UTILIZATION OF THE PROFESSIONAL MAN IN INDUSTRY

23 September 1952

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Publication No. L53-27

INDUSTRIAL COLLEGE OF THE ARMED FORCES

Washington, D. C.

Mr. Don G. Mitchell, President, Sylvania Electric Products, Inc., was born in Bayonne, New Jersey, 26 April 1905. He attended the University of Florida, specializing in mathematics. He has been awarded the following honorary degrees: LL.D., Parsons College, Iowa, 1949; D.E., Rensselaer Polytechnic Institute, New York, 1950; and LL.D., Northeastern University, 1951. After a short period as an instructor of mathematics at Montclair High School, Montclair, N. J., he joined the McGraw-Hill Publishing Company and later became manager of the company's industrial site service bureau. He was appointed director of Industrial Development of the Niagara Hudson Power Company and was active in development work in enterprises dealing in rayon, hosiery, bakelite, and paper milk containers. In 1933 he became manager of the Marketing Division of the American Can Company. It was through his efforts that the paper milk container and the metal beer can was placed on the market. In 1937 he became general sales manager of the Manufacturing Division, Marshall Field and Company, and in 1939 he was appointed vice-president in charge of sales of the Pepsi Cola Company. In 1942 he joined Sylvania Electric Products, Inc., as vice-president in charge of sales and became director in 1943. In 1946 he was elected President of the Company. He has served as a member of the Advisory Council to the Senate Committee on Trade Policies, a member of the National Distribution Council, which is advisory to the Secretary of Commerce, and an adviser to the Under Secretary of the Air Force on electronic problems.

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COLONEL VAN WAY: Admiral Hague, gentlemen of the Industrial College: Last week Colonel Diehl in his introduction to his Technological Progress Course stated very clearly the important role played in technological advancement by the professional man. Behind every advancement in the efficiency of our industry stands some man who has dedicated his life to the advancement of science and of our technical know-how. Today in our period of partial mobilization, we find that our supply of these professionally trained people is not too generous. Both the Government and industry are becoming aware of the necessity for exercising economy in the use of these vital resources.

Our speaker for this morning, Mr. Don G. Mitchell, President, Sylvania Electric Products, Inc., is especially well-fitted to talk to you and discuss with you this vital problem. Mr. Mitchell is not only the president of a large technical company but he has had long and varied experience in industry in various other technical fields. He is also a consultant of the Air Force; and, what was not mentioned in his biography, his company had a leading part to play in the development of the proximity fuze with which shells were fitted.

I take great pleasure in introducing Mr. Don G. Mitchell.

MR. MITCHELL: Colonel Van Way, Admiral Hague, and gentlemen: I think we will get off on a very informal basis this morning. This group is small enough so we can talk man to man. In talking to you about the reasons why you are here and the place that this lecture fits into the general series to which you have been listening, it seems to me that we had better stick pretty closely to the utilization of professionally trained engineers in industry.

Industry is commonly thought of as that part of the national economy that manufactures goods and equipment. In order to distinguish it from agriculture, or banking, or other economic pursuits such definition of industry is adequate. It is only when one is asked to define industry as an operation that one is confronted with a concept much more complex than just production of materials.

While basically industry is physical or mechanical, it has come to realize that it is also social. Production is the output of people and the machines they operate are but tools. Human beings may act collectively through their union but they are still human beings, each different from the other. Their health and welfare are important.

Industry is partly research in order to keep its products desirable in the eyes of the customer. It is partly legal in order to steer a course not in conflict with the ever-increasing number of laws regulating the conduct of business. It is partly about everything that is concerned with modern existence.

When that is understood it is not surprising that industry should employ so many professional people of one kind and another. Doctors, for instance, are employed so extensively in industry that they have a professional society of their own.1/ No large industrial company could get along today without a legal department. Teachers are being employed more and more for training work and for other educational work. One company, I understand, employs a person full time and with interesting results.2/

Competition, regulation, and unionization have complicated the course of industrial management and have made it necessary that the best in professional skills be available to solve special problems. There is a science to industry today that did not exist 50 years ago and its performance depends very largely upon the wise use of professional skills and advice. The largest number of professional people employed in industry are, by all odds, the engineers and the number is increasing. At the turn of the century, industry employed one graduate engineer for every 250 workmen. Today industry employs one engineer for every 52 workmen and would employ more engineers if more were available.3/ In a nutshell this indicates how extensively engineers are being utilized in industry.

