## THE DEMING QUESTIONS

To: Deming Electronic Network
Date: 24 Jan 1996
Subject: Deming Questions # 1
------ DEMING QUESTIONS ------

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers.

By Jean-Marie Gogue

From: Jean-Marie Gogue

I guess that many DEN subscribers read again the Chapter 5 "Questions to Help Managers" of *Out of the Crisis*. Perhaps they wonder what to do with these questions. Let me suggest an approach upon which Dr. Deming would certainly agree.

The chapter contains 66 sets of questions, some with one element, some with several ones, a, b, c, etc. We could start from the beginning and study two sets of questions per week. This exercise would take 33 weeks, say one year.

Some people could study the questions individually. Other people could study them in a teamwork. The questions address all kinds of organizations: companies, schools, universities, hospitals, public services, etc. The aim would be to increase your knowledge about your organization. Your comments on Internet are not mandatory, but they would help.

## 1-1. (N° 1 in the Book) - Constancy of Purpose

- a) Has your company established constancy of purpose?
- b) If yes, what is the purpose? If no, what are the obstacles?
- c) Will this stated purpose stay fixed, or will it change as presidents come and go?
- d) Do all employees of your company know about this stated constancy of purpose (raison d'être), if you have formulated one ?
- e) How many believe it to the extent that it affects their work?
- f) Whom does your president answer to? Whom do your board of directors answer to?

#### **COMMENTS**

Try to understand what really exists, not what you wish or what your boss would like people believe. Sometimes the purpose can be self-destructive. Who has got a purpose? Who agrees and who disagrees?

#### 1-2. (N° 2 in the Book) - Vision of the Future

- a) Where would you wish your business to be five years from now?
- b) How do you think you will accomplish these aims?

These questions are difficult because they involve your personal business, your department's business, your companies' business and your countries' business. Try to see this as a system, think about all the interactions.

Date:	1	Feb	1996

Subject: Deming Questions # 2

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

Last week I proposed you to think about a first set of questions copied in Chapter 5 of Out the Crisis. My plan is to have a weekly page on the DEN for 33 weeks from now on, if the Moderator agrees. I just would propose 33 sets of questions in the book's order.

## 2-1. (N° 3 in the Book) - Learning whether the system is stable

- a) How may you learn whether, with respect to some quality characteristic, you have a stable process or stable system?
- b) If stable, where lies the main responsibility for further improvement? Why is it in this circumstance futile to plead with the plant manager, superintendents, division chiefs, and the work force, for better quality?
- c) If not stable, what is different? What would be different about your attempt to accomplish improvement?

#### **COMMENTS**

Some beginners tend to consider stability of a system, of a process, as a whole. A system may be stable with respect with 41 quality characteristics and unstable with respect with 3 quality characteristics. In question (a) don't forget the restriction "with respect to some quality characteristics". Some beginners tend to explore the only characteristics using in the monthly reports. SPC requires more curiosity.

## 2-2. (N° 4 in the Book) - Teamwork at the company level

- a) Have you established teams to work on each of the 14 points in Chapter 2, and on the deadly diseases and obstacles of Chapter 3?
- b) How are you doing on Point 14?
- c) What are you doing to create teamwork between purchasing and production?

### **COMMENTS**

If you have established teams, what can you do to improve their work? If not, how can you start? What would be required?

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Date: 9 Feb 1996

Subject: Deming Questions # 3

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

The last week's questions stressed on process stability and teamwork. They gave us the opportunity of reading again Point 14 (pages 86 to 94), where the PDSA Cycle, called "The Shewhart Cycle" is explained. Another reading of Point 14 is provided by the Henry Neave's book THE DEMING DIMENSION (pages 405 to 413).

Following the book's order, the menu of the week is:

## 3-1. (N° 5 in the Book) - Looking for stable processes in your company.

- a) Is absenteeism in your company a stable process?
- b) How about fires?
- c) How about accidents?
- d) If yes, where lies the responsibility for improvement? (Answer: with the management)

## **COMMENTS**

Deming suggests to study absenteeism, fires and accidents probably because the it's easy to find the relating data, but we may study other characteristics. You can find a lot of other characteristics about people in the organization, supplies, equipments, customers. These questions concern all kinds of organizations: production companies, service companies, public services, schools, hospitals, cities, states. Is the USA trade balance a stable process?

It's impossible to answer without plotting data on control charts. You cannot rely on the rule of thumb when you have to make a judgement about stability.

## 3-2. (Nº 6 in the Book) - Transformation is necessary for survival.

- a) Why is transformation of management necessary for survival?
- b) Are you creating a critical mass of people to help you to change?
- c) Why is this critical mass necessary?
- d) Do all levels of your management take part in the new philosophy?
- e) Can any of them initiate proposals for consideration? Do they?

Transformation of management is necessary for survival but unfortunately it's not enough. Companies, organizations, are subjected to the rules of the system they live in. A willing company might be punished by the system in the same way a willing worker might be punished in the Red Beads Experiment.

The major benefit of the transformation of management is to make your organization more clever to predict future and to find opportunities for improvement and survival.

Date: 16 Feb 1996
Subject: Deming Questions # 4
------ DEMING QUESTIONS ------

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

The last week's questions stressed on the fact that the present style of management is obsolete, producing huge losses, and that a transformation is required to survive. I remember that Deming once said: « transformation is not mandatory, but the survival of your organization is not mandatory either ».

Following the book's order, the menu of the week is:

## 4-1. (N° 7 in the Book) - Knowledge in a Service Organization

- a) What proportion of the people in your company know that you have a product, that this product is service?
- b) Does every employee know that he has a customer?
- c) How do you define quality? How do you measure it?
- d) Is your service better than it was a year ago? Why? How do you know?
- e) (If yes) Why is this?
- f) Do you have more than one vendor for any item that you purchase repeatedly?
- g) (If yes) Why is this?
- h) If you have one vendor for an item, do you have a long-term loyal relationship with him?
- i) Is absenteeism at a stable rate?

