

THE LITERARY BASES OF KNOWLEDGE, EXPERIENCE..., THOUGHT AND LANGUAGE

Dragoș Avădanei

Assoc. Prof., PhD., “Alexandru Ioan Cuza” University of Iași

“By the year 2070 we cannot say, or it would be imbecile to do so, that any man alive could understand Shakespearean experience better than Shakespeare, whereas any decent eighteen-year-old student of physics will know more physics than Newton.”(our emphases)
Baron C. P. Snow, 1970

Abstract: If we add thought and language to Snow’s knowledge and experience, we get the full range of the significant dimensions of human existence. For a variety of reasons, language is a good starting point, and in this case a fruitful one, too. Whorf (after Sapir and Dewey) proposes the theory that language shapes or determines thought, and thought is best expressed in “literature” (everything that gets written down). For C. P. Snow, a decade after his “Two Cultures” famous lecture, the knowledge offered by science (Newton) is limited, temporary, partial, replaceable, while experience (Shakespeare) results in general, universally human knowledge. One century before, De Quincey wrote about “the literature of knowledge and the literature of power.” So: how important is literature (art) for STEM-s—a question that is answered by invoking and quoting various authors from the non-humanities; and—if language is so important in shaping thought, where does language come from? From cognitivists (Turner first of all) and others, the answer is “story” (i.e. literature); and the conclusion appears as surprisingly obvious: literature is fundamental for thought and language, for knowledge and experience, for all intellectual pursuits.

Keywords: language, literature, knowledge, experience, cognitivism

When there are so many theories of truth, it almost goes without saying that nobody really knows what truth is (we, for sure, don’t); one may then know what truth is according to one of a couple of theories he happens to know (about) and accept; a good first source are encyclopedias (Britannica, Stanford, Encyclopedia.com...), where truth is discussed in terms of representation and correspondence, pragmatism, deflationism and other minimalist theories, coherence, truth conditions...; what comes out pretty often is the importance of language (and the philosophy of language, with the role of sentences, propositions, assertions and meanings) and the fact that truth is different from knowledge; in the Britannica we also get interested in reading that the pursuit of truth characterizes the good scientist, the good historian, and the good detective (the good philosopher or the good novelist seem to belong elsewhere, with the good John Doe). All in all, this pursuit of truth looks like a quixotic, useless attempt and endeavor, to be easily replaceable with the pursuit of knowledge and the study and contemplation of experience (see our Snow epigraph). And here we are confronted with the old dichotomy (C. P. Snow—1905-1980—again, and his 1959 “two cultures”:

lecture) between literature (or the arts) and sciences, with human experience partaking of (or even including) both.

What the physical chemist and novelist certainly has in mind in his Newton part of the anticipation is that science (i.e. “knowledge”—from Lat. scientia—obtained by natural, social, formal, and applied disciplines—over seven hundred in the Index of the Branches of Science) is the result of knowledge accumulated step by step, (thought) experiment by (thought) experiment, theory by theory...--often competing and some/most of them left behind for good, in the perpetual process of new developments replacing (sometimes completely) older theories and beliefs; the apparent contradiction comes from the truism that any scientific hypothesis or statement must be falsifiable, or disprovable, as another experiment or discovery can prove it to be false or simply wrong; in other words, no hypothesis can be meaningfully tested, but it could generate (and usually does) new ideas, so more research is encouraged; this way, no theory can ever be considered final and, as new problematic evidence is discovered, a new theory or modifications to the previous theory are proposed; thus science gives partial answers with each step, which explains the fatally limited understanding at any given moment during its/their history; so Popper could easily declare that all our scientific knowledge is conjectural, or Maxwell could see that the blueprints/stories describing the composition of reality are always changing, being, again and again, at any moment, provisional or inadequate; examples from astronomy, biology, physics, mathematics... can be given by the dozen; Snow must have had in mind, among other things, the replacement of Newtonian mechanics by Einstein’s relativity theory.

Two important aspects of scientific activity need to be mentioned here: scientific research and science communication; scientific investigation (with or without the awareness of the falsifiability paradox mentioned above) is, in many ways, the experience of science, the detailed study and inquiry of past knowledge and new information and phenomena, of facts and principles, in order to reach a new level of understanding; so the basic story includes evidence, information, findings, theories and/or hypotheses, experiments, answers or solutions and proofs; thus, both a process and a product, followed by a description of both, in a language that could ensure the knowledge transfer (another story) onto the world at large; and this is science communication, whose purposes include making science accessible for education or entertainment, but also influencing policy and decision making, determining behavioral change, stimulating critical thinking, i.e. making a difference in general and, why not, popularization.

