

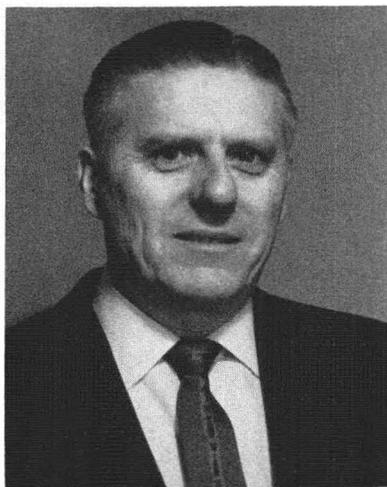
Are Mass Production Methods Limiting the Development of Photogrammetrists?*

CHESTER E. KOWALCZYK AND ROBERT C. STIRLING,
*U. S. Navy Hydrographic Office,
Washington, D. C.*

ABSTRACT: *The critical shortage of manpower in the scientific, professional and managerial fields is discussed; the effect of the mapping profession is considered; the necessity for fully developing the potentialities of individuals presently employed is explained. Mass production methods are given as one of the detriments to personnel development. The responsibilities of management and the individual in a personnel development program are defined. Management's responsibilities are presented as maintaining and stimulating the employee's interest, and sponsoring a personnel development program which includes progressive technical training. (The U. S. Navy Hydrographic Office Training Program is presented as an example.) The individual's responsibilities for his own development are stated to include the acceptance of every opportunity that management provides for his development, and the realization that stagnation of his career may be the result of his own lack of interest and effort.*

BEFORE we examine the question posed by the title of this paper, let us consider why the question is worth answering at all: why concern ourselves with the professional development of individual photogrammetrists? The reason is, of course, that our profession can be no better than the individuals in it, so that it becomes a primary concern of management to develop personnel that are qualified to perform efficiently and productively, and from whom satisfactory selections can be made in promotional actions. To those from whom these selections must be made, it is just as important that they have equipped themselves with education and the broad experience that is necessary but increasingly difficult to acquire in our mass production age of specialization.

Recently we have read and heard much regarding the critical shortage of manpower in the scientific, professional and managerial fields. This shortage stems from the vast expansion of our economy, the acceleration of industrial development, the effects of atomic energy, and the requirements of national defense. Thus it appears that we must examine every possible



CHESTER E. KOWALCZYK

way to the fullest utilization of the manpower that is now and will be available to us. Many indirect approaches are open, such as those leading to better educational opportunities for today's young men and women who will be tomorrow's employees. However, there is already a wealth of man-

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power available—those presently in our employment.

The importance of these persons will be quite apparent if we reflect upon the effect in each of our companies, departments, divisions or the like, of the initiation of a sudden expansion program, such as might be required by a national emergency. Many new positions would have to be filled, as well as vacancies in existing ones. What earlier steps have we taken to fill such positions when they become vacant? In the Government, for example, the complex selection and promotional procedures prescribed by the Civil Service Commission can do little to help if the supply of qualified personnel is short of the demand. Are we therefore providing within our organizational structures the opportunity for the fullest possible development of the potentialities of individuals engaged in all levels of work? Is an intensive effort being directed toward developing and maintaining the interest and enthusiasm of the younger personnel, particularly those performing the more routine operations? For many reasons, it is more advantageous to promote from within an organization rather than to raid from another organization; but to do this there must be a plan of personnel development in operation.

In considering such plans, we should first acknowledge that in our new science of photogrammetry many of the positions require a college education or the equivalent in experience. What often happens to the qualified man who has come to us full of enthusiasm and interest in our field? Photogrammetric mapping within the larger organizations has necessarily been subdivided into many operations, the degree of subdivision as a general rule being directly related to the size of the organization. Therefore our new, enthusiastic employee must be assigned to one of the operations in the production chain. At first he is eager to please, and to learn his new job. He conscientiously strives to master the particular function assigned to him and normally takes great pleasure in perfecting the operation and in becoming a self-reliant member of the production team. In due time he perhaps will begin to search his mind for methods of improving his particular operation, since the comparatively new science of photogrammetry offers unlimited opportunities for employee suggestions. How-

ever, when all of these phases have passed, and the work has settled down into more or less constant repetition, then the dangers caused by monotony begin.

Monotony, if ignored by management, produces varying degrees of inefficiency and dissatisfaction, depending in part upon both the character traits of the individual employee and the particular type of work to which he has been assigned. Some operations, of course, sustain interest for longer periods than others. Operation of stereo plotting instruments is of sufficient complexity and interest to foster enthusiasm to a greater degree than, for example, indexing photographs. But in due time, unless the individual is shifted to another phase of work, stereo plotting also will begin to be boring.

Practically no one, the engineering graduate included, comes into the profession of photogrammetry with significant practical training. Therefore, it takes time and money to train a new employee. After this training, we want the employee to produce maps—great quantities of maps. The more proficient he becomes the more we expect. It is quite human that the manager or supervisor not worry about machinery that is functioning quietly and turning out the required work. However, if management does not provide some means of stimulating the employee's interest, the months can soon turn into years, and the years into a job of a specified salary with little hope of advancement. Inevitably the higher paid positions demand more than the ability to perform one or two photogrammetric operations—a fact of which the employee is well aware. Often, an employee confined to one operation for long periods will give up in disgust and either "jump" to another photogrammetric firm, or leave the profession altogether to take up what he expects to be a more interesting and lucrative line of work.

