook-Gumperz 1986). The editor begins with an article of her own with the same title. There is no indication of what “social construction” means, nor any attempt to exemplify it. The book is about innovative ways of teaching children to read. The children are often disadvantaged, then they learn to read, both in and out of the California school system. Now it certainly is possible to think of literacy—the idea of literacy—as a social construct, with a good many political overtones (Hacking 1999). But that was not the point of the book at hand. It undertakes the valuable task of presenting a “social perspective” on how children learn to read, or don’t. Why talk of social construction? We fear a case of bandwagon-jumping.

Construction has been trendy. So many types of analyses invoke social construction that quite distinct objectives get run together. An all-encompassing constructionist approach has become rather dull—in both senses of that word, boring and blunted. One of the attractions of “construction” has been the association with radical political attitudes, stretching from bemused irony and angry unmasking up to reform, rebellion, and revolution. The use of the word declares what side one is on.

Sometimes this declaration tends to complacency. Sometimes utter-
ing the very phrase “social construction” seems more like standing up at a revival meeting than enunciating a thesis or project. Two things are readily forgotten. One is that a great many social construction discussions are embedded in the conception of a social problem that began, for American professors, perhaps a century ago. It led in due course to the journal *Social Problems*, and a gifted set of sociologists centered in Chicago. The trouble is that social construction has become a part of the very discourse that it presents itself as trying to undo.²

Secondly, it is astonishingly easy to lose the whole picture while focusing on a single pixel. Some constructionists wish to declare a kind of ownership over the context in which a social problem emerged, with the view that the outrages of times gone by are the same outrages which determine the present. This antiquarian view exists as a veneration for the past—though a strange veneration, which its practitioners would be insulted to hear so described. Such a position may suffer from myopia, for “most of what exists it does not see at all, and the little it does see it sees much too close up and isolated; it cannot relate what it sees to anything else and it therefore accords everything it sees equal importance and therefore to each individual thing too great importance” (Nietzsche 1874/1983, 74).

**PROCESS AND PRODUCT**

Most words ending in “tion” are ambiguous between process and product, between the way one gets there, and the result. The termination of the contract: that can mean the process of terminating the contract. It can also mean the upshot, the product, the end of the contract. The pattern is not identical for each “tion” word, because each word nuances the ambiguity in its own way. “Production” itself can mean the process of producing, or, in other circumstances, the result of producing. Is the production of a play process or product? What about movies?

As Lewis White Beck [1950, 27] noted long ago, our word “construction” shares in this ambivalent pattern of ambiguity. Thus we read, in a travel guide to Japan, that the construction of the Garden of Katsura Rikyu, the Imperial Villa in Kyoto, was completed by Toshihito in 1620. This refers to a process that came to an end in 1620. Then we read that the garden is a remarkably meaningful formal construction which consists of a semiformal pavement combining cut and irregular stones, followed by a series of natural stepping stones, which contrast with the stylized cut stones of the villa at the end of the path. In this sense it is the product that is meaningful, a delicate play between art and nature, that might not even have been intended by Toshihito.

Construction-as-process takes place in time. Some social construction books make this plain in a subtitle. Pickering on constructing quarks [1986] is subtitled *A Sociological History of Particle Physics*. Danziger [1990] on constructing the subject is subtitled *Historical Origins of Psychological Research*. The recourse to history is implied by other phrases, as in “The invention of teenage pregnancy” (Arney and Bergen 1984), or “The ‘making’ of teenage pregnancy” (Wong 1997). When Latour and Woolgar ([1979] wrote of the construction of a scientific fact, they wrote a fragment of the history of endocrinology. It is true that Latour presented himself as an anthropologist, and many others who write about the sciences present themselves as sociologists. Nevertheless their individual case studies are histories. The waters may seem a little muddied here. Some of the most prominent early social studies of science came from Edinburgh in the 1970s. The Edinburgh school, as it was called, identified its work as sociological, and claimed that it was engaged in a scientific study of science. The theoretical positions of leading figures such as David Bloor and Barry Barnes, updated in Barnes, Bloor, and Henry [1996], were more the result of philosophy than sociology. The empirical work done by the school, well represented also by MacKenzie [1981] or Mulkay [1979], was historical in character. Trained historians would often write differently about the phenomenon of teenage pregnancy than do Wong [a philosopher], or Arney and Bergen [sociologists], but the description and analysis of the process of construction, in all these cases, are historical in character.

Construction stories are histories, but to insist on only that angle is to miss the point. Constructionists about X usually hold that X need not have existed, or need not be at all like it is. Some urge that X is quite bad, as it is, and even that we would be much better if X were done away with, or at least radically transformed. X, the product, is the focus of attention, although, as I have explained, it is usually not X, the thing, teenage pregnancy, but the idea of X, the idea of teenage pregnancy, and the matrices in which the idea has life. If we overhear someone say, “And even I am a social construction,” we know that it is the person as product who is in question, a person who has been constructed by a social process, that person’s life history.
Process and product are both part of arguments about construction. The constructionist argues that the product is not inevitable by showing how it came into being (historical process), and noting the purely contingent historical determinants of that process.

In the next chapter I turn to natural sciences such as physics, chemistry, and molecular biology. Social construction provides one arena for the science wars. Constructionists state that various items from the natural sciences are social constructs. Many scientists deny that. They will admit that there is a [social] history of the discovery of the item in question, say the Second Law of Thermodynamics. Once upon a time the Second Law had ideological, political, or religious overtones. That does not matter. “The Second Law of Thermodynamics is neither an empirical claim, nor a social construction, nor a consensus by institutionalized experience, but an inexorable law based on the atomic constitution of matter” (Perutz 1996, 69). It is a fact about the universe that we have discovered. The history of its discovery makes no jot of difference to what it is, was, and always will be.

Disability

In social affairs, as opposed to chemistry or physics, scholars do make distinguishable claims, some meaning process and some meaning product. Take discussions of disability. We read that “disability as a category can only be understood within a framework which suggests that it is culturally produced and socially structured” (Olivier 1984, 15). The “it” that is “culturally produced” is a product. The cultural production is process. The “socially structured” is ambiguous. It could mean that the product is socially structured, in the sense that it has a structure that exists in a social setting (a structure reminiscent of the synchronic structure of Parisian structuralism). Or it could mean that the product is organized by a historical process named social structuring.

