During the Progressive Era, the landscape of the United States was radically reconfigured in concert with the feats of engineering technologies. Similarly the landscape of the American educational system was altered—both physically and intellectually. Between the years 1870 and 1900, teaching laboratories were built and introduced into many physics curricula in higher education. This pedagogic innovation has largely been cited by education historians and historians of science as an important step leading to the emergence of the modern research university in America. For the most part, however, the little existing scholarship casts laboratory teaching as a natural progression in the rise of the modern research university. Not only does this interpretation rest on a teleological explanation, but it also presents the situation incorrectly: my own preliminary research indicates that the practicality and efficacy of laboratory teaching hung in the balance, even after its introduction in higher education. In addition, there has been no attention paid to the actual laboratories themselves.

To fill this lacuna, I suggest a project where the major historical actor is the laboratory itself. To avoid teleology, I will regard the laboratory as being the tangible result of the co-construction of the discipline of physics with the modern research university. Both emerged at the same time and the processes which were driving one were related to the processes driving the other: the discipline of physics and the research university did not come about independently. In the course of building each other, laboratories were erected, shaped by the changing needs of physics and higher education. In other words, in my conception of this project, the local site of the laboratory acts simultaneously as a grounded entity whose physical layout and construction reveals a story about the spaces and practices of physics, and also as a means of investigating the dynamics of historical change in the nature of the university, the students, pedagogy, and the discipline of physics.

Historiographically this study will introduce the issues of space, materiality, and architecture into the study of American science. A few similar studies have been done on laboratories in the European context, providing methodological examples for, and further insight into, my research. Significantly, American physicists during this time often went to Europe, especially Germany, to get their Ph.D.s, and their experiences in the laboratories there fashioned the scientific ideals they were to bring back. However, although inspiration may have been drawn from places like Berlin or Göttingen, I want to show these laboratories as distinctly American.

Specifically, I propose an investigation of two of these laboratories in particular—Franklin Hall of Cornell and Jefferson Physical Laboratory of Harvard—opening their doors in 1883 and 1884 respectively. A study of these sites has twofold importance: first, similarities in the stories will suggest generalizable historical trends, and second, the distinct characteristics of each will highlight the local nature of universities and physics. The impact of local and contingent circumstances on the development of these laboratories will be investigated. Moreover, the architectural layouts provide the historian with a materialization of the answer to the question: how did the planners envision the ideal practice of physics? The idealized spaces in a blueprint can act as historical evidence. (I have already acquired the layouts of these buildings.)

In preparation for this project, I have taken a course in “Materialized Epistemology” (in other words, how one connects knowing with material culture) under Professor Norton Wise. His guidance and instruction have been central to my understanding of material culture as an object of study as well as methodology. Additionally, this past quarter, I examined the broader world of the history of the social sciences with Professor Ted Porter. Important to our investigation was the role of the university in discipline building, and it is under his mentorship that I am planning to perform this research as part of the Graduate Summer Research Mentorship. As a historian of nineteenth-century science and someone whom I have worked with in a variety of courses, Professor Porter is perfectly placed to advise and mentor me.

Research on laboratories, more generally material culture, can act as a crucible to forge together disparate threads of scholarship, such as architecture, physics, and pedagogy. This sort of work is needed to provide fresh perspectives and draw new connections in nineteenth-century American science. The Graduate

Sameer Shah

Building a Discipline: The Construction of Physics Teaching Laboratories, 1870-1900

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Research on laboratories, more generally material culture, can act as a crucible to forge together disparate threads of scholarship, such as architecture, physics, and pedagogy. This sort of work is needed to provide fresh perspectives and draw new connections in nineteenth-century American science. The Graduate
Summer Research Mentorship will provide me with the opportunity to do this, and to explore an important topic in the history of science which I hope will extend into my dissertation.