



PRODUCTION MANAGEMENT IN INDUSTRY

Mr. Robert H. Gathman

NOTICE

Property of the Library
INDUSTRIAL COLLEGE OF THE
ARMED FORCES

This lecture has not been edited by the speaker. It has been reproduced directly from the reporter's notes for the students and faculty for reference and study purposes.

You have been granted access to this unedited transcript under the same restrictions imposed on lecture attendance namely, no notes or extracts will be made and you will not discuss it other than in the conduct of official business.

No direct quotations are to be made either in written reports or in oral presentations based on this unedited copy.

Reviewed by Col E. J. Ingmire, USA on 17 January 1964

INDUSTRIAL COLLEGE OF THE ARMED FORCES

WASHINGTON, D. C.

1963 - 1964

PRODUCTION MANAGEMENT IN INDUSTRY

8 January 1964

CONTENTS

	<u>PAGE</u>
INTRODUCTION--Major General Tom R. Stoughton, USA, Deputy Commandant, ICAF.....	1
SPEAKER--Mr. Robert H. Gathman, Vice President, General Motors Corporation, and General Manager, Fisher Body Division, General Motors Corporation.....	1
GENERAL DISCUSSION.....	23

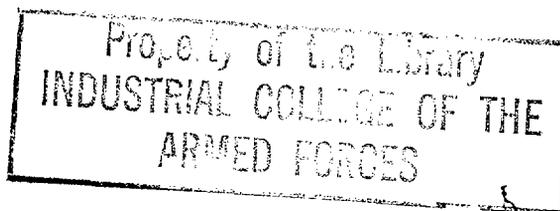
NOTICE

This lecture has not been edited by the speaker. It has been reproduced directly from the reporter's notes for the students and faculty for reference and study purposes.

You have been granted access to this unedited transcript under the same restrictions imposed on your attendance; namely, no notes or extracts will be made and you will not discuss it other than in the conduct of official business.

No direct quotations are to be made either in written reports or in oral presentations based on this unedited copy.

Reviewed by: Col E. J. Ingmire _____ Date: 17 January 1964
Reporter--Grace R. O'Toole



Publication No. L64-91

INDUSTRIAL COLLEGE OF THE ARMED FORCES

Washington 25, D. C.

PRODUCTION MANAGEMENT IN INDUSTRY

8 January 1964

GENERAL STOUGHTON: Gentlemen: Our speaker today, Mr. R. H. Gathman, is really a true representation of that often-heard expression, "He grew up in the business."

As you have noticed from his biography, Mr. Gathman has spent practically his entire professional career with the Fisher Body Division, of which he is now General Manager, and likewise he is a Vice President of General Motors Corporation.

So we are most fortunate to have a man of his experience come here to share his knowledge with us in the important field of production management.

It is a pleasure to welcome to the Industrial College and to present to this audience, Mr. Gathman.

MR. GATHMAN: Thank you, General Stoughton, for that introduction. I am honored at being chosen to speak to this group. I know that the automotive industry and the Armed Forces have much in common, and, as we discovered during the war years, an exchange of ideas is of mutual benefit.

Basically our operations are similar in many ways. We are both confronted with constant problems of efficient operation, the training and selection of people, coordination of effort, and logistics, just to name a few.

I must admit that, since I have the platform today, you are going

to hear more of my organization than I am of yours. Nevertheless, I am certain that the question-and-answer session to follow will be an interesting experience for me.

Our subject for discussion, Production Management in Industry, is a broad one. Obviously it has been necessary to limit it to the broadest outlines. Therefore, I will confine my remarks to four general topics:

First, the organizational structure of General Motors

Second, the problems encountered by a division in the manufacture of a product.

Third, utilization of the administrative tools of management, and,

Fourth, the selection and leading of personnel.

Putting first things first, I would like to give you a brief description of General Motors and what makes it tick. The answer is as simple as this: It is an enterprise which owes its origin to motors, its existence to the quality of its products and the satisfaction of its customers, and its high position in the industrial world to the vision, the dedication, and the talents and teamwork of its people.

This has been accomplished in a highly competitive industry, and I dare say there is scarcely a country in the free world that has not benefited in one way or another from GM products--and these horizons are constantly expanding.

All of you are familiar with the fact that we produce five lines of automobiles--Chevrolet, Pontiac, Oldsmobile, Buick, and Cadillac.

We also produce trucks that carry goods to and from and within cities, and busses which give rubber-tired, mass transportation of people an unmatched flexibility and mobility.

Motor vehicles comprise our principal business, 90 percent of it, but the other 10 percent covers a wide variety of items. For example, these are: Diesel locomotives, refrigerators, ranges, dishwashers, washing machines, bulldozers and other earth-moving equipment, guidance systems used in space vehicles, and, during World War II, we produced tanks, planes, and countless other weapons in the volume needed. In short, GM's research, styling, manufacturing, and distribution skills are devoted to the development, production, and distribution of products which run the alphabet from air cleaners to wiring systems, and they range the entire spectrum of size, from tiny parts of electronic and guidance equipment to massive machines.

With few exceptions, these products which GM makes are built around a motor or for use with a motor. Thus the General Motors of today is a composite creation of many hands and many minds and many talents. As I have said, the motor is the nucleus around which most GM products are built, but its heart and spirit, the real essence of its success, are its organization and its people.

The foundation of this structure is decentralized operations and responsibilities under coordinated policy control. Decentralization of operations is applied geographically as well as in the organizational structure. General Motors operates 127 plants in 70 communities in

19 States. Outside the United States it has five plants in Canada and manufacturing, assembly, or warehousing operations in 21 other countries.

