

inventive project.⁶¹⁴ "Creative capacity was interpreted as a facility in the art of design",⁶¹⁵ but with little philosophy of invention the attention was rather on reduction to practice, than on getting the best possible problem and plan to start on, through imagination. The results were mediocre⁶¹⁶ save for experience, which led to the present, more imaginative, two-year course. It is given in four cities each serving the GE plants of several States, in a four-hour session each week, except in summer, beside much home work. The students are carefully selected for their psychology, interest, and success on a trial problem, rather than from reports of their college work. They are all employees in their 20's, recent graduates in engineering or physics. The instructor, who gives full time to the course, is always a recent graduate of it, to maintain *rapprochement* with his students, to whom he gives much individual attention. A sort of textbook is Von Fange's,⁵⁵⁶ a former director of the course. There are guest lecturers, and many written and oral class reports. The first year is given more to the theory and encouragement of creativity, with some experimentation with brainstorming, and other techniques, use of check lists (§ 592), training in exposition, and increasing the student's acquaintance with very many strange machines and principles. These are described by the students, and sometimes demonstrated by a model three or four made, all for the main *ideas* in each, not for the mathematical working out. This is a contrast to engineering education, which is overwhelmingly mathematical. There is also direct practice of making inventions, first at a once-a-week clip, then one in half a year, carried through to model stage, if possible according to an advance schedule for each step of the development.⁶¹⁷ The second year is given more to analytical physical and engineering studies, and to reducing to practice, by the cooperative labor of three or four, of an invention these choose and carry through to the last detail of manufacturing procedure, and advocacy to the management. The invention then may or may not be accepted for production by the company. Almost all the problems worked on are of interest to it.⁶¹⁸

[617] At the same time the student's regular job is being rotated through half a dozen assignments, suitable to his interests, under creative senior engineers, as in the original system. Here again he is given as much responsibility for developing an invention as possible, so that he may gain confidence as well as experience, and exercise his inventive faculties while young instead of suppressing them, as has been required in the traditional jobs for a young engineer (§ 635). By graduation he has usually started several patent dockets, finds several suitable product departments asking for his services, has good prospects for an inventive career, according to the history of the alumni,⁶¹⁹ and strongly endorses the course.⁵⁴⁷

[618] A much smaller program has been given by Harris in the AC Spark Plug division of General Motors, begun in 1953.⁶¹⁸ Consisting of a dozen two-hour seminars, it stresses examination⁶¹⁹ for entrance, brainstorming, checklists, refresher programs later, and pointing out the blocks to creativity, such as fear of making a mistake or appearing foolish, haste, lack of flexibility, habits, technicways, customary valuations. Good results were reported,⁶¹⁹ especially through the employee suggestion system. The better group, comprising 16 trainees, increased their suggestions 40% to 13 per man-year,