Sometimes process is clearly intended. “I call the interaction of the biological and the social to create [or prevent] disability the ‘social construction of disability.’” [Wendell 1993, 22]. Now examine this statement: “The disabled individual is an ideological construction related to the core ideology of individualism” (Asche and Fine 1988, 13). “The disabled individual” may refer either to a kind of person, almost a subspecies (as in “the whale is . . .”) or to individuals of that kind, particular disabled individuals. In either case the author refers to a product, the kind or the individuals.

There is yet another sense of construction, in addition to product and process. It has the same etymological roots as, and is similar in meaning to, “construal.” “Construal” originally meant seeing how a sentence is to be understood on the basis of its component parts. But the word quickly acquired the sense of interpretation. In the United States, a strict constructionist is a constitutional expert who argues for a strict construal of the American Constitution, trying to go no further than the very words written down and agreed upon by the founding fathers.

Harlan Lane is a distinguished deaf rights advocate, and partisan of American Sign Language as the basis for a viable linguistic community. He wrote an essay titled “The Social Construction of Deafness.” There he mentioned two “constructions of deafness, which are dominant and compete for people’s destinies” (Lane 1975, 12). What he meant was two ways of understanding deafness, two ways of thinking about deafness, two ways of construing deafness. One way to construe deafness is to think of it as a disability. Another way to construe deafness is to think of it as the basis for the formation of a linguistic minority. Construal, construction-as-process, and construction-as-product are inevitably intertwined, but to fail to distinguish them is to fall victim to forgotten etymologies.

Is “Social” Redundant?

Most items said to be socially constructed could be constructed only socially, if they are constructed at all. Hence the epithet “social” is usually unnecessary and should be used sparingly, and only for emphasis or contrast. Take for example the G entry for my alphabetical list in Chapter 1. Lorber and Farrell’s anthology (1991) is entitled The Social Construction of Gender. I have already sketched a diversity of feminist approaches to gender. Yet no matter what definition is preferred, the word is used for distinctions among people that are grounded in cultural practices, not biology. If gender is, by definition, something essentially social, and if it is constructed, how could its construction be other than social? The point seems to become self-evident when we get to titles like The Social Construction of Social Policy (Samson and Smith 1996).

The emphasis made with the word “social” becomes useful when we
turn to inanimate objects, phenomena, or facts that are usually thought of as part of nature, existing independent of human society. This is true for Latour and Woolgar's [1979] book, subtitled The Social Construction of Scientific Facts. They described work done in a laboratory whose head shared a Nobel prize for medicine for discovering the structure of a certain tripeptide, a hormone called Thyrotropin Releasing Hormone. What, according to the authors, was socially constructed? The fact, they answer, that this hormone was such and such a tripeptide. The hormone, and the new methods for establishing its structure, were thought to be so important that they earned the Nobel prize. So it was shocking, in 1979, to be told about the social construction of such an impersonal, presocial, biochemical fact. Yet in their second edition, Latour and Woolgar [1986] dropped the word "social" from their subtitle: "What does it mean to talk about 'social' construction? There is no shame in admitting that the term no longer has any meaning . . . By demonstrating its pervasive applicability, the social study of science has rendered 'social' devoid of any meaning" (p. 281). Latour had his own agenda here, increasingly apparent later with the "hybrid natural/social actants" (Latour 1987) and the "parliament of things" (Latour 1993). He holds that the usual distinction between the natural and the social is a sham. But one need not agree with his agenda in urging that we drop the "social," except for an occasional emphasis.

Now turn to essentially social entities, states, or conditions—I strive for sufficiently generic and noncommittal nouns here—such as literacy or lesbianism. If literacy is constructed, how other than socially? Perhaps being lesbian is an innate characteristic of some women, but if lesbianism is constructed, how other than socially? The philosophers-sociologists of the natural sciences seem to have been ahead of those who study more humane topics such as lesbianism or literacy. They banned the adjective "social" from their titles and their texts. Authors discussing specifically human affairs continued to employ it rather unreflectively.

KANT'S HOUSE

It is not always pointless to use the word "social" in connection with construction. For example, "social constructionist" has come to name a quite widespread body of tenets, theories, or attitudes. The adjective "social" is part of the name of this body of thought. Thus Donna Haraway [1991, 184] wrote that "recent social studies of science and technology have made available a very strong social constructionist argument for all forms of knowledge claims, most certainly and especially scientific ones." She cited Knorr-Cetina and Mulkay [1983], Bijker et al [1987], and "especially Latour" [1987] on Pasteur. Although Latour would erase the adjective "social," it is useful for Haraway to have a name for the school of constructionism that she takes to be represented by Latour, Knorr-Cetina, Mulkay, and Bijker. This is because there are many other schools. All of them, including social constructionism, seem to derive from Kant.

Kant was the great pioneer of construction. Onora O'Neill's book about Kant, Constructions of Reason [1989], is well titled. Kant was truly radical in his day, but he still worked within the realm of reason, even if his very own work signaled the end of the Enlightenment. After his time, the metaphor of construction has served to express many different kinds of radical philosophical theory, not all of them dedicated to reason. But all agree with Kant in one respect. Construction brings with it one or another critical idea, be it the criticism of the Critique of Pure Reason or the cultural criticisms advanced by constructionists of various stripes. We have logical constructions, constructivism in mathematics, and, following Kant, numerous strains of constructionism in ethical theory, including those of John Rawls and Michel Foucault.

Bertrand Russell's Logical Constructions

"Wherever possible," wrote Russell, "logical constructions are to be substituted for inferred entities" [Russell 1918, 155]. When you infer an entity, you infer that it exists. Do numbers exist? Do electrons exist? We infer [thought Russell] that electrons exist from the reliability of scientific laws involving electrons. Platonists suppose that numbers exist. Russell urged ontological caution. He did not like us to infer the existence of things of some kind, unless we could be certain that things of that kind do exist. Yet he did not want to follow the skeptical Diogenes to the bathtub, feigning ignorance about everything. We know a good deal that we express in terms of numbers and electrons. Russell wanted to be able to state what we do know, without assuming the existence of such things. That is where the notion of a logical construction comes in. On the surface, we appear to be talking about things of a certain kind, but when we analyze more deeply, we are not.
More technically: Let $T$ be a term that, grammatically, is used to refer to $X$, either an individual thing, or things of a certain kind. $T$ is shown to be a name for a logical construction when sentences in which $T$ appears are, in a systematic way, logically equivalent to sentences in which $T$ does not occur, and no reference is made to $X$. Thus although statements using $T$ appear to refer to $X$, and hence to imply or presuppose the existence of $X$, logical analysis obviates the implication.