The United States operations are conducted by 21 operating units called divisions. Each operates under an executive officer, the General Manager, who, within limits of broad overall policies, is responsible for building his own organization, coordinating its efforts, and planning its progress. Beyond that there is available to him the know-how of the central organization.

This management concept was conceived and put into operation at General Motors by Alfred P. Sloan in 1920. Revolutionary at the time, the Sloan plan has now become a model for the management of a successful business where many products and divisions are involved. Expressed in formal terms, Mr. Sloan's philosophy amounted to decentralized operations and responsibilities with coordinated control. A simpler way of expressing it is to give a man a clear-cut job and let him do it. Under this philosophy, overall objectives and principles are determined at the top management level based on information flowing up from all levels of the organization. The task of carrying out these policies is up to the men down the line.

Decentralization also means dividing up the job into as many pieces as is practical. It means placing in charge of each piece an executive with complete responsibility for its success or failure. It makes the most effective use of talents and gives the executive maximum scope

to exercise his initiative and to capitalize on his opportunities.

Coordinated control refers to the formulation of overall policy, the framework or area within which the various pieces operate. Under this philosophy, a two-way flow exists at each level of management. On the one hand there is a downward flow of authority stemming from established policy. On the other there is the upward flow of facts and opinion stemming from individual initiative exercised down the line. This in turn enters into policy considerations. A proper balance of these two flows, the downward flow from authority and the upward flow from initiative, is constantly sought.

I have briefly discussed General Motors philosophy of management. For a better understanding of how it works, let's consider how it is organized. It is recognized that in a business of General Motors scope no one man is capable of making all the decisions or performing all the executive functions required in every day's operations. Therefore we have provided for separate and clearly defined line and staff functions.

Our divisions and subsidiaries, which comprise our operating or line organization, operate very largely as independent businesses. Each consists of a plant or group of plants manufacturing one product or a number of related products. Subject to certain broad policy controls and to a few phases of the business which are necessarily centralized, the divisions are in a large measure self-contained. Each division is proud of this independence and is fully aware of its competitive position, even with other divisions of General Motors.

Operating divisions manufacturing related products are, for the most part, grouped together for better coordination. There are five product-related groups in General Motors, and four of these are under the direct supervision of a Group Executive who is a Vice President.

As shown on this chart, three of these groups are designated as the Automotive and Parts Divisions. These are the car and truck group, the body and assembly division group, of which my organization, Fisher Body, is a part, and the accessory group.

As shown in this next slide, the other two groups are designated as other operating divisions and are also under the general supervision of an Executive Vice President who supervises directly the operations of the overseas and Canadian group and the Allison Engine Division. The other group is designated as a Dayton, household appliance, and engine group.

This chart also shows the number of divisions in each of these groups. The Group Executive represents GM management to and acts as advisor for the General Managers of the Divisions in his group. In exercising this function he works closely with the divisional managers and the with Executive Vice President to whom he reports.

As shown in this next slide, the Executive Vice Presidents having jurisdiction over these five groups report directly to the President.

General Motors central office organization includes three major staff activities: the operation staff, the financial staff, and the legal staff.

This next slide shows these staff activities and their relationships to the line organization. The operation staff activities, each headed by a Vice President of the Corporation, who reports directly to the Executive Vice President, Operations Staff, concern themselves with such specialized functions as marketing, styling, engineering, research, manufacturing, public relations, and personnel. The executives in charge of these staffs serve in an advisory and service capacity to both the divisional and central management. They also help in the policy-formulation function through their tie-in with the activities of the various policy groups where policy recommendations and suggestions of the various staffs are discussed.

The other staff activities shown on this chart, the financial staff and the legal staff, are under the jurisdiction of a Chairman. The financial staff is under the direction of an Executive Vice President and has responsibility of providing management with information on various financial and operational aspects of the business.

The legal staff, under the direction of a General Counsel appointed by the Board of Directors, has general control of all legal matters concerning the Corporation. The Chairman is the chief executive officer of the Corporation. He is directly responsible to the Board. The President is the chief operating officer of the Corporation.

In General Motors it is recognized that policy formulation is separate from administration. Policy-making is the responsibility of two governing committees in the Corporation, the Finance Committee and the

Executive Committee. This slide shows the place of these committees on the organization chart. The Finance Committee is appointed by the Board from its membership. This committee is delegated to act for the Board in determining the financial policies and affairs of the Corporation. The Chairman of the Board is the Chairman of this committee. The Executive Committee also is composed entirely of members of the Board. It is delegated to act for the Board in determining operating policies. The President is Chairman of this committee. Included in its membership are the Chairman of the Board, the four Executive Vice Presidents, and the two Group Executives, who are Board members.

These two committees deal with policy at the top level. It should be emphasized that they do not deliberate or establish policy in isolation from the rest of the organization. Our organization patterns provide for a channel whereby policy ideas and suggestions filter up from our line and staff organizations.

Let's see how this works. This slide shows the policy groups which work with the Executive Committee, in effect subcommittees, where policy recommendations originate and policy questions are discussed. Of these nine policy groups four are concerned with products or operations. They are Canadian, general engine, household appliance, and overseas. The other five policy groups have to do with specific functions. The executive in charge of the central office staff, whose function is directly related to the interest of the group, generally is Chairman of that particular group. The five functional policy groups are marketing, engineering, personnel,

public relations, and research.