In other professions men with formal education are largely self-employed, or are employed in organizations largely manned by members of that profession. I refer to law, medicine, education, and church. Just the opposite is the case with engineers. A few are self-employed or work in consulting engineering offices, but by far the large majority are employees of organizations engaged in general fields such as manufacturing, construction, transportation, communications, and utilities.4/ Estimated number of engineers at the present time is probably slightly in excess of 400,000.5/ Using some earlier percentages developed by the Engineers Joint Council, it would appear that nearly 40 percent were employed in manufacturing.

1/ Industrial Hygiene Foundation of America.
2/ "Circuit Rider of the Mills," Readers' Digest, Mar 1949.
3/ Engineering Manpower Convocation, 28 Sep 1951, Proceedings, Pittsburgh, Pa.
4/ Engineers Joint Council, The Engineering Profession in Transition, N. Y.
5/ Engineering Manpower Convocation, 28 Sep 1951, Proceedings, Pittsburgh, Pa.

Using our rather narrow definition of industry as those engaged in manufacturing, industry is presently employing around 160,000 engineers and this is not enough. Over a year ago it was variously estimated that some 20 percent more engineers were needed for civilian work. At that time the number of graduating engineers was less than half the civilian requirements for all purposes and between a third and a half of them, it was estimated, would put on a uniform.6/ That was June 1951--for the first time since the war the number of engineering graduates was less than the year before. The situation might not have caused so much concern but for that fact that we had imposed a greatly increased national defense demand on top of the civilian demand. Once more industry had to do handsprings and it needed many more engineers. There were not enough and in June this year the new crop was still smaller. And it is estimated 7/ that the number graduating each year will continue to fall off until maybe 1957 when a slight upturn is expected. I don't propose to bore you with a lot of statistics. From the footnote references to this lecture you can get all the data you want to confirm the fact that there is a serious shortage of engineers in this country.

We were hard pressed for engineers during the past World War but the number of engineers then in the United States was some 25 percent less than the number today and a large proportion of them probably were in uniform. Still we got by and we furnished our armed forces with munitions of brand new design and in such quantity as to confound out enemies and amaze our allies.

Without taking away one iota from the brilliant and gallant achievements of our armed forces, let me say that victory was made possible by the engineer. It was the engineer who found ways to do the impossible and to raise our productivity not only to meet but even to surpass the seemingly absurd quotas demanded of industry. If we could do such a whale of a job then with fewer engineers, what has happened to cause a shortage now when the total industrial production 8/ is but slightly more now than it was at the peak of the war? The answer is simple. We had only one job to do then and that was to win the war. We could concentrate our energies.

Today we have a defense production job of no small proportions but immensely more complicated because of the advances in the military art, added to a civilian program larger than anything previously enjoyed. Industry had enough engineers to take care of its civilian production needs but it did not have enough to satisfy the sudden

6/ Engineers Joint Council, News Letter, 29 August 1951.
7/ Ibid.
8/ F.R.B. Index

national defense needs as well. And I might add that the recruitment needs of the armed forces did not make matters any easier.

Let me review for you in broad terms some of the ways in which we use engineers in private civilian life. They are employed to find ways and means of increasing industrial productivity in order to keep costs down as low as possible. Under an imposed program of ceiling prices this has been industry's salvation. And, of course, it is this competitive and economic stimulus to constant improvement in productivity that keeps the United States in the lead as the arsenal of democracy. At the same time engineers are charged with the responsibility of improving our standard of living. Productivity is part of it by enabling the worker to work fewer hours for his automobile or his television set and thereby to have more for the hours he works each week. Another part of it is new and improved ways of living--construction, household devices, amusements, transportation, and utilities. For instance, one of the marvels of the postwar years has been the rapid expansion of television--an engineering achievement.