#### **COMMENTS**

The issue is everyone's knowledge about the corporate business. Knowledge is located in mind. Everyone builds his own knowledge from information. You cannot communicate knowledge directly from mind to mind: information is required, but information is not knowledge. The transformation of management aims at increasing knowledge, considered as a ressource of the company. These questions are helpful to check everyone's knowledge.

## 4-2. (N° 8 in the Book) - Knowledge in a construction company

- a) Is your service to your customers better than it was two years ago?
- b) In what way?
- c) What have you done to try to improve it?

#### **COMMENTS**

You may study these 12 questions as well if your company produces toys, bicycles, foods, computer programs, etc. It would be interesting to make a working group and to discuss that in a teamwork.

Date: 27 Feb 1996

Subject: Deming Questions # 5

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 5-1. (N° 9 in the Book) - What are you doing to create teamwork

- a) between design and production of product (or service)?
- b) between design and sales of product (or service)?
- c) between design and purchasing of product (or service)?

#### **COMMENTS**

There are two keywords in these questions: "teamwork" and "design". Let me suggest the reading of Chapter 3 of *The New Economics*, Introduction to a System, with the famous flow chart that Deming drew on the blackboard in front of an audience of Japanese top executives in August 1950. Design is an important node on this chart. The aim is to break down barriers that isolate design from the system.

Nobody is requested to deliver a message about the way to break down these barriers, but all the people who work in a company or any kind of organization would do very well to consider the organization as a system (including the psychology of the actors), to discuss together and make plans to create and improve teamwork.

A French joke about teamwork in Europe. Once, there was a storm in the Channel. First page headline of an English newspaper: Storm over the Channel - The Continent is isolated.

5-2. ( $N^{\circ}$  10 in the Book) - What are you doing to close the gap between design of product and service, and actual production and delivery? In other words, what are you doing to improve test of your product and your service before you go into production and delivery?

In my opinion, Deming wanted to prompt readers to focus on the Deming Cycle which is so important in Japanese companies (*Out of the Crisis* page 180): (1) Design the product, (2) Make it and test it, (3) Put it on the market, (4) Test it in service.

There are a lot of stories about the way the Japanese use the Deming Cycle. You will find a very instructive one in the Henry Neaves book "The Deming Dimension" page 148-149. Many Western managers worry about the poor design of product and service. How to improve design? Those who are acquainted with the Deming Cycle know that a company is always too slow to improve product and service when here is no comprehensive test before going into production and delivery. And how to improve test? That is the question. Top management might understand there is a real problem.

Date: 5 March 1996	
Subject: Deming Questions # 6	
DEMING QUESTIONS	

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 6-1. (N° 11 in the Book) - What steps are you taking to improve quality of :

- a) incoming materials for production?
- b) tools, machinery and non-productive items?
- c) internal communications (delivery of mail, papers, telephone, telegraph)?

## **COMMENTS**

The link between these three things is not obvious. I would say that Deming asks a question about some components of the production processes. The first difficulty raises with the word "quality". In the case of incoming materials, tools, machinery, racks, trucks, copier machines, internal mail, etc. I would say "quality" means ability to contribute to achieve the required process output.

Let me suggest you to focus on teamwork in order to understand how the process is running, to eliminate special causes and to reduce variations.

## 6-2. (N° 12 in the Book) - Questions about purchasing policy

- a) Does your purchasing department stick to the lowest bidder? If yes, why? And what is this policy costing you?
- b) Does cost of use come into consideration? How?

I am afraid that many purchasing departments are still sticking to the lowest bidder. But are they responsible for total cost of purchasing? What is the attitude of top management towards the purchasing department? In "The Deming Route", Dr. Scherkenbach wrote (p. 50): « Purchasing organizations in the automotive industry waste untold man-hours worrying about dimensioning the labor cost difference between Japan and the United States. One of the prime motives for this frenetic activity is to document their cost reductions vis-a-vis the Japanese to get a better annual rating. »

I will be away from my office until 16 March. The DEN Moderator will not receive my paper # 7 next week but the week after.

Date: 20 March 1996	
Subject: Deming Questions # 7	
DEMING QUESTIONS	

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 7-1. (N° 13 in the Book) - Program for improving relationships with your suppliers

- a) What is your program for reduction in number of suppliers?
- b) How do you proceed with the suppliers of four important items that you use on a regular basis, including commodities and transportation?
- c) For each of these items, how many suppliers have you now?

How many a year ago?

How many two years ago?

How many three years ago?

d) What is your program for developing long-term relationships of loyalty and trust with your suppliers (including commodities and transportation)?

## **COMMENTS**

The most helpful text I know about relationships with your suppliers is the appendix of *The New Economics*, 2nd edition, p. 227: "Continuing Purchase of Supplies and Services"

I like to quote this Deming's ironic comment: « The idea of several suppliers for any one item, competing with each other for lower prices (as advocated by some authors), makes good talk, but as a pratical matter it is only talk, even under long-term contracts. »

## 7-2. (N° 14 in the Book) - Performance rating

Do your people in management receive an annual performance rating? If yes, what are you doing to supplant this system with a better plan?

I have got on my files a posting dated 21 November 1995 from Sheri Marshall to the DEN, about performance appraisal. Let me quote his conclusion: « A question worth considering is: What are you trying to accomplish with performance appraisal? and what are your assumptions about people? » I would also like to mention that the G.M. Powertrain Division has eliminated performance appraisals, and still works efficiently.

Date: 27 March 1996	
Subject: Deming Questions # 8	
DEMING OUESTIONS	

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 8-1. (N° 15 in the Book) - Cost of engineering changes

Does your management know about the cost of engineering changes? What is the underlying cause of engineering changes? Do your engineers have time to do their work right in the first place? How are they rated? Do you see any problems with your system for rating your engineers? If yes, what are your planning to do about it?

#### **COMMENT**

What is engineering? Try to locate it on the flow diagram of your company, which helps you to view the company as a system.

## 8-2. (Nº 16 in the Book) - On the Job Training

Does training and retraining in any operation in your company teach the requirements of the next operation?

#### **COMMENT**

The top management should be aware that a worker cannot perform a good job without knowing the requirements of the next operation, and that this knowledge primarily comes from good training.