“Experience”—which C. P. Snow associates with Shakespeare and, thus, literature—has, we are told, no more and no less than 3,185 synonyms and related words—a whole language, one might say, and numberless stories; from Latin experientia (skill gained by practice), it includes knowledge, intelligence, education in general, understanding, participation, power (see De Quincey, infra), and all the conscious events that make up an individual (or social) life—i.e. a personal or group narrative. Time to quote philosopher John R. Shook, associate editor of Free Inquiry: “Human experience is the ultimate source and justification for all knowledge. Experience itself has accumulated in human history and culture, gradually producing the methods of intelligence called reason and science.” (2009, p.19)

The structure of various types of experience (including perception, thought, memory, imagination, emotion, volition, bodily awareness, embodied action, and linguistic activity) is studied by phenomenology (Gk. phainomenon=appearance); if “to experience” is “to live through” (the Romanian uses the equivalent of “to live” for “to experience”) or “perform,” “intention” and “intentionality” refer to the way an experience is directed through its content

or meaning toward a certain “object” in the world to make it part of consciousness; so the stories of phenomenology attempt to cover the intentional structure of consciousness (temporal and spatial awareness, the self in different roles—“what is it like to be.../a bat/...?”, Thomas Nagel, infra--, purpose or intention in action, social interaction...), which is the subject of description, interpretation (hermeneutics) and analysis. Back to Snow, we can understand his “knowledge” (product of the mind) as narrower, always partial, limited, discardable and in progress, and his “experience” as a picture of the whole of man.

As part of Britannica’s “Propaedia,” the “Outline of Knowledge seeks to provide a logical framework for all human knowledge...,” therefore knowledge provided by the arts as well; this needs to be emphasized since many/most people usually consider (artistic) literary thinking to be a peripheral activity reserved for “specialists, poets, prophets, lunatics, and babysitters;” (Turner, 1996) being made up of writings that possess high quality or distinction (“the best expression of the best thought reduced to writing”—Britannica, 11th edition), literature—the liberal arts/humanities, the belles-lettres—may appeal to a particular type of audience and may easily and sometimes rightfully be seen as unscientific, but it also addresses itself to the irreducibly human, subjective and contingent, mostly by asking questions (What does it feel like to be alive? What should we do with our life on earth? Where do we come from and where are we going?—see also William Deresiewicz, 2008/2009), without even attempting any answers; the artist/writer is certainly capable of imparting dependable knowledge—philosophical, historical, integrative, general experiential knowledge and intellectual skills.

This is basically what Snow means in his Newton (partial, limited answers)/Shakespeare (great universal questions) story, only one hundred years before (1848) Thomas De Quincey (1785-1859) had put a new twist on the discussion about literature, knowledge, and experience: “There is first the literature of knowledge /science=literature/, and secondly, the literature of power. The function of the first is-- to teach; the function of the second is—to move; the first is a rudder, the second an oar or a sail; the fist speaks to the mere discursive understanding, the second speaks ultimately, it may happen, to the higher understanding or reason, but always through affections of pleasure and sympathy.” (“The Poetry of Pope,” p.5) The Principia of Sir Isaac Newton, the Romantic essayist continues, well in advance of Snow, will be “thrown out of the sunshine into decay and darkness,” or will “transmigrate into other forms,” whereas the Iliad, Prometheus (Aeschylus), Othello, King Lear, Hamlet, Macbeth or Paradise Lost will stay “triumphant for even as long as languages exist—they can never transmigrate into new incarnations.” The knowledge literature, like fashions, passes away; even encyclopaedias are superannuated after one generation; “all the steps of knowledge ... carry you further on the same plane, but could never raise you one foot above your ancient level of earth; whereas the very first step in power is a flight, is an ascending movement into another element where earth is forgotten.”(ibid.)

Romanticism aside, we can confidently notice that our key concepts—science, experience, literature—are all made up of entities and events that are refashioned in human consciousness by means of language and its various types of accounts, records, histories, relations..., i.e. stories. As language seems to be the place where any intellectual pursuits or endeavours begin, a discussion of such pursuits (of knowledge, primarily) should also begin in language—undoubtedly essential for human thought—infra—and holding a central position in the play of reality and mind; and thus we might simply attempt to speculatively show how language and its “feats” have been viewed by some comparatively recent theorists—including, again, trespassers from “non-humanities” domains.