Engineers and scientists, whom we think of in industry almost in the same breath, are responsible for research which brings us new information on the behavior of matter from which come new devices to extend the boundaries of human happiness and human endeavor. And at the same time we pick up such interesting jobs as designing and building, in quantities, rugged radio tubes smaller than anything previously used commercially in quantity, yet with a life some ten to twenty times that of an ordinary tube. To the engineer is entrusted the efficient utilization of our raw materials. It's a tremendously important task because we know that there is a limit to the earth's bounty and that there are other nations more liberally supplied with some very important raw materials. When supplies get critically low and production must proceed, it is the engineer who gives us substitutes; nor is it unusual for the substitute to prove to be as good or even better than the original.

Our natural resources, communications, transportation, and utilities are wards of the engineer. Developed primarily for civilian living, they are indispensable to the armed forces. Electric generating capacity, for instance, will be almost double this year what it was 10 years ago. Thus in 10 years the manufacturers of generating and distrubution equipment had to do as large a job as they had previously done in 60 years, while the manufacturers of utilization equipment had the chore of making enough to use up this new capacity. That took engineering and lots of it, but it is ready for any emergency that this country will have to meet.

In addition to these broad categories of engineering responsibility, industry has found certain advantages in using men with technical training wherever technical matters might be involved, such as in sales, in purchasing, and in industrial relations. And now comes one that could

absorb many thousands of newly graduated engineers--foremen. This first rung in the management ladder not only offers an opportunity to start in on the ground floor, but it indicates a possible change in industry's attitude toward foremen. To use a simile, we are beginning to draw our noncoms from our officer training schools.

Altogether this is a pretty broad area of responsibility for such a small segment of our population. Nevertheless, each year the demands upon it are greater and now we have a shortage.

It is true that we have had a severe drop in engineering graduates and in enrollment in engineering schools. But even if the June graduates had been up to the peak level, there wouldn't be enough--and let us not forget that we have had peak levels of engineering graduates for only the past four years.9/ No, the problem is more deep seated than that. In my opinion, it involves the use we make of our engineers and in a way this shortage may, in the long run, prove to be most beneficial to the engineering profession as well as to industry.

Engineers are well paid now, but for a long time they were poorly paid by comparison with college-trained men in other professions. Supply and demand, of course, had more than a little to do with it, but an important factor was the type of work they were doing. Even so, I am none too sure that industry did not pay more to engineers for doing that kind of work than it would have had to pay to noncollege-trained people. In other words how much of our present shortage of engineers could be corrected if we replaced them on routine jobs with others especially trained for such work?

Industry has had to answer this question before in other fields, so engineering is nothing new except that it involves more highly educated personnel. For instance, industry used to demand journeyman machinists which meant men with seven years of apprenticeship. There were not enough machinists with that kind of training to man the machines of mass production, so industry trained men for special work in a fraction of the time it took for the over-all training. Industry will do the same with engineers--in fact, many manufacturers are already embarked on some such program. It is slow at the moment, probably because it is always difficult to change habits--and we have industrial habits just as we have personal habits. The benefits, however, will give momentum to the idea.

Engineers' time can be conserved by a greater use of assistants who have been trained to do much of the detail work that is attached to engineering work. I learned the other day of a company largely engaged in producing defense equipment that is clearing the red tape

9/ Engineers Joint Council, News Letter, N. Y., 29 Aug 1951.

for a 235-man engineering department with a group of eight nonengineers.10/ There are some things that can be done now that will be effective but just as the situation was a long time building up, it will take some time to make the necessary corrective adjustments. In the first place, not all engineers can be upgraded or, should I say, uprooted, because obviously there are many men who succeed in getting an engineering degree who will never be able to go beyond routine work.

Many men can be upgraded provided they are given some training and this will take time. In fact I have had a feeling all along that there was much to be gained in engineering manpower by encouraging professional development among engineers. They are human and, like anyone else, can get so deeply engrossed in a certain piece of work that they feel they are too busy to devote time to self-improvement. That's where they are wrong, of course, and something must be done to help them. Many of the new engineering problems of industry require knowledge that the older men did not get in college. Industry recognizes that it has a responsibility in this connection, if not to the individual at least to itself, and so much is being done by many companies to help its engineers keep abreast of technical progress.