What is the point? When an inferred entity $X$ is replaced by a logical construction, statements about $X$ may be asserted without implying the existence of $X$s, since the logical form or deep structure of those sentences makes no reference to $X$. We are allowed to talk about $X$s while being agnostic about the existence of $X$s. This is not a "same-level" skepticism which outright denies that we have grounds for thinking that there are $X$s. Russell's analysis shows that the logical form of statements about $X$ is not what we think. We discover that below the grammatical surface we were never talking about so-and-sos in the first place. Russellian analyses do not debunk inferred entities. They show that there is no commitment to the existence of so-and-sos. But they do license statements about so-and-sos, precisely because they show that those statements do not have the existential commitments we expect them to have.

**Logical Positivism**

Logical positivism, usually thought of as antagonistic to constructionism, was also deeply committed to the construction metaphor. Russell's program was energetically pursued in Rudolf Carnap's *Der logische Aufbau der Welt* (1928). The English translation renders *Aufbau* as "Structure," but *Aufbau* means "construction" (or, in context, "building"), and that is what Carnap meant. He wanted to establish that the world could be built up from elements, the data of sensory experience, or perhaps items that played a role in physical science.

The logical positivists (aside from Otto Neurath) might have been troubled by some of the twists of constructionism in recent sociology. Not too upset: Thomas Kuhn is standardly presented as the originator of the modern trend toward social studies of science, but as Peter Galison (1990) has shown, there is a good deal in common between Kuhn and Carnap, and both men knew it. The roots of social constructionism are in the very logical positivism that so many present-day constructionists profess to detest.

Yet we should not overdo that statement. Kuhn said little about the social. More than once he insisted that he himself was an internalist historian of science, concerned with the interplay between ideas, not the interactions of people. His masterpiece, ever fresh, is now over thirty-five years old—truly the work of a previous generation. *The Structure of Scientific Revolutions* is rightly honored, by those who conduct social studies of the sciences, as their pre-eminent predecessor. Yet for all that Kuhn emphasized a disciplinary matrix of one hundred or so researchers, or the role of exemplars in science teaching, imitation, and practice, he had virtually nothing to say about social interaction.

**Construct Validity in Empirical Psychology**

Before turning to a later genre of construct-ism, another of Russell's heirs should be mentioned—this one from empirical psychology. In the late 1930s logical positivist philosophers of the natural sciences had begun using the noun "construct" for theoretical entities such as electrons (see Beck 1950 for references). It was taken up in fundamental debates in the philosophy of the social sciences, for example, in connection with historical individualism, where you find J. W. N. Watkins, a Popperian, challenged by May Brodbeck, who studied with Herbert Feigl, the distinguished logical positivist who had emigrated from Berlin to Minnesota. Watkins introduced the "anonymous individual," which Brodbeck denounced as an irreducible theoretical construct and thereby unworthy of a scientific sociology. [For a summary of 1950s debates, with references, see May 1987, 14–18.]

After World War II this usage was also transferred to the philosophy of experimental psychology [for example, MacQuarquodale and Meehl 1948]. Hypothetical entities or quantities in psychology came to be called constructs. Familiar examples are IQ, or Spearman's controversial g, the factor called "general intelligence." How can we distinguish constructs that logical positivists took to be virtuous from those that they took to be suspicious, such as libido? When are hypothetical constructs valid? The most authoritative text on psychological testing states that "The term 'construct validity' was officially introduced into the psychologist's lexicon in 1954 in the *Technical Recommendations for*
Psychological Tests and Diagnostic Techniques, which constituted the first edition of the 1985 Testing Standards. The first detailed exposition of construct validity appeared the following year in an article by Cronbach and Meehl [1955]" [Anastasi 1988, 161].

The logical positivist ancestry of construct validity has been somewhat suppressed in psychology's self-history. In 1955 Lee Cronbach (b. 1916) was rapidly establishing himself as a leading figure in education. Paul Meehl (b. 1920), one of the most sophisticated critics of much experimental and statistical psychology, was another associate of Herbert Feigl. Russell's logical constructions and Carnap's Aufbau were very much present at the birth of that cardinal concept of psychological testing, construct validity.

Nelson Goodman's Constructionalist Orientation

Nelson Goodman, a philosopher of both the arts and the sciences, has described his philosophical orientation as "skeptical, nominalist, and constructionist" [Goodman 1978, 1]. "Constructionalist" seems to be a word of Goodman's invention. Possibly two meanings are packed into this label. One refers to Goodman's early work. It involves making or exhibiting constructions. Goodman and Quine (1947) published "Steps towards a Constructive Nominalism," dedicated to a systematic elimination of, among other things, classes, in favor of logical constructions. Goodman's The Structure of Appearance (1951), based on his doctoral dissertation (1940/1990), was the heir to Carnap's Aufbau. His early version of constructionalism was an active philosophy which constructed, or showed how to construct.

It was also a critique of Aufbau, arguing that what we call the world could be constructed in many ways. Might some ways be simpler than others? No. Goodman is the author of the most trenchant of critiques of the notion that simplicity has any existence outside of the eye of the beholder. Any one world may be made in many ways, and many worlds may be made.

Goodman's philosophy evolved from Russell and Carnap. His title, Ways of Worldmaking (1978), means what it says. Goodman contentedly talks of making worlds, and takes for granted that it is we, people, who make them. Moreover, we do so in concert. This sounds social, but Goodman got there in a straight line from Russell and Carnap.

Goodman and his fellow constructionalists say almost nothing about actual societies or social processes. This is to some extent a generational effect. Goodman's collaborator, W. O. Quine, wrote a great deal about translation, but it tended to dwell on translation involving imaginary explorers encountering natives who live in jungles populated by fauna unknown to any real jungle, namely rabbits. Whatever be the case with Quine, whose philosophy is more given to regimentation than inquiry, Goodman's world-making has to be social: it is people who do it. Goodman has been enthusiastic about at least some social studies of construction in the natural sciences. Yet his work gives no hint of any actual social process involved in world-making. Chapter 5 below starts to fill the gap with a single example; many more are needed.