In addition to the two governing committees there is also an Administration Committee, as shown at the lower left of this slide. This committee has the responsibility for making recommendations to the President regarding the manufacturing and selling activities of the Corporation. The President is Chairman of this committee. Its membership includes the members of the Executive Committee, the Group Vice Presidents not on the Executive Committee, the Car Division General Managers, and the General Managers of GMC Truck and Coach overseas operations, and myself as General Manager of Fisher Body.

In addition to formal committee meetings, we are in almost daily contact with each other on a friendly, informal basis, discussing our mutual problems in the business.

Up to now I have discussed General Motors and how it is managed at the corporate level. Now I would like to narrow the subject to my own area of responsibility and use it as an example of how one producing division functions. I have chosen Fisher Body for two reasons. First it is the subject with which I am most familiar, and, second, because of its great size and diversity of operations, it represents a good cross-section of the Corporation.

Simply stated, Fisher Body's function is to manufacture the body for General Motors cars. Roughly, the body is the passenger area after the firewall. To engineer, fabricate, and assemble this body involves a production chain thousands of miles long. It includes 32 plants, each

with its own Manager. In 24 American cities it employs approximately 85,000 people.

Now, what do these people do? They take the body configuration from a rough clay model, they design the structural and feature aspects, they engineer the tools, and they build the tools with which the body is formed and assembled before they deliver it to the Car Division as a finished product.

For instance, more than 2,000 highly skilled men are at work at Fisher Body, creating from the stylist's conceptions the extremely accurate engineering drawings. It is no simple task, since there are more than 30,000 preliminary drawings in an average body program, and approximately the same amount of time and effort is required to design the tools and dies. The manufacture of dies, through successive stages of wood, plaster, and steel, is a costly and time-consuming process. Almost 20,000 dies and about 6 million man hours are needed for a typical model program. Most of these tools are designed and manufactured in our own shop, utilizing, for example, 135 profiling machines of all kinds and sizes.

Another step is construction of the jigs and fixtures needed to perform the task of assembling the body with precision and speed. More than 39,000 jigs and other tools go into a typical body fabricating and assembling program. These are vital to quality and cost. The building of these precision jigs and fixtures is a major manufacturing industry within Fisher Body.

Cutting and sewing trim material is another major industry. Each year the cut-and-sew plants transform nearly 40 million yards of cloth and coated fabrics into seat coverings, head linings, door panels and other soft trim. More than 800 different interior trim combinations are required for the five Car Divisions. To produce these in volume requires approximately 110 cutting and embossing presses and over 3,000 individually operated sewing machines.

Among the great capital investments of General Motors are Fisher's nine stamping plants and two trim plants which supply body components to Fisher's 17 body assembly plants and to the 7 BOP plants, GM of Canada, and GM Overseas.

Logistics with us as with you in the military services is a key science. As you can guess, it takes split-second scheduling to make sure that thousands of parts arrive at scores of destinations on time and in usable condition. In an average year Fisher Body ships more than 127,000 loaded freight cars, traveling nearly 84 million miles over the Nation's railways. Here standardization plays an important role in upgrading our efficiency. In Fisher Body, every new production model needs new loading and shipping procedures. Specifications are developed for each particular part to be shipped and given to all the plants so that everybody is doing the same thing in the same way. They know how to load the items, how to block them, how to nest them, and how many to put in a row--in other words, standardization.

This program can be carried out because Fisher has a standard railroad car. It took a lot of time and a lot of work with railroads to get

to this point, but now loading is faster and easier, and shipping damage has been reduced.

As you can see, this is a business of great diversity and high specialization. Briefly, here is our organization. You will see that in many respects it is similar to the line organization of the Corporation. Not present here are the special committees which help formulate policy.

Reporting directly to me are six General Directors. They are the General Director of Engineering, who is responsible for body engineering, production engineering, and die engineering; the General Director of Production Scheduling, which is the key job in maintaining the proper flow of material between plants and to our five Car Division customers; the General Director of Purchases, who is responsible for our relations with 9,000 individual suppliers and the expenditure of roughly a billion dollars per year; the General Director of Quality Standards and Service, who is the watch dog over our quality program, helping plant and engineering personnel in the identification and correction of product defects; the General Director of Industrial Relations, who is in charge of all matters pertaining to personnel, employee benefits, salary administration, and all relations with the unions; and, finally, the General Director of Public Relations and Advertising, who is in charge of maintaining the Division sale image and aiding in plant relations in the local communities.

In terms of employees and invested capital, the biggest single operation in Fisher Body falls under the direction of the General Manufacturing Manager. His job is to supervise and coordinate all in-plant production. To help him he has his own staff, consisting of specialists in such areas as material handling and traffic, works engineering and facilities planning, paint standards, and labor standards. He further has the assistance of plant-management specialists in assembly and fabrication.

A General Factory Manager in charge of fabrication supervises nine stamping plants where tools are made and where metal-body components are formed.

Another General Factor Manager supervises what we call the Michigan Body Assembly Plants. These are located near the Car Division plants where Buicks, Oldsmobiles, Pontiacs, and Cadillacs are assembled.

As I mentioned, trim fabrication is a major industry of Fisher. There are two entire plants and three plant activities devoted to the cutting, sewing, and embossing of headlining, seat covers, door pads, and so forth. A General Factory Manager supervises this activity.

Finally, there are 12 plants devoted primarily to assembling Chevrolet bodies, although in recent months they have taken on certain BOP body responsibilities. These plants are divided geographically into Eastern and Western Districts, with a General Factory Manager over each.