Drafting of young engineers is a delicate subject because no class is supposed to be exempt in a democracy. Of course, the draft requirements cut down on the number of graduates available for industry and make the shortage just so much greater. However, the time these men are lost to industry is short and the draft of one year will be made up by the releases of those previously drafted.

But, industry asks, why, when these men are called up, can't they be placed where their education will do the most for the armed forces? I cannot believe a doctor would be put in the Infantry. Why put engineers there when there is such a need for them in engineering work? When you return these men to industry, will they have kept up their engineering or will they have been subjected to a two-year engineering vacuum at a time when they most needed to put their college training to the test of experience?

In addition to the draft of newly graduated engineers, there is another call which in some ways is harder to take. I refer to the calling of engineers out of industry for the armed forces or for other government work associated with national defense. These are not green engineers but trained men who, in all probability, are working on some phase of defense production. They are part of a team that is functioning at top pace and along comes a notice that not only breaks up that team but causes readjustments in several other places.

10/ Modern Industry, p. 40, 15 Apr 1952.

Is it not possible for the armed forces to re-examine the occupational status of men on reserve and, where reservists are engineers or scientists employed by companies with defense contracts, to refrain from putting them back in uniform? Of course, if certain kinds of engineers are needed, the need must be filled--but the decision might be made in such a way as to help defense preparations to the maximum.

If it is true, as reported 11/, that Russia is annually training 30,000 engineers and more than three times that number of scientists and technicians, then we might pause for a moment to re-evaluate our own situation. If Russia is embarked on any such program, it could mean only one thing to my lay mind; that is, Russia believes that the best defense is superior weapons and superior production. It would almost seem as though it was out to defeat us at our own game. I wonder if Russia drafts its young engineers and scientists for foxhole training.

Eventually, as in other job classifications that formerly were all male, there will be an invasion of technical occupations by women. Some, not many women are enrolled in engineering schools but I believe more can be expected. Certainly they can be used in the jobs that do not require a long formal training. There are some types of engineering work that are too rugged for women but that isn't true in industry. As we begin to upgrade engineers and so release to people with less technical education many of the jobs they formerly held, it is not at all unlikely that women will be attracted to the work.

In the past when engineers were plentiful, at times almost too plentiful, we were wasteful of their talents, just as we have been wasteful of our forests, our rivers, and our mines. Plenty always seems to bring a disregard for value. However, a shortage of engineers will not be permitted to affect seriously the smooth operation of industry any more than the shortage of some physical commodity. When the latter occurs people are put to work to find a substitute, preferably as good as or better than the original, after other surveys have determined the essential and the unessential uses. Many companies are now surveying their engineering requirements and are beginning to learn which parts of their operations can be classified as "unessential" in the use of professional personnel. But we cannot move people out of jobs until we have trained replacements.

So what we have today, as I see it, is a long-range program that has been forcibly brought to our attention by two things. One is the demand for engineers brought about by the imposition of a defense emergency on top of a record-high civilian economy. The second is that this came at a time when the number of graduates and the enrollment in engineering schools was falling off sharply. Together they brought about a shortage of engineers. Sooner or later a pinch in the supply

11/ Prof. A. C. Conrad (Yale) Electrical Engineering, p. 335, Apr 1952.

of engineers would have been brought about solely by the expanding civilian economy, but in that case industry would have seen its approach before a critical situation was reached. Now the fact of a shortage is brought to light with an abruptness that is startling. Like any other sudden shortage, industry was unprepared.

But I can promise you this: Industry will find a remedy and soon. And it could be, although this I am not promising, that, like most shortages when you put your combined will to its solution, this shortage will disappear and we shall once more be in comfortable supply.

Since you are here for the serious purpose of understanding the many facets of the civilian economy of the United States in order that you may better mobilize them in a national emergency, may I point out that while industry will solve its engineering shortage problem, it can do so only in terms of the civilian demand. When the armed forces impose upon industry an emergency demand, they cannot forever ask industry to make bricks without straw.

