

SUITABLE CURRICULA FOR HIGH SCHOOL CHEMISTRY

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Since hypothetical considerations on curricula for High School Chemistry have been discussed so frequently and so thoroughly, it mounts almost to the height of the ridiculous to break down and build up once more, with the hope of attaining anything like the ideal.

High School Curricula as viewed in this paper cover the well known accepted line: First, General Chemistry; Second, College Entrance Equivalent; Third, Popular Course; Fourth, General Science. These have their various advantages and disadvantages.

Because of these apparent advantages and disadvantages a rapid summary will be sufficient to bring them to our attention. First, General Chemistry is an encyclopedic description of practically the entire field. This is found successful with students who have carried two to three years of science or those who have the ability to do scientific thinking. On the other hand students who have had but one year of science or no previous training would perhaps lose all enthusiasm or never develop an inclination towards chemical viewpoints.

Second, the College Entrance Equivalent, is the course that should enable the student after entrance examination, to register in Analytical Chemistry or carry a condensed course in General Chemistry. It is recognized in many colleges that this course is sufficient preparation for Analytical Chemistry. However, many college freshmen find the following difficulties: (A) they are not as yet orientated into college; (B) they do not think with adult scientific minds; (C) the ebullition of High School Chemistry has ceased.

Third, the Popular Course in Chemistry and fourth, the General Science Course should develop a scientific attitude of mind, and the ability to do critical thinking, and should serve as vocational guidance courses for the scientifically minded.

Estimating these courses from the teacher's platform, his adequacy and in-

adequacy of preparation comes to the fore. The following appears in the Illinois Bulletin No. 8, 1940, concerning preparation of teachers in Physical Sciences, effective in Illinois High Schools: In the field of Physical Sciences sixteen hours are required, in the subject ten hours. Is this preparation adequate? Yes, if as a student, the teacher in question had developed the two concepts (critical thinking, and a scientific attitude of mind) and can stimulate a critical attitude and an appreciation of science. Adversely many with stereotyped preparation never get beyond a mechanical presentation of the subject.

The nucleus of this paper is to discuss the fact that the ideal course in High School Chemistry should be given primarily to incite stimulation. (This stimulating course would act as a sounding-board to test the student's aptitude for Chemistry.) Also the General Inorganic Course taken in the college is practically indispensable for the Chemistry Major.

The advantages of the above suggestions may be listed:—a) This would give all entrance students relative mental aptitudes—their orientation and tools with which to begin their major work would lie in the same plane; b) with this average requirement of knowledge, enthusiasm would not suffer; c) presentation of theory in High School Chemistry should be subservient to practical application. This inductive method, broadens instead of cramps the student's ability to do creative thinking; d) an elaboration of theory if not accompanied by thorough understanding and sufficient practical application, stifles scientific interest and progress; e) an elaboration of theory accompanied by thorough understanding creates a superiority complex with regard to the student's idea of his knowledge of Chemistry; this has a disintegrating effect which is practically irrevocable; f) it is almost impossible to introduce into High School a course that will be equivalent to a General Inorganic Course as

given in college; this means that the student with the General Inorganic Course that is supposed to be College equivalent, has inadequate background for major study in Chemistry.

What would be the ideal course in High School Chemistry? These would no doubt amount to courses, and would differ according to the type of high school. In an academy for girls where the majority will be Home Economics majors or technicians the practical applications can be directed in those fields. In a boy's high school industrial and special professional fields may be considered, whereas in the co-ed high school, a varied course would be advisable, one having general application. Such a course would be one that would accompany the laboratory manual, "Test It Yourself" published by Scott Foresman.

A great objection to the above suggestions is the well-worn fear that Chemistry majors will be retarded if they are not able to step into courses in Analytical Chemistry as soon as entering college. There are other time saving devices which would not nip the scientific bud. Cannot the High School equip the student so well in fundamentals of rhetoric, history, languages, that these can be eliminated in college by proficiency examinations? This would afford more hours in the major field.

May I be pardoned for referring to personal observations and experiences? In the teaching of High School Chemistry for nine years, I have noticed that: a) much of the truly theoretical material is beyond the grasp of the majority, therefore presentation is cramped; b) the time element being limited, presentation of extensive theoretical or practical applications must suffer in assimilation; c) whether they be potential Chemistry majors or not emphasis on the practical will leave all students with a fair understanding of everyday Chemistry; d) for potential Chemistry majors, practical Chemistry gives them a background which broadens their concepts to the fact that theory without application is like a soul without a body, rather ghostly.

Carrying this knowledge into the teaching of six years of Freshmen College Chemistry, the following points have come to my attention through observation and interviewing of students who have had Chemistry before entering college: a) decided superiority complex: b) waning of interest; c) class morale disintegration; d) fallacy in theoretical knowledge.

As a closing question: If these suggestions made in this paper are valuable to our future Chemists, can we do anything about them?