Constructivism in Mathematics

Kant's house has many mansions. Kant began his Critique of Pure Reason by trying to understand a puzzle about the truths of arithmetic and geometry. How can we know them just by thinking, and yet apply them in the real world which exists independently of thought? The answer comes in two parts. First, all experience is in space and time, which is not a fact about experience, but a precondition for anything we call experience. Second, space is structured by the laws of geometry, and the units of time are structured by the laws of arithmetic. Both structures derive from the nature of thought itself. Thus the laws of geometry and arithmetic are a priori, yet anything experienced must conform to them. Hence the famous doctrine of the synthetic a priori. Kant's view of geometry was devastated at the beginning of this century, when it became clear through Einstein's use of Riemann's mathematics that the real world might best be described by non-Euclidean geometry: there was no pure geometry of the mind uniquely best suited for experience.

A second, arithmetical, revolution failed to take place. The Principia Mathematica of Whitehead and Russell [1910] was intended to undo Kant's views of arithmetic, showing that number theory could be deduced from pure logic—the numbers and all their properties were, rather literally, logical constructions. That program did not pan out, for very famous reasons, connected with the name of Kurt Gödel. And at the very same time that Whitehead and Russell were writing their opus, a rival program named intuitionism was inaugurated in Holland by L. E. J. Brouwer. The "intuition" in question had a technical connotation, alluding to what Kant called pure intuitions of space and time. According
to Brouwer, number-theoretic knowledge has two sources. The first source is a rather Kantian pure intuition of number. Numbers are generated by us, as they structure the experience of counting. The second source is proof, and all that we can build up from those intuitions by proof. Proofs are generated by us, as active thinkers. That seems like a truism, but it was taken seriously by intuitionists, with remarkable consequences.

Intuitionists held that mathematical objects do not exist until they have been built up by proofs of their existence, that is, until they have been constructed by mental operations. Valid proofs must be constructive; that implies that a mathematical object can be assumed to exist only when, by proof, we have been able to construct it out of intuited entities. Mathematics, so often thought of as a body of eternal truths, takes place in time, and objects come into being as they are constructed. This approach has a well-known radical consequence. You cannot assume the law of the excluded middle. You cannot assume that for any proposition \( p \), either \( p \) is true, or \( \neg p \) is true. That is because the proposition may refer to an object that has not yet been constructed by proof. The first years of the twentieth century were revolutionary times indeed. Einstein had dethroned Kant, while Brouwer’s intuitionistic reasoning challenged Aristotle. Next in line were Lenin and the new quantum mechanics, the one trying to undo capitalism and the other undoing causality.

Brouwer’s intuitionism led to various types of what are called constructive mathematics, especially constructive analysis (calculus) (Bishop 1967). As with other construct-isms, constructivism in mathematics is skeptical, because it allows us to assert the existence of objects only after we have constructed them in a sequence of mental operations. Hence it forbids us to assert the existence of many mathematical objects that most mathematicians take for granted—the continuum of real numbers, for example.

**Moral Theory**

I have said nothing about ethics, nor will I in these chapters. Let us record, however, that it has been a constant thrust in moral theory, from Immanuel Kant’s categorical imperative to John Rawls’s theory of justice and Michel Foucault’s self-improvement, to insist that the demands of morality are constructed by ourselves, as moral agents, and that only those we construct are consistent with the freedom that we require as moral agents. Some readers may find it natural to couple the names of Rawls and Kant but bizarre to pair Kant and Foucault. On the contrary, Foucault began his intellectual career with Kant’s Anthropologie. Georges Canguilhem was on the mark in calling Les Mots et les choses a study of the historical a priori. Foucault was pursuing, in his own inimitable and transformative way, Kantian ethical themes of the well-made life in his own final days.

**Different names for different construct-isms**

Kant may have cast the mold, but the drive for construction belongs to the twentieth century. The constructing attitude is skeptical. It is also humanist. It says that the demands of morality do not come from the idealized and not-human Father or even the idealized posthuman Son. They come from the demands on rationality that free human agents place on themselves. It says that mathematical objects are not out there in Plato’s nonhuman heaven; it is we who bring them into being. It says that we should not infer the existence of minute and unobservable entities from their causal effects; instead we are to describe phenomena as they appear to us, analyzing the theoretical entities into logical constructions. It says that in experimental psychology we do not use categories found in nature but constructs whose validity is established by our practices. To cap it all, Nelson Goodman tells us about ways of world-making. Not even the world itself is safe from these philosophies of construction. It is chiefly in this company that the adjective “social” marks out a further theme. Social constructionists teach that items we had thought were inevitable are social products.

What are we to call these different mansions built within Kant’s house? We can help ourselves to labels that are almost ready-made. Goodman called himself a constructionalist. So let constructionalism refer to the philosophical projects of Russell, Carnap, Goodman, Quine, and their associates and followers. They aim at exhibiting how, or proving that, various important entities, concepts, worlds, or whatever are constructed out of other materials.

Constructionalists may hold that constructions are made by people, together, but they do not study historical or social events or processes. Their instincts are skeptical about constructed items, and yet not profoundly so. They do not say flatly that the items do not exist, or that we
cannot have grounds for believing they exist. On the contrary, we have excellent grounds, but after analysis we realize that our beliefs are not what they seem. Constructionalism is a change in the level of discourse. I see this attitude as including not only Brodbeck’s critique of Watkins, but also the Cronbach and Meehl proposals—now so entrenched in the experimental psychology of measurement—for legitimating constructs in psychology which do not derive from direct observation.

Without placing any weight on the terminology, I find it convenient to leave the label constructivism to mathematics. That is where the term was first used, at least in modern times, and it denotes a flourishing, if minority, research activity. If we left “constructivism” to mathematics, we would avoid the confusion invited by a title such as Social Constructivism as a Philosophy of Mathematics (Ernest 1998), which suggests, to anyone who knows anything about mathematical constructivism, something like a social variant of Brouwer’s program (a rather incoherent idea). It would have been better, I think, to speak of social constructionism as a philosophy of mathematics, a philosophy that would presumably maintain that in some sense mathematical objects, such as numbers, and mathematical facts—theorems—are social constructs. That would be analogous to constructionism about the natural sciences, although the arguments would presumably be different.

It is true that many people nowadays speak of social constructivism rather than constructionism in any context whatsoever. Throughout Chapter 1 I spoke instead of [social] constructionism. (I suspect that some readers, out of habit, actually pronounced the word as “ivism,” not as “ionism.”) Nothing should hang upon a spelling, or a syllable, but my usage does pay attention to the fact that recent enthusiasm for social constructs is only one mansion in Kant’s big house, and it allows the others, such as mathematics, to keep the names that they chose for themselves quite a long time ago.