Modern long-drawn-out conflicts are won back of the line by the technicians who find ways to produce more and better so that the men in uniform will have an advantage over their adversaries. Think of them not as men who can be put into uniforms, nor as men who can be called to Washington as expediters, but rather as essential auxiliaries of the armed forces. On the job in industry, they can do more to help win a battle than they can carrying a rifle at the front.

If mobilization means anything, it must mean the disposition of our manpower and physical assets to provide the best national defense. If we are never to be too late with too little, we better all be sure that industry has enough engineers and technical talent to do the job we want done and on time. Now we will have questions.

QUESTION: Mr. Mitchell, by the very competitive nature of industry, you have engineers working on the same things that the engineers in another company are working on. Would advantages accrue from the services giving to one company an engineering mothering contract as a means of saving duplication of engineers?

MR MITCHELL: We do have a large amount of engineering duplication in industry. When each company is operating on its own, it has to do much of the same work as its competitors in the same field in order not to be left behind. I think the armed services can, by means of engineering mothering contracts to a single company, greatly reduce unnecessary duplication without subjecting the industry to judicial investigation.

QUESTION: Does industry have any training program that you know of to develop these subprofessionals so they could draw curves and do

data production and data reduction for these engineers and even direct some individuals?

MR. MITCHELL: In our own company we are training engineering assistants to handle the detail work for our central engineering top men. This is routine work, mostly of a paper nature, and some reports. We have not yet started to develop what you call subprofessionals. I am not acquainted with the details of our training of these subprofessionals but, since the work is not engineering per se, I do not believe that any special or long-drawn-out training is necessary. The important thing, as I see it, is to be careful to select people who are meticulous as to detail and who can get along well with people.

Other companies, I understand, are doing likewise and have found that their engineers can accomplish much more engineering than they could when hindered by routine detail. I have also heard of some companies that are training subprofessionals to undertake technical work. One school in New York is emphasizing training of that sort. A company that has for years used trained engineers as sales people is now turning to nontechnical people for that kind of work.

Remember that this shortage is rather recent and whatever we do in industry must have a more lasting effect than just the present. Training of this nature, however, will build up, in my opinion.

QUESTION: On this question of maximum contracting to private organizations, I have heard that one result frequently was a raiding of government engineers by the contractor to whom the order was given, so that the Government ended up no net gainer but had lost some men in the process. Would you care to comment on that?

MR. MITCHELL: I would not deny that some instances of that happened, but I would be surprised if in the over-all the Government was no net gainer.

Now, for instance, there are many companies, particularly in the California area, that didn't even exist in this field of electronics four years ago--or, if they did, they were what you might call "small fry"--and today have engineering departments ranging up into the hundreds and, in some instances, thousands of engineers. Those fellows did what you or I would do if we were faced with the same problem. They sold the atmosphere and climate of southern California to get engineers and they did it because 90 percent of the easterners who have never been to California have a yearning to live there. They raided the engineering staffs of electronics manufacturers and any other outfits that had desirable men--no question about it.

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But they weren't always successful. Some companies were using their engineering talent to the limit of their capacity. The engineers were so interested in what they were doing and felt that they were being appreciated so they would not leave; they were fascinated in the job they were doing. For most engineers the compensation for work is the satisfaction they get out of doing a good job. That and fair treatment mean much more than money in trying to wean engineers away from their present employers.

QUESTION: I realize the requirements for engineers in sales and procurement; but there have been a great many engineers attracted into the sales business because of greater remuneration or something like that. Would you care to comment on the extent of that?

MR. MITCHELL: You are right, some engineers are attracted to sales. The percentage is not--not nearly so high as manufacturers of technical products would like. In some cases it undoubtedly has stemmed from what the individual thought was a greater financial opportunity, but not in every case by any means. Some engineers actually want to sell. Some like to travel. Some are plain extroverts. Engineers do lots of things besides design, construct, operate, and maintain. Some teach, others write. Some take law and enter patent work. Some go into personnel work. Financing attracts a number. You can't say that it's money that woos them in more than a small percentage of cases. It generally is a kind of work that they like to do.

