

Phi Beta Kappa Literary Exercises, Harvard
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May 27, 2014

“The Ether of Space”

I’m honored to be here with you today, and delighted to be here as a fiction writer—but I’m not going to talk directly about writing fiction. Instead, I’d like to say a few things about how we tell and respond to stories. I write what’s usually termed historical fiction, often drawing on the lives and work of scientists, so if you’ll bear with me for a bit, I’ll tell you a story about Oliver Lodge, a British physicist born in 1851 and prominent during the last decades of the nineteenth century.

Over a career that spanned more than fifty years—Maxwell to Schrodinger, electromagnetism to quantum mechanics—Lodge contributed significantly to studies of lightning, radio waves, electrical theory and more. He was especially interested in how electromagnetic waves propagated through what was then called the ether of space: that continuous, invisible, invariable, omnipresent, incompressible, and rigid fluid through which the waves must wave. Lodge spent much of his working life trying to define the properties of what he saw as “the unifying and connecting mechanism which welds together the disconnected atoms of matter and makes cosmos out of chaos.”

While Lodge did solid theoretical and experimental work trying to prove the ether’s existence, he also played a crucial role in explaining the concept to the general public. A gifted scientific writer and one of the age’s best-known popular lecturers—

think of him as someone like Brian Greene--he summarized his investigations in 1909 in a clear and compact book meant for lay readers.

“Take a steel disk,” he wrote, describing the famous set of experiments he conducted in the 1890s. “Or rather a couple of large steel disks a yard in diameter clamped together with a space between. Mount the system on a vertical axis and spin it like a teetotum as fast as it will stand without flying to pieces. Then take a parallel beam of light, split it into two by a semi-transparent mirror . . . and send the two halves of this split beam round and round in opposite directions in the space between the disks.” The massive rotating disks, he hypothesized, would drag the surrounding ether along with them, much as a truck drags air along the highway. A motorist traveling behind the truck may be pulled by the entrained air, while a motorist traveling in the opposite lane is impeded. In Lodge’s experiment, the beam of light traveling in the direction of the rotating disks might move faster relative to the beam travelling in the opposite direction. The difference in their velocities could be measured by interference between the two beams--assuming that there *was* a material ether to be dragged by the disks.

Drawings of Lodge’s great machine show a huge stone pier supporting the disks, which look like giant saw blades; heavy beams and frames on which are bolted pieces of optical equipment—and a person standing within the frames, horrifyingly close to the whirling disks and directly exposed to the air--or anything else--they threw off. Lodge, who never fudged his data, said frankly after his work was completed that “not the slightest effect of acceleration is manifested by the beam of light.” Like all the other experiments meant to detect the ether, including the better-known set performed in 1887

by physicists Albert Michelson and Edward Morley, Lodge's yielded only negative results.

Some believers drifted away—especially after 1905, when Einstein's special theory of relativity and his work on the photoelectric effect made an ether of space unnecessary. Many more jumped ship after experiments performed during the 1919 solar eclipse, which measured the deflection of starlight by the sun. The results, seeming to confirm the predictions of General Relativity, so startled Lodge that he walked out of the meeting at which they were announced. Still, he clung to his belief in the ether until his death—perhaps in part because for him it had an additional meaning.

Like many other prominent Victorians, including Arthur Conan Doyle, William James, and Charles Dickens, Lodge was deeply interested in the possibility of communicating with the spirit world. As a younger scientist, at first simply curious, he'd attended séances and investigated, in connection with the Society for Psychical Research, the survival of personality after death. He wrote in 1909 that “If anyone thinks that the ether, with all its massiveness and energy, has probably no psychical significance, I find myself unable to agree with him”—and he came to regard the ether as a medium that carried not only electromagnetic waves but the transmissions of disembodied spirits. By the time of his 1913 Presidential Address to the British Association for the Advancement of Science—speaking *as* a scientist, that is, on an occasion when he had to know exactly how controversial this was—he was saying: “I will not shrink from a personal note summarizing the result on my own mind of thirty years' experience of psychical research, begun without predilection—indeed with the usual hostile prejudice Already the facts so examined have convinced me that memory and affection are not limited to that

association with matter by which alone they can manifest themselves here and now, and that personality persists beyond bodily death.”

After his youngest son was killed fighting in France in 1915, his convictions deepened and he began attending séances as a way to converse with and receive news about his dead boy. Towards the end of his book *Raymond*, an account of those sittings along with an analysis of what Lodge believed to have taken place, he wrote: “I am as convinced of continued existence, on the other side of death, as I am of existence here. It may be said, you cannot be as sure as you are of sensory experience. I say I can. A physicist is never limited to direct sensory impressions, he has to deal with a multitude of conceptions and things for which he has no physical organ: the dynamical theory of heat, for instance, and of gases, the theories of electricity, of magnetism, of chemical affinity, of cohesion, aye, and his apprehension of the Ether itself, lead him into regions where sight, hearing, and touch are impotent as direct witnesses, where they are no longer efficient signs.”

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So—there’s a little bit about the complex, contradictory character of Oliver Lodge. There are twenty paths through that material, twenty ways to shape it as a story. A handful are interesting; the rest are not. A handful will mean something to someone; the rest, not. Lodge’s life can be made to seem shapely and meaningful or chaotic and thwarted; happy or not; whole or not. Relevant to us, today, as we celebrate our community of curious, thinking beings—or not.

