REVIEW ESSAYS

What Kind of Creatures Are We? NOAM CHOMSKY. New York: Columbia University Press, 2016. xxvi + 174 p. Cloth $19.95.

Noam Chomsky's *What Kind of Creatures Are We?* presents his views on several philosophical topics. He has held most of these views for decades. He gives updated, concise, provocative elaborations. The chapters are 'What Is Language?', 'What Can We Understand?, 'What Is the Common Good?', and 'The Mysteries of Nature: How Deeply Hidden?'.

Chomsky's work in linguistics marks him as one of the greatest scientists, ever, in the *Geisteswissenshaften.* Much of what he says about language is powerful. Much of what he writes on methodology is insightful. The book offers large-scale, independent-minded speculation. It uses history to indicate parochialness in some current thinking. It shows a genuine concern for making the world better.

Chomsky takes language fundamentally to provide a structure for thought, not a vehicle for communication. He calls 'the Basic Property' of language a 'generation of an unbounded array of hierarchically structured expressions mapping to the conceptual-intentional interface, providing a kind of "language of thought"' (13). This formulation revises another (4) by deleting mention of a mapping of the unbounded array to a sensori-motor interface that "externalizes" language in sound or signs. Chomsky notes that language always involves externalization (14). He excludes this feature from the Basic Property.

Against doubters from outside mainstream linguistics, Chomsky maintains that, although specific postulations of properties as universal may be mistaken, postulating a universal grammar is the only reasonable way to account for the fact that language—as distinguished from communicative systems that lack the Basic Property—is unique to humans (8–9, 20–24).

Chomsky targets the view that 'the function of language is communication' (15). He holds that communication is a peripheral feature: 'Doubtless language is sometimes used for communication, as is style of dress, facial expression and stance, and much else' (16). He gives elegant, telling examples of mismatches between linguistic structure and the linear order that seems simplest for sensori-motor systems that serve communication (10–13, 15–20, 22–23).

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Chomsky makes three points against his target (15–16). The first two aim to cast doubt on the idea that language has any function. The first is that language is not designed by humans. A second is that there are intuitive questions about which properties of biological structures have functions. He concludes that the notion of biological function is unclear. A third is that communication is not all-or-nothing, and that shared meanings, sounds, or structures are not needed for various degrees of communicative success.

The view that communication is a peripheral feature of language links with Chomsky's belief that investigating origins of language by exploring development of communication from animals to humans is a mistake. He has long proposed that language, with its Basic Property, emerged from a chance rewiring of the brain—only fifty to one hundred thousand years ago (3, 7–8, 16–20, 25, 39–40). He thinks that communication is irrelevant to the origin of language.

I believe Chomsky right to champion universal grammar. He is right that hierarchical recursive structure is basic to human language. He is probably right that this property distinguishes human language from all communication systems in non-human animals. I think that genuine predication, exemplified in main verb-phrases, also has these features. Perceptual and sensori-motor contents have the structure of demonstrative-like singular applications governing attributives. They nowhere contain scope-dominant attributives. I agree with Chomsky's opposing the view that *the* function of language is communication. I agree that a basic feature of language is that it provides or extends propositional structure for thought.

However, Chomsky's three reasons for not taking communication to be *a* function of language, even if not an originating function, lack force. First, design by humans is not a condition on function. A rock can function as a door stop without being designed to be one. Almost no biological functions depend on human design. Language may have an analogous communicative function. Second, the armchair questions that Chomsky raises about which properties of biological structures have functions do not render the notion of biological function unclear, much less useless for science. Determining what properties evolved, or are sustained, because they contribute to fitness is a standard way of determining what properties are functional. Third, it is true that sharing meaning is not necessary for linguistic communication. It does not follow that language does not have a communicative function. It does not even follow that there is no scientific value in taking similarities in idiolectic meaning to ground abstractions that allow cross-personal sameness of meaning.[1] Chomsky's comparison of language to dress

[1] Tyler Burge, "Wherein Is Language Social?," in Alexander George, ed., *Reflections on Chomsky* (London: Basil Blackwell, 1989); reprinted in my *Foundations of Mind* (Oxford: Clarendon Press, 2007).

and stance underplays the systematicity and potential for scientific treatment of linguistic communication.

Chomsky's views about origins of language are stimulating. But the evidence is thin, as he notes (25). Broad claims are speculative. Any account that ignores language's hierarchical structure will fail. The topic is, however, complex. Multi-pronged exploration seems warranted.

