Microchemical Training for Young People Planning a Career in Chemistry.

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One can get a good picture of how far microchemistry has progressed in our own time if he examines the curriculum of what is being taught today in our field. Indeed, this first International Microchemical Congress with its wealth of fascinating papers and its rich background of historical tradition as laid down by two great teachers, Emich and Pregl, would seem incomplete if some consideration were not paid at this meeting to the modern problem of microchemical education. It seems fitting that we dedicate a brief span of time to the consideration of the welfare of those who are going to come after us.

The present problem of microchemical education is to decide what to teach. It arises from the fact that the microchemical field like other branches of physical science has now become highly specialized. Conscientious teachers of microchemistry are asking themselves today, “What knowledge should I present to students intending to enter the chemical profession and how can I coordinate this instruction with their general education?” Clearly, the old practice of adding one more new topic to the curriculum whenever another significant paper appears in the literature does not go any more. Nowadays the good course in microanalytical principles must be carefully organized. In such a course the topics must be considered in a logical sequence. The work must at the proper pace so that at no one time is the student rushed advance to cover vast amounts of material. Proper emphasis must be placed on those elements of the field which are significant and the course should not be cluttered with trivialities. On the other hand, sufficient detail must be brought in to give meaning to the generalities.
There is also the question of how much time the college student can devote to his study of microchemistry. If we are to offer him a balanced education, we must share his interest in us with the demands of his other subjects. Consequently science courses in general have to be designed within the framework of the so-called “common core” of education. They have to be “blueprinted” not only to present basic principles to the student within a specified period of time, but also to assume a correct proportion within the overall picture of the needs of his professional training. Thus, too, it happens that the professor is under an increasing pressure to teach more effectively. He can do his work best by confining himself to the fundamental principles, the brilliant discoveries, and the significant refinements which have taken place in his field.

The choice of what to teach in microchemistry, therefore, is part of a larger problem which does not concern us here. We may note, however, that in American colleges the argument is being advanced that science students are better off later on in life if they do not concentrate too deeply in science study before they arrive at the university. The trend in college today is away from highly specialized courses in science. According to such philosophy a course in microanalysis which is too long or too detailed is out of place in an undergraduate curriculum. The idea seems to be that if you would be an outstanding microchemist you must first have a strong foundation of general knowledge upon which to establish your scientific career. Consequently, if one approves the above philosophy, one should put in a microchemical course only those topics which are either highly fundamental or unusually interesting or of great cultural value. Highly detailed treatment of subject material is inappropriate.

The importance of a general background is also reflected in our common industrial practice in America of staffing the microanalytical laboratories of our chemical plants with college trained personnel. In spite of the considerable expense involved in time consuming interviews, these persons are very carefully selected. Qualities of character and personality are very important. Careful attention is paid to the applicant’s training in the humanities, his foreign languages, his social studies and his hobbies. The analysts selected, men and women, often receive the same rate of pay as that authorized for comparable ability in other departments. Moreover, attempts to make use of narrowly trained, so-called “technicians” in plant microanalytical laboratories do not seem to work out well in the long run. Such groups are rarely conspicuous for their creative ideas or for their development of new microanalytical techniques. In their laboratories you see that knowledge of alternate procedures, for instance, is scant and innovations are rare. Glaring weaknesses in technique appear whenever a strange apparatus has to be