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Of Special Interest

Travels with my Syllabi: The College Chemistry Consultant's Service (C_3S)

JEFF C. DAVIS, JR.
Department of Chemistry
University of South Florida
Tampa, FL 33620-5250
davis@chuma.cas.usf.edu

There are C_3S consultants available who can tackle just about any concern for which a department or institution would like to turn….

My first call was from a well-known University in the Northeast. The chemistry faculty there had decided that it was time to take a hard look at their curriculum, which had been in place for many many years, and examine the content and appropriateness of specific courses. Would I be willing to consider these questions and offer some advice? That was certainly an intriguing request, especially after having been involved with some novel ideas for a chemistry program at my own school, and so I accepted the challenge. I was soon the recipient of an armful of catalogs, course descriptions, and departmental statistics.

The visit followed what was to become a familiar pattern. Time was spent on the afternoon plane flight refreshing my memory on several specific items. The Chair of the Chemistry department met me at the airport. At that point I was more than happy to have brought along the overcoat I never use in

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Florida. About a half-hour later we were in his home and I was meeting some faculty and spouses who had gathered for refreshments and brightly-lit shelter from the descending darkness and cold rain outside. After being deposited at a local motel I spent a bit more time alternating between checking on some facts in the syllabi I had in hand and watching the shenanigans on TV before I called it a day.

The next morning one of the faculty stopped by for a brief breakfast; we drove to the campus and went on a tour of the department. After a brief session with the Chair, who outlined his concerns, I began a full day meeting with individual faculty, looking at their laboratories and other facilities, and filling in a lot of the details you never see on paper. In this process several of the faculty bent my ear about personal concerns, ranging from the sacredness of specific courses in their current curriculum to motivations of other faculty and/or administrators. Fortunately, it was not my job to make judgments or report on such issues, but these discussions did and do help put a department's environment in a clearer light, something that is usually needed to help everyone to act together constructively. Another supper with a few faculty that evening was followed by some more time in my room trying to formulate a tentative response to the issues that had been raised, partly as a departure point for raising questions the next day.

My second day included more individual conferences, as well as meetings with the Dean and a couple of other department heads. The afternoon was capped off by a group meeting with all of the faculty at which both they and I could raise specific questions. While some individuals might hope that I would come down hard on one side or another of a dispute that had been fermenting within the department, I think most of the faculty and I recognized that there were no unassailable authorities present to make such judgments, certainly not me. My aim was to lead faculty into thinking about some concerns more broadly than they might have done individually and to deepen my own understanding of their backgrounds and interests as they related to course structure and curriculum. There was more note taking and more questions on my part. I tried to summarize my overall impressions and the direction I thought the department might take, then see what faculty responses were to those suggestions. I wanted to leave a sense of what I thought could be a fruitful path while saving more detailed analyses until I had time to put all the information together systematically. Then it was back to the airport and on the way home. The net result of this visit was a written report in which I responded to the issues I had been asked to examine and gave

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S 1430-4171 (97) 02119-5

my impressions of faculty interest and ability to respond to the changes that were sought. My personal summary of the whole activity is that perhaps I gained more food for thought than my clients, but it was gratifying to learn later that the faculty had indeed mapped out a game plan and were pleased with the changes that were underway.

This scenario has been somewhat typical for me as a C_3S consultant. Leave Florida in the afternoon, spend a full day and most of the next visiting a department, and then leave in the late afternoon or evening for home. The agenda and schedule have differed from school to school; both local circumstances and local agenda determine what will happen and when. Nevertheless, a key ingredient has always been private discussions with individual faculty and sometimes staff, examination of facilities and equipment, usually a meeting with students, and at least one meeting with all of the faculty where overall concerns can be discussed. Meetings with Deans and other administrators are included, especially when the College or the institution has initiated a review, and these always provide an opportunity to represent department goals and problems to the administration as well as an opportunity to better appreciate the institution's view of the department's role and circumstances. Again, I don't hesitate to say that these visits are thought provoking and inspiring for me and have almost always resulted in championing some new initiative back here at University of South Florida (USF).

Why invite a C_3S consultant? Surely, none of us represent the final word on any issue. Still most of us have garnered experience in one area or another that could be useful to a department when faculty or administrators feel they could benefit by having someone from the outside to help them gain a useful perspective on their problems. For example, I spent several years coordinating a large-enrollment general chemistry lecture and laboratory program; served two terms as Department Chair under two quite different kinds of administration; have been intimately involved with articulation among school districts, two-year colleges, and four-year institutions in Florida; served as Director of Academic Computing for the College of Arts and Sciences at USF; have had many years of experience writing, editing, and testing ACS exams, and have been involved with science literacy issues and curricula for my entire academic career. I certainly have figured out some things that work and some things that don't, and that provides at least a starting point for considering similar situations at other institutions.