The chapter on the common good develops a form of what Chomsky calls 'anarchism'. Chomsky writes that the term 'resists straightforward characterization' (63), and I could not find one in the chapter. What Chomsky defends is a libertarian socialism that asks forms of 'hierarchy, authority, and domination' to justify themselves (63). He maintains that, absent justification, they deserve to be challenged and dismantled. Chomsky focuses on economic exploitation. He holds that government and authority can be justified insofar as they restrict exploitation by non-governmental institutions—such as corporations (67). He identifies a strain of aristocracy, patronization, and democracy-restriction in classical liberalism (75–76), and traces it to attitudes expressed by Madison in developing the United States Constitution (77–79).

These positions seem reasonable. Chomsky deserves credit for identifying, long ago, the exploitative, anti-democratic effects of corporate power. His points about aristocratic aspects of the United States Constitution are well known, but certainly correct. I think that what is more strikingly deplorable about the original Constitution is its racism in allowing states to continue slavery. Chomsky does not mention this factor. Yet its ripple effects loom large in the nation's failure to limit economic exploitation. Numerous blacks and whites are to this day exploited—whites, by being diverted from voting their economic interests—by political currents deeply connected to race-related issues.

The second and last chapters discuss understanding. Chomsky claims that mysterianism is a truism. He provides no single specification of the doctrine. He seems to take it minimally to be the view that we may be cognitively unable to formulate some questions that are 'the right ones to ask' on important scientific issues; and that we may be unable to 'completely explain' important phenomena that we can identify (27–28). Elsewhere (104), he takes mysterianism to be the view that we may be unable to unify theoretical understanding in one domain with theoretical understanding of phenomena in other domains. Chomsky states that 'much of what we seek to understand', indeed 'maybe a true understanding of anything', 'might lie beyond our cognitive limits' (104). He cites past thinkers who expressed similar-sounding views—Galileo, Descartes, Newton, Locke, Hume,

Russell. Chomsky writes that we should not 'lightly ignore' concerns about understanding voiced by these thinkers (85). Bracketing questions about what 'complete' explanation or 'true understanding' would be, these views are reasonable. The world is complex. It has many explanation-worthy patterns. We have limited minds.

Chomsky thinks that the less modest formulations have definite applications, not just "in-principle-possible" status. A recurrent theme is that science does not solve "hard" problems, but abandons them. It lowers its goals, and lives with permanent "mysteries" whose solutions lie beyond our cognitive capacities (27, 32, 53, 87, 98, 103–04, 109). Advances, like Newton's accounts of motion and gravity, leave the world 'permanently' 'unintelligible' or 'inconceivable'. Such advances settled for accounts that achieved something weaker than intelligibility—'theories that are intelligible to us whether or not what they posit is intelligible' (32, 53).

These supposed deficiencies of science have as backdrop the loss of a theological world view. Chomsky notes the loss (33, 53). Some thinkers whom Chomsky quotes as "mysterians" piously defer to God's size and power in the context of a nascent, immature early-modern science. According to Chomsky, the loss of theology helped make it clear that we live in a world that is significantly unintelligible, because of our biological limitations.

Theologically centered philosophies did provide a sense of complete intelligibility that modern science has not duplicated. However, this sense and the accompanying standards for complete intelligibility were illusions. There is no rationally written book of nature of the sort that many early-modern natural philosophers sought. Yet, the world is much better understood than it was before science separated from theology. There are indeed issues—such as the origin of the universe (not merely the Big Bang, which assumes an initial state)—on which science has made little progress. After Newton, science was indeed more cautious about trying for all-encompassing, 'ultimate' explanations (87), though ambition to find comprehensive, unifying explanations remains in science. Chomsky's minimal point is that the world *may* be too complex for us to develop a fully satisfying, all-encompassing science, even on issues that we can identify. That point is certainly correct. But the idea that science regularly gives up on intelligibility, or on understanding *the world*, in favor of some 'lower' cognitive value, seems ungrounded.

Chomsky discusses, at length, Newton's theory of gravity, the threat of action at a distance that it posed, and the failure of early-modern mechanics. Much of this discussion is well taken. But Chomsky's claims

that the problems of motion and attraction were not solved but abandoned (32–33, 53, 85, 90, 98) are at best misleading.

The problem of explaining magnetic and gravitational forces purely in terms of material contact by bodies *was* abandoned. It was abandoned because it was misconceived. The statement of the problem assumed a mistaken theoretical framework. This pseudo-problem, together with determination to avoid action at a distance, was the source of many of the quotes, especially those by Galileo, Locke, Hume, and Newton, about the world's being unintelligible or inconceivable (32–33, 52–53, 81–82, 86, 91).

Abandonment of the problem, and the subsequent history of explaining these phenomena, do not illustrate cognitive limitation. They exemplify science's transcending common-sense models to yield better understanding. It is striking that not once does Chomsky mention General Relativity's insight into electro-magnetic and gravitational forces, and its avoidance of postulating action at a distance. The idea that non-mechanical field forces are unintelligible, or that science failed with and abandoned an early-modern problem *because* human cognition was too limited to solve it, has no appeal in this central case for Chomsky's picture of science.