In addition to all of these, of course, is the Comptroller, who has the dual responsibility of reporting to the General Manager and directly

to the Corporation Comptroller, where he coordinates financial and accounting policies.

One of our big problems is keeping informed about what all these people are doing. I have already mentioned the theory of the two-way flow of information up and down the chain of command. Now I would like to discuss how it works in practice.

Over the years we have developed various reporting techniques which in effect compile vast amounts of information into manageable and digestible doses. One of the most significant tools we have for controlling our operations is the monthly four-months forecast. It was originated back in the early twenties, when the very existence of General Motors was threatened by lack of a workable system for financial control. Over the years the plan has been refined and has grown to be one of our most highly regarded management tools.

Basically, the plan is this: We pre-operate the activities of the Division on paper, month by month, for the next four months. Carefully prepared building schedules for each Car Division are furnished to us by the Corporation. The schedules are then analyzed by our plant and central office cost accountants for estimating what they mean in terms of dollars. Efficiency levels are predicted as are material usage and price changes, organization changes, product expenses. Virtually every phase of the business is evaluated by those especially skilled in each operation. Results are summarized through various reports into the standard balance

sheets and profit and loss schedules. This not only gives the General Manager and his staff data for forward planning but also indicates where he must make corrections for running an efficient and profitable business.

From this example you can see that a Division Manager must have two important tools--cost control and financial control. Cost control in the automotive segment of General Motors actually begins several years in advance of actual production. Even before the styling of a new model begins, studies of the product and tool costs help to guide such basic decisions as to whether or not to introduce a new line of cars or how much to change the present lines.

After the first decisions are made, Fisher engineers and cost estimators work closely with the styling groups and the Car Divisions during the development stage, at least 2 years before production. Each month the effect of any design changes in economics is accumulated to show the latest cost trend on representative, forward models. The monthly Fisher Body estimates are consolidated with Car Division data at the Corporation level for use by the various committees we discussed earlier.

To keep control of cost after production begins, we use a system which we call the variance method. In this plan cost standards are established for every possible situation, and management is kept informed of any significant deviations. Our system, of course, is only as good as the standards-- for example, the standards on direct labor, that is, work done on the building of the actual product. They are based on past

experience and time and motion studies of some 12,000 operation groupings, and, although the plants may alter these standards to meet local physical conditions, their particular operations are measured against similar operations elsewhere. Management measures individual plant performance through daily, weekly, and monthly reports of various types. These comparisons are published, along with the standards set up for the Division, thereby creating an internal, competitive spirit which we feel is vital to the success of the Division as a whole.

As you can guess, the most efficient plant measures the accuracy of the divisional operation standards and creates a second set of standards as well. For instance, no plant manager wants to be No. 10 out of 10 similar plants in labor efficiency. Although direct labor comparisons are probably the most effective tool we have for controlling cost, there are many which serve a similar purpose. There are budgets for the remaining items of manufacturing expense which cannot be evaluated by time and motion studies.

Again, we have the advantage of multiplying operations in establishing these budgets. Every year the plants submit budgets in considerable detail, based on predetermined production plans. Central Staff analysts then evaluate these budgets in view of the past experience and inter-plant comparisons, and prepare suggestions and recommendations.

Our Central Staff Manufacturing Managers then review the budgets and negotiate the changes required for fair, uniform, and consistent evaluation of plant performance.

I might add that the budgets are based on the fixed nondurable and durable concepts, so they may be adjusted for volume fluctuations.

Still other management controls within the broad categories of material, labor, and burden are the numerous bulletins and reports which treat specific items. Each plant manager and each Central Staff management member is kept informed on how each plant stands on the following: Direct labor by department within each plant; all indirect labor by type of occupation; usage of supply items and small tools by categories; utilization of stamping-press time with reasons for nonutilization; the cost of rejected or reworked parts; manufacturing delays of all types; steel inventories in relation to production; steel waste in relation to production, by reason; usage of bulk materials, such as paint, solder, sealers, cements, welding wires, and so on; the cost of warranty service on bodies from each plant, by reason.

One of the variables which we try to control is overtime cost in both our plant operations and salary organization. In general, however, a divisional manager can be concerned with only the high spots of all these cost-control reports if he intends to fulfill his other obligations. That is the reason we have divisional analysts to advise top management by means of letters and concentrated summarizations.

Another major function of the divisional manager, which I mentioned, is financial control. Specifically this has to do with profit and return on investment. While it is true that cost must be controlled in spite of constantly rising labor and material expenditures, it is also true that

additional investment must be controlled and adequate volumes be achieved. To control investments in plants and equipment and tools we have a chain of approval which we call appropriation requests. They are simply formal requests to spend money. Depending on the purpose and the amounts involved, these must bear management approval in a definite order. The approval of any major request depends on what the money is for, what it is intended to achieve, and a determination of any effects which can be projected upon sales, profits, investments, and returns. The request, of course, must contain this information in detail.

Management techniques, therefore, are improving all the time, and much of the credit can be given to the technological revolution brought about by computers. At Fisher we are not only using computers to digest and supply us with information about our business but as an aid in performing many of the engineering and manufacturing functions as well.

Today virtually every activity in Fisher Body relies in some way on the use of electronic data-processing equipment. By producing faster and more accurate information, the computer is enabling us to shorten the time from the forecast schedules until the body is assembled to the customer's specifications.

Time and accuracy have been improved all along the line, from the design stage to engineering and building the tools and dies. This applies as well to production scheduling, to purchasing, and to better control of our labor standards. It includes equally material handling, accounting, fabrication, assembly, and all the other operations which constitute the

body-building business.