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The circumstances that might lead a department to request a visit from a C_3S consultant are many. Several of my visits, for example, have been to departments in relatively small schools who would like to apply for certification by the ACS Committee on Professional Training (CPT). If you read the CPT guidelines you are left with two impressions: (1) *everything* is laid out specifically—general disciplinary categories, hours of class and laboratory work in each category, departmental resources, etc. and (2) *nothing* is laid out specifically—about course content? Do we have the right journals in the library? How often do lower-enrollment courses have to be offered? What kind of department budget should we have? Are the labs adequate? What about faculty teaching loads? What about instrumentation and other resources? Since the CPT does not want to be completely prescriptive and leaves lots of room for innovation and flexibility, a number of possible alternatives often seem unresolvable without someone's advice. When the focus is on CPT certification my approach has been to ask the department to provide all the detail of information that they would have to provide to CPT when making an application. Armed with that information, my job during a visit has been to size up how department curricula and resources match CPT expectations and find any areas in which glaring deficiencies exist. I think of myself first as one of the CPT evaluation team, then as the attorney for the other side. Usually there are alternate routes to remedying deficiencies and some will be more viable than others for a particular department. I try to think of those alternatives and pass them on. I am pleased that the departments I have visited for this purpose have subsequently attained CPT certification, but the fact is that this goal was reached by the members of the faculty themselves based on their own program and their own vision. A large part of the process is to show CPT exactly what your strengths are and one role of C_3S consultants is to help identify those strengths.

In addition to helping with the CPT approval process and working on curriculum revisions I have been called on as a consultant in a variety of situations including:

- institution- and state-mandated program reviews;
- new degree programs;
- concerns about administration, budgeting and general operations;
- review of health and safety issues;

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- integrating undergraduate research activities into the curriculum; and
- efforts to reduce faculty teaching loads to educationally productive levels.

C_3S consultants have helped with many other kinds of issues such as:

- proposal writing;
- implementing multimedia/computing tools;
- student recruiting and retention;
- establishing work-study programs and developing career opportunities for students;
- strengthening industry and community interactions;
- improving student/faculty interactions;
- design of classrooms and laboratories;
- special programs for school teachers.

There are C_3S consultants available who can tackle just about any concern for which a department or institution would like to turn outside for advice. Consultants are not just sitting around waiting to pass out their own brand of advice either. Periodic workshops have been conducted by and for C_3S consultants to share information, discuss the appropriateness of different problems and actions, and generally come up to speed on a variety of areas in which each individual consultant might not otherwise have as much experience.

As a consultant it has been interesting to me that in many departments, perhaps most, there are situations that have not been recognized as problems or potential problems. I'm happy to pass on a couple of these *gratis* . (Watch out, this means I have my soap box out.) For example, health and safety issues often lurk in the background, especially if there has been no institutional thrust to remedy unsatisfactory facilities or procedures. While we all may feel that regulatory mandates have overly restricted what we are allowed to do, ours has become a litigious society. Not only should we be concerned about the safety of our students, but we are even more prone to legal action

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if accidents occur. A wise move for any department is to launch their own study of how chemicals are stored, how well the air handling system functions, whether hoods work effectively and that there are enough of them, whether electrical power and equipment are sufficient and safe, and how students are instructed to handle chemicals and apparatus. The scarred ear and missing finger are no longer the hallmarks of the chemical profession and safety awareness should be ingrained in the psyche of any potential science or technical professional.

A second aspect of chemical education has become more and more apparent to me over the past several decades. In many respects colleges and universities were closed societies for many years. There have always been some faculty concerns about whether students were adequately prepared in science and mathematics skills when they entered freshman chemistry courses and an interest in making sure students obtained good jobs or proceeded to a good graduate program, but otherwise each institution was inclined to do its own thing and not worry much about anything except how well the curriculum ticked along. Today, many institutions work in a completely different environment. There are vast networks of agreements between school systems, colleges, businesses, and other community agencies that allow and encourage students to participate in college-level curricula through a variety of entry routes and that involve them in a variety of activities outside of the college environment. Furthermore, most students do not have the same kind of academic preparation we once expected to be more or less standard for college-bound students. In short, many faculty and departments are not aware enough of exactly where their students come from and what they are supposed to and actually have learned at those schools. They are not familiar enough with how off-campus programs affect their students' schedules and their experiences. They often do not know enough about what those students are going to be doing when they graduate and whether their training in college prepares them as well as it could for those additional studies or jobs. The jargon for establishing links between a college department and these sources of students at one end and acceptors of graduates at the other is *articulation* and I have come to realize that better knowledge about these external factors often helps make the right decisions about courses and curricula at the college level. This is a faculty responsibility in today's society.

The College Chemistry Consultants Service was conceived by members of the ACS Division of Chemical Education back in the 1960's. Today support and oversight is

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provided by members of the Division and by the ACS through its Society Committee on Education. The program is managed by the Office of College Chemistry in the Division of Education and the combination of dedicated staff in that office and interested professionals in chemical education have helped this effort remain viable and useful. The aim is to provide resources to departments that might be helpful in many different areas, only some of which were listed above.

Using C_3S is a bargain. The basic charges are transportation costs plus $200 a day for consultant visits, and $150 for the written report from the consultant. Institutional administrations often are willing to bear these costs and the C_3S office is able to help reduce costs in many instances, particularly those that involve minority faculty and students. This is a nonprofit service under the American Chemical Society umbrella. So when your department begins to focus on some area in which you would like more information about what the rest of the scientific and educational community is thinking and doing, what seems to be working and what isn't, get out your C_3S brochure and look for some consultants who seem like they might be able to help. Contact one and talk over your problem and their possible interest. Call another potential consultant if necessary. Then give the C_3S office at ACS a call to make it official. I think we will all enjoy the experience. For C_3S brochures, information, or application for consultation services contact: College Chemistry Consultants Service American Chemical Society/ Education Division, 1155 Sixteen Street NW, Washington, DC 20077-5768; phone: (202) 872-6269; FAX: (202) 833-7732; or e-mail: m_fitzgerald@acs.org.