Occasionally, Chomsky acknowledges the historically conditioned nature of earlier thinkers' remarks on unintelligibility. As noted, many took failure of mechanical explanation to *amount* to unintelligibility (34, 36, 52–53, 86, 91). Instead of counting this view mistaken about intelligibility and about what it is to understand the world, he seems to take it as a standard for intelligibility and understanding. He apparently does so because the view is the natural correlate of common sense (28, 82, 84, 86, 90–91, 103–04). By leaving genetically conditioned common sense, science is supposed to be lowering its standards for, or abandoning, intelligibility and understanding. But common sense is not a standard for intelligibility or understanding, any more than it is an approximately true account of the physical world at all scales.

A major weakness in Chomsky's discussion is lack of explication of the notions of conceivability, intelligibility, and understanding. It is not fully clear what he thinks modern science misses out on. He stresses a distinction between understanding explanatory theories and understanding the world (32, 34, 53, 87, 90). He asserts that science settles for understanding *theories*—perhaps theories with 'explanatory depth'—, but fails to yield understanding of the world. He never explains the distinction. A basic type of understanding the world just *is* understanding *approximately true* explanatory theories that are systematic and deep.

In philosophy, Chomsky takes Locke, Hume, and Russell as primary sources for his conception of understanding (28, 32, 34, 53, 82, 85, 98, 102). I think that all three have seriously defective views of understanding. All overrate closeness to perception. All accord poorly with post-Newtonian improved understanding through greater abstraction and less adherence to pre-theoretical, perception-based models in natural science and pure mathematics.

Chomsky analogizes the "hard problem" of explaining mind-brain relations to Newton's "hard problems". This line suggests that we are likely to be unable to understand such relations because of our cognitive limitations. If 'understand' comes to something like modeling in a common-sense-, perception-based way, the conclusion is unexceptional. If 'understand' is used in a more reasonable and common way—like the way cited above—, the fate of Newton's problems suggests cautious optimism about deepening understanding of mind-brain relations.

Chomsky has long taken the traditional mind-body problem to be defunct because 'any serious notion of *body* or *matter* or *physical*' has 'collapsed' post-Newton (35, 99, 102, 111, 120). Despite the just-stated position, Chomsky thinks that organic structure of the brain is a "serious" enough notion that *reduction* of 'properties termed mental' to the organic structure of the brain is 'almost inescapable' (111, 120).

I find Chomsky's view that the notions of *body*, *matter*, and *physicality* are empty greatly exaggerated. Axiomatic treatments of *body*, in continuum mechanics, and broad assumptions about matter and physicality are present in modern physics. *Body*, *materiality*, and *physicality* are at least as well grounded as modern psychological notions. Given current knowledge, fruitful exploration of mind-body issues does not require scientific precision. Chomsky's discussion of modern analogs of Descartes' mind-body problem skates over distinctions important to fruitful discussion. In a single page, he runs together the mental's causal dependence on the brain, reduction of the mental to the neural, mental activity's being 'nothing more than' brain activity, and the brain's thinking (35). He praises a proposal to define 'physical' in such a way that psychological states are *by definition* physical (120, 125).

Chomsky is at his best on mind-body issues in emphasizing that progress must derive from focus on relations among postulations in the natural and psychological sciences. He correctly notes how little is known about representation as well as consciousness (95–96). He recommends caution about what to conclude from our ignorance. There is excellent discussion of how science took new directions in Dalton's work on atoms (106–10), leading to unexpected unifications. Recurrently, but as noted not always, there is an openness to how

understanding and "unification" could be achieved, not restricted to reduction (89, 104, 106).

Two other positions on mind are prominent in the book. One rejects "referentialism"—the view that there is a 'direct relation between words and extra-mental entities' in ordinary language (42). Chomsky does not explicate 'direct'. He insists that "reference" plays no significant role in thought outside scientific thought, and that individuals, not words, refer. Sometimes the point seems merely to be that "picking out" particulars is commonly context-dependent (43) and is, in language, done by persons, not merely by words. He goes further, urging that semantical relations generally ("reference" by predicates to attributes—what I call 'indication'—and being-true-of, as well as reference proper) do not figure in ordinary language or thought. He notes that some things to which human language seems to connect are not fully mind-independent (*house*, 44), or are not things 'that a physicist could in principle discover' (London, *city*, 50; *person*, 46–47). He holds that semantical relations of words to a subject matter have a role in science ('electron', 'phoneme', 44). He writes that 'water', 'mind', 'animal body', and 'vegetable' bear no such relations to a subject matter (45). He thinks that the notion of mind/subject-matter semantical relations is highly theoretical, introduced by Frege and Peirce, with no serious application to ordinary language or non-scientific thought (126).