Specific examples of computer operation include the processing of forecast schedules, engineering parts lists, and purchased parts requisitions and releases. In the plant electronic processing equipment is being utilized for determining which operations need special attention, the supply and control of materials, and the determination of gross shipping requirements by shipping item, just to name a few.

Most of what we have accomplished in these areas has happened in the last five years, and we have^{just} scratched the surface. Also under development is the use of the digital computer for reducing the time required to make drawings and prototype models of automotive designs.

Looking at these scientific advances of recent years, we can see what is in store for future leaders of the Corporation, and we know future planning must include the selection and training of ever-increasing numbers of educated and skilled managers.

From what I have already said, I am sure you can appreciate that we at General Motors are greatly concerned about our people. This concern leads me to discuss our people and their role in our success in detail beyond previous reference to their line and staff functions and the way in which information flows among them.

Specifically I'd like to speak on three points, all of which have the greatest importance in determining, shaping, and getting maximum results. These points have to do with where people come from, the philosophy behind the training they receive, and the careful attention they

receive as employees. Attention will be focused on our management group because I am sure this is the group which interests you most.

Let's first look at the requirements for the kind of men needed to keep a management team self-regenerating and dynamic over the years. The primary requisite obviously is good raw material, in other words, men with the capacity, the desire, and the self-discipline for continuing growth and development.

There are only two ways to get management manpower--train them or take them. Some companies are particularly adept with the latter technique. Their policy appears to be: let other companies train them so we can take them. In General Motors we do not pursue such a policy. We consider that it damages morale and in the long run impairs efficiency. Of course, there are times when the only way to get the particular man you need is to go out and hire him. This is particularly true when a specialized know-how is needed. The practice, however, has been the exception and not the rule with us. Admittedly, the training route is much slower and requires far more effort, but the results are superior.

The first step is to find men of high potential who are worth training for management responsibilities. Our General Motors Institute at Flint, Michigan, which has offered a cooperative educational program since 1926, is a continuing source of fine engineering and management material. Of the approximately 5,000 graduates of this program, almost 70 percent are currently employed by General Motors. These men are found in all levels of management, a number of them having risen to

positions of great responsibility in the corporation.

In addition, we feel we are doing a good job of recruiting men with a college level of education. General Motors has eight central offices and 24 divisional people assigned to recruit college graduates. Last year they interviewed more than 7300 candidates at 132 institutions. More than 800 of these people were hired.

Then there is the management material that we are always looking for in our plants and offices, men whose formal education, in some cases, may be limited but whose inherent intelligence, energy, leadership qualities, and willingness to assume responsibility qualify them for advancement. We are especially pleased when we find such men. This is not only because we feel that unused managerial capacity is more wasteful than idle machine capacity but also because we believe that a flow of recruits from the shops and offices to the supervisory and management groups is an effective way to bring hourly-rate employees and lower-level, salaried employees to an understanding of the common interests of labor and management.

Members of GM management represent all three backgrounds just described. They are also common products of a fourth education influence, a cross-pollination process by which they have all learned and are still learning from each other. It is this continuing exchange of knowledge and experience of all kinds within an organization that gives it breadth and balance and a vitality that can be acquired in no other way. It virtually goes without saying that it is our policy to promote from within

the organization whenever we have an individual qualified to fill the position that is open. As a result men of high potential are closely observed on the job to insure that the initial evaluation was correct and also to determine how best each man can be employed.

If I have belabored the subject of personnel in the last few minutes, it is because we at General Motors have learned from experience that, in the final analysis, the quality of our people is the only advantage we can have over competition. Organizational structure is at best only a framework within which people may cooperate constructively. People are what make one company different from all others. Other companies can establish equal facilities, they can inform themselves as to similar techniques and processes, they can purchase the same materials and supplies and services, they can have access to the same markets. All of these things can be duplicated by any company that makes the effort but the one thing that cannot be duplicated is people and the spirit that motivates them.

If a company prospers, it is primarily because of its people. It must have people who know how to plan and to make policy. It must have people who know how to organize and administer. It must have people who know how to design and engineer and people who know how to merchandise and sell. And, in addition to talents and skills, these people must be able to work together effectively. This last item is the most important of all.

The efficient leadership of any organization, whether it be military,

as in your experience, or business, as in mine, presents many common challenges. I am sure you meet these with some of the same tools of management that we have learned to use, because our mutual aim is a stronger Nation and a stronger national economy. The opportunity to exchange ideas, such as afforded me here today, is extremely important to the common effort.

Up to now I have been doing the talking, but I will look forward to hearing from some of you during the question-and-answer period in a few minutes.

Thank you.

COLONEL NORMAN: Mr. Gathman is ready for your questions.

QUESTION: In using computers for your production forecasting, have you found any actual reduction in the fluctuations of overtime and layoff?

MR. GATHMAN: With the business being what it has been in the last year or so, the volume has increased, so I really wouldn't have any true measure of that right now. I do know one thing, and it has a very bad spill-out as far as we are concerned--it's just too easy to change schedules, and we are now working on putting that into focus.

QUESTION: Mr. Gathman, because of the increased cost of your dies and the fact that your production seems to be growing every year, is there any trend to stabilize the body shape at your Fisher plant?

MR. GATHMAN: Well, I'd say the customer determines that. They get more and more selective every year, so I think it's here to stay.

I'll tell you this, though. It's a partial answer to your question. We are doing an awful lot of work in trying to reduce tooling costs. One of the things that we have had a lot of success with is the use of critical-path planning as it applies to tool building. It's showing a marked decrease in tool cost.