Date: 3 April 1996 Subject: Deming Questions # 9
DEMING QUESTIONS

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 9-1. (N° 17 in the Book) - Understanding the next operation's requirements

What proportion of your workers have a chance to understand the requirements of the next operation? Why does not everybody have an understanding of the next operation?

#### **COMMENTS**

This question is not only applicable to a factory, but also to every kind of organization: a school (what proportion of teachers...), an hospital (what proportion of nurses...), a city hall (what proportion of clerks...), etc.

Why do you fail to do it? One may ask if your top management cares whether people try to understand the requirements of the next operation or not, if the people who make this effort are recognized. How could someone learn the requirements of the next operation without a training program and the possibility to exchange with the next operator?

## 9-2. (N° 18 in the Book) - The huges losses due to lack of knowledge

How would you calculate the loss from failure of everyone to have a chance to understand the requirements of the next operation? (This is one of those unknown and unknowable figures - deadly disease in Ch. 3.)

#### **COMMENTS**

There is a lot of examples where awful problems occured because somebody was not aware of the requirements of the next operation. In every case we may appraise the cost of failure, even if the real figure is unknowable. I would be interested if the DEN subscribers could write some examples of huge losses due to Lack of Knowledge (LoK).

Date: 11 April 1996

Subject: Deming Questions # 10

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 10-1. (N° 19 in the Book) - Eliminate work standards

What is your program for elimination of work-standards (numbers, measured day work on the factory floor), replacing them by competent knowledge and leadership? (See Ch. 2)

#### **COMMENTS**

The question is not whether you want to eliminate work-standards or not, but how you will do it. When Deming says « replacing them by competent knowledge and leadership », he suggests that eliminating work-standards is a profound change that takes time, similar with learning to swim.

## 10-2. (N° 20 in the Book) - Management by objective, by numbers

- a) Do you manage by objectives? If yes, how much is this mode of management costing you? Do you understand what is wrong with this practice? What are you doing to replace it with better management? (Reference: Chs. 2 and 3.)
- b) Do you manage by numbers? (require a man to improve productivity or sales by a specified amount, or to reduce scrap or payroll or expenses by some specified amount, such as 6 per cent)? (Reference: Ch. 2 and 3.)
- c) Show that a figure that is forced (e.g. a requirement that the plant turns out 1 200 items every day, or that a salesman is expected to take orders for \$ 7200 per day) is not an example of a stable system. It is either meshed like gears, or the figures are adjusted through fear to meet the requirement but nothing more.

#### **COMMENTS**

Most people in top and middle management believe that Managing by Objectives is compulsory, except for amateurs and jokers. Their assumption is : « No forced figure, no authority ». Unfortunately, it's false. They don't believe that there is a better way, I mean the highly professional method that Deming taught. They don't want to try out. But seeing is necessary for believing. Behind the question  $N^{\circ}$  20, the message is : Remove management by objectives, remove management by numbers. It's worth a try!

Date: 19 April 1996

Subject: Deming Questions # 11

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

#### 11-1. (N° 21 in the Book) - Cultivate Leadership

Are you changing supervision to leadership, at least in some areas of your organization?

#### **COMMENTS**

Leadership is an ambiguous word that everyone believes he understands. A special term covering the concept of "Deming Style Leadership" would be helpful. This concept is a new way of dealing with other people in a community. This concept requires a sharp sense of variations. It is neither an innate quality, nor a matter of "common sense" but it has to be continually improved with learning.

## 11-2. (N° 22 in the Book) - The foreman's job

a) How do you select foremen? In other words, how do your foremen come to be foremen?

- b) What do your foremen know about the job?
- c) Do they know how to calculate who if anybody is in need of individual help, not part of the system?
- d) Do they know how to calculate who is outstanding, not part of the system?

Let me quote Deming. (1) Out of the Crisis, page 116: « The first step in a company will be to provide education in leadership. » (2) Out of the Crisis, page 77: « People in management are accustomed to long hours, faced with declining sales, declining quaterly dividends, increases in cost of almost everything. They have plenty to worry about. They can face these problems, but are helpless to face the problems of people. They shrug off problems of people with crab walk and wishful thinking, hoping that problems will go away. They establish employee involvement, employee participation, quality of work life, all as smoke screens. All these hopes wither away in a few months where the management is not ready to take actions on suggestions. »

Date: 28 April 1996

Subject: Deming Questions # 12

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 12-1. (N° 23 in the Book) - Elimination of piece work and incentive pay

- a) What are your plans for elimination of piece work?
- b) What are your plans for elimination of incentive pay?

## **COMMENTS**

The question is not to explain why piece work and incentive pay must be eliminated (point 12 in the 14 points) but to say how your company will do it. If your chief executive is an adept of incentive pay, you don't have to answer. On the contrary if top management wants to remove barriers that rob people of pride of workmanship, this question is an opportunity for you to suggest a plan for removing every kind of incentive pay.

## 12-2. N° 24 in the Book) - How management should address people about performance

- a) Would any good accrue to the morale of the people involved if the management sent a letter every month to dealers who did more than the average amount of business that month?
- b) How may you know which ones should receive commendation?
- c) How may you know which ones are in need of special help or special direction of some kind?

d) What about letters to people that fall below the average?

#### **COMMENTS**

Most people who attended either a Deming seminar or any conference where the Red Beads Experiment was performed can answer these questions without contradicting the Deming Philosophy. They may perceive Red Beads in their own work. Some people forget however that the Red Beads Experiment shows an imaginary situation, a situation without special causes, while any real business can exhibit some special causes. That is the question.

N.B. Could the DEN moderator make a survey in order to know the percentage of subscribers who attended a performance of the Red Beads Experiment?

Date: 7 May 1996

Subject: Deming Questions # 13

----- DEMING QUESTIONS ------

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 13-1. (N° 25 in the Book) - Pride of workmanship

What is your plan and what are you doing about it for removal of barriers that rob the hourly worker of his pride of workmanship?