It is true that not so many years ago the engineer was not highly paid as a class. That situation has changed and I rather imagine that starting compensation in sales is less today than it is in engineering. Nevertheless, men will continue to switch because, after all, job satisfaction is nine-tenths of the reason for success.

QUESTION: What is the attitude of the professional man toward control which might cause him to be taken out of the job that he is holding, if we are at war, and put into some other job? And is industry giving any indoctrination course for professional men, explaining this situation to them?

MR. MITCHELL: Will you give a specific instance of what you mean by controls that take them out of one job and put them into another?

QUESTION: What I mean is controls over employment, which might result in an engineer who is employed on a good job in a nonessential by the government agency, or something of that kind.

MR. MITCHELL: My experience has been that the professional man doesn't want to be told by anybody what he is to do. He wants to be left alone to do what he wants to do. And he will generally try to do the best he can on the job if he is left alone. On the other hand

they are no less patriotic than anybody else. People are not oriented on the need for public service. Maybe that is something that we are going to have to undertake, the job of orienting our people on public service. In an emergency we do; but I am thinking more in terms of peace.

Let me suggest that there is a tremendous reserve of manpower available for public service. It is getting greater every year. It is in the fellows who work for companies that have a mandatory 65-year retirement age. There are lots of them at the age of 65 who are better men than a great many who are years younger.

QUESTION: This question has to do with training particularly and it begins with all our new electronic equipment. I am bringing it up because I have seen so much equipment go out of service about as soon as it goes to the field. It seems like industry should try to take a little more interest in keeping them going longer, because with the troops turning over so fast, you can't keep them on the job long enough. I wonder what industry would think of taking large groups of these people and taking them into production areas and letting them work through that area. It seems to me like it would help a lot in this particular field, and I don't mean these tech reps. Not these small groups, but large groups--bring them back into that training, so we have better continuity between industry and the services, particularly in the radar equipment.

MR. MITCHELL: My broad answer to you would be that in times of a manpower shortage, such as now, we would be pleased to have people to train on a somewhat lesser scale, so it wouldn't interrupt our normal production too much--say, two or three percent of our total. Let me make this observation, however. A little knowledge can be a dangerous thing. Just to work in a factory for a few weeks would not be of much help. There are a great many operations that go into the manufacture of any equipment and these are not learned, or better still understood, in a few days.

As for tech reps, I don't think I can speak for all industry here. But I know that Philco does have an appropriation for training tech reps to go out and work on its equipment all over the world. In Raytheon it is the same and in RCA likewise. I don't believe that the Philco fellow knows anything about the Raytheon equipment or that the RCA lad knows anything about that of the other two. But they are all experts on their own equipment.

It does seem to me to be some duplication of effort to have fellows who specialize in each manufacturer's equipment at every base where there is a lot of the complicated electronic equipment, to service only their own equipment. I think we ought to have some supertech reps, so that if we get into an emergency, they can work on both ours and Philco's.

My suggestion is: Why couldn't we have a tech rep school that taught them all the stuff on all the various guns? Maybe it is too complicated, but it would still be one way that you could end some duplication.

QUESTION: We have been told about industry combing through the senior classes and picking up the graduates in June. Is industry doing anything about going down to the high school level and encouraging boys to go into engineering?

MR. MITCHELL: Yes. Perhaps not so much industry as individual companies or through their associations, such as the American Society of Mechanical Engineers, Electrical Engineers, and so forth. Those fellows do a great deal of propaganda work--sending out literature and much more of it is planned for this fall and next spring. The Thomas A. Edison Foundation, for instance, is bringing groups of industrialists and secondary school people together state by state.

QUESTION: Apparently during the last war the Government entered to some extent into the education of professional people. What do you think of the Government cooperating or aiding in this training within industry, especially in this partial mobilization? Do you think the Government should enter the picture or do you think industry should do all the training of these engineers?

MR. MITCHELL: I think the Government should enter it in cooperation with industry. Training within industry as practiced in the last war and training of professional men are two different things. I do not think the Government can or should engage in the latter. On the other hand if what you had in mind is the training of subprofessional technicians, then I think the comparison with the training-within-industry program is fair and in times of emergency desirable.