QUESTION: Can you tell us, Mr. Gathman, the extent to which you are using automated procedures in preprogramming procedures, like numerical control for your toolmaking? Also, there were some published rumors a year or two ago that this may be adopted for assembly transfer machine operations.

MR. GATHMAN: Well, some of it is a little far out. We spent millions of dollars on it. We have some very successful examples of the use of numerically controlled tools, and we are now in the process of getting some more, but it's no magic word. I think we showed a slide there where you can go from a clay model to curtsite, we'll say, to make prototype bodies, solely with the use of computers. I saw one a couple weeks ago. Don't ask me how it works or anything about it, because it was away out there so far as I was concerned. But it's coming; I feel sure of it.

QUESTION: Mr. Gathman, I noticed on those excellent charts you had up there a large number of General Motors Divisions, but I didn't see one labeled "Defense" on there, or "Defense Production." You presumably have some or are sure to have some in any emergency. Would you explain how this is set up?

MR. GATHMAN: Yes. If I get your question correctly, our stamping plants are all subject to conversion. For at least some product during the war they were all busy on some sort of defense work. Our assembly plants are not adapted to it. We have one plant at Willow Springs, outside of Chicago, which was built strictly for Defense. Buick built aircraft engines in one half of it and we were stamping out body parts in the other. I'd say that of all of them that would be the easiest one to swing over. But, when you get the two of them together in one place, it's not much fun--I'll tell you that.

QUESTION: Sir, would you discuss R&D a little bit? Is this centralized or decentralized? How much money do you spend on it? And so forth.

MR. GATHMAN: Well, the money I'm not going to tell you about, because I don't know, but it's a hell of a lot. It's not centralized. Every Division carries on on its own. There is an awful lot of coordination between the Car Division and ourselves, for example. I am sure that is true in the Accessories Division too. The Motor Division is the key in the whole thing. Fisher Body is a supplier to them and all of our Accessory Divisions are. But they all do independent work, and an awful lot of it.

QUESTION: How much has labor productivity increased because of the new technology?

MR. GATHMAN: I am sorry you asked that. I think it's getting worse all the time. Everybody wants to do less and less for more and more money.

It isn't very funny to me. I think that all you can say about it is that we are trying to level it and keep it somewhere near where it is at the moment. I think it's a very disturbing thing, and I don't know if we can run fast enough to keep up with it.

QUESTION: Mr. Gathman, you mentioned the setting of standards for production and the importance of these standards. My question is: Who makes the decision that the standard will be such and such, and what procedure do you have to arrive at the decision in setting the standards?

MR. GATHMAN: We set them centrally. Then they go to the plants. Now, if you are talking about budgets, they come in the other direction. They are set by the plant and reviewed by central organization. You know, they always ask for a little more than they should have and we have to knock it off. The labor standards themselves are set centrally and they're set a long time in advance. That's why it is done centrally. They have the fastest access to engineering information.

STUDENT: Who in the organization would make the decision on standards?

MR. GATHMAN: Our Labor Standards Department. That department is under a General Manufacturing Manager. Of course, we have a long history in setting these things. It might be an awful lot easier for us to do that job than it would be if someone were to take a new product and start its manufacture.

QUESTION: Sir, I assume that Fisher Body effectively sells the bodies to the Car Division. Can you tell me how the price is arrived at?

MR. GATHMAN: I was asked that question a few moments ago and I had to refuse to answer it, because this is a very complicated thing. But I did say one thing and this is the clue to it. All the Divisions of General Motors more or less are separate entities. They have to be run as though each were an individual business. There's a check and balance on the thing, of course. I don't think we could arbitrarily say, "Well, we are going to add \$200 on the body cost next year because we think things are going to be tough." We wouldn't get away with it. We have this check and balance on it.

QUESTION: Sir, you mentioned labor standards and performance. How about engineering standards within each Division? Is there sort of a corporate overall look?

MR. GATHMAN: There's a look, but it's a rough look. It's pretty much up to the Division to keep it under control.

QUESTION: Concerning your 32 plants, sir, how can you tell that the Plant Manager is doing a good job? Also, concerning the Division, what standards does the Division have for performance and all that?

MR. GATHMAN: Well, it's going to take a lot of words to answer you, I think. In all of our assembly plants, for example, we have a sheet that we put out weekly, on which all the performance in all these plants--the body shop, the trim shop, and the paint shop--is measured against a centrally established standard. Now, it needs some interpretation, because you can't make a cold comparison. We may have one plant sitting out in the Midwest, where labor is nice and peaceful and everything

runs smoothly every day, and you can't compare that with a plant in, say, Flint, Michigan--I'm just using that as an example--because that was the home of labor unrest and there were practices built up and settlements made that they'll pay for all their lives, so they'll look very poor in that report.

So, when you look at it, you have to shade it a little bit. But it's a wonderful tool. I think one of the biggest parts of that report, and one on which we made the most strides in the last 3 or 4 years, is our direct labor standards. Those are all compared. Material handling, sweeping and cleaning, and all sorts of maintenance are all measured.

QUESTION: Mr. Gathman, it is obvious from the size and complexion of your organization that the pressures on your time are tremendous. Could you give us some idea of the major techniques you use to keep yourself informed, and also some idea of the division of your time as between production, personnel management, public relations, and so on?