#### **COMMENTS**

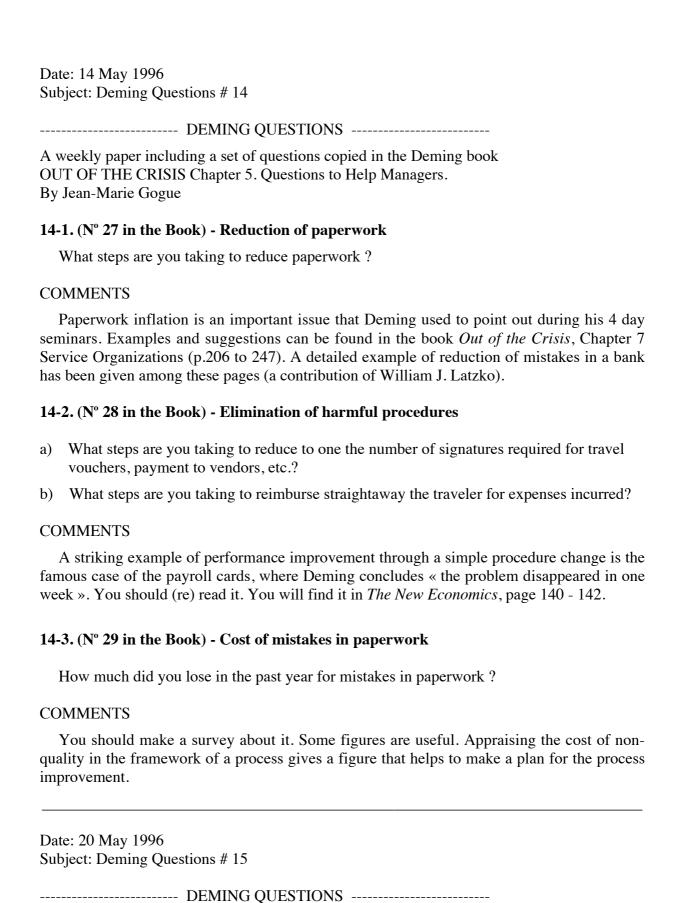
The question may be extended to everybody you deal with in such a way that you have some influence on his (her) work. For instance those you can help are your children, your pupils if you are a teacher, the employees you meet in a gas station, a restaurant, an airport, etc.

## 13-2. (N° 26 in the Book) - The emptiness of goals and exhortations

Do you plaster your walls with goals and exhortations? If yes, what are you doing to supplant them with news about activity of your management to reduce the barriers that rob the hourly worker of his pride of workmanship?

## **COMMENTS**

Deming suggests another type of information to display on your walls instead of goals and exhortations. It is explaining what management is doing month by month to purchase better quality of incoming materials, better maintenance, or to provide better training (*Out of the Crisis*, p. 69).



A weekly paper including a set of questions copied in the Deming book

OUT OF THE CRISIS Chapter 5. Questions to Help Managers.

By Jean-Marie Gogue

## 15-1. (N° 30 in the Book) - Plan for new products

- a) What is your program for development of new product and new service for the future?
- b) How do you plan to test your new designs or ideas?

#### **COMMENTS**

Making a plan for new products is the aim of Chapter 6 Quality and the Consumer, in *Out of the Crisis*. It's a very complex issue. The answer is "The New Way" described page 180. Deming explained "The New Way" in front of an audience of Japanese CEO's in Tokyo, 12 July 1950. Since this historical event, the Japanese have made thousands of seminars on the subject. Did your company adopt "The New Way"? And for people graduated from a business school: did you learn "The New Way" at the university?

[Moderator's note: For those new to the Deming philosophy and/or for those who may still be working through *Out of the Crisis*, could I suggest that those more proficient elaborate on "The New Way?" Thanks, Jim Clauson]

Date: 12 June 1996

Subject: Deming Questions # 16

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

# 16-1. (N° 31 in the Book) - Knowledge about your customers' relations with your products

- a) What do you know about the problems of your customers in the use of your products? What tests do you make of your products in service?
- b) How do your customers see your product in relation to competitive products? How do you know? What data have you?
- c) Why do they buy yours? How do you know? What data have you?
- d) What problems or dissatisfaction do customers see in your products? How do you know? What data have you?
- e) What problems or dissatisfaction do customers see in your competitors' products? How do you know? What data have you?

#### **COMMENTS**

The first idea that comes to my mind when I read these questions is: « There is no substitute for knowledge ». Everybody in the Top Management should keep in mind this sentence, especially when they take strategic decisions on the basis of so-called marketing surveys. Customers are too often questionned by incompetent people who don't care about the success of the company they are working for. I don't think that your boss, during his vacation time, would drive across an unknown river on the only basis of the statement of a walking

around kid who tells him: < OK, go ahead, the water is shallow, it never exceeds two feet depth >.

## 16-2. (N° 32 in the Book) - Vision of the future market

Will your customers of today be your customers a year hence? Two years hence?

#### **COMMENTS**

This question is not of the same nature as the others. It's a matter of self- examination. I urge you to ask your boss the question and to add this Deming's quotation:

« Have you ever heard of a plant that closed? Why did it close? Poor workmanship? Low productivity? Mistakes? Faults? Never. Because it was producing the wrong product. One that has no market. Not enough market. Management didn't look ahead ». The Wall Street Journal, Monday, June 4, 1990, pages R39-41.

Date: 17 June 1996

Subject: Deming Questions # 17

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 17-1. (N° 33 in the Book) - Knowledge about your customers' relations with your services

- a) Do your customers think that your product lives up to your expectations? What did your advertising and your salesmen lead your customers to expect? More than you can deliver? How do you know?
- b) (If applicable.) Are your customers satisfied with the service that you or your dealers provide? If yes, what is satisfactory about it? The quality of workmanship? The lag between your call and appearance of the serviceman? How do you know?

#### **COMMENTS**

Page 179 of *Out of the Crisis* we read: « In the olden days, before the industrial era, the tailor, the carpenter, the shoemaker, the milkman, the blacksmith knew his customers by name. He knew whether they were satisfied, and what he should do to improve appreciation for his product... With expansion of industry, this personal touch is easy to lose... But sampling, a new science, steps in and pierces that barrier. »

Dr. Deming said that in front of an audience of 24 Japanese top managers in Tokyo, July 1950. We know that this historical conference (the text is available) was the spark which started the Japanese industrial revolution.