Reality—experience—mind/thought—language—narrative/story—knowledge seems too difficult a path for our limited purposes here, so we shall just have to pick and choose: “...thoughts are not merely a reflection on reality, but are also a movement of that reality itself. The mapmaker, the self, the thinking and knowing subject, is actually a product and a performance of that which it seeks to know and represent.” (Willis Harman, 1918-1997, 1994) And, four decades earlier, E. A. Burt (1892-1989) meaningfully hesitated: “The key question is whether—or to what extent—the order that science ‘reveals’ is imposed by the mind on the world, or by the world on the mind.” (1952, p.322)

The “missing link” here is language, itself discussed, in its origins and development, at least from these important perspectives: as innate (the LAD—Language Acquisition Device—we are born with: Chomsky, Fodor, Black, Pinker, Lenneberg, Bloom...) and almost identical with the mind; as the garb or clothing of thought (most common view); as necessary for and even shaping or determining thought (Sapir-Whorf); as off-line thinking (Devlin) or the result of the “story mind” (Turner). Our choice is the Dewey-(Sapir)-Whorf hypothesis, though the Dewey-Whorf connection is problematic (as was the Sapir-Whorf one) and, for later, the Turner theory.

Benjamin Lee Whorf (1897-1941) was a chemical/fire-prevention engineer who worked for the Hartford Fire Insurance Company and moonlighted as an anthropology lecturer at Yale University, where he conducted a seminar helping students decipher Maya hieroglyphic writing or understanding Nahnatl dialects; side by side (but never really together) with his mentor, Edward Sapir (1884-1939), teaching a course in American Indian Linguistics, Whorf became attracted by the fact that the difference between the structures of different languages shape how their speakers perceive and conceptualize the world (linguistic relativity); and so, at Sapir’s death, he wrote his definitive statement in his memorial article “The Relation of Habitual Thought and Behavior to Language” (1940): on language’s power over mind and how our mother tongue restricts what we are able to think (a “prison house” in Guy Deutscher’s and others’ terms). Incidentally, we may not know if Whorf did or did not read John Dewey’s 1910 How We Think in Yale’s magnificent Sterling Memorial Library, but (one of) the founder-s of American pragmatism, while defending the pre-eminence of language instruction in schools also had noted that “the chief intellectual classifications that contribute the working capital of thought have been built up for us by our mother tongue” (p.175), and so, “/language’s/ effects upon habits of thought are much deeper than those of conscious study.” (p.178) One of the more recent followers (of both Dewey and Whorf), after language studies in China, Greece, Chile, Australia, Indonesia, Russia..., convincingly ends her “How Does Our Language Shape the Way We Think?” : “language is central to our experience of being human..., and the languages we speak profoundly shape the way we think, the way we see the world, the way we live our lives.” How does that happen?—“Each language has its own toolkit.” And one more question here (to be answered later): if language shapes and determines thought (literary-artistic, philosophical, scientific, engineering, technological, mathematical...), what is it that shapes and determines language?

For one thing, most STEM-s (Scientists, Technicians, Engineers, Mathematicians) have—especially in the past century—become more keenly aware of the cognitive role of language in their respective types of reasoning, intellectual pursuits and communication; how metaphors and many other figures (Fahnestock) and their “constitutive powers” came to be recognized as essential in science is something so well known that we just need a couple of opinions from the STEMs themselves: “metaphorical thought is central in all branches of science, just as it is in everyday life and mathematics” (T. L. Brown—chemistry professor, 2003); “the simple truth is that scientists themselves constantly make use of analogies,

metaphorical devices, and similes. Sometimes it's the only way to build an intuition for a problem, by relating it to something else.”(Caleb A. Scharf—astrobiologist, 2013)... And Kelly Bryan who writes about “The 9 Scientific Theories /Darwin’s, Pavlov’s, Newton’s, Copernicus’s, Einstein’s, Heisenberg’s/ Hawking’s, Hooke’s, Lorenz’s/ Always Used as Metaphors...”

Second—and more importantly—the very foundations of science have come (ever since Kant’s 1786 Metaphysical Foundations of Natural Science) to be described as metaphysical, i.e. based on speculative or abstract reasoning, unsubstantial, unreal, spiritual or transcendental—and thus “literary” thought to a great extent; let us also simply mention Edwin Arthur Burt’s 1926 The Metaphysical Foundations of Modern Physical Science and the 1952 Metaphysical Foundations of Modern Science, Willis Harman’s 1994 New Metaphysical Foundations of Modern Science, N. Maxwell’s 2007 The Metaphysics of Science... and other similar ones; the main claims are for the study of the subjective element in all scientific enterprises and that, since evidence alone is never enough to determine what scientific theories are accepted or rejected, science must inevitably make metaphysical assumptions for a more suitable epistemology.