MR. GATHMAN: Well, for the last two months I've been spending most of my time on some personnel problems. Starting in another couple weeks I'll be with the Car Division going over new models. This is a couple years out in front. I hate to admit this, but you have to fly by the seat of your pants a lot. Another thing--you saw all the bosses I have there. They have demands on your time, too, and when they whistle you run.

QUESTION: Sir, your charts indicate two parallel lines of control, the managerial one and the comptrollership one. It seems that the

controllershship at the top has direct access to the Board of Directors and can dip down and get some information from the comptroller at the lower echelon. Does the General Manager for Fisher have any say-so over what your Comptroller will feed up the line?

MR. GATHMAN: Only by how you promote those relations. They can be lousy or they can be wonderful. Mine are wonderful, so I have no problem. But if you have a sneaky guy on the job, look out.

QUESTION: Sir, I wonder if you can tell us, first, what the portion of General Motors total business is with the Department of Defense, and what your general corporate attitude is toward that business, let's say, within the framework of the last 2 or 3 years when you had a booming business outside of the Government?

MR. GATHMAN: As far as I am concerned we would do anything we could. We just lost a big contract to one of our competitors in Cleveland, and we wanted it, too. I think we did. I am sure that if we were asked to do anything we'd do it, if we could.

STUDENT: Will you tell us what percentage of your business is with Defense?

MR. GATHMAN: I really can't say, but it's a very small percentage. If I were to guess I'd say it's about 2 percent, or something like that. I think a couple years ago it was up around 9 percent. Don't quote me on that, because I'm not positive.

QUESTION: My question relates to the human factors of the systems engineering design. Relating to the body of an automobile, one car I

had from a competitor of yours, and every time I'd get into it the first four or five times I'd knock off a kneecap. In the design of a body, who is it that set these anatomic standards? Is it a doctor or an engineer, or is it a combination of both?

MR. GATHMAN: No. I'd say that outside of the seating room it's pretty much in the hands of the stylist and the capability to manufacture the thing at a reasonable cost. There are standards on seating and those have been violated. If you had, I think, a 1957 car and if you didn't knock your head off every time you got in it you must have crawled in.

QUESTION: Sir, you mentioned a four-month prediction program. Can you tell us how well your crystal ball works?

MR. GATHMAN: It works surprisingly well. The only thing that will really throw it in a cocked hat, naturally, is if the business should fall off momentarily. Then you are stuck. Of if you had bad weather on the East Coast in two winter months your volume figures would go off and you couldn't correct all of them out of the forecast.

But I'm really amazed at it.

QUESTION: I understand that GM is going through a major realignment in the assembly plants, with the big cars--Oldsmobile, Buick, and Pontiac-- in one plant and the small cars in another plant. What implications does this have for centralization of the policy? It seems that you would have to have more centralized control.

MR. GATHMAN: That was just started this year. Of course for years

we've had what we call the BOP Assembly Division, and they built the full lines of Buick, Olds, and Pontiac automobiles. Because the distribution of their products covered wider areas, it was a good deal, and it was a successful thing. So this year, with these new A cars, they decided, and we were all part of it, to take two plants and assemble Chevrolet, Buick, Olds, and Pontiac in one plant. One is in Baltimore and the other is in Kansas City. Then BOP has a plant at Freemont where the same thing is done.

It's a rough one. I'm not sure it will stay. I don't know, really. All I know is we are building a lot of cars in Baltimore. I guess some of you fellows are going to see that tomorrow.

QUESTION: My question relates to purchases from outside sources. The question has two parts. First, to what extent if any is there competition from outside sources for supplies of items which are utilized within the company?

MR. GATHMAN: You mean where we make a product?

STUDENT: Yes, sir.

MR. GATHMAN: They have to bid against one another.

STUDENT: I am speaking of just outside suppliers, say for a radio and accessories of all types.

MR. GATHMAN: They bid against outside competition.

STUDENT: They don't make it so they buy it outside?

MR. GATHMAN: No, no, no, no. Take moldings, for example. There are all kinds of people who make body moldings in this country. Our Turnstead

Division has to compete against that competition. There might even be competition in General Motors on die castings, for example. There are two or three Divisions that have comparatively large installations. It's on a bid basis, and it's a rough one, too. You hear a lot of people in General Motors squeal on that one.

QUESTION: Mr. Gathman, with respect to the United States balance of payments, would you comment on General Motors' contribution to it? And what do you see for the future?

MR. GATHMAN: Boy, you're away out of my field now. I know of some of the problems that exist in that area, but I'm certainly not qualified to talk about them.

QUESTION: With the apparent great proliferation of computer-based technology in the Fisher organization, have you found it necessary to do any reconstructing of the organization to make maximum use of this new technology, or is it imposed on you?

MR. GATHMAN: In certain areas we've had to reorganize and actually start new departments to cope with it.

QUESTION: You mentioned that the frequent changes in body styles reflected customer demand. Do you suppose that customers would demand something of a more stable nature like Volkswagen if they knew what the costs were?

MR. GATHMAN: That isn't what made the automobile business in this country what it is today. I would have said 3 or 4 years ago that maybe they'd like this, but now everybody wants to have something different, and they are willing to pay good money to make it different. The

Corvair Manza is a very good example of it. The Corvair was going down hill rapidly until we put the Manza in the line. I think the customer pays another \$160 or something like that, and we can't make enough of them. They constitute 70 percent of that production. We can see it on options, on air conditioning, and on all these things. They want the best and they want something new.

I hope they stay that way. Even though it's a lot rougher on us to cope with all these options and all this variety, it makes a lot of business.