Let me say that they can do it in cooperation and agreement with industry, which I am sure they can. But I don't think the two should have a similar system going on at the same time, with no coordination between the two, because I think that does not accomplish the purpose. My example of cooperation or coordination can be expressed by the so-called cooperative engineering schools in the country, where industry and education cooperate. I think it is a tremendous thing. I am sure the same thing could be true of industry and the military.

QUESTION: Almost every group you talk about thinks it is so important to the war effort that it says, "If you must draft those men, please use them in their special skill." How are we going to get the fighting men? Which is the group that is actually going to fight the war?

MR. MITCHELL: All business, all industry, all military, everything else, is a constant matter of compromise. I was once a consultant to

Paul Hoffman, when he was head of the Economic Cooperation Administration on the business of closing the dollar gap. Closing the dollar gap is very simple--all you have to do is increase your imports. I have spoken to many groups and said that we should take that step, and everybody agreed provided it wasn't his industry that had to meet the competition of foreign-made goods.

What you have to do is have some fellow who has a good, logical mind say: "All right. In my opinion there is more to it in this field than in that. So we will take a little more of this than we will of that." You are blamed if you do and blamed if you don't. There is no simple solution to it.

QUESTION: We hear a lot around Washington about small business. Would you care to comment on that in the present situation, particularly with respect to the idea of mothering engineering contracts.

MR. MITCHELL: My theory on small business is this: There is nothing in the world that promotes the prosperity of small business like having a lot of prosperous big businesses. You can go through the records of any big company, whether it is General Motors, RCA, or du Pont and you will be surprised at the dollar volume of business that they pass out in the normal course of their civilian business to companies with less than 500 employees, which is the arbitrary definition of small business.

Now, if our civilian folks on the Hill would recognize that fact and also the fact that incentive is the greatest thing in the world for getting the job done, then you would have a situation like this.

Let us suppose that the procurement people say to the big companies that are mothering a contract: "Because we want you to mother this project, we will give you a small percentage override on the amount of business that you subcontract." Then there would be an incentive to subcontract it.

Then let us suppose that the renegotiation people would say to small business: "Look, as long as this prime contractor, in whom we have faith, will vouch for the fact that his subcontract with you is at a fair price, we won't renegotiate you. You are free. We will just renegotiate the big companies." I would almost guarantee that you would solve your small business problem overnight, because the small businessman would then rather have a subcontract than a prime. He is getting the mothering company's engineering on his requirements. He is free from renegotiation worries.

There is still another phase of the big business vs. small business debate. I know of at least half a dozen contracts for complicated items of procurement, which the procurement people felt they had to give to small business but which, because of lack of engineering talent,

procurement, at the end of 18 months, had to cancel the contract and give it to a large company. The net loss to the military was not only the dollars involved in unsuccessful development but also the time, the 18 months, which in time of emergency could be very serious.

QUESTION: Your subject is primarily engineers. We have a lot of people under consideration who are not engineers, that the armed forces use, both civilians and military. A lot of those people don't come into contact with engineering, especially in the combatant activities. In some of them we don't need so much education as physical ability. Don't you hire all your people with the expectation that their brain is going to do the work and not their brawn?

MR. MITCHELL: Yes. We certainly do. I would say there may be some sweepers and some elevator operators where brawn is important.

QUESTION: That is the other half of my contention--where you don't have equipment or machines to do their work?

MR. MITCHELL: Yes. I agree with you.

A very large percentage of the girls that work in our small town plants are high school graduates; and they are fine, clean American girls who want to work. We get the more intelligent girls because there is no job in the whole company where we are not more interested in their brain than in their brawn. But then we are making small products--radio tubes and stuff like that. If we were making bridges or Diesel locomotives, maybe I wouldn't feel the same way. Maybe brawn would be more important there.

COMMANDER CASTELAZO: Our time has run out. I thank you for a very wonderful lecture and an explanation of not only the professional man in industry but management problems as well.

(4 Dec 1952--350)S/ss/ibc