Where least expected—in mathematics—one finds some of the most uncommon inconsistencies: cognitive psychologist, neuroscientist and mathematician Stanislas Dehaene (b. 1965) thinks the “number sense” is wired into the brain (like Chomsky’s language) as a domain specific, biologically determined ability, though—he admits—alongside the mental number line there also is a verbal format—a string of words--, as well as a string of digits (The Number Sense, 1997). Social scientist and mathematician Keith J. Devlin (b. 1947) also believes in an innate sense of number (“the math gene”), only for him the ability to do math and the ability to communicate by language are one and the same—they rest on the same features of our brains--, and so “numbers are like gossip”; quoting linguist Derek Bickerton (1926-2018) and his 2018 Roots of Language, Devlin introduces the concept of “off-line /or what if.../ thinking”—making logical connections between abstract objects and/or constructing sentences are identical in structure; so “mathematicians think about mathematical objects and the mathematical relationships between them using the same mental faculties that the majority of people use to think about other people...” (The Math Gene..., p.262); thus math as tale-telling, rumor, gossip, or story (*infra*), as “the combinatory machinery necessary to initiate and maintain off-line thinking is nothing other than syntax.”(p.244)

But then comes mathematician William Byers (b. 1943) to tell us, first, that the core ingredients of math are not numbers, structures, patterns, and proofs, but ideas, and, second, that mathematicians (very much like poets, for instance—our parenthesis) think by using such non-logical qualities as ambiguity, contradiction, and paradox, uncertainties, conflicts, and incompatible perspectives; this way he is “attempting to develop... a paradigm shift in our understanding of the nature of the math enterprise...”(p.26); and mathematical statistician Reuben Hersh (b.1927), who finds math “a social practice” and “a collective work of art,” whose acquired knowledge is none other than “fallible, corrigible, tentative, and evolving”(p. VIII); and on the next page he informs us that “many math objects can be seen as shared ideas, like Moby Dick in literature...”(p. IX); only to end his “Introduction” with this warning: “mathematicians are having to face honestly the embarrassing ambiguity and temporal dependence of our central sacred icon—rigorous proof.”(p. X of 18 Unconventional Essays on the Nature of Mathematics).

There thus seems to be as lot of language and literature in all sciences (metaphor and other figures, subjectivity and metaphysics, “gossip” and storytelling, art and subjective thinking...), so one is not surprised to find that STEMs—i.e. “Scientists and Engineers /plus

Technicians and Mathematicians/ Need Literature”—in fact, good thinkers in all fields need literature, because literary works are the most refined and complex versions of our natural way of thinking (see also Turner, *infra*). And our quoted author, Troy Camplin knows that the most creative scientists have been avid lovers of literature and the arts (works like Kafka’s—not only his “Metamorphosis”—may have prompted the discovery of the “strange things” in quantum mechanics or chaos theory, while Sir Arthur Eddington quoted the “Jabberwocky” to explain how electrons behave in an atom—“ Eight slithy toves gyre and gimble in the oxygen wabe”) and defines literature as “how we download another’s mind into our own.” Author, among others, of “Bridging the Two Cultures” (see Snow, *supra*) the Dallas Museum of Art Gallery assistant is unambiguous: “If we want our scientists and engineers and inventors to be good thinkers, we should encourage them to read literature.../because/...it helps them to sharpen and complexify.../their/...thinking.”

As a Professor of the “Engaged Humanities” (our quotes and our topic for some time) Department of English at Durham, David Herman also returns us to Snow to remind us that narrative is making sense of experience itself and thus becomes a crucial resource for making sense of the world; in another higher education center (New School for Social Research, New York), a PhD candidate and his supervisor propose five experiments to measure the effect of reading literary fiction on participants’ understanding others’ mental states (i.e. ToM—theory of mind); these participants are assigned to read literary fiction (which requires intellectual engagement and creative thought), popular fiction (thrillers and romances), or nonfiction, and those who read literary fiction turned out to perform significantly better on the ToM tests; conclusion: “literary fiction defamiliarizes its readers; just as in real life, the worlds of literary fiction are replete with complicated individuals whose inner lives are rarely easily discerned but warrant exploration.” (David Comer Kidd and Emanuele Castano, 2013); in short, reading literary fiction improves mind-reading skills, and all STEMs need that badly.