QUESTION: Is there any way to get rid of the body rust you get from the salt on city streets and what have you? I have in mind greater use of something like fiberglass bodies or something of this sort.

MR. GATHMAN: I don't know--with a fiberglass body you will still have a steel floor. You find on cars that have been used in areas like Buffalo, New York, where salt is on the street all the time or on the Pennsylvania Turnpike that the outside shell might look good, but you might step in a car like that some day and go right through to the ground.

That's a horrible problem. I certainly hope that somebody comes up with something that's a little more gentle than this salt. One thing that we are doing, and we put a lot of money in the product in the last couple years, is to be sure that the areas where bad damage can occur are protected or the condition eliminated that traps this corrosive material.

QUESTION: Do you see any trend toward going toward more fiberglass bodies?

MR. GATHMAN: Well, at the present state of the art, if we were to build all the jobs that we build every day out of fiberglass I think we'd probably have to have a plant about as big as Washington, D. C., to do it. That's a rough approximation. But I have no doubt that somebody will come along with something some day that at least in part will permit some of the bodies being made out of fiberglass.

If you can't go all the way now, it's very difficult to match the appearance, even though they are the same color, on a metal surface as against the fiberglass. In other words, if you had a door made out of a fiberglass outer and a fender made out of steel, they wouldn't match. But people like two-toned suits, so maybe they would learn to like that.

QUESTION: Sir, on your organization charts you have indicated that in the plant and division staff structures quality control is on the same level as engineering and manufacturing, but in your corporate staff structure I didn't see quality assurance represented.

MR. GATHMAN: No, that's strictly a division matter. The only control over it rests in our Service Division--that's not the right name, but I can't remember the name. They control all the warranty and dealer relationships. There is a feedback there, and there are a lot of reports that they publish where quality is a factor. But they come right back to the Division. I mean, it's not something that gets away up high--not that they are not concerned about it, because they talk about it a lot.

STUDENT: Do you have any trouble with standards and interchangeability?

MR. GATHMAN: Yes, we have a lot of it. We are trying to do something

about it, because a lot of it is ridiculous. This is talking out of school: I don't know how many of you guys are engineers, but every engineer has got his own idea of what little gismo he needs to do a certain job. For the last three years we have been making a lot of progress in that area.

QUESTION: In your discussion you indicated quite a lead time
Would
in making your designs. / you discuss how you protect the security of your new designs against competitors, or does that bother you?

MR. GATHMAN: You do it 100 percent, but the other guy takes time, too. This one goes back a long, long way. In fact, when I was a die designer General Motors designed the first all-steel top for a production car, and Hudson--they are out of business so we can use their name--hired our die expert and they beat us on the street with that car. But then you get some that work in reverse. When we came out with a four-door hardtop one of our competitors hired, I think it was, two engineers and they packed the drawings out in their briefcases. We watched that carefully, too, but this happened. But, unfortunately, they stole the wrong design. We had four schemes, and they had 1 and 3, and they picked 3. They thought that was the best one. Neither one was any good. So they were on the street about three months after we had a four-door hardtop, and then they had a lot of junk.

So it happens, and while we take extreme precautions against it I imagine it will go on as long as we are in the business.

QUESTION: I notice that you have an Engineering Section in your office, and that there is also one at the corporate level. What interplay

is there between those two staffs? Do you have trouble with the staff at the corporate level?

MR. GATHMAN: No, the body is left pretty much to us, although we have a lot of coordination to do, and that applies to that shroud area where heater systems and windshield wipers and those sorts of things are involved. What we do is, when a program starts out, we have a meeting once a month in which all the questions we have or the Motor Division has are asked. All the Divisions are involved--Chevrolet, Buick, Olds, and Pontiac. Cadillac more or less stands alone. They hash out these problems, and cost is a very important part of their business. When they raise a question and there are two or three alternatives, we have to go to work and price them all out. Then they come in and they'll make a decision. But it's very closely knit. It has to be.

QUESTION: Would you discuss the problem that exists in personnel turnover in your engineering personnel and managerial personnel?

MR. GATHMAN: In managerial it is so small that I couldn't even give you a number. In engineering it floats. For the last six months or so it has been very stable. But once in a while one of our competitors gets a little bit behind the eight ball and they'll go out and make salary offers of as much as \$200 or \$300 a month more than we are willing to pay, and we'll lose them. But it's a sporadic thing. Those fellows have always floated as long as I have been in the business. But I think now that these employee benefits are getting tied into your length of service a lot of these guys are thinking and they are not jumping off

the cliff as rapidly as they used to.

QUESTION: Mr. Gathman, with respect to this separate administrative change on the comptroller side of the business, who hires or fires the comptrollers in the divisions? Is this a division responsibility, or is it the central comptroller's?

MR. GATHMAN: It's pretty hard to fire a guy any more, you know. But I know that if we had a problem in that area we would consult with the Corporation and we'd come to some meeting of the minds as to what we were going to do. Our Comptrollers work with our Plant Managers-- although they don't report to them directly--very closely. I mean in operation it's nothing like you see on that chart in that regard.

The reason for it is obvious. I think it was a decision that was made a long time ago in the past, and maybe it isn't as necessary now as it used to be. The automobile business used to have a lot of really fancy guys running it. So they took that money man and set him off on the side. When I was a boy I could see the need for it. Now it's there and it works, so I am not concerned with it.

It's just a case of working together.

COLONEL NORMAN: Mr. Gathman, we are very appreciative of you for spending your time and experience with us this morning. Thank you very much.

MR. GATHMAN: I have enjoyed it.