Hence by constructionism (or social constructionism if we need, on occasion, to emphasize the social) I shall mean various sociological, historical, and philosophical projects that aim at displaying or analyzing actual, historically situated, social interactions or causal routes that led to, or were involved in, the coming into being or establishing of some present entity or fact.

Most constructionists have never heard of constructivism in mathematics. Constructivists, constructionists, and constructionalists live in different intellectual milieus. Yet the themes and attitudes that char-

acterize these isms are not so different. From all three we hear that things are not what they seem. All three involve iconoclastic questioning of varnished reality, of what the general run of people take for real. Surprise, surprise! All construct-isms dwell in the dichotomy between appearance and reality set up by Plato, and given a definitive form by Kant. Although social constructionists bask in the sun they call postmodernism, they are really very old-fashioned.

BUILDING, OR ASSEMBLING FROM PARTS

Construction has become stale. It can be freshened up if we insist that the metaphor retain one element of its literal meaning, that of building, or assembling from parts. After the plethora of titles cited at the start of Chapter 1, it is good to be brought back to the real world, with a book title such as Constructing a Five String Banjo. When it comes to banjos, we are told how to make one. Most of the [social] construction/constructing works do not exhibit anything resembling a construction. Construction has become a dead metaphor. That expression, itself a metaphor, is from Fowler’s eccentric Modern English Usage:

METAPHOR. 1. Live & dead m. In all discussion of m. it must be borne in mind that some metaphors are living, i.e., are offered & accepted with a consciousness of their nature as substitutes for their literal equivalents, while others are dead, i.e., have been so often used that speaker & hearer have ceased to be aware that the words used are not literal; but the line of distinction between the live & the dead is a shifting one, the dead being sometimes liable, under the stimulus of an affinity or a repulsion, to galvanic stirrings indistinguishable from life. [Fowler 1926, 348–49.]

If we are to return “construction” to life, we should attend to its ordinary meanings, as in constructing a five-string banjo. The core idea, from Latin to now, is that of building, of putting together. The fairly new (1992) American Heritage Dictionary first offers “to form by assembling or combining parts.” Then it gives us a dead metaphor, lacking brick and mortar, or girders and concrete: “To create [an argument or a sentence, for example] by systematically arranging ideas or terms.” This metaphor, like the very ancient and very dead geometrical metaphor of constructing with a ruler and compass, retains the sense of systematic
arrangement of elements, which become part of a whole. Of course the whole is more than the sum of the parts, because it is a systematic arrangement, a structure. Buildings are always more than the sum of their parts.

Constructionalists [Russell] and constructivists [Brouwer] were true to the root metaphor of construction as building. Whitehead and Russell wrote down the construction of the number 1 and its successors within their system of logic. Brouwer had well-understood criteria for the building up of a mathematical object by proof. And although I would not argue the point here, it seems to me that in ethics, Kant, Rawls, and Foucault, to repeat the names of the three moralists I have mentioned, tell us how to build, and why. I urge [social] constructionists to keep the same faith. Anything worth calling a construction was or is constructed in quite definite stages, where the later stages are built upon, or out of, the product of earlier stages. Anything worth calling a construction has a history. But not just any history. It has to be a history of building. There is no harm in one person stretching a metaphor, but when many do, they kill it.

Most writers never reflect on the metaphor in “construction.” Sergio Sismondo is the rare philosopher who does. He generously notices six legitimate metaphorical uses of the word in the social construct literature. In fact one of these is not a metaphor at all: scientists “construct, through material intervention, artifacts in the laboratory” (Sismondo 1996, 50) Surely a great deal of apparatus is literally, not metaphorically, built out of, or assembled, from parts? Sismondo is insightful when he includes the root philosophical metaphor of construction which, as I observed above, derives from Kant. In contrast to Sismondo, I would, however, insist that most social construct writing is almost wildly metaphorical, or rather, passes beyond metaphor. Rather than give invidious examples, it is better to mention a few authors in whose work the construction metaphor is put to good use.

The Psychological Subject

Kurt Danziger’s Constructing the Subject (1990) is a fine example of how the construction metaphor can be used, fairly literally, when applied to a social rather than a natural science. Danziger has written a history of experimental psychology. The subject in question is none other than “the subject” who appears in the experimenters’ laboratory report, once upon a time often abbreviated by the letter “S” to depersonalize the subject as much as possible. Today we are all subject to such tests and expect to be given them when we are growing up, are inducted into the military, try out for a corporate job, or report an inexplicable malaise to a psychiatrist.

Danziger writes about the social construction of the subject. But what is that? As is quite common in Constructing books, Danziger writes about constructing at least four distinct kinds of entity: a concept or idea, a practice, a body of knowledge, and individuals themselves. First, there is the idea of the subject to observe or to test in experiments. Danziger is convincing when he urges that this is not a self-evident idea that was well understood as soon as the idea of laboratory-style experimentation on the human mind came into being. The first subjects of psychological experiments were commonly the experimenters themselves—Gustav Fechner, for example. Or the experimenter and subject were two people who took turns switching roles: the subject becoming the experimenter who subject ed the former experimenter to test. This contrasts dramatically with the subsequent notions of an objective psychology, in which the subject is thought of as an object that must be scrupulously set apart from the experimenter in order to avoid contamination.

Secondly, Danziger’s book is about constructing a family of practices within which the subject is embedded. The upshot is a laboratory that is expanded to occupy the worlds of business, the military, education, law, and pathology, where people are regarded as subjects for testing. In a powerful passage at the end of his book, Danziger writes of “a fundamental convergence between contexts of investigation and contexts of application”:

the individuals under investigation became the objects for the exercise of a certain kind of social power. This was not a personal, let alone violent, kind of power, but the kind of impersonal power that Foucault has characterized as being based on “discipline.” It is the kind of power that is involved in the management of persons through the subjection of individual action to an imposed analytic framework and cumulative measures of performance. The quantitative comparison and evaluation of these evoked individual performances then leads to an ordering of individuals under statistical norms. (Danziger 1990, 170)
A third item to be constructed is knowledge. [Danziger's last chapter is titled "The Social Construction of Psychological Knowledge."] The passage quoted above continues as follows:

Such procedures are at the same time techniques for disciplining individuals and the basis of methods for producing a certain kind of knowledge. As disciplinary techniques the relevant practices had arisen during the historical transformation of certain social institutions, like schools, hospitals, military institutions, and, one may add, industrial and commercial institutions.... This kind of knowledge was essentially administratively useful knowledge required to rationalize techniques of social control in certain institutional contexts. Insofar as it had become devoted to the production of such knowledge, mid-twentieth-century psychology had been transformed into an administrative science.