The Japanese chief executives understood the Dr. Deming's message. Listening to the Voice of the Customer is everybodie's job. Sampling techniques can help. The American chief executives did not understand the Dr. Deming's message. They believed they had to create new categories of specialists (Quality Control, Marketing etc.). Wrong.

# 17-2. (N° 34 in the Book) - Everybody sees the quality of your product with his own eyes

- a) How do you distinguish between your quality as your customer perceives it and your quality as your plant manager and work force perceive it?
- b) How does the quality of your product, as your customer sees it, agree with the quality that you intended to give him?

#### **COMMENTS**

Everybody has heard of some large manufacturing companies who lost their customers and went to bankruptcy during the last two decades. Their names were famous but they disappeared. The former managers argued that they suffered from unfair competition. False. They failed because they confused their own feeling about the quality of their products with the customer's one.

Date: 29 June 1996	
Subject: Deming Questions # 18	
DEMING OUESTIONS	

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 18-1. (N° 35 in the Book) - Knowledge about your customers' psychology

- a) Do you depend on complaints from customers to learn what is wrong with your product or service?
- b) Do you depend on costs on warranty?

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#### **COMMENTS**

When Deming was asking: « Do you depend on warranty? » you could get the impression he asked a disabled person: « Do you depend on crutches to walk? ».

Everybody needs to know what makes the customers unhappy. Good idea. This information will enable the company to make corrective actions on the product or service. But the belief that this information is given by the complaints from customers is a mistake. Too late. Remember what Mr. Robert W. Peach, a friend of Dr Deming, said: « The goods come back, but not the customer » (*Out of the Crisis*, p. 175). Moreover, most customers have disagreements about your product or service, but they don't tell them. A company cannot

escape from his obligation to have a continual dialogue with his customers. Same about warranty. There is no substitute for knowledge; there is no substitute for a positive dialogue.

## 18-2. (N° 36 in the Book) - How to stay in business with your customers

- a) Why is that customers switch?
- b) Where lies your main chance for profit ? (Repeat customers)
- c) What must you do to hold on to a customer?

#### **COMMENTS**

Dr. Yoshio Kondo, Professor emeritus, Kyoto University, said that there are three concepts of product quality: (1) conformance to specifications, (2) satisfaction of the customer, (3) amazement of the customer. What is the best one to keep faithful customers?

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Date: 6 July 1996

Subject: Deming Questions # 19

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 19-1. (N° 37 in the Book) - Exploring the future business

- a) Who makes the decision about whether to buy your product?
- b) What new design would serve better four years from now?

#### **COMMENTS**

These questions are the most important and the most difficult to answer. If a company can predict that a new design will result in tremendous sales, they are nearly invincible. But neither in *Out of the Crisis* nor in *The New Economics* Deming provides a solution.

Let's come back to the C. I. Lewis' statement: « Knowing begins and ends in experience; but it does not end in the experience in which it begins ». Knowledge is prediction. When a company has made the Deming transformation the capital of knowledge is cultivated with great care, for everybody has understood that it's the most important resources. When knowledge improves, the ability to predict the future business improves.

## 19-2. (No 38 in the Book) - The inspection status in your company

- a) What inspection or verification are you carrying out on incoming materials?
- b) What inspection or verification are you carrying out in process?

c) What inspection or verification are you carrying out on final product?

#### **COMMENTS**

Inspection is necessary, inspection must be documented by procedures, but inspection must not be installed for ever. Remember point 3: "Cease dependence on mass inspection".

Some organizations suffocate to death under a lot of inspections that got settled, year after year, one over the other, in successive layers, like geological layers. Nobody understands the cause of the disease.

Date: 18 July 1996

Subject: Deming Questions #20

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 20-1. (N° 39 in the Book) - Reliability of inspection and test

- a) How reliable is your inspection at each of these points? How do you know?
- b) What data have you to show whether your inspectors are in line with each other?
- c) What about your test instruments, or rather, your use of them? Can you present evidence of statistical control of the system of measurement or classification? Visually? Or by instrument?

#### **COMMENTS**

Perhaps some readers may think they are not concerned, but inspection exists everywhere. Administration, police, schools, universities, department stores, wine shops, doctors, etc. have inspection. Even families with children have inspection.

The concept of inspection suffers from the Taylor's cliche' of the inspector in a factory, sorting out defective products. But Deming was not an engineer, and his teachings were not devoted to factories. In the Deming philosophy, inspection is one of the three steps of the universal cycle proposed by Shewhart in 1938: Specification, Production, Inspection, that he transformed into the Deming cycle: Design, Make, Put on the market, Test in service. Thus inspection is related to Knowledge.

Misunderstanding about the aim of inspection leads to a poor inspection system, that is a big source of waste. This question is a gold mine.

## 20-2. (N° 40 in the Book) - Optimizing the cost of inspection

a) Where is inspection being carried out where no inspection would minimize total cost?

b) At which points are you carrying out no inspection where you ought to carry out 100 per cent inspection to minimize cost ? (See Ch. 15.)

#### **COMMENTS**

I remember visiting a French manufacturing plant with Dr. Deming in 1980. In the inspection and test areas he asked questions about the cost of materials, the investments, the time of operations, the percentage of defects. Two weeks later, I received a letter where he explained that their inspection system was far from the optimum. In some places they were perfectly under control, with almost no failures, but with 100 % inspection. In other places, no inspection, but they were out of control with a huge cost of defects. He made calculations to estimate the possible savings by reorganizing inspection: about 2 % of their sales.

Date: 26 July 1996
Subject: Deming Questions # 21
----- DEMING QUESTIONS ------

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 21-1. (N° 41 in the Book) - Inspection records

- a) What records do you keep of your inspections? In what form? In the form of control charts or run charts? If not, why not?
- b) What other use do you make of the records that you keep?
- c) If you keep no record, why don't you?
- d) If you keep no records at some point, why don't you cut the inspection there?