Of course it is far easier to present the problem than the answer. However, if this paper stimulates some thinking about personnel development, its purpose will have been achieved. Let us consider a few aspects of the problem and a few of the things that can be done.

Although we are prone to assume that capable men will continue to rise in spite of obstacles placed in their way, we should not expect that all of our more responsible positions will be filled by men of adequate

background unless management provides help and encouragement. Another unfounded assumption of many college graduates is that once their degree is received, there is nothing more to be learned. Where does the responsibility lie to correct this kind of complacency? All will agree that specialization is often necessary to cope with today's complex problems in mapping, and that most college or high school graduates can become proficient in any single specialty. The remedy for the limitations imposed by such specialization can be found by management if it keeps its needs and those of its employees constantly in view.

Management must make the most of the full potential of every employee in the organization. Every effort must be made to see that an employee's interest is maintained and stimulated. Sometimes simply renaming a position will help. For example, think of the difference between "multiplex operator" and "stereo topographer." The environment in which a man works is also important. Those who have been in Europe are aware of the high prestige enjoyed by the mapping profession. Even in our country an interesting environment can be promoted by the existence of well-executed research and development programs established to create and find more efficient instruments and techniques.

Another way to maintain interest lies with the immediate supervisor. He knows his employees better than anyone else. It is his job to broaden their knowledge continually by explaining the theory and practice involved, and by varying, as much as possible within the scope of his unit, the types of work given each employee.

But management has an even more important part to play in creating a planned personnel development program to which is given constant attention and support. Such a program must encompass the maximum number of employees and not merely a few of the more promising employees who are moved from one position to another as fast as they can learn. The effect of a program that is limited to a selected few is devastating to the morale of the other employees.

Mass production, despite its place in our competitive business world and in the mapping activities of the government, often creates operations that some people find repetitious and tedious. Because wom-

en frequently object less than men to doing such work, we should not forget the possibilities of employing women to help solve what would otherwise be a serious personnel problem.

In preparing its employees for more responsible types of work, management must know the job requirements of each position exactly. Such requirements must be completely realistic, and not demand more education and experience for a position than is needed. Once these requirements are established, every effort should be made to see that personnel acquire the experience and education required for the higher positions. It is sometimes said that we are in business to make maps and not to train men; such a short-sighted view can only lead to a stagnant organization with supervisory positions filled by mediocre personnel.

The Hydrographic Office is attempting to meet the problem with a four-fold Personnel Training Program. This is divided into: "Technical Training," "On-the-Job-Training," "Bachelor of Science Degree Program" and "Graduate Training." Under "Technical Training," personnel receive basic training in such specialties as: Multiplex Compilation, Multiplex Stereo-Triangulation, Stereoplanigraph Triangulation, and Photo-Evaluation. Under "On-the-Job-Training," personnel, as the title implies, are trained while working on actual production jobs, usually after completing one of the Technical Training Courses.

On an experimental basis a Cartographic Degree Program has been established with George Washington University. A Bachelor of Science Degree in Cartography is offered. At present, classes are conducted at the Hydrographic Office with a 2½-hour class starting 45 minutes before the end of the work-day. Employees are allowed time with pay for this 45 minutes. The University offers these courses at a special, reduced tuition rate, which is paid by the individual. George Washington University requires a minimum of 20 students for each course. However, if as many as 14 register, the Navy Department underwrites the difference required to bring the total tuition fee up to the established minimum.

Under the "Graduate Training" program, a limited number of civilian and military personnel attend colleges or universities for graduate work in cartography.

geodesy, or photogrammetry. In this program, the student's tuition is paid by the Department of the Navy and he continues to receive his regular salary while attending the school.

How about the employee? What is his responsibility in this age of mass production and specialization? He must first realize that his college degree, regardless of the field, is only the key that opens the door to the specialty he has selected. He must take full advantage of every opportunity management provides for his development. He must realize that boredom and the limited opportunities he sees in his job may be the result of his own lack of interest and effort.

Finally, we must recognize that the solutions to the problems presented here lie within the collective capabilities of the members of the mapping societies meeting here this week, and that possibly our most important task is to recognize the problems and keep them before us. Most of

those who have reached supervisory positions in this complex field of mapping had the advantage of learning our "trade" when the profession was quite young and the organizations in which we worked were comparatively small. Monotony was never a problem in those days. Today we must maintain the challenging atmosphere that existed in the past, not only for our top employees, but all the way down the line. Each of us, whether he be in a small private organization or in a government mapping agency employing hundreds of persons, must continually seek ways of developing the full potential of each employee in that organization. Failure to do so will leave little hope of nurturing the highest and best capabilities of our future leaders in this profession.

NOTE: The opinions expressed in this article do not necessarily represent those of the Navy Department.

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