Only by implication does Danziger discuss a fourth category, individual people. We are now trained to answer questionnaires or perform various tasks in order to find out our talents or what ails us. Of course the tests themselves do not settle things. Some readers will wish I had followed the advice given after my vocational aptitude tests early in high school—that I should become a meteorologist. The point is not what the tests say about each of us, but that each is now a kind of person who hardly existed a century and a half ago: fit subject for testing. Without us as common fodder for tests, there could hardly be such a thing as the Mental Measurements Yearbook [Mitchell, 1992]. This handbook is scrupulous in admitting only very well validated and widely used tests. [Meehl's construct validity is strictly enforced!] The number of available tests has doubled with each edition over the past decades.

Danziger's book is a paragon of fairly literal constructionism. It presents a history of crafting various parts that are in turn assembled into larger structures. Experimental psychology begins with the physiology laboratory as model. Through the use of that model a new type of investigation is constructed. Certain types of inquiry are pared away from it—Wundt's introspection, for example. A new element is added. Subjects are not treated individually; aggregates become essential as statistical technologies are advanced. Statistical procedures from agronomy or biometrics are incorporated, often in black-box form; the psychologists who use the tests often have little idea of their rationale. There have been meta-experiments in which fully accredited psychologists were asked what a significance level means; only a minority give methodologically sound answers.

The metaphor of construction fits the chain of events that Danziger organizes. This is because there is something of a historical step-by-step building of specific techniques, institutions, and problems, each using previous steps, and assembled to form a further stage in the production of later techniques, institutions, and problems.

UNMASKING

Chapter 1 mentioned another metaphor, the metaphor of unmasking. It goes back to a familiar predecessor of constructionism—exactly contemporary with logical positivism. In his definitive 1925 paper on the sociology of knowledge, Karl Mannheim stated the four factors that created a need for the sociology of knowledge:

1. the self-relativization of thought and knowledge,
2. the appearance of a new form of relativization introduced by the "unmasking" turn of mind,
3. the emergence of a new system of reference, that of the social sphere, in respect of which thought could be conceived to be relative, and
4. the aspiration to make this relativization total, relating not only thought or idea, but a whole system of ideas, to an underlying social reality. [Mannheim 1925/1952, 144]

It is slightly misleading to take the term "unmasking" from Mannheim, for the word is that of his translator. The German original is enthüllung, which means revealing or exposing. In Wagner's Parsifal the cry goes up, "Uncover the grail!"—Entthüllet den Gral! "Unmasking" has, in addition, an overtone of exposing something that was deliberately covered, in order to conceal its true nature. The "unmasking turn of mind," wrote Mannheim, is

a turn of mind which does not seek to refute, negate, or call in doubt certain ideas, but rather to disintegrate them, and that in such a way that the whole world outlook of a social stratum becomes disintegrated at the same time. We must pay attention, at this point, to the phenomenological distinction between "denying the truth" of an idea, and "determining the function" of its exercises. In denying the truth of an idea, I
still presuppose it as “thesis” and thus put myself upon the same theoretical [and nothing but theoretical] basis as the one on which the idea is constituted. In casting doubt upon the “idea,” I still think within the same categorical pattern as the one in which it has its being. But when I do not even raise the question [or at least when I do not make this question the burden of my argument] whether what the idea asserts is true, but consider it merely in terms of the extra-theoretical function it serves, then, and only then, do I achieve an “unmasking” which in fact represents no theoretical refutation but the destruction of the practical effectiveness of these ideas. [Mannheim 1925/1952, 140]

Mannheim’s model was Marxian, and he thought in terms of unmasking entire ideologies. He had, moreover, a sort of functionalism in mind. An ideology would be unmasked by showing the functions and interests that it served. Yet unmasking, in very much the terms used by Mannheim, has broader implications.

Mannheim wrote that the hidden history of the unmasking turn of mind “still calls for more exact investigation” (141). There is a lot of not-so-hidden history, featuring such household gods as Hegel, Marx, and Freud. An instructive hidden history would take in not only the unmasking of ideologies, but the local unmaskings attempted by Bertrand Russell and his admirers. The Russelian doctrine of logical constructions did not in general aim at refuting claims about theoretical or abstract entities, but instead tried to remove extra-theoretical presuppositions of statements about them.

Constructionism today is usually a more local sort of unmasking than Mannheim had in mind. Undoubtedly, studies of the construction of gender want to unmask an ideology. But let us turn to a more typical and less discussed example.

Serial Killers

Here is a set of common beliefs about serial killers. Serial murders are monstrous—far more crimes thus classified occur in the United States than elsewhere—the number of serial killers has been on the rise in many countries—serial killers are rare nonetheless—but not all serial killers are men—these murderers had vile childhoods—their victims are chosen at random from a specific class of hapless people [prostitutes, black homosexuals, or whatever]—serial murder involves warped sex.

Every one of those beliefs is widely held. Each is, in the main, true. Together they form objective knowledge about a class of crimes, established by experts. Or so we think. Then we come across Philip Jenkins’s Using Murder: The Social Construction of the Serial Killer (1994). We know what to expect. The author will not strictly refute our beliefs. But he will teach how the classification has been made up. He will show that the categorization of certain crimes as serial homicides functions for the benefit of some elements of law-and-order enforcement, and he will tell us how a new kind of expertise has come into being.

The effect of this is somewhat unsettling. It is not at all clear what to do, or that anything should be done. Take this true anecdote: a successful free-lance businesswoman told me that she will not let a courier with a package into her premises, especially when her attractive young assistant is about. There are too many serial killers out there. Her office is on the fourth floor of an upmarket mixed-use building in central, well-ordered Toronto. What is a relevant observation? At the level of truths about serial killers: they just don’t invade premises like yours! Or at the unmasking level: you have somehow been conned into an irrational fear about a kind of person, a category constructed in order to serve certain interests, and to gratify certain fantasies! The anecdote is of no moment except as example. There may be straightforward political conclusions to draw from unmasking. Insofar as serial killing is an especially American conception [the British rippers and notorious Russian and Italian examples notwithstanding], is its “extra-theoretical force” intended to deflect attention from gun control, inner-city mayhem, and so forth?