The other position that Chomsky opposes is "externalism" about the mind. He asserts that internalism is a truism (31), but he does not explain an issue. "Externalism"—which elsewhere Chomsky takes to include anti-individualism, a view that I have supported—is supposed to be committed to 'methodological dualism', that is, 'a tendency to treat mental aspects of the human organism differently from so-called physical aspects' (30–31).

Anti-individualism is the view that the natures of many psychological states depend constitutively on relations between individuals in those states and features of the subject matter of those states. Chomsky takes the apparent anti-individualistic aspects of psychology to be heuristic. For example, perceptual psychology's specification of a perceptual state as representing depth, position, size, shape, or motion is supposed to be merely heuristic, not what the science is committed to.[2]

Chomsky's views on reference run against mainstream semantical work in linguistics and philosophy, over the last half-century. I do not find his reasons forceful. The fact that houses constitutively depend on

[2] Noam Chomsky, *New Horizons in the Study of Language and Mind* (Cambridge, UK: Cambridge University Press, 2000), pp. 158–63.

connection to human minds does not disqualify them from being *representata*. The fact that London or the kind *city* or *person* (perhaps delimited vaguely, and allowing for idiolectic differences) would not be discovered by a physicist is irrelevant to whether they can figure in semantical relations with representations in thought or language. The fact that non-scientific thought does not use 'water' with the precision that science uses 'water' or 'H_2O' does not bear on whether a semantics of the ordinary term can be scientific.

Semantics must, and does, accommodate the type of individuation and degree of precision appropriate to the case. Chomsky does not articulate any conception of science that motivates rejection of mainstream semantics. Given this rejection and given a half-century of progress in the subject, any such conception would, I think, be too restrictive. Scientific practice nearly always trumps antecedent conceptions of what science should be. Moreover, our notions of reference, indication, and being-true-of are rooted in our ordinary understanding of perception, not in theory. Frege and Peirce precisify and generalize ordinary notions.

Contrary to Chomsky's views on "externalism", anti-individualism does not postulate methods for psychology that differ from methods of physical sciences. Perceptual psychology—a central example of a science with anti-individualist presuppositions—can, and does, treat systems as units that depend entirely for their *processing* on their antecedent states and proximal stimulation. It is common in the *physical* sciences for basic *kinds* to constitutively depend on relations between entities of those kinds and further entities. Individuation of kinds in geology, physiology, evolutionary biology, and even physics follows this pattern. Laws of processing embed such kinds. The processing need not depend on anything beyond what impinges on and what is contained in a local system.[3]

The science of visual perception clearly specifies perceptual states as indicating and attributing environmental features and picking out environmental particulars—in sum, representing aspects of the environment—, not merely as a heuristic, but in its statements of central processing laws. The claim that postulating representation of environmental features and relations is a mere heuristic in visual perceptual psychology is simply out of touch with the practice and laws

[3] Chomsky mistakenly thinks that the fact that direct stimulation of the initial receptors (not by the usual distal stimulations) would yield the same processing laws is a problem for anti-individualism (*ibid.*, p. 158). His other thought-experiment-based arguments (*ibid.*, pp. 160–62) against anti-individualistic mental-kind individuation either beg the question, misconstrue the view, or underestimate its resources for dealing with his arguments.

of the science. Using notions (representation of size, shape, motion, position, reflectance, and so on) that Chomsky counts as heuristic, it gives literal, rigorous explanations of exactly what it says that it aims to explain: the processes that yield instances of accurate and inaccurate perception. Chomsky's revisionary accounts of the science can do no such thing. Rigorous explanations of visual perceptual reference ("picking out" of particulars) and veridical attribution of environmental properties derive from combining psychological accounts of processing in perceptual systems with accounts in optics of how light reflects from environmental entities into retinal receptors.[4]

Chomsky's account of language and thought is remarkably free of consideration of their relations to perception. Perceptual psychology is well ahead of much biology and of other parts of psychology, including linguistics, in the rigor and depth of its explanations of *process*. A better grip on the science would provide deeper insight into the contents of thought and their semantical aspects, including universal aspects—although even ordinary, non-scientific thought goes well beyond anything suggested in perception.

Despite my having reservations about Chomsky's historical and philosophical views, I value the book's strong points: its stress on how much is yet to be learned about mind, its openness to how understanding can be achieved. Chomsky's account of some basic aspects of language is authoritative. His concern for improving the human condition is genuine and well directed.

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[4] For a fuller account relevant to all these issues, see my *Origins of Objectivity* (Oxford: Clarendon Press, 2010), especially chapters 1, 3, and 8–11.