#### **COMMENTS**

Out of the Crisis is full of excellent stories, e.g., page 9. There were 24 people on the line. The inspector would take a case of items as it went by her, inspect them, and record the results, then intercept another case for inspection. « What do you do with the tickets you fill out? » Answer: « I put them on the pile here, and when the pile gets too high, I discard the bottom half into the trash. »

Dr. Deming was a consultant, just a consultant. Supposing the chief executive is visiting the factory, would it be foolish of him to ask such a question?

## 21-2. (N° 42 in the Book) - Material unfitted for production

a) How much material that goes into the production line is used in desperation by the production manager (invariably with waste of material or rework or both)? Try to answer the above question for two or three important production lines.) How often do you encounter examples like the following? (i) - Material that met the specification but was not suited to the process or to the finished product. (ii) - Inspection of incoming material

- was considered to be necessary, but inspection was hurried or skipped, owing to high vacuum on the production side.
- b) How much incoming material turns out to be totally unusable in the judgment of the production managers? (Again, answer this question only for two or three important production lines.)
- c) What system have you for report and correction of these problems?

Many production systems are incoherent because of a bad management. When the losses become intolerable, they find a solution: slimming, throwing out thousands of people. But the problem remains.

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Subject: Deming Questions # 22

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 22-1. (N° 43 in the Book) - Statistical control of suppliers

- a) What arrangements have you with your suppliers for receipt from them of evidence of statistical control, so that you may safely decrease inspection?
- b) What cooperative work are you carrying on with your suppliers to make sure that you are both talking about the same kind of centimeter, and the same kind of test?

## **COMMENTS**

The state of statistical control is necessary for improving quality and reducing cost. Any organization has thousands of quality characteristics, each one is either state of statistical control or not. All of them must be in a state of statistical control. The statistical control of a quality characteristic enables a company to make (1) predictions, (2) savings by through variation shrinkage. Your suppliers must be in a state of statistical control because they belong to your system.

When people understand that statistical control in the whole system is needed to stay in business, they know why it is so important to have the best cooperation with the suppliers.

## 22-2. (N° 44 in the Book) - Waste in production due to purchased material

- a) What are you doing to make quality (and productivity) everybody's job, including management?
- b) Do you know the loss that ensues from a defective item or product or from a mistake at any point along the line?

The point is that a failure of any component in the system can make the failure of the whole system happen. The traditional Western management (Management by Results) is unable to prevent failures, even through motivation campaigns. The Deming style of management (Management by Knowledge of the System) is able to prevent failures.

Date: 24 August 1996

Subject: Deming Questions # 23

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 23-1. (N° 45 in the Book) - Incoming inspection

Are you still using Military Standard 105D or Dodge-Romig plans for sale or for purchase of materials ? Why ? (See Ch. 15.)

#### **COMMENTS**

In America since 1960 and up now the Quality Control Managers have been educated according to the idea that their company could be successful without fair relationships with their suppliers, provided they have an efficient "carrot and stick" system. The Military Standard 105D - statistical incoming inspection - was presented as a cheap substitute for a dialogue with the suppliers. Deming destroyed the myth during the 80's.

## 23-2. (N° 46 in the Book) - Cost of defects from the supplier

What proportion of your costs are chargeable to defects inherited from previous operations?

#### **COMMENTS**

Deming said that the most important figures are unknown and unknowable, but he did not say that the all the known figures should be disregarded. Some known figures are essential for the success of the company. The cost of defects (if you can really find the defect causes) is a good start for improvement plans.

Date: 2 September 1996

Subject: Deming Questions # 24

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 24-1. (N° 47 in the Book) - Troubles caused by people and management responsibility

What proportion of the troubles that you have with quality and productivity are the fault of (i) the production workers? (ii) the system (management responsibility)? How do you know? (answer this question for three or four items only.)

#### **COMMENTS**

Deming estimated that 6 % of the troubles in an organization are the fault of people and 94 % the fault of the system (*Out of the Crisis*, p. 315). Perhaps the proportion is different in your company: it would be useful to know the actual figures. Many executives are inclined to believe that more than 90 % of the troubles in their company are the fault of people, but you cannot prove they are wrong without control charts. If an executive admits that more than 90 % of the troubles are the fault of the system, he will take an interest in control charts. When control charts are used properly, the company will eliminate troubles caused by the system, instead of increasing troubles and making production workers unhappy (as well as management people), because of inadequate actions due to confusion between common causes and special causes (tampering).

## 24-2. (N° 48 in the Book) - Consequences of handling damages

How much loss do you attribute to handling damage (i) along the production line? (ii) in packing, transportation, installation? What data have you on these problems? What are you doing about them?

#### **COMMENTS**

The cost of handling damages is an useful figure for management. There are two ways to eliminate handling damages: better protection of the product and training production workers. It is the management responsibility, because handling damages are the fault of the system. Exhortations are useless.

Date: 9 September 1996

Subject: Deming Questions # 25

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 25-1. (N° 49 in the Book) - Training of new employees

What are you doing to improve the training of new employees? What about retraining to keep up with new product and new procedures and new equipment?

## **COMMENTS**

The present economic situation incites companies to reduce all the expenses which are not necessary on the short term. Most executives consider that training new employees is

necessary, but that the current practice to send them to a training center where they will spend many days with competent instructors is too expensive. Management aims at giving old employees the responsibility to train new employees. The result is a drastic deterioration of workmanship. (Funnel Rule No 4. Deming said: « Off we go to the Milky Way ».)

## 25-2. (N° 50 in the Book) - Some actions are never repeated

- a) Why is that every endeavour to put out a product or service is one of a kind? (Once the plans are part way under action, subsequent changes are costly in time and money.) There is accordingly little chance for improvement, once the original plans go into action.
- b) Why is that lessons for training for a job, or lessons for retraining for a new job, or lessons on the piano or on the violin, are one of a kind? (A pupil once taught can not be reconstructed.)