What sorts of things are, in general, to be unmasked? Above all, the unpleasant—disaster (Fowles 1982). Even when we pass from specific kinds of people, such as serial killers, to quite general attributes of people, we are not surprised to find the construction of anger (Miller 1983), or both danger (McCormick 1995) and dangerousness (Webster et al. 1985). The construction of joy or tenderness would astonish us. But the all-too-good are doubtless in for it: we would be disheartened, but not shocked, by a construction analysis of Médecins Sans Frontières. When I first wrote the previous sentence I added “or Mother Teresa.” Hardly had the ink dried than there appeared Christopher Hitchens’s (1995) sardonic book about the saintly lady.
Hitchens did not exactly expose her—another reason that “unmasking” is to be preferred to the original German word, which can be translated as “exposing.” Unmasking is different from exposing; they work at different levels. When the American evangelist Jim Bakker was shown to be sexually involved with acolytes and to be salting away a fortune, he was exposed, not unmasked. The difference between unmasking Teresa and exposing Bakker is analogous to Mannheim’s distinction between challenging the extra-theoretical effectiveness of a doctrine, and simply refuting it, showing it to be false.

Refuting

Mannheim distinguished refuting from unmasking. Refuting a thesis works at the level of the thesis itself by showing it to be false. Unmasking undermines a thesis, by displaying its extra-theoretical function. The distinction is not all that sharp, for some analyses that chiefly aim at refuting or discrediting may gain added cogency by showing how what is to be refuted or discredited was constructed in the first place.

The construction metaphor is severely weakened by not distinguishing pure cases of unmasking from mixed cases of unmasking and refuting. Two remarkable books by Donald MacKenzie illustrate the difference. His Inventing Accuracy, subtitled An Historical Sociology of Nuclear Missile Guidance [1990] unmarks, but it also refutes the claim of any cold warrior (or of today’s sons of cold warriors) to have “correctly” defined missile accuracy. The measured comparisons of “our” with “their” missiles were proposed in order to satisfy various political or technical agendas.

The point is not that missiles are not sufficiently accurate to be lethal. The point is that exceedingly delicate, competing, and incompatible measures of accuracy are defined to cater to two distinct interests. The paymasters and the public must be convinced that our missiles deliver excellent accuracy per dollar, but also that enemy missiles are so accurate that we need to build yet more missiles, or else introduce multiple entry missiles that leave a large enough footprint (the jargon of the trade) to cancel out inaccuracies. MacKenzie’s historical sociology shows how experts and the lay public are taken in by the assertions of the weaponeers, engineers and policy makers alike. We walk away from MacKenzie’s book knowing that in terms of the accuracy debates them-
was not a piece of constructionism, even though I described the willful construction of an unwarranted “pseudo-fact” by a small but very influential social group of psychiatrists and psychologists.

HUMAN AFFAIRS

In Chapter 3 I turn to construction ideas about the natural sciences. There is a body of such work, and it has recently attracted hostile attention, but it is as nothing compared to work on human affairs. Politics, ideology, and power matter more than metaphysics to most advocates of construction analyses of social and cultural phenomena. Talk of construction tends to undermine the authority of knowledge and categorization. It challenges complacent assumptions about the inevitability of what we have found out or our present ways of doing things—not by refuting or proposing a better, but by “unmasking.” One area of focus involves people: childhood, gender, youth homelessness, danger, deafness, disaster, illness, madness, lesbianism, literacy, authorship. Another is kinds of person: the woman refugee, the child viewer of television, the psychologist’s subject. There is also behavior, such as serial homicide or white collar crime, and feelings, such as anger. We have vital statistics and postmodernism. We can focus on these diverse examples in different ways. For example, youth homelessness is a condition; the homeless youth, or the runaway, is a kind of person.

Should we distinguish this great variety of items from kinds of inanimate entities, such as the quark, or knowledge about a tripeptide? Why are people different? We get an intimation of the answer from the motivation of much constructionism. Constructionists are greatly concerned with questions of power and control. The point of unmasking is to liberate the oppressed, to show how categories of knowledge are used in power relationships.

It is widely taken for granted in constructionist studies that power is not simply exercised from above. Women refugees or deaf people participate in and assist in the power structure. One hope of unmasking is to enable the deaf or the women refugees to take some control over their own destiny, by coming to own the very categories that are applied to them. I used to call kinds of people, kinds of human action, and varieties of human behavior by the made-up designation, “human kinds.” It is an important feature of human kinds that they have effects on the people classified, but also the classified people can take matters into their own hands. I called this phenomenon “the looping effect of human kinds” (Hacking 1995a). I now prefer to talk about interactive kinds.

The fundamental idea is almost too simple-minded. People are self-conscious. They are capable of self-knowledge. They are potential moral agents for whom autonomy has been, since the days of Rousseau and Kant, a central Western value. Quarks and tripeptides are not moral agents and there is no looping effect for quarks. Hence constructionism applied to the natural sciences was in the first instance metaphysical or epistemological—about pictures of reality or of reasoning. When applied to the moral sciences, the interest must first of all be moral. Assuredly there are infirm boundaries. The nonhuman may increasingly be invested with moral qualities—species, forests, ecosystems, Gaia. Yet the modeling of the moral remains firmly rooted in human values and the potential for self-awareness. Although many constructionists are moved by deeply moral concerns, all-purpose talk of social construction has tended to deflect attention from moral issues. This is doubtless partly because of a nervousness, noticed in some constructionists, in admitting the possibility of the very idea of morality. But if the point of the exercise is moral, one should not be squeamish about saying so.

THE NATURAL SCIENCES

Karl Mannheim had an attitude to physical science very different from that of modern constructionists. “Scientific-technological thought,” he wrote, “completes just one and the same system during successive periods . . .”