And not just STEMs, but also those who find literature (stories) fundamental for/in all intellectual pursuits, for the whole of knowledge and experience; medical doctors, for instance, and we find their most persuasive speaker in Oliver Wolf Sacks (1933-2015), the “poet laureate of contemporary medicine...” (*New York Times*) and Commander of the Order of the British Empire; in a series of books, of narratives, Sacks demonstrates again and again (case histories, clinical anecdotes, his own disorders—including prosopagnosia, i.e. “face blindness,” see his Man Who Mistook His Wife for a Hat—and experiences) that the capacity of storytelling is what makes us human: “Humans are storytelling creatures preeminently. We organize the world as a set of tales.” (*On the Move: A Life*, 2015) Or a cognitive psychologist, Roger Schank (b. 1946) who speaks for a whole range of intellectual categories (educational reformer, linguist, learning scientist, entrepreneur, AI and computer scientist) when he equates stories with intelligence in Tell Me a Story: knowledge is “experiences and stories, and intelligence is the apt use of experience and the creation and telling of stories...”(p.16) whether fairy tales, science or philosophical stories, mathematical, cultural or literary narratives; intelligence, of whatever sort and complexity, is “having stories to tell.”(p.54)

With this insistence on mind/thought/intelligence we are in full cognitive revolution, the most important intellectual development of the post-World War II period, bringing about a fundamental change in the contemporary cultural climate; and we can thus find an answer to our mid-paper question about language and its origin, or what shapes and determines it (as it shapes and determines thought). Keith Devlin provided his “gossip” answer: “it arose almost by chance, as a by-product of our ancestors acquiring the ability for an ever richer understanding of the world in which they found themselves...”(p. 172); still, a major revision

of our understanding of thought and the origins of language comes with Mark Turner (b. 1954, with scholarly degrees in both mathematics and English from Berkeley), who proposes a new model of mind based on literary mechanisms, and in which stories are central to the workings of the mind; in this “Copernican revolution” (David Herman), the basis of all understanding is storying and conceptual projection, with the literary mind coming first, before all other kinds of thought and before language itself; as stories are the building blocks of human thought (see also R. Fulford), stories and parables are the means by which the brain works; more specifically, story, projection, and parable precede grammar, so that language is seen as the child of the literary mind.

Using neuroscientists Antonio Damasio’s and Gerald Edelman’s theory of a fluid brain activity, Turner overthrows Chomsky’s, Pinker’s, Paul Bloom’s... theories, sees no value in their ideas about genetic instructions—a hidden substructure—in the brain for the development of language/grammar and proclaims repeatedly (not only in his The Literary Mind: The Origins of Thought and Language) that stories are the foundation from which language arose; not grammar and the mind’s linguistic capacities inhabit the deepest regions of the mind, but parable and the ability to tell (and listen to) stories: “Story is a basic principle of mind. Most of our experience, our knowledge /back to Snow?/, and our thinking is organized as stories. The mental scope of story is magnified by projection—one story helps us make sense of another. The projection of one story onto another is parable, a basic cognitive principle that shows up everywhere...” (Preface), because “parable /which combines story and projection/ is the root of the human mind—of thinking, knowing, acting, creating...”

Meaning itself—all types of meaning—does not reside in one site of the brain, “but typically a dynamic and variable pattern of connections over many elements,” and hence blending—our ability to transfer meaning parabolically from one situation/context to another—or the creation of a conceptual blend in blended brain spaces: “The modern mind derives from our capacity to deploy a cohort of basic mental operations—story, projection, blending, and parable...--a mental cohort /which/ precedes the human singularities we know as language, art, music, mathematical and scientific discovery... or advanced social cognition...” As different modes of thinking blend into one another (conceptual blending by composition, completion, and/or elaboration) new meanings are emergent in the blend, and is thus easy to see science as “no more, but certainly no less, than any other discourse; it is one story among many stories” (Aronowitz, p.192) and scientific disputes as stories competing against one another; the same “narrative thinking and blending combine to give us abilities for mathematical thought...” (“Mathematics and Narrative,” 2005, p.4), whose quest story is a proof quest; and in every case, from finance, to astronomy, to all natural, formal, and social sciences, “the most sophisticated and recent” research is “indebted for its existence to our ability to blend strange mental arrays with simple... stories to produce human-scale little /or big/ narratives that ground our thinking.”(p. 22)

Finally, Mark Turner’s conclusion (see also Dutton, 1998): the capacity to tell stories (i.e. literature) and to project them on new contexts as parables, is the fundamental and essential tool of human reason (experience and knowledge). And ours (sic?): literary thinking is shown and proved to be far from “peripheral and dispensable...” (as a number of STEMs might still believe).

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