#### **COMMENTS**

This is a philosophical matter. When we put out a new service, or when we learn something, like playing the piano, we build a particular system. Deming showed evidence that a system is difficult to change. (See Ch. 3 of *The New Economics*.)

Date: 16 September 1996

Subject: Deming Questions # 26

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 26-1. (N° 51 in the Book) - Deming in a job shop

- a) Are your customers better satisfied now, one by one, than they were two years ago? Why?
- b) How about materials and equipment? How many suppliers have you for any one type?
- c) If more than one, why? What steps are you taking towards reduction?
- d) How about maintenance of equipment: improving?
- e) How about performance on the job?
- f) How about your turnover rate?
- g) What about repeated operations that do not change with the product : do you keep a running record and a control chart of some of them ?
- h) Are some of your problems stable? If the answer is yes, where lies the responsibility for improvement?

« The present style of management is the biggest producer of waste, causing huge losses whose magnitudes can not be evaluated, can not be measured. » Deming, *The New Economics* (page 22). What is the number of job shops in your country? What is the total amount of the national waste caused by their poor management? Who will pay?

## 26-2. (N° 52 in the Book) - Understanding the concept of Training

- a) Do your people that are engaged in training understand when an employee is trained and when he is not yet trained?
- b) Do they know that they have only one chance? That an employee once trained can not be helped by further training in the same procedures?

#### **COMMENTS**

The concept of Training is misunderstood by executives and even HR managers in many companies. People consider training is a commodity, a purchased product which makes folks have skill in the same sense as when you say a cleansing product makes furniture shine. False. Training has no "mechanical" effect, except in some skills, e.g., typewriting. It aims at facilitating a learning process which is hidden in the individual mind. A training session is one of a kind. The effect of training can be evaluated with control charts (*Out of the Crisis*, page 252).

Date: 23 September 1996

Subject: Deming Questions # 27

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 27-1. (N° 53 in the Book) - Numerical goals for production

Are you guilty of setting numerical goals on the factory floor for production?

#### **COMMENTS**

This question should address not only the plant managers of manufacturing companies but also everybody in industry, services, trade, government and education. Numerical goals result in much distress and frustration. Deming gives striking examples of the damaging effects of numerical goals in the chapter 2 of *The New Economics*: "Heavy Losses".

## 27-2. (N° 54 in the Book) - Understanding the statistician's job

a) If you have a competent statistician in your company, are you making maximum use of his knowledge and ability?

- b) Is he teaching statistical thinking to your management, engineers, chemists, physicists, production workers, foremen, supervisors, purchasing agents, in your department of commercial research and design of future product?
- c) Do you send him to statistical meetings?
- d) Is he working throughout your company to find problems and to find causes and results of corrective action? Is he working on all your problems of design, quality, procurement, specifications, testing of instruments?
- e) Does he have authority and responsibility to look anywhere in the company for problems, and to work on them? If not, why not? (Ch. 16.)

How can you judge somebody is a "competent statistician" when you are not a statistician? There are charlatans everywhere. The only way is to rely on the community of competent statisticians. The W. Edwards Deming Institute is the most valuable source of information in this respect.

Date: 30 September 1996

Subject: Deming Questions # 28

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 28-1. (N° 55 in the Book) - Corporate Statistical Culture

- a) Are you trying to set up your statistical work in conformance with the best interests of the company?
- b) If you have no competent statistician, what efforts are you putting forth to find one to help you with your problems of quality, productivity, procurements, redesign of product?

#### **COMMENTS**

Additional comment to the last week question 27-2 (No 55 in the Book): Deming gives useful indications about the statistician's job (*Out of the Crisis* page 466). « He must be a man of unquestioned ability. He will assume leadership in statistical methodology throughout the company. He will have authority from top management to be a participant in any activity that in his judgment is worth his pursuit. He will be a regular participant in any major meeting of the president and staff. He has the right and obligation to ask questions about any activity, and he is entitled to responsible answers. The choice of application for him to pursue must be left to his judgment, not to the judgment of others, though he will, of course, try to be helpful to anyone that asks for advice. The non-statistician can not always recognize a statistical problem when he sees one. » This statement should be written on a poster and stuck on the wall of the corporate statistician's office (if any).

Statistics is a new language for management. The CEO and staff must speak and understand it, as Eugene Taurman wrote on 18 Sep 1996. The corporate statistician is their teacher. This implies that he (or she) has to deal with confidential matters. He (or she) is a trustworthy person.

## 28-2. (N° 56 in the Book) - Self-improvement of people

Do you encourage self-improvement of your people? How? In what way?

#### **COMMENTS**

Society produces forces of destruction that discourage self-improvement of people. We have been injured since childhood. Your company must replace these forces with management that will restore the power of the individual (see *The New Economics* page 122).

Fear is the major obstacle to self improvement of people. We must drive out fear first.

Date: 7 October 1996

Subject: Deming Questions # 29

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 29-1. (N° 57 in the Book) - Education of people

Do you have an educational program within the company?

## **COMMENTS**

Some companies have a library, a photo laboratory, a radio amateur station, etc. They invite their people to conferences, theater evenings, etc. There are many ways to facilitate education of people. That depends on the country, the corporate technology, the corporate culture. An educational program anyway requires time and money.

## 29-2. (N° 58 in the Book) - Education of people (following)

Do you provide information to your employees about courses in local schools?

## **COMMENTS**

None

Date: 14 October 1996 Subject: Deming Questions # 30	
DEMING QUESTIONS	

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 30-1. (N° 59 in the Book) - Management by figures

- a) Do you run your company on visible figures alone?
- b) If yes, why?
- c) What steps are your management taking to learn the importance of figures unknown and unknowable?

## **COMMENTS**

The great majority of people believe that a company MUST be run on visible figures alone. Why? They want a scientific management -- right way -- but they believe that "Scientific" means "Based on Figures Only" -- wrong. A good instance of a scientific approach that is not based on figures alone is modern medecine. Perhaps many diseases could be explained better with unknown figures. Visible figures (e.g. heart pulse) can help however.

#### 30-2. (N° 60 in the Book) - Involvement in Standard Organizations

Does your company participate in committees of standardizing bodies?