As a writer telling Lodge’s story, I might linger on the remarkable machine, inviting you to imagine yourself caged by the beams, on a hot summer night in a

basement room, with the dynamo roaring and the disks vibrating so intensely that the sandstone trembles beneath the floor. You've been working on this for years, raising money from local merchants, hiring workmen, refining the machine's design and overseeing its construction—and now, at last, you reach eagerly for the rheostat while trying to keep your head below the level of the disks. You know that the concert at which you promised to join your wife has already ended and your children are asleep, already, again; another day gone without seeing them; another day gone. You turn the dial. The dynamo roars. The whirling disks, despite yielding no answers, still make everything make sense.

Or I could linger on the moment when Lodge, listening to his fellow physicists declare the triumph of Einstein's theories, bolted from the meeting and disappeared into the night. Imagine yourself as he was then, nearing seventy and aware that your reputation has been slipping even as the gently mocking young geniuses produce their theories, with which you suspect you disagree but which also excite you, even thrill you, except that you can't trust those responses because you can't be sure you understand the theories. Baffled, you slip out the back door, knowing even as you step into the street that you'll have to find some excuse for this, some story to cover this action you didn't quite mean to make. You will say, you think, striding quickly, that you had a train to catch, an essential train, which if you missed it would cause you to miss—what? You'll have to make that up as well. Youngsters are laughing behind you.

Or—this seems so strange to us, now!--I could linger instead on the séances, inviting you to imagine yourself in those darkened rooms, your cheeks troubled by insidious breezes, your hands stroked suggestively as you write down the whispered

messages. After pondering those transcriptions, you'll incorporate them into a book that makes you famous among your fellow mourners. "Reality," you might write, as Lodge did then, "is what everyone is keen to know about. No one wants to be deceived; all are eager for trustworthy information, if it be forthcoming, about both the material and the spiritual worlds, which together seem to constitute the Universe. The Ether of Space is the connecting link."

To tell the story is to shape it. I can tell it so that Lodge seems eager and brilliant but unluckily wrong; mistaken but still flexible and open-minded; mistaken and stubbornly deluded. I can let hindsight color the story, so that we almost automatically judge him a failure; or I can try to try to set it more accurately in the scientific and cultural context of the time, when no one yet knew who was right or wrong. I've told part of it once before, in a story also called "The Ether of Space." There I showed Lodge—an actual person, used as a fictional character--through the eyes of an invented character, an astronomer and science writer who listens to him lecture in 1920 and, despite being widowed herself, judges his mixture of science and spiritualism harshly. Probably you'd feel differently about Lodge, reading that story, than you do listening to this.

But suppose I gave you a better sense of what a large role conceptions of the ether played in nineteenth-century thought, how many scientists and philosophers bent their intelligence toward investigating it, how many poets and artists thrilled to its metaphoric possibilities? Much of Lodge's thinking stemmed from the work of the physicist Faraday, whom Lodge greatly admired, and without stretching very far I might connect Lodge to Emerson, the presiding spirit of this occasion, who was also fascinated by Faraday's work. Faraday's 1831 discovery of electromagnetic induction and his conclusions that

electricity and magnetism are transmitted as lines of force in a space-filling ether, and that matter itself is essentially electrical, induced such excitement in Emerson that the images sparked in his work. A decade after Faraday's discovery, Emerson wrote, in "Compensation"--

"Polarity, or action and reaction, we meet in every part of nature; . . . in the undulations of fluids and of sound; in the centrifugal and centripetal gravity; in electricity, galvanism, and chemical affinity. Superinduce magnetism at one end of a needle, the opposite magnetism takes place at the other end. If the south attracts, the north repels. To empty here, you must condense there." If Emerson brought back such figures from his study of electromagnetism, does that change the way we respond to Lodge's vivid metaphors relating matter, energy, and spirit?

I imposed one set of meanings on Lodge's life by what I chose to tell you and how I did the telling; other sets are imposed not only by the science itself but by the history of the science, the culture in which Lodge was embedded, and the history of that culture. You don't need all of a writer's tools to understand how and why you were steered through that story—but you need a few, including an ear attuned to Lodge's seductive rhetoric, which persuades even when he's wrong. A little acquaintance with science helps too, at least enough to give you some working vocabulary and to subdue the fear of looking up material for yourself. Helpful as well is some knowledge of history—especially the slaughter of the Great War—and a modest understanding of how evidence is weighed as history gets written.

Context, then. Those of you being honored today for your scholarly achievements already know how arbitrarily academic subjects are divided, and how deeply blended all

real knowledge about the world is. The connecting link Lodge defined as “the ether of space” might be a useful metaphor for the continuous field of shared knowledge, undulating across space and time, that binds us all together and is the kind of context a liberal arts education is meant to give you.

When he was in his mid-seventies, Lodge wrote: “Everything is interlocked; we cannot take a comprehensive survey before we look at things individually, and we cannot consider individual things fully and completely without a comprehensive survey. Thus there is a difficulty, but it is unavoidable.”

Lodge was wrong, but in good company, about the existence of the ether of space, and wrong in a different way, but one that makes perfect emotional sense, about the presence of spirits in the ether. We can’t appreciate any part of that without knowing all the twists and turns of his heart and his life. We can’t grasp his work—as you can’t grasp the full meaning of the paths you’ll take next—without embracing all the complexity and contradictions: the art, the science, the history, the feelings. I hope you’ll delight in the pure joy and depth of all you have yet to investigate and feel—and congratulations on all you’re already achieved!