Because it is the same system that is being built up in science in the course of the centuries, the phenomenon of change of meaning does not occur in this sphere, and we can picture the process of thought as direct progress toward ultimately “correct” knowledge which can be formulated only in one fashion. In physics, there are not several different concepts of “force,” and if different concepts do appear in the history of physics, one can classify them as mere preparatory steps before the discovery of the correct concept prescribed by the axiomatic pattern of the system. [Mannheim 1925/1952, 170]

This attitude is characteristic of sociology of knowledge from Durkheim through Mannheim. It took individuals trained in the sciences to apply
sociology to the sciences themselves. One such was Ludwik Fleck, a remarkable epidemiologist and immunologist, who published over 100 medical research papers, some written in the Lvov ghetto until it was destroyed in 1943. He was a survivor. In 1935 he published a path-breaking book about scientific thought-styles (Denkstile), and about the origin and development of a scientific fact [Fleck 1935/1979, Cohen and Schnelle 1986]. In retrospect he looks like the first author to have had a thoroughly “constructionist” attitude to scientific facts, although blessedly he did not use the construction metaphor. It would not have been very apt—or literal—for his story of the Wasserman test for syphilis.

It is part of Fleck’s thesis that scientific facts exist only within styles of thinking, a doctrine to which I am myself sympathetic [Hacking 1992b]. Fleck did not allude to Mannheim, but he did write caustically of sociologists such as Durkheim, Lévy-Bruhl, and less well-known figures such as Gumplowicz and Jerusalem: “All these thinkers trained in sociology and classics, however, no matter how productive their ideas, commit a characteristic error. They exhibit an excessive respect, bordering on pious reverence, for scientific facts” [Fleck 1979, 47]. The era of excessive respect has passed! That is one reason for the science wars of today. Scientists feel inexorable laws of nature are not treated with sufficient respect by the sociologists. In fact, the early sociologists did treat laws with complete respect, and accepted the background scientific ideology without question. Only a real scientist such as Fleck could start questioning the mystique in which he himself had been educated.

Leaving the subject of pious reverence for later, let us try to catch a glimpse of where Fleck was directing us. Here is one rather conservative way to understand the thrust of his and subsequent arguments. The standard view is of science as discovery of facts that exist “in the world.” The world comes structured into facts. That is not a scientific hypothesis. It is a metaphysical picture.

Fleck had a different metaphysical picture. He wrote of the emergence and development of scientific facts. He did not mean just that they emerge in human consciousness and develop in the history of science. He meant that the world does not come with a unique prepackaged structure. If we want an old name for this metaphysical picture, it is nominalism.

Constructionism about the natural sciences is also, in part, a metaphysical position. It is directed at certain pictures of reality, truth, discovery, and necessity. It joins hands very naturally with what Nelson Goodman calls irrealism: not realism, not anti-realism, but an indifference to such questions, which in itself is a metaphysical stance. Since neither scientists nor constructionists dare to use the word metaphysics, it is not surprising that they talk past each other, since each is standing on metaphysical ground in opposition to the other.

Talk of metaphysics will seem, to many, a highbrow evasion of the issues current in the science wars. On the contrary, it is a central part of the story, and ignorance of it brings confusion. But it is only part of the story. Already, in 1935, Fleck was challenging pious reverence for the sciences. After 1945 there was a backlash against science itself. Science had been at the service of the concentration camps and gas chambers; only science could have created Hiroshima and Nagasaki. There were valiant attempts to defend the value of science as a human endeavor. The most notable was Jacob Bronowski’s television series, The Ascent of Man. This was shown for uplift to millions upon millions of English-speaking schoolchildren. It began with heartfelt concern. Here I, Jacob Bronowski, am a man whose relatives perished in the camps. I have made a pilgrimage there. Here I, Jacob Bronowski, am a man who helped pioneer operations research [as the theory of efficient bombing] for the Royal Air Force during the war. I have made a pilgrimage to Hiroshima. But I now want to restore the Enlightenment vision of science, as one of the greatest endeavors of the human race, which shall save us yet, when undertaken with humility. Science can be restored to a state of grace.

There was another reaction, what Richard Bernstein names “the rage against reason.” A rage against science and scientists. A rage that continued through the nuclear arms race, the Doomsday machine, chemical weapons, ecological disaster, the silent spring, the nuclear winter. That rage was so powerful that it needed few allies, but in intellectual and academic circles it latched on to the metaphysics of constructionism.

That is because metaphysics can have ideological consequences. The sciences, for some researchers, seem to involve getting to know the essence of creation, the mind of God. The metaphysics of constructionism denies that creation had an essence, or that there is a God’s eye view. It is a threat to such a world view. Likewise, feminist critics of the natural sciences formed alliances with constructionists, in order to undermine the idea that the sciences must proceed along an inevitable, preordained patriarchal track.

Constructionism about the natural sciences is not necessarily politi-
cal or critical. A constructionist could be committed to the current enterprises of the natural sciences, and just as full of admiration for past genius and present achievements as the most gung-ho science journalist who weekly announces the latest discovery. But constructionism can be used to unmask an ideology of science, an ideology that is intended to produce pious reverence. It must be said, as a purely anecdotal generalization, that every single constructionist about the natural sciences whom I know well is thoroughly irreverent.

The science wars, as I see them, combine irreverent metaphysics and the rage against reason, on one side, and scientific metaphysics, and an Enlightenment faith in reason, on the other. Hence the next chapter is about metaphysics and rage.

Chapter Three

WHAT ABOUT
THE NATURAL SCIENCES?

Is there any point in talking about social constructs in connection with the natural sciences? Yes, there is a point in doing so, but that may not be the best way to examine the issues. We should separate out some fundamental disagreements about natural science that are made contemporary by using the phrase “social construct.” Call them sticking points. They begin with philosophy and go almost as far as politics. Many would prefer to proceed in the other way round. Dorothy Nelkin (1996) wrote a one-page essay asking “What are the science wars really about?” Her answer is that “current theories about science do seem to call in question the image of selfless scientific objectivity and to undermine scientific authority, at a time when scientists want to claim their lost innocence, to be perceived as pure, unsullied seekers after truth. That is what the science wars are about.” Or, more dramatically, the science wars are fueled by the rage against reason-masquerading-as-innocence. We should never forget that, but neither rage nor an image promises a clear view of constructionism about science. We first must grasp some basic philosophical issues that separate the two sides.

The issues may be irresoluble, for they are contemporary versions of problems that have vexed Western thinkers for millennia. I shall deliberately avoid traditional formulations, because old words tend to become ancient hulls encrusted with barnacles. But scrape off the parasites for yourself, and you might glimpse the gleaming hull of an Aristotle or a Plato shining through. My observation is not that we ought to be doing the same old things that they began, but that the same old things are still being done.

Only towards the end of this chapter will I get around to two less