## **COMMENTS**

Standard committees are good sources of knowledge. The late lamented Dr. Kaoru Ishikawa was involved in JIS (Japanese Industrial Standards) and ISO committees. He wrote: « In implementing Quality Control in various industries, it became clear that the existing Japanese Industrial Standards were not adequate or accurate ».

Date: 21 October 1996
Subject: Deming Questions # 31
DEMING QUESTIONS

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 31-1. (N° 61 in the Book) - Citizenship

What is your company doing for the community?

The first duty of companies to the community should be to provide jobs. As Deming wrote in the preface of *Out of the Crisis*: « it is no longer socially acceptable to dump employees on to the heap of unemployed ».

## 31-2. (N° 62 in the Book) - Technical Motivations

Do you rid yourself of problems with people on the factory floor by establishing EI (Employee Involvement) groups, EPG (Employee Participation Groups), QC-Circles, QWL (Quality of Work Life), and then leave them stranded with no participation of management?

#### **COMMENTS**

Managers expect that professionals of psychology will provide them with methods for solving problems of people. A lot of methods had been proposed but none of them had proved satisfactory until the Red Beads Experiment showed the good way. In my opinion, this failure to find effective leadership methods explains why managers tend to escape from these problems and take refuge in the universe of the management figures. Let me quote Deming:

« People in management are accustomed to long hours, faced with declining sales, declining quaterly dividends, increases in costs of almost everything. They have plenty to worry about. They can face these problems, but are helpless to face the problems of people. They shrug off problems of people with crab walk and wishful thinking, hoping that the problems will go away. They establish employee involvement, employee participation, quality of work life, all as smoke screens. All these hopes wither away in a few months where the management is not ready to take action on suggestions. » (Out of the Crisis p. 77-78.)

Date: 23 October 1996

Subject: Deming Questions # 32

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

#### 32-1. (N° 63 in the Book) - Continual improvement

- a) Are all activities in the company taking part in improvement? Are some lying dormant?
- b) What steps are you taking to discover dormant areas, and to help them?

### **COMMENTS**

According to traditional management (carrot & stick system), numerical goals are incentives to improvement. It's a big mistake because numerical goals demand that people improve a few activities in the company while most of the others are considered as simple routine. People are not willing to improve their activity by themselves when they feel that their management does not care about it, and that perhaps they will be punished for doing it!

To discover dormant areas, if you are a manager, the only way I know is to become acquainted with the processes. Myron Tribus and Yoshikazu Tsuda explain the method in their paper: "Planning the Quality Visit", a chapter of the book "Quality First" published by the National Society of Professional Engineers, 1420 King Street, Alexandria, VA 22314 (703) 684 2800.

## 32-2. (N° 64 in the Book) - Management's job in a stable system

- a) What is your understanding of a stable system?
- b) Has some annoying problem of quality or of low productivity stabilized? How do you know? Why were efforts to bring improvement so effective and encouraging at first? Why did quality level off towards a stable system (Ch. 11)?
- c) If a process has stabilized, whose responsibility is it to invent and apply methods and changes for improvement?

#### **COMMENTS**

The word "system" in question (a) risks to be misleading. It means "system of causes", not "system of components". The question could be as well: « What is your understanding of a stable characteristic? »

Deming raises the problem of a stable characteristic that you must improve in order to be competitive, e.g. defect rate. Yes, efforts to bring improvement are very effective and encouraging at first, because people find special causes of variation (*Out of the Crisis* p. 323). But when the system is stable (with common causes of variation only) it's more difficult to improve it. In this case, never react to variation, you would increase future variation (by tampering). Faced with a stable system, nobody else than the manager can invent and apply changes for improvement. The method must be based on the System of Profound Knowledge.

Date: 30 October 1996

Subject: Deming Questions # 33

----- DEMING QUESTIONS -----

A weekly paper including a set of questions copied in the Deming book OUT OF THE CRISIS Chapter 5. Questions to Help Managers. By Jean-Marie Gogue

## 33-1. (Nº 65 in the Book) - Management mistakes about motivation

Are you depending on EI (Employee Involvement), EPG (Employee Participation Groups), QWL (Quality of Work Life), QC-Circles, posters, exhortations, for quality, instead of doing your job?

This question looks like question N° 62. Let me quote Deming again « Another false start is QC-Circles. The idea has appeal. The production worker can tell us a lot about what is wrong and how improvements can be made... A QC-Circle can thrive only if the management will take action on the recommendation of the Circle. Many QC-Circles are, I fear, management's hope for a lazy way out. » (*Out of the Crisis* p. 136.)

## 33-2. (Nº 66 in the Book) - Vision of quality in the future

What are you doing about quality that you hope to provide to your customers four years from now?

#### **COMMENTS**

My personal commitment is to continually improve my knowledge so as to serve my clients better. Four years from now, that means November 2000. Deming would be 100 years old.

Dr. Deming said that a system cannot understand himself, that the transformation requires a view from outside. It is the reason why he could help his clients to transform their system. One might argue that transforming the United States of America required a view from outside, whereas Deming was inside. False! No doubt that Dr Deming was a genuine American citizen, but he was outside the American system. He was free from any political system.

Now Dr. Deming is no longer with us, who will help America to make the required transformation? and given that I am an European, I ask: who will help Europe to make it?

The chapter 5 of *Out of the Crisis* ends with a very important advice: « The list of questions for the Deming Application Prize, page 188 in the Kaoru Ishikawa's book: *What is Total Quality Control?* (Prentice-Hall, 1985), may be a helpful extension here. »

That's all, folks!

I send my sincere thanks to the DEN subscribers who contributed to this long study of the Deming's work. I learned much from them.

Special thanks to Eugene Taurman for so many helpful comments.

Special thanks to Jim Clauson, our devoted moderator.

Thanks also to those who read my papers in silence.

I hope that many people will continue to learn from the Deming's books, *OUT OF THE CRISIS* and *THE NEW ECONOMICS*. They are an inexhaustible source of knowledge.

I have done my best.

Jean-Marie Gogue