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Jay A. Labinger

Up from Generality

How Inorganic Chemistry Finally Became a Respectable Field

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Contents

Abstract

Inorganic chemistry, with a negation in its very name, was long regarded as that which was left behind when organic and physical chemistry emerged as specialist fields in the nineteenth century. Scarcely differentiated from general chemistry, inorganic chemistry was not widely accepted as an independent, intellectually viable discipline, especially in US academia, before the middle of the twentieth century; only then did it begin to gain its current stature of equality with that of the other main branches of chemistry. Discussion of the evidence for this transition, both quantitative and anecdotal, includes consideration of the roles of local and personal factors, with particular focus on the Chemistry Division at the California Institute of Technology, as an illustrative example. Examination of key developments, as well as the central figures that fostered them, leads to proposed explanations for the remarkable upgrade of status enjoyed by inorganic chemistry.

Keywords Inorganic chemistry · History of chemistry · Discipline formation · American inorganic chemists · Chemistry in US academia · Chemistry at Caltech · Mechanism in chemistry · Organometallic chemistry · Donald Yost

Chapter 1
Introduction

> "*Chaplain, I once studied Latin. I think it's only fair to warn you of that before I ask my next question. Doesn't the word Anabaptist simply mean that you're not a Baptist?…. Now, Chaplain, to say you're not a Baptist doesn't really tell us anything about what you are, does it? You could be anything or anyone.*"
>
> Joseph Heller, Catch-22

In the late summer of 1967, between my junior and senior years at Harvey Mudd College (HMC) in California, I traveled east to look at some possible choices for graduate study in chemistry. At Harvard I stopped by the chemistry department office and asked if any faculty members were available to talk about the graduate program. The head of the office staff (she had been in that position for many years, and was clearly used to such inquiries) replied, graciously, "Certainly. Are you organic or physical?"

Her question, thus phrased, surprised me considerably, as I was leaning towards specializing in inorganic chemistry for graduate work. I had done a summer project, and was planning to do my senior research project, in that subfield (with Mits Kubota, the inorganic chemist at HMC). It had never occurred to me that its status might be considered inferior elsewhere. When I told her my preference, she seemed at least equally surprised, but quickly recovered, and arranged a visit that, while impressive, was mostly limited to organic chemists.

I chose to go to Harvard anyway, and to do my Ph.D. in inorganic with John Osborn (Fig. 1.1), who arrived at Harvard shortly after my visit. That went very well; but I had a few more disconcerting experiences during my first year. The inorganic faculty, besides Osborn, consisted of full professor Eugene Rochow, who was slated to retire the following year, and Mel Churchill, another assistant professor. A search for a full professor to succeed Rochow brought in several of the leading names in the field—Harry Gray, Fred Basolo, Fred Hawthorne—each of whom spent a week at Harvard and gave what seemed to me several first-rate lectures. In the end, though, none was offered the position, which was left vacant for a number of years thereafter. I found opportunities to ask a couple of the senior organic faculty why, and was told (they were quite open about their opinions!) the department felt that not only the particular candidates interviewed, but the field of inorganic chemistry as a whole, fell well short of the standards of intellectual importance and respectability that Harvard required of its senior appointees.

As I pursued my career in inorganic chemistry over the next few decades, it was eminently clear (to me, anyway) that the field *did* enjoy a status fully coequal to

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