Chemistry, Medicine, Photography.

The factors involved in the selection of a profession are often so diverse and complicated that it is difficult to trace the sequence of events and influences which have led to the final choice of a career. Never-the-less autobiographies frequently contain either too much inconsequential detail, betraying the author's vanity and egotism; or, due to mistaken deference, skim over important relationships. It is with these opposite faults in mind and the intention of steering a middle course that I am about to embark on the difficult task of accounting for my present choice of photography as a profession.

Because my father received his education at a period when science was expected presently to illiminate all the ills of mankind and when Darwinism was shaking the foundations of reactionary theology, I was brought up with the idea that a scientific career was by far the most desirable mode of life. I was privately instructed in many branches of science including astronomy, biology, geology and chemistry. The instruction was of the most delightful sort. My brothers and I were taken on walks along the shore of Lake Michigan, camping in the Rocky Mountains, to the Grand Canyon of the Colorado, and later to spend our summers on an island off the coast of Maine. Father would tell us about the things we saw and expound to us scientific theories of their origin. Being, of course, very impressionable, we were fascinated by his information and our imaginations were stimulated b y his explanations. Since museums were to us the centers of scientific activity we went through periods of collecting minerals, fossils and marine animals.

The latter were preserved in alcohol or boiled and dried under the kitchen stove. I collected also butterflies and bird's eggs. We were encouraged in these activities and in any scientific interests.

My dislike of and difficulties with Latin and preference for chemistry and physics in High school were sympathized with. The study of Latin, a dead language I was told, was unimportant. My inability to spell correctly, though the despair of my teachers, never troubled my father, for after all, Darwin could not spell.

About this time I was given a Chemcraft set for Christmas which was intended to give me elementary instruction in chemical phenomena. I learned through its use how to generate oxygen, carbon dioxide and hydrogen sulphide; to perform chemical magic such as changing wine into water or manufacturing invisible ink; and to perform other harmless experiments. The chemistry course in school however, gave me a vision of the more exciting fields exploitable at home though prohibited in the school laboratory. I learned how to make explosives from sugar and potassium chlorate as well as from the more usual ingredients and experimented with bombs badly frightening the maid by exploding one on the cellar steps. I made gun cotton and tried repeatedly though fortunately unsuccessfully, to make nitro-glycerine. I burned holes in the floor of my bedroom with thermite and blew out many house fuses with an improvised electric furnace. I do not think my parents fully realized the extent or alarming nature of my experimentation though my father did admonish me about making holes in the cellar steps and frightening people with explosives.

With this background it is not surprising that I became de-

termined to have a university education devoted primarily to scientific fields of learning and particularly to chemistry. In 1920 I entered the Harvard Engineering School, which was then a school for under-graduates, and enroled in the course of Industrial and Engineering Chemistry. For two and one-half years everything was according to my expectations and desires. My specific needs for knowledge were gratified. However, as the training became less theoretical - as more and more emphasis was laid on practical industrial and engineering problems and proceedures - I gradually grew dissatisfied. Organic chemistry had especially aroused my interest and the chemical problems associated with biological processes were the most stimulating. The prospect of a future spent in an industrial laboratory performing routine analyses or calculating heat exchanges and efficiencies for an engineering firm was not very attractive. Biological chemistry on the other hand, was an exciting field full of unexplored ground containing innumerable mysteries waiting for clarification. I pictured myself performing ingenious experiments and making notable discoveries. Such is the vision I had, and to prepare myself for engaging in the severe competition of a life of discovery I was advised to enter Medical School where I could obtain a grounding in biochemistry, physiology and pathology which would be invaluable for the work which I anticipated.

The last year at the Engineering School was spent doing the minimum necessary to obtain an engineering degree as well as preparing for the study of medicine by fulfilling the requirements of admission to the Medical School. In 1924 I entered the Harvard Medical School. My intention was, after obtaining my M. D. to become a biological chemist. Circumstances however,

intervened which turned me from this purpose and led to my spending several years in a field of endeavor not previously considered. Due to the influence of a bacteriologist who had a magnetic personality and was a brilliant teacher I tried also to become a bacteriologist. There was no effort on his part to induce me to turn in this direction but knowing him was sufficient to make me sure that nothing suited my tastes better than bacteriology. It was probably unfortunate for me that this occurred for I wasted much time in futile experimentation. I made no discoveries nor did anything for that matter of a scientific nature worth recording.

After several years, during which time the realization grew in me that I had better occupy myself in some other way more suited to my particular abilities, I overcame the inertia accompanying routine and returned to my original determination. I spent the next four years working in biological and physical chemistry with considerably more scientific if not financial success. By teaching I continued to earn a very modest salary. As time went on the possibilites of advancement became more remote since my scientific achievements and abilities were not of the outstanding quality to put my services in sufficiently great demand. It became apparent to me that I could earn as good a living at some other accupation as in research, without the necessity of teaching, which I never enjoyed.

In a previous article in this magazine I have described the growth of my interest in photography. Because this interest was sufficienly great and also because I have been able to earn as much through photography as by teaching I decided recently, but not without some hesitation, to become a full time photographer.

My hesitation in making this decision arose from the question, which naturally occurs immediately to others, of the waste of time and money represented by my elaborate and extensive scientific training. However, no matter how reckoned, it cannot be considered a complete waste any more than any experience can with certainty be regarded as a loss. It is obviously impossible to foretell what effects a particular course of action is going to have on a persons' future life, and similarly, after the fact, it is impossible to say what would have been the result of a contrary action. One can only guess. From the point of view only of photography it seems reasonable to conclude that my medical training has been useless . On the other hand the chemistry I have learned could lead to a much more thoughtful regard for and intelligent use, than is generally the case, of photographic principles, which are indeed based on phenomena of importance also in other fields of chemical science.

Publications by photographers have frequently impressed me as exhibiting a lack of understanding of the technical subjects discussed. Too often there has been an attempt to expound or apply principles with insufficient grasp of their significanc e. The results are unfortunate. Simple relationships may be unnecessarily complicated, to say the least, or their application may be carried to a ridiculous extreme. More serious criticism is justified by the misapplication of principles, not to stress false assertions which have appeared.

For example much emphasis is to be found today in photographic literature on the exposure-density relations of photosensitive materials. Though not new knowledge, interest in these relations is probably a sign that photographic technique is growing up. It is now in its adolescense. It is, I believe, because

of this rapidly growing interest in technique, due to the large number of amateur photographers without a scientific background and much inpressed by anything with a scientific flavor, that has contributed to overcoming the notorious reluctance of photographers to apply available knowledge to their profession. However, popularity has led to a swing to the opposite extreme of over-complicating a process, which, though up to a certain point is amenable to rigorous scientific control, does not warrant the added labor because of factors which cannot be rigorously formulated. A case in point is the literature on methods for obtaining so-called perfect prints. It is true that the density range of a negative and the contrast scale of printing paper can be fairly accurately determined and from the measurements a paper can generally be selected which will reproduce most of the density gradations of the negative. To do this a densitometer must be constructed or purchased and the paper to be used must be repeatedly measured, since it is well known that the contrast scale of paper changes with time and conditions of storage. However, the print obtained, after following this proceedure, may not be that desired. It will be as faithful a reproduction of the gradations of the negative as can be obtained, provided the photographer has at his disposal a very wide choice of paper. It will not necessarily give a print which has the desired qualities. This is because the characteristics which add up to a good picture according to the photographers own ideas contain emotional elements not possible to formulate in chemical and physical terms. Generally it is as quick and inexpensive to select the paper after inspection of the negative, determine the exposure by the strip test method and make one or two trial prints. Of course it is assumed that the photographer, no matter which method he uses,

has had considerable experience. Furthermore this criticism is not intended to apply to tri-color processes which require the greatest possible precision and in which the possibilities for control are much restricted.

If my scientific training arms me against these pitfalls and errors in which others, less fortunate in their background than I, may fall, then it has made an invaluable contribution to the success of a life devoted to photography.

This is all I originally intended to say and this account logically ends at this point but since the editor of U. S. Camera Magazine insisted on my saying something about pictures, I shall, at the risk of repeating what has already been said too many times, venture a few general remarks on photography.

It is impossible to lay down universal rules or to set up specific criteria for good photography. No individual photographer can do this. He is limited to telling, at most, why he takes pictures in his particular way. If he has developed a characteristic style or uses exclusively a certain technique he will find this task easier than if he has no style of his own. For my part it is not difficult up to a certain point and in general terms to account for the way I photograph. I always intend to get into a picture what I see in the original. This is not as obvious a statement as it might seem without consideration, since, what one person sees is quite personal and not necessarily what another sees. When I look at a field, here in Maine in the late spring, I see many things besides an expanse of grass and weeds. Close to me I see, individually, translucent grass blades with the sunlight filtered through them. I see furry hawk-weed stems, very straight and stiff, without dark buds, a little too heavy at the top. Further from me the field seems speckled with these buds.

I see, below the new, the matted, yellow, dead grass that in another year will sink into the soil. If I should photograph this field I should want these things to appear. Therefore, a technique that will bring out great detail is necessary. On another the field will make quite a different impression. To him the detail might be secondary if not lost entirely in a general effect. He would photograph it for that general effect and his technique would be adapted to his impression.

The detail of a subject is of especial interest to me so I always try to retain as much of it as possible in a photograph. To me this is important but I cannot dogmatically say that every picture is better with detail than without. A friend of mine apparently gets a general impression of a subject without noticing the detail, for he once said to me that he could not understand my pictures, they were so intricate. If I were like my friend I probably would not be a photographer.

And finally the camera is an instrument especially suited to recording the intricasiss, delicacy and detail of a subject. It issuperior in this respect to any pictorial art. Is it not a pity to neglect